Staphylinina
(Coleoptera: Staphylinidae) of Poland

Scientific editors
Andrzej Mazur, Andrzej Melke

Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu

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Contents

From the Authors

Over 40 years have passed since the publication of two scientific studies, which have had such a significant impact on the state of our knowledge on Staphylininae in Poland. The first was book 24e from the series "Taxonomic keys to the identification of Polish insects" [Klucze do oznaczania owadów Polski], devoted to the subfamily Staphylininae[1]. The other publication was the 7th volume of the "Catalogue of Polish fauna" [Katalog fauny Polski][2] comprising data on the occurrence of species from this subfamily throughout Poland. Professor Andrzej Szujecki, the pioneer of studies on rove beetles (Staphylinidae) in Poland, was their author and co-author, respectively.

Andrzej Szujecki was also the author of all taxonomic keys for the identification of rove beetles published in the years 1961–2013[3]. It were these studies that greatly contributed to the popularisation of knowledge on Staphylinidae.

Initially the scientific interests of Prof. Szujecki focused on problems in the ecology and faunistics of Staphylinidae, as well as biology of development and morphology of immature stages in Staphylininae. However, the primary direction of research initiated and developed by Prof. Szujecki was connected with the valuation of forest ecosystems using zooindication methods. Diversity of rove beetle assemblages in forest habitats was investigated within the framework of several research projects realised both in natural forests, considered as models, as well as commercial (managed) forests subjected to cyclical silvicultural and protection operations. Research results have been implemented in forestry practice and inspired many further faunistic, valuation and ecological studies[4].

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[1] Szujecki, A. (1980). Kusakowate – Staphylinidae: Kusaki – Staphylininae. Klucze do oznaczania owadów Polski, cz. XIX, z. 24e. Warszawa, Wrocław: PWN.

[2] Burakowski, B., Mroczkowski, M., & Stefańska, J. (1980). Chrząszcze – Coleoptera. Kusakowate – Staphylinidae, cz. 2. Katalog Fauny Polski, XXIII, 7. Warszawa.

[3] Tracz, H., Mazur, A., Klimaszewski, J., Byk, A. (2018). In memoriam: Prof. hab. Andrzej Szujecki, PhD – Portrait and Scientific Achievements. *Acta Sci. Pol. Silv. Colendar. Ratio Ind. Lignar*., **17**(1), 5–16.

[4] Tracz, H., Byk, A. (2021). Drogi ku proekologicznemu modelowi gospodarki leśnej w Polsce. Historia działalności Stacji Terenowej Kształtowania i Ochrony Ekosystemu Leśnego w Starej Brdzie Pilskiej. Warszawa: Wyd. SGGW.

In the early 1990s Professor Szujecki, while serving as an undersecretary of state at the Ministry of Environmental Protection, Natural Resources and Forestry exerted considerable influence on the Forestry Policy of Poland and the implementation of principles of sustainable development and environmentally-friendly management to the model of Polish forestry. This resulted from his conviction that forest is common good[5].

After retiring Professor Szujecki still continued to participate in research works conducted at the Department and devoted much of his time to entomological studies. During that period two successive issues were published comprising keys to the identification of Omaliinae together with Oxytelinae[6] and Tachyporinae[7]. In turn, the publication summing up the entire scientific output of Professor Szujecki concerning Staphylinidae and valuation of forest habitats using unique characteristics of this group of beetles is entitled "Rove beetles of Polish forests" [Kusakowate lasów Polski][8] – a beautifully illustrated book popularising the species and ecological diversity of this beetle family, most numerous in terms of the number of species.

We are deeply grateful to our colleague Andrzej Melke for his concept to publish a monograph presenting the latest data on the occurrence of the largest Staphylinina from the subtribe Staphylinina in Poland, dedicated to the memory of Professor Andrzej Szujecki. Thanks to his multifaceted collaboration with numerous individuals and institutions it has been possible to collect such an extensive body of unpublished faunistic data concerning the occurrence of Staphylinina in Poland. In this way this abundant collection of information greatly exceeded the volume acceptable for publication in any scientific journal. This naturally led to the proposal to further expand its scope and present all the data as a scientific monograph. The application filed in 2019 by the PULS University Publishers Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu for the publication of such a monograph was accepted for financing within the framework of the Ministry of Education and Sciences programme "Excellent Science – Support for scientific monographs".

We would like to present to our Readers the results of our work, which significantly supplement and expand knowledge on the occurrence of beetles from

[5] Tracz, H., Byk, A. (2017). Sylwetka i osiągnięcia naukowe prof. dr. hab. Andrzeja Szujeckiego – wspomnienie pośmiertne. *Sylwan*, **161**(11), 958–968.

[6] Szujecki, A. (2008). Wstęp oraz podrodziny: Micropeplinae, Piestinae, Osoriinae, Pseudopsiinae, Phloeocharinae, Olisthaerinae, Proteininae, Omaliinae, Oxytelinae, Oxyporinae. Kusakowate – Staphylinidae. Chrząszcze – Coleoptera. Klucze do oznaczania owadów Polski, cz. XIX, z. 24a. Toruń: PTE.

[7] Szujecki, A. (2013). Podrodzina: Skorogonki – Tachyporinae. Kusakowate – Staphylinidae. Chrząszcze – Coleoptera. Klucze do oznaczania owadów Polski, cz. XIX, z. 24f. Toruń: PTE.

[8] Szujecki, A. (2017). Kusakowate (Staphylinidae) lasów Polski. Aspekt różnorodności i monitoringu zooindykacyjnego. Warszawa: CILP.

the family Staphylinidae in this part of Europe. We are fully aware that advances in this special area of entomology have been made possible thanks to the seminal works of Professor Andrzej Szujecki.

Poznań – Kalisz, September 2021

Post Scriptum

Andrzej Melke died suddenly and unexpectedly while working on the final draft of this manuscript. At that time one of the issues we were discussing was the wording of the paragraph at the top of this page. It was Andrzej's intention to change it and with his characteristic modesty he wanted to remove his name as the initiator of the concept for the monograph on Staphylinina in Poland. Still we are all absolutely positive that it was thanks to his enormous dedication and massive efforts that the primary part of this manuscript was prepared.

Andrzej has published (as an author or co-author) 75 scientific publications, mainly original articles and chapters of monographs published in the years 1994-2022. During this period, he identified 36 species of Staphylinidae as new to the fauna of Poland[9].

With Andrzej we lost a unique Colleague and a dear Friend – a specialist in the taxonomy and ecology of rove beetles, admired for his exceptional expertise in all the subtleties and intricacies of identification of Staphylinidae.

Authors

[9] Ruta, R. (2022). Andrzej Melke (1964-2021). *Wiad. Entomol.*, 41(2), online A, 2-8. DOI: 10.5281/zenedo.6673154

In memoriam

by Henryk Tracz

Professor Andrzej Szujecki. Still from the film – an interview on the problems of the Białowieża Forest (photo The Forest Oral History Archiv, Library of the Forest Research Institute, Sękocin Stary)

In memory of Professor dr hab. Andrzej Szujecki, *dr h.c. multi*

Professor Andrzej Szujecki was born on 31th July 1929 in Stawiska, Kolno county. He started his elementary education in Lwów (Lviv) and his formal school education was interrupted when Soviet troops invaded Poland – after they entered Lwów his family was deported in April 1940 to Kazakhstan. In 1942 Andrzej Szujecki was evacuated together with the Polish Army commanded by Gen. Władysław Anders to Iran, where he stayed for two years and then in the years 1944–1947 lived in Polish settlements in India and Northern Rhodesia (Lusaka, present-day Zambia), where he graduated from the 3rd class of grammar school. He returned to Poland in 1947 and after 2 years of schooling at a junior and later senior secondary school in Ostrów Mazowiecka, he took his final

secondary education examination in Warsaw. In 1953 he completed his studies at the Faculty of Forestry, the Warsaw University of Life Sciences – SGGW graduating based on his M.Sc. thesis prepared in the field of forest protection and entomology under the supervision of Professor Marian Nunberg. In 1962 he was awarded a Ph.D. title in forestry sciences. Four years later he was awarded his habilitation (post-doctoral) title based on a dissertation concerning the ecology of rove beetles (Staphylinidae), where he indicated for the first time the adverse impact of clear-cutting on viability of forest ecosystems. In 1967 he was awarded the Associate Professor [docent] title, while seven years later – the title of Assistant Professor [profesor nadzwyczajny]. In 1980 he was granted the title of full professor. In 1987 Professor Szujecki was elected a corresponding member of the Polish Academy of Sciences (PAS), while in 2002 he became an ordinary member of PAS. For his scientific, social and organisational accomplishments he was awarded two honorary doctoral titles – doctor honoris causa: by the Warsaw University of Life Sciences – SGGW in 1999 and the Agricultural University of Poznań in 2002.

Scientific interests of Professor Andrzej Szujecki focused mainly on problems concerning protection of forest ecosystems, ecological engineering and entomology (taxonomy, faunistics, ecology). Professor Szujecki developed extensive studies on the effect of anthropopressure on forest ecosystems, particularly the impact of human interference on litter and soil insect associations, providing the methodological foundations for zooindication and zooindicator valuation of forest ecosystems. He presented the concept of forest ecological engineering, hylosozology[1] and a new model for forest management, focused on the ecosystem rather than a stand.

The entire body of Professor Szujecki's published works comprises over 250 scientific publications and popular science articles. The best known include "Ecology of forest insects" (1980; 1984), published also in English by PWN and Dr. W. Junk Publishers in the Netherlands in 1987. In 1996 and 1998 a highly praised and valuable academic textbook "Forest entomology" (vol. I and II) was published.

The outstanding entomological interests of Professor Szujecki may be evidenced by his last book published by the State Forests in 2017, dedicated to a wide range of readers and entitled "Rove beetles (Staphylinidae) of Polish forests in view of diversity and zooindicator monitoring". This particularly valuable,

[1] The term "hylosozology" according to Professor Szujecki means: protection of forest resources. The subject of interest in hylosozology are threats and protection of forest ecosystems, as well as protection of forest formation at any spatial scale, and methods of preserving forest sustainability - an element of modern and future civilization. It is a term introduced into the literature by the professor (Szujecki A. 2000. Hylosozologia – nauka XXI wieku. In: H. Malinowski (Ed.), Stan i perspektywy badań z zakresu ochrony lasu (pp. 9–19). Warszawa: IBL).

beautifully illustrated and meticulously edited book presents the richness and species diversity of rove beetles in different forest habitats, both in lowland and mountain areas, as well as the use of this insect group in bioindication and valuation of forest habitats. This publication to a considerable extent is based on the individual scientific accomplishments of Professor Szujecki, as well as those of other well-known authors, specialising in this group of insects. A few years earlier, in 2008 when he was already retired his study on the family Staphylinidae was published within the series of monographs "Taxonomic keys to the identification of Polish insects". This publication, keenly awaited by the Polish entomologist community, especially specialists investigating this family, has become the crowning achievement of Professor Andrzej Szujecki in the field of entomology and it was met with high acclaim. It needs to be stressed that Professor Szujecki was an author of all (5) books concerning rove beetles within the series of taxonomic keys covering 15 subfamilies and approx. 700 species of *Staphylinidae*, which were published in the years 1961–2013 by the Polish Entomological Society.

Professor Andrzej Szujecki knew how to create a community of enthusiasts and specialists in *Staphylinidae* from many scientific centres in Poland – as evidenced for example by this publication.

Professor Andrzej Szujecki died on 9th October 2017 at the age of 88 years. He is buried at the Służewiec cemetery at the St. Catherine church in Warszawa. He was a man who exerted a tremendous impact on Polish forestry – environmentally friendly and sustainable forestry. He left us with his outstanding accomplishments in forestry, entomological and ecological sciences.

Professor dr hab. Andrzej Szujecki as a member of the Polish Academy of Sciences

by Małgorzata Mańka

Among the various types of activity and accomplishments of Prof. Andrzej Szujecki we need to mention also his membership in the Polish Academy of Sciences. Professor Szujecki in 1989 was elected a corresponding member of PAS, Division V Agricultural and Forestry Sciences PAS, while in 2002 – an ordinary member of PAS (at that time renamed to Division V Agricultural, Forestry and Veterinary Sciences).

A motion to appoint Prof. Andrzej Jerzy Szujecki as a corresponding member of the Polish Academy of Sciences was presented in December 1988 by prof. dr Wiesław Grochowski, an ordinary member of PAS (from the Forest Research Institute), prof. dr Karol Mańka, an ordinary member of PAS (from the Agricultural University of Poznań), prof. dr hab. Eugeniusz Bernadzki, a corresponding member of PAS (from the Warsaw University of Life Sciences), prof. dr hab. Ryszard Babicki, a corresponding member of PAS (from the Wood Technology Institute in Poznań) and prof. dr hab. Janusz Haman, an ordinary member of PAS (from the Agricultural University of Lublin and the Warsaw University of Life Sciences – SGGW).

Earlier, in the years 1984–1985, Professor Szujecki was a deputy secretary of Division II Biological Sciences PAS, while in the years 1985–1986 he was a deputy secretary of Division V Agricultural and Forestry Sciences PAS. Professor Andrzej Szujecki worked in four scientific committees of PAS: from 1968 he was a member of the Committee on Forestry Sciences PAS, in the years 1981–1983 a member of the Committee on Ecology PAS, in the period of 1981–1987 the Committee on Zoology PAS and in the years 1998–2002 a member of the Committee on Nature Conservation PAS. In the first of the above-mentioned committees he served two terms as the deputy chairman (1976–1981). In 1981 he was elected the chairman of the Polish Forestry Society and thus starting from 1982 he was a member of the Committee on Forestry Sciences Council PAS.

Professor Andrzej Szujecki was also a member of the Committee on Humans and the Environment at the PAS Presidium (1987–1990), in the years 1990–1992 serving the function of the vice-chairman, as well as a member of the National Committee on Cooperation with the International Geosphere-Biosphere Programme IGBP Global Change (1993–1998).

In the years 1984–1987 Professor Andrzej Szujecki was also a chairman of the Scientific Council of the Institute of Ecology PAS in Dziekanów Leśny. He was granted the award of Divison V Agricultural, Forestry and Veterinary Sciences PAS three times (1967, 1981, 2007) for his scientific publications, while in 2007 he received the Michał Oczapowski Medal, the highest distinction awarded by PAS Division V to individuals and institutions for their outstanding contribution to the development of agricultural sciences in Poland.

The Michał Oczapowski Medal, the highest distinction awarded by Polish Academy of Sciences, Division V – Agricultural and Forestry Sciences (medal made by the Polish artist, sculptor, professor Bronisław Chromy; https://instytucja.pan.pl/)

1. Introduction

by Andrzej Mazur & Andrzej Melke†

The first Staphylinidae species described, named and classified in the 10th edition of "Systema Naturae" by Carl Linné (Linnaeus) was *Staphylinus hirtus*, i.e. presently *Emus hirtus* (Linnaeus, 1758). Along with 18 other species, classified by the author to one genus *Staphylinus*, these taxa provided a certain foundation for the further classification of Staphylinidae. At present these species are classified to 15 genera, among others from the subfamilies Staphylininae (genera *Emus*, *Ontholestes*, *Creophilus*, *Staphylinus*, *Philonthus*, *Quedius*), as well as Oxyporinae, Paederinae, Tachyporinae, Steninae, Aleocharinae and Omaliinae. Carl Linnaeus in the next years (1761 and 1767) described seven other species (Smetana & Herman, 2001). In the period from mid-18th century to the end of the 20th century (specifically in the years 1758–2000) a total of 45 700 Staphylinidae species were described, which accounted for 14% of all beetles and 5% of all animals. In turn, only within the 20 years of the 21st century the number of described Staphylinidae species increased to 63 000 (e.g. Elven *et* al., 2010; Irmler *et* al., 2018), which makes this family of beetles one of the most speciose families worldwide, not only among insects, but all animals.

Staphylininae from the subtribe Staphylinina Latreille, 1802 are easily distinguishable and are termed "charismatic species" (Brunke *et* al., 2015) due to their body size and predatory lifestyle, manifested in their huge mandibles and their agility despite considerable body size. The subtribe Staphylinina groups large and medium-sized species, of 9–42 mm in body length. The millennium catalogue of Staphylinidae (Herman, 2001) classifies 41 genera with 780 species within this subtribe. To date over 900 species belonging to almost 50 genera have been identified (Schillhammer, 2011). A total of 34 genera (562 species and subspecies) have been reported from the Palearctic, of which representatives of 33 species classified to 9 genera are found in Poland (Staniec, 2004a). It is likely that another four species may also be identified here. These include *Tasgius falcifer falcifer* (Nordm., 1837) and *Platydracus flavopunctatus* (Latr., 1804), possibly also *Dinothenarus flavocephalus flavocephalus* (Goeze, 1774) and *Ocypus mus* (Brullé, 1832). All these species are already known from countries neighbouring Poland, in the South or South-east separated only by the Carpathian Mts. or limited in their range by too low winter temperatures or other climatic

conditions. However, this may change in the future together with further climate change in Europe.

Staphylinina are predatory beetles both in the larval stage and as imagines. They feed on invertebrates, mainly insects. As epigeic organisms they are typically associated with the forest floor, while in open space habitats it is with the surface soil layer, where they tend to be found in the vegetation cover, under mosses, stones, lying logs, stems or within rotten stumps. They are particularly common in decaying plant residue (less often in decomposing animal matter), in compost, fruiting bodies of large mushrooms as well as sites where tree and plant sap is deposited. Some Staphylinina species colonise excrements of wild and domestic animals. Three species are commonly found in synanthropic habitats, particularly within urban areas. Feeding preferences of Staphylinina species have been determined only in the case of single species, considered useful as predatory species hunting fly larvae. Examples include American studies on the developmental biology of *Creophilus maxillosus* (L., 1758) to assess their potential application to control fly populations on commercial cattle farms (Greene, 1996). In Italy investigations were conducted on predation of *Ocypus olens* (Müll., 1764) towards pupae of the fly *Bactrocera oleae* (Diptera: Tephritidae) to a considerable extent reducing olive fruit production and which overwinters in the soil as pupae (Albertini *et* al., 2018). Beetles of this Staphylininae species also hunt earthworms, insects, including ground beetles (Carabidae), isopods (*Oniscus* species), soft larvae and slugs (Nield, 1976; Gruttke, 1992; Bonacci *et* al., 2006). In Poland studies were conducted on predation of *O. olens* in relation to larvae and pupae of butterflies and Hymenopterans overwintering in the leaf litter of pine coniferous forests and prone to gradations (Korczyński *et* al., 2016). Cases have been reported of *Platydracus stercorarius* (Ol. 1795) hunting worker ants from the genera *Tetramorium* Mayr, 1855, *Lasius* Fabr., 1804 and *Myrmica* Latr., 1804 (Horion, 1965).

Similarly as in the case of other species from the family Staphylinidae, early developmental forms of Staphylininae are probably found in the same microhabitats as imagines, as indicated by field observations in the case of e.g. *Ontholestes murinus*, *Ocypus fulvipes*, or *O. nitens nitens* (Staniec, 2004b; Staniec *et* al., 2009; unpublished data). Larvae of representatives of this subtribe differ from the other species of the tribe Staphylinini in their relatively larger body size, compact body, typically broad, strongly sclerotised, dark head capsule and dark thoracic tergites (see Chapter 4). In the Polish species two phenological development types are distinguished: autumn-spring and spring-summer.

In reference to the present-day territory of Poland data on the occurrence of Staphylinina date back to the early 19th century. The first reports were rather unprecise and represent single descriptions of species provided by Johan Ludwig Gravenhorst (e.g. *Ocypus tenebricosus*, *locus typicus*: Schlesien; Smetana & Herman, 2001). Johan L. Gravenhorst was an outstanding entomologist and museologist, a creator of the natural science museum at the newly-founded

Königliche Universität zu Breslau (1811) as well as a promoter of scientific activity (Pawłowski, 2006). A larger body of frequently more systematic data comes from the second half of the 19th century and particularly from the early 20th century, describing the occurrence of Staphylinina in Lower and Upper Silesia, in southern Wielkopolska, in Western Pomerania and in the Masurian Lake District (Lentz, 1853; 1857; 1879; Letzner, 1871; 1886, Gerhardt, 1910a; Lüllwitz, 1916). These were the historical regions belonging at that time to the Kingdom of Prussia. Analogously, several faunistic reports published in the 19th century came from the historical region of Galicia (German Galizien; Łomnicki, 1866; 1884; Nowicki, 1864; 1865; 1873; Wachtl, 1870; Kotula, 1873; 1874), particularly referring to the Tatra Mts. (Łomnicki, 1868; Nowicki, 1868) and Babia Góra (Stobiecki, 1883). In the period between WWI and WWII new faunistic data were published for the Roztocze region (Tenenbaum, 1913; 1926), the area of Przemyśl (Trella 1929; 1936) and the Wielkopolska region (Szulczewski, 1922; Myrdzik, 1933) from Bielinek nad Odrą (Zumpt, 1931; Engel, 1938) and the area of Skwierzyna (Arnold, 1936).

Following WWII, particularly starting from the 1960s increased interest could be observed in faunistic and ecological studies with a growing number of reports on the occurrence of both single species and beetle assemblages, thus initiating zoocenological studies. Results of such research (e.g. Pawłowski, 1967 – "Chrząszcze Babiej Góry…", Szujecki, 1966c – "Kształtowanie się stosunków ilościowych i jakościowych…") provided not only lists of species identified in a given area, but also described quantitative relationships between species (elements) of these assemblages. In this respect Staphylinidae assemblages constituted an important test group, based on which the methodology of valuation studies was developed for forest ecosystems (Nowosad & Mazur, 2010), areas of nature value, such as e.g. the Białowieża Forest (Szujecki, 2001; 2006), the Bieszczady Mts. (Szujecki, 1996) as well as specific habitats, such as the coastal coniferous forest of the *Empetro nigri-Pinetum* plant association (Smoleński, 2000a; 2000b), montane coniferous forests of the Sudety Mts. (Mazur, 2012), raised bogs (Sławska & Smoleński, 2003) and burrows of mammals (Nowosad, 1990; 2000), or the microhabitat under the tree bark (Tykarski, 2006).

Nevertheless, the entire body of literature concerning faunistics and ecology of rove beetles from Poland lacks a publication dedicated solely to species from the subtribe Staphylinina. In contrast, such narrow-scope studies have been presented for regions neighbouring Poland, such as e.g. Mecklenburg-Western Pomerania (Kleeberg & Uhlig, 2011), Saxony (Gollkowski, 2003), the Orlické Mts. (Jelínek, 2001) and Latvia (Cibuļskis, 2007). A separate publication on the distribution of Staphylinina was published for Portugal (Ferreira, 2018).

The aim of this monograph was to revise entomological collections, present unpublished faunistic data and analyse phenological and zoogeographical findings in relation to species from the subtribe Staphylinina found in Poland.

2. Systematic position of the subtribe Staphylinina

by Dagmara Żyła

The most recent studies concerning the phylogenetic relationships of the subfamily Staphylininae (sensu Newton & Thayer, 1992) and between its tribes were published in 2020 by Żyła & Solodovnikov. Those authors proposed to exclude the tribes Arrowinini, Platyprosopini, Diochini, Othiini, Maorothiini and Xantholinini, and restrict Staphylininae to what had previously been treated as the tribe Staphylinini (Żyła & Solodovnikov, 2020). Further, they elevated most former subtribes of Staphylinini to tribe status, while Staphylinini in the new sense has been restricted to the lineage earlier informally called "Staphylinini propria", which comprises the subtribes Algonina, Anisolinina, Philonthina, Philothalpina, Staphylinina and Xanthopygina (Żyła & Solodovnikov, 2020).

The relationships between the subtribes of Staphylinini (sensu Żyła & Solodovnikov, 2020) have been discussed in several studies that addressed different questions concerning Staphylininae (sensu Newton & Thayer, 1992). Most of them focused on the composition and relationships of the tribe Quediini (sensu Żyła & Solodovnikov, 2020), but in all cases the former "Staphylinini propria" were comprised in the taxon sampling (e.g., Solodovnikov & Schomann, 2009; Chatzimanolis *et* al., 2010; Brunke & Solodovnikov, 2013; Brunke *et* al., 2015; Brunke *et* al., 2021). Other publications that included representatives of Staphylinina concerned one of the closely related subtribes, i.e. Philonthina (e.g. Chani-Posse *et* al., 2018) and Xanthopygina (e.g. Chatzimanolis, 2014). In all of these studies, the subtribe Staphylinina was recovered as monophyletic; however, it was with a largely restricted taxon sampling for the group. All the analyses based either partly or entirely on molecular data resolved the subtribe Anisolinina as the sister group to Staphylinina (Chatzimanolis *et* al., 2010; Brunke *et* al., 2015; Brunke & Smetana, 2019). However, the position of this monophyletic clade within Staphylinini remains unresolved.

The only phylogenomic study with wider taxon sampling for Staphylininae and more than a single representative of Staphylinina is that of Brunke *et* al. (2021), where the authors used an anchored hybrid enrichment approach to resolve relationships of the tribe Quediini. The two included species of Staphylinina were resolved together and then again, sister to Anisolinina, corroborating

the previous molecular studies. Altogether, they were confirmed as sister to the tribes Algonina and Philonthina (Brunke *et* al., 2021).

Table 2.1. Examples of phylogenetic studies with more than four representatives of Staphylinina

Paper	Solodovnikov & Schomann, 2009	Chatzimanolis *et* al., 2010	Brunke & Solodovnikov, 2013	Brunke *et* al., 2015	Chani-Posse *et* al., 2018	Brunke & Smetana, 2019
Number of Staphylinina taxa	5 (including *Euristus* Fauvel, 1899)	11	6	5	7	19
Sister group	All other subtribes of Staphylinini	Anisolinina	Xanthopygina + Philonthina	Anisolinina	Anisolinina	Anisolinina
Type of data	morphological	molecular (4 loci)	morphological	molecular (7 loci)	molecular (7 loci) + morphological	molecular (7 loci) + morphological

Those phylogenetic analyses of Staphylininae, which included broader taxon sampling for the subtribe (Brunke *et* al., 2015; Chani-Posse *et* al., 2018; Chatzimanolis *et* al., 2010), have revealed at least three distinctive lineages in Staphylinina. They were named and summarised in a paper by Brunke & Smetana (2019), which is also the only recent phylogenetic study targeting the internal relationships of Staphylinina, while describing a new genus from China. The lineages are as follows: the *Creophilus* group, the *Ocypus* group, and the *Platydracus* group (Fig. 2.1).

The authors suggested and further confirmed that the first group would refer to the *Creophilus* complex of Clarke (2011) and could be defined by at least one morphological synapomorphy, unique to the group, i.e. a ventral basal ridge of the head separate from the postoccipital suture and not parallel to the postoccipital suture. In recent phylogenetic studies that included molecular data, the *Creophilus* group was resolved as the sister group of all other sampled Staphylinina (Brunke & Smetana, 2019; Chani-Posse *et* al., 2018; Chatzimanolis *et* al., 2010). Genera that are currently considered to be part of this informal group include *Creophilus* Leach, *Cafioquedus* Sharp, *Hadropinus* Sharp, *Hadrotes* Maklin, *Liusus* Sharp, and *Thinopinus* LeConte. In the same studies (e.g. Brunke & Smetana, 2019; Chani-Posse *et* al., 2018), the *Ocypus* and *Platydracus* groups were considered as sister to each other.

The *Ocypus* group consists of the genera *Ocypus* Leach, *Dinothenarus* Thomson, *Tasgius* Stephens, and those comprising the former *Eucibdelus* lineage (e.g. see Schillhammer, 2012), previously the subtribe Eucibdelina. Brunke & Smetana

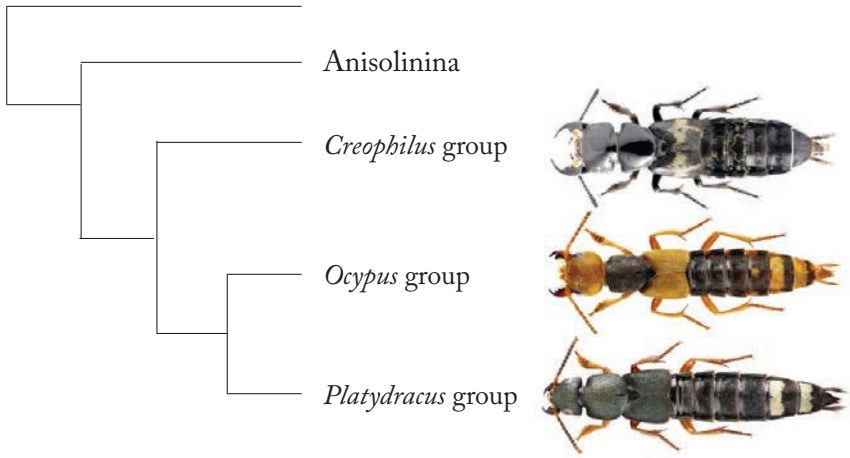


Fig. 2.1. Summary of results of molecular-based phylogenetic analyses (pictures by K.V. Makarov; from the top: *Creophilus maxillosus* (L., 1758), *Dinothenarus chrysocomus* (Mann., 1830), *Platydracus fulvipes* (Scop., 1763))

(2019) listed three morphological synapomorphies that support the clade: parascutellar seta 2 (Brunke & Smetana, 2019; Fig. 3, PsP), absent, median lobe at least slightly asymmetrical, and a paramere with asymmetrical torsion.

The final major clade, identified by Chatzimanolis *et* al. (2010) and corroborated later in part by other studies with fewer taxa (Chani-Posse *et* al., 2018) and in a publication by Brunke & Smetana (2019), included the genera *Naddia* Fauvel, *Ontholestes* Ganglbauer, and *Platydracus* Thomson. Brunke & Smetana (2019) added five more genera in their analysis that were resolved in this group: *Abemus* Mulsant & Rey, *Emus* Leach, *Leistotrophus* Perty, *Lesonthotes* Smetana & Brunke, *Saniderus* Fauvel, and *Thoracostrongylus* Bernhauer. Those authors also hypothesised that *Boothia* Rougemont, from Borneo, and tropical African genera *Bafutella* Levasseur, *Paragastrisus* Bernhauer, and *Pancarpius* Bondroit may also belong to this group. In an analysis presented by Brunke & Smetana (2019) this clade was supported by four morphological synapomorphies: presence of tooth T3; the pronotum with appressed and pale microsetae; and an anterior disc of the pronotum facing the hind margin of the head abruptly flattened and usually glabrous (Brunke & Smetana 2019; Fig. 3, P).

Even though the study by Brunke & Smetana (2019) has been the most complex for Staphylinina conducted to date, the taxon sampling covered only a small part of the subtribe diversity. The authors expect that with a more targeted taxon sampling for the group, an even larger number of distinctive lineages

may be discovered in the future. Among them, the most enigmatic remains the position of the type genus of the whole family Staphylinidae, a morphologically distinctive, Holarctic genus *Staphylinus* Linnaeus, which has never been included into any molecular-based phylogenetic analysis.

3. Morphology

by Andrzej Mazur & Radosław Witkowski

Rove beetles (Staphylinidae) are a family of beetles with specific and unique morphological traits. It was distinguished to comprise beetles with short elytra, which typically cover only the first frontal thoracic segments. A feature of Staphylinidae characterisitic to that family is that the first two thoracic tergites covered with elytra are incompletely sclerotised and membranous. In turn, the other thoracic segments (including tergites) have hard chitin terga and are articulated, which makes it possible to move the abdomen up and down, as well as sideways. This characteristic is also specific to rove beetles with longer elytra, classified into the subfamilies Scaphidiinae Latr., 1806 and Dasycerinae Reitt., 1887 as well as the genus *Eusphalerum* Kr., 1857.

Shortening of elytra (i.e. brachelytry) is a feature manifested independently also in other families and groups of beetles, e.g. clown beetles (Histeridae) and large carrion beetles (Silphidae). However, in these cases elytra reveal only several posterior segments of the abdomen, tergites under elytra are membranous and the abdominal segments are strongly fused. Moreover, in rove beetles with long elytras on the crown there are eyelets that are absent in representatives of other families (Szujecki, 2008; Assing & Schülke, 2011).

The subfamily Staphylininae Latr., 1802, comprises the largest beetles in terms of their body size. Body length of European species ranges from 3-35 mm. This trait is commonly used as a key characteristic in the identification of Staphylininae. Apart from body size this subfamily is also distinguished by a set of Staphylininae-specific traits – elongated body, strongly reduced elytra and a large head with a specific location of the antennae attached at a such a large distance from each other that the distance between their scape of each antenna exceeds the distance from the scape to the eye margin.

The subfamily Staphylininae is divided into 7 tribes, comprising 300 genera and over 6700 species, of which 3 tribes occur in Central Europe. These are **Staphylinini** Latr., 1802, **Xantholinini** Er., 1839 and **Othiini** Thoms., 1859 (Schillhammer, 2011). The key trait for the tribe Staphylinini is assumed to be a lack of a sclerotised *anterior prosternum* (Fig. 3.1, 3.2A), which is found in the other tribes (Assing, 2008; 2010) – Othiini and Xantholinini. These tribes until recently were included in the subfamily Xantholininae (cf. Szujecki, 1976).

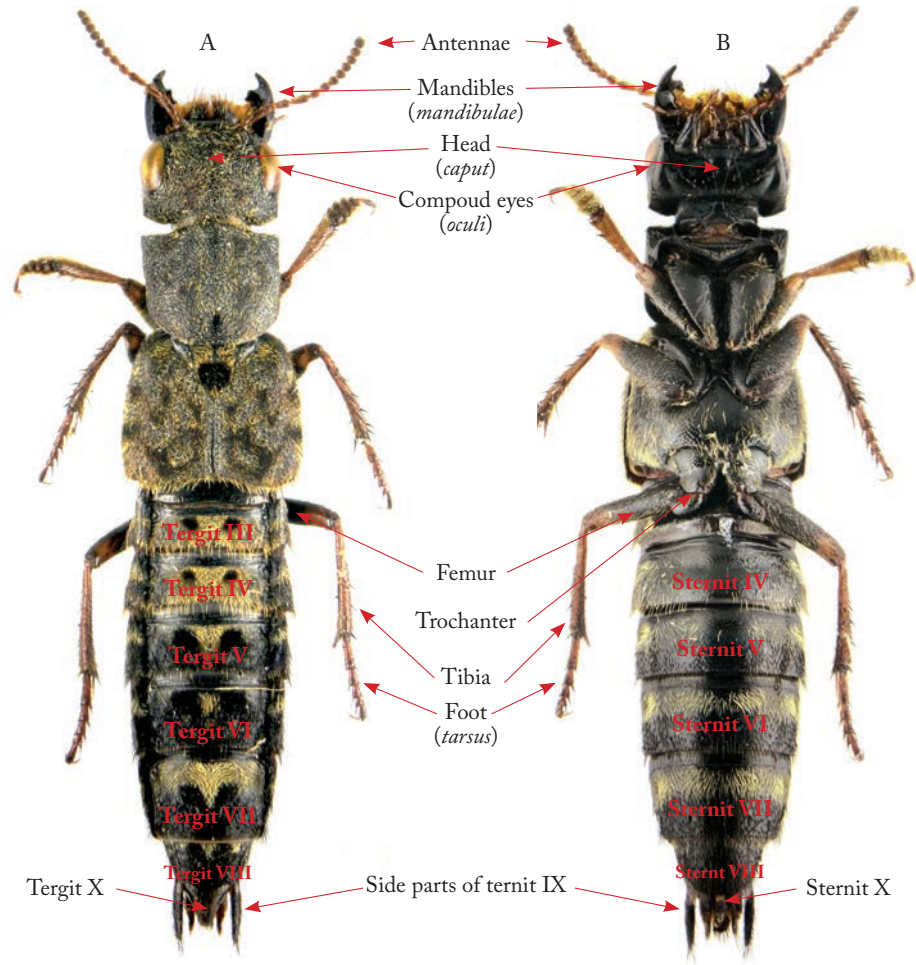


Fig. 3.1. Morphology of a beetle from the subtribe Staphylinini based on *Ontholestes haroldi* (Epp., 1884): A – dorsally, B – ventrally (photo R. Witkowski)

In the tribe **Staphylinini** at present 5 subtribes are distinguished: **Staphylinina** Latr., 1802, **Philonthina** Kirby, 1837, **Quediina** Kr., 1857, **Tanygnathinina** Reitt., 1909 and **Amblyopinina** Seevers, 1944.

Staphylinina are distinguished from the subtribes **Quediina** and **Amblyopinina** by a lack of an infraorbital ridge under the lower eye margin beneath the temple and when viewed sideways (Fig. 3.2A–3.2B) visible epipleurae in the posterior part of the pronotum (Fig. 3.1B). The subtribe **Tanygnathinina** is disitinguished by the 5–4–4 tarsus formula, while in the other subtribe all the tarsi are composed of 5 segments (tarsus formula 5–5–5).

The subtribe **Philonthina** is characterised by the lack of empodial setae, a glossy neck and a smooth pronotum (covered only with microsculpture), most frequently with two rows of puncture. The tribe comprises species typically with body length of max. 12 mm (although body length may only be an auxiliary trait) (Schillhammer, 2011). In contrast to **Philonthina** Staphylininae (subtribe **Staphylinina**) are characterised by the presence of empodial setae (Fig. 3.2C), large body size as well as punctate neck and densely punctate pronotum, on which in some cases a smooth, impunctate median line is found. An exception in this respect is observed in the genus *Creophilus* Samoulle, 1819, in which the entire pronotum is smooth and glossy, whereas on the abdomen and elytra spots of grayish silver short hairs are found. Szujecki (1980) reported the shape of the labial glossa, which in Staphylinina is specifically shaped, as the trait distinguishing both subtribes (Fig. 3.2D).

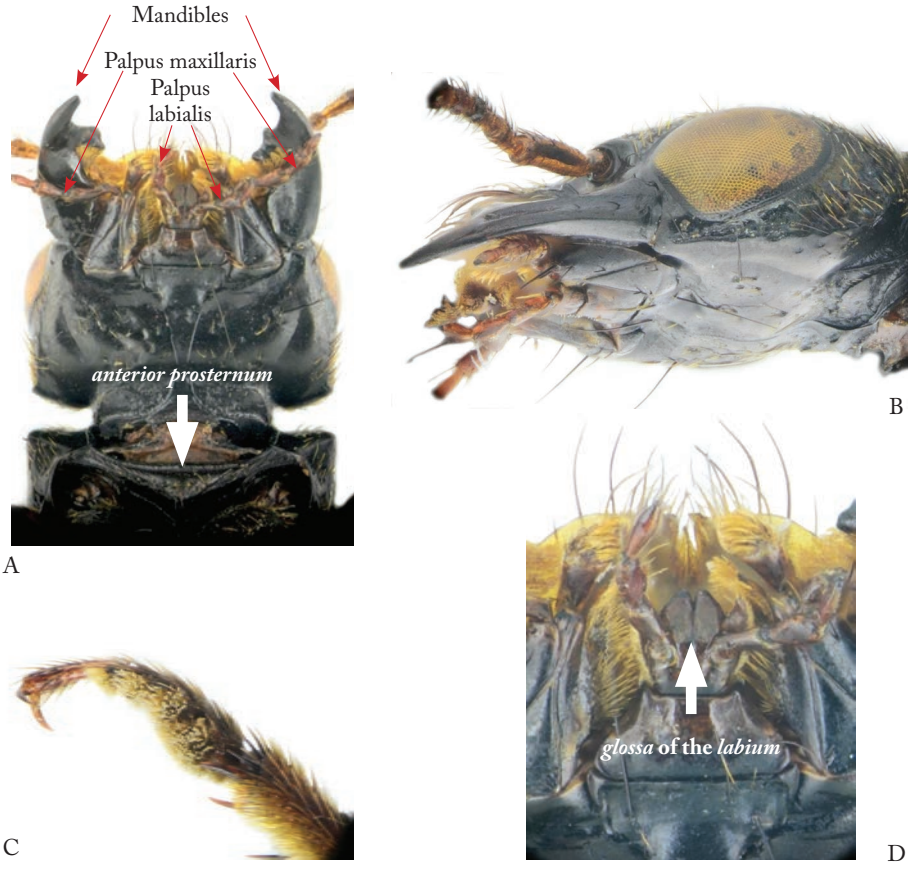


Fig. 3.2. Key characteristics for the tribe Staphylinini based on *Ontholestes haroldi* (Epp., 1884): A – ventral side of the head and prothorax with visible unsclerotised *anterior prosternum*, B – head in lateral view without infraorbital ridge, C – ventral side of the tarsus with empodial setae visible on the last segment, D – bilobed *glossa* of the *labium* (photo R. Witkowski)

All the genera in the subtribe have unique traits, which facilitate their identification. The genus ***Abemus*** Muls. et Rey, 1876 consisting of only 3 species, of which only one is found in Europe and in Poland, is distinguished by the position of a large ocellus, which is not markedly aligned closer to the eye margin rather than the posterior head rim. The head is rectangular in outline, rounded posteriorly with barely discernible angles. It is a subtle characteristic, which makes it possible to distinguish species from the genus *Abemus* from species of the genus ***Platydracus*** Thoms., 1858 (Fig. 3.4). Within this genus the large ocullus postokular puncture located at the posterior eye margin is situated markedly closer to the posterior eye margin than the posterior margin of the head, while the head is enlarged posteriorly, trapezoid in outline (Fig. 3.3).

Fig. 3.3. The location of the postocular puncture in species of the genera *Platydracus* Thoms., 1858 (photo R. Witkowski)

The only European species of the genus ***Creophilus*** Leach 1819, i.e. *C. maxillosus* (L. 1758), is characterised by a smooth, glossy and impunctate pronotum, devoid of setae (Fig. 3.5A). It is a unique feature, since representatives of all the other genera within Staphylinina have a pubescent or setose pronotum or dense mesh-like microsculpture causing a matting effect.

Equally unique characteristics distinguish the only species of the genus ***Emus*** Leach, 1819. The entire body of the beetle is covered with dense, relatively long hairs, due to which it resembles a bumblebee rather than the other large Staphylininae. Moreover, its antennae are relatively short, their length smaller than the distance from the scape of the antenna to the posterior margin of the head, while 5

A B

C

D

E

Fig. 3.4. Species of the genera *Abemus* Muls. et Rey, 1876 and *Platydracus* Thoms., 1858: A – *Abemus chloropterus* (Panz., 1796), B – *Platydracus chalcocephalus* (Fabr., 1801), C – *Platydracus fulvipes* (Scop., 1763), D – *Platydracus latebricola* (Grav., 1806), E – *Platydracus stercorarius* (Ol., 1795) (photo A. Sedláček & P. Bož̌a, www.hmyzfoto.cz)

A B

C

D

E

Fig. 3.5. Species of the genera *Creophilus* Leach, 1819, *Emus* Leach, 1819 and *Ontholestes* Ganglb., 1895 found in Poland: A – *Creophilus maxillosus* (L., 1758), B – *Emus hirtus* (L., 1758), C – *Ontholestes haroldi* (Epp., 1884), D – *Ontholestes murinus* (L., 1758), E – *Ontholestes tessellatus* (Geoffr., 1785) (photo A. Sedláček & P. Boža, www.hmyzfoto.cz)

distalsegments of the antennae are wider than the others forming an indistinct club. The eyes are partly shifted towards the upper surface of the head (Fig. 3.5B).

The genus ***Ontholestes*** Ganglb., 1895 may be recognized by the anterior pronotal angles, which are sarplypointed. The body in 3 European species is glossy, metallic brown. The surface of the body is covered with greyish-yellow hairs forming mosaic patterns, underneath which longer, black chaetae are visible (Fig. 3.5C–3.5E)

The genus ***Dinothenarus*** Thoms., 1858 is distinguished among the Polish Staphylinina in the formation of the inner mandibular margin. The appendage on the inner rim of the mandibles (the so-called *prostheca*) is covered with setae and divided (Fig. 3.6A). It is a trait found also in other genera (e.g. in the genus

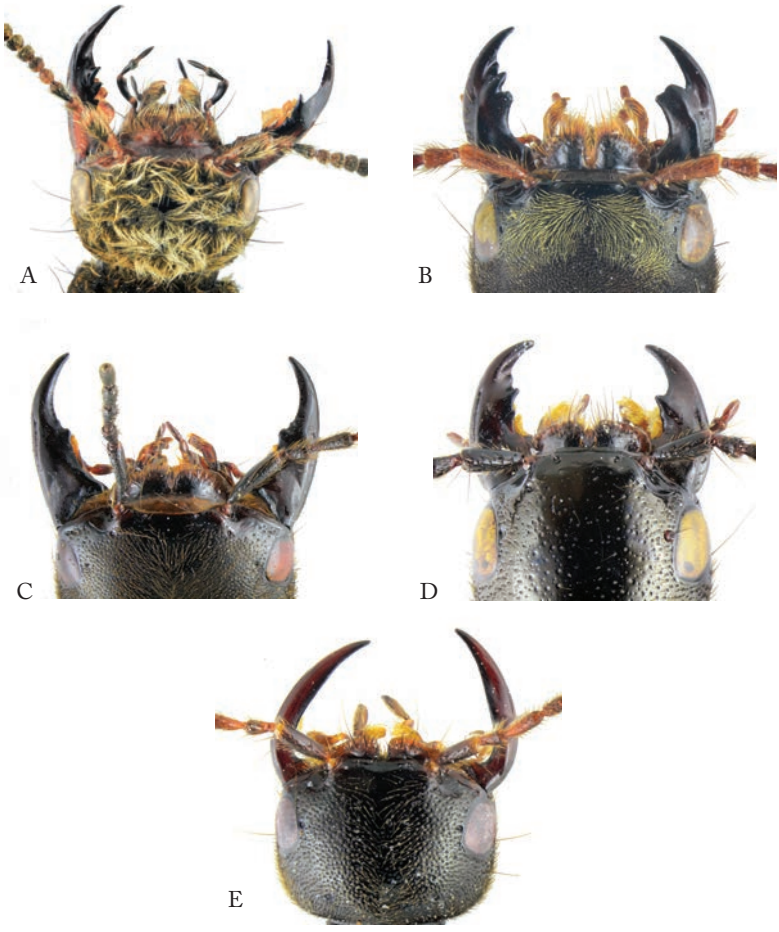


Fig. 3.6. Shape of internal mandibulare rims in the genera: A – *Dinothenarus* Thoms., 1858, B – *Staphylinus* L., 1758, C – *Ocypus* (*Ocypus s. str.*) Leach, 1819), D – *Ocypus* (*Pseudocypus*) Muls. et Rey, 1876, E – *Tasgius* Steph., 1829 (photo R. Witkowski)

A

B

C

D

E

Fig. 3.7. Species of the genera *Dinothenarus* Thoms., 1858 and *Staphylinus* L., 1758 found in Poland: A – *Dinothenarus fossor* (Scop., 1771), B – *Dinothenarus pubescens* (De Geer, 1774), C – *Staphylinus caesareus* Ceder., 1798, D – *S. dimidiaticornis* Gem., 1851, E – *S. erythropterus* L., 1758 (photo A. Sedláček & P. Boža, hmyzfoto.cz)

Abemus); however, in the case of the genus *Dinothenarus* the inner rim at the base of the mandible is shallow and almost straight, with an additional small tooth (called the subbasal tooth) at the base of the large mandibular tooth. The head is elongated and covered with dense silvery setae or short and indistinct setae, but in that case the entire anterior part of the body is reddish-coloured (Fig. 3.7A–3.7B). Moreover, species of that genus on their mesoventrite are characterised by a transverse arch-like line linking setiferous puncture.

Opposite features are observed in the genus ***Staphylinus*** L., 1758. In species of this genus the mandibular *prostheca* is undivided (Fig. 3.6B) and the dorsal surface of the head is covered with black setae. The anterior part of the body is not red-coloured and only the elytra may be red (Fig. 3.7C–3.7E). Additionally, the spots of golden pubescence, located on the sides of the abdominal segments provide these Staphilininae their characteristic appearance.

The genera ***Ocypus*** Leach, 1819 and ***Tasgius*** Steph., 1829 are very similar in terms of morphological characteristics. The key traits, on the basis of which these two genera may be distinguished include the shape of their mandibles and the presence of teeth on their internal margin.

Mandibles in the genus *Ocypus* are compact, relatively short, sickle-shaped, slightly curved, on the inner margin with teeth or at least the left mandible with two teeth or one double (bicuspid) tooth (Fig. 3.6C, D). In *Tasgius* the mandibles are long, slender, sickle-shaped (saber-shaped), devoid of teeth on the inner margin or with one instinct tooth (Fig. 3.6E). The genus *Ocypus* is divided into 3 subgenera[1], distinguished mainly by the shape of the last segment of the palpi (Fig. 3.8). The subgenus *Matidus* Motschulsky, 1860 comprises species having the last segment of the labial palpus furnished with setae (Fig. 3.8A, 3.9).

The subgenus *Ocypus s. str.* Leach, 1819 is composed of species with palpi having short segments or at least the length of the last segment is smaller than its width. This segment is also wide and truncated (Fig. 3.8B). Species from both these subgenera are very similar (Fig. 3.10).

In turn, in the subgenus *Pseudocypus* Mulsant et Rey, 1876 the segments of palpi are elongated, fusiform, and the last segment is elongated and pointed (Fig. 3.8C). Polish species from this subgenus (Fig. 3.11) in terms of their body shape slightly resemble species of the genus *Staphylinus*.

Polish species of the genus *Tasgius* are classified into two subgenera – *Tasgius* (*s. str.*) Steph., 1829 (Fig. 3.12) and *Rayacheila* Motsch., 1845 (Fig. 3.13). The subgenus *Tasgius* is characterised by strong mandibles with one large tooth on the inner margin. The last segments of the mandibular and labial palpi are thickened. The head and pronotum have a rather loose double punctuation, pronotum usually with a smooth, impunctate median line.

[1] In 2005, the subgenus *Angulephallus* (Khachikov, 2005) was described on the basis of anatomical features, see page 101.

A

B

C

Fig. 3.8. Shape of the last segment of palpi in the subgenera: A – *Matidus* Motsch., 1860, B – *Ocypus* Leach 1819, C – *Pseudocypus* Muls. et Rey, 1876 (photo R. Witkowski)

A B

C

D

E F

Fig. 3.9. Species from the genus *Ocypus* Leach, 1819 from the subgenus *Angulephallus* (Khachikov, 2005) and *Matidus* Motsch., 1860 found in Poland: A – *Ocypus* (*A.*) *brunnipes* (Fabr., 1781), B – *Ocypus* (*M.*) *biharicus* (Müll., 1926), C – *Ocypus* (*M.*) *macrocephalus* (Grav., 1802), D – *Ocypus* (*M.*) *nitens* (Schr., 1871), E – *Ocypus* (*M.*) *ormayi* (Reitt., 1887), F – *Ocypus* (*M.*) *tenebricosus* (Grav., 1846) (photo A. Sedláček & P. Boža, www.hmyzfoto.cz)

Fig. 3.10. Species from the genus *Ocypus* Leach, 1819 from the subgenus *Ocypus* found in Poland: A – *Ocypus* (*O.*) *olens* (O.F. Müll., 1764), B – *O.* (*O.*) *ophthalmicus* (Scop., 1763) (photo A. Sedláček & P. Bož̌a, www.hmyzfoto.cz)

A B

C D

Fig. 3.11. Species from the genus *Ocypus* Leach, 1819 from the subgenus *Pseudocypus* Muls. et Rey, 1876 found in Poland: A – *Ocypus* (*P.*) *aenocephalus* (De Geer, 1774), B – *O.* (*P.*) *fulvipennis* Er., 1840, C – *O.* (*P.*) *fuscatus* (Grav., 1802), D – *O.* (*P.*) *picipennis* (Fabr., 1793) (photo A. Sedláček & P. Boža, www.hmyzfoto.cz)

Fig. 3.12. Species from the genus *Tasgius* Steph., 1829 found in Poland: A – *Tasgius* (*T.*) *ater* (Grav., 1802), B – *T.* (*T.*) *pedator* (Grav., 1802) (photo A. Sedláček & P. Boža, www.hmyzfoto.cz and R. Witkowski)

A

B

Fig. 3.13. Species from the genus *Tasgius* Steph., 1829 found in Poland: A – *Tasgius* (*R.*) *globulifer* (Geoffr., 1785), B – *T.* (*R.*) *melanarius* (Heer, 1839), C – *T.* (*R.*) *morsitans* (Rossi, 1790), D – *T.* (*R.*) *winkleri* (Bernh., 1906) (photo A. Sedláček & P. Boža, www.hmyzfoto.cz)

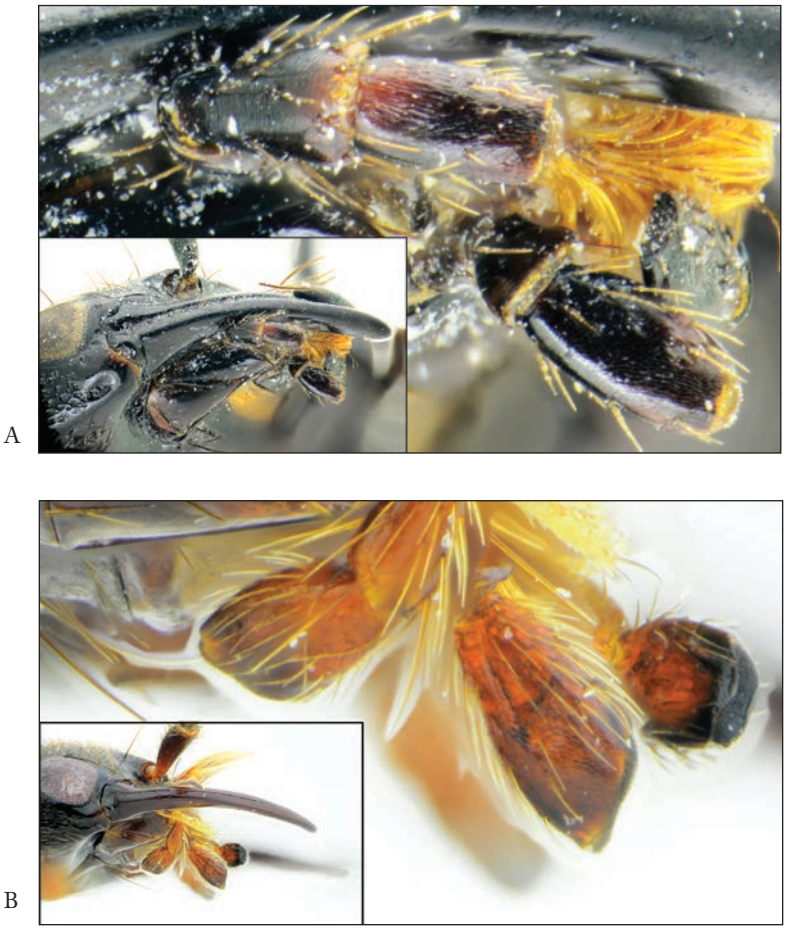


Fig. 3.14. View of the last segments of mandibular and labial palpi in: A – *Tasgius* (*T.*) *ater*, B – *Tasgius* (*R.*) *morsitans* (photo R. Witkowski)

In turn, species from the subgenus *Rayacheila* (previously classified to the subgenus *Alapsodus* Tottenham, 1939) are distinguished by long, sickle-shaped mandibles, devoid of teeth on the inner margin. The last segment of the labial palpi is strongly thickened, while the last segment of mandibular palpi is chisel-shaped (Fig. 3.14B).

Taxonomic keys to the identification of Polish insects – book 24e, part XIX (Szujecki, 1980) may be used to identify imagines of Polish species. However, it is a publication, which does not apply the currently adopted taxonomic changes. A more recent elaboration on the key traits of Staphylinina is provided in a chapter by Dr. Harald Schillhammer in a monumental book *Die Käfer Mitteleuropas* (Schillhammer, 2011).

4. Morphology and biology of immature stages in Staphylinina

by Ewa Pietrykowska-Tudruj & Bernard Staniec

Morphology. Studies on the morphology of the early developmental stages and the biology of Staphylinina have been conducted worldwide for over 170 years. Apart from descriptions, which are mainly of historical significance (e.g. Paulian, 1941), information on the morphology and biology of the immature stages have been provided to date mainly by Pototskaya (1967), Kasule (1970) and Boháč (1982). In Poland investigations on the subject were initiated in the 1960s by Prof. dr hab. Andrzej Szujecki, and they are continued by Prof. dr hab. Bernard Staniec with a team of other researchers. Despite the relatively long history of world studies on the preimaginal stages, the knowledge is much more limited when compared to that concerning imagines.

The egg stage (Figs 4.1–4.2). The egg is the least known preimaginal stage in the life cycle of Staphylinina (Table 4.1). The first data on the appearance of eggs based on four species from the genera *Staphylinus* and *Ocypus* were supplied by Szujecki (1966d). Morphological characteristics of another 9 species from 5 genera: *Creophilus*, *Ontholestes*, *Staphylinus*, *Tasgius* and *Ocypus*, were included in his book *Biology of insect eggs* by Hinton (1981), where the author, next to schematic figures, also provided an identification key. One year later knowledge on the egg morphology in Staphylinina was supplemented by Boháč (1982), and it concerned previously undescribed genus *Abemus* as well as several species of *Ocypus*. In the most recent studies Pietrykowska-Tudruj & Staniec (2007) and Staniec *et* al. (2009) presented in detail and illustrated the morphology of two species: *T. melanarius* and *O. fulvipennis*. To date morphological data on eggs in Staphylinina concern 18 species, primarily *Ocypus*, a genus represented in greatest numbers in the Polish fauna, as well as *Staphylinus* and the monospecific *Creophilus* and *Abemus*. In contrast, practically nothing is known on egg structure in *Emus* and *Platydracus*.

The larval stage (Figs 4.3–4.8). At present the best known developmental stage of Staphylinina in terms of its morphology is the larva (Table 4.1). Until now, larval morphology was described for 29 species (see references in the table), while no studies were conducted on four species: *Ontholestes haroldi*, *Tasgius ater*, *T. morsitans* and *Ocypus ormayi*. Nevertheless, it does not mean that the state of our knowledge on larvae in this group of *Staphylinidae* is sufficient or

satisfactory. The first studies concerning representatives of three genera: *Staphylinus*, *Platydracus* and *Ocypus*, were published in the 1960s by Szujecki (1966a; 1966b; 1966e), and the author presented there descriptions of primarily the early larval stage (L_1). A basic and more comprehensive source of morphological data is provided by the key for the identification of larvae of European Staphylinidae, presenting most species (as many as 15) of Polish Staphylinina (Pototskaya, 1967). However, descriptions contained in that book are not sufficiently detailed, as they contain only main diagnostic features, unfortunately poorly illustrated. Kasule (1970) continued the work started by Pototskaya and apart from the key at genus level and in the case of the genus *Ontholestes* also on the species level, for the first time provided a short characteristic of the larvae in *Ocypus brunnipes*. A more detailed morphological description with schematic illustrations of selected structures of larvae from 17 species from the genera: *Abemus*, *Staphylinus* sensu lato and *Ocypus*, was given by Boháč (1982) in his monograph of larval Czechoslovak species. Of these, larvae of 5 species were presented for the first time: *Abemus chloropterus*, *Ocypus biharicus*, *O. macroaephalus*, *O. tenebricosus*, and *Tasgius winkleri*. However, due to unclear measurement methodology and an incomplete list of diagnostic characters illustrated inaccurately, these larval data may be problematic when used for species determination. Accurate and detailed morphological information supported by comprehensible and exhaustive figures are contained in two most recent works by Staniec *et* al. (2009) and Pietrykowska-Tudruj & Staniec (2012), where the authors described three species: *Platydracus latebricola* (Fig. 4.8), *Staphylinus erythropterus* (Figs 4.6, 4.7) and *Ocypus fulvipennis*. Generally the knowledge on Polish larval Staphylinina is far from complete. Correct identification of this preimaginal stage is possible at the genus level, but it continued to be highly problematic for lower systematic levels.

The pupal stage (Figs 4.10–4.12). In comparison with larvae, the pupae of Staphylinina are less known (Table 4.1). Knowledge of pupal morphology is fragmentary and varies in detail, depending on the genera. The most comprehensive knowledge is available for the genus *Staphylinus*. Pupae of the genera *Tasgius*, *Ontholestes* are represented by single species. Nothing is known about *Dinothenarus* and *Platydracus*. Overall, pupae of 12 species have been described to date; however, works by other researchers provide fragmentary descriptions and require serious re-descriptions (see references in the table). The first comprehensive and the most recent work summarising existing knowledge of the pupal stage within the entire tribe Staphylinini is *Pupae of the mega-diverse rove beetle tribe* Staphylinini (Staniec & Pietrykowska-Tudruj, 2019). The paper includes an illustrated key to the identification of pupae at the subtribe level including *Staphylinina* and on some generic levels such as *Abemus*, *Creophilus*, *Emus*, *Ontholestes*, as well as a group comprising *Ocypus*, *Staphylinus* and *Tasgius*. The paper also comments on pupal habitat, phenology and morphology in the

context of antipredator and environmental adaptations. It is also the first-ever attempt to employ the pupal morphological characters in phylogenetic analysis. The study shows that the external structures of Staphylinini pupae could be a useful, alternative source to assess relationships of certain taxa within the tribe.

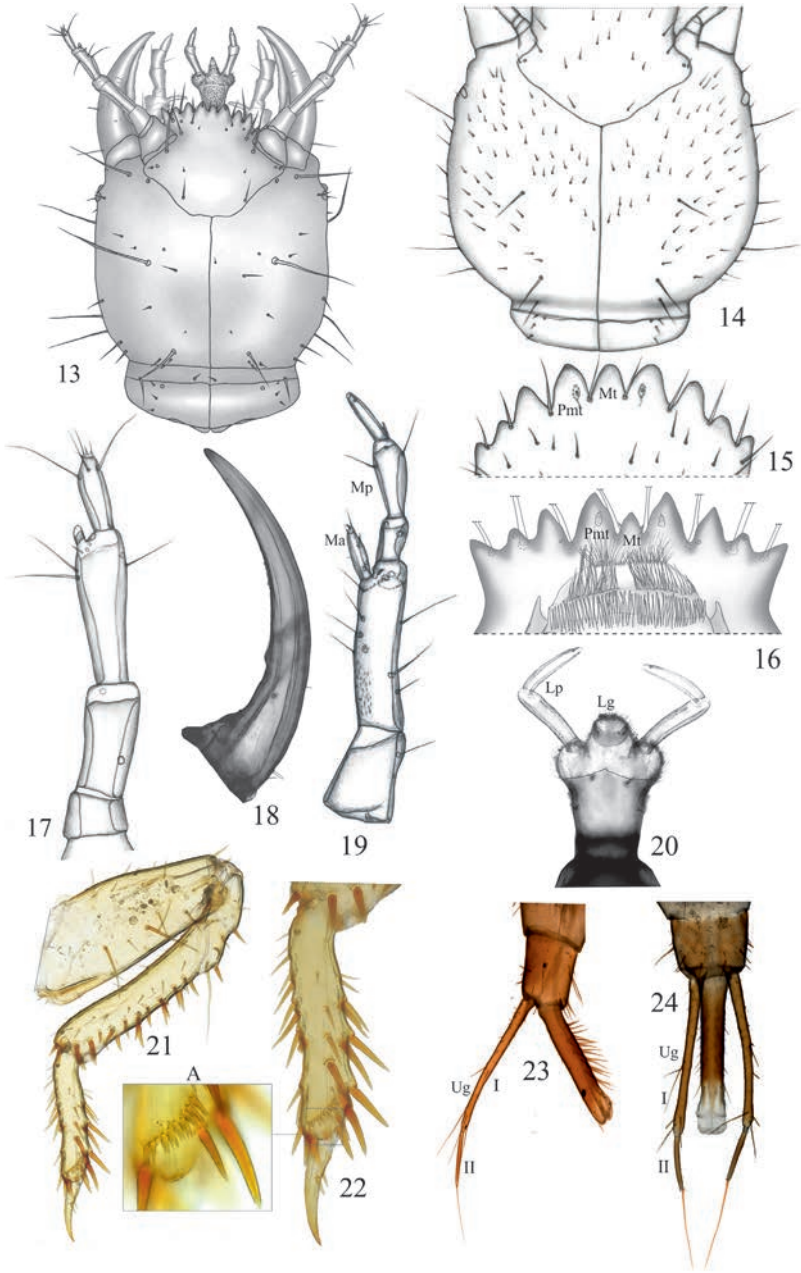
Characters of immature stages. Egg (Figs 4.1, 4.2): (**1**) relatively large, usually clearly longer than 2 mm; (**2**) shape less or more broadly oval; (**3**) surface smooth without any ridges or separated depressions visible; (**4**) posterior pole without any projection, at most with low tuberculate projection (Fig. 4.1); (**5**) aeropyles (Ap) numerous and tiny, forming a light sinuate (Fig. 4.1) or regular equatorial band (Fig. 4.2).

Mature larva (Figs 4.5, 4.7, 4.8, 4.13–4.23): (**1**) relatively large, usually clearly longer than 10 mm; (**2**) head and tergites of thorax at least usually dark, strongly sclerotised (Figs 4.5, 4.7, 4.8); (**3**) head with scarce (Fig. 4.13) or numerous setae (Fig. 4.14); (**4**) anterior margin of nasale with median (Mt) and paramedian teeth of equal lenght (Fig. 4.15) or Mt smaler than Pmt (Fig. 4.16). (Fig. 4.16); (**5**) antenna 4-segmented, usually with small acorn-shaped sensory appendages on segment III (Fig. 4.17); (**6**) mandibles falcate with 2–3 microsetae on outer margin (Fig. 4.18); (**7**) maxilla slender with finger-shaped mala (Ma) and 3 or 4-segmented maxillary palp (Mp) (Fig. 4.19); (**8**) labium with different shape of ligula (Lg) and 2- or 3-segmented labial palp (Lp) (Fig. 4.20); (**9**) legs stocky, usually with thick, spine-shaped setae (Fig. 4.21); (**10**) foretibiae usually with bifid setae scattered or forming a regular comb (Figs 4.22, 4.22A); (**11**) urogomphi (Ug) usually more or less elongated and slim, segment I longer than abdominal segment X (Figs 4.22, 4.23).

Pupa (Figs 4.10–4.12): (**1**) obtect type, strongly sclerotized; (**2**) relatively large, usually clearly longer than 7 mm; (**3**) anterior margin of pronotum and abdominal segments VII–VIII with short setiform projections located on protuberances, setiform projections on pronotum shorter than half pronotum length; (**4**) pronotum usually with min. 15 setiform projections at least.

Biology. The history of studies on the biology of Staphylinina, including the life cycle, is relatively short. The species, which was focused on in this respect is *Creophilus maxillosus*, a common fly predator associated with decomposing cadavers and carcasses. This hairy rove beetle is recognised for its use in forensic entomology. For this reason some forensically important aspects of his biology, such as e.g. the effect of various constant temperatures or different diets on the development and mortality of individual developmental stages, sex- and size-related patterns of carrion colonisation, habitat preferences have been studied (e.g. Larsson & Gígja, 1959; Dajoz & Caussanel, 1968; Keshavarzi *et* al., 2015; Eremeev, 2021; Matuszewski & Szafałowicz, 2013; Frątczak-Łagiewska *et* al., 2020). Short reports on the bionomy of 17 species were given by Boháč (1982) in his monography of Czechoslovak species. They included the duration of the individual development stages, mortality rate of the species

Figs 4.1–4.12. Preimaginal stages of selected Staphylinina, general aspect. *Staphylinus erythropterus* (1, 6, 7, 9, 10–12), *Ocypus nitens* (2–5), *Platydracus latebricola* (8): 1, 1A, 2 – egg and aeropyles (Ap); 3–8 – larva, L_1 (3, 6), L_2 (4, 7), L_3 (5, 8); 9 – prepupa; 10–12 – pupa in ventral (10), lateral (11) and dorsal (12) aspect



Figs 4.13–4.24. Mature larvae of selected Staphylinina, external morphology. *Ocypus fulvipennis* (13, 16), *Platydracus latebricola* (14, 15, 17, 19), *Staphylinus erythropterus* (18, 20, 21, 22), *O. nitens* (23, 24): 13, 14 – head, dorsal, 15 – anterior margin of nasal projection (dorsal aspect), 16 – epipharynx with anterior margin of nasal projection (ventral aspect), 17 – antenna, 18 – mandible, 19 – maxilla, 20 – labium, 21 – foreleg, 22 – foretibia with apical part (A), 23, 24 – abdominal segment IX–X with urogomphi, lateral (23) and ventral aspect (24)

under laboratory conditions, or phenological data from field studies. Imagines and larval stages of *Ocypus olens*, a predator of the brown garden snail, and *O. similis* (now *O. nitens*) feeding on millipedes were investigated in terms of their diet and predator pressure by Orth *et* al. (1975, 1976) and Krooss & Schaefer (1998). A detailed course of the life cycle under laboratory conditions, taking into consideration many aspects such as e.g. the duration of the copulation period or oviposition, frequency of egg laying by females and their deposition in the substrate, female fecundity or the duration of development of individual preimaginal stages, was described only for representatives of *Staphylinus* (*S. erythropterus*) and *Ocypus* (*O. fulvipennis*, *O. nitens*; Krooss, 1994; Staniec *et* al., 2009; Pietrykowska-Tudruj & Staniec, 2012).

The life cycle. Beetles from the subtribe Staphylinina are monovalent and represent primarily the autumn-spring development type. Adult females of *Platydracus*, some species of *Staphylinus* (e.g. *S. dimidiaticornis*), *Ocypus* (except for *O. fuscatus*) and *Tasgius* lay eggs in autumn, larvae overwinter and complete their development in spring or early summer of the following year. However, females which started their oviposition in late autumn, complete it in spring and larvae from these eggs attain their adult stage in late summer of the same year. In contrast, species of *Abemus* and some of *Staphylinus* genera undergo the spring-summer development type. Their adult females lay eggs in spring and larvae complete their development in the same year (Boháč, 1982; Pietrykowska-Tudruj & Staniec, 2012).

Unique course of life cyle in Staphylinus erythropterus. Among Staphylinina *S. erythropterus* is a species with the best known life cycle determined under laboratory conditions. After copulation that is repeated with intervals for a period of 6–12 days, the female lays eggs every day for 15 days. Eggs are laid separately, distributed in the soil, with one female laying 1–2, sporadically 3 eggs per day, with a total of 26. During the oviposition period the insects hide in the ground. The period of embryonic development lasts on average 9 days, afterwards the larva hatches and leaves the egg through a crack in the egg casing. The larval stage is observed from the middle of May to the middle of June (4 weeks). The development of particular larval stages last 6 days for the first stage (L_1), and 8 days for the last stage. Shortly before pupation larvae become less and less active. Prepupae (Fig. 4.9) and pupae (Figs 4.10–4.12) in that study were recorded from the end of May to June, with the mean duration of development in these stages lasting 2 and 12 days, respectively. After metamorphosis mature specimens of the new generation come out onto the soil surface in the first decade of June. The complete duration of the development cycle in *S. erythropterus* under laboratory conditions, from the egg until the emergence of the adult form of a new generation, was about 5 weeks. *Staphylinus erythropterus* has only two larval instars, in contrast to three instars observed in the case of other closely related species: *Creophilus maxillosus*, *Ocypus fulvipennis*, *Platydracus latebricola* (Dajoz &

Caussanel, 1968; Staniec & Pietrykowska-Tudruj, 2007; Staniec *et* al., 2009). The newly hatched larvae combine morphological features observed in the first and second larval instars of other known larvae of Staphylinina. Causes for this phenomenon may be seen in the predatory lifestyle of both imagines and larvae of this large and very active beetle. The inherency of the two larval instars of *S. erythropterus*, and as a consequence of the short duration of the entire larval stage provides new insights into the life cycle and is unique within Staphylinina.

Table 4.1. Contribution to knowledge on the morphology of immature stages of Polish Staphylinina (published and excluding the description after Paulian, 1941)

	Egg	**Larva**	**Pupa**
	1	2	3
Abemus chloropterus (Panz.)	Boháč, 1982	Pototskaya, 1967; Boháč, 1982	Boháč, 1982; Staniec, 1999
Creophilus maxillosus maxillosus (L.)	Kramer, 1955; Hinton, 1981	Hinton, 1945; Kramer, 1955; Pototskaya, 1967; Dajoz & Caussanel, 1968; Kasule, 1970; Topp, 1978; Schmidt, 1999	Kramer, 1955; Dajoz & Caussanel, 1968; Staniec, 1996c; Staniec & Pietrykowska-Tudruj, 2019
Dinothenarus pubescens pubescens (De Geer)	–	Pototskaya, 1967	–
D. fossor (Scop.)	Boháč, 1982	Schwaller, 1973; Boháč, 1982	–
Emus hirtus (L.)	–	Pototskaya, 1967; Kasule, 1970; Topp, 1978	Staniec & Pietrykowska-Tudruj, 2019
Ontholestes haroldi (Epp.)	–	–	–
O. murinus (L.)	Hinton, 1981	Hinton, 1945; Pototskaya, 1967; Kasule, 1970	Staniec, 2004a
O. tessellatus (Geoff.)	–	Pototskaya, 1967; Kasule, 1970 ; Topp, 1987	–
Platydracus chalcocephalus (Fabr.)	–	Boháč, 1982	–
P. fulvipes (Scop.)	–	Pototskaya, 1967; Boháč, 1982 (after Pototskaya, 1967)	–

	1	2	3
*P. latebricol*a (Grav.)	–	Pietrykowska-Tudruj & Staniec, 2012	–
P. stercorarius Oliv.	–	Szujecki, 1966a; Pototskaya, 1967; Kasule, 1970; Boháč, 1982	–
*Staphylinus caesareu*s Ceder.	Hinton, 1981; Boháč, 1982	Pototskaya, 1967; Boháč, 1982	Boháč, 1982; Staniec, 1999
S. dimidiaticornis Gemm.	Szujecki, 1966d; Hinton, 1981; Boháč, 1982	Szujecki, 1966b; Boháč, 1982	–
*S. erythropterus erythropteru*s L.	Szujecki, 1966d; Hinton, 1981; Boháč, 1982	Szujecki, 1966b; Boháč, 1982; Pietrykowska-Tudruj & Staniec, 2012	Szujecki, 1960c; Boháč, 1982; Staniec, 1999; Pietrykowska-Tudruj & Staniec, 2012
Tasgius ater (Grav.)	–	–	–
T. globulifer (Geoff.)	Hinton, 1981	Pototskaya, 1967	–
T. melanarius (Heer)	Staniec & Pietrykowska-Tudruj, 2007	Boháč, 1982	Staniec & Pietrykowska, 2005
T. morsitans (Rossi)	–	–	–
T. pedator pedator (Grav.)	–	Boháč, 1982; Pototskaya, 1966; 1967; Sharova & Pototskaya, 1972	–
T. winkleri (Bernh.)	Boháč, 1982	Boháč, 1982	–
Ocypus aeneocephalus (De Geer)	Boháč, 1982	Boháč, 1982	Boháč, 1982; Staniec, 1999
O. biharicus (Müll.)	Boháč, 1982	Boháč, 1982	–
O. brunnipes (Fabr.)	Hinton, 1981	Kasule, 1970	–
O. fulvipennis Erich.	Staniec *et* al., 2009	Staniec *et* al., 2009	Staniec *et* al., 2009
O. fuscatus (Grav.)	Hinton, 1981; Boháč, 1982	Pototskaya, 1967; Boháč, 1982	Boháč, 1982; Staniec, 1999
O. macrocephalus (Grav.)	Boháč, 1982	Boháč, 1982	–

	1	2	3
O. nitens (Schr.)	Szujecki, 1966d; Boháč, 1982	Gilarov, 1964; Szujecki, 1966e; Pototskaya, 1966; 1967; Boháč, 1982	Boháč, 1982; Staniec, 1999; Staniec & Pietrykowska-Tudruj, 2019
O. olens (Müll.)	Lincoln, 1961; Nield, 1976; Hinton, 1981; Boháč, 1982	Pototskaya, 1967; Nield, 1976; Orth *et* al., 1976; Boháč, 1982	Nield, 1976; Orth *et* al., 1976
O. ophthalmicus (Scop.)	–	Topp, 1978; Bohač, 1982	–
O. ormayi (Reitt.)	–	–	–
O. picipennis (Fabr.)	Szujecki, 1966d	Gilarov, 1964; Pototskaya, 1966; 1967; Boháč, 1982	–
O. tenebricosus (Grav.)	Boháč, 1982	Boháč, 1982	–

5. List of Polish fauna

by Andrzej Mazur

A complete list of Staphylinina species of the fauna of Poland is presented in the Catalogue of Polish fauna (Burakowski *et* al., 1980). Following that publication a list of species was also given in the key to identification of species from the subfamily Staphylininae (Szujecki, 1980) and in the list of animals of Poland (Mroczkowski & Stefańska, 1991), which definitely rejected the potential occurrence of *Ocypus alpestris* Er., 1840, *Ocypus (Tasgius) falcifer* (Nordm., 1837) and *Ocypus italicus* (Aragona, 1830) in our fauna. Information on the occurrence of *Ocypus mus* (Brullé, 1832) in the Mazowsze region was denied by Horion (1965) and Burakowski *et* al. (1980).

In the late 1990s taxonomic changes were introduced, which included the distinction of the genera *Dinothenarus*, *Platydracus* and *Tasgius* (Assing & Schülke, 2001; 2007) provided in the most recent list of Staphylinidae species in the Polish fauna (Staniec, 2004a). Most recently, in the 1990s *Tasgius winkleri* (Bernh., 1906) was reported from Poland as a new species for the Polish fauna (Kubisz & Melke, 1996; Paśnik, 1999).

The list below comprises species reported in Poland together with names previously used in major Polish literature sources concerning Staphylinini.

Family: **Staphylinidae** Latreille, 1802
Subfamily: **Staphylininae** Latreille, 1802
Tribe: **Staphylinini** Latreille, 1802
Subtribe: **Staphylinina** Latreille, 1802

Genus: ***Abemus*** Mulsant *et* Rey, 1876
Abemus chloropterus (Panzer, 1796)
= *Staphylinus (Abemus) chloropterus Panzer*, 1796: Szujecki, 1980
Genus: ***Creophilus*** Leach 1819
Creophilus maxillosus maxillosus (Linnaeus, 1758)
Genus: ***Dinothenarus*** Thomson, 1858
Dinothenarus fossor (Scopoli, 1771)
= *Staphylinus (Parabemus) fossor* Scopoli, 1772: Szujecki, 1980
Dinothenarus pubescens pubescens (De Geer, 1774)
= *Staphylinus (Dinothenarus) pubescens* De Geer, 1774: Szujecki, 1980

= *Parabemus fossor* (Scopoli, 1772): Burakowski *et* al., 1980; Mroczkowski & Stefańska, 1991

Genus: ***Emus*** Leach, 1819

Emus hirtus (Linnaeus, 1758)

Genus: ***Ocypus*** Leach, 1819

Ocypus (Angulephallus) brunnipes (Fabricius, 1781)
= *O. (Goerius) brunnipes* (Fabricius, 1781): Burakowski *et* al., 1980
= *O. (Ocypus) brunnipes* (Fabricius, 1781): Szujecki, 1980

Ocypus (Matidus) biharicus (G. Müller, 1926)[1]
= *Ocypus (Goerius) biharicus* (J. Müller, 1926): Burakowski *et* al., 1980
= *Ocypus (Ocypus) biharicus* (J. Müller, 1926): Szujecki, 1980

Ocypus (M.) macrocephalus (Gravenhorst, 1802)
= *Ocypus (Goerius) macrocephalus* (Gravenhorst, 1802): Burakowski *et* al., 1980
= *Ocypus (Ocypus) macrocephalus* (Gravenhorst, 1802): Szujecki, 1980

Ocypus (M.) nitens nitens (Schrank, 1781)
= *Ocypus nero* Feldermann, 1835
= *Ocypus similis semialatus* (G. Müller, 1904): Szujecki, 1980; Burakowski *et* al., 1980

Ocypus (M.) ormayi (Reitter, 1887)
= *Ocypus (Ocypus) ormayi* (Reitter, 1887): Szujecki, 1980
= *Ocypus (Goerius) ormayi* (Reitter, 1887): Burakowski *et* al., 1980

Ocypus (M.) tenebricosus (Gravenhorst, 1846)
= *Ocypus (Ocypus) tenebricosus* (Gravenhorst, 1846): Szujecki, 1980
= *Ocypus (Goerius) tenebricosus* (Gravenhorst, 1846): Burakowski *et* al., 1980

Ocypus (Ocypus) olens (O.F. Müller, 1764)
= *Ocypus (Goerius) olens* (O.F. Müller, 1764): Burakowski *et* al., 1980

Ocypus (O.) ophthalmicus ophthalmicus (Scopoli, 1763)
= *Ocypus (Goerius) ophthalmicus* (Scopoli, 1763): Burakowski *et* al., 1980

Ocypus (Pseudocypus) aeneocephalus (De Geer, 1774)

Ocypus (P.) fulvipennis Erichson, 1840
= *O. vagans* Heer 1839: Letzner, 1871

Ocypus (P.) fuscatus (Gravenhorst, 1802)

Ocypus (P.) picipennis picipennis (Fabricius, 1793)

Genus: ***Ontholestes*** Ganglbauer, 1895

Ontholestes haroldi (Eppelsheim, 1884)

Ontholestes murinus (Linnaeus, 1758)

Ontholestes tessellatus (Geoffroy, 1785)

Genus: ***Platydracus*** Thomson, 1858

Platydracus chalcocephalus (Fabricius, 1801)
= *Staphylinus chalcocephalus* Fabricius, 1801: Szujecki, 1980

[1] The description of *Ocypus biharicus* was written by **Josef (Giuseppe) Müller** (1880--1964), born in Zara (Dalmatia, present-day Croatia), who collaborated with the Museum of Natural History in Triest. He was the author of descriptions of 61 species and 5 genera of Staphylinidae. He was the first to extensively use the aedeagus for distinguishing the species and particularly subspecies (Smetana & Herman, 2001). Due to the different transcriptions of his name he is cited as J. (Josef) Müller or G. (Giuseppe) Müller.

Platydracus fulvipes (Scopoli, 1763)
= *Staphylinus fulvipes* Scopoli, 1763: Szujecki, 1980
Platydracus latebricola (Gravenhorst, 1806)
= *Staphylinus latebricola* Gravenhorst, 1806: Szujecki, 1980
Platydracus stercorarius stercorarius (Olivier, 1795)
= *Staphylinus stercorarius* Olivier, 1795: Szujecki, 1980

Genus: ***Staphylinus*** Linnaeus, 1758
Staphylinus caesareus caesareus Cederhjelm, 1798
Staphylinus dimidiaticornis Gemminger, 1851
= *Staphyllinus parumtomentosus* Stein, 1903
Staphylinus erythropterus erythropterus Linnaeus, 1758

Genus: ***Tasgius*** Stephens, 1829
Tasgius (Rayacheila) globulifer globulifer (Geoffroy, 1785)
= *Ocypus (Alapsodus) globulifer* (Fourcroy, 1785): Szujecki, 1980
= *Ocypus (Ocypus) globulifer* (Fourcroy, 1785): Burakowski *et* al., 1980
Tasgius (R.) melanarius melanarius (Heer, 1839)
= *Ocypus (Alapsodus) melanarius* (Heer, 1839): Szujecki, 1980
= *Ocypus (Ocypus) melanarius* (Heer, 1839): Burakowski *et* al., 1980
Tasgius (R.) morsitans (Rossi, 1790)
= *Ocypus (Alapsodus) compressus* (Marsham, 1802): Szujecki, 1980
= *Ocypus (Ocypus) compressus* (Marsham, 1802): Burakowski *et* al., 1980
Tasgius (R.) winkleri (Bernhauer, 1906)
= *Ocypus (Alapsodus) winkleri* Bernhauer, 1906: Szujecki, 1980
Tasgius (Tasgius) ater (Gravenhorst, 1802)
= *Ocypus (Tasgius) ater* (Gravenhorst, 1802): Szujecki, 1980; Burakowski *et* al., 1980
Tasgius (T.) pedator pedator (Gravenhorst, 1802)
= *Ocypus (Tasgius) pedator* (Gravenhorst, 1802): Szujecki 1980, Burakowski *et* al., 1980

6. Faunistic review of species

by Andrzej Melke†, Rafał Ruta, Andrzej Mazur, Katarzyna Erdmann, Andrzej Górz, Wojciech Grodzki, Jacek Hilszczański, Tomasz Jaworski, Szymon Konwerski, Karol Komosiński, Tomasz Kościelny, Andrzej Nowosad, Tomasz Olbrycht, Ryszard Orzechowski, Bartosz Pacuk, Karolina Pietras-Couffignal, Radosław Plewa, Tomasz Rutkowski, Mateusz Sapieja, Paweł Sienkiewicz, Bernard Staniec, Marzena Stańska, Henryk Szołtys, Dariusz J. Tarnawski, Jan Tatur-Dytkowski, Grzegorz Tarwacki, Dariusz Twardy, Marek Wanat, Tadeusz Wojas

Material and methods

This monograph uses numerous sources of faunistic data coming from collections of physical persons and scientific institution (the list is given below). These data are the results of basic faunistic observations, research projects realised at different times by scientific units as well as a review of entomological museum collections.

The list of institutions and private entomological collections includes (the abbreviation for the collection applied in the text is given in bold):

DFP collection of the Department of Forest Protection, Forest Research Institute, Sękocin Stary (Jacek Hilszczański, Radosław Plewa, Tomasz Jaworski, Grzegorz Tarwacki)

DMF collection of the Department of Mountain Forests, Forest Research Institute, Kraków (Wojciech Grodzki)

FE UAK collection of the Department of Forest Protection, Entomology and Forest Climatology, Institute of Forest Protection, University of Agriculture, Kraków (Jerzy R. Starzyk)

FE UPP collection of the Department of Forest Entomology, Poznań University of Life Sciences, Poznań (Andrzej Mazur)

MIZ collection of the Museum and Institute of Zoology, Polish Academy of Sciences (Dariusz Iwan, Przemysław Szymroszczyk)

MCSU collection of the Department of Zoology, Maria-Curie Sklodowska University, Lublin (Bernard Staniec, Mateusz Sapieja)

MNHW collection of the Museum of Natural History, University of Wrocław (Paweł Jałoszyński, Marek Wanat)

NHC collection of the Natural History Collections, Faculty of Biology, Adam Mickiewicz University, Poznań (Szymon Konwerski, Tomasz Rutkowski)

PNP collection of the Pieniny National Park, Krościenko on the Dunajec river (Krzysztof Karwowski)

USM collection of the Upper Silesian Museum, Bytom (Roland Dobosz)

AK private collection of Andrzej Krupicki, Łask

AM private collection of Andrzej Melke, Kalisz

AMa private collection of Andrzej Mazur, Poznań
AN private collection of Andrzej Nowosad, Poznań
ASl private collection of Andrzej Słabikowski, Połczyn Zdrój
AT private collection of Andrzej Trzeciak, Stasiówka
BP private collection of Bartłomiej Pacuk, Toruń
DJT private collection of Dariusz J. Tarnawski, Gdańsk
DT private collection of Dariusz Twardy, Birchów
HS private collection of Henryk Szołtys, Brynek
JG private collection of Janusz Grzywocz, Ruda Śląska
JM private collection of Jacek Mazepa, Jarosław
JTD private collection of Jan Tatur-Dytkowski, Warszawa
KK private collection of Karol Komosiński, Olsztyn
KL private collection of Krzysztof Lubecki, Zielona Góra
KR private collection of Krzysztof Rudziński, Złocieniec
LK private collection of Leszek Kośny, Jelenia Góra
MaM private collection of Marek Miłkowski, Radom
MAr private collection of Michał Argasiński, Połczyn Zdrój
MSa private collection of Mateusz Sapieja, Wrocław
MW private collection of Marek Wanat, Wrocław
PJ private collection of Paweł Jałoszyński, Wrocław
RRu private collection of Rafał Ruta, Wrocław
SK private collection of Szymon Konwerski, Poznań
TK private collection of Tomasz Kościelny, Konopiska
TO private collection of Tomasz Olbrycht, Rzeszów
ToK private collection of Tomasz Klejdysz, Poznań
TW private collection of Tadeusz Wojas, Kraków
WK private collection of Wojciech Kucza, Słubice
WMi private collection of Wojciech Michalski, Osieczna

Other abbreviations

AF Andrzej Florczak
AG Andrzej Gruszka
AGo Andrzej Górz
AH Andreas Hirler
AKo Andrzej Kokot
AL Andrzej Lasoń
AP A. Pobiedziński
Ask Andrzej Skalski
AS Andrzej Szujecki
ASz Andrzej Szmyt
ASze Anna Szewkienicz
BB Bartosz Browarski
BS Bernard Staniec
CzG Czesław Greń
DK Daniel Kubisz
ED Eberhard Drescher
EJ E. Jarosiewicz
FK Franz Kirsh
GR Greipel
HD Henryk Dutka

HN	Hans Nowotny
IH	Izabela Hajdamowicz
JC	Jan Czarnecki
JJ	Jacek Jackowski
JK	Jan Kowalewski
JaK	Jacek Kalisiak
JKo	Jakub Kowalski
JKZ	Joanna Kocot-Zalewska
JMG	Jerzy M. Gutowski
JT	Jacek Twardowski
KHM	Konrad H. Maciejewski
LB	Lech Buchholz
LBo	Lech Borowiec
LS	Leon Sawkiewicz
ŁM	Łukasz Minkina
ŁN	Łukasz Nicewicz
MB	Marian Bielewicz
MBu	Marek Bunalski
MCz	M. Czyżykowska
MK	Maksymilian E. Krzoska
MKŚ	Monika Kucharska--Świerszcz
MM	Marek Mażewski
MP	Marek Przewoźny
MS	Mariusz Salmanowicz
MŚ	Marek Świdurski
PCh	Piotr Chachuła
PD	P. Dąbkowski
PG	Paweł Górski
PR	Paweł Radzikowski
PRu	Paweł Rutowicz
PS	Paweł Sienkiewicz
PSt	Paweł Stachowiak
PSz	Paweł Szymański
PW	Paweł Wolszczak
RaK	Rafał Konrad
RD	Roland Dobosz
RO	Ryszard Orzechowski
RR	Robert Rozwałka
SB	Sławomir Baszczyński
SCz	Szymon Czerwiński
SG	Stanisław Gruszka
SKo	S. Konkol
SSz	Stanisław Szafraniec
SŠ	Soňa Šebková
ST	Karol Stefek
TM	Tomasz Majewski
TOd	Tomasz Oder
TP	Tomasz Pietrzak
TPl	Tadeusz Plewka
TR	Tomasz Rutkowski
TS	Tadeusz Spaltenstein
TSz	Tomasz Szrama
WCz	Wojciech Czarniawski
WM	Wojciech Mączyński
WtR	Wt. Rychter
WS	W. Sołtys
WY	Wycisło
WŻ	Waldemar Żyła

A list of research projects, from which data was obtained on the occurrence of Staphylinina in the Carpathian Mts., the Białowieża Forest and selected regions of western Poland:

- *Biodiversity of coprophagous Scarabaeoidea (Coleoptera) of the Polish Carpathian Mts*. grant no. NN304 139940, financed by the National Science Center, realised by dr hab. Andrzeja Górz, the Institute of Biology, Pedagogical University of Cracow
- *Assessment of biodiversity in selected forest districts of the Regional Directorate of the State Forests in Krosno based on selected natural and cultural elements*,

research project commissioned by the General Directorate of the State Forests, realised by a research consortium of the Forest Research Institute (project leader), the Institute of Nature Conservation PAS, F.H.U. Biodata and the Hereditas Foundation under the supervision of Prof. dr hab. Wojciech Grodzki (the Department of Mountain Forests FRI) in the years 2016–2018

- *Assessment and monitoring of chnages in biodiversity in the Białowieża Forest based on selected natural and cultural elements*, research project commissioned by the General Directorate of the State Forests, realised by the Forest Research Institute under the supervision of dr hab. Tomasz Jaworski in the years 2017–2019
- *Stand utilisation and threshold values of dead wood in forests – the role in the preservation of diversity and functionality of forest ecosystems*, research project commissioned by the General Directorate of the State Forests, realised by the Department of Forest Entomology, PULS under the supervision of dr inż. Andrzej Łabędzki in the years 2013–2015
- *Potential applicability of pathogens, parasitoids and predators to control the populations of pest insects,* research project commissioned by the General Directorate of the State Forests, realised by the Department of Forest Entomology and the Department of Forest Phytopathology, PULS under the supervision of prof. UPP dr hab. Robert Kuźmiński in the years 2015–2019.

The faunistic division of Poland is adopted after Burakowski *et* al. (1980) (fig. 6.1); the names of regions are highlighted in bold characters.

The material from the Świętokrzyski National Park (2009 and 2012) was collected in modified flight intercept traps (mFIT) with pheromones for collecting bark beetles, primarily *Trypodendron* spp. (the commercially available trap IBL-2 "Trypodor") used for the permanent monitoring of several Scolytine spp. and associated fauna in selected sites and forest types.

The materials collected by Tomasz Olbrycht in the years 2015–2016 near Pacław within the framework of the project no. DEC-2013/11/B/NZ9/00793 financed by the National Centre of Science.

Original data on the distribution were plotted onto the map of Poland within the UTM system using the MapaUTM application software by Grzegorz Gierlasiński (www.heteroptera.us.edu.pl). On the maps of species distribution all the original data are marked in red, regardless of the data of the report. Localities are marked in black, those published:

- before 1945 (black triangle)
- in the period 1945–1999 (black square)
- 2000–2021 (black disc).

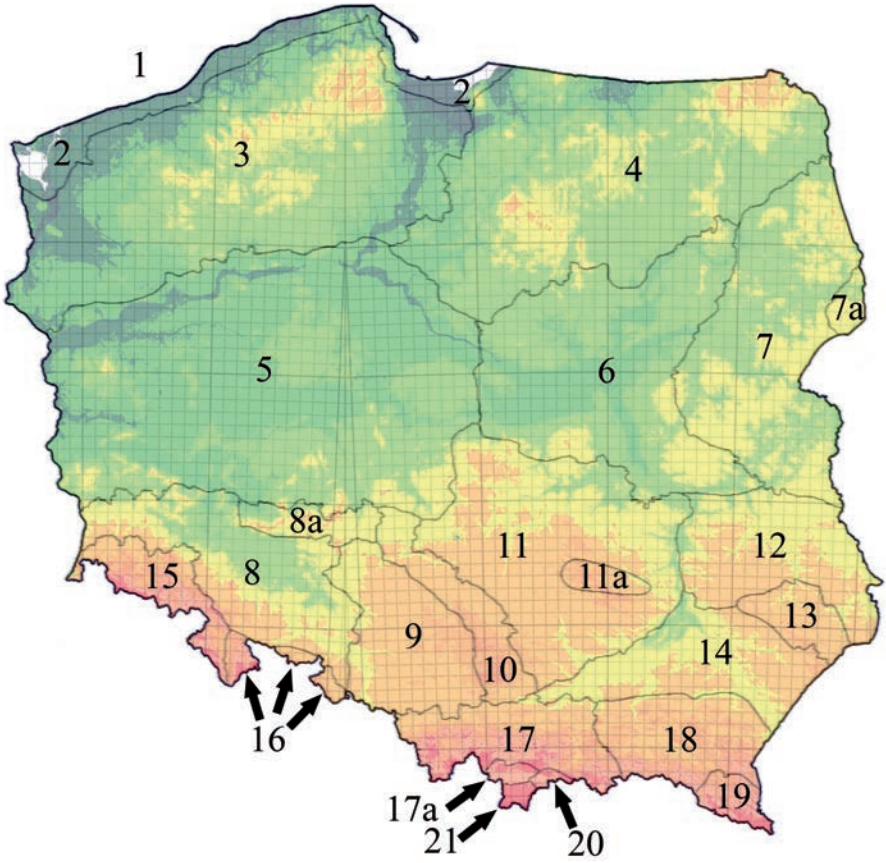


Fig. 6.1. The faunistic division of Poland after Catalogue of Polish Fauna (Burakowski *et* al., 1980). Legend: 1 – Baltic, 2 – Baltic Coast, 3 – Pomeranian Lake District, 4 – Masurian Lake District, 5 – Wielkopolska-Kujawy Lowland, 6 – Mazovian Lowland, 7 – Podlasie, 7a – Białowieża Primeval Forest, 8 – Lower Silesia, 8a – Trzebnica Hills, 9 – Upper Silesia, 10 – Kraków-Wieluń Upland, 11 – Małopolska Upland, 11a – Świętokrzyskie Mts., 12 – Lubelska Upland, 13 – Roztocze, 14 – Sandomierska Lowland, 15 – Western Sudety Mts., 16 – Eastern Sudety Mts., 17 – Western Beskid Mts., 17a – Nowy Targ Basin, 18 – Eastern Beskid Mts., 19 – Bieszczady Mts., 20 – Pieniny Mts., 21 – Tatra Mts.

For each species graphs of their frequency were prepared based on the original, dated reports. Unless stated otherwise, species determinations were given by the collection owners.

Information on the natural conditions at the localities of species found in forests is available on the website of the Forest Data Bank (Bank Danych o Lasach) - https://www.bdl.lasy.gov.pl/portal/en

Abbreviations used in the presentation of original data

Distr. – district (nadleśnictwo)
for. comp. – forest compartment (oddział leśny)
for. distr. – forest distr. (leśnictwo)
obs. – observation
NP – national park (park narodowy)
nat. res. – nature reserve
p.u. – protective unit (in national parks)
vic. – vicinity.

Abemus Mulsant & Rey, 1876

The genus comprises three, solely Palaearctic species, of which only *A. chloropterus* – (in Polish: Abek zielonokrywek after Szujecki, 2017) was reported from Poland.

Abemus chloropterus (Panzer, 1796)

General distribution. The species is known from 20 countries of southern and central Europe and from Turkey (Herman, 2001; Löbl & Löbl, 2015). The northern slopes of the Carpathian Mts., including those situated in Poland, constitute its northern range limit. To date the species is unknown in Portugal (Ferreira, 2018), although reported in the Iberian Peninsula in Andalucia (Gamarra & Outerelo, 2008).

Zanetti & Tagliapietra (2005) distinguished two major centres of the occurrence of this species in Europe. They are old, well-preserved forest areas in France in the west and a large Carpathian and Balkan region in the east. In Italy it is only found near Trieste, where it is found in large numbers in forests, whereas earlier data (Horion, 1965) on its occurrence in the Bolzano province were not confirmed (Zanetti & Tagliapietra, 2005).

Habitat preferences. It is a thermophilous species and lives in light broad-leaved forests, on their verges, in the leaf litter at the tree base. Probably the microhabitat is provided by the bases of deciduous trees (birch, oak, hornbeam), from which sap is released, or by growing large arboreal fungi, e.g. sulphur polypore. Burakowski *et* al. (1980) reported highly diverse biotopes, which this species colonises, such as rotten tree stumps or trunks, bracket fungi, mosses, the leaf litter, fallen leaves and decaying plant residue. In Slovakia this species was observed at the sap flowing down an oak trunk, at the forest edge, in a sunny, very dry site (oral communication P. Jałoszyński).

Interesting data concerning habitat preferences of *A. chloropterus* were obtained in the course of studies on Staphylinidae assemblages subjected to urbanisation pressure. In the area of Debrecen (Magura *et* al., 2013) investigations were conducted along a forested rural-suburban-urban gradient characterised by increasing disturbances caused by urbanisation. *Abemus chloropterus* showed the greatest frequency in the suburban environment, followed by rural habitats, while it was least numerous in urban ones. Penetration of thermophilous species to urban environments is explained by the existence of advantageous temperature conditions and microhabitats.

Abemus chloropterus was placed on the list of Central European relict beetles of natural forests *sensu lato* (Eckelt *et* al., 2017). Szujecki (2017) termed it as

a relict of primeval broadleaved forests. Mihailov & Derjnaschi (2010) defined it as a saprophagous species.

Occurrence in Poland. This species was reported in two localities in Poland (Fig. 6.2). Unfortunately, despite intensive searches in the area of Przemyśl *Abemus chloropterus* was not confirmed again since the 1930s. The locality in Brylińce, mentioned by T. Trella (1923) practically no longer exists, while Pikulice became considerably urbanised over the period of 90 years and changed greatly in character. Obviously, this is not equivalent to the elimination of this species from the list of Polish fauna. Further searches are required, particularly in south-eastern Poland. As the only species from this subtribe it was classified in the "Polish Red List" as CR – critically endangered (Pawłowski *et* al., 2002), although in the light of the criteria about the disappearance of sites and unconfirmed occurrence for at least the last 50 years, *A. chloropterus* can be considered extinct (EX).

New records
No new data.

Previously recorded from:

Western Beskid Mts.: the basin of the Soła and Koszarawa (Wachtl, 1870)
Eastern Beskid Mts.: Pikulice near Przemyśl (Trella, 1923; 1929; 1939), Przemyśl vic. (Trella, 1929; 1939; Horion, 1965; Szujecki, 1980)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Löbl & Smetana, 2004; Löbl & Löbl, 2015).

Phenology and development. Field observations concerning the date of swarming (activity) and development were reported by T. Trella (1939). That author observed hunting and swarming beetles at the end of May on freshly cut oak stumps covered with fermenting sap, where in the afternoon they hunted for fly larvae and males competed for females. Beetles were very active and when flushed they hid in underground galleries in the leaf litter, but they did not fly away. This situation lasted for a very short time, since on the next day the author found only a single beetle. In June and July scarce larvae and single beetles remained in underground galleries. In August and September the author found no beetles, while the first, probably young individuals appeared in the beginning of October. In spring of the next year (in the first days of April) in that location the author found a torpid beetle. Beetles are active during the day, they swarm in May, the development of predatory larvae occurs in the leaf litter and the ground up to autumn, young beetles overwinter in the leaf litter near their development grounds (Trella, 1939). Similar data were reported from Slovakia, according to which beetles were caught into soil emergence traps from 2nd April to 28th May (Kollár & Cunev, 2019).

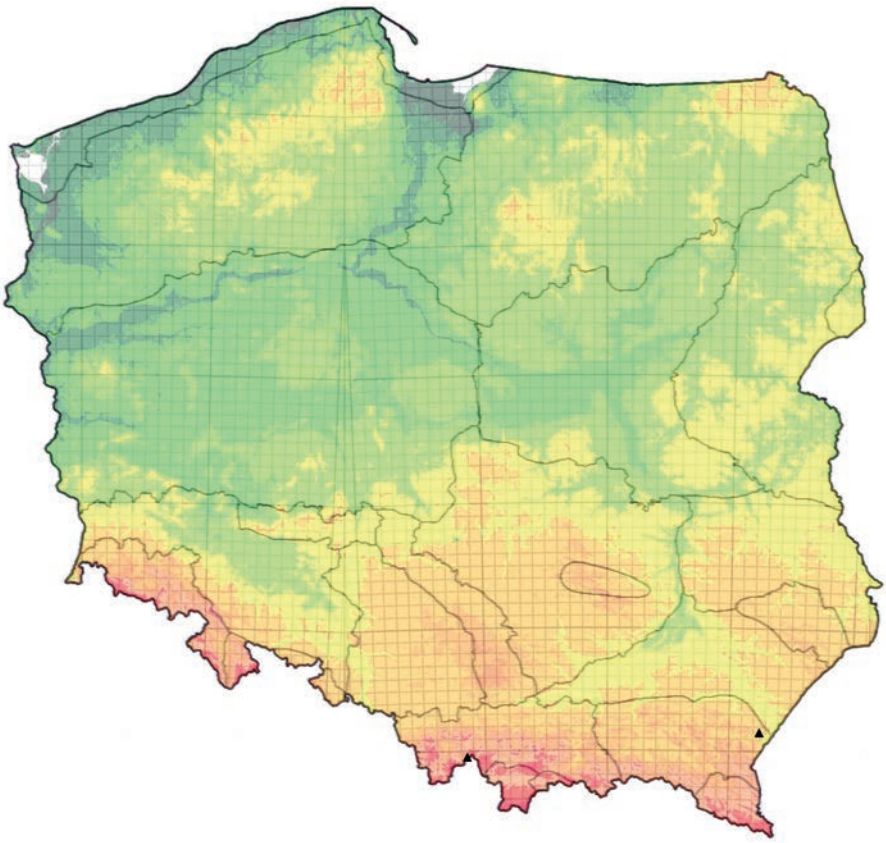


Fig. 6.2. Distribution of *Abemus chloropterus* (Panz., 1796) in Poland: ▲ – localities before 1945

Creophilus Leach, 1819

This genus comprises 13 species, of which two are found in the Palearctic.

Creophilus maxillosus maxillosus (Linnaeus, 1758)

The nominative subspecies found in Poland, it is cosmopolitan, mainly due to human intervention (introduced as biological control). The other subspecies *Creophilus maxillosus villosus* (Grav., 1802) lives in eastern Asia and in Nearctic and Neotropical Regions (Herman, 2001; Schülke & Smetana, 2015).

General distribution. A Holarctic species. In the Palearctic it is found practically throughout the region – from the Azores, the Canary Islands and Madera through whole of Europe, Siberia, Mongolia up to Japan and northern China and Korea (Ahn *et* al., 2017). In Asia it was recorded in West India, Iran and Afghanistan. In northern Africa it is found from Morocco to Egypt. In the Nearctic region – in North America from Alaska and Canada to Mexico the subspecies *C. maxillosus villosus* is found (Kleeberg & Uhlig, 2011). It is also recorded in Argentina and Chile (Herman, 2001). The nominative species was accidentally spread and introduced in many regions worldwide, e.g. in the Hawaii, islands of the Oriental and neotropical regions.

In Europe it is found from the farthest northern regions, including Greenland and Iceland to the Mediterranean (Corsica, Sardinia, Sicily, Cyprus; Burakowski *et* al., 1980; Kleeberg & Uhlig, 2011; Herman, 2001; Bordoni, 2010).

Habitat preferences. This large, black-grey Staphylinina species with a characteristic appearance lives in various habitats, particularly in sites of decay processes and where numerous fly larvae are developing, since it tends to hunt them. They are mainly compost heaps, piles of other plant residue (particularly cabbage) or bulky manure, as well as large mushroom fruiting bodies and excrement of various large animals. On cow dung it is a fierce predator killing (without feeding on them) large beetles of the family Scarabaeidae: *Onthophagus fracticornis* (Preyssler, 1790), *O. similis* (Scriba, 1790) as well as smaller *Aphodius* species: *Aphodius coenosus* (Panz., 1798) or *A. fimetarius* (L., 1758). Szwałko (2001) expressed an opinion that such behaviour is probably a manifestation of care of adult beetles for their offspring (larvae), colonising primarily cow dung. Moreover, *C. maxillosus* is also frequently observed on carrion of large animals, including domestic swine (Matuszewski *et* al., 2008).

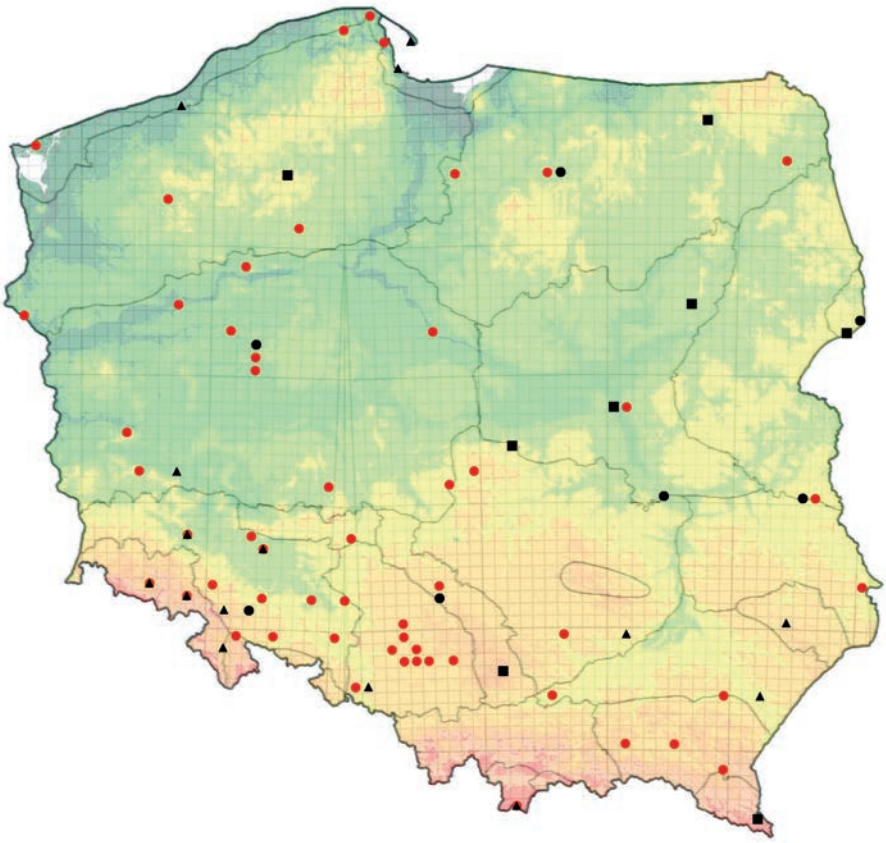


Fig. 6.3. Distribution of *Creophilus maxillosus maxillosus* (L., 1758) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

The species does not avoid synanthropic habitats and it is found e.g. in zoological gardens, rubbish heaps or home gardens (Kleeberg & Uhlig, 2011), always selecting sites with accumulated decaying organic matter.

Occurrence in Poland. The hairy rove beetle (Polish: rabież wielka; Szujecki, 2017) is found throughout Poland (**Fig. 6.3**).

New records

Baltic Coast: Lisewo Kaszubskie [CF06], IX 1984, 1 ex., leg., coll. AM; Lubiatowo [XA88], VI 1990, 1 ex. leg. SCz, coll. AM; Międzyzdroje [VV67], 3 VI 1998 and 9 X 2006, 2 exx. leg., coll. HS; Mechelinki [CF35], 3 VI 2010, 1 ex., leg., coll. DJT; Rewa [CF35], 9 VIII 1995, 1 ex. under the swan carrion on

the beach, leg., coll. KK; Władysławowo [CF27], 13 VI 1993, 3 exx., leg. RD, det. AM, coll. USM, 1 ex. coll. AM

Pomeranian Lake District: Gozdowice vic. [VU54], 1 IX 2009, 1 ex., xerothermic stipa grassland, pitfall trap, leg. PS, det., coll. AM; Zakrzewska Osada [XV61], 25 V and 19 IX 2011, 2 exx., and 25 V 2012, 1 ex., leg., coll. DJT; Okonek [XV23], 8 V 2003, 2 exx. on dry carrion, leg., det., coll. MAr; Złocieniec [WV63], 26 VII 2011, 5 exx. on fox carrion and 10 IX 2015, 1 ex. on the road, leg., coll. KR

Masurian Lake District: Augustów [FE36], 26 and 28 V 1980, 2 exx., leg. Jankowicz A., coll. HS; Naglady vic. [DE55], 27 VII–4 IX 1999, 1 ex. dry meadow, bait trap (fish), leg., coll. KK; Olsztyn [DE65], 6 VII 1997, 1 ex. on fish carrion, leg., det. KK, coll. AMa; Susz District– Michałowo for. distr., for. comp. 28, [CE85], 26 VII 1999, 1 ex. on red deer carrion, leg., det. MS, coll. AMa; Wigierski National Park, Huta [FE39], 19 VI 1991, 14 exx. on carrion of wild boar, leg. coll. AMa

Wielkopolska-Kujawy Lowland: Długie [WT42], 15 VI 2013, 1 ex. leg., coll. RO; Drawski Młyn [WU75], 1 VII 1990, leg. D. Szczepańska, det., coll. AMa; Piła-Kalina 2 km SE [XU28], 15 VII 1999, 3 exx. on carrion, leg. coll. RRu; Poznań [XU31], 23 VI 1994, 5 exx., leg., coll. PJ; Poznań vic., Darzybór [XU30], 12 V 1969, 10 exx., leg. AS, coll. NHC; Poznań-Rataje [XU30], 5 IX 2003, 1 ex. on an asphalt alley, leg. A. Konwerska, coll. SK; Przygodzice [XT91], 30 VII 2010, 1 ex., causeway over ponds, det. AM, leg., coll. MW; Sycyn Dolny ad Szamotuły [XU13], 26–31 V 2008, 1 ex., leg. MBu, coll. PJ; Włocławek [CD63], 14 IX 1992, 1 ex., 11 IX 1992, 1 ex., leg., coll. PJ; Zielona Góra [WT35], 8 X 1976, 1 ex. leg. PSt, det. coll. AMa

Mazovian Lowland: Świder [EC17], 4 VII 1903, 1 ex., leg. WM, det. AM, coll. USM; Warszawa-Kabaty [EC07], 5 V 2013, 1 ex. at the forest edge, leg., coll. JTD

Podlasie: Suchawa [FC60], 27 VI 2014, 1 ex., cereal crop pitfall trap, leg. PR, coll. AM

Białowieża Primeval Forest: Białowieża-Krzyże [FD94], for. comp. 475B, 17 V 2016, 2 exx. on the carrion of *Nyctereutes procyonoides*, leg., coll. JTD

Lower Silesia: Bardo Śląskie [XR29], 10 VII 1929, 2 exx., leg. FK, det. AM, coll. USM; Legnica [WS87], 2 VII 1960, 1 ex., leg. AKo, det. AM, coll. USM; Ligota Otmuchowska [XR59], 4 exx., leg. ED, det. AM, coll. USM; Nowy Młyn [YR09], 25 V 1917, 2 exx., leg. MK, det. AM, coll. USM; Ołdrzyszowice [XS82], 9 V 1975, 3 exx., det., leg. LBo, coll. RRu; Pawłów [BA95], 7 VII 1925, 1 ex., leg. MK, det. AM, coll. USM; Strzelin [XS42], 10 IX 1989,1 ex. in the garden, leg., det., coll. AMa; Świdnica [XS03], 14 VI 1964, 1 ex., leg. TS, det. AM, coll. USM; 22 V 1963, 1 ex. leg., det. ex coll. AG, coll. MNHW; Węgry near Opole [BB82], 22 VII 2016, 1 ex., leg. Piotr Cholewa, det. et coll. TW; Wrocław-Swojec [XS46], 30 IV 1946, 2 exx., leg., det. ex coll. AG, coll. MNHW; Wrocław-Wilkszyn [XS37], 2 V 2010, 1 ex., Mokrzański forest, det. AM, leg., coll. MW

Upper Silesia: Bielszowice [CA47], 10 X 1925, 1 ex., 5 X 1935, 1 ex., leg. MK, det. AM, coll. USM; Brynek [CA39], 20 VI 2007 and 2 VI 2015, 2 exx., leg., coll. HS; Brynek-Park [CA39], 13 V 2017, 1 ex., leg., coll. HS; Bytom [CA57], 2 V, 2 exx., 5 XI 1911, 2 exx., leg. GR, 15 V 1925, 2 exx., 6 X 1928, 1 ex., 1 VI 1929, 1 ex., 1 VI 1941, 1 ex., leg. FK, 22 IX 1933, 1 ex., HN, det. AM, coll. USM; Dąbrowa Górnicza [CA77], VI 1935, 1 ex., leg. ST, det. AM, coll. USM; Kochłowice [CA57], 3 VI 1939, 3 exx., leg. JK, det. AM, coll. USM; Kończyce [CA37], 5 IX 1956, 1 ex., leg. WtR, 10 X 1968, 1 ex., leg. ST, det. AM, coll. USM; Rozbark [CA48], 27 V 1924, 1 ex., leg. FK, det. AM, coll. USM; Ruda Śląska [CA47], 16 VII 1923, 1 ex., 20 VI 1924, 1 ex., 12 VIII 1929, 2 exx., 10 XI 1931, 1 ex., leg. MK, det. AM, coll. USM; Siemianice [BB97] 5 VI 1980, 1 ex. leg. PSt, det. coll. AMa; Taciszów [CA28], 24 V 1925, 1 ex., leg. HN, det. AM, coll. USM; Tworóg [CB30], 28 X 1928, 1 ex., leg. HN, det. AM, coll. USM; 9 VI and 18 VII 2007, 2 exx., 21 VIII 2010, 1 ex., leg., coll. HS

Kraków – Wieluń Upland: Częstochowa [CB63], 13 VI 1937, 1 ex., leg. ST, det. AM, coll. USM

Małopolska Upland: Głębock near Pogórzyn [WS53], 5 IV 1974, 1 ex. leg. PSt, det., coll. AMa; Łask-Ostrów [CC71], 24 and 30 VI 2006, 3 exx. in a compost heap of horse excrement, leg., coll. AK; Modlnica [CC92], 12 VII 1948, 1 ex., leg. anonim, det. AM, coll. USM; Pińczów-Skowronno [DA69], 10–15 V 1991, 2 exx., det., leg. LBo, coll. RRu; Skowronno [DA69], 12 V 1991, 2 exx., det. AM, leg., coll. MW

Sandomierska Lowland: Niepołomicka Forest [DA54], 16 VII 2002, 5 exx. on carrion, leg. det., coll. ToK

Lubelska Upland: Hrubieszów [GB03], 5 V 1945, 1 ex., leg., det. ex coll. AG, coll. MNHW

Western Sudety Mts.: Wałbrzych [WS82], 1950, 1 ex. leg. ex coll. AG, det. AM, coll. MNHW

Eastern Beskid Mts.: Biecz [EA10], 24 IV 1933, 1 ex., leg. anonim, det. AM, coll. USM; Korczyna [EA50], VI 1956, 1 ex., leg. A. Szeptycki, det. ex coll. AG, coll. MNHW; Markowa [EA94], 22 IV 1984, 1 ex., in henhouse. leg., coll. TO; Manasterzec [EV98], 28 IV 2015, 1 ex., leg, det. et coll. DT

Tatra Mts.: Polana Kalatówki [DV25], 11 VII 2011, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa

Previously recorded from:

Baltic Coast: Gdańsk-Brzeźno (Brischke, 1894), Koszalin (Lüllwitz, 1916), Hel (Węgrzecki, 1932)

Pomeranian Lake District: Człuchowska Forest (Szujecki, 1995), records without exact data (Kniephof, 1913; Zumpt, 1931; Błażejewski, 1956)

Masurian Lake District: Borecka Forest (Melke & Maciejewski, 1999), Olsztyn vic. (Komosiński, 2001a)
Wielkopolska-Kujawy Lowland: Biedrusko (Matuszewski *et* al., 2008), Glogau (Głogów) and records without exact data (Letzner, 1871; Koerth, 1916; Szulczewski, 1922; Eichler, 1929; Myrdzik, 1933; Arnold, 1936)
Mazovian Lowland: Warszawa, Warszawa-Natolin (Szujecki, 1968), Ostrów Mazowiecka (Burakowski *et* al., 1980)
Podlasie: Policzna (Szwałko, 2001)
Białowieża Primeval Forest: records without exact data (Karpiński, 1949; Derunkov & Melke, 2001)
Lovel Silesia: Breslau (Wrocław), Liegnitz (Legnica) and records without exact data (Letzner, 1871; 1886), Muszkowicki Las Bukowy nat. res. (Mazur, 2000a)
Upper Silesia: Ratibor (Racibórz) and records without exact data (Kelch, 1846; Roger, 1856; Letzner, 1871; 1886; Lgocki, 1908; Stefek, 1939)
Kraków-Wieluń Upland: Ojcowski NP and vic. (Pawłowski *et* al., 1994), Konopiska (Kościelny, 2006), Częstochowa-Dźbów (Klasiński, 2013), records without exact data (Jabłoński, 1869; Lgocki, 1908; Eichler, 1914; Stefek, 1939; Mroczkowski, 1950)
Małopolska Upland: Rytwiany near Staszów (Varendorff, 1917), Rogów near Koluszki (Burakowski *et* al., 1980)
Lubelska Upland: Poleski NP – Wytyczno (Staniec, 2010)
Roztocze: records without exact data (Tenenbaum, 1913)
Western Sudety Mts.: Hirschberger Tal (Kotlina Jeleniogórska), Waldenburger Gebirge (Góry Wałbrzyskie), Eulengebirge (Góry Sowie) (Letzner, 1871; 1886)
Eastern Sudety Mts.: Grafschaft Glatz (Ziemia Kłodzka; Letzner, 1871; 1886)
Western Beskid Mts.: records without exact data (Wachtl, 1870; Letzner 1886)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929)
Bieszczady Mts.: Ustrzyki Górne, in synanthropic habitat (Szujecki, 1996; Pawłowski *et* al., 2000)
Tatry Mts.: records without exact data (Nowicki, 1868; 1873; Łomnicki, 1868)

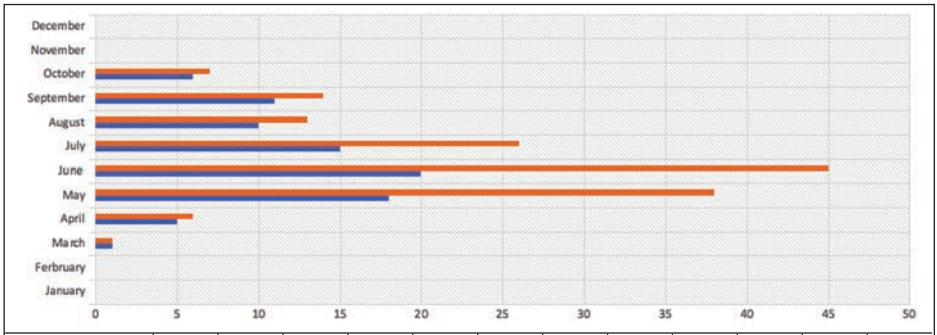
Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Kulwieć, 1907; Łomnicki, 1913; Szujecki, 1980; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Prussia (Siebold, 1847; Lentz, 1853; 1857; Schilsky, 1888; 1909; Łomnicki, 1913), Silesia (Weigel, 1806; Endler i Scholz, 1819; Reitter, 1870b; Gerhardt, 1910a; Kuhnt, 1912), Galicia (Łomnicki, 1884; 1886), Western Galicia (Nowicki, 1873), Carpathians (Nowicki, 1873).

Phenology and development. The larva and the pupa were described as early as the second half of the 19th century. A more recent description of larvae was given by Paulian (1941), who collected numerous larvae in March on the Atlantic coast from under seaweeds, among numerous puparia of flies (Kleeberg & Uhlig, 2011). The morphological structure of the developmental stages and the biology of this species were also determined by Dajoz & Caussanel (1968). The developmental stages and temperature conditions for their development are used as important data in forensic entomology (Matuszewski, 2011; Watson-Horzelski, 2012).

Based on new data an analysis of frequency was prepared for *Creophilus maxillosus* in localities in Poland (**Fig. 6.4**).

Beetles have been found in Poland from April (the earliest caught individual on 5th April) to November (the latest observation 10th November 1931), typically single, since the mean number of reported individuals during observations is 1.8 specimens.

Adult individuals under laboratory conditions at constant temperature of 25°C live up to 26 weeks: males slightly longer, on average 22 weeks, while females live shorter – on average 18 weeks (Dajoz & Caussanel, 1968). Methods of laboratory breeding were developed for *C. maxillosus* relatively recently (Greene, 1996) in order to control the populations of flies by beetles at sites of large-scale commercial cattle rearing in the USA. Beetles were fed larvae of flies *Calliphora* sp. and *Musca domestica* L. Feeding on larvae of blow flies (*Calliphora* sp.) resulted in longer lifespan of beetles and a larger number of laid eggs. The lowest survival rates under laboratory conditions were observed during egg development and in the prepupal period. Mortality during larval development is 70%. One female lays a total of 500 eggs (Greene, 1996).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	1	6	38	45	26	13	14	7	0	0
Number of records	0	0	1	5	18	20	15	10	11	6	0	0

Fig. 6.4. Frequency of *Creophilus maxillosus maxillosus* (L., 1758) in localities in Poland

Dinothenarus Thomson, 1858

The genus comprises 24 species inhabiting the Palearctic, the Nearctic and the Indomalayan (Oriental) regions (Herman, 2001). Four of the species are found in Europe, including three in central Europe (Schillhammer, 2011). In Poland two species are recorded, with *D. fossor* (Scop. 1771) reaching the definite northern limit of its range, while the occurrence of a rare.

Dinothenarus pubescens pubescens (De Geer, 1774)

The species comprises two subspecies: *D. pubescens pubescens* (De Geer, 1774) and *D. pubescens mediorientalis* (Bordoni, 1984) – described and recorded from Lebanon (Herman, 2001).

General distribution. Horion (1965) defines this species as northern Palearctic, found in northern and central Europe as well as locally in southern Europe in mountainous areas as well as in Siberia. In the North the species range covers southern Lappland, in western Europe in extends to the Pyrenees, while in southern Europe it covers France, Italy, the Balkans, southern Russia and Ukraine, with its range reaching the Urals.

The area of the occurrence of *D. pubescens* was described similarly by Burakowski *et* al. (1980), who included in it almost the entire European continent, except for extreme northern and southern provinces as well as Siberia. Additionally the distribution area of the species included also Greece, the Baltic states, Bulgaria and Turkey (Löbl & Smetana, 2004; Bordoni, 2010), but excluding Siberia. More recent data on the area of its occurrence come from Latvia (Cibuļskis, 2007), Romania (Stan, 2004), Slovakia (Gajdoš & Majzlan, 2018) and Portugal (Ferreira, 2018).

In Germany (particularly in the northern part of the country) a dramatic decline is observed in the species population size and the number of its localities (Kleeberg & Uhlig, 2011).

Disappearance of the species from many localities may be related to the disappearance of pastures and decline in free range grazing of farm animals (Boháč & Jahnova, 2014). *Dinothenarus pubescens*, along with other large Staphylininae (e.g. *Emus hirtus* (L.), *Ocypus ophthalmicus* (Scop.), *Philonthus intermedius* (Lac.), was classified to species retreating from Czechia as a result of the disappearance of such biotopes (*op. cit*.).

Habitat preferences. It inhabits primarily lowland open areas, in the mountains reaching above the upper tree line. In open space habitats it is found in fields, meadows and forest edges, less frequently in forests. This trend is observed also in the mountains, where it is found in forests, but also in alpine meadows and alpine pastures.

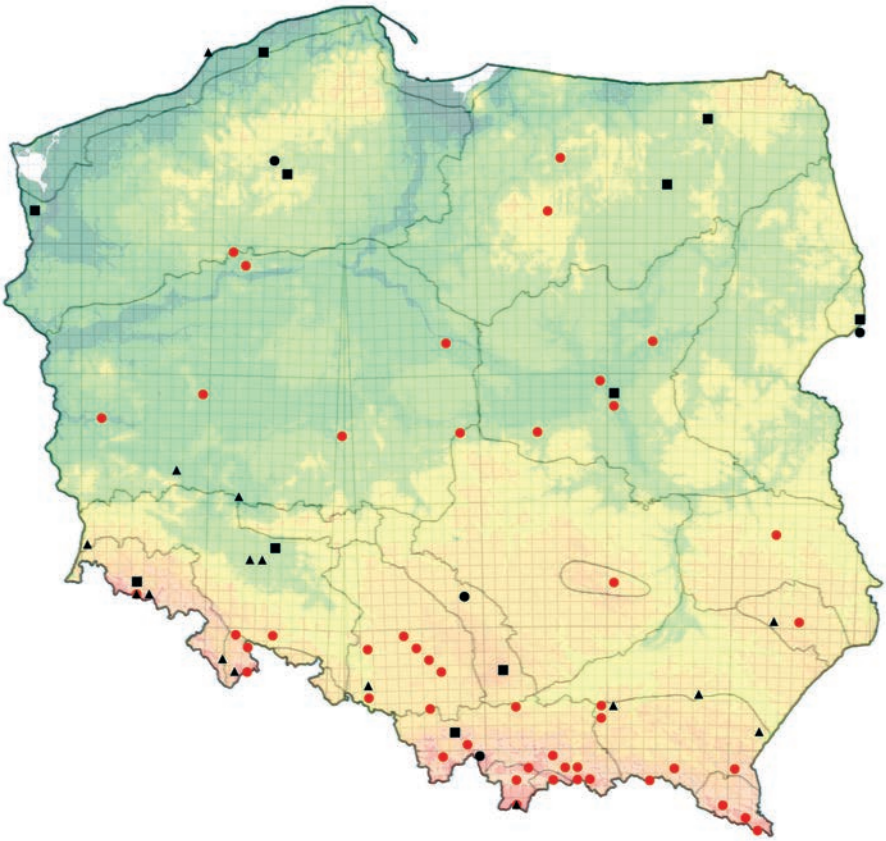


Fig. 6.5. Distribution of *Dinothenarus pubescens pubescens* (De Geer, 1774) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

Beetles are found in the vicinity of various types of decaying organic matter, at fresh and dried dung (cow and horse dung; Jelínek, 2001), at compost heaps and on carrion (Burakowski *et* al., 1980; Kleeberg & Uhlig, 2011). In Moravia (near Opava) found in large numbers on lures from dead rats, although classified in this microhabitat as a casual species (Kočárek, 2003).

Occurrence in Poland. The species is found throughout the country, although more frequently observed in the southern part of Poland (**Fig. 6.5**).

New records

Pomeranian Lake District: Dolaszewo vic. [XU19], 9 V 2000, 1 ex. in dung, leg., coll. RRu; Zbyrosławice near Przechlewo [XV46], 7 VIII 1982, 1 ex. leg., det. TM, coll. AM

Masurian Lake District: Dobrzyń vic. [DE52], 17 VI–17 VII 1998, 1 ex., mixed forest, bait trap (fish), leg., coll. KK; Słupy near Olsztyn [DE66], 28 III 1997, 1 ex., leg. MS, coll. KK

Wielkopolska-Kujawy Lowland: Dziembowo vic. [XU28], 12 VII 1999, 1 ex., leg., coll. RRu; Grodzisk Wielkopolski [WT98], 1910–1920 (no exact date), 2 exx., leg. Zemlerski, coll. NHC; Kowal vic. [CD72], 19 VII 1994, leg., coll. PJ; Tursko near Gołuchów [YT05], 31 V 1992, 1 ex. leg., det., coll. AM; Krosno Odrzańskie [WT16], 23 III 2019, 1 ex. on the dry dryad's saddle (*Cerioporus squamosus* (Huds.) Quél.) fruiting body-leg., coll. MAr, det. AMa

Mazovian Lowland: Bielany [DC99], 9 VII 1888, 1 ex., leg. WM, det. AM, coll. USM; Natolin [EC07], 6 V 1893, 1 ex., leg. WM det. AM, coll. USM; Skierniewice [DC45], 28 VII 1894, 1 ex., leg. WM, det. AM, coll. USM; Szumin near Łochów [ED32], 25 VI 1991, 1 ex. leg. SCz, det., coll. AM; Warszawa [EC08], 5 IX 1895, 1 ex., leg. WM, det. AM, coll. USM; Wawer [EC08], 2 IV 1905, 2 exx., leg. WM, det. AM, coll. USM

Białowieża Primeval Forest: Białowieża, Polana Białowieska [FD94], 15–27 VI 1991, 1 ex., det., leg. LBo, coll. RRu

Lower Silesia: Bardo Śląskie [XR29], 20 VII 1930, 2 exx., leg. FK, det. AM, coll. USM; Ligota Otmuchowska [XR59], VII 1908 and 17 V 1909, 5 exx., leg. ED, det. AM, coll. USM

Upper Silesia: Bytom [CA57], 13 IV 1925, 2 exx., 10 IV 1930, FK, det. AM, coll. USM; Dziedzice [CA53], 15 VI 1925, 1 ex., leg. ZT, det. AM, coll. USM; Miedary [CA39], 27 V 2007, 1 ex., leg., coll. HS; Murcki [CA66], 21 III 1923, 1 ex., leg. HN, det. AM, coll. USM; Pogrzebień [CA04], 10 and 14 VII 1931, 2 exx., leg. WY, det. AM, coll. USM; Rokitnica [CA48], 11 X 1929, 1 ex., leg. HN, det. AM, coll. USM; Rozbark [CA48], 10 XI 1926, 1 ex., leg. FK, det. AM, coll. USM; Sławęcice [CA08], 13 V 1926, 1 ex., leg. FK, det. AM, coll. USM

Kraków-Wieluń Upland: Kraków [DA23], 26 VI 1948, 1 ex. leg., det. ex coll. AG, coll MNHW

Małopolska Upland: Orle near Łódź [CC85], 2 X 1994, 1 ex., leg. JK, det., coll. AM

Świętokrzyskie Mts.: Świętokrzyski NP, Łysa Mt. [EB03], 24 VII–16 X 2008, 4 exx., pitfall trap in *Abietetum polonicum* forest, leg. K. Dąbrowicz, coll. SK

Lubelska Upland: Jaszczów near Milejów [FB37], 20 III 1985, 1 ex. in the swamps on the meadow of the Wieprz River valley, leg. BS, coll. MCSU

Roztocze: nat. res. Święty Roch [FB50], 19 VI 1990, 1 ex., det., leg. LBo, coll. RRu

Western Sudety Mts.: Karkonosze Mts., Chojnik [WS43], 2 VI 1993, 1 ex. on carrion, leg., det., coll. AMa; Jagniątków [WS42], 13 VI 1990, 2 exx. leg., det., coll. AMa

Eastern Sudety Mts.: Kletno [XR36], 7 IX 1975, 1 ex., det., leg. LBo, coll. RRu; Lądek Zdrój [XR38], 1934, 1 ex., leg. FK, det. AM, coll. USM

Western Beskid Mts.: Ciechań [EV37], 26 X 2013, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa; Gaboń [DV68], 9 VII 2011, 1 ex., 17 VIII 2011, 1 ex. in cow's faeces, leg. AGo, det., coll. AMa; Gołkowice Dolne [DV68], 9 VI 2011, 2 exx., 10 VII 2011, 1 ex., 8 VII 2012, 1 ex., 29 X 2013, 3 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Hala Boracza [CV69], 25 VII 2012, 1 ex., 18 VIII 2012, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa; Kamienica [DV59], 8 VI 2011, 2 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Pleśna [DA93], 26 V 2011, 1 ex., 11 VI 2012, 1 ex. in cow's faeces, leg. AGo, det., coll. AMa; Przehyba [DV77], 29 IX 2012, 2 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Przełęcz Krowiarki [CV99], 9 VI 2012, 9 exx., 3 VII 2012, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa; Rytro [DV78], 20 V 2013, 1 ex., 14 X 2013, 1 ex. in sheep droppings, leg. AGo, det., coll. AMa; Turbacz Mt. [DV38], 30 V 1950, 1 ex. leg., det. ex coll. AGo, coll. MNHW; Uhryń [DV87], 18 V 2011, 3 exx., 8 VI 2011, 1 ex., 29 IX 2012, 1 ex. in sheep droppings and cow's faeces, leg. AG, det., coll. AMa; Żabnica [CV69], 12 V 2012, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa; Kocoń [CA80], 28 X 2013, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa

Nowy Targ Basin: Rogoźnik [DV27], 27 IX 2017, 1 ex., meadow, on cow dung, leg., det. et coll. TW

Eastern Beskid Mts.: Birchowa [DA92], 26 V 1999, 1 ex. det. AM, leg., coll. AT; Paszowa [FV08], 31 VII 2011, 2 exx., 9 IX 2011, 1 ex. in cow's faeces, leg. AGo, det., coll. AMa; Trzciana near Krosno [EV58], 10 VII 1968, 1 ex. det. AM, leg. ex coll. AG, coll. MNHW

Bieszczady Mts.: Łopienka [EV95], 10 V 2013, 1 ex., 7 X 2013, 2 exx., in excrement pitfall trap, leg. AGo, det., coll. AMa; Brzegi Górne [FV14], 7 VI 2011, 1 ex., 16 VI 2011, 1 ex., in excrement pitfall trap, leg. AGo, det., coll. AMa; Przełęcz Bukowska [FV23], 6 VI 2011, 1 ex., in excrement pitfall trap, leg. AGo, det., coll. AMa

Pieniny Mts.: Hala Majerz [DV57], VII 1994, 1 ex. w pułapki Barbera, leg., coll. MAr, det. AMa

Tatry Mts.: Upłazińska Kopa [DV25], 9 IX 2012, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa

Previously recorded from:

Baltic Coast: records without exact data (Lüllwitz, 1916; Dreyfeldt, 1933)

Pomeranian Lake District: Szczecin vic. (Cykowski, 1977), Bielsko distr. Słupsk (Burakowski *et* al., 1980), Człuchowska Forest (Szujecki, 1995)

Masurian Lake District: Piska Forest – Szeroki Bór (Szujecki, 1966f)

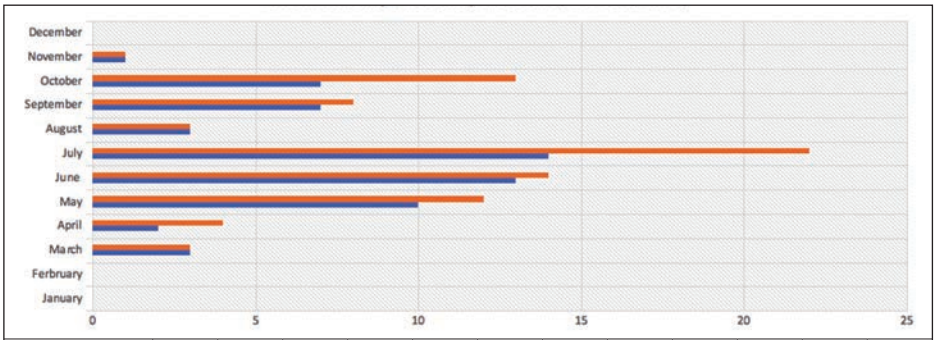
Wielkopolska-Kujawy Lowland: Glogau (Głogów; Letzner, 1871; 1880)

Mazowian Lowland: Warszawa-Wawer (Szujecki, 1968), Borecka Primeval Forest (Melke & Maciejewski, 1999)
Białowieża Primeval Forest: records without exact data (Karpiński, 1949; Derunkov & Melke, 2001)
Lower Silesia: Breslau (Wrocław), Görlitz (Zgorzelec) (Letzner, 1871; 1886; Goos, 1973)
Upper Silesia: Ratibor (Racibórz; Letzner, 1871; 1886), records without exact data (Kelch, 1846; Roger, 1856; Stefek, 1939)
Kraków-Wieluń Upland: Ojcowski NP and vic. (Pawłowski *et* al., 1994), Konopiska and Zrębice (Kościelny, 2006), records without exact data (Kotula, 1873; Lgocki, 1908)
Roztocze: Tenenbaum, 1913
Sandomierska Lowland: Tarnów (Stefek, 1939), Rzeszów vic. (Schaitter, 1870)
Western Sudety Mts.: Jagniątków (Mazur, 1994; 1998), Riesengebirge, Koppenplan, Melzengrund (Karkonosze, Równia pod Śnieżką, Karpacz-Wilcza Poręba; Letzner, 1871; 1880)
Eastern Sudety Mts.: Grafschaft Glatz (Ziemia Kłodzka; Letzner, 1871; 1880)
Western Beskid Mts.: Beskid Mały (Paśnik, 1998); Babia Góra Mt. (Kubisz & Szafraniec, 2003), records without exact data (Kelch, 1846; Stobiecki, 1883; Letzner, 1886; Stefek, 1939; Pawłowski, 1967)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929)
Tatry Mts.: records without exact data (Łomnicki, 1866; 1868; Nowicki, 1873)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Kulwieć, 1907; Łomnicki, 1913; Szujecki, 1980; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Prussia (Siebold, 1847; Lentz, 1857), Silesia (Weigel, 1806; Reitter, 1870a; Gerhardt, 1910a; Kuhnt, 1912), Galicia (Łomnicki, 1884; 1886), Nord Galicia (Nowicki, 1873), Carpathians (Nowicki, 1873).

Phenology and development. Beetles are found from March and April to October, being most numerous in June and July. According to Horion (1965) the larva overwinters. Larval forms were described by Paulian (1941).

Individuals of *D. pubescens* were observed from March to November, most often singly, less frequently with several individuals at one locality (mean number of individuals / locality = 1.5). Frequency of beetles during their period of activity shows two culminations: from May to July, with peaks in June, as well as in September and October. The number in August is comparable to the springtime frequency from March and April, whereas the frequency in October is equal to that in May (**Fig. 6.6**).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	3	4	12	14	22	3	8	13	1	0
Number of records	0	0	3	2	10	13	14	3	7	7	1	0

Fig. 6.6. Frequency of *Dinothenarus pubescens pubescens* (De Geer, 1774) in localities in Poland

Dinothenarus fossor (Scopoli, 1771)

General distribution. A European species found in the central part of the continent. In the south it is recorded in the mountainous areas – in southern France, northern Spain, Portugal, southern Tirol and northern Balkans. In the west it is known from the Netherlands and Belgium and through Switzerland, Germany, Poland, Czechia and Slovakia, and it reaches Hungary and Ukraine. It is not reported from Russia (Horion, 1965; Löbl & Smetana, 2004; Ferreira, 2018). The northern limit of its range extends through north-eastern Germany (Mecklenburg – Western Pomerania) and north-western Poland (the Pomerania Lake District), as the species is not recorded in Sweden, Denmark and Schleswig-Holstein or in the Western Pomerania (Burakowski *et* al., 1980; Silfverberg, 1992; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011).

Habitat preferences. It inhabits light broadleaved forests as well as xeric and exposed localities. In the mountains it may reach the upper tree line (2000–2200 m a.s.l.). It is found under stones, among mosses, under leaf litter and peeling bark, typically near ant colonies (e.g. *Formica sanguinea*), where it hunts for these insects (Horion, 1965).

A thermophilous species. In Poland in the Bialskie and in the Sowie Mts. It is found most numerous in young cultures and thinned sapling stands above 1000 m a.s.l. (Mazur, 2012). In the Bieszczady Mts. also in upper parts (Połonina Caryńska, Szeroki Wierch, Halicz, Bukowiec nad Haliczem) at altitudes of 600–1300 m a.s.l. (Szujecki, 1996). In the Alps it inhabits coniferous forests at an altitude of 1000–1200 m a.s.l. (Zanetti, 2015). Moreover, it has been reported occasionally in caves as a trogloxene (Kocot-Zalewska & Melke, 2021).

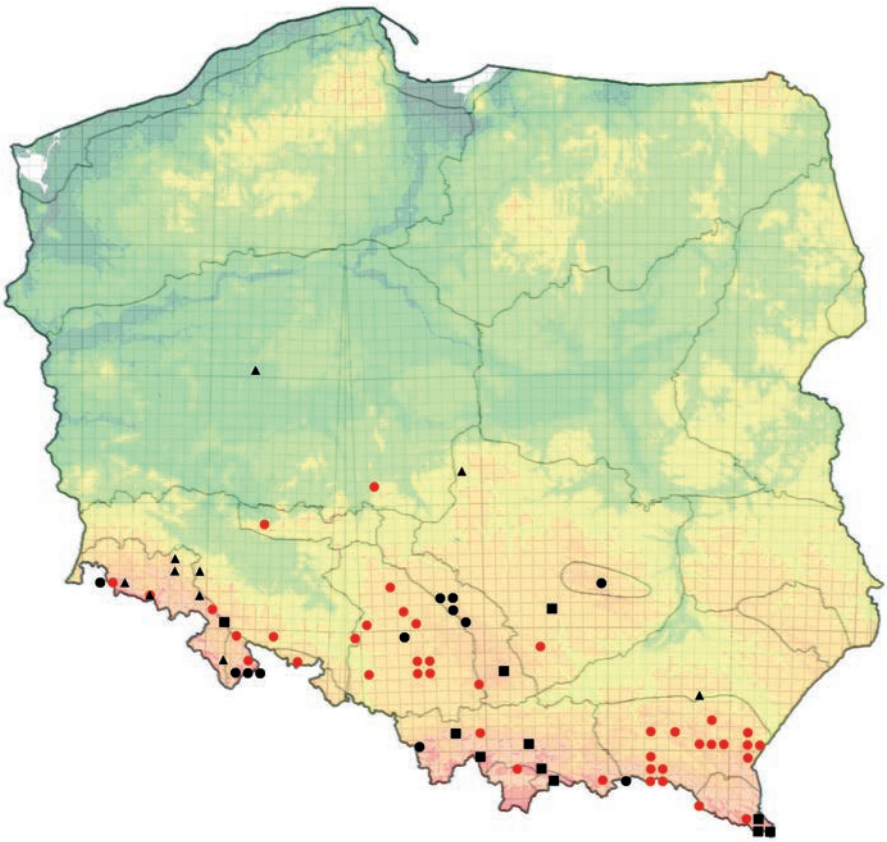


Fig. 6.7. Distribution of *Dinothenarus fossor* (Scop., 1771) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

Occurrence in Poland. Dinothenarus fossor (Polish: słońcolubek złotowłos, after Szujecki, 2017) is found in Poland south of the Lubsko–Poznań–Jędrzejów–Przemyśl–Ustrzyki Górne line (Szujecki, 1980; **Fig. 6.7**).

New records

Wielkopolska-Kujawy Lowland: Brzeziny near Godziesze [CC11], 21 VI 1984, 1 ex. in a pine forest, under a pine trunk, leg. PSz, det., coll. AM; 28 VIII 1983, 2 exx., under a thick bark and in russet-lying birch, pine forest, leg., coll. AM

Lower Silesia: Bardo Śląskie [XR29], 24 IV 1926, 1 ex., 4 V 1927, 2 exx., leg. HN, det. AM, coll. USM; Ligota Otmuchowska [XR59], 1 ex., leg ED, det. AM, coll. USM; Zakrzów [BA99], 1 V 1923, 1 ex., leg. FK, det. AM, coll. USM

Trzebnica Hills: Trzebnica [XS48], 3 VII 1950, 1 ex., leg. TS, det. AM, coll. USM

Upper Silesia: Bytom [CA57], 12 V 1911, 1 ex., leg. GR, 24 IV 1925, 1 ex., 24 V 1929, 1 ex., leg. HN, 7 X 1925, 1 ex., 18 V 1930, 1 ex., 3 VI 1944, 1 ex., leg. FK, det. AM, coll. USM; Kalety [CB40], 7 VII 2012, 1 ex., leg. Kocot P., coll. HS; Kochłowice [CA56], 30 IV 1977, 1 ex., 5 V 1989, 1 ex., leg. JK, det. AM, coll. USM; Lubliniec [CB31], 1 VI 1993, 1 ex., 28 and 30 IV 1994, 2 exx., leg. JK, det. AM, coll. USM; Nędza [CA06], 23 V 1929, 1 ex., leg. HN, det. AM, coll. USM; Rędziny [CB23], 16 VI 1960, 1 ex., leg. MB, det. AM, coll. USM; Ruda Śląska-Halemba [CA46], 22 IV 1991, 1 ex., leg. A. Mrowicki, coll. AM; Szymiszów [CB00], 16 V 1928, 1 ex., leg. FK, 14 V 1930, 1 ex., leg. HN, det. AM, coll. USM; Zabrze [CA47], 16 V 1921, 1 ex., leg. MK, det. AM, coll. USM

Kraków-Wieluń Upland: Kusięta [CB72], 12 VIII 2008, 1 ex. leg. ŁM, det. AM, coll. JM; Młoszowa [CA95], 14 V 2010, 1 ex., Dulowska pass, pitfall trap, leg. Rafał Celadyn, coll. PJ

Małopolska Upland: Giebułtów [DA48], 28 III–22 IX 2015, 2 exx., pitfall trap, leg., coll. JTD

Western Sudety Mts.: Izerskie Mts, Polana Izerska [WS23], 24 VI 2004, 1 ex., leg., coll. RRu; Karkonoski NP, Karpacz vic. Wang [WS52], 21 V 2016, 1 ex., det. based on the photo AM, leg. et coll. RO; Świeradów District, for. comp. 383a [WS13], 14 VII 2005, 7 exx., 16 VIII 2005, 3 exx., 12 VII 2006, 3 exx., 16 IX 2006 1 ex. pitfall trap in *Calamagrostio villosae–Piceetum*, leg., det., coll. AMa; Świeradów Distr., for. comp. 358d [WS13], 10 VI 2005, 4 exx., 14 VII 2005, 20 exx., 16 VIII 2005, 4 exx., 18 IX 2006, 20 exx. pitfall trap, leg. det., coll. AMa

Eastern Sudety Mts.: Bialskie Mts., Bialska Pętla [XR37], 26 V 1989, 1 ex., leg., coll. AM; Opawskie Mts., Złoty Creek Valley [XR77], 12 V 1995, leg., coll. AM; Niedźwiedzia cave [XR36], 3 VII 1993, 1 ex., leg. det., LBo, coll. RRu; Śnieżnik Kłodzki Mt. [XR36], 15 VIII 2006, 1 ex. pitfall trap, leg., det., coll. AMa

Western Beskidy Mts.: Krynica Zdrój, Czarny Creek Valley [DV97], 30 V 1990, 1 ex., leg., coll. AM; Sucha [CA91], 5 VIII 1964, 1 ex., leg. TPl, det. AM, ex coll. AG, coll. MNHW

Nowy Targ Basin: Klikuszowa [DV28], 9 V 1999, 1 ex., leg. AF, coll. AM

Eastern Beskid Mts.: Turze Pole [EA70], 29 V 2006, 3 exx., leg. det. et coll. DT; Osławica vic. [EV75], 30 V 2017, 2 exx., pitfall trap, leg., coll. AM; Bircza District: Brzuska for. distr. [FA11], 13 VII, 2 exx. and 10 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jureczkowa for. distr. [FV19], 14 VII 2016, 1 ex., det. AM, leg., coll. DMF; Birchów District: Dydnia for. distr. [EA80], 27 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dukla District: Mszana for. distr. [EV48], VII 2016, 2 exx., det. AM, leg., coll. DMF;

Żmigród for. distr. [EV48], 29 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dynów District: Borownica for. distr. [EA90], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kańczuga District: Szklary for. distr. [EA82], 18 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kołaczyce District: Bierówka for. distr. [EA31], 30 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Krzeczkowa for. distr. [FA10], 15 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Krasiczyn District: Węglówka for. distr. [EA51], 29 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kormanice for. distr. [FA20], 12 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Magurski NP: Baranie [EV47], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; hornbeam [EV37], VII 2016, 2 exx. pitfall trap, and VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Hałbów [EV38], VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Jaworze [EV39], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Ciechania [EV37], 3 VII 2013, 2 exx. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Rozstajne [EV38], 27 V 2012, 1 ex., in an excrement, leg. AGo, det., coll. AMa

Bieszczady Mts.: Brzegi Górne [FV14], 28 V 2012, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Bieszczady NP: trail Rozsypaniec–Halicz–Tarnica [FV23], 29 V 2014, 1 ex., leg., coll. PJ; Ustrzyki Górne [FV24], V 1971, 1 ex., det. AM, leg. AG, coll. NMHW

Previously recorded from:

Wielkopolska-Kujawy Lowland: Poznań (Szulczewski, 1922)

Upper Silesia: Srebrna Góra (Smoleński, 1996b), Brynek (Szołtys & Grzywocz, 2014), Jaskinia Pod Sokolą Górą near Olsztyn (Kocot-Zalewska & Melke, 2021), Striegauer Berge (Wzgórza Strzegomskie) and records without exact data (Kelch, 1846; Roger, 1856; Letzner, 1871; 1886; Lgocki, 1908)

Kraków-Wieluń Upland: Ojcowski NP and vic. (Pawłowski *et* al., 1994), Złoty Creek (Słabikowski, 2006), Konopiska, Kusięta, Mirów, Sokole Mts. (Kościelny, 2006), records without exact data (Kulczyński, 1873; Lgocki, 1908; Eichler, 1914)

Małopolska Upland: Pawłowice near Pabianice (Eichler, 1929), Jędrzejów Distr. (Karczewski, 1961)

Świętokrzyskie Mts.: Cisów Distr. (Mokrzycki, 2007; 2011)

Sandomierska Lowland: Rzeszów vic. (Schaitter, 1870)

Western Sudety Mts.: Izerskie Mts. (Mazur, 2012), Sowie Mts. – Wielka Sowa (Mazur, 2012), Hessberg (Góra Górzec), Riesengebirge, Schmiedeberg (Kowary), Hochstein (Wysoki Kamień, Góry Izerskie), Waldenburger Gebirge (Góry Wałbrzyskie), Bolkenheim (Bolków) (Pfeil, 1866; Letzner, 1871; 1886; Polentz, 1942a)

Eastern Sudety Mts.: Bialskie Mts. – Rudawiec, Czarna Góra Mt., Śnieżnik Kłodzki Mt. (Mazur, 2012), Grafschaft Glatz (Ziemia Kłodzka; Zebe, 1852, Letzner, 1871; 1886)

Western Beskid Mts.: Gorce Mts. – Kluszkowce, Ochotnica Górna, Mszana Dolna vic. (Wojas, 1994), Little Beskid Mts. (Paśnik 1998), Babia Góra Mt. (Pawłowski, 1964; 1967; Kubisz & Szafraniec, 2003), Wisła-Obłaziec (Szołtys & Grzywocz, 2014), records without exact data (Wachtl, 1870; Kotula, 1873; Nowicki, 1873; Letzner, 1886)

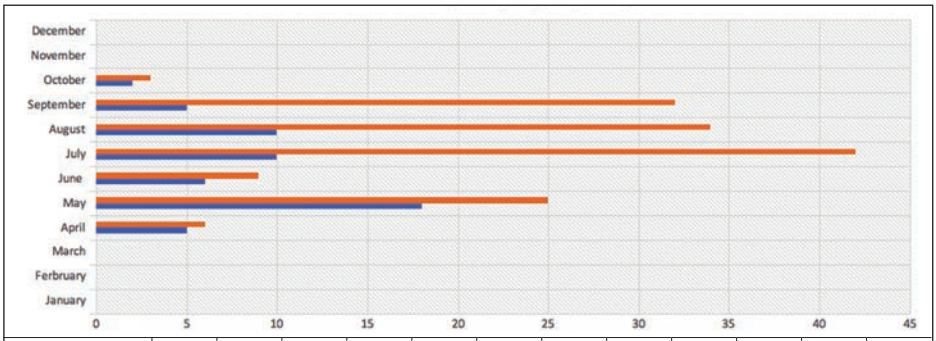
Eastern Beskid Mts.: Wysowa-Zdrój (Taszakowski *et* al., 2018)

Bieszczady Mts.: records without exact data (Szujecki, 1996; Burakowski *et* al., 1980; Pawłowski *et* al., 2000)

Pieniny Mts.: Szczawnica vic. (Łomnicki, 1886)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Horion, 1965; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015), Southern Poland (Szujecki, 1980), Silesia (Weigel, 1806; Reitter, 1870b; Gerhardt, 1910a; Kuhnt, 1912), Galicia (Łomnicki, 1884), Piotrków Province (Jakobson, 1909).

Phenology and development. Its developmental stages and bionomics were described by J. Boháč (1982). Gradation of young individuals takes place at the turn of September and October (Szujecki, 1996). In new localities the beetles were observed from April to October, most numerously in July (**Fig. 6.8**).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	6	25	9	42	34	32	3	0	0
Number of records	0	0	0	5	18	6	10	10	5	2	0	0

Fig. 6.8. Frequency of *Dinothenarus fossor* (Scop., 1771) in localities in Poland

Emus Leach, 1819

The genus contains only one confirmed species. The only other name still residing in *Emus*, *E. aeneicollis* Lacordaire, 1835 is either a synonym of *E. hirtus* or belongs to another genus (Herman, 2001).

Emus hirtus (Linnaeus, 1758)

General distribution. The area of the species occurrence covers warm regions of southern and Central Europe as well as the Balkans, the Caucasus, Turkey, Ukraine and Iran (Löbl & Smetana, 2004, Gamarra & Outerelo, 2008; Stan, 2009; Bordoni, 2010; Anlas & Newton, 2010; Kleeberg & Uhlig, 2011; Biel *et* al., 2014). In south-western Europe it is found from Portugal and Spain, through France, Italy, Germany reaching England and southern Sweden in the North, while it is not recorded in Norway, Finland and northern Russia. In central Europe and in the southern parts of Scandinavia and the Baltic states it is found locally and rarely, being numerous only in warmer periods (Szujecki, 1980; Kočárek, 2000; Telnov *et* al., 2011; Kleeberg & Uhlig, 2011; Ferreira, 2018). It is not found on islands of the Mediterranean.

In the area of its occurrence the species is found both at lower altitudes and in mountainous regions reaching up to the alpine zones (e.g. The Pyrenees at 1800 m a.s.l., the Alps at 2000 m a.s.l.), although there it is found less frequently than in lower localities (Horion, 1965; Gladitsch, 1970, Schatz, 2008; Biel *et* al., 2014; Ambrožová *et* al., 2019).

In Germany in the second half of the 20th century fluctuations were recorded in the numbers of this species, related also with the appearance of the beetles in new areas. Horion (1965) assumed the basic range of the species to be south-eastern Europe, from which it spreads north during the warmer periods, thus treating this beetle as a migrating species, the so-called Wanderkäfer (Brandstetter, 1992). This hypothesis proposed by Horion may be confirmed by data from the north-eastern lands of Germany (Mecklenburg-Western Pomerania and Brandenburg; Kleeberg & Uhlig, 2011). A similar opinion was also expressed by Biel *et* al. (2014), who investigated the ecology of *Emus hirtus* in Lower Saxony and recorded a growing number of observations in the years 2010–2012, while over the entire period the species has been reported in that area (since 1822), while marked and intermittent fluctuations in the population size have been found (Krawczynski *et* al., 2010). Also other German entomologists have stressed the need to accurately record the incidence of this species (Eichler and Gollkowski, 2005; Vogel after Tietz, 2010). Kleeberg & Uhlig (2011) stated that this species is an expansive Ponto-Mediterranean faunistic element.

It is covered by legal protection in Czechia as an endangered species (EN); it was also entered in the Red Book of endangered species classified as VU (Vávra *et* al., 2017). In Poland it is registered in the Red List of Endangered and Threatened Species (Pawłowski *et* al., 2002) classified as NT – near threatened.

Habitat preferences. Beetles have a predatory lifestyle, staying mainly on animal dung and on carrion, where they hunt for smaller coprophagous beetles (Hydrophylidae and Aphodiinae) (Psarev, 2001a). Behaviour of these Staphylininae was described, when while hunting they penetrate openings and galleries made by coprophages and when they catch their prey the beetles roll into the dorsal position. Lying on their back they hold the prey firmly with their legs and eat it. However, this is a rarely observed behaviour, since typically the beetles when hunting tend to remain in the zone beneath feces at the boundary of grass or soil, where the accumulation of coprophages is the greatest (Biel *et* al., 2014).

Beetles were also observed in the vicinity of numerous remains of species from the genus *Ontophagus* Latr., 1802 and attacking large beetles *Trypocopris vernalis* (L.) at sap released by birch trees, on cow pats in the presence of *Copris lunaris* (L.) (Pacuk *et* al., 2011).

Unique "cemeteries" of scarab beetles, i.e. accumulations of beetle remains (*T. vernalis*, *Anoplotrupes stercorosus* Scriba) at dung or sap released from tree trunks may indicate the presence of *Emus hirtus* (Pacuk *et* al., 2011, observation reported by AM).

Particularly large dung pats are preferred – cow pats and horse droppings (over 30% and 15% observations, respectively), followed by manure or dung heaps – over 11%, carrion – 9%, the leaf litter and sap released by trees – 8% and compost heaps – 7%. Beetles were also reported on droppings of sheep, pigs, dogs, roe deer and human feces (Pacuk *et* al., 2011; Biel *et* al., 2014).

The volume and accumulation of feces may be of considerable importance for *Emus hirtus*. Droppings of large herbivores (cattle, horses) may weigh as much as approx. 2 kg, while sheep feces is only 0.06 kg (Biel *et* al., 2014), attracting as many as over 1000 beetles from the genus *Aphodius*.

Analyses of assemblages of coprophilous insects indicate that horse droppings attract larger numbers of both coprophagous beetles and their predators, i.e. mainly rove beetles (Psarev, 2001b). During colonisation of feces by Staphylinidae, species from the genus *Philonthus* are found in varying numbers during the next stages of succession. In turn, *Emus hirtus* and species from the genus *Ontholestes* appear in the same numbers during successive days of excrement drying (Psarev, 2001b). Limited traditional grazing in many lowland and piedmont areas of Europe is considered to be the primary cause for the decreasing population size of this species (Kočárek, 2000).

An eurytopic species, inhabiting open biotopes (meadows and pastures), frequently in the vicinity of human settlements, both in mesic and xeric habitats (Telnov & Kalnins, 2003).

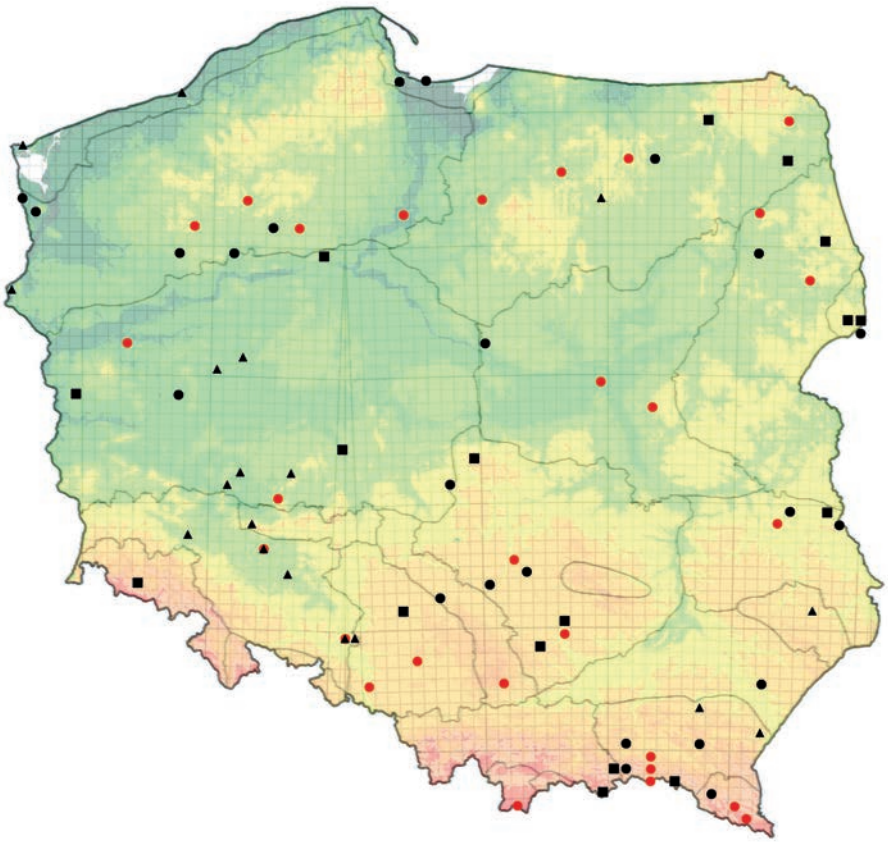


Fig. 6.9. Distribution of *Emus hirtus* (L., 1758) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

Occurrence in Poland. Emus hirtus (Polish: truchcik trzmielowiec, after Szujecki, 2017) in Poland has been reported throughout the country, although only in small numbers or in clusters (**Fig. 6.9**). A more extensive study analysing the distribution of the species in Poland and reporting new localities was written by B. Pacuk and co-authors (Pacuk *et* al., 2011). Until 1980 *Emus hirtus* was recorded in 13 regions (Burakowski *et* al., 1980; Pacuk *et* al., 2011), after that year it was also in 13 regions, while it was reported for the first time from Wyżyna Małopolska, Wyżyna Lubelska, Podlasie, the Bieszczady and Western Beskid Mts. (Pacuk *et* al., 2011).

New records

Pomeranian Lake District: Piecnik vic. [WV81], 11 V 2015, a few individuals on bison droppings, observation W. Stephan et M. Skibicka; Zakrzewska Osada

[XV61], 16 V and 18 V 2013, 2 exx., the pitfall trap, leg., coll. DJT; Okonek [XV23], 8 V 2003, 1 ex. on dried carcasses, leg., det., coll. MAr; Złocieniec [WV63], 16 V 2016, 3 exx. and 30 V 2017, 2 exx. in horse droppings, leg., coll. KR

Masurian Lake District: Augustów [FE36], 30 V 1980, 1 ex., leg. Jankowicz A., coll. HS; Lasowiec near Mrągowo [EE16], 8 V 1998, 1 ex. on cow excrement, leg.,coll. KK; on Lake Karaś [DE03], 29 V 1998, 1 ex. on cow excrement, leg., coll. KK; Olsztyn-Kortowo [DE65], 1 IX–1 X 1999, 1 ex. bait trap (fish), leg., coll. KK; Wigierski NP–Krzywe [FE39], 23 VI 1991, 9 exx. running on fresh cow's feaces, leg., det., coll. AMa; 1 ex. ex coll. AMa, coll. PJ

Wielkopolska-Kujawy Lowland: Grudziądz vic. [CE42], 17 VIII 1988, 1 ex. in a rotting mushroom, leg., coll. KK; Lasowice near Milicz [XT50], 30 IV 1994, 1 ex., leg., det. AG, coll. MNHW; Skwierzyna vic. [WU32], 28 VIII–13 X 2012, 1 ex. sandy place with heather and scratch, pitfall trap, leg. TR, coll. SK

Mazovian Lowland: Bielany [DC99], 22 VIII 1893, 1 ex., leg. WM, det. AM, coll. USM; Borków ad Kołbiel [EC37], VIII 2001, 1 ex. under the dried cow feces, obs. PG

Podlasie: Biebrza Reg., Goniądz [FE12] 9 V 2001, 1 ex., old garbage place, det. AM, leg., coll. MW; Nowosady ad Białystok [FD57], 7 VIII 2012, 1 ex. on the cow feces, leg., coll. JTD

Białowieża Primeval Forest: Białowieża meadows near Białowieża NP [FD94], 28 and 30 VI 1991, 3 exx. gate, leg., coll. MW; Białowieża [FD94], 5 VII 1992, 1 ex. leg. A. Matusiak, det. HS

Lower Silesia: Gogolin [BA89], 10 V 1927, 1 ex., leg. HN, det. AM, coll. USM; Wrocław [XS46], 28 IV 1975, 1ex. on the sidewalk in the park district, leg. et det.. SG; 5 VI 1950, 1 ex, leg., det. SG, coll. MNHW; Wrocław-Swojec [XS46], VI 1954, 1 ex. on cow manure, leg., det. SG, coll. MNHW

Upper Silesia: Racibórz [CA05], 1907, 1 ex., leg, MK, det. AM, coll. USM; Ruda Śląska Wirek, "Nowa Wieś" [CA47], 31 VIII 2001, 1 ex. leg., det., coll JG

Kraków-Wieluń Upland: Dolina Będkowska ad Kraków [DA15], 7 VI 2004, 1 ex. running on tourist trail, leg., det. J.R. Starzyk, coll. AMa

Małopolska Upland: Krzyżanowice [DA69], 13 VII 1996, 1 ex. leg., det., coll. JG; Przedborski Landscape Park: Rączki near Dobromierz [DB25], 1 V 2008, 1 ex. leg., coll. MW

Lubelska Upland: Ciechanki Łańcuchowskie [FB38], 26 VIII 1993, 1 ex. in excrements of cows, leg. BS, coll. MCSU

Western Sudety Mts.: Karkonosze Mts., Chojnik Mt. [WS43], 22 V 1991, 1 ex. under the cow's faeces, leg., det., coll. AMa

Eastern Beskid Mts.: Ciechań [EV37], 8 VIII 2013, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa; Kąty on the Wisłoka River [EV39], 27 VII 2014, 2 exx. running on fresh cow manure, observation AM; Krempna

[EV38]; 14 VII 2011, 3 exx. *Arrhenatheretum alatioris*, in cow's faeces, leg. AGo, det., coll. AMa

Bieszczady Mts.: Brzegi Górne [FV14], 28 V 2013, in excremnet pitfall trap, leg. AGo, det., coll. AMa; Łopienka [FV05], 20 V 2013, in excrement pitfall trap, leg. AGo, det., coll. AMa; Połonina Caryńska [FV14], 5 X 2012, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa, records without exact data: 22 VI 1960, 1 ex. leg. ex coll. AG, det. AM., coll. MNHW

Tatra Mts.: szlak na Kasprowy Wierch [DV25], without exact data, 1 ex. leg. AGo, det., coll. AMa

Previously recorded from:

Baltic Coast: Mikoszewo (Pacuk *et* al., 2011), records without exact data (Lüllwitz, 1916; Horion, 1938; 1965; Kleine, 1940b), Trójmiejski Landscape Park, Gdańsk vic. [CF42] (Konopko & Wilga, 2014)

Pomeranian Lake District: Bielinek (Frenzel & Hedicke, 1940), Rzeczyca (Gutowski & Ruta, 2004), Kuźnickie Lakes vic. (Ruta, 2009), Dolaszewo, Kujanki vic., Szczecin – Arkoński Forest, Wkrzańska Forest – Dobieszczyn and Świdwie nat. res. (Pacuk *et* al., 2011)

Masurian Lake District: Augustów (Szwałko, 1994); Borecka Forest (Melke & Maciejewski, 1999), Mikołajki (Pacuk *et* al., 2011), records without exact data (Lentz, 1879; Horion, 1965)

Wielkopolska-Kujawy Lowland: Gołuchów (Kubisz & Melke, 1994), Gądków Wielki (Szwałko, 1994), Wojnowo ad Bydgoszcz (Pacuk *et* al., 2011), Hernstadt (Wąsosz), Krotoszyn, Rawicz, Buk, Bogdanka (Letzner, 1842; 1871; 1886; Gerhardt, 1910a; Szulczewski, 1922; Myrdzik, 1933; Horion, 1965)

Mazowian Lowland: Popłacin near Płock (Pacuk *et* al., 2011), records without exact data (Szujecki, 1960b; Szujecki, 1968)

Podlasie: Kopna Góra Supraśl vic. (Kubisz & Szwałko, 1991), Tykocin (Pacuk *et* al., 2011)

Białowieża Primeval Forest: Białowieska Clearing (Borowiec *et* al., 1992), Białowieża NP (Smoleński 2006), records without exact data (Derunkov & Melke, 2001), Grudki (Pacuk *et* al., 2011)

Lower Silesia: Breslau (Wrocław), Liegnitz (Legnica), Ohlau (Oława) (Rotermund, 1833; Letzner, 1842; 1871; 1886; Fein & Haase, 1881; Gerhardt, 1910a; Kolbe, 1928)

Trzebnica Hills: Oborniki Śląskie (Letzner, 1886; Gerhardt, 1910a)

Upper Silesia: Lubliniec (Dobosz, 1994), Annaberg (Góra Świętej Anny), Gogolin (Kelch, 1846; Roger, 1856; Reitter, 1870b; 1871; Letzner, 1886; Gerhardt, 1910a)

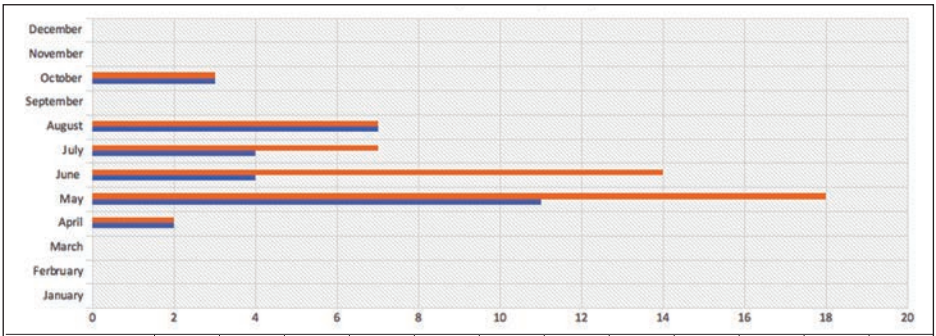
Kraków-Wieluń Upland: Konopiska, Siedlec Mirowski (Kościelny, 2006), records without exact data (Jabłoński, 1869; Kulczyński, 1873)

Małopolska Upland: Łask-Ostrów (Pawlikiewicz & Krupicki, 2008), Łódź – city park (Kowalczyk & Watała, 1988), Książ Mały (Szwałko, 1994)
Lubelska Upland: Poleski NP – Bubnów Swamp (Staniec, 2010), Oleszno, Skowronno (Pacuk *et* al., 2011)
Świętokrzyskie Mts.: Góra Rzepka (Bidas, 2012)
Lubelska Upland: Gródek, Macoszyn Mały, Wola Uhruska (Pacuk *et* al., 2011)
Roztocze: Zielone – Zamość Province (Tenenbaum, 1913)
Sandomierska Lowland: Rzeszów vic. (Schaitter, 1870), Radawa (Pacuk *et* al., 2011)
Western Sudety Mts.: Bolkenheim (Bolków; Polentz, 1942a), Karkonoski NP, Chojnik Mt. (Mazur, 1993a; 1998)
Western Beskid Mts.: Majdan near Muszyna Zdrój, Czyrna near Krynica Zdrój (Pacuk *et* al., 2011)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929), Barwinek (Szwałko, 1994), Birchów, Gładyszów (Pacuk *et* al., 2011), Libusza (Taszakowski *et* al., 2018)
Bieszczady Mts.: Duszatyn (Pacuk *et* al., 2011)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Kulwieć, 1907; Łomnicki, 1913; Horion, 1965; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Prussia (Siebold, 1847; Lentz, 1857), Silesia (Weigel, 1806; Endler & Scholz, 1819; Hartlieb, 1827; Kuhnt, 1912; Horion, 1965), Galicia (Łomnicki, 1884); Western Galicia (Nowicki, 1873), Carpathians (Nowicki, 1873).

Phenology and development. Locally and periodically it may appear in very high numbers: Polentz (1942a) reported that in the area of Bozen (Bolzano) in 1926 over 300 beetles were caught within a very short period of time.

Beetles in new localities in Poland were observed from April to August and in October (**Fig. 6.10**). Most numerous observations were reported in May.



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	2	18	14	7	7	0	3	0	0
Number of records	0	0	0	2	11	4	4	7	0	3	0	0

Fig. 6.10. Frequency of *Emus hirtus* (L., 1758) in localities in Poland

This is confirmed by literature data, since according to Horion (1965) beetles were found in Germany from mid-May until the end of July. Individuals found in April overwintered, while those appearing in the autumn (August–October) are specimens, which pupated and are getting ready to overwinter.

Ocypus Leach, 1819

The genus compriseslarge, predominantlydark-colored species, occasionally with metallic sheen, found in the Palearctic, Nearctic and Oriental regions (Herman, 2001). This genus is composed of almost 150 species, of which 23 are found in Central Europe (Schillhammer, 2011). The subgenera differ also in terms of ecological requirements. Species from the subgenus *Matidus* Motschulsky, 1860 prefer forest habitats (Schillhammer, 2011). The basis for distinguishing the subgenus *Angulephallus* Khachikov, 2005 was the structure of the endophallus and spermatheca (Khachikov, 2005).

Subgenus *Angulephallus* Khachikov, 2005

Ocypus brunnipes (Fabricius, 1781)

General distribution. The species inhabits the central part of the European continent – from the British Isles and southern France through central Europe and southern Scandinavia (southern regions of Norway, Sweden and Finland) and the Baltic states to central Russia and Ukraine. In the South it reaches northern Italy and the northern Balkans (Bosnia, Slovenia, Croatia, Albania; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011). It has also been reported from the Caucasus and Turkey; moreover, it has been unintentionally introduced to North America (Newton, 1987; Anlaş, 2009; Bordoni, 2010; Kleeberg & Uhlig, 2011).

Habitat preferences. It is found primarily in forest habitats in moist sites – stream banks and lake shores, under stones, lying longs, among mosses and peat mosses as well as leaf litter. It is also observed in sandy open spaces, heaths and beaches, where it also remains in wet locations, under decaying organic matter, fungi, alluvia and macroalgae (Horion, 1965; Burakowski *et* al., 1980; Kleeberg & Uhlig, 2011), as well as on carrion (Mądra *et* al., 2014). Irmler & Gürlich (2007) characterised it as a species characteristic to calcareous and alkaline soils (Irmler *et* al., 2018).

A predatory sylvan species found with high frequency in patches of giant knotweed (*Reynoutria* spp.), in ruderal localities in the area of Düsseldorf-Urdenbach (Topp *et* al., 2008).

Occurrence in Poland. In Poland it has not been observed very often. Towards the end of the 19th century the species was even described as very rare in the lowlands and foothills (Letzner, 1871; Gerhardt, 1910a). Present-day localities (**Fig. 6.11**) concentrate in lowland areas and apart from the Kłodzko region (Gerhardt, 1910a) the Beskid Mały Mts. (Paśnik, 1997) the species is not found in mountainous regions.

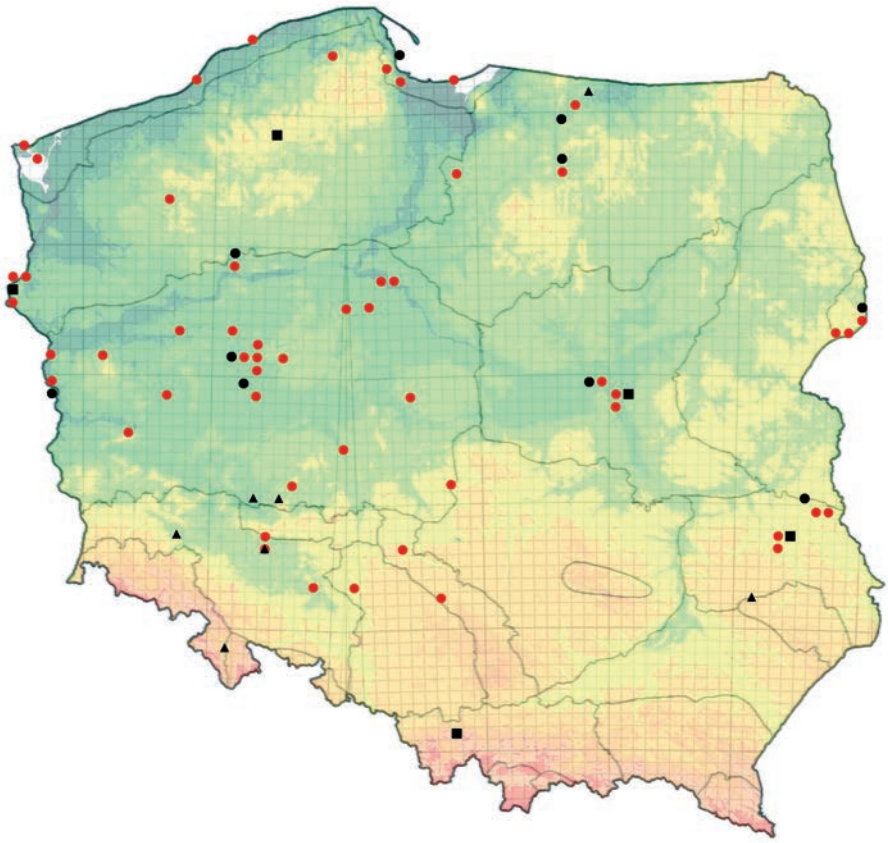


Fig. 6.11. Distribution of *Ocypus brunnipes* (Fabr., 1781) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

New records

Baltic Coast: Bobolin near Dąbki [WA82], 1 VII 2008, 1ex., on the beach, leg., coll. SK; Gdańsk vic. [CF33], 15 VIII 2009,1 ex. and 10 VII 2010, 1 ex. and 26 VII 2012, 1 ex., Trójmiejski Landscape Park, leg., coll. DJT; Gdańsk vic. [CF42], 9 III 2017, 1 ex., Trójmiejski Landscape Park, leg., coll. DJT; Lubiń, Wolin Island [VV66], 31 VII–8 VIII 1991, 1 ex., det. AM, leg., coll. MW; Orzechowo ad Ustka [XA25], 15 VII 1989, 1 ex. in scot pine forest *Empetro nigri-Pinetum*, leg. W. Kostrubiec, det., coll. AMa; Sztutowo [CF82], 4 IX 1964, 1 ex., leg. TPl, ex coll. AG, det. AM, coll. MNHW; Świnoujście [VV57], 17 V 2007, 1 ex. and 14 VI 2007, 2 exx., by the sea, leg. PD, det. AM, ex coll. OA, coll. AM

Pomeranian Lake District: Bielinek nat. res. [VU46], 14–16 XI 1987, 1 ex., det. LBo, leg. LB, coll. RRu; 7 VII 2009, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Krajnik Dolny [VU57], 28 VI 2010, 1 ex., 4 VIII 2011, 2 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Raduń [VU47], 15 V, 1 ex., 7 VII 2009, 1 ex., 29 VII, 1 ex., 30 VII, 1 ex., 4 X 2010, 1 ex., stipa grassland pitfall trap, 29 VII 2010, 1 ex., xerothermic flowering, pitfall trap, 8 VII 2011, 1 ex., ols over the stream pitfall trap, 28 IV, 1 ex., 30 V, 1 ex., 8 VII, 1 ex, 5 VIII, 2 exx., 30 VIII 2011, 1 ex., beech forest on the embankment of the Odra River, pitfall trap, leg. PS, det., coll. AM; Rozłazino [XA84], 8 VI 2007, 2 exx and 27 VII 2007, 2 exx., young pine forest, leg. SKo, det. AM, ex coll. OA, coll. AM; Stary Kostrzynek [VU45], 7 VII, 1 ex., 1 VIII 2009, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Złocieniec [WV63], 12 VIII 2011, 2 exx. in the hollow maple tree, leg., coll. KR

Masurian Lake District: Lidzbark Warmiński [DF70], 24 VIII 1985, 1 ex., leg. TM, coll. AM; Miłogórze vic. [DE69], 2 VIII–12 IX 1997, 1 ex., wet meadow, bait trap (fish), leg., coll. KK; Olsztyn-Kortowo [DE65], 29 VIII 2006, horse farm, under the stone, leg., coll. KK; Susz District – Michałowo for. distr. [CE85], 8 VI 2000, 1 ex., 15 VI 2000, 1 ex. leg., det. MS, coll. AMa

Wielkopolska-Kujawy Lowland: Biedrusko vic. – military training ground [XU32], 22 V 2003, 1 ex., 18 VI 2003, 1 ex., 17 VII 2005, 1 ex., pitfall trap in thick bushes *Pruno-Crataegetum*, leg. PS, coll. SK; Bielawy vic. [BD95], 21 VI–21 VII 2016, pitfall trap, leg., coll. SK; Cierpice vic. [CD27], 17 VI 2017, 1 ex., pitfall trap, leg., coll. AM; Dąbrowice near Koło [CC48], 2 XI 1991, 1 ex., leg. SCz, coll. AM; Gołuchów [YT04], 14 III 1993, 2 exx., 4 IV 1993, 1 ex., under the moss, leg., coll. AM; 1 V 1992, 7 exx. in red rotting, leg., coll. AM; 9 III 1991, 1 ex., mixed forest, under the bark of pine, at the base of the trunk, leg., coll. AM; 14 III 1988, 1 ex., leg., coll. AM; 5 II 1988, 1 ex. under the moss, leg. TM, coll. AM; Inowrocław [CD15], 5 VIII 2003, 1 ex., pitfall trap on the salt pan, leg. A. Kasprowicz, coll. SK; Krajkowo [XT38], 29 III 2010, leg., det., coll. PJ; Laski [VU71], 1 IX, 7 exx., 7 VII, 1 ex., 1 IX, 10 exx., 6 X 2009, 1 ex., 28 VI, 1 ex., 30 VII 2010, 2 exx., xerothermic flowering, pitfall trap, 14 V, 1 ex., 7 VII, 1 ex., 1 VIII, 1 ex., 1 IX 2009, 3 exx., 29 IV, 1 ex., 28 V, 1 ex., 2 X, 1 ex., 28 VI 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Owczary [VU71], 1 VII, 4 exx.,1 IX, 8 exx., 6 X, 2 exx., 7 VII 2009, 2 exx., 29 IV, 1 ex., 2 X, 9 exx., 28 VI, 1 ex., 30 VII 2010, 1 ex., xerothermic flowering, pitfall trap, 1 VIII, 1 ex., 7 VII 2009, 4 exx., 28 VI, 2 exx., 6 X 2010, 1 ex., mixed xerothermic pitfall trap, leg. PS, det., coll. AM; Pamięcin nat. res. [VU71], 7 VII, 1 ex., 9 XI 2009, 1 ex., 31 VIII, 1 ex., 2 X 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Piła [XU18], 28 III 1998, 1 ex., det. AM, leg., coll. RRu; Piła, Zalew Koszyce lake [XU19], 28 VI 2001, 1 ex., leg., coll. RRu; Piła, Gładyszewo [XU19], 17 III 1997, 1 ex. in dead pine tree, det. AM, leg., coll. RRu; Poznań – Cytadela [XU30/31],

1 III 1999, leg., det., coll. PJ; Poznań – New Zoo [XU30], 24 VII, 1994, leg. SK, det. AM, coll. SK; Promno vic. [XU51], 18 VII 1998, 1 ex., leg., det., coll. PJ; Puszczykowo vic. [XT29], 25 I, 1 ex., 14 II 1998, 2 exx. and 28 II 1998, 1 ex., leg., det., coll. PJ; Rogalin [XT38], 12 I 2008, 1 ex. overwintering under bark of oak, leg., coll. TK, det. AMa; Ruda Milicka [XT61], 6–7 V 1989, 1 ex., det., leg. LBo, coll. RRu; Rzepińska Forest, vic. Świecko [VT79], 4 XII 2009, 1 ex., det. AM, leg., coll. WK; Sierakowski Landskape Park, Sieraków [WU73], 31 V–19 IX 2004, 8 exx. on the Jaroszewskie Lake, pitfall trap, leg. MŚ, det., coll. AM; Sulęcin District [WU11], for. comp. 126f, 9 VII 1995, 2 exx., for. comp. 125f, 9 VII 1995, 2 exx., 1 X 1994, 1 ex. leg. W. Gorączka, det., coll. AMa; Toruń-Bielany [CD37], 28 III 1992, 1 ex. under moss, leg. KHM, coll. AM; Toruń – airport [CD37], 14 IV 1992, 1 ex., leg. KHM, coll. AM; Uścikowiec near Oborniki Wielkopolskie [XU13], 2 VI–21 VII 2007, 3 ex., pitfall trap, leg. TSz, det., coll. AM; Wielkopolski NP, Szreniawa vic. [XT29], 1 III 1997, 1 ex. in rotting wood, leg., coll. SK; Wolsztyn District [WT68], for. comp. 40b, 7 IX 2017, 1 ex. in scot pine forest, leg. A. Skórzewska, det. et coll. AMa; Złotniki vic. – military training ground [XU21], 28 VI 2005, 2 exx., pitfall trap on meadow, leg. PS, coll. SK

Mazovian Lowland: Bielany [DC99], 2 VI 1897, 1 ex., leg. WM, det. AM, coll. USM; Warszawa-Marymont [EC08], 17 IV 1888, 1 ex., leg. WM, det. AM, coll. USM; Warszawa-Kabaty [EC07], 7 II 2011, 1 ex. under the rotting tree trunk, leg., coll. JTD

Podlasie: transitional bog "Bukowski Las" [FB79], 23 V 2007, 1 ex. pitfall trap, leg. TOd, coll. MCSU; Laski Burskie [FC50], 26 VI 2014, 1 ex. and 31 VII 2014, 1 ex., meadow, pitfall trap, leg. ŁN, coll. AM; Zielona Góra – osiedle Forest [WT35], 23 V 2013, 1 ex. leg., coll. RO

Białowieża Primeval Forest: Białowieża National Park [FD94], pitfall trap: 4 V–14 VI 2016, 1 ex. (for. comp. 342Cb), 2 exx. (315Db), det. AM, leg., coll. DFP; Hajnówka District [FD73], pitfall trap, 14 VI–10 VII 2016, 1 ex. (for. comp. 534Ag), det. AM, leg., coll. DFP; Białowieża District [FD83], pitfall trap: 10 VII–13 VIII 2016 (for. comp. 546Ah) 2 exx., 13 VIII–11 IX 2016: 1 ex. (546Ah), det. AM, leg., coll. DFP

Lower Silesia: Łosiów near Brzeg [XS83], 7 VII 2004, 1 ex., 8 IX 2004, 1 ex. leg. JJ, det., coll. AMa; Laskowice [BB93], 28 VII 2016, 2 exx., leg. Piotr Cholewa, det. et coll. TW; Wrocław-Pawłowice [XS47], 7 VII 2003, 1 ex., 11 VIII 2003, 1 ex. leg. JJ, det. et coll. AMa; Wrocław-Swojczyce [XS46], 20 VII 2004, 1 ex., leg. JT, coll. AM

Upper Silesia: Zielony Gaj – Mazury near Częstochowa [CB62], 16 VII 2004, 1 ex. leg. A. Słabikowski, det. et coll. TK

Małopolska Upland: Łask-Ostrów [CC71], 7 VII 2010, 1 ex., leg., coll. AK

Kraków-Wieluń Upland: Załęcze Wielkie near Działoszyn [CB36], 5 VI 2009, leg., coll. AK

Lubelska Upland: Białka near Milejów [FB47], 22 III 1992, 1 ex. sown from leaves in the forest, leg. BS, coll. MCSU; Fajsławice [FB36], VI 2004, 1 ex. cultivation *Echinaecea purpurea*, pitfall trap, leg., WCz, coll. MCSU; Ciechanki Łańcuchowskie [FB37], 22 VI, 17 VII and 17VIII 2005, 7 exx. the pitfall trap in the xerothermic communities of the Nadwieprzański Landscape Park, leg. JK, coll MCSU; PGR Krychów: [FB69], 24 VI 2014, 1 ex., meadow pitfall trap, leg. ŁN, coll. AM

Previously recorded from:

Baltic Coast: Gdynia-Kępa Redłowska (Konopko *et* al., 2017), records without exact data (Lüllwitz, 1916; Labler, 1921; Szujecki, 1960b)

Pomeranian Lake District: Szujecki, 1980, Bielinek nat. res. (Borowiec, 1990), Bielinek nat. res. (Kubisz & Melke, 1996), Kuźnickie Lakes vic. (Ruta, 2009)

Masurian Lake District: Bartoszyce (Barkowski, 1933), Olsztyn vic. (Komosiński, 2001a), Wróblik, Tumiany (Komosiński, 2001b), Szujecki, 1980

Wielkopolska-Kujawy Lowland: Lusowo (Konwerski & Melke, 2000), Wielkopolski NP (Podbylski & Nowosad, 2001; Stanoch-Podbylska & Nowosad, 2001), Kuźnik nat. res. (Ruta & Melke, 2011), Birnbäumel (Gruszeczka near Milicz; Letzner, 1871; 1886; Gerhardt, 1910a; Hubenthal, 1916), sandy localities near Poznań (Szulczewski, 1922; Myrdzik, 1933; Szujecki, 1980)

Mazowian Lowland: Kampinoski NP (Mazur S. *et* al., 2010), Warszawa vic. (Szujecki, 1980), records without exact data (Szujecki, 1960b; Szujecki, 1968)

Białowieża Primeval Forest: Szujecki, 1980; Białowieża NP (Smoleński & Szujecki, 2001), Smoleński *et* al., 2004; Smoleński, 2006, records without exact data (Szujecki, 1960b; Derunkov & Melke, 2001)

Lower Silesia: Liegnitz (Legnica), Breslau (Wrocław) (Letzner, 1871; 1886; Gerhardt, 1889; 1910a; Polentz, 1943)

Lubelska Lowland: Białka near Lublin (Staniec, 1994), Poleski NP (Staniec, 2010)

Roztocze: Buczyna Gorajska – Zamość Province (Tenenbaum, 1913; Szujecki, 1980)

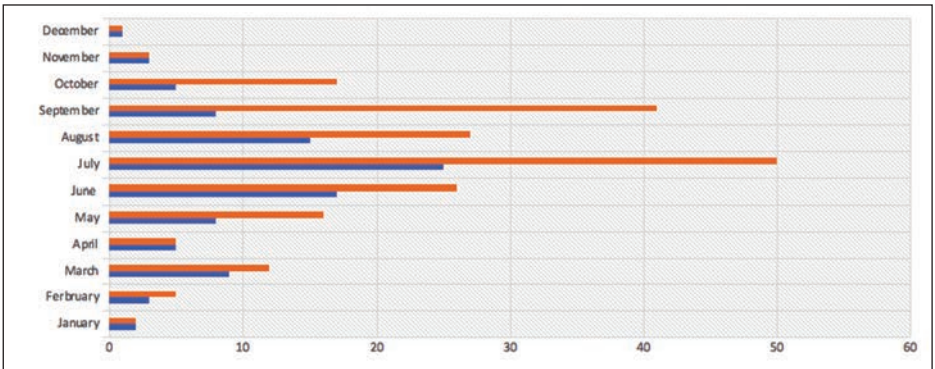
Western Sudety Mts.: records without exact data (Letzner, 1871; 1886; Gerhardt, 1910a)

Eastern Sudety Mts.: Grafschaft Glatz (Ziemia Kłodzka; Zebe, 1852; Letzner, 1871; 1886; Gerhardt, 1910a)

Western Beskid Mts.: Królewizna (Paśnik, 1997), Little Beskid Mts. (Paśnik, 1998)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Horion, 1965; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015), Prussia (Zebe, 1852; Siebold, 1847; Lentz, 1857; Horion, 1965), Silesia (Weigel, 1806; Kuhnt, 1912; Szujecki, 1980).

Phenology and development. Beetles are found the year round. They were observed most often and most numerously in July, whereas in September, despite scarce observations a relatively high number of individuals were observed (**Fig. 6.12**). Data from Poland confirm also observations from Mecklenburg-Western Pomerania (Kleeberg & Uhlig, 2011). According to Horion (1965) in Denmark larvae are found from the end of April, pupae from the first decade of May, while imagines from the end of May. Both larvae and imagines overwinter.



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	2	5	12	5	16	26	50	27	41	17	3	1
Number of records	2	3	9	5	8	17	25	15	8	5	3	1

Fig. 6.12. Frequency of *Ocypus brunnipes* (Fabr., 1781) in localities in Poland

Subgenus *Matidus* Motschulsky, 1860

Ocypus biharicus (G. Müller, 1926)

General distribution. The species is distributed mainly in the south-eastern parts of Central Europe (Burakowski *et* al., 1980). It has been reported from Bulgaria, Romania, Hungary, Czechia, Slovakia Austria and Slovenia(Herman, 2001; Majzlan, 2005; Boháč *et* al., 2006; Legorsky, 2007; Löbl & Löbl, 2015). In the west it has been recorded in the Bohemian Forest (Šumava, western Czechia; Boháč & Matějíček, 2004).

Habitat preferences. In the centre of its range (Hungary) it is a forest species, found with high frequency in oak forests (Balog *et* al., 2008). Together with

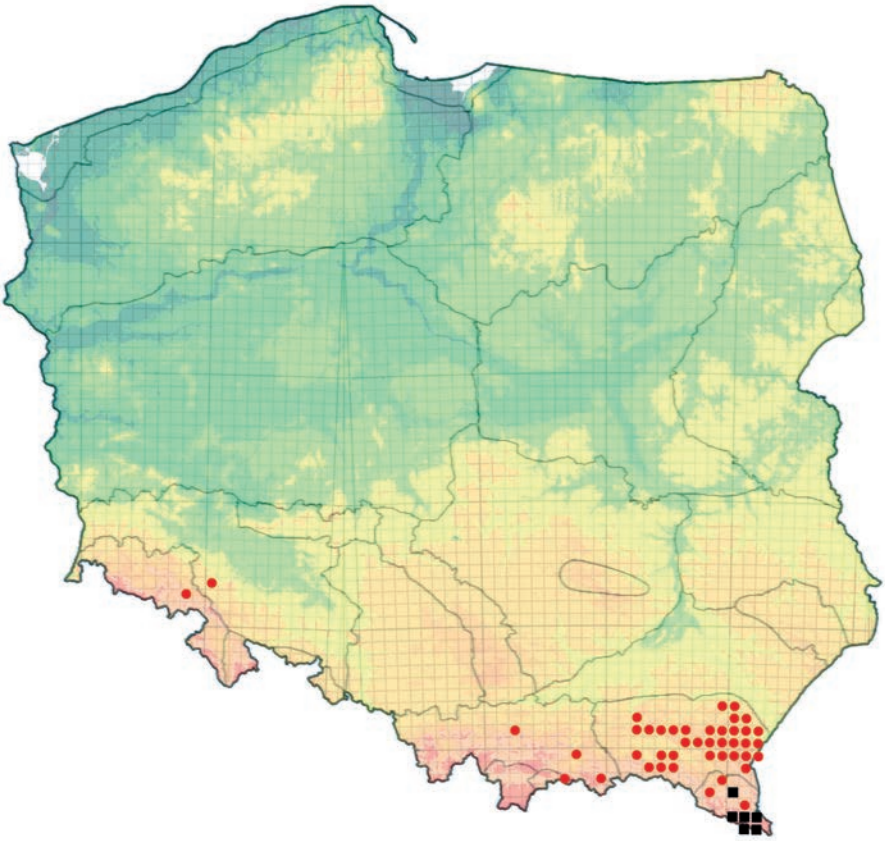


Fig. 6.13. Distribution of *Ocypus biharicus* (G. Müll., 1926) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

Ocypus (*Pseudocypus*) *mus* (Brullé, 1832) it belonged to dominant species in assemblages of Staphylinidae observed during long-term ecological studies in oak forests in the Bükk National Park (Balog *et* al., 2008).

It has been recorded in the Slovak Karst (Benedikt, 2014) as a species inhabiting forests and forest steppes, a Carpathian-Balkan species. In the Bohemian Forest it has been observed as a species characteristic of forest edges (Boháč & Matějíček, 2004)

Occurrence in Poland. In Poland to date recorded only in the Western Bieszczady Mts. (Burakowski *et* al., 1980), where in 9 localities at altitudes from 460 to 1250 m a.s.l. in the years 1960–1969 a total of 12 specimens were caught (Szujecki, 1996). Monitoring studies of forest habitats showed several new localities, mainly in the Eastern Beskid Mts. (Fig. **6.13**).

New records

Lower Silesia: Zagórze Śl. vic., Chojna Mt. [XS03], 21 VII 1988, 1 ex. female in the dry litter of spruce forest, under the spruce trunk, leg., coll. AM

Sandomierska Lowland: Sieniawa District: Białobrzeżki for. distr. [FA10], 14 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Western Sudety Mts.: Wałbrzych [WS82] no exact date, 1950, 1 ex., leg., det. ex coll. AG, ver. AM, coll. MNHW

Western Beskid Mts.: Krynica-Zdrój [DV97], 11 VI 2016, 1 ex. (male), leg. Zuzanna Sidorowicz, det. et. coll. TW; Myślenice [DA21], 5 VI 2015, 1 ex. and 8 IV 2017, 2 exx., under a stone in the garden, leg., coll. DJT; Szczawnica [DV67], VII 2017, 1 ex. leg. T. Geisler, det. et coll. TK

Eastern Beskid Mts.: Husówka nat. res. [EA93], 7 VII 2017, 1 ex. in pitfall traps, det. AM, leg., coll. TO; Łomna near Bircza [FV09], 4 VIII 1987, 3 exx. pitfall traps, leg. BS, coll. MCSU; Nowy Sącz [DV79], 8 VIII 1951, 1 ex. and VIII 1952, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW; Pacław vic. [FV29], 23 V – 1 ex., 21 VI – 3 exx., 17 VII – 1 ex., 3 VIII 2015 – 1 ex. in the tree stand, pitfall trap, leg. TO, det. et coll. AM; Turze Pole [EA70], 29 V 2006, 3 exx., leg. det. et coll. DT; Zatwarnica [FV15], 2 VIII 2017, 2 exx., pitfall trap, leg., coll. AM; Zwierzyń near Lesko [EV97], 24 VI 2015, 2 exx., Fagus forest, leg. MW, coll. PJ; Bircza District: Arłamów for. distr. [FV19], 14 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Borysławka for. distr. [FA10], 14 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Brzuska for distr. [FA01], 13 VII, 1 ex., 10 VIII, 3 exx., 13 IX 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Brzuska for. distr. [FA11], 13 VII 2016, 2 exx. pitfall trap, 10 VIII 2016 1 ex., det. AM, leg., coll. DMF; Dobrzanka for. distr. [EA 90] 12 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jamna for distr. [FV 19], 13 VII 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Jasienica for. distr. [FA01], 14 VII 2016, 4 exx., 10 VIII, 2 exx. and 12 IX 2016, 1 ex. pitfall trap, [FA00], 14 VII, 1 ex. and 10 VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Jureczkowa for. distr. [FV18], 14 VII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Kuźmina for. distr. [FV09], 14 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Leszczawa for. distr. [FA00], 14 VII, 1 ex. and 12 VIII 2016, 4 exx. pitfall trap, [FV09], 14 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Leszczyny for. distr. [FV19], 16 VIII 2016, 1 ex. pitfall trap, [FV29], 13 VII 2016, 2 exx., 16 VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Łodzinka for. distr. [FA10] 13 VII 2016, 2 exx. pitfall trap, [FA00], 13 VII 2016, 5 ex. pitfall trap, [FV09], 16 VIII, 1 ex., 13 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Malawa for. distr. [FA00], 11 VIII, 2 exx., 13 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Pechniów for. distr. [FV19], 13 VII 2016, 1 ex. pitfall trap, det. AM, leg.,

coll. DMF; Posada Rybotycka for. distr. [FA10], 11 VIII, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Sierakośce for. distr. [FA20], 17 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Turnica for. distr. [FV19], 13 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Wojtkówka for. distr. [FV19], 13 VII, 3 exx., 16 VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Birchów District: Bykowce for. distr. [EV99], 27 VII, 5 exx. and 31 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dębna for distr. [EV89], 27 VII, 1 ex., 28 VII, 1 ex., 28 VIII, 2 exx. and 28 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dobra for. distr. [EV99], 27 VII, 1 ex., VII 2016, 4 exx., 26 VIII, 2 exx., 29 IX, 1 ex. and IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Izdebki for. distr. [EA80], 20 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Liszna for. distr. [EV89], 27 VII, 3 exx., 28 VII, 2 exx. and VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Sady for. distr. [EV99], 20 VII, 10 exx., 28 VIII, 2 exx., 29 VIII, 1 ex., 29 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Siemuszowa for. distr. [EV99], 27 VII 2016, 5 exx. pitfall trap, det. AM, leg., coll. DMF; Trepcza for. distr. [EV89], VII, 1 ex. and 29 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dukla District: Franków for. distr. [EV49], 28 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Iwonicz for. distr. [EV59], 1 VIII, 4 exx. and 30 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Mszana for. distr. [EV 48], VII, 2 exx. and 30 VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Piotruś for. distr. [EV58], 1 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Żmigród for. distr. [EV48], 29 VII, 1 ex. and 31 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dynów District: Dąbrówka for. distr. [EA81], VII 2016, 1 ex., VIII 2016, 1 ex. pitfall trap, [EA91], VII 2016, 10 exx., VIII 2016, 5 exx., IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Dylągowa for. distr. [EA91], VIII 2016, 6 exx. pitfall trap, det. AM, leg., coll. DMF; Jabłonica for. distr. [EA90], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Piątkowa for. distr. [EA91], 26 VII, 1 ex. and 29 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Siedliska for. distr. [EA91], 24 IX 2016, 1 ex., [EA80], 27 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Wybrzeże for. distr. [EA91], VII 2016, 3 exx., VIII 2016, 1 ex., IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kańczuga District: Borowiec for. distr. [FA02], 15 VII 2016, 1 ex., [FA12], 15 VII, 2 exx., 16 VIII, 1 ex. and 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Lipinki for. distr. [EA93], 18 VII, 3 exx., 17 VIII, 4 exx. and 16 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Hungaryka for. distr. [FA12], 18 VII, 8 exx., 16 VIII, 10 exx. and 16 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kołczyce District, Bierówka for. distr. [EA31], 30 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Bieździedza for. distr. [EA31], 29 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Czarnorzeki for. distr. [EA51], 29 VII, 2 exx., 1 VIII, 1 ex. and 1 IX 2016,

4 exx. pitfall trap, det. AM, leg., coll. DMF; Lisów for. distr. [EA 21], 29 VII 2016, 2 exx., [EA22], 29 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Odrzykoń for. distr. [EA51], 1 VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Pietrusza Wola for. distr. [EA41], 30 VII, 2 exx. and 30 VIII 2016, 1 ex., [EA51], 29 VII, 1 ex. and 29 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Węglówka for. distr. [EA51], 29 VII, 3 exx., 30 VII, 2 exx., 29 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Wola Komorska for. distr. [EA61], 30 VII, 2 exx., 29 VIII 2016, 1 ex., [EA60], 30 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Krasiczyn District: Bełwin for. distr. [FA12], 14 VII, 2 exx. and 16 VIII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Cisowa for. distr. [FA10], 13 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kormanice for. distr. [FA20], 18 VIII 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Korytniki for. distr. [FA11], 13 VII, 7 exx., 15 VII, 2 exx. and 16 VIII 2016, 8 exx. pitfall trap, det. AM, leg., coll. DMF; Krzeczkowa for. distr. [FA11], 13 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kupna for. distr. [FA01], 13 VII, 1 ex. and 16 VIII 2016, 1ex. pitfall trap, det. AM, leg., coll. DMF; Olszany for. distr. [FA10], 15 VII, 1 ex. and 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Prałkowce for. distr. [FA21], 16 VIII 2016, 1 ex., [FA11], 15 VII, 2 exx. and 16 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Rokoszyce for. distr. [FA10], 17 VIII 2016, 1 ex., [FA20], 14 VII, 5 exx. and 17 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Średnia for. distr. [FA12], 14 VII, 1 ex., 16 VIII 2016, 2 exx., [FA11], 14 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Wapowce for. distr. [FA12], 18 VIII 2016, 1 ex., [FA11], 13 VII, 2 exx. and 15 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Magurski NP: Folusz [EV29], VII 2016, 4 exx., VIII 2016, 1 ex., IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Huta Krempska [EV38], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jaworze [EV29], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kamień [EV38], VII 2016, 3 exx., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Pielgrzymka [EV38], VII 2016, 5 exx. pitfall trap, det. AM, leg., coll. DMF; Rozstaje [EV38], VII 2016, 1 ex., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Hungaryka near Pruchnik [FA03], 2 XII 1963, 1 ex., leg. anonim , det. AM, coll. USM

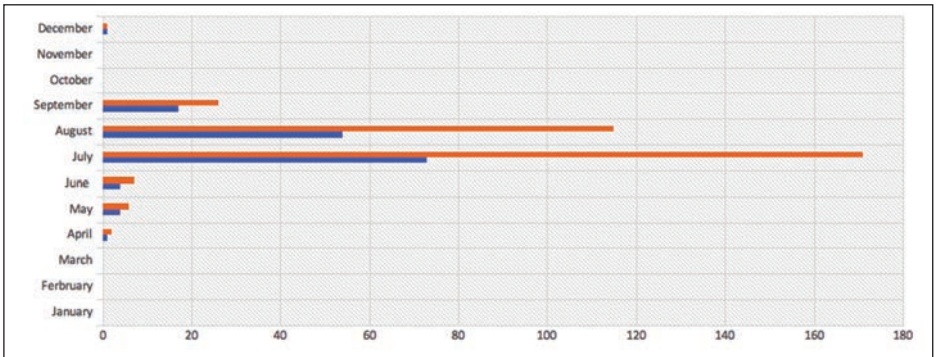
Bieszczady Mts.: trail Rozsypaniec-Halicz [FV23], 29 V 2014, 1 ex., leg., coll. PJ; Duszatyn [EV86], 16 VII 1958, 1 ex., leg. ASk, det. AM, coll. USM; Połonina Caryńska Mt., [FV14], 14 VII 1963, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW; Połonina Wetlińska Mt. [FV14], 15 VII 1974, 1 ex., leg. LBo, coll. RRu; Ustrzyki Górne [FV23], VIII 1960, 1 ex., leg. AG, det. AM, coll. MNHW; 19 VIII 1958, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW; Wołosate-Rozsypaniec trail [FV23], 29 V 2014, 1 ex., leg., coll. PJ

Previously recorded from:

Bieszczady Mts.: Solinka Upper Valley, Bukowiec nad Soliną, Łopienka, Połonina Wetlińska, Połonina Caryńska, Moczarne, Mała and Wielka Rawka, Szeroki Wierch, Tarnica and Krzemień, around Bereżek (Szujecki, 1963; Horion, 1965); Western Bieszczady Mts. (Szujecki, 1980; 1996; Pawłowski *et* al., 2000); Western Bieszczady Mts. pastures (Szujecki, 1970).
Poland: Löbl & Smetana, 2004; Löbl & Löbl, 2015.

Phenology and development. Beetles in Poland have been met from April to the end of September. Except for a single individual observed in December no specimens of *O. biharicus* were observed in the period from October to April (**Fig. 6.14**). This is consistent with observations from Hungary, where imagines were caught from May to September, with a peak in the first half of June; eggs and larvae were identified as overwintering forms (Balog *et* al., 2008)

A description of developmental stages (eggs, larvae L_1 and L_2) was given by Boháč (1982).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	2	6	7	171	115	26	0	0	1
Number of records	0	0	0	1	4	4	73	54	17	0	0	1

Fig. 6.14. Frequency of *Ocypus biharicus* (G. Müll., 1926) in localities in Poland

Ocypus macrocephalus (Gravenhorst, 1802)

General distribution. The species has been described from the Harz and it inhabits mountainous areas of central and central-eastern Europe (the Harz, the Sudety Mts., the Alps, western Carpathian Mts.; Burakowski *et* al., 1980; Herman, 2001).

Habitat preferences. It is found in subalpine forest zones in moist sites, under decaying organic matter, stones and lying logs, as well as on fungi and among

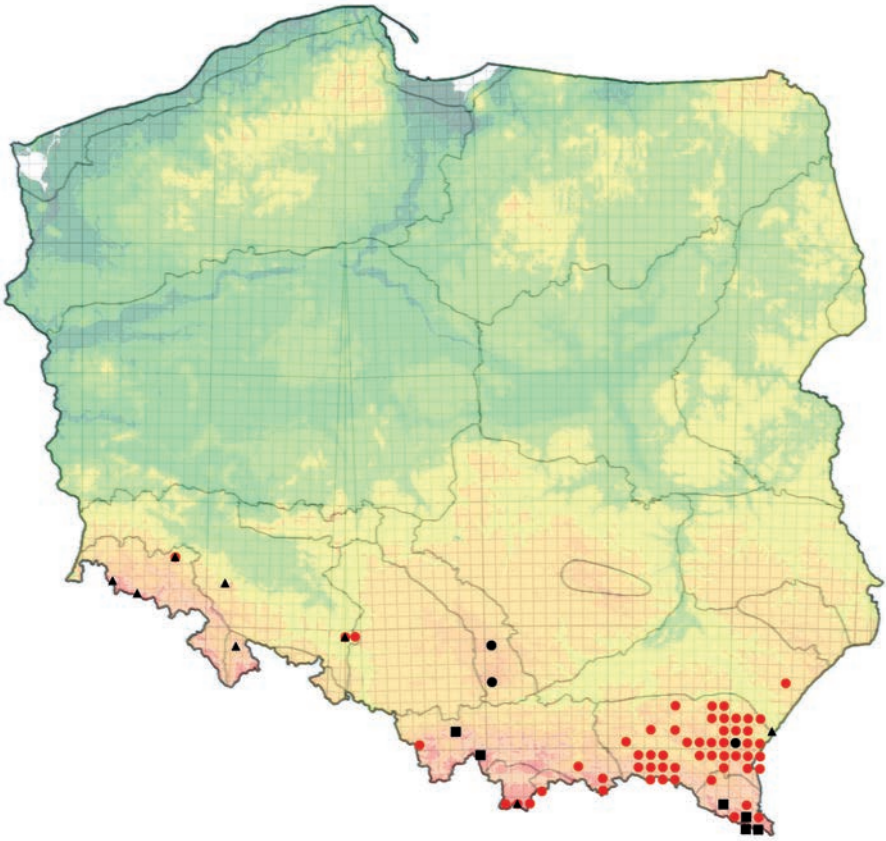


Fig. 6.15. Distribution of *Ocypus macrocephalus* (Grav., 1802) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

mosses (Burakowski *et* al., 1980). In the Bieszczady Mts. It has been caught at altitudes of 550–1250 m a.s.l. in polonynas (montane meadows), fallow land, in grey alder thickets and beech forests (Szujecki, 1996). It has also been incidentally found in caves as a trogloxene (Kocot-Zalewska & melke, 2021). In Saxony the occurrence of *O. macrocephalus* is limited almost entirely to mesic forests at higher mountain altitudes (Gollkowski, 2003).

Occurrence in Poland. In Poland, the species is rarely observed in the southern parts of the country (Burakowski *et* al., 1980). At the turn of the 19th and 20th centuries in the Sudety Mts. and in the foothills (from Pradziad to the the Izera Mts., Ślęża, the area of the town of Gogolin) it was reported relatively frequently (Horion, 1965). It is surprising that despite detailed studies of the epigeic fauna in the Sudety Mts. (Mazur, 2010; 2012) the species was not observed (**Fig. 6.15**). In neighbouring Saxony much more data has been available since the late 1950s

(Gollkowski, 2003); nevertheless, it has been proposed to enter the species, due to its limited range, in the Red Book as "endangered" (Gollkowski, 2003).

New records

Lower Silesia: Gogolin [BA89], 20 IV 1927, 1 ex., leg. HN, det. AM, coll. USM
Upper Silesia: Lesisko near Żyrowa [BA99], 4 VIII 2002, 1 ex. leg., coll. JG, det. AM
Sandomierska Lowland: Nowa Grobla near Oleszyce [FA45], 10–20 V 1994., 1 ex., det. AM, leg., coll. JM
Western Sudety Mts.: Wąwóz Myśliborski [WS75], 16 V 1992, 1 ex., det., leg. LBo, coll. RRu
Western Beskid Mts.: Równica [CA40], 6 IX 1998, 1 ex. leg., coll. JG, det. AM; Babia Góra NP [CV99], 26 VI 1999, 1 ex. in fir wood, leg. SSz, coll. AM; Babia Góra NP, Stonów [CV99], 15 IV 1999, 1 ex., leg. AF, coll. KK; Babia Góra NP, 16 VI 2008, 1 ex., leg., coll. SK; 20 VIII 2008, 2 exx., spruce forest, under stones, leg., det. et coll. TW; Przełęcz Krowiarki – Babia Góra [CV99], 3 VII 2019, 2 exx. tourist trail, approx. 1300 m a.s.l., leg., det., coll. MSa; Czantoria Mt. [CA40], 13 VIII 2011, 1 ex., leg., coll. HS; Jaworzyna Krynicka Mt. [DV97], 19 VII 1984, 1 ex., leg., coll. AM; Krynica Zdrój, Czarny Creek Valley [DV97], 13 VI 1989, 1 ex. and 17 VII 1984, 1 ex., leg., coll. AM; Ryto [DV78], 21 VII 1901, 1 ex., leg. WM, det. AM, coll. USM; Ustroń [CA40], 2.05.1997, 1 ex. leg. T. Gazurek, det. et coll. TK; Wojkowa near Krynica [DV96], 20 V 1983, 1 ex., leg. K. Urbas, coll. AM
Eastern Beskid Mts.: Arłamów vic. [FV19], 1 V 2011, 1 ex., leg., coll. AM; Bystrzyca near Pstrągowa [EA53], 13 V 2012, 1 ex. in the forest, Barber trap, leg. K. Ochał, det. AM, coll. TO; Husówka nat. res. [EA93], 26 VI 2017, 1 ex. in Barber trap, det. AM, leg., coll. TO; Pacław vic. [FV29], 21 VI 2015, 1 ex. in the forest, 17 VII 2015, 1 ex. with lonely oak, pitfall trap, leg. TO, det., coll. AM; Pacław vic. [FV29], 14 IV 2012, 1 ex. in the forest, in the wood of dead, lying fir – *Picea abies*, det. AM, leg., coll. TO; Sanok [EV89], 29 V 2006, 2 exx. in the stump, leg., coll. KR; Załuż [EV98], 28 V 2012, 2 exx., 31 V 2012, 1 ex., 22 VI 2012, 1 ex., 2 V 2017, 2 exx., leg. det. et coll. DT; Zatwarnica [FV15], 2 VIII 2017, 1 ex., pitfall trap, leg., coll. AM; Zyndranowa [EV57], 6 IX 1999, 1 ex. in a fir log, red rotten wood, leg., coll. SK; Bircza District: Arłamów for. distr. [FV19], 14 VII, 2 exx., 16 VIII 2016, 3 exx., [FV29], 15 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Borysławka for. distr. [FA10], 13 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Brzuska for. distr. [FA01], 10 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jamna for. distr. [FV19], 13 VII, 3 exx., 15 VIII, 3 exx., 15 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Jasienica for. distr. [FA01], 14 VII 2016, 2 exx., [FA00], 10 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jureczkowa for. distr. [FV28], 16 VIII

2016, 1 ex., [FV18], 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Krzywe for. distr. [FV19], 13 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kuźmina for. distr. [FV09], 13 VII, 1 ex. and 14 VII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Leszczawa for. distr. [FV09], 14 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Leszczyny for. distr. [FV19], 6 VIII 2011, 1 ex., stream bank, under the stone, det. AM, leg., coll. TO, 16 VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Łodzinka for. distr. [FA10], 13 VII, 5 exx. and 16 VIII 2016, 1 ex., [FA00], 16 VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Malawa for. distr. [FA00], 14 VII, 2 exx. and 10 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Posada Rybotycka for. distr. [FA10], 12 VII, 1 ex. and 19 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Sierakośce for. distr. [FV29], 13 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Trzcianiec for. distr. [FV18], 14 VII 2016, 3 exx., [FV09], 14 VII, 2 exx., 12 VIII, 1 ex. and 15 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Wojtkówka for. distr. [FV19], 14 VII, 1 ex. and 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Birchów District: Bykowce for. distr. [EV98], 27 VII 2016, 2 exx., [EV99], 27 VII 2016, 3 exx., 31 VIII 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Dębna for. distr. [EV89], 27 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dobra for. distr. [EA90], 27 VII 2016, 5 exx. pitfall trap, det. AM, leg., coll. DMF; Dydnia for. distr. [EA80], 27 VII, 2 exx. and 29 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Grabownica for. distr. [EV79], 28 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Liszna for. distr. [EV89], 27 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Niewistka for. distr. [EA80], 28 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Przysietnica for. distr. [EA80], 27 VII 2016, 1 ex., [EA70], 27 VII, 4 exx. and VIII 2016., 2 exx. pitfall trap, det. AM, leg., coll. DMF; Podlesie for. distr. [EA70], 27 VII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Sady for. distr. [EV99], 28 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Trepcza for. distr. [EV 89], VII 2016, 5 exx., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Tyrawa Wołoska for. distr. [EV98], 28 VII, 1 ex. and 29 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Wola Krecowska for. distr. [EV99], VII 2016, 3 exx., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dukla District: Barwinek for. distr. [EV47], 24 VII 2002, 1 ex., stream bank, under the stone, det. AM, leg., coll. TO, 30 VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Daliowa for. distr. [EV57], 29 VII, 1 ex., 30 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Folusz for. distr. [EV29], 29 VII, 2 exx. and 16 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Franków for. distr. [EV49], 19 VII, 1 ex., 29 VII, 3 exx., 29 VIII and 1 ex., 30 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kamionka for. distr. [EV57], 29 VIII, 2 exx., 30 VIII, 1 ex. and 31 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Mszana for. distr. [EV48], VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Piotruś for. distr. [EV58], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Zyndranowa

for distr. [EV57], 29 VII, 1 ex., 30 VII, 2 exx., 29 VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Żmigród for. distr. [EV39], 29 VII 2016, 3 exx., [EV49], 29 VII 2016, 1 ex., [EV48], 31 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dynów District: Borownica for. distr. [EA90], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dąbrówka for distr. [EA91], VIII 2016, 4 exx., IX 2016, 1 ex., det. AM, leg., coll. DMF; Dylagowa for. distr. [EA91], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Piątkowa for. distr. [EA91], 26 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Siedliska for. distr. [EA91], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Ulucz for. distr. [EA90], VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Żochatyn for. distr. [EA90], 24 VIII 2016, 2 exx., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kańczuga District: Borowiec for. distr. [FA02], 15 VII, 8 exx., 16 VIII 2016, 2 exx. pitfall trap, [FA12], 15 VII, 2 exx., 16 VIII 2016, 3 exx.pitfall trap, det. AM, leg., coll. DMF; Hadle for. distr. [EA83], 15 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Lipnik for. distr. [EA93], 18 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Kramarzówka for. distr. [FA02], 15 VII, 2 exx., 16 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Rączyna for. distr. [EA92], 17 VIII, 1 ex., 16 IX 2016, 1 ex. pitfall trap, [FA02], 16 IX 2016, 1 ex. pitfall trap, [EA92], 15 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Szklary for. distr. [EA82], 18 VII, 4 exx., 17 VIII 2016, 5 exx. pitfall trap, [EA92], 17 VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Śliwnica for. distr. [EA92], 16 VIII, 4 exx., 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Hungaryka for. distr. [FA12], 18 VII, 2 exx., 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kołaczyce District: Bierówka for. distr. [EA31], 30 VII, 3 exx., 30 VIII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Czarnorzeki for. distr. [EA51], 1 X 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kormanice for. distr. [FA20], 12 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Pagorzyna for. distr. [EA10], 29 VII, 1 ex, 29 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Wola Komborska for. distr. [EA60], 30 VII, 9 exx., 30 VIII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Krasiczyn District: Bełwin for. distr. [FA12], 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Cisowa for. distr. [FA10], 13 VII, 5 exx., 16 VIII, 4 exx. 13 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Korytniki for. distr. [FA11], 13 VII, 2 ex., 14 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kupna for. distr. [FA11], 14 VII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Łętownia for. distr. [FA22], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Rokoszyce for. distr. [FA20], 17 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Magurski NP, Baranie for. distr, [EV47], VIII 2016, 3 exx. pitfall trap, Żmigród for. distr. [EV49], 29 VII, 1 ex., IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Folkusz for. distr. [EV29], VII 2016, 1 ex. pitfall trap, Żmigród for. distr. [EV49], 29 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Hałbów for. distr. [EV38], VII, 2 exx., VIII, 2 exx., IX 2016, 2 exx. pitfall trap, det. AM, leg.,

coll. DMF; Jaworze for. distr. [EV38], VII, 3 exx., VIII 2016, 1 ex. in Barbers trap, det. AM, leg., coll. DMF; Kamień for. distr. [EV38], VII, 1 ex, IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Pielgrzymka for. distr. [EV29], VII 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Polany for. distr. [EV38], VIII, 1 ex. IX 2016, 1 ex. pitfall trap, [EV37], VII 2016, 1 ex. pitfall trap, [EV47], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Rozstaje for. distr. [EV38], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Świątkowa for. distr. [EV28], VII 2016, 2 exx. pitfall trap, [EV38], VIII, 1 ex., IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Żydowskie for. distr. [EV38], VIII 2016, 4 exx, pitfall trap, [EV37], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Bieszczady: Cisna [EV95], 17–18 IV 1992, 2 exx. under stones, leg. KHM, coll. AM; Falowa [EV95], 18 IV 1992, 1 ex. under stone, leg. KHM, coll. AM; Mików [EV87], 6 VIII 1976, 1 ex., det. AM, leg. JMG, coll. RRu; Polonynas (montane meadows) onWetlińska Mt. [FV14], 13 VII 1974, 4 exx., det., leg. LBo, coll. RRu; 29 VI 2010, 1 ex., leg., det. et coll. TW; Rozsypaniec–Halicz trail [FV23], 29 V 2014, 1 ex. leg., coll. PJ; Ustrzyki Górne [FV24], 25 VI 1988, 1 ex., det. LBo, leg. MBu, coll. RRu; Wetlina [FV15], 21–30 VI 2000, 2 exx., 6–14 VIII 2002, 2 exx. leg. J. Klasiński, det. et coll. TK; Wetlina PGR [FV14], 27 VII 1994, 1 ex., det., leg. LBo, coll. RRu; Wołosate–Tarnica trail [FV23], 28 V 2014, 1 ex., leg., coll. PJ; Zatwarnica [FV15], 16 VII 1974, 1 ex., det., leg. LBo, coll. RRu; Zatwarnica vic., [FV15], 9 VI 2013, 1 ex., leg., coll. JTD; Wetlina vic. [FV04], 12 VI 2013, 1 ex., leg., coll. JTD; Smerek [FV04], 11 VII 2018, 1 ex, leg., coll. JTD

Pieniny Mts.: Straszny Potok [DV46], 6 VII 1994, 1 ex. under stones, leg. M. Argasiński, det., coll. AMa

Tatry Mts.: Tatry NP: Kościeliska Valley [DV15], VI 1965, 1 ex. leg. M. Gałuszka, det., coll. AN; Małej Meadows Valley [DV15], 11 VII 1971, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW; Roztoki Valley [DV35], 5 and 7 VII 1992 and 20 VIII 1998, 3 exx. under stones, leg. BS, coll. MCSU; Skoruśniak Mt. [DV25], 16 VI 1991, 1 ex., leg., coll. AM; Skupniów Upłaz [DV25], 5 IX 2013, 1 ex., leg. AGo, det., coll. AMa

Previously recorded from:

Lower Silesia: Jauer-Hasel (Jawor), Zobten (Sobótka) (Letzner, 1871; 1886; Gerhardt, 1910a; Kolbe, 1924; 1928; Scholz, 1924; Horion, 1965)

Upper Silesia: the Zegar cave, near the Pilica (Kocot-Zalewska & Melke, 2021)

Kraków-Wieluń Upland: Nielepice near Kraków (Wojas, 2006)

Western Sudety Mts.: Isergebirge (Góry Izerskie), Riesengebirge, Wiesenbaude (Karkonosze, Lučni Bouda; Gravenhorst, 1847; Pfeil, 1866; Letzner, 1871; 1886; Gerhardt, 1910a; Scholz, 1924; Horion, 1965; Szujecki, 1980)

Eastern Sudety Mts.: Glatz (Kłodzko; Zebe, 1852; Rottenberg, 1864; Letzner, 1871; 1880; Horion, 1965; Szujecki, 1980)

Western Beskid Mts.: Little Beskid Mts. (Paśnik, 1998), Babia Góra Massif (Pawłowski J., 1963; 1967; Kubisz & Szafraniec, 2003), records without exact data (Kelch, 1846; Roger, 1856; Reitter, 1870b; Letzner, 1871; 1886; Kotula, 1873; Nowicki, 1873; Stobiecki, 1883; Gerhardt, 1910a; Horion, 1965)

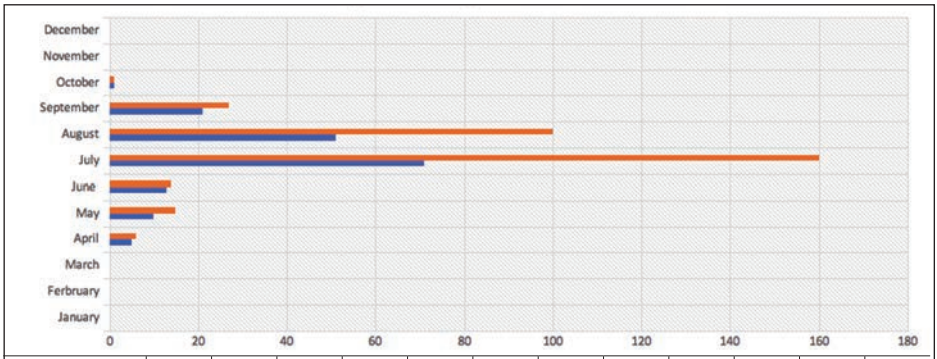
Eastern Beskid Mts.: Arłamów, Arłamów for. distr., Germanka Valley (Buchholz & Melke, 2018), Przemyśl vic. (Trella, 1929), Przemyśl (Horion, 1965)

Bieszczady Mts.: Western Bieszczady Mts. pastures (Szujecki, 1970; 1980), Bieszczady NP: Sasów, Habkowice, Drewnik, Połonina Caryńska, Ustrzyki Górne, Szeroki Wierch, Tarnica – Krzemień (Szujecki, 1996; Pawłowski J. *et* al., 2000)

Tatry Mts.: records without exact data (Miller, 1859; Nowicki, 1864; 1865; 1873; Łomnicki, 1866; 1868; Reitter, 1870a; Horion, 1965)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Silesia (Jakobson, 1909; Kuhnt, 1912; Horion, 1951), Galicia (Gravenhorst, 1847; Łomnicki, 1884; Jakobson, 1909), Eastern Carpathians (Miller, 1868), Carpathians (Ganglbauer, 1895; Bernhauer & Schubert, 1914; Müller, 1926; Szujecki, 1980), Sudety Mts. (Ganglbauer, 1895; Reitter, 1909; Bernhauer & Schubert, 1914; Müller, 1926; Szujecki, 1980), Beskidy Mts. (Reitter, 1909).

Phenology and development. Beetles are observed from April to October with a activity peak in July (**Fig. 6.16**).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	6	15	14	160	100	27	1	0	0
Number of records	0	0	0	5	10	13	71	51	21	1	0	0

Fig. 6.16. Frequency of *Ocypus macrocephalus* (Grav., 1802) in localities in Poland

Ocypus nitens nitens (Schrank, 1781)

The species comprises 4 subspecies and forms found either in mountainous areas or in the south of its range (Smetana & Davis, 2000; Herman, 2001).

General distribution. The species is widely distributed in Europe. In the northern part of the continent it is rarely and only locally observed. According to Horion (1965) it was not recorded in the northern parts of Scandinavia. In central and southern Europe it is found from France, Spain and Portugal throughout the Mediterranean (in Corsica and Sardinia) to the European part of Russia, the Caucasus, Turkey, Georgia and Iran (Löbl & Smetana, 2004; Anlaş, 2009; Anlaş & Newton, 2010; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015; Özgen *et* al., 2017; Ferreira, 2018). Moreover, it is also known from Morocco, and recently it has been reported from Armenia and Nagorno-Karabakh (Assing & Schülke, 2019). It was introduced to North America in the mid-1940s (Bordoni, 2010; Klimaszewski & Brunke, 2018).

Habitat preferences. It inhabits broadleaf and coniferous forests, particularly mesic forests. It is also found in midfield thickets, less frequently in open spaces (Szujecki, 1980) while avoiding xerothermic localities (Burakowski *et* al., 1980). The latter thesis is rather ambiguous: both data reported by Horion (1965) and the data on individuals caught in the Małopolska and the Świętokrzyskie regions (see below) indicate the occurrence of *O. nitens nitens* in xeric and sunny localities. Beetles are found in the leaf litter, topsoil and under stones, lying log fragments and bark debris.

It was reported as the dominant species in the biomass of Staphylinidae in a study conducted in the agricultural landscape in winter wheat fields in the area of Göttingen (Krooss, 1994). In this habitat the feeding spectrum of larvae and beetles was also analysed under laboratory and field conditions (Krooss & Schaefer, 1998). *Ocypus nites nitens* is a universal predator with a wide range of potential prey. Both larvae and beetles preferred millipedes (Diplopoda) from the families Julidae and Polydesmidae; in contrast, they did not hunt for spiders and larvae of Cantharidae (Krooss & Schaefer, 1998). Beetles and L_2 larvae in the period of the greatest feeding activity (in June) reduce the millipede populations by 7–35 % (Krooss & Schaefer, 1998).

In the opinion of Sushko (2016) *O. nitens nitens* in Belarus is not found in peatbogs, while in the Polesie National Park it has been caught in boggy coniferous forests, peatbogs, oak-hornbeam forests, alder swamp forests and oak forests (Staniec, 2010). It has been reported with very low frequencies in willow plantations (Konieczna *et* al., 2013), while in Holstein it has been found in moist localities in oak forests with thickets of willow (*Salix*) and buckthorn (*Rhamnus*) (Kleeberg & Uhlig, 2011). It is also caught (together with *Ocypus biharicus*)

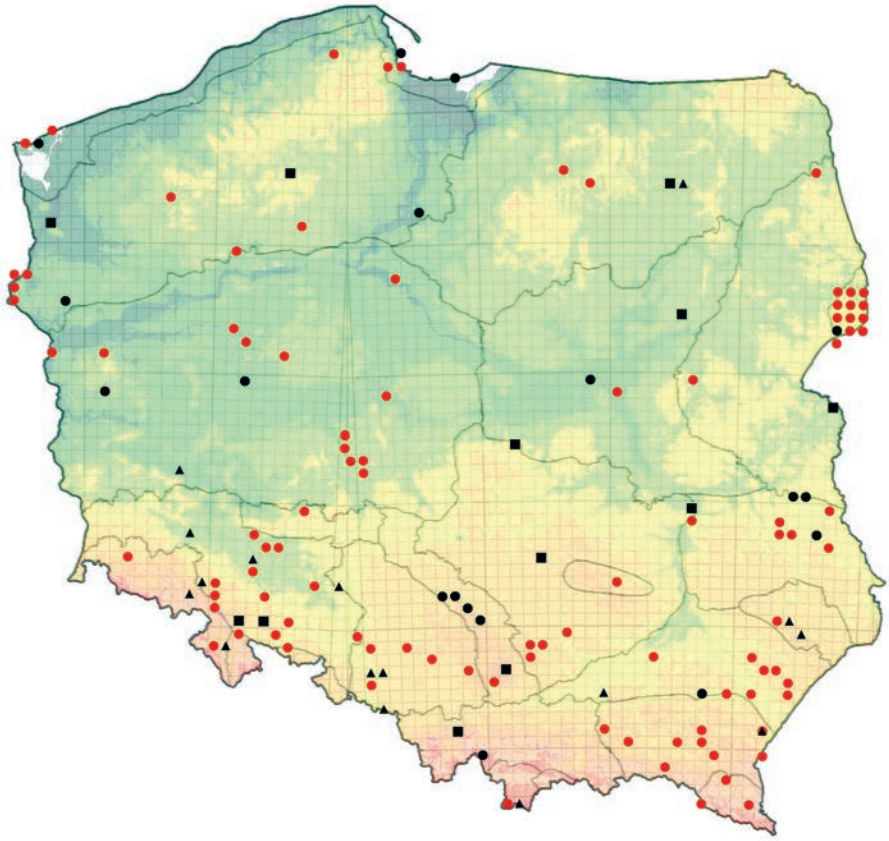


Fig. 6.17. Distribution of *Ocypus nitens nitens* (Schrank, 1781) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

in traps on fruit tree stems in orchards in Romania and Hungary (Balog & Markó, 2007b) together with other dendrophilous and subcortical species.

In Eastern Tirol it is recorded more frequently than *O. tenebricosus*; however, the localities are situated in alpine valleys, while at higher altitudes it is observed much less frequently (Kofler, 2015).

Occurrence in Poland. Ocypus nitens nitens (Polish: zbójca leśny, after Szujecki 2018) is found throughout the country, inhabiting lowland areas and foothill localities and mountain valleys located at lower altitudes (**Fig. 6.17**).

New records

Baltic Coast: Gdańsk vic. [CF33], 21 IV 2014,1 ex. in the entomological sieve, Trójmiejski Landscape Park, leg., coll. DJT; Gdańsk-Oliwa [CF43], 23 IX

1964, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW; Świnoujście [VV57], 14 VI 2007, 1 ex., by the sea, leg. SD, det. AM, ex coll. OA, coll. AM; Woliński NP, Wisełka vic. [VV78], 3 VIII 1993, 1 ex., leg. JMG, coll. AM; 29 VI 1991, 1 ex. on the dunes, leg., coll. AM

Pomeranian Lake District: Bielinek nat. res. [VU46], 6 X 2009, 1 ex., 4 XI 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Krajnik Dolny [VU57], 12 XI 2011, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Piła [XU19], 2 km N, Ruda river valley, 23 IX 2001, 1 ex., det. AM, leg., coll. RRu; Raduń [VU47], 7 VII 2009, 1 ex., 4 X 2010, 1 ex., stipa grassland, 2 XI, 1 ex., 7 VII 2009, 1 ex., 29 IV, 3 exx., 28 VI, 2 exx., 4 XI 2010, 1 ex., xerothermic flowering, 30 V 2011, 2 exx., beech forest on the embankment of the Odra River pitfall trap, leg. PS, det., coll. AM; Rozłazino near Łęczyce [XA84], 8 VI–27 VII 2007, 5 exx., young pine forest, leg. SKo, det. AM, ex coll. OA, coll. AM; Stary Kostrzynek [VU45], 1 IX, 2 exx., 2 XI 2009, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Zakrzewska Osada [XV61], 22 IX 2010, 1 ex., under the stone in the forest, leg., coll. DJT; Złocieniec [WV63], 12 V 2010, 1 ex. on the way, leg., coll. KR

Masurian Lake District: Biebrza NP, Ostrowie [FE55], 4 VIII 1999, 1 ex., peat-bog Błota Biebrz., det. AM, leg., coll. MW; Krzywonoga [DE84], 28 V 2006, 1 ex. and 11 VI 2006, 1 ex., pitfall trap on the border of pine forest, leg. AP, coll. KK; Olsztyn vic. [DE65], 8 VI 2005, 1 ex., the edge of the transitional bog, pitfall trap, leg. M. Jackiewicz, coll. KK; Olsztyn vic., Kortowskie woods [DE65], V 2011, 1 ex., in moor, pitfall trap, leg. M. Jackiewicz, coll. KK

Wielkopolska-Kujawy Lowland: Bałdoń near Godziesze [CC02], 1 IV 1991, 1 ex., leg., coll. AM; Biedrusko vic., military training ground [XU22], 6 IV 1998, 1 ex. in sandy area, leg., coll. SK and 22 V 2003 1 ex., pitfall trap in thick bushes *Pruno-Crataegetum*, leg. PS, coll. SK; Dąbkrowice vic. [CC28], 26 III 1991, 1 ex., leg. TM, coll. AM; 10 VIII 1983, 1 ex., mixed forest, on the so-called Devil's way, leg. TM, coll. AM; Golęczewo vic., military training ground [XU22], 7 V 2000, 1 ex. on a sandy road, leg., coll. SK; Gołuchów [YT04], 15 VIII 1992, 1 ex., leg., coll. AM; Gołuchów vic. [YT05], 16 IV 1990, 1 ex., park-arboretum, leg., coll. AM; Gryżyna Landskape Park, Gryżyna [WT18], 7 IX 2009, det. AM, leg., coll. RO; Laski [VU71], 6 X, 6 exx., 2 XI 2009, 1 ex., 29 IV, 1 ex., 28 V, 1 ex., 2 X 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Kalisz [BC93], 16 VI 1985, 1 ex., leg., coll. AM; 8 V 1985, 1 ex., Braci Niemojowskich street, leg. SB, coll. AM; "Odrapanki" so-called near Kalisz [BC93], 6 IV 1991, 1 ex., leg., coll. AM; Kalisz-Wolica [CC03], 25 IX 1994, 1 ex., leg., coll. AM; Owczary [VU71], 1 IX 2009, 1 ex., 28 V 2010, 1 ex., mixed xerothermic grassland, 29 IV, 1 ex., 29 IV 2010, 1 ex., xerothermic flowering, 28 V 2010, 2 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Pamięcin nat. res. [VU71], 2 XI, 1 ex., 9 XI 2009, 1 ex., 29 IV 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Pobiedziska vic. [XU51], 22 IX 1996, 1 ex. leg., coll. PJ; Puszczykowo

near Poznań [XT29], 6 VI 1998, 1 ex. leg., coll. PJ; Sulęcin District [WU11], for. comp. 125f, 1 X 1994, 2 exx. leg. W. Gorączka, det., coll. AMa; Toruń vic., military training ground, Żymierski Hill [CD36/37], 19 VI 2012, 1 ex., det. AM, leg., coll. BP; Uścikowiec near Oborniki Wielkopolskie [XU13], 21–28 IV 2007, 1 ex., pitfall trap, leg. TSz, det., coll. AM

Mazovian Lowland: Saska Kępa [EC08], 26 IV 1894, 1 ex., leg. WM, det. AM, coll. USM; Wawer [EC08], 14 IV 1894, 2 exx., leg. WM, det. AM, coll. USM

Podlasie: transitional bog "Bukowski Las" [FB79], 18 V 2007, 8 exx. and 9 X 2007, 1 ex. pitfall trap, leg. TOd, coll. MCSU; Podsusze near Węgrów [EC69], 19 IX 1963, leg. TPl ex coll. AG, det. AM, coll. MNHW

Białowieża Primeval Forest: Białowieża [FD94], 2 V 1994, 2 exx., 10 and 19 IV 1994, 4 exx., 20 V 1993, 1 ex., 10 IX 1993, 1 ex., 31 V 1991, 1 ex., leg. JMG, coll. AM; Białowieża NP, for. comp. 218 [FD94], 4 V 1993, leg., coll. AM; Grudki vic. [FD94], 19 VI 1991, 1 ex., for. comp. 475, leg., det., coll. MW; Białowieża District [FD83, FD84, FD93, FD94], pitfall trap: 4 V–14 VI 2016: 4 exx. (for. comp. 217Cc), 1 ex. (217Db), 7 exx. (219Df), 2 exx. (220Bc), 2 exx. (248Ak), 2 exx. (251Aa), 2 exx. (277Bd), 9 exx. (279Cd), 1 ex. (279Da), 2 exx. (311Ch), 6 exx. (312Aa), 1 ex. (337Bc), 2 exx. (338Cg), 4 exx. (339Ag), 1 ex. (363Ak), 1 ex. (365Ab), 1 ex. (367Da), 3 exx. (368Dh), 1 ex. (392Bc), 2 exx. (392Cg), 1 ex. (393Aa), 7 exx. (423Ch), 2 exx. (423Dd), 3 exx. (426Cj), 3 exx. (442Ab), 3 exx. (446Dc), 7 exx. (447Ab), 5 exx. (448Dd), 3 exx. (449Bf), 5 exx. (449Ca), 3 exx. (450Aa), 3 exx. (475Af), 1 ex. (475Bd), 3 exx. (476Ba), 3 exx. (477Ac), 1 ex. (492Dh), 6 exx. (495Bg), 1 ex. (495Ca), 2 exx. (496Ac), 6 exx. (498Bo), 2 exx. (502Ah), 4 exx. (521Cd), 3 exx. (523Ca), 3 exx. (526Cd), 8 exx. (526Df), 1 ex. (527Ad), 3 exx. (544Ah), 4 exx. (545Dj), 1 ex. (546Ah), 2 exx. (546Bc), 1 ex. (548Ca), 1 ex. (578Ad), 6 exx. (579Ca), 2 exx. (579Dc), 1 ex. (580Ag), 5 exx. (580Bb), 11 exx. (582Ca), 8 exx. (583Ah), 3 exx. (606Bc), 1 ex. (608Cb), 7 exx. (609Ab), 2 exx. (640Aa), 1 ex. (671Ak), 1 ex. (672Fb), 1 ex. (673Bc); 14 VI–10 VII 2016: 1 ex. (219Df), 1 ex. (220Bc), 1 ex. (220Ca), 1 ex. (249Dg), 1 ex. (250Cg), 2 exx. (252Ca), 10 exx. (279Cd), 1 ex. (309Ah), 1 ex. (311Ch), 1 ex. (312Aa), 1 ex. (336Bc), 1 ex. (393Aa), 2 exx. (402Ca), 2 exx. (424Ba), 2 exx. (447Ab), 2 exx. (476Ba), 1 ex. (477Ac), 1 ex. (492Dh), 2 exx. (496Ac), 1 ex. (498Bo), 4 exx. (521Cd), 3 exx. (523Ca), 4 exx. (523Da), 1 ex. (524Ab), 1 ex. (526Cd), 2 exx. (526Df), 2 exx. (527Ad), 4 exx. (544Ah), 1 ex. (545Dj), 1 ex. (546Bc), 1 ex. (551Db), 1 ex. (578Ad), 3 exx. (579Ca), 1 ex. (579Dc), 4 exx. (583Ah), 3 exx. (606Aa), 1 ex. (640Aa), 1 ex. (671Gc), 1 ex. (673Cd); 10 VII–13 VIII 2016: 1 ex. (279Cd), 1 ex. (311Ch), 1 ex. (311Db), 1 ex. (312Aa), 2 exx. (336Bc), 3 exx. (426Cj), 1 ex. (428Cb), 4 exx. (471Bd), 1 ex. (471Cc), 1 ex. (476ba), 1 ex. (500Db), 1 ex. (527Bg), 1 ex. (546Ah), 2 exx. (608Bh), 1 ex. (608Cb); 13 VIII–11 IX 2016: 2 exx. (312Aa), 1 ex. (402Ca), 1 ex. (403Bd), 1 ex. (426Dd), 1 ex. (426Db), 2 exx. (447Ab), 1 ex. (476Ba), 1 ex. (492Dh), 1 ex. (500Db), 1 ex. (526Cd), 1 ex. (527Bg), 1 ex. (608Bh), 1 ex. (640Aa), det. AM, leg., coll. DFP;

Hajnówka District [FD72, FD73, FD74, FD75, FD83, FD84, FD85], pitfall trap: 4 V–14 VI 2016: 2 exx. (for. comp. 210Ad), 3 exx. (215Bg), 4 exx. (241Bc), 5 exx. (242Bg), 18 exx. (242Ca), 13 exx. (244Cf), 3 exx. (245Aj), 4 exx. (247Ch), 1 ex. (247Df), 1 ex. (271Cb), 3 exx. (272Aa), 2 exx. (274Bk), 1 ex. (303Ba), 24 exx. (304Aa), 1 ex. (305Dd), 5 exx. (306Ad), 1 ex. (307Ai), 2 exx. (329Dl), 1 ex. (332Cb), 1 ex. (358Aa), 3 exx. (359Cc), 1 ex. (360Aa), 1 ex. (362Dc), 1 ex. (384Ca), 1 ex. (385Cb), 1 ex. (387Bf), 3 exx. (389Bj), 1 ex. (411Aa), 2 exx. (412Cc), 1 ex. (413Bf), 1 ex. (413Ch), 3 exx. (415Bb), 2 exx. (418Ca), 2 exx. (435Dp), 1 ex. (463Bo), 6 exx. (463Cd), 2 exx. (464Ab), 2 exx. (465Db), 1 ex. (466Bb), 3 exx. (487Ca), 8 exx. (489Ci), 1 ex. (490Ba), 4 exx. (512Da), 4 exx. (515Cc), 4 exx. (518Cb), 12 exx. (519Ag), 7 exx. (534Bd), 1 ex. (535Cf), 3 exx. (535Da), 1 ex. (536Ab), 2 exx. (537Di), 3 exx. (539Am), 3 exx. (540Fg), 5 exx. (541Aj), 1 ex. (542Dn), 2 exx. (566Bc), 1 ex. (568Ca), 3 exx. (568Db), 3 exx. (571Cf), 2 exx. (571Db), 4 exx. (573Dk), 6 exx. (595Ak), 1 ex. (597Ca), 2 exx. (600Cd), 2 exx. (603Af), 1 ex. (603Ba), 2 exx. (627Dg), 3 exx. (628Cf), 2 exx. (632Ab), 1 ex. (637Aa), 1 ex. (662Ab), 2 exx. (670Cc), 1 ex. (696Aa), 1 ex. (728Bg), 1 ex. (733f); 14 VI–10 VII 2016: 1 ex. (242Bg), 1 ex. (242Ca), 1 ex. (245Ba), 1 ex. (272Aa), 1 ex. (273Df), 2 exx. (302Dc), 2 exx. (304Aa), 1 ex. (307Ai), 2 exx. (329Cf), 1 ex. (333Aa), 1 ex. (418Ca), 1 ex. (435Dp), 2 exx. (439Ac), 2 exx. (465Db), 1 ex. (466Ac), 1 ex. (514Ek), 5 exx. (516An), 6 exx. (516Bb), 2 exx. (535Da), 1 ex. (541Aj), 1 ex. (542Ca), 1 ex. (568Db), 1 ex. (574Ai), 1 ex. (576Ci), 1 ex. (594Dl), 1 ex. (596Db), 1 ex. (598Aa), 1 ex. (600Cd), 1 ex. (636Ba), 1 ex. (733f); 10 VII–13 VIII 2016: 1 ex. (242Bg), 2 exx. (274Bk), 1 ex. (329Cf), 2 exx. (359Db), 1 ex. (389Bj), 1 ex. (439Bf), 1 ex. (440Dd), 1 ex. (488Ab), 1 ex. (490Ba), 1 ex. (516Bb), 1 ex. (518Cb), 1 ex. (603Af), 2 exx. (634Fk); 13 VIII–11 IX 2016: 1 ex. (242Bg), 1 ex. (247Df), 1 ex. (274Bk), 1 ex. (357Ca), 1 ex. (410Ch), 1 ex. (415Bb), 1 ex. (418Ca), 1 ex. (444Aj), 1 ex. (465Db), 1 ex. (487Ca), 1 ex. (490Aa), 1 ex. (516An), 1 ex. (517Dg), 1 ex. (518Bl), 3 exx. (519Ag), 1 ex. (543Af), 1 ex. (694Aa), 2 exx. (733f), det. AM, leg., coll. DFP; Browsk District [FD75, FD76, FD85, FD86, FD95, FD96], pitfall trap: 4 V–14 VI 2016: 4 exx. (for. comp. 3Ab), 2 exx. (14Ba), 4 exx. (16Bg), 1 ex. (16Cd), 5 exx. (17Af), 2 exx. (23Bc), 4 exx. (23Db), 3 exx. (24Dc), 3 exx. (26Dg), 3 exx. (27Ca), 5 exx. (28Ad), 6 exx. (28Bc), 2 exx. (35Da), 1 ex. (38Cg), 1 ex. (40Cd), 2 exx. (41Bb), 1 ex. (44Dd), 1 ex. (45Ax), 2 exx. (47Ab), 5 exx. (48Cg), 1 ex. (50Ci), 3 exx. (53Ch), 2 exx. (53Dc), 2 exx. (56Bc), 6 exx. (57Ci), 9 exx. (57Df), 2 exx. (60Df), 4 exx. (61Bd), 1 ex. (65Bf), 1 ex. (80Ca), 2 exx. (83Cf), 3 exx. (83Da), 1 ex. (84Ah), 10 exx. (84Bb), 3 exx. (92Ad), 1 ex. (94Bg), 1 ex. (95Aa), 1 ex. (96Cc), 1 ex. (96Dd), 2 exx. (98Cb), 1 ex. (99Da), 1 ex. (100Aa), 1 ex. (100Bb), 1 ex. (101Cb), 2 exx. (103Ei), 1 ex. (119Cd), 4 exx. (120Ag), 1 ex. (120Bc), 1 ex. (121Da), 8 exx. (122Ca), 1 ex. (123Aa), 4 exx. (125Af), 2 exx. (125Ba), 4 exx. (128Aa), 2 exx. (147Cb), 3 exx. (148Ad), 2 exx. (150Cb), 7 exx. (153Bc), 2 exx. (153Cd), 1 ex. (155Db), 1 ex. (178Da),

1 ex. (182Ag), 1 ex. (182Bb), 1 ex. (184Db), 4 exx. (185Ab), 6 exx. (742Db), 2 exx. (743Ca), 1 ex. (746Bb), 2 exx. (748Dh), 4 exx. (749Cb), 3 exx. (751Df), 3 exx. (755Cc), 1 ex. (755Dd), 1 ex. (756Ba), 4 exx. (759Bj), 1 ex. (759Cb), 3 exx. (769Cg), 4 exx. (770Bg), 7 exx. (773Ad), 1 ex. (773Bc), 7 exx. (776Ac), 2 exx. (776Bc), 1 ex. (780Di), 2 exx. (781Cd); 14 VI–10 VII 2016: 1 ex. (3Ab), 3 exx. (9Ch), 6 exx. (15Dd), 1 ex. (16Bg), 2 exx. (26Dg), 2 exx. (27Ca), 1 ex. (28Ad), 1 ex. (34Bf), 3 exx. (38Ba), 4 exx. (41Bb), 1 ex. (49Ac), 1 ex. (53Ch), 2 exx. (57Df), 1 ex. (65Bf), 1 ex. (83Cf), 1 ex. (84Ah), 1 ex. (84Bb), 2 exx. (96Cc), 1 ex. (96Dd), 1 ex. (99Da), 1 ex. (101Db), 1 ex. (122Ca), 1 ex. (128Aa), 1 ex. (153Bc), 2 exx. (154Aa), 1 ex. (184Ch), 2 exx. (185Ba), 1 ex. (751Df), 1 ex. (753Bc), 1 ex. (755Db), 3 exx. (773Ad), 1 ex. (776Bc), 1 ex. (781Cd); 10 VII–13 VIII 2016: 1 ex. (15Dd), 1 ex. (49Ac), 1 ex. (51Ac), 10 exx. (147Da), 2 exx. (153Bc), 1 ex. (155Db), 1 ex. (179Cc), 2 exx. (185Ab), 2 exx. (753Bc), 1 ex. (759Cb), 1 ex. (781Dc); 13 VIII–11 IX 2016: 1 ex. (48Cg), 1 ex. (127Bd), 3 exx. (147Da), 1 ex. (753Bc), 1 ex. (756Ba), det. AM, leg., coll. DFP; Białowieża NP [FD84, FD85, FD94, FD95] pitfall trap: 4 V–14 VI 2016: 2 exx. (for. comp. 105Ai), 3 exx. (107Bi), 4 exx. (107Cb), 5 exx. (108Af), 4 exx. (130Cf), 1 ex. (130Db), 2 exx. (132Dg), 1 ex. (133Ca), 2 exx. (134Ag), 1 ex. (158Da), 1 ex. (160Db), 1 ex. (161Bc), 1 ex. (161Cb), 2 exx. (162Ac), 5 exx. (163Cb), 3 exx. (164Bn), 1 ex. (164Cf), 1 ex. (165Ad), 2 exx. (166Dc), 1 ex. (190Bd), 2 exx. (193Ad), 5 exx. (195Cg), 3 exx. (196Aa), 1 ex. (221Bc), 2 exx. (226Ba), 1 ex. (228Df), 3 exx. (229Bg), 1 ex. (257Ca), 3 exx. (260Cb), 2 exx. (290Bd), 3 exx. (342Cb), 2 exx. (343Af), 3 exx. (372Bh); 14 VI–10 VII 2016: 2 exx. (105Ba), 1 ex. (108Af), 1 ex. (133Ca), 1 ex. (164Bn), 1 ex. (164Cf), 3 exx. (193Bb), 3 exx. (196Aa), 1 ex. (229Bg), 1 ex. (285Cg), 1 ex. (289Ad), 1 ex. (290Bd), 2 exx. (315Db), 1 ex. (342Cb), 2 exx. (343Af); 10 VII–13 VIII 2016: 1 ex. (130Cf), 1 ex. (158Ca), 1 ex. (196Aa), 1 ex. (375Bg); 13 VIII–11 IX 2016: 1 ex. (159Ba), det. AM, leg., coll. DFP

Lower Silesia: Bardo Śląskie [XR29], 15 VII 1930, 1 ex., leg. FK. det. AM, coll. USM; Budziszów [XS34], 18 VI and 23 VII 2009, 2 exx. in the cultivation of maize in the pitfall trap, leg. JT, det. AM, coll. JK; Łosiów ad Brzeg [XS83], 25 IX 2002, 4 exx., 29 IX 2004, 1 ex. leg. JJ, det., coll. AMa; Kamienna Mt. [BA99], 7 V 1926, 1 ex., 17 1938, 2 exx., leg. HN, det. AM, coll. USM; Ligota Otmuchowska [XR59], 3 exx., leg ED, det. AM, coll. USM; Makowice near Skoroszyce [XS60], 15 IX 1963, 1 ex. leg., det. ex coll. AG, ver. AM, coll. MNHW; Opoczka [XS03], 27 V 1961, 3 exx., leg. TS, det. AM, coll. USM; Paniowice near Wrocław [XS37], 1 V 2005, 1 ex., det. AM, leg., coll. MW; Sowie Mts. [XS01], 27 V 1951, 1 ex. on a forest road and 2 VIII 1957, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW; Strzelin [XS42], 30 IX 1989, 1 ex., 6 VII 1991, 1 ex., 2 VIII 1991, 1 ex., 9 VIII 1991, 1 ex., 12 VIII 1991, 3 exx., 9 VII 1993, 1 ex. in home garden, leg., det., coll. AMa; Szczawin ad Strzelin [XS42], 9 IV 1994, 1 ex. in garden, leg., det., coll. AMa; Wieruszów near Świdnica [XS02], 23, IX 1960, 1 ex., leg. TS, det. AM, coll. USM; Wrocław [XS46],

24 VIII 1968, 1 ex., leg. Teresa Gruszka, 3 IV 1956, 1 ex., leg. ex coll. AG, 1 IX 1951, 1 ex., leg. ex coll. AG, 18 IV 1949, 2 exx., leg. ex coll. AG, det. AM, coll. MNHW; Wrocław-Wojnów [XS56], 1 VI 1991, 1 ex., det. AM, leg., coll. MW

Trzebnica Hills: Bukowina Sycowska [XS79], 14 VII 1985, 1 ex., leg., coll. AM

Upper Silesia: Bytom [CA57], 20 V 1911, 1 ex., leg. GR, det. AM, coll. USM; Jaworzno-Ciężkowice [CA86], 11 V 2006, 1 ex., xerothermic grassland, leg., det. et coll. TW; Przezchlebie [CA38], 8 VI 1926, 1 ex., leg. FK, det. AM, coll. USM; Racibórz [CA05], 23 V 1929, 1 ex., leg. HN, det. AM, coll. USM; Sławęcice [CA08], 15 X 1925, 1 ex., leg. HN, det. AM, coll. USM

Kraków-Wieluń Upland: Czerna [DA05], 4 VII 1902, 1 ex., leg. WM, det. AM, coll. USM; Ojców NP [DA16], 16 VIII 1926, 1 ex., leg. MK, det. AM, coll. USM; Ojców [DA16], 24 IX 2000, 1 ex., det. AM, leg., coll. RRu

Małopolska Upland: Pińczów-Skowronno [DA69], 10–15 V 1991, 6 exx., det., leg. LBo, coll. RRu; Grzymałów [DA48], 28 III–22 IX 2015, 4 exx., pitfall trap, leg., coll. JTD; Szczepanowice [DA37], 28 III–22 IX 2015, 1 ex., xerothermic slope, pitfall trap, leg., coll. JTD; Komorów [DA37], 28 III–22 IX 2015, 1 ex., xerothermic slope, pitfall trap, leg., coll. JTD; Sławice Szlacheckie [DA37], 28 III–22 IX 2015, 2 exx., xerothermic slope, pitfall trap, leg., coll. JTD; Widnica [DA38], 28 III–22 IX 2015, 2 exx., xerothermic slope, pitfall trap, leg., coll. JTD

Świętokrzyskie Mts.: Świętokrzyski NP, p.u. Chełmowa Góra, for. comp. A-1g [EB03], 31 III–15 IV 2012, 1 ex., pitfall trap, leg. LB et S. Kuroś, det., coll. AM

Lubelska Upland: Białka near Milejów [FB47], 13 IV 1995, 1 ex. compost pile in the garden, leg. BS, coll. MCSU; Chełm-Wzgórze Kredowe [FB76], 13 V 1997, 1 ex. visually observed, leg. BS, coll. MCSU; Ciechanki Łańcuchowskie [FB37], 25 IV, 22 V, 22 VI and 17 VII 2005, 6 exx., the pitfall trap in the xerothermic communities of the Nadwieprzański Landscape Park, leg. JKo, coll MCSU; Jaszczów near Milejów [FB37], 21 V 1988, 1 ex. in entomological sieve, in compost, 22 V 1995, 1ex. in an entomological sieve, with moss over a small pond, 10 X 1997, 1 ex. on the sidewalk, leg. BS, coll. MCSU; Kazimierz Dolny [EB68], limestone quarry, 21 VII 1999, det. AM, leg., coll. RRu; Łańcuchów [FB38], 11 IX 1997, 1 ex. visually observed, leg. BS, coll. MCSU; Łęczna vic. the bank of the Mogielnica River near the estuary to the Wieprz River [FB38], 17 VI 2008, 1 ex. pitfall trap, leg. BS, coll. MCSU; Milejów [FB37], 18 IX 1993, 1 ex. in entomological sieve, in compost, leg. BS, coll. MCSU

Roztocze: Roztoczański NP, Bujowa Góra [FB30], 6 X 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Sandomierska Lowland: Jaroslaw [FA14], 24 VI 2007, 1 ex., municipal greenery, det. AM, leg., coll. JM; Malinie near Mielec [EA37], 22 V–6 VI 2016, 2 exx, in the park, pitfall trap, leg. MKŚ, det et coll. AM; Nowa Grobla near Oleszyce [FA45], 10–20 V 1994, 1 ex., det. AM, leg., coll. JM; Oleszyce District: Zabiała for. distr. [FA36], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll.

DMF; Sieniawa District: Pawłowa for. distr. [FA26], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Szegdy for. distr. [FA17], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jarosław District: Kobylnica for. distr. [FA44], VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF

Eastern Sudety Mts.: Głuchołazy [XR68], 26 VI 1927, 1 ex., leg. FK, det. AM, coll. USM; Polanica Zdrój [XR08], IV 1939, 1 ex., leg. HN, det. AM, coll. USM

Western Sudetes Mts.: Lubomierz [WS35], 12 VII 1994, 1 ex. det. AM, leg., coll. SK; VII 2000, 1 ex. leg. A. Sieniuć, coll. SK

Eastern Beskid Mts.: Biecz [EA10], 10 and 15 V 1944, 2 exx., leg. anonim, det. AM, coll. USM; Grąd w Średniej Wsi nat. res. [EV97], 24 VI 2015, leg. MW, coll. PJ; Humniska (Mała Strona) [EA70], 28 V 2010, 1 ex., leg. det. et coll. DT; Jastrzębia [DA91], 26 VI 1998, 1 ex., det. AM, leg., coll. AT; Krosno vic. [EA50], VII 1947, 1 ex. and IX 1953, 1 ex., leg. AG, det. AM, coll. MNHW; Liszna near Sanok [EV89], 24 IX 1953, 1 ex., leg. AG, det. AM, coll. MNHW; Osławica vic. [EV75], 12 VII 2017, 2 exx., pitfall trap, leg., coll. AM; Markowa [EA94], 8 X 2011, 1 ex., old orchard, Barber trap, det. AM, leg., coll. TO; Pacław vic. [FV29], 30 IV 2011, 1 ex., leg., coll. AM; 5 VI 2015, 2 exx. in the tree stand, 21 VI 2015, 1 ex. in the forest, pitfull trap, leg. TO, det., coll. AM; Przemyśl vic. [FA21], 9 V 2013, 1 ex. castle park, on the stairs, det. AM, leg., coll. TO; Rybotycze [EA10], 28 IV 2017, 1 ex. on xerotherms, det. AM, leg., coll. TO; Sanok-Olchowce vic., [EV89], 3 X 2011, 1 ex., leg. det. et coll. DT; Turze Pole [EA70], 6 V 2012, 1 ex., leg. det. et coll. DT; Zatwarnica [FV15], 2 VIII 2017, 3 exx., pitfall trap, leg., coll. AM; Birchów District: Blizne for. distr. [EA71], 28 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dukla District: Folusz for. distr. [EV48], 29 VII, 1 ex., 29 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; **Tatry Mts.**: Kościeliska Valley [DV15], VI 1965, 1 ex. leg. M. Gałuszka, det., coll. AN., ver. AMa.

Previously recorded from:

Baltic Coast: Kąty Rybackie (Komosiński, 2001b), Międzyzdroje (Wolender & Zych, 2007), Gdynia-Kępa Redłowska (Konopko *et* al., 2017), records without exact data (Habelmann, 1854; Lentz, 1879; Kletke, 1889; Lüllwitz, 1916; Horion, 1965)

Pomeranian Lake District: Człuchowska Forest (Szujecki, 1995), Grudziądz (Komosiński, 2001b), Klęskowo near Szczecin (Cykowski, 1977)

Masurian Lake District: Pisz (Folwaczny, 1937; Horion, 1965), Piska Forest – Szeroki Bór (Szujecki, 1966f)

Wielkopolska-Kujawy Lowland: Glogau (Głogów; Letzner, 1871; 1886), Wielkopolski NP (Podbylski & Nowosad, 2001), Gryżyński Landscape Park (Ruta *et* al., 2016)

Mazowian Lowland: (Szujecki, 1966c; Szujecki, 1966f; Szujecki, 1968; Szwejda, 1974), Kampinoski NP (Mazur S. *et* al., 2010)
Podlasie: Poleski NP – Pieszowola (Staniec, 2010), Terespol (Burakowski *et* al., 1980)
Białowieża Primeval Forest: Białowieża NP (Smoleński & Szujecki, 2001), Borowski, 2001; Byk, 2001a; Smoleński *et* al., 2004; Smoleński, 2006; Byk *et* al., 2006, records without exact data (Burakowski *et* al., 1980; Derunkov & Melke, 2001)
Lower Silesia: Jaworek near Ząbkowice Śląskie and Ziębice Śląskie (Smoleński, 1996b), Bögenberge (areas of Witoszów), Breslau (Wrocław), Liegnitz (Legnica) (Letzner, 1871; 1886; Schwarz & Letzner, 1874)
Upper Silesia: Rauden (Rudy; Kelch, 1846; Roger, 1856; Letzner, 1871; 1886)
Kraków-Wieluń Upland: Ojcowski NP and vic. (Pawłowski *et* al., 1994), Częstochowa, Kusięta, Mirów, Creek Złoty, Raków, Zawodzie (Kościelny, 2006), Złoty Creek (Słabikowski, 2006), records without exact data (Kotula, 1873; Łomnicki, 1886; Lgocki, 1908)
Małopolska Upland: Rogów near Koluszki (Burakowski *et* al., 1980)
Świętokrzyskie Mts.: Słupia Nowa (Burakowski *et* al., 1980)
Lubelska Upland: Puławy (Burakowski *et* al., 1980), Stawska Góra nat. res. near Chełm (Staniec, 2002), Poleski NP (Staniec, 2010)
Roztocze: Nart and Hamernia – Zamość Province (Tenenbaum, 1913)
Sandomierska Lowland: Tarnów vic. (Viertl, 1872)
Western Sudety Mts.: Waldenburger-Gebirge (Góry Wałbrzyskie; Letzner, 1871; 1886)
Eastern Sudety Mts.: Glatz (Kłodzko; Letzner, 1871; 1886)
Western Beskid Mts.: Kotula, 1874; Stobiecki, 1883; Letzner, 1886, Pawłowski, 1964; 1967; Pawłowski & Szujecki, 1966; Little Beskid Mts. (Paśnik, 1998), Babia Góra Massif (Kubisz & Szafraniec, 2003)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929), Rzeszów-Zalesie (Konieczna *et* al., 2013)
Tatry Mts.: records without exact data (Nowicki, 1864; 1865; 1873; Łomnicki, 1866; 1868)

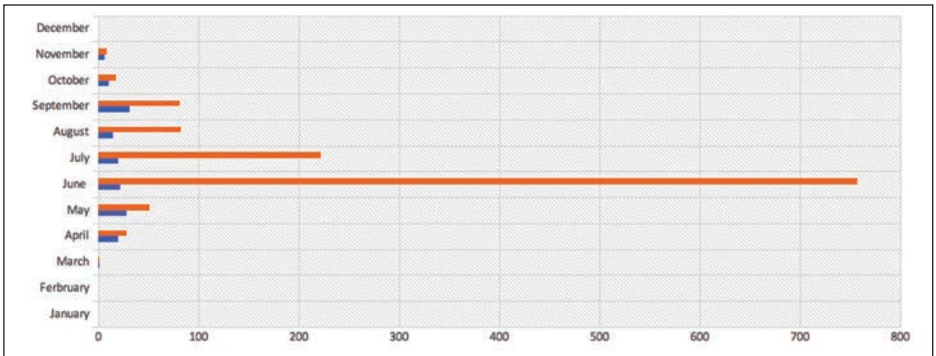
Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Kulwieć, 1907; Łomnicki, 1913; Müller, 1926, Scheerpeltz, 1933; Szujecki, 1966c; 1980, Löbl & Smetana, 2004; Löbl & Löbl, 2015), Prussia (Siebold, 1847; Lentz, 1857), Silesia (Weigel, 1806; Reitter, 1870b; Kletke, 1889; Gerhardt, 1910a; Kuhnt, 1912; Kolbe, 1928), Galicia (Gravenhorst, 1847; Łomnicki, 1884).

Phenology and development. Eggs and the first larval stage were described by Szujecki (1966a; 1966e), in later studies also by Boháč (1982). Eggs of 3.2 × 2.6 mm were observed under laboratory conditions at the end of May. First stage larvae reach 10.5–11 mm in length.

According to observations reported by Boháč (1982) that the reproduction period of *O. nitens* begins in autumn and lasts until spring, while a cooling period is required for further development of larvae.

The period of larval development observed under laboratory conditions (the natural day / night cycle and at temperatures of 12–19°C) lasts from 88 to 110 days. The individual stages take: egg development – 19 days, development of the three larval stages of 12, 10 and 29 days, respectively; diapause before pupation 14 days, pupation of 30 days. Mortality under these conditions amounted to 71% and it was highest at the third larval stage L_3. Causes for mortality have not been explained (Krooss, 1994).

Beetles in newly reported localities in Poland were observed from April to November with a marked population peak in June (**Fig. 6.18**), which corresponds to the highest feeding activity of larvae and beetles (Krooss & Schaefer, 1998).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	1	28	51	757	222	82	81	17	8	0
Number of records	0	0	1	20	28	22	19	14	31	10	6	0

Fig. 6.18. Frequency of *Ocypus nitens nitens* (Schrank, 1781) in localities in Poland

Ocypus ormayi (Reitter, 1887)

General distribution. A mountain species widely distributed in the Eastern and Southern Carpathian Mts. (the Transylvanian Alps). It has been reported from Slovakia, Romania and the countries of former Yugoslavia (Smetana, 1958; Horion, 1965; Herman, 2001; Stan, 2002; 2004; Löbl & Löbl, 2015; Jászay & Hlaváč, 2016).

Habitat preferences. In the eastern and southern Carpathian Mts. (Romania) it inhabits mainly upper montane zones and the subalpine zone. It is classified

as a stenotopic (mountain, subalpine) hygrophilous, silvicolous and humicolous species (Stan, 2010).

In Poland it was entered in the Red List of Threatened and Endangered Species (Pawłowski *et* al., 2002) classified as VU – vulnerable. It represents a highly valuable eastern mountain element in the fauna of Poland (Banaszak *et* al., 2004).

Occurrence in Poland. In Poland it was recorded by J. Pawłowski in the only known locality in the Bieszczady Mts. at 1250 m a.s.l. One male was caught to a pitfall trap in June 1964 (Szujecki, 1980; 1996; Pawłowski *et* al., 2000).

New records
No new data.

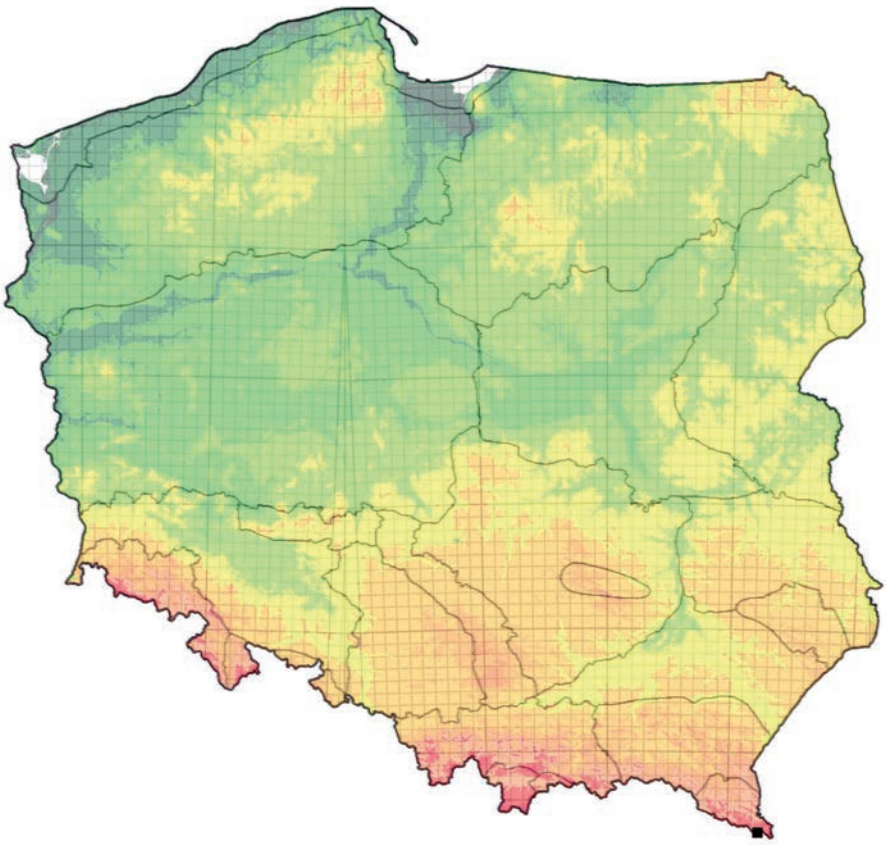


Fig. 6.19. Distribution of *Ocypus ormayi* (Reitt., 1887) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

Previously recorded from:

Bieszczady Mts.: Western Bieszczady Mts. pastures (Szujecki, 1970), Western Bieszczady Mts., between Szeroki Wierch Mt. and Krzemień Mt. (Szujecki, 1980; 1996; Pawłowski *et* al., 2000; **Fig. 6.19**).

Phenology and development. Based on data from Romania (Stan, 2010; Merkl *et* al., 2011), it can be concluded that beetles of this species were observed from May to August, most frequently in June. However, the largest number of observations was in July.

Ocypus tenebricosus (Gravenhorst, 1846)

General distribution. A European species. It is found in mountainous and foothill areas of central and eastern Europe, in the northern part of the Balkan Peninsula and in northern Italy (Horion, 1965; Szujecki, 1980). Recorded in France, Germany, Switzerland, Austria, Poland, Czechia, Slovakia, Hungary, Slovenia, Dalmatia, Croatia, Bosnia and Hercegovina, Albania, Serbia and Romania (Herman, 2001; Boháč *et* al., 2006; Uhlig *et* al., 2006; Schatz, 2008; Löbl & Löbl, 2015).

Habitat preferences. It inhabits forests, is found in the leaf litter and topsoil (Szujecki, 1980). In Eastern Tirol it was frequently observed up to an altitude of 1600 m a.s.l. (Kofler, 2015). In the Italian Alps it was found at the edge of meadows at the base of aspen trees at an altitude of 850 m a.s.l. (Zanetti, 2015).

The species was registered in the Red Book of fereral ftate of Saxony-Anhalt (Hussein *et* al., 2004).

Occurrence in Poland. In Poland *O. tenebricosus* is recorded in the southern part of the country from the Sudety Mts., through the Beskidy to the area of Przemyśl. One isolated locality was recorded in the 1960s in the Augustów Forest (Burakowski *et* al., 1980; Szujecki, 1980). New localities of the species come from the areas, from which the species was recorded; however, they are scarce (**Fig. 6.20**). Gerhardt (1910b) reported that in the Lower Silesia towards the end of the 19th century this species was more frequently observed than *O. olens*.

New records

Lower Silesia: Sowie Mts. [XS01], 4 VII 1952, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW

Western Sudety Mts.: Kaczawskie Mts., Podgórki [WS64], 24 VIII 2017, 2 exx. male, in the litter of an old deciduous forest (beech, oak, ash), leg. Piotr Chachuła, det., coll. AM

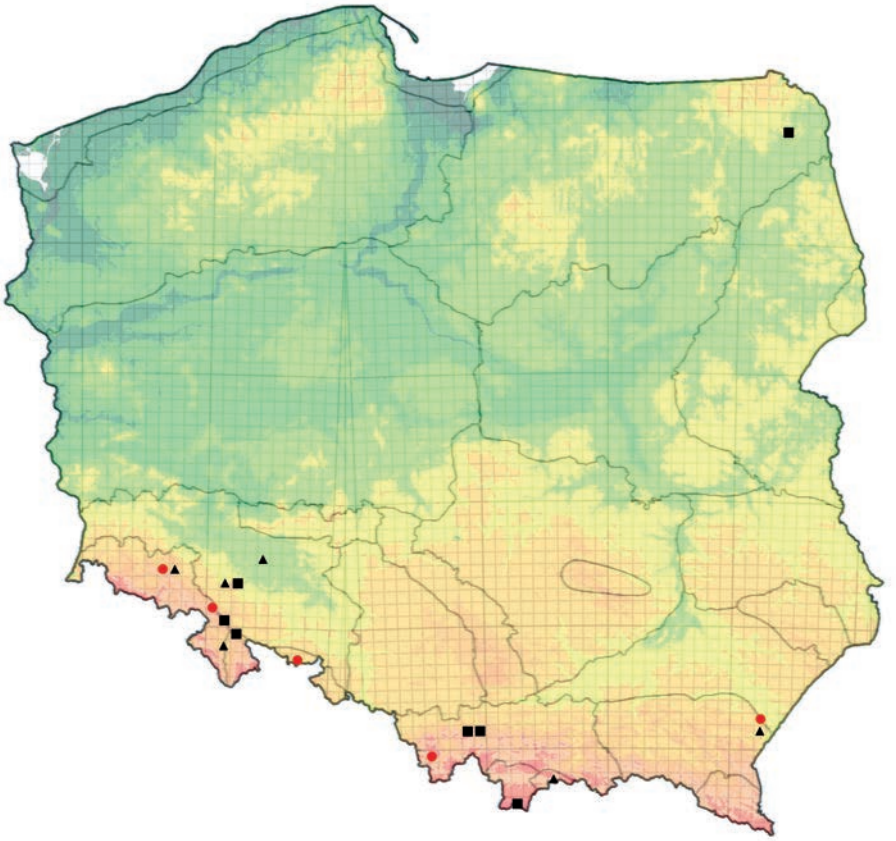


Fig. 6.20. Distribution of *Ocypus tenebricosus* (Grav., 1846) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

Eastern Sudetes Mts.: Opawskie Mts. – Zamkowa Mt. [XR77], 12 V 1999, 1 ex., leg., det. AM, in coll. TK

Western Beskid Mts.: Kamesznica near Milówka [CV59], 25 VII 2009, 1 ex., on the banks of the Soła River, under stone, leg. CzG, det. et coll. TK

Eastern Beskid Mts.: Łętownia near Przemyśl [FA22], 26 VII 2007, 1 ex., oak forest litter, leg. det. et coll. TW.

Previously recorded from:

Masurian Lake District: Augustowska Forest, Szczerba Distr. (Szujecki, 1963; 1980)

Lower Silesia: Breslau (Wrocław), Sobótka and Wrocław (Horion, 1965; Szujecki, 1980), Jemna ad Srebrna Góra (Smoleński, 1996b)

Western Sudety Mts.: Bolkenhein (Bolków; Letzner, 1871; Polentz, 1942a; Horion, 1965)
Eastern Sudety Mts.: Grafschaft Glatz (Ziemia Kłodzka; Zebe., 1852; Kraatz, 1857; Letzner, 1871; Horion, 1965)
Western Beskid Mts.: Little Beskid Mts. – Magórka Wilkowicka (Paśnik, 1997), Little Beskid Mts. (Paśnik, 1998), records without exact data (Kelch, 1846; Roger, 1856; Reitter, 1870b; Letzner, 1871; Wachtl, 1870)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929; Szujecki, 1980)
Tatry Mts.: Szujecki, 1980

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Szujecki, 1980; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Eastern Prussia (Seidlitz, 1889), Silesia (Letzner, 1886; Gerhardt, 1909a; 1909b; 1910a; Kuhnt, 1912; Horion, 1951; Szujecki, 1980), Carpathians (Nowicki, 1873), Sudety Mts. (Reitter, 1909); Beskidy Mts. (Reitter, 1909).

Phenology and development. In newly identified localities beetles were caught in May, as well as July and August. A half of the records came from July.

Subgenus *Ocypus* Leach, 1819

Ocypus olens (O. F. Müller, 1764)

General distribution. A species of western, central and southern Europe (Horion, 1965), inhabiting mainly western Europe, becoming increasingly less frequent towards the east. In the north of the continent it reaches southern Scandinavia and Denmark, while in the east found through the Balkans, Hungary, Czechia and Slovakia to Russia. It is also recorded in Turkey, Cyprus[1], northern-western Africa (Tunisia, Algeria, Morocco, Mauretania) and in the Canary Islands, Madera and the Azores. It was unintentionally introduced in North America (Herman, 2001; Anlaş, 2009; Bordoni, 2010; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015; Özgen *et* al., 2017; Ferreira, 2018), where it has been known since the 1930s from California (Orth *et* al., 1975) and it is found on the West coast (www.gbif.org/species/5746121).

Habitat preferences. The species is definitely eurytopic. According to Horion (1965) and Burakowski et al. (1980) it prefers shaded and moist sites, mainly in forests, less frequently in heaths and urban open spaces (fields, meadows), where beetles are found under stones, fallen leaves, in rotting wood, in the leaf litter and

[1] The records from Turkey and Cyprus are doubtful and probably refer to *Ocypus curtipennis* Motsch., 1849 (after H. Schillhammer)

among mosses. It inhabits various types of forests, with a marked preference of pine forests, although it also lives in urban parks, orchards, fields, meadows, edges of water bodies – ponds, rivers, lakes, where beetles are found under leaf litter, organic matter, fungi, in rotting wood (Kleeberg & Uhlig, 2011). Some data on the habitat preferences of this species is clearly contradictory, which may indicate high ecological tolerance determining its extensive geographical distribution. In England it inhabits practically with no exceptions open sandy biotopes (Nield, 1976). In Berlin large populations of *O. olens* were observed in ruderal meadows, also in pioneer communities with a high share of herbs. In black locust stands and xeric meadows its frequency was much lower. The species was not recorded in older stands (Gruttke, 1992). That author also stated that in Berlin *O. olens* finds advantageous conditions for development, both in the city centre and in the suburbs, depending on the connectivity of green areas, food abundance (earthworms, isopods) and a lack of competition from large species from the genus *Carabus* (Gruttke, 1992).

In the Mediterranean it is a very common species in a mosaic landscape with cork oak plantings and pastures (Da Silva *et* al., 2009). Also referred to as a species found in meadows and in anthropogenic phaces (Lupi *et* al., 2006). In Italy, it is widespread (Ruffo & Stoch, 2005) and inhabited floodplain forests, floodplains, banks, riverbanks, marshy areas (*Phragmitetum*, *Caricetum*) (Della Rocca *et* al., 2021), orchards, sandy small areas, vegetable crops, wetlands near source and cellars (Zanetti *et* al., 2016), but is known to be a species sensitive to agricultural practices (Daccordi & Zanetti, 1989). In the mountains of Sierra de Guadarrama (Spain) it was found at altitudes from 1200 to 1800 m a.s.l., most numerously at 1300 m a.s.l. (Fernández *et* al., 2010).

Beetles and larvae are zoophages (Gruttke, 1992). Its prey includes earthworms, insects, isopods (woodlice), soft larvae and snails or slugs (Nield, 1976; Gruttke, 1992). Its prey also comprise smaller ground beetles (Carabidae). Predation of *O. olens* beetles towards ground beetles was investigated by Bonacci *et* al. (2006). Observations indicate that a rapid movement of the prey triggers aggressive behaviour of the predator, considering that *O. olens* has morphological adaptations to chase and capture very fast-moving prey. This species prefers prey devoid of chemical protection or aposematic colour patterns (bright, frequently contrasting body colour characteristic of organisms equipped with potent and effective protection, such e.g. poison or a sting; Bonacci *et* al., 2006).

Beetles and larvae feed on snails *Helix aspersa* and *H. pomatia* (Orth *et* al., 1975a). A feeding dependence was also found between *O. olens* and an isopod *Armadillidium sordidum* Dollfus, 1887, found in southern Europe (Italy, southern coast of France and Corsica; Migliorini *et* al., 2004). Relationships between the predator (*O. olens*) and prey (*A. sordidum*) were observed when analysing bioaccumulation of lead and other heavy metals at a shooting range in the vicinity of Siena, Italy (Migliorini *et* al., 2004). It was stated that a considerable amount of metallic lead in the form of soluble fractions is bioavailable in

soil and may be bioaccumulated by edaphic organisms contained the soil trophic zone (*Armadillidium sordidum* (saprophage) and *Ocypus olens* (its predator), but without biomagnification, i.e. an increase in the concentration of the toxic substance concentration in the organism occupying a higher trophic level.

Ocypus olens is an efficient predator of pupae of the fly *Bactrocera oleae* (Diptera: Tephritidae) – which considerably reduces production of olives and overwinters in the soil in the pupal stage (Albertini *et* al., 2018).

Presence of beetles *O. olens* is also recorded on carrion, where it is an indicator of a late summer and autumn phenological aspect (Mądra *et* al., 2014). In Hungary it was recorded with a relatively low frequency in maize fields (Balog *et* al., 2010).

Occurrence in Poland. In Poland it has been recorded in scattered localities in various parts of the country, mainly in the lowlands and in the mountains at lower altitudes (Burakowski *et* al., 1980). New localities concentrate markedly in the western regions of Poland (**Fig. 6.21**).

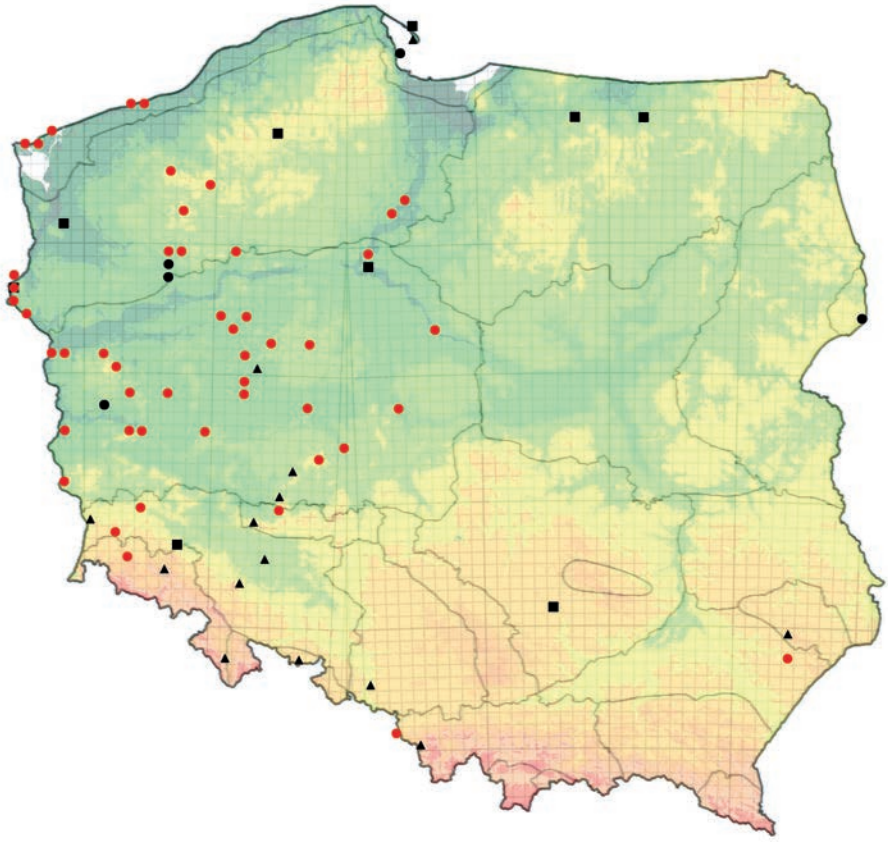


Fig. 6.21. Distribution of *Ocypus olens* (O.F. Müll., 1764) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

New records

Baltic Coast: Kołobrzeg [WA30], 20 VIII 2016, 1 ex., town park, leg., det. et coll. TW; Kołobrzeg-Podczele [WA40], 29 VIII 2016, 1 ex., leg., det. et coll. TW; Międzyzdroje [VV67], 20 VIII, 1 ex., leg. ASk, det. AM, coll. USM; 3 VI 1998, 9 X 2006, 2 exx., leg., coll. HS; Świnoujście [VV57], 17 V, 1 ex., 14 VI 2007, 5 exx., by the sea, leg. PD, det. AM, ex coll. OA, coll. AM; Woliński NP, Wisełka vic. [VV78], 3 VI 1995, 1 ex. in a mixed forest, in an oak trunk, leg. RaK, coll. AM; 2–6 VII 1991, 4 exx. in thick beech litter, leg., coll. AM; 5 VII 1991, 1 ex., leg., det. AM, coll. TK

Pomeranian Lake District: Bielinek nat. res. [VU46], 1 IX, 2 exx., 6 X 2009, 8 exx., 30 VIII, 6 exx., 1 X 2010, 20 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Cedynia nat. res. [VU45], 30 VII, 2 exx., 1 X 2010, 1 ex., moor, 30 VIII, 1 ex., 1 X, 29 exx., 4 XI 2010, 2 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Dąbrowy Krotoszyńskie Landscape Park – Stary Las for. distr. [XT83], 15 VI 2002, 1 ex., leg. M. Melke, coll. AM; Drawieński NP, on the shore of Lake Czarne [WU67], 15 IX 1996, 1 ex. in the bedding, leg., coll. KK; Drawieński NP, for. distr. 15b [WU69], 3 V 2014, 1 ex. old pine forest, window trap, leg. det. AMa, coll. FE UPP; Gozdowice [VU54], 30 VIII, 1 ex., 1 X 2010, 28 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Gozdowice vic. [VU54],6 X 2009, 8 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Piła, Gładyszewo [XU19], 3 km NE, 27 VIII 2001, 4 exx., leg., coll. RRu; Raduń [VU47], 6 X, 16 exx., 1 IX, 1 ex., 21 VIII 2009, 1 ex., 4 XI, 6 exx., 30 VIII 2010, 4 exx., 12 XI, 1 ex., 4 X, 8 exx., 5 VIII 2011, 3 exx., flowering turf, 6 X, 1 ex., 7 VII 2009, 1 ex., 4 X, 7 exx., 4 XI 2010, 8 exx., 2 XI, 4 exx., 30 VIII, 1 ex., 5 VII, 3 exx., 4 X 2011, 5 exx., steep grassland, 28 IV, 1 ex., 30 V, 1 ex., 8 VII, 1 ex., 5 VIII, 10 exx., 30 VIII, 8 exx., 4 X, 48 exx., 12 XI 2011, 5 exx., beech forest on the embankment of the Odra River, 4 X 2011, 2 exx., ols over the stream pitfall trap, leg. PS, det., coll. AM; Grabowiec nat. res. [CE32], no exact date 2015, 1 ex., leg., coll., det. BP; Jezioro Fletnowskie nat. res. [CE43], 11 VIII 2017, 1 ex., under fragment of bark on the ground, leg., coll., det. BP; Ostrowąs near Połczyn Zdrój [WV65], 15 VIII 2015, 1 ex., det. AM, leg., coll. ASl; Rakowo [WV94], VIII 2010, 1 ex., leg. et det. S. Woźniak, coll. TW; Stary Kostrzynek [VU45], 6 X 2009, 7 exx., 30 VIII, 2 exx., 1 X, 29 exx., 4 XI 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Wrzosowiska Cedyńskie nat. res. [VU45], 1 IX 2009, 2 exx., moor pitfall trap, leg. PS, det., coll. AM; Sośnica nat. res. near Złocieniec [WV72], 14 VI 2011, 8 exx. and 2 VII 2015, 4 exx. leg., coll. KR; Złocieniec [WV63], 27 VII, 6 exx. and 21 IX 2010, 4 exx. on the way, leg., coll. KR; Tuczno [WU79], 7–21 V 2011, 4 exx., pine forest, pitfall trap, leg., coll. JTD

Wielkopolska-Kujawy Lowland: Bieczyny near Czempiń [XT28], 16 VIII 1993, 1 ex., leg. PS, coll. AM; Chalin ad Sieraków [XU72], 10 IX 1998,

1 ex. leg., coll. AN, det. AMa; Czeszewo-Żerków Landskape Park, Czeszewki Las [XT77], 17 IX 2008, 2 exx., in the pitfall traps, leg. PRu, coll. NHC; Gołuchów [YT04], 19 VIII 1992, 1 ex., leg., coll. AM; Górka [XT 29], 15 VII 1985, leg., det. AN as *O. ophtalmicus*, ver. AMa, coll. AN; Gubin [VT85], VII/VIII 2015, 1 ex., leg. B. Kędzior, det. et coll. TW; Jany [WT45], 24 V and 4 X 2015, 2 exx. dead, det. AM, leg., coll. RO; Ludomy near Oborniki [XU24], 4 V 2009, 1 ex. in the pine forest, leg., coll. SK; Laski [VU71], 6 X 2009, 1 ex., 30 VIII 2010, 1 ex., xerothermic flowering grassland, 2 X 2010, 3 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Mużakowski Park [VT81], 16 IX 2017, 1 ex. dead, det. AM, leg., coll. RO; Obrzycko near Zielonagóra [XU04], VI 1994, 1 ex. ♂, in rotting wood, det. AM., leg., coll. SK; Osogóra [WT38], IX 2016, 1 ex. leg. RO; Owczary vic. [VU71], 20 VIII 2005, 1 ex. in a shady ravine, leg., coll. SK; Owczary [VU71], 6 X 2009, 2 exx., 31 VIII 2010, 2 exx., stipa grassland, 6 X 2009, 1 ex., 31 VIII, 2 X 2010, 6 exx., xerothermic flowering grassland, 2 X 2010, 1 ex., xerothermic flowering grassland, pitfall trap, leg. PS, det., coll. AM; Poznań-Morasko [XU21], 19 VII 2008, 1 ex. in the municipal forest, leg. M. Leyk, coll. SK; Poznań-Rusałka [XU21], 11 IX 2015, 1 ex., leg., coll. PJ; Promno [XU51], 19 VIII 2006, 1 ex., pitfall trap in *Potentillo quercetum*, leg. PS, coll. SK; 5 IX 2009, 1 ex., 25 VIII 2014, 1 ex., leg., coll. PJ; Puszcza Zielonka [XU42], 23 V 1998, 1 ex. leg. coll. AMa; Reptowo nat. res. [CD19], no exact date 2015, 1 ex., leg., coll., det. BP; Sieniawa [WU20], 24 VIII 2007, 1 ex., leg., coll. RO; Sulęcin District [WU11], for. comp. 126b, 17 IX 1994, 2 exx., 1 X 1994, 3 exx., for. comp. 125f, 1 X 1994, 1 ex., for. comp. 124j, 17 IX 1994, 3 exx., for. comp. 125b, 19 IX 1994, 3 exx., for. comp. 105h, 1 X 1994, 1 ex., for. comp. 121j, 1 X 1994, 7 exx., 23 VIII 1995, 2 exx. leg. G. Rączka, det., coll. AMa; Świniary [VU81], 8 VIII 1979, 1 ex., a pine forest, pitfall trap, leg. KL, coll. AM; Tarnowa near Turek [CC37], 28 V 1987, 1 ex., Gravel mine, leg. TM, coll. AM; Trzebaw near Poznań [XT29], 13 IX 2006, 1 ex. leg. B. Borowiak, coll. PJ; Uścikowiec near Oborniki Wielkopolskie [XU13], 28 IV–13 X 2007, 71 exx., pitfall trap, leg. TSz, det., coll. AM; Wielkopolski NP, Grabina nat. res. [XT29], 9 X 2006, 1 ex., pitfall trap, leg. PS, coll. SK; Włocławek vic. [CD63], 20 IX 1997, 1 ex., leg., coll. PJ; Włoszakowice Distr. [WT95], 10 VII 2008, 1 ex., oak forest, leg., coll. SK; Wolsztyn District [WT68], for. comp. 10a, 3 V 2017, 1 ex., 7 IX 2017, 2 exx., for. comp. 8b, 3 V 2017, 2 exx., 28 V 2017, 1 ex., 31 VII 2017, 1 ex., 7 IX 2017, 10 exx., 16 X 2017, 2 exx., 5 XI 2017, 3 exx., for. comp. 40b, 28 V 2017, 1 ex., 31 VII 2017, 1 ex., 7 IX 2017, 8 exx. in scot pine forest, leg., det. A. Skórzewska, ver. AMa, coll. FE UPP; Zielona Góra-Chynów [WT35], 4 IV 2016, 1 ex. dead, det. AM, leg., coll. RO

Lower Silesia: Czerna [WS27], VII/VIII 2015, 1 ex., leg. Tomasz Kędzia, det. et coll. TW; Trzebień [WS49], 8 IX 2012, 1 ex., leg. Berezowski A., coll. HS

Trzebnica Hills: Skoroszów [XS59], 6 VIII 1991, 1 ex., det., leg. LBo, coll. RRu

Sandomierska Lowland: Solska Forest, Borowiec [FA47], 15 VIII 1960, 1 ex., leg. WS, det. AM, coll. USM
Western Sudetes Mts.: Lubomierz [WS35], V 2001, 1 ex., leg. A. Sieniuć, coll. SK
Western Beskid Mts.: Cieszyn vic. [CA21], 2 IX 2008, 1 ex., observation M. Fiedor, from the picture det. AM

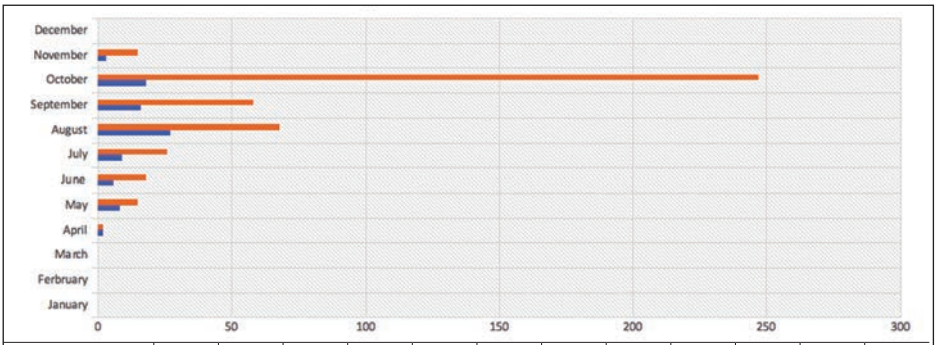
Previously recorded from:

Baltic Coast: Hel (Węgrzecki, 1932; Szujecki, 1980), Międzyzdroje, Wisełka (Wolender & Zych, 2007), Gdynia-Kępa Redłowska (Konopko *et* al., 2017), records without exact data (Pfeil, 1854; Węgrzecki, 1932)
Pomeranian Lake District: Wielgowo and Klęskowo near Szczecin (Cykowski, 1977), Bielinek nat. rez. (Kubisz & Melke, 1996), Człuchowska Forest (Szujecki, 1995), Drawieński NP (Komosiński, 2001b), Płociczna Valley (Gutowski & Ruta, 2004)
Masurian Lake District: Lidzbark Warmiński, Kętrzyn (Szujecki 1980), records without exact data (Siebold, 1847; Lentz, 1857; 1879)
Wielkopolska-Kujawy Lowland: Solec Kujawski Distr. (Smoleński, 1993), Szujecki, 1995, Gryżyński Landscape Park (Ruta *et* al., 2016), Birnbäumel (Gruszeczka; Letzner, 1871; 1886; Gerhardt, 1910a; Koerth, 1916; Szulczewski, 1922; Błażejewska, 1960)
Białowieża Primeval Forest: Białowieża NP (Smoleński & Szujecki, 2001; Smoleński, 2006)
Lower Silesia: Legnica (Szujecki, 1980), Zobten (Sobótka, Ślęża), Breslau (Wrocław), Görlitzer Heide (Puszcza Zgorzelecka; Letzner, 1871; 1886; Gerhardt, 1896; 1910a; Horion, 1965)
Trzebnica Hills: Oborniki Śląskie (Polentz, 1943; Szujecki, 1980)
Upper Silesia: Ratibor (Racibórz; Kelch, 1846; Roger, 1856; Letzner, 1871; 1886; Gerhardt, 1910a)
Małopolska Upland: Jędrzejów Distr. (Karczewski, 1961)
Roztocze: Florianka – Zamość Province (Tenenbaum, 1913; Szujecki, 1980)
Western Sudety Mts.: Heßberge (Górzyca; Letzner, 1871; 1886; Gerhardt, 1910a; Polentz, 1942a)
Eastern Sudety Mts.: Bischofskoppe (Biskupia Kopa), Grafschft Glatz (Ziemia Kłodzka; Reitter, 1870b; Letzner, 1871; 1886; Gerhardt, 1910a)
Western Beskid Mts.: Ustron (Ustroń; Letzner, 1886; Gerhardt, 1910a)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Kulwieć, 1907; Łomnicki, 1913; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015), Eastern Prussia (Seidlitz, 1889; Jakobson, 1909), Silesia (Weigel, 1806; Endler i Scholz, 1819;

Fein & Haase, 1881; Otto, 1890; Kuhnt, 1912), Galicia (Łomnicki, 1884), Carpathians (Nowicki, 1873).

Phenology and development. Beetles were found in Poland from April to November (**Fig. 6.22**). Most often imagines were observed in August, they were caught most numerously in October.



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	2	15	18	26	68	58	247	15	0
Number of records	0	0	0	2	8	6	9	27	16	18	3	0

Fig. 6.22. Frequency of *Ocypus olens* (O.F. Müll., 1764) in localities in Poland

Larvae and pupae were described by Orth *et* al. (1975). Eggs, highly sensitive to lack of moisture, are deposited in Europe in August and September. Larvae L_1 are found from the end of September to mid-October. The second larval stage (L_2) lasts on average 35 days, maximum 44–45 days and it observed in October and November. Larvae L_3 are found until April, the length of development in this stage with the period of winter diapause is 112 days. The pupal stage may last up to 40 days and occurs in April and May (Nield, 1976; Gruttke, 1992; Kleeberg & Uhlig, 2011).

Phenology of this species was also investigated in a historic urban park (Giardini della Biennale) in Venice (Zanella, 1995). Beetles were observed throughout the year with higher frequency from May to December and the peak in the period of September–November. A similar frequency of this species in that habitat was recorded both in wooded areas and in a meadow (lawn).

Ocypus ophthalmicus ophthalmicus (Scopoli, 1763)

A heterogenous species, with – formerly 7, now 2 – subspecies, inhabiting mainly southern regions of the species range (Drugmand, 1998; Herman, 2001; Löbl & Löbl, 2015).

General distribution. The species is found in Europe, Russia, Ukraine, Georgia, Armenia, Turkey, Azerbaijan, Kazakhstan, Turkmenistan as well as northern Africa (Libya, Tunisia, Algeria, Morocco: Horion, 1965; Herman, 2001; Löbl & Smetana, 2004; Cibuļskis, 2007; Bordoni, 2010; Kleeberg & Uhlig, 2011; Ferreira, 2018, Assing & Schülke, 2019). On the European continent it is found mainly in its southern and central parts, with the northern limits of its occurrence in southern Scandinavia and Karelia. Its range also covers western Siberia (Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015).

Habitat preferences. It inhabits mixed forests, heaths, grassy slopes and xerothermic cliffs, with sandy or calcareous soils. It is also found in orchards (Szujecki, 1980). Beetles remain under decaying plant material, stones and among mosses (Burakowski *et* al., 1980). Occasionally found on carrion (Mądra *et* al., 2014).

In the area of xerothermic hills of Wzgórza Byszewskie *O. ophthalmicus* was caught solely in the xerothermic grassland habitats together with *Ocypus nitens* and *Platydracus stercorarius* (Ruta, 2007). During studies on rove beetle assemblages of grassland communities in the Fulda river valley (Germany) *O. ophthalmicus* was found in extensively managed pastures, xerithermic slopes with sparse and compact grassy vegetation and in shrubland (Apfel *et* al., 2006).

In Šumava it was classified together with *Ocypus biharicus* as a species characteristic of forest edges (Boháč & Matějíček, 2004). In the Greater Fatra mountain range it is found in old beech and mixed forests, in glades and felling areas of forests, meadows and rocky pastures, extending over the upper forest line (Franc, 2002). This author termed this species as a thermophilous Mediterranean element (Franc, 2002).

In the Alps it was found on farmland at altitudes of 700–1500 m a.s.l. (Zanetti, 2015). In the Dolomites (Naturpark Schlern-Rosengarten, Parco Naturale Sciliar-Catinaccio) it was recorded in the alpine zone, above 2200 m a.s.l. in alpine meadows, at shaded rock faces (dolomite and volcanic) (Schatz, 2008). Also Kofler (2015) when listing localities of *O. ophthalmicus* in Eastern Tirol classified them as alpine zone inhabitants up to an altitude of 2300 m a.s.l.

Occurrence in Poland. In Poland it is found practically throughout the country, although rarely recorded, with new localities identified mainly in western and southern Poland (**Fig. 6.23**).

New records

Baltic Coast: Bobolin near Dąbki [WA82], 1 VII 2008, 2 exx. on the beach, leg., coll. SK; Łazy near Koszalin [WA71], 18–28 VIII 2001, 2 exx. on the dune, leg., coll. SK; Orzechowo ad Ustka [XA25], 15 VII 1989, 1 ex. in Scots pine forest *Empetro nigri-Pinetum*, leg. W. Kostrubiec, det., coll. AMa; Piecki near Mierzeja Wiślana [DF03], 1 IX–1 X 2015, 1 ex., dunes, pitfall trap, leg.

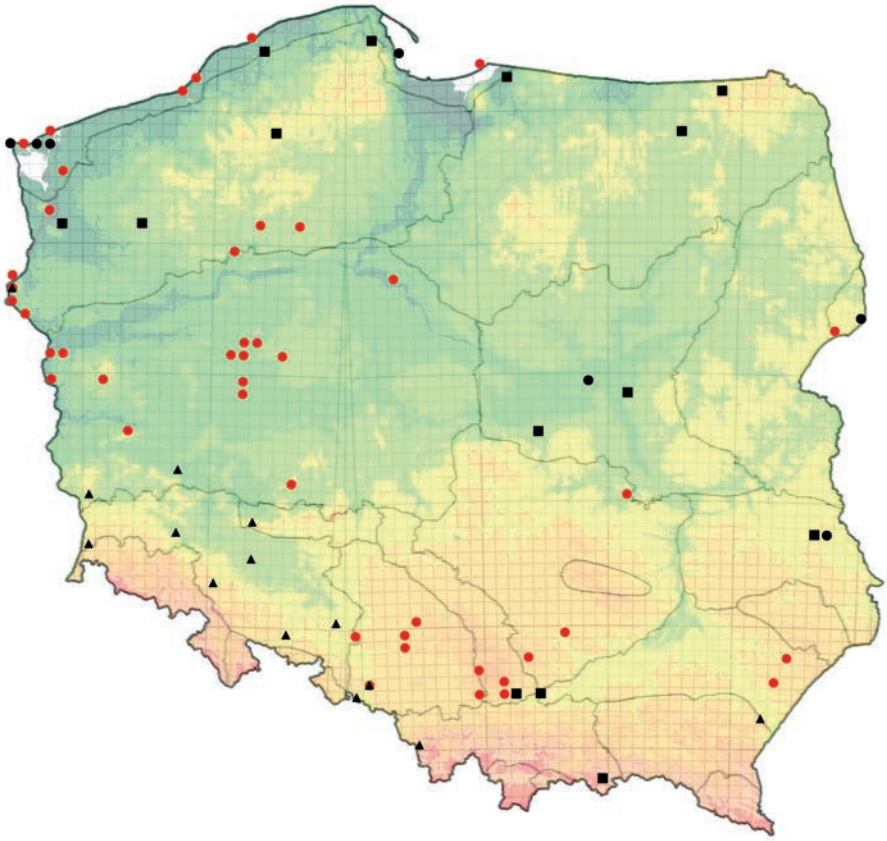


Fig. 6.23. Distribution of *Ocypus ophthalmicus ophthalmicus* (Scop., 1763) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

A. Pokojski, coll. KK; Świnoujście [VV57], 14 VI 2007, 11 exx., by the sea, leg. PD, det. AM, ex coll. OA, coll. AM; Woliński NP, Wisełka vic. [VV78], 25 VII 1993, 2 exx., leg. JMG, coll. AM

Pomeranian Lake District: Bielinek nat. res. [VU46], 1 IX 2009, 2 exx., 28 VI, 1 ex., 29 VII, 2 exx., 30 VIII, 1 ex., 1 X 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Gozdowice [VU54], 30 VIII 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Krajnik 2011, 2 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Laski [VU71], 29 IV, 1 ex., 31 VIII, 4 exx., 2 X 2010, 6 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Rokita District [VV85], 15 VII 1985, leg. W. Piątek, det., coll. AMa; Szczecin-Nord part [VV72], 17 V 2007, 1 ex., leg. A. Zawał, det. AM, ex coll. OA, coll. AM; Wrzosowiska Cedyńskie nat. res. [VU45], 1 IX 2009, 1 ex., moor, pitfall trap, leg. PS, det., coll.

AM; Zakrzewska Osada [XV61], 14 IX 2011, 1 ex., the pitfall trap, leg., coll. DJT; Złotów [XV31], Wilhelma Mt., 19 VI 2008, 1 ex., leg., coll. RRu

Wielkopolska-Kujawy Lowland: Bieczyny near Czempiń [XT28], 27 VII 1993, 1 ex., under the bark of a pine tree lying by the road, leg. PS, coll. AM; Biedrusko vic. [XU32], 25 VI 1999, 1 ex. rotten trunk in *Potentillo albae-Quercetum*, leg., coll. SK; 31 VIII 2000, 8 exx. in pitfall trap, leg. PS, coll. PS; 18 VI and 1 VII 2003, 2 exx., 17 VII 2005, 4 exx., pitfall trap in thick bushes *Pruno-Crataegetum*, leg. PS, coll. SK; Golęczewo vic. – military training ground – Napoleona Mt. [XU22], 30 VII 2003, 3 exx., pitfall trap in the sand, leg. PS, coll. SK; Kunice [VT79], 9 VIII 2013, 1 ex., det. AM, leg., coll. WK; Lusowo [XU11], 24 VI 1998, 1 ex. on a sandy road, leg., coll. SK; on Malcz Lake [WT19], 27 VIII 2008, 1 ex. leg., coll. RO; Owczary [VU71], 1 IX, 5 exx., 2 XI, 2 exx., 6 X 2009, 39 exx., 31 VIII, 1 ex., 2 X 2010, 3 exx., mixed xerothermic grassland, 1 IX 2009, 1 ex., 28 VI, 2 exx., 31 VIII, 1 ex., 2 X 2010, xerothermic flowering grassland, pitfall trap, leg. PS, det., coll. AM; Pamięcin nat. res. [VU71], 7 VII, 1 ex., 1 VIII 2009, 1 ex., 30 VII, 1 ex., 2 X 2010, 2 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Piła-Gładyszewo [XU19], 18 III 2000, 1 ex., det. AM, leg., coll. RRu; Promno vic. [XU51], 18 VII 1998, 1 ex., leg., coll. PJ; Puszczykowo [XT29], 27 VII 1997, 1 ex., leg., coll. PJ; Raduń [VU47], 7 VII 2009, 1 ex., 28 VII, 3 exx., 30 VIII 2010, 5 exx., 8 VII, 4 exx., 30 VIII 2011, 3 exx., xerothermic flowering grassland, 15 V, 1 ex., 7 VII, 12 exx., 1 VIII, 2 exx., 1 IX, 3 exx., 6 X, 4 exx., 2 XI 2009, 1ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Radojewo vic. military training ground [XU21], 27 V 2003, 3 exx., pitfall trap in shrubs *Cytisus scoparius*, leg. PS, coll. SK; Ruda Milicka [XT61], 17–27 VII 1991, 3 exx., leg. LBo, coll. RRu; Świecko [VT79], 14 VI 2009, 1 ex., det. AM, leg., coll. WK; Świniary [VU81], 29 VII 1980, 1 ex. and 8 VIII 1979, 1 ex., leg. KL, coll. AM; Toruń [CD37], 22 VII 2009, 1 ex., airport vic., det. AM, leg., coll. MW; Wielkopolski NP, Pod Dziadem nat. res. [XT29], 17 VII 1998, 1 ex. leg., det., coll. AMa; Zielona Góra [WT35], 4 IV 1982, 1 ex., leg. A. Beling, coll. AM

Mazowian Lowland: Kozienicka Forest-Dąbrowa Kozłowska [EC10], 5 VII 2012, 1 ex. on the forest path, det. AM, leg., coll. MaM

Białowieża Primeval Forest: Hajnówka District [FD73], pitfall trap, 13 VIII–11 IX 2016, 1 ex. (for. comp. 631Ac), det. AM, leg., coll. DFP

Lower Silesia: Kamienna Mt. [BA99], 7 V 1926, 1 ex., leg. HN, det. AM, coll. USM

Upper Silesia: Brynek-Park [CA39], 6 and 30 VIII 2012, 2 exx., 28 VIII 2016, 1 ex., leg., coll. HS; Kalety [CB40], 16 VIII 2011, 1 ex., leg. P. Kocot, coll. HS; Racibórz [CA05], 5 V 1911, 1 ex., leg. MK, det. AM, coll. USM; Łabędy [CA38], 7 V 1924, 1 ex., 8 X 1925, 2 exx., leg. HN, det. AM, coll. USM

Kraków-Wieluń Upland: Kobylańska Lowland [DA15], 8 VI 2014, 1 ex., xerothermic slope, leg. J. Wojas, det. et coll. TW; Kraków-Kostrze [DA14], 16 IX

2018, 1 ex. in the habitat of meadows and thickets on a limestone hill, leg., det. et coll. TW; Podłęże [CA94], 9 IX 2018, 1 ex., xerothermic grasslands, leg., det. et coll. TW; Żurada [CA96], 22 VI 2012, 1 ex., leg. K. Piątek, det. et coll. TW

Małopolska Upland: Pińczów-Skowronno [DA69], 10–15 V 1991, 2 exx., det., leg. LBo, coll. RRu; 11 VII 1996, 1 ex., xerothermic grassland, leg., det. et coll. TW; Pasturka [DA69], 31 V 1993, 1 ex., det., leg. LBo, coll. RRu; Kalina Mała [DA37], 28 III–22 IX 2015, 1 ex., xerothermic slope, pitfall trap, leg., coll. JTD; Komorów [DA37], 28 III–22 IX 2015, 1 ex., xerothermic slope, pitfall trap, leg., coll. JTD

Sandomierska Lowland: Solska Forest, Borowiec [FA47], 15 VIII 1960, 1 ex., leg. WS, det. AM, coll. USM; Oleszyce District, Lipina for. distr, [FA35], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Western Sudety Mts.: Wałbrzych [WS82], 1950, 1 ex., leg., det. ex coll. AG, ver. AM, coll. MNHW

Previously recorded from:

Baltic Coast: Międzyzdroje, Świnoujście, Wisełka (Wolender & Zych, 2007), Gdynia-Kępa Redłowska (Konopko *et* al., 2017), records without exact data (Siebold, 1847; Habelmann, 1854; Lentz, 1857; 1879; Kletke, 1889; Labler, 1920; Kleine, 1940b)

Pomeranian Lake District: Bielinek (Griep, 1937), Wejherowo (Szujecki, 1960b; 1980), Szczecin vic. (Cykowski, 1977), Bielsko-Słupsk Province (Burakowski *et* al., 1980), Mielno Stargardzkie (Szujecki, 1980), Stara Brda Pilska (Smoleński, 1995a)

Masurian Lake District: Braniewo, Giżycko, Gołdap (Szujecki, 1960b; Szujecki, 1980), records without exact data (Lentz, 1857; 1879; Albien, 1905; Horion, 1965)

Wielkopolska-Kujawy Lowland: Glogau (Głogów), Freiwaldau (Gozdnica) (Letzner, 1871; 1886; Riedel, 1892; 1893; Gerhardt, 1910a; Koerth, 1916; Szulczewski, 1922; Myrdzik, 1933; Horion, 1965; Szujecki, 1980)

Mazowian Lowland: Skierniewice, Warszawa vic. (Szujecki, 1960b; 1980), Kampinos NP (Mazur S. *et* al., 2010)

Białowieża Primeval Forest: Białowieża NP (Smoleński & Szujecki, 2001; Smoleński, 2006)

Lower Silesia: Görlitz (Zgorzelec), Liegnitz (Legnica), Breslau (Wrocław), Schweidnitz (Świdnica), Neisse (Nysa), Proskau (Prosków, Prószków; Letzner, 1871; 1886; Gerhardt, 1910a; Kolbe, 1931; Horion, 1965; Szujecki, 1980)

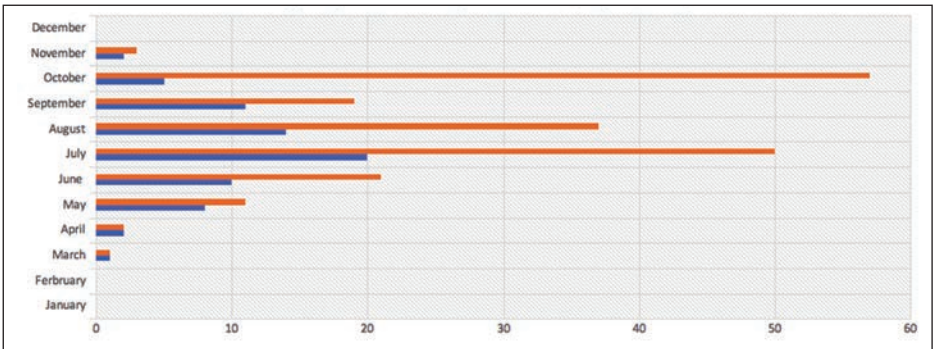
Trzebnica Hills: Obernigk (Oborniki Śląskie; Dietl, 1903; Gerhardt, 1904; 1910a)

Upper Silesia: Ratibor (Racibórz), Borutin (Borucin; Kelch, 1846; Roger, 1856; Letzner, 1871; 1886; Gerhardt, 1910a; Stefek, 1939; Szujecki, 1980)
Kraków-Wieluń Upland: Kraków vic. (Myczkowski, 1954)
Sandomierska Lowland: Niepołomicka Forest (Myczkowski, 1954)
Lubelska Upland: Stawska Góra nat. res. near Chełm (Staniec, 1996a; 2002)
Western Beskid Mts.: Wisła (Stefek, 1939), Krynica (Burakowski *et* al., 1980)
Eastern Beskid Mts.: Żurawica near Przemyśl (Trella, 1936; Szujecki, 1980)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Kulwieć, 1907; Łomnicki, 1913; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Silesia (Kletke, 1889; Kuhnt, 1912).

Phenology and development. According to literature data beetles appear from winter and early spring months to October, most numerously from June to August (Horion, 1965). That author also reported data from Sweden, where well-developed larvae, which had overwintered, were observed in May (Horion, 1965).

Resulting from data recorded in Poland (**Fig. 6.24**), imagines appear from March to November with two peaks – in July (smaller) and October (greater in number). They may be found most often in July.



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	1	2	11	21	50	37	19	57	3	0
Number of records	0	0	1	2	8	10	20	14	11	5	2	0

Fig. 6.24. Frequency of *Ocypus ophthalmicus ophthalmicus* (Scop., 1763) in localities in Poland

Subgenus *Pseudocypus* Mulsant & Rey, 1876

Ocypus aeneocephalus (De Geer, 1774)

General distribution. A northern Palearctic species. In northern Europe it is found in Norway, Sweden, Finland and Karelia, in the British Isles (England, Ireland) and Denmark. Within the broadly understood central part of the continent it has been recorded over the entire area from the Pyrenees, northern Spain (Asturias) and Portugal through the Alp countries (Switzerland, Austria, northern Italy, except for the French Alps), to Hungary, the Balkans, Ukraine, Russia and the Baltic states. It was unintentionally introduced in the Nearctic region (Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015; Ferreira, 2018).

Habitat preferences. It inhabits various habitats: from xeric open areas (fields, grassland meadows, sandy and insolated hills) to moist forested areas. Beetles are found under stones, in the leaf litter and mosses, as well as alluvia (Horion, 1965). In Schleswig-Holstein it has been caught at the North Sea coast in exposed, sunny levees, although not in brackish habitats (Kleeberg & Uhlig, 2011). In the mountains recorded less frequently than in the lowlands; however, in the Alps it reaches the subalpine and alpine zones (Horion, 1965).

It was caught in a boggy coniferous forest and a meadow in the Poleski National Park (Staniec, 2010).

Occurrence in Poland. In Poland *O. aeneocephalus* is observed in the southern and western parts of the country. It has not been recorded in the north-eastern part of Poland (**Fig. 6.25**).

New records

Baltic Coast: Słowiński NP, Wydma Łącka dune [XA56], 18 IX 2003, 1 ex., obs. RRu

Pomeranian Lake District: Wojnowo [XV80], 22 VIII 1987, 1 ex., leg. E. Jagieło et AM, coll. AM

Wielkopolska-Kujawy Lowland: Cierpice vic. [CD27], 17 VI 2017, 1 ex., pitfall trap, leg., coll. AM; Golęczewo vic., military training ground – Napoleona Mt. [XU22], 30 VII 2000, 1 ex., pitfall trap, leg. PS., det. AM, coll. SK; Gołuchów [YT04], 9 IV 1983, 1 ex., leg., coll. AM; Koło [CC38], 27 VI 1983, 3 exx., under stone, leg., det. TM, ver., coll. AM; Krajkowska Island near Krajkowo [XT38], 2 XII 2008, 4 exx., pitfall trap on a dry meadow, leg. PS, det. AM, coll. SK; Notecka Forest, Mężyk vic. [WU85], 8 IV 1994, 1 ex., leg., det., coll. PJ, ver. AM; Nowy Młyn [XU37], 31 V 1917, 1 ex., leg. MK, det. AM, coll. USM; Osowo Stare [XU13], 20–31 X 1992, 1 ex., pitfall trap, leg. MBu, coll. AM

Małopolska Upland: Łask-Ostrów [CC71], 24 III 2007, 2 exx., leg., coll. AK

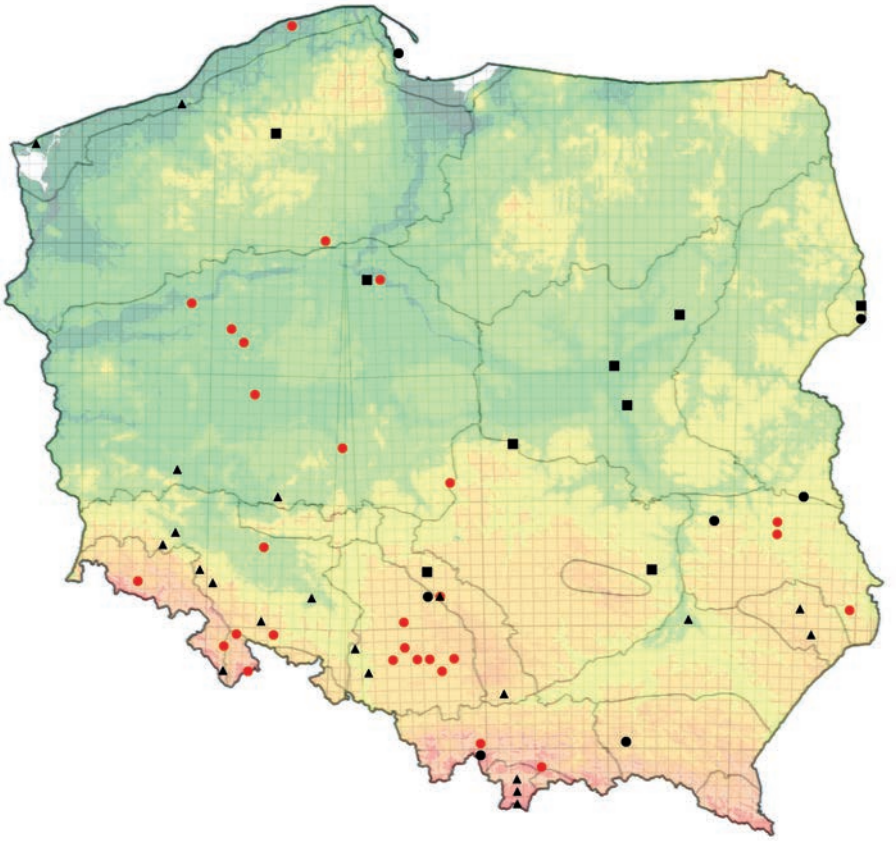


Fig. 6.25. Distribution of *Ocypus aeneocephalus* (De Geer, 1774) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

Mazovian Lowland: Świder [EC17], 6 VII 1906, 1 ex., leg. WM, det. AM, coll. USM

Lower Silesia: Bardo Śląskie [XR29], 26 IX 1935, 1 ex., leg. FK, det. AM, coll. USM; Ligota Otmuchowska [XR59], VII 1905, 17 V 1909, VIII 1910, 5 exx., leg. ED, det. AM, coll. USM; Wrocław [XS46], IV 1964, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW; Wrocław-Swojczyce [XS46], 9 XI 2005, 1 ex., leg. JT, coll. AM

Upper Silesia: Bytom [CA57], 22 IV 1911, 1 ex., leg. GR, 27 III 1925, 1 es., leg. HN, 9 X 1924, 1 ex., 16 VI 1926, 1 ex., 7 VI 1937, 1 ex., leg FK, det. AM, coll. USM; Chorzów [CA57], 7 X 1995, 1 ex., leg., coll. TK; Dąbrowa Górnicza [CA77], 1 and 3 XI 1936, 2 exx., leg. ST, det. AM, coll. USM; Dąbrowa Mysłowicka [CA66], 1 XI 1926, 1 ex., leg. FK, det. AM, coll. USM; Konopiska

[CB62], 18 XI 1994, 1 ex., leg., coll. TK; Łany [CA27], 28 VII 1927, 1 ex., leg. ED, det. AM, coll. USM; Potępa [CB30], 18 X 1937, 1 ex., leg. HN, det. AM, coll. USM; Przezchlebie [CA38], 18 V 1930, 1 ex., leg. WY, det. AM, coll. USM; Zabrze [CA47], 21 VI 1913, 1 ex., leg. MK, det. AM, coll. USM

Lubelska Upland: Ciechanki Łańcuchowskie [FB38], 14 IX 1985, 1 ex. in an entomological bucket, leg. BS, coll. MCSU; Klarów [FB37], 5 exx. in swamps on the meadow, leg. BS, coll. MCSU; Tyszowce [FB91], 3 VII 1995, 1 ex. old sand mine, leg. BS, coll. MCSU

Western Sudetes Mts.: Podgórzyn-Podzamcze [WS43] near Jelenia Góra, 1–8 VIII 1994, 1 ex., det., leg. LBo, coll. RRu

Eastern Sudetes Mts.: Kletno [XR36], 3 IX 1975, 1 ex., det. leg. LBo, coll. RRu; Krowiarki Mts., Skowronia Mt. [XR18], 17 IX 1990, 1 ex., leg., coll. AM; Krowiarki Mts., Żelazno vic. [XR18], 17 IX 1990, 12 exx. under stone, leg., coll. AM

Western Beskid Mts.: Ochotnica Górna [DV48], 9–10 VII 2002, 1 ex., 31 VII 2005, 1 ex., leg., det. et coll. TW; Zawoja [CA90], 23 VII 1938, 1 ex., leg. Popek, ex coll. AS, coll. MIZ

Previously recorded from:

Baltic Coast: Międzyzdroje (Habelmann, 1854), Koszalin (Lüllwitz, 1916), Gdynia-Kępa Redłowska (Konopko *et* al., 2017)

Pomeranian Lake District: Człuchowska Forest (Szujecki, 1995)

Wielkopolska-Kujawy Lowland: Solec Kujawski Distr. (Smoleński, 1993; Szujecki, 1995), Sulau (Sułów), Glogau (Głogów) (Uechtritz, 1844; Letzner, 1871; 1886; Gerhardt, 1910a)

Mazowian Lowland: Kampinoska Forest – Sieraków (Breymeyer, 1966), Świdry Wielkie (Szujecki, 1968), Ostrów Mazowiecka (Burakowski *et* al., 1980)

Białowieża Primeval Forest: Białowieża NP (Smoleński, 2006), records without exact data (Karpiński, 1949; Derunkov & Melke, 2001)

Lower Silesia: Liegnitz (Legnica), Wolfsberg b. Goldberg (Wilcza Góra near Złotoryja), Striegauer Berge (Wzgórza Strzegomskie), Münsterberg (Ziębice), Schweidnitz (Świdnica), Waldenburg (Wałbrzych) (Letzner, 1871; 1886; Schwarz & Letzner, 1874; Gerhardt, 1910a)

Upper Silesia: Rauden (Rudy near Kuźnia Raciborska), Odertal (Zdzieszowice) (Kelch, 1846; Roger, 1856; Letzner, 1871; 1886; Gerhardt, 1910a)

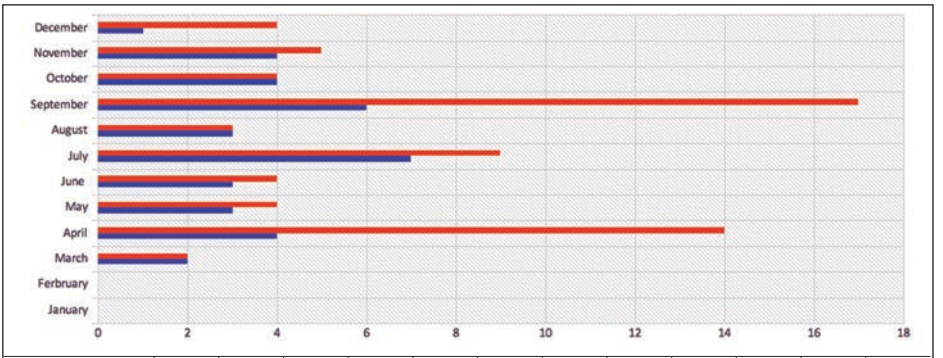
Kraków-Wieluń Upland: Kraków-Panieńskie Skały (Łomnicki, 1886), Częstochowa-Zacisze (Lgocki, 1908), Łobodno near Częstochowa (Burakowski *et* al., 1980), Konopiska (Kościelny, 2006)

Małopolska Upland: Jędrzejów Distr. (Karczewski, 1961), Rogów near Koluszki (Burakowski *et* al., 1980)

Lubelska Upland: Poleski PN (Staniec, 2010), Nałęczów (Miłkowski, 2017)
Roztocze: Korhynie – Zamość Province (Nowicki, 1870; Łomnicki, 1886), Ulów – Zamość Province (Tenenbaum, 1913)
Sandomierska Lowland: Kotowa Wola – Tarnobrzeg Province (Jachno, 1880)
Western Sudety Mts.: records without exact data (Letzner, 1871; 1886; Gerhardt, 1910a)
Eastern Sudety Mts.: Grafschaft Glatz (Ziemia Kłodzka; Zebe, 1852; Letzner, 1871; 1886; Gerhardt, 1910a)
Western Beskid Mts.: Babia Góra Massif (Kubisz & Szafraniec, 2003), records without exact data (Kelch, 1846; Roger, 1856; Reitter, 1870b; Wachtl, 1870; Letzner, 1871; 1886; Stobiecki, 1883; Gerhardt, 1910a; Roubal, 1930; Pawłowski, 1967)
Eastern Beskid Mts.: Libusza (Taszakowski *et* al., 2018)
Nowy Targ Basin: Zakopane (Łomnicki, 1886)
Tatry Mts.: records without exact data (Nowicki, 1864; 1865; 1873; Łomnicki, 1866; 1868)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Horion, 1965; Szujecki, 1980; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015), Prussia (Siebold, 1847; Zebe, 1852; Lentz, 1857), Eastern Prussia (Gerhardt, 1910b), Silesia (Kolbe, 1892; Kuhnt, 1912), Galicia (Łomnicki, 1884).

Phenology and development. In contrast to *O. olens* a gradation of imagines of this species is observed in early summer. Beetles overwinter and are recorded from January (data from England), while the peak of their activity related with reproduction comes in the spring months (Nield, 1976). Boháč (1982)



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	2	14	4	4	9	3	17	4	5	4
Number of records	0	0	2	4	3	3	7	3	6	4	4	1

Fig. 6.26. Frequency of *Ocypus aeneocephalus* (De Geer, 1774) in localities in Poland

indicated that the reproduction period is observed both in autumn and early spring. Both beetles and well-developed larvae overwinter.

Data from catches from Poland indicate that beetles are found from March to December with the population size peak in April and September. The frequency of catches was greatest in July (**Fig. 6.26**).

Ocypus fulvipennis Erichson, 1840

General distribution. A species inhabiting central and south-eastern Europe, including Russia, Georgia, Turkey, Azerbaijan, Kazakhstan, Armenia and Nagorno Karabakh. In the West of Europe it has been recorded in France, Switzerland and Spain, while in the South – in northern Italy and the Balkans (Burakowski, *et* al., 1980; Herman, 2001; Uhlig *et* al., 2006; Bordoni, 2010; Fernández *et* al., 2010; Assing, 2013; Özgen *et* al., 2017; Assing & Schülke, 2019). The species was mentioned in the list of fauna of Latvia, although without specific locations (Cibuļskis, 2007).

Habitat preferences. Beetles have been found in grassland habitats (meadows, forest edges) and sunny forests (forest roads, gaps in stands; Burakowski *et* al., 1980; Apfel *et* al., 2006) as well as apple orchards (Honěk *et* al., 2012). It inhabits hilly areas and lower mountain elevations (Burakowski *et* al., 1980). In the Alps it was observed in numerous regions – in the western parts at altitudes up to 1900 and 2000 m a.s.l. (Kofler, 2015), in the southern parts in mountain meadows at altitudes of 900–1000 m a.s.l. (Zanetti, 2015), whereas in Spanish mountains of the Sierra de Guadarrama – up to 1300 m a.s.l. (Fernández *et* al., 2010).

Occurrence in Poland. In Poland this species is rarely observed. Historical localities include the mountainous regions in southern Poland. Isolated localities are also found in the area of Poznań as well as the Białowieża Primeval Forest. New data are also scarce and come from the Lubelska Upland and the Białowieża Primeval Forest (**Fig. 6.27**).

New records

Białowieża Primeval Forest: Białowieża District [FD94], pitfall trap: 10 VII–13 VIII, 1 ex., 13 VIII–11 IX 2016, 15 exx. (for. comp. 499Ab); [FD83], 13 VIII–11 IX 2016, 1 ex. (578Ad), det. AM, leg., coll. DFP; Hajnówka District [FD75], pitfall trap, 10 VII–13 VIII, 1 ex. (for. comp. 211Dj), det. AM, leg., coll. DFP

Roztocze: Korhynie [FA78], 23 IX 1993 – 7 exx., 23 IV and 25 VII 1994 – 3 exx., 25 IX 1995, 2 exx. pitfall trap, xerothermic station, leg. RR, coll. MCSU; Łabunie near Zamość [FB61], 21–22 IX 1963, 1 ex. leg. JP, det., coll. AM

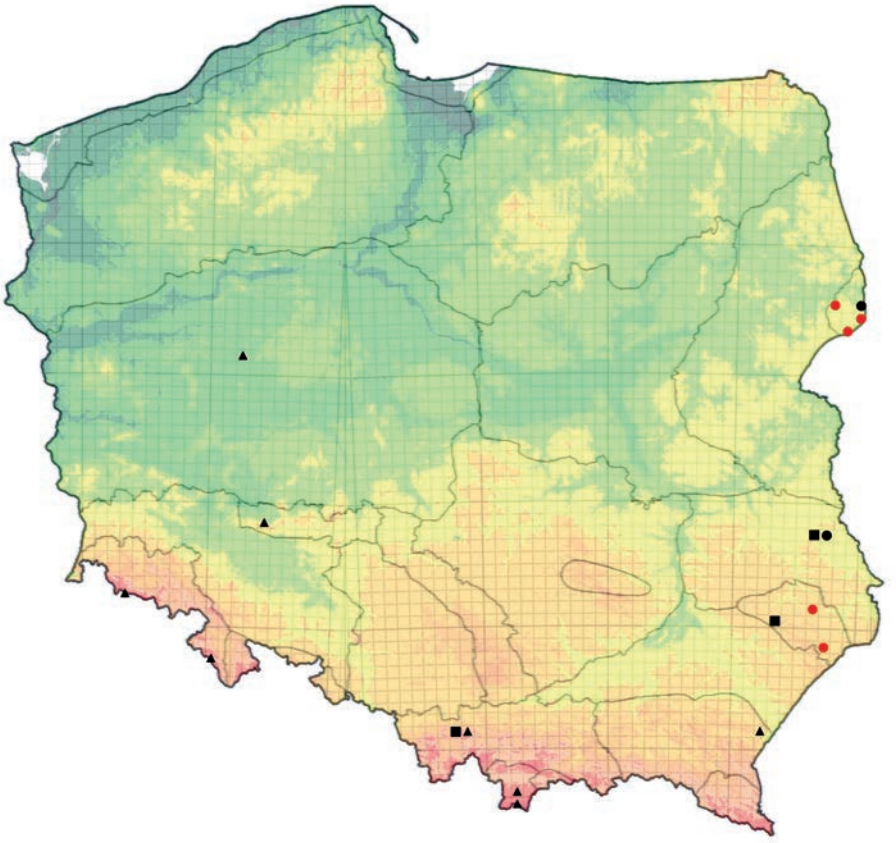


Fig. 6.27. Distribution of *Ocypus fulvipennis* Er., 1840 in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

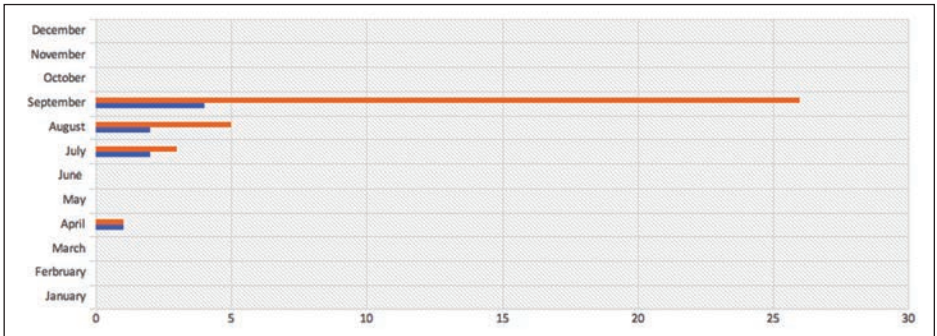
Previously recorded from:

Wielkopolska-Kujawy Lowland: Poznań (Szulczewski, 1922; Horion, 1965)
Białowieża Primeval Forest: Białowieża NP (Smoleński, 2006)
Trzebnica Hills: Topolice – Wrocław Province (Müller, 1895)
Roztocze: Zwierzyniec – Zamość Province (Szujecki, 1963)
Lubelska Upland: Stawska Góra nat. res. near Chełm (Staniec, 1996a; 2002; Staniec *et* al., 2009)
Roztocze: Zwierzyniec (Szujecki, 1980)
Western Sudety Mts.: Riesengebirge (Karkonosze; Letzner, 1871; 1886; Gerhardt, 1910a; Pax, 1921)
Eastern Sudety Mts.: Grafschaft Glatz (Ziemia Kłodzka; Zebe, 1852; Letzner, 1871; 1886; Gerhardt, 1910a; Pax, 1921)

Western Beskid Mts.: Little Beskid Mts. (Paśnik, 1998), records without exact data (Reitter, 1870b; Letzner, 1871; 1886; Gerhardt, 1910a; Wanka, 1917; Szujecki, 1980)
Nowy Targ Basin: Zakopane (Łomnicki, 1886; Szujecki, 1980)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929; Szujecki, 1980)
Tatry Mts.: records without exact data (Łomnicki, 1866; 1868; Nowicki, 1873)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Silesia (Kuhnt, 1912; Szujecki, 1980), Galicia (Łomnicki, 1884), Carpathians (Nowicki, 1873; Horion, 1965), Sudety Mts. (Horion, 1965).

Phenology and development. The morphology of all immature stages and some details on biology of the species were described by Staniec *et* al. (2009). New data from Poland include catches of beetles in April and in the summer months – from July to August with the peak in August (**Fig. 6.28**).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	1	0	0	3	5	26	0	0	0
Number of records	0	0	0	1	0	0	2	2	4	0	0	0

Fig. 6.28. Frequency of *Ocypus fulvipennis* Er., 1840 in localities in Poland

Ocypus fuscatus (Gravenhorst, 1802)

General distribution. A northern-Palearctic species. It inhabits all northern and central Europe, from eastern France, through Great Britain, Scandinavia up to the remote provinces in the North. In Central Europe it is found from the Baltic states to northern Italy, the Balkans, Greece, Ukraine and Georgia. In the East it reaches the European part of Russia and Siberia (including eastern Siberia) (Horion, 1965; Burakowski *et* al., 1980; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011).

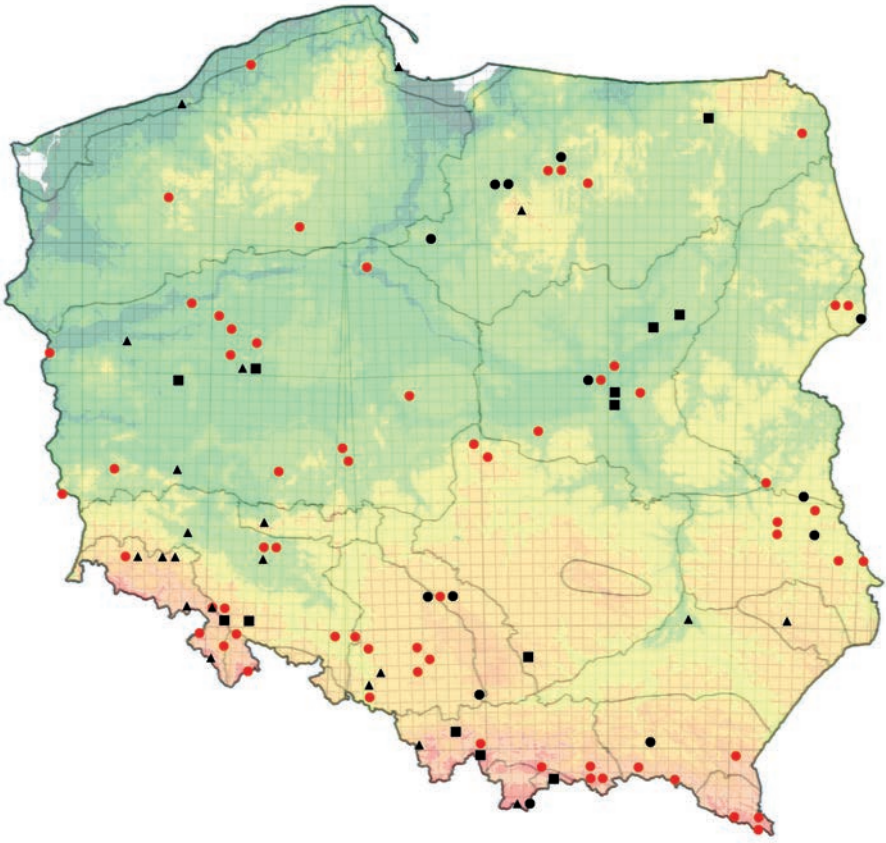


Fig. 6.29. Distribution of *Ocypus fuscatus* (Grav., 1802) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

Habitat preferences. It is found both in forest habitats and open spaces, where it is met under stones, in leaf litter, among mosses and fallen leaves, also in alluvia and at the waterline after receding inundations. In forests it is frequently found in the vicinity of ponds, also under stones, in leaf litter overgrown with fungi and in mole burrows (Horion, 1965; Kleeberg & Uhlig, 2011). A species with considerable tolerance of soil salinity (Kleeberg & Uhlig, 2011).

Occurrence in Poland. The species is found throughout the country (**Fig. 6.29**).

New records

Pomeranian Lake District: Zakrzewska Osada [XV61], 30 IX 2009, 1 ex. and 11 VI 2016, 1 ex. and 20 V 2017, 2 exx., damp meadow over a drainage ditch,

leg., coll. DJT; Złocieniec [WV63], 22 IX 2010, 1 ex. sown from under the poplar, leg., coll. KR; Widzino [XA23], 5 VI 2006, 1 ex., meadow, leg. MCz, det. AM, ex coll. OA, coll. AM

Masurian Lake District: Krzywonoga [DE84], 28 V 2006, 1 ex. and 11 VI 2006, 1 ex., pitfall trap on the border of pine forest, leg. AP, coll. KK; Naglady vic. [DE55], 25 VII–29 VIII 1998, 2 exx., dry meadow, bait trap (fish), leg., coll. KK; Olsztyn-Kortowo [DE65], 25 IV 1996, 1 ex., 2 IV 1997, 1 ex., ditch to amphibians, the shore of the transition bog, leg., coll. KK; Wigierski PN – Suche Bagno nat. res. [FE48], 20 VI 1991, 1 ex. leg., det., coll. AMa

Wielkopolska-Kujawy Lowland: Biedrusko vic. – military training ground [XU32], 30 V 2003, 1 ex., pitfall trap in thick bushes *Pruno-Crataegetum*, leg. PS, coll. SK; Gołuchów [YT04], 10 III 1991, 1 ex., leg., coll. AM; Jezierce near Solec Kujawski [CD18], 22 V 2017, 1 ex., pitfall trap, leg., coll. AM; "Odrapanki" so-called near Kalisz [BC93], 13 IV 1989, 1 ex., leg., coll. AM; Koło [CC48], VIII 1989, 1 ex., 28 IV 1988, 2 exx., leg. TM, coll. AM; Laski [VU71], 6 X 2009, 1 ex., steep grassland in pitfall trap, 2 XI 2009, 2 exx., xerothermic flowering grassland, pitfall trap, leg. PS, det., coll. AM; Łęknica [VT80], 25 IV 2015, 1 ex. det. AM, leg., coll. RO; Mężyk, Notecka Forest [WU85], 8 IV 1994, 1 ex. leg., coll. PJ; Milicz [XT52], 13 V 1960, 4 exx., leg. TS, det. AM, coll. USM; Obrzycko vic. [XU04], 7 VI 1994, det. AM, leg., coll. SK; Sycyn Dolny near Szamotuły [XU11], 8–10 V 2009, 1 ex. forest cultivation, pitfall trap, leg. MBu, det. AM, coll. PJ; Uścikowiec near Oborniki Wielkopolskie [XU13], 21 IV–18 VIII 2007, 6 exx., pitfall trap, leg. TSz, det., coll. AM; Żagań-Karliki [WT22], 26 VII 1990, 1 ex., leg. CzG, coll. AM

Mazovian Lowland: Bielany [DC99], 26 IV, 30 V 1889, 1 ex., 17 IV 1894, 1 ex., leg, WM, det. AM, coll. USM; Czerna [ED00], 4 VII 1902, 1 ex., leg. WM, det. AM, coll. USM; Miłosna [EC28], 2 XI 1893, 1 ex., leg. WM, det. AM, coll. USM; Natolin [EC07], 1–17 V 1888, 4 exx., leg. WM, det. AM, coll. USM; Skierniewice [DC45], 15 X 1889, 2 exx., leg. WM, det. AM, coll. USM; Warszawa [EC08], 16 IV 1890, 1 ex., leg. WM, det. AM, coll. USM

Podlasie: Koczów [FB85], 27 V 2014, 1 ex., meadow pitfall trap, leg. AH, coll. AM; Tyśmienica [FC21], 27 V, 2 exx. and 21 VI 2014, 1 ex., meadow pitfall trap, leg. AH/ ŁN, coll. AM

Białowieża Primeval Forest: Białowieża [FD94], 22 VI 1972, 1 ex. leg. AG, det. AM, coll. MNHW; Browsk District [FD85], pitfall trap, 4 V–14 VI 2016, 1 ex. (for. comp. 181Cg); [FD75], 10 VII–13 VIII 2016, 2 exx. (147Da), det. AM, leg., coll. DFP

Lower Silesia: Bardo Śląskie [XR29], 24 IX 1926, 1 ex., leg. HN, 26 IX 1935, 1 ex., leg. FK, det. AM, coll. USM; Bielawskie Hills near Dzierżoniów [XS11], 20 III 1954, 3 exx. under stone, leg., det. ex coll. AG, ver. AM, coll. MNHW; Sowia Mt. [XS01], 2 VIII 1957, 1 ex., det., leg. ex coll. AG, ver. AM, coll. MNHW; Wrocław-Swojczyce [XS46], 28 IV 2005, 1 ex., 20 VII

2004, 1 ex., leg. JT, coll., AM; 20 V 1949, 1 ex., det., leg. ex coll. AG, ver. AM, coll. MNHW; Wrocław-Wojnów [XS56], 12 IV 1992, 2 exx., leg., det., coll. MW, ver. AM

Upper Silesia: Bytom [CA57], 22 IV, 26 VI 1911, 2 exx., leg. GR, 9 V 1989, 1 ex.,1 ex., 16 VII 1987, 1 ex., leg. HD, 9 X 1934, 27 III 1925, 1 ex., leg. HN, 1 V 1926, 1 ex., 15 IV 1928, 1 ex., leg. FK, det. AM, coll. USM; Góra Św. Anny Mt. [BA99], 10 IV and 17 X 1928 1 ex., leg. HN, det. AM, coll. USM; Kędzierzyn Koźle [CA08], 20 VIII 1924, 1 ex., leg. HN, det. AM, coll. USM; Konopiska [CB62], 4 VI 2000, 1 ex., leg., coll. TK; Ligota Tworkowska [CA04], 23 V 1935, 1 ex., leg. WY, det. AM, coll. USM; Nędza [YR09], 23 V 1929, 1 ex., leg, HN, det. AM, coll. USM; Pogrzebień [CA04], 18 IV 1933, 1 ex., 23 det. AM, coll. USM; 1935, 1 ex., leg. WM, det. AM, coll. USM; Rozbark [CA48], 20 VII 1927, 1 ex., leg. FK, det. AM, coll. USM; Ruda Śląska [CA46], 5 VI 1936, 1 ex., leg. MK, det. AM, coll., USM; 20 IV 1996, 1 ex., leg. CzG, coll. TK

Małopolska Upland: Łódź [CC94], 20 VII 1970, 1 ex., leg. JC, det. AM, coll. USM; Łódź Widzew-Wschód [DC03], 9 V 1998, 1 ex., leg. MM, coll., AM

Lubelska Upland: Jaszczów near Milejów [FB37], 20 X 1994, 1 ex. damp forest, entomological sieve, leg. BS, coll. MCSU; Klarów [FB37], 20 III 1985, 1 ex. in the entomological sieve, leg. BS, coll. MCSU; Kulczyn [FB69], 30 VII 2014, 2 exx., meadow pitfall trap, leg. ŁN, coll. AM; Leszczana [FB85], 27 V 2014, 6 exx. and 3 VII 2014, 1 ex., meadow pitfall trap, leg. AH, coll. AM; Łańcuchów [FB38], 21 X 1993, 1 ex. under the bark of a lying tree trunk, leg. BS, coll. MCSU; Skryhiczyn [GB05], 29 IV 2014, 1 ex., cereal crop pitfall trap, leg. ŁN, coll. AM

Western Sudetes Mts.: Stołowe Mts. NP, Karłów [WR99], 29 VI 2010, 1 ex. on the street, leg., det. AM, coll. LK; Lubomierz [WS35], 20 VII 2004, 1 ex. on the sidewalk, det. AM, leg., coll. SK; Milęcice vic. [WS35], 12 III 1999, 1 ex., closed gravel pit, det. AM, leg., coll. SK

Eastern Sudetes Mts.: Krowiarki Mts. [XR18], 17 IX 1990, 9 exx. under stone, leg., coll. AM; Krowiarki Mts., Skowronia Mt. [XR18], 17 IX 1990, 1 ex. under stone, leg., coll. AM; Krowiarki Mts., Żabnica Mt. [XR18], 17 IX 1990, 1 ex. on between, leg., coll. AM; Śnieżnik Mt. [XR36], 5 VII 1993, 1 ex., det., leg. LBo, coll. RRu

Western Beskid Mts.: Jaworzyna Mts., Felczyńskiego Creek Valley [DV88], 23 V 1992, 1 ex., leg., coll. AM; Ochotnica Górna [DV48], 10–12 VII 2006, 1 ex., leg. Antoni Wojas; det. et coll. TW; Powroźnik [DV97], 6 IX 1987, 2 exx., leg., coll. AM; Wierchomla Mała [DV87], 18 VIII 2010, 2 exx., leg., det. et coll. TW; Zawoja-Wełczoń [CA90], 25 VIII 2012, 1 ex., leg., det. et coll. TW

Eastern Beskid Mts.: Ustrzyki Dolne Distr., Zawadka for. distr., for. comp. 65m [FV09], 6 VII 2017, pitfall trap, det. AM, leg. coll. DMF; 1 ex. Zyndranowa

[EV57], 23 V 1995, 1 ex. under stone, det. AM, leg., coll. SK; Nieznajowa [EV28], 3 VII 2013, 1 ex., in excrement, leg. AGo, det., coll. AMa

Bieszczady Mts.: Bieszczady NP, [FV24], 23 VI 1988, 1 ex. leg. MBu, det., coll AMa; Wetlina [FV04], 21–30 VI 2000, 1 ex., leg. J. Klasiński, coll. TK; Wołosate-Tarnica trail [FV23], 28 V 2014, 1 ex., leg., coll. PJ

Previously recorded from:

Baltic Coast: Sopot (Lentz, 1879), Koszalin (Üllwitz, 1916)

Masurian Lake District: Dąbrówno – Olsztyn Province (Lentz, 1879), Borecka Forest (Melke & Maciejewski, 1999), Olsztyn, Stanowo, Tyrowo, Wąbrzeźno (Komosiński, 2001b)

Wielkopolska-Kujawy Lowland: Jastrzębsko near Nowy Tomyśl (Nowosad, 1990), Poznań (Olejnik, 1994), Glogau (Głogów; Letzner, 1871; 1886; Gerhardt, 1910a; Szulczewski, 1922; Arnold, 1936)

Mazowian Lowland: Warszawa-Natolin, Warszawa – ogród Saski (Szujecki, 1968), Ostrów Mazowiecka (Burakowski *et* al., 1980), Biała Forest (Szujecki, 1995); Kampinoski NP (Mazur S. *et* al., 2010); Białowieża Primeval Forest (Derunkov & Melke, 2001), Białowieża NP (Smoleński & Szujecki, 2001, Smoleński *et* al., 2004, Smoleński, 2006)

Lower Silesia: Jaworek near Ząbkowice Śląskie, Srebrna Góra, Ziębice Śląskie (Smoleński, 1996b), Breslau (Wrocław), Liegnitz (Legnica), Bögenberge (Góra Górzec, Męcinka) (Letzner, 1871; 1880; Schwarz & Letzner, 1874; Gerhardt, 1910a)

Trzebnica Hills: records without exact data (Letzner, 1871; 1886; Gerhardt, 1910a)

Upper Silesia: Rauden (Rudy Raciborskie), Ratibor (Racibórz) (Kelch, 1846; Roger, 1856; Letzner, 1871; 1886; Lgocki, 1908; Gerhardt, 1910a)

Kraków-Wieluń Upland: Miechów vic. (Burakowski *et* al., 1980), Dębowiec near Choroń, Konopiska, Mirów, Srocko (Kościelny, 2006)

Małopolska Upland: records without exact data (Eichler, 1929; Karczewski, 1961)

Lubelska Lowland: Stawska Góra nat. res. near Chełm (Staniec, 2002), Poleski NP (Staniec, 2010)

Roztocze: records without exact data (Tenenbaum, 1913)

Sandomierska Lowland: Kotowa Wola – Tarnobrzeg Province (Jachno, 1880)

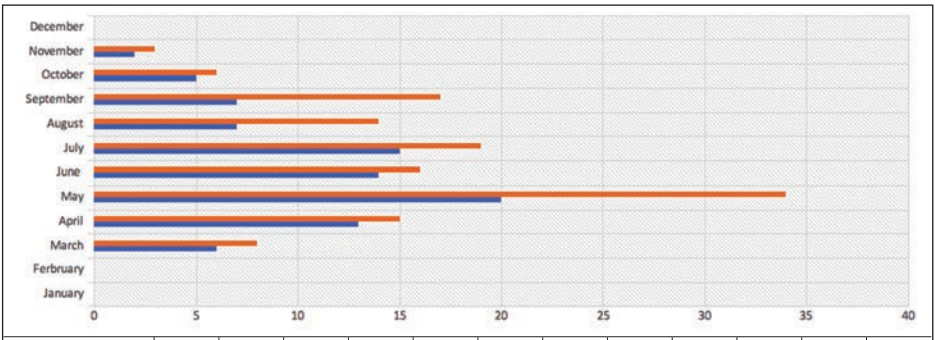
Western Sudety Mts.: Brechelshof (Zarek near Jawor), Eulengebirge (Góry Sowie), Waldenburger Gebirge (Góry Wałbrzyskie), Lähn (Wleń) (Letzner, 1871; 1886; Kolbe, 1892; Gerhardt, 1910a)

Eastern Sudety Mts.: Glatzer Berge (Góry Kłodzkie; Zebe, 1852; Letzner, 1871; 1886; Gerhardt, 1910a)

Western Beskid Mts.: Little Beskid Mts. (Paśnik, 1998), Babia Góra Massif (Kubisz & Szafraniec, 2003), Ustron (Ustroń) (Kelch, 1846; Wachtl, 1870; Letzner, 1871; 1886; Stobiecki, 1883; Gerhardt, 1910a), (Pawłowski, 1964; 1967)
Nowy Targ Basin: Zakopane (Łomnicki, 1886)
Bieszczady: Burakowski *et* al., 1980, Szujecki, 1996, Pawłowski *et* al., 2000
Pieniny Mts.: Ociemne (Mroczkowski, 1978)
Tatry Mts.: Tatrzański NP, Gęsia cervix (Wojas, 2006), records without exact data (Łomnicki, 1866; 1868; Nowicki, 1873)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Horion, 1965; Szujecki, 1980; Nowosad, 2000; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015), Prussia (Siebold, 1847; Zebe, 1852; Lentz, 1857), Silesia (Kuhnt, 1912; Kolbe, 1914), Galicia (Łomnicki, 1884), Carpathians (Nowicki, 1873).

Phenology and development. Following the overwintering period beetles start the reproduction period, which occurs in spring (Boháč, 1982). In Mecklenburg-Western Pomerania beetles were observed from March to December (Kleeberg & Uhlig, 2011). In the opinion of Horion (1965) beetles frequently overwinter in mole burrows. In Poland the species is observed from March to November, with the highest frequency of individuals and catch frequency in April (**Fig. 6.30**).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	8	15	34	16	19	14	17	6	3	0
Number of records	0	0	6	13	20	14	15	7	7	5	2	0

Fig. 6.30. Frequency of *Ocypus fuscatus* (Grav., 1802) in localities in Poland

Ocypus picipennis picipennis (Fabricius, 1793)

General distribution. A species with an extensive distribution, covering the Palearctic region and comprising several subspecies (Smetana & Davis, 2000; Herman, 2001; Löbl & Löbl, 2015). The general area of its occurrence covers Europe except for the very northern provinces and Great Britain, the entire central and southern parts of the continent, northern Africa, Turkey, countries of the Caucasus (Georgia, Azerbaijan) and located farther to the East (Iran, Kirghizstan, Kazakhstan and Uzbekistan). In the East it is also found in Siberia, Mongolia and Tibet (Horion, 1965; Löbl & Smetana, 2004; Anlaş, 2009; Anlaş & Newton, 2010; Bordoni, 2010; Kleeberg & Uhlig, 2011; Assing, 2013; Özgen *et* al., 2017; Ferreira, 2018).

Habitat preferences. It inhabits lowland areas, foothills and mountain areas at lower altitudes reaching the subalpine zone (Horion, 1965). The species prefers (Horion, 1965) xerothermic, open sites, fields, meadows, xeric shrubland hills and forest edges. Beetles have been found under stones and wood (as well as other objects, such as lying roof tiles and bags), hay, straw and other organic matter, as well as under bark. In the mountains it is met on xeric, stone slopes, under stones and among mosses, while in mountain meadows also under cow pats and sheep droppings (Horion, 1965; Kleeberg & Uhlig, 2011).

Occurrence in Poland. Except for the Bieszczady and Eastern Beskid Mts. the species is found throughout Poland (**Fig. 6.31**).

New records

Pomeranian Lake District: Lisewo Kaszubskie [CF06], 19–29 IX 1985, 2 exx., leg., coll. AM; Wierzchołek vic. [XV52], 18 VIII 2000, 1 ex. in cow dung, leg., coll. RRu; Zakrzewska Osada [XV61], 26 IX 2014, 2 exx., xerothermic station, leg., coll. DJT; Złocieniec [WV63], 14 X 2014, 1 ex. on the gravel pit, leg., coll. KR

Masurian Lake District: Biebrza Reg., Osowiec – Twierdza [FE02], 30 V 1999, 1 ex. fort II behind the river, det. AM, leg., coll. MW; Olsztyn-Kortowo [DE65], 10 IV 1997, 1 ex., ditch to amphibians, the shore of the transition bog, leg., coll. KK; Olsztyn vic. [DE65], 21 VI 2007, 3 exx., dry meadow, pitfall trap, leg. A. Czarnecka, coll. KK

Wielkopolska-Kujawy Lowland: Owczary [VU71], 29 IV 2010, 1 ex., flowering turf, 2 X 2010, 1 ex., xerothermic mixed grassland, pitfall trap, leg. PS, det., coll. AM; Pamięcin nat. res. [VU71], 2 XI 2009, 10 exx., 4 XI 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Poznań – Cytadela [XU30], 23 IV 1993, 1 ex. leg., coll. PJ; Poznań-Naramowice [XU31] without date, 1 ex. in xerothermic forest side, leg., det., coll. AN; Poznań-Rusałka [XU21],

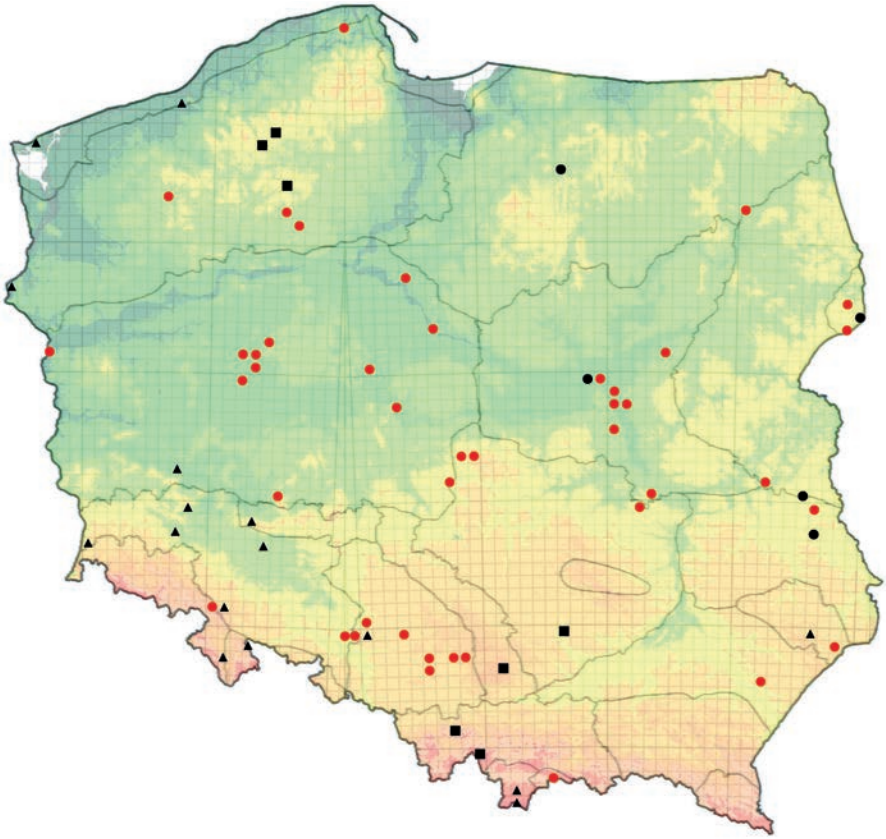


Fig. 6.31. Distribution of *Ocypus picipenis picipennis* (Fabr., 1793) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

11 IX 2015, 1 ex., leg., coll. PJ; Poznań-Winogrady [XU31], 19 X 2013, 1 ex., leg., coll. PJ; Puszczykówko near Poznań [XT29], 1 V 1976, 1 ex. leg. PSt, det., coll. AMa; Sułów near Milicz [XT50], 16 VIII 1948, 1 ex. in animal droppings, det., leg. ex coll. AG, ver. AM, coll. MNHW; Ślesin [CD10], 3 VIII 1977, 1 ex. in a pine forest, leg. TM, coll. AM; Tarnowa near Turek [CC37], 5 X 1991, 1 ex., leg. SCz, coll. AM; 12 XI 1983, 2 exx. and 15 X 1983, 1 ex., in a pine forest, a sand mine, leg. TM, coll. AM; Toruń-Kaszczorek [CD47], 30 VI 1999, 1 ex., J. Rafa leg., det. AM, coll. BP; Włocławek District, Mień for. distr. [CD63], 4 X 1996, 1 ex. leg., coll. PJ; Zielonka near Murowana Goślina [XU42], 4 IV 1990, 1 ex. xerothermic station, leg., det., coll. AMa

Mazovian Lowland: Bielany [DC99], 26 V 1889, 1 ex., leg. WM, det. AM, coll. USM; Urle [ED41], 6 IX 1909, 1 ex., leg. WM, det. AM, coll. USM; Kozie-

nicka Forest: Jedlnia-Letnisko [EB29], 4 XII 2011, 1 ex., on the railway embankment; Januszno [EC30], 15 III 2007, 1 ex., on a sandy dirt road, det. AM, leg., coll. MaM; Warszawa [EC08], 21 V 1891, 1 ex., leg WM, det. AM, coll. USM; Wawer [EC08], 4 VII 1894 and 23 IX 1901, 3 exx., leg. WM, det. AM, coll. USM; Józefów [EC17], 1 VII 1899, 1ex., leg. WM, det. AM, coll. USM; Natolin [EC07], 5 V 1888, 1 ex., leg. WM, det. AM, coll. USM; Wągrodno vic. [EC05], 22 VII 2015, 1 ex. on a dry meadow near railway tracks, leg., coll. KK

Podlasie: Tyśmienice [FC21], 31 VII 2014, 1 ex., meadow, pitfall trap, leg. ŁN, coll. AM

Białowieża Primeval Forest: for. comp. 494 [FD94], no exact date – 1976, 1 ex., leg. K. Wołk, coll. AM; Białowieża District [FD83], pitfall trap, 13 VIII–11 IX 2016, 2 exx. (for. comp. 578Ad); Browsk District [FD85], pitfall trap, 13 VIII–11 IX 2016, 1 ex. (184Ch), det. AM, leg., coll. DFP

Lower Silesia: Gogolin [BA89], 7 IV 1926, 2 exx., leg FK, 25 VIII 1924, 2 exx., 27 VIII 1930, 1 ex., 23 VIII 1936, 2 exx., 15 IV 1938, 2 exx., leg, HN, det. AM, coll. USM; Sowia Mt. [XS01], 2 VIII 1957, 1 ex., det., leg. ex coll. AG, ver. AM, coll. MNHW

Upper Silesia: Brynek [CA39], 26 IX 1994, 1 ex., leg. Henryk Szołtys, coll. TK; Bukowo [CA87], 22 V 1933, 2 exx., leg. ST, det. AM, coll. USM; Bytom [CA57], VII 1910, 4 exx., leg. GR, 2 X 1934, 1 ex., leg FK, det. AM, coll. USM; Dąbrowa Górnicza [CA77], 23 VII 1938, 1 ex., leg, ST, det. AM, coll. USM; Góra Św. Anny Mt. [BA99], 19 VIII 1923, 1 ex., leg. HN, det. AM, coll. USM; Kamienna Mt, [BA99], 17 X 1938, 2 exx., leg. HN, det. AM, coll. USM; Katowice [CA56], 2 X 1933, 1 ex., leg. WY, det. AM, coll. USM; Szymiszów [CB00], 2 IV 1928, 1 ex., leg. FK, det. AM, coll. USM

Małopolska Upland: Łask-Ostrów [CC71], 5 V 2005, 1 ex., leg., coll. AK; Łódź-Lublinek [CC83], 1 IV 1981, 1 ex., airport, det. AM, leg., coll. MW; Łódź-Stoki [CC93], 21 IV 1976, 1 ex. det. AM, leg., coll. MW

Lubelska Upland: Biała Góra [FA25], 27 V and 5 VIII 1995, 3 exx. pitfall trap, xerothermic station, leg. RR, coll. MCSU; PGR Krychów [FB69], 30 VII 2014, meadow pitfall trap, leg. ŁN, coll. AM

Roztocze: Machnów [FA88], 11 IX 1994, 2 exx., pitfall trap, xerothermic station, leg. RR, coll. MCSU

Pieniny Mts.: Pieniny [DV57], 25 VII 1966, 2 exx., leg. ex coll. AG, det. AM, coll. MNHW.

Previously recorded from:

Baltic Coast: Międzyzdroje (Habelmann, 1854), Koszalin (Lüllwitz, 1916)

Pomeranian Lake District: Bielinek (Engel, 1938), Bielsko – Słupsk Province (Burakowski *et* al., 1980), Człuchowska Forest (Szujecki, 1995; Łęgowski *et* al., 1995); Niedźwiady Distr. (Smoleński, 1995b)

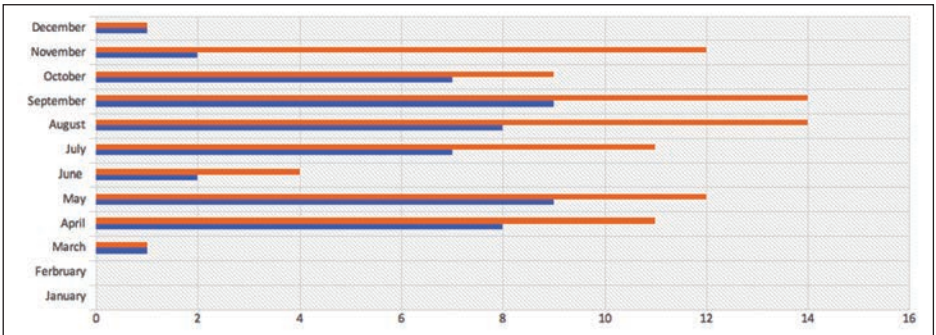
Masurian Lake District: Olsztyn (Komosiński, 2001b)
Wielkopolska-Kujawy Lowland: Glogau (Głogów; Letzner, 1871; 1886; Gerhardt, 1910a)
Mazowian Lowland: Szujecki, 1966c; 1968; Kampinoski NP (Mazur S. *et* al., 2010)
Podlasie: Poleski NP – Pieszowola (Staniec, 2010)
Białowieża Primeval Forest: Białowieża NP (Smoleński & Szujecki, 2001; Smoleński, 2006)
Lower Silesia: Reichenbach (Dzierżoniów), Görlitz (Zgorzelec), Lüben (Lubin), Liegnitz (Legnica), Breslau Karlowitz (Wrocław Karłowice) (Letzner, 1871; 1886; Gerhardt, 1910a; Kolbe, 1928)
Trzebnica Hills: Obernigk (Oborniki Śląskie; Letzner, 1871; 1886; Gerhardt, 1910a)
Upper Silesia: Adamowitz, Ohlau (Adamowice,Oława; Kelch, 1846; Roger, 1856; Letzner, 1871; 1886; Gerhardt, 1910a)
Kraków-Wieluń Upland: Pińczów vic. (Burakowski *et* al., 1980), Ojcowski NP and vic. (Pawłowski *et* al., 1994), records without exact data (Łomnicki, 1866; 1886; Lgocki, 1908)
Lubelska Upland: Stawska Góra nat. res. near Chełm (Staniec, 2002), Poleski NP (Staniec, 2010)
Roztocze: Rogóźno – Zamość Province (Tenenbaum, 1913)
Western Sudety Mts.: records without exact data (Letzner, 1886; Gerhardt, 1910a)
Eastern Sudety Mts.: Reichenstein (Złoty Stok), Grafschaft Glatz (Ziemia Kłodzka) (Letzner, 1871; 1886; Gerhardt, 1910a)
Western Beskid Mts.: Babia Góra Mt. (Pawłowski, 1967), Little Beskid Mts. (Paśnik, 1998), Babia Góra Massif (Kubisz & Szafraniec, 2003), records without exact data (Reitter, 1870b; Letzner, 1871; 1886; Stobiecki, 1883; Gerhardt, 1910a)
Nowy Targ Basin: Zakopane (Łomnicki, 1886)
Tatry Mts.: records without exact data (Nowicki, 1864; 1865; 1873; Łomnicki, 1866; 1868; 1886)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Kulwieć, 1907; Łomnicki, 1913; Müller, 1926; Szujecki, 1980; Nowosad, 2000; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Prussia (Siebold, 1847; Lentz, 1857), Silesia (Weigel, 1806; Kuhnt, 1912; Horion, 1965), Galicia (Łomnicki, 1884), Western Galicia (Nowicki, 1873), Carpathians (Nowicki, 1873).

Phenology and development. The reproduction period is in late summer and autumn (Boháč, 1982). Females lay eggs in November (Szujecki, 1966d) and

the process may be extended to the spring months. Pupae in Sweden are observed in early August. Beetles have been found from February to November, with particularly high numbers from October to November (data from the Netherlands; Horion, 1965; Kleeberg & Uhlig, 2011).

Data from Poland confirm that beetles are found from March to December, with two peaks in the number of individuals and frequency of catches (**Fig. 6.32**). The peaks come in April and May as well as August and September.



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	1	11	12	4	11	14	14	9	12	1
Number of records	0	0	1	8	9	2	7	8	9	7	2	1

Fig. 6.32. Frequency of *Ocypus picipennis picipennis* (Fabr., 1793) in localities in Poland

Ontholestes Ganglbauer, 1895

The genus comprises 32 species distributed in the Neotropical, Nearctic, Palearctic, Ethiopian and Oriental regions (Herman, 2001; Smetana & Shavrin, 2013).

Ontholestes haroldi (Eppelsheim, 1884)

General distribution. A European species, inhabiting the central part of the continent. The area of its occurrence covers southern Germany, Poland, Czechia, Slovakia, Ukraine, France, Switzerland, Austria, Italy, Hungary, Romania, the Balkan countries, Latvia and Moldova (Burakowski *et* al., 1980; Herman, 2001; Löbl & Smetana, 2004; Stan, 2004; Bacal, 2007; Boháč & Matějíček, 2009; Mihailov, 2016).

A sub-Mediterranean element (Drugescu & Geacu, 2004).

Habitat preferences. It is found in compost heaps, dung and under excrement (Burakowski *et* al., 1980). The typical habitats for this species include warm, xeric, sunny and sparse forests and thickets growing in the lowlands, although it is also found in anthropogenic or even strongly polluted habitats (Šustek & Tóth, 1986; Horák, 2011; Taszakowski *et* al., 2018). In Czechia it is considered to be a thermophilic eurytope, while in forest habitats as a relict species (Boháč & Matějíček, 2009). In contrast to the other species of this genus, that develop on carrion and feces, *O. haroldi* lives in the leaf litter and for this reason it is less frequently observed (Šustek & Tóth, 1986; Taszakowski *et* al., 2018). In Moldova it is found in forests with a share of oaks, ashes and maples – a auxiliary (accompanying) species, caught into Barber traps (Mihailov & Derjanschi, 2011).

Localities from the Polish part of the Carpathian Mts. are not consistent with these opinions, since it colonises feces together with other species from the genus (cf. localities and further species). In the Slovak Tatras the species has been recorded at altitudes of 510 m a.s.l. (Majzlan, 2006), in the Austrian and Italian Alps at altitudes of 1500 m a.s.l. (Gladitsch, 1970; Schatz & Zanetti, 2017).

Occurrence in Poland. From Poland it was reported in the 1920s from the area of Warszawa and it has not been found since then according to Szujecki (1980), although that author stressed the potential occurrence of this species in southern Poland. Again one male was found only in 2009 in the Beskid Niski Mts. (Libusza). In the successive years it was found in the Bieszczady Mts. (the Wołosate–Tarnica tourist trail (2014) and in the Rozumice reserve in the Eastern Sudety Mts. (in 2020; Jałoszyński & Wanat, 2021). New localities have

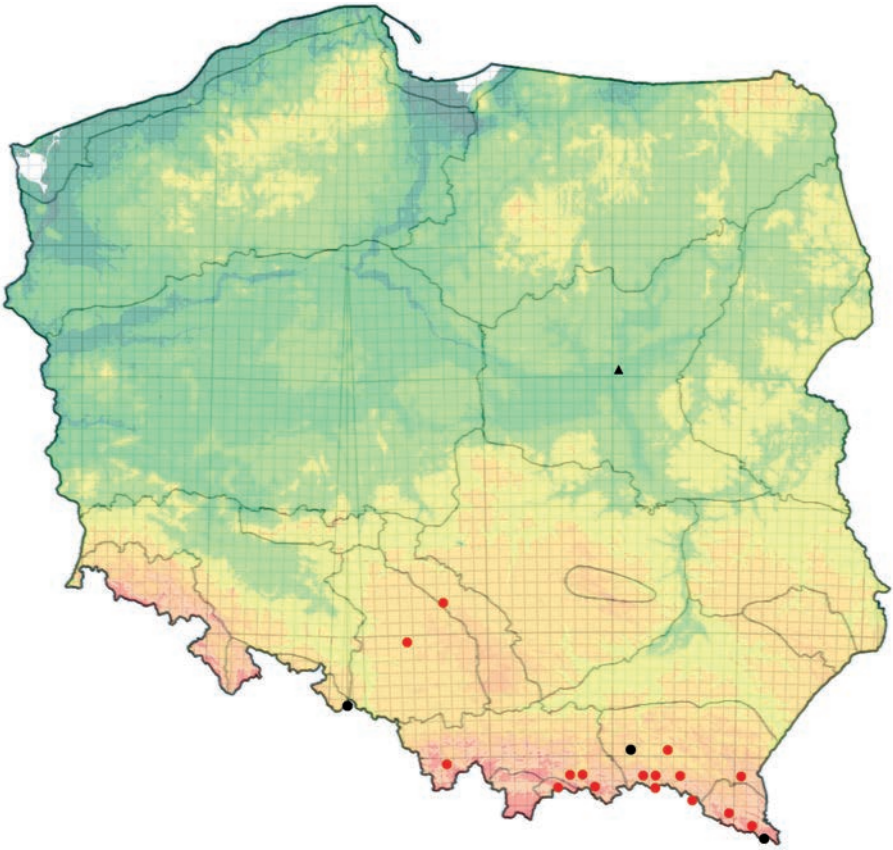


Fig. 6.33. Distribution of *Ontholestes haroldi* (Epp., 1884) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

been identified in the Beskid Niski, Beskid Sądecki and Beskid Żywiecki Mts. as well as the Pieniny and the Bieszczady Mts., which indicates a wider distribution of this species in southern Poland (**Fig. 6.33**).

New records

Upper Silesia: Konopiska vic. near Blachownia [CB62], 22 VI 2018, 1 ex. female, on the trunk of a cut birch, with leaking sap. Old mixed forest: pine, oak, birch, beech. Caught together with *Ontholestes murinus*, leg., coll. TK; Połomia [CA39], 27 IV 2015, 1 ex. female, leg., det. et coll. HS

Westren Beskid Mts.: Beskid Żywiecki, Żabnica [CV69] 16 VIII 2012, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa

Eastern Beskid Mts.: Rymanów District: Rudawka for. distr., Źródliska Jasiołki nat. res. [EV66], 8 IX 2017, 1 ex., pitfall trap, det. AM, leg. coll. DMF; Szklary for. distr. [EV58], 1 ex., 6 IX 2017, pitfall trap, det. AM, leg. coll. DMF; Beskid Niski, Rozstajne [EV38], 5 VII 2012, 3 exx., 17 VIII 2012, 1 ex. in an excrement, leg. AGo, det., coll. AMa; Nieznajowa [EV28], 26 X 2013, 1 ex., in excrement, leg. Ago, det., coll. AMa; Krempna [EV38] 3 IX 2011, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Ciechań [EV37], 18 VI 2012, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Beskid Sądecki, Naszacowice [DV68], 8 V 2012, 2 exx., 27 VI 2012, 3 exx., 6 VII 2012, 5 exx., 29 VII 2012, 2 exx., 10 IX 2012, 3 exx., 29 IX 2012, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Rytro [DV78], 20 V 2013, 5 exx., 9 VIII 2013, 8 exx., 1 X 2013, 2 exx., in excrement pitfall trap, leg. AGo, det. et coll. AMa; Uhryń [DV87], 18 V 2011, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Góry Słonne, Paszowa [FV08], 9 IX 2011, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Pogórze Ciężkowskie, Tarnowiec [EA40], 19 VIII 2013, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa

Bieszczady Mts.: Brzegi Górne [FV14] 28 V 2012, 6 exx., 6 VII 2012, 1 ex., 16 VII 2012, 2 exx., 4 X 2012, 2 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Łopienka [EV95], 20 V 2013, 2 exx., 10 VIII 2013, 1 ex., 18 IX 2013, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa

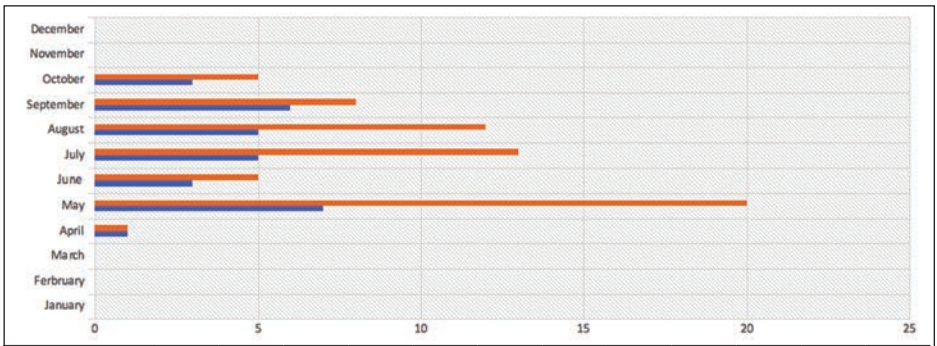
Pieniny Mts.: NP, Kras [DV57], 17 and 21 V 2018, 2 exx. on rotting hay, on the edge of the forest, in mushrooms of *Peziza vesiculosa* (Ascomycota), leg. PCh, det. AM, coll. AM and PNP

Previously recorded from:

Mazowian Lowland: Czarna Struga (Tenenbaum, 1926)
Eastern Sudety Mts.: the Rozumice reserve (Jałoszyński & Wanat, 2021)
Eastern Beskid Mts.: Libusza (Taszakowski *et* al., 2018)
Bieszczady Mts.: Wołosate – Tarnica tourist trail (Jałoszyński & Wanat, 2021)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Löbl & Smetana, 2004; Löbl & Löbl, 2015), Silesia (Letzner, 1886).

Phenology and development. Beetles in Poland have been found from April to October, with the highest frequency in May (**Fig. 6.34**).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	1	20	5	13	12	8	5	0	0
Number of records	0	0	0	1	7	3	5	5	6	3	0	0

Fig. 6.34. Frequency of *Ontholestes haroldi* (Epp., 1884) in localities in Poland

Ontholestes murinus (Linnaeus, 1758)

General distribution. A Palearctic species with a wide distribution. In Europe it is found throughout the continent, reaching far to the North and South, found outside the Arctic circle, as well as the Mediterranean islands. Moreover, it has been reported in Georgia, Armenia, Turkey, Iran as well as Kazakhstan and Kirghizstan. In the east it inhabits Siberia and reaches as far as China. It has been unintentionally introduced in Canada (Horion, 1965; Burakowski *et* al., 1980; Herman, 2001; Löbl & Smetana, 2004; Staniec, 2004b; Anlaş & Newton, 2010; Bordoni, 2010; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015; Ferreira, 2018; Assing & Schülke, 2019).

Habitat preferences. It is found in lowlands and mountainous areas reaching the subalpine zone (Horion, 1965; Burakowski *et* al., 1980). It inhabits open habitats – fields, meadows and forest edges, it is also found in synanthropic habitats. In all these habitats it is observed at all types of decaying organic matter: feces, carrion, compost, manure heaps, haystacks, alluvia, decomposing fungi and sap dripping from trees, where it hunts larvae and imagines of flies and beetles, with this species moving with high speed and agility.

Ontholestes murinus hunts prey, such as e.g. coprophagous beetles, by waiting until the prey preparing to flight raises its elytra and exposes soft parts of its body. In that moment the predator rapidly attacks the exposed body parts and with several movements of its mandibles it immobilises and rips open its prey. Immediately afterwards the predator drags the prey under the excrement surface (Petrenko, 2013).

Occurrence in Poland. Ontholestes murinus (Polish: szaroń after Szujecki, 2017) in Poland is found throughout the country, although in the 1980s it was not reported from several regions in the East and South of Poland (Burakowski *et* al.,

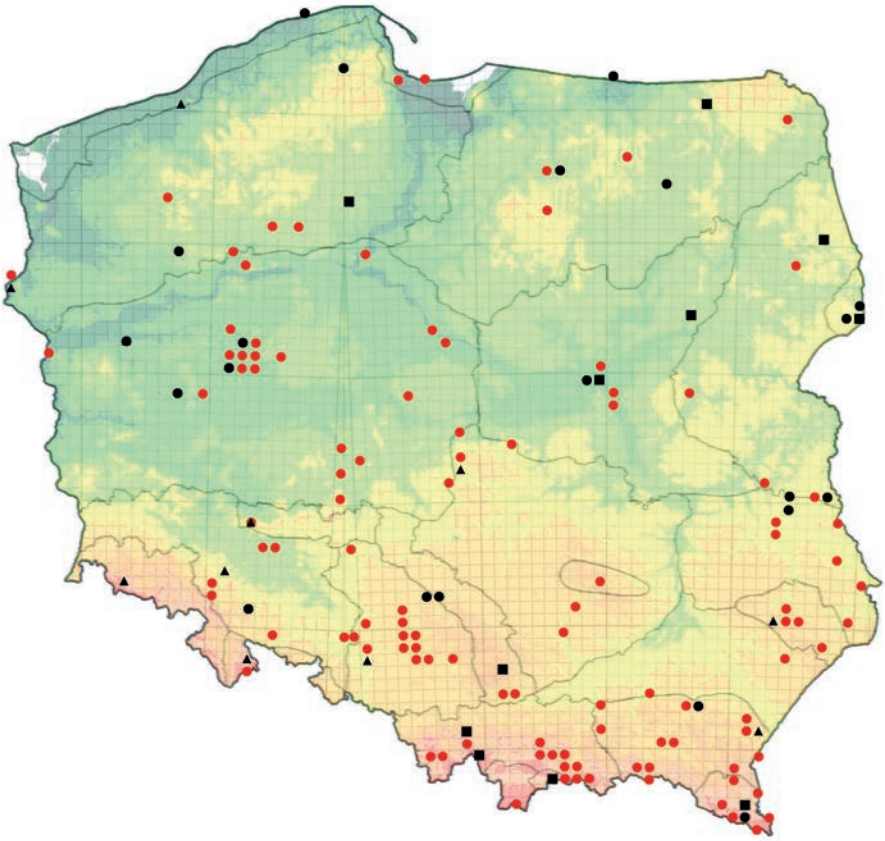


Fig. 6.35. Distribution of *Ontholestes murinus* (L., 1758) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

1980; **Fig. 6.35**). It is one of the most encountered species among the Polish representatives of *Ontholestes*.

New records

Baltic Coast: Gdańsk [CF42], 7 VII 2014, 1 ex., in compost, leg., coll. DJT; Sobieszewo-Orle [CF62], 18 VII 2010, 1 ex., in the forest, leg., coll. DJT

Pomeranian Lake District: Kujanki [XV41], 22–23 V 1999, 4 exx. in dung, leg., coll. RRu; Piła, Gładyszewo, 2 km N [XU19], 2 V 1999, 2 exx., leg. coll. RRu; Raduń [VU47], 5 VIII, 1 ex., 12 XI 2011, 1 ex., xerothermic flowering grassland, pitfall trap, leg. PS, det., coll. AM; Zakrzewska Osada [XV61], V 2010, 2 exx. and IX 2011, 4 exx., the pitfall trap, leg., coll. DJT; Złocieniec [WV63], 28 VII 2016, 16 exx. in a composter and 11 V 2016, 7 exx. in horse dropping, leg., coll. KR

Masurian Lake District: Dobrzyń vic. [DE52], 3 V–17 VI 1998, 1 ex., mixed forest, bait trap (fish), leg., coll. KK; Dorotowo vic. [DE65], 2 V–11 VI 1997, 1 ex., wet meadow, bait trap (fish), leg., coll. KK; Naglady vic. [DE55], 25 VII–29 VIII 1998, 1 ex., dry meadow, bait trap (fish), leg., coll. KK; Olsztyn-Kortowo [DE65], 26 VII 1995, 4 exx. in manure, leg., coll. KK; Słomowo vic. [EE16], 2 VIII–10 IX 1999, 2 exx., wet meadow, bait trap (fish), leg., coll. KK; Waplewo vic. [DE52], 2 V–16 VI 1999, 7 exx., dry meadow, bait trap (fish), leg., coll. KK; Olsztyn vic., on the Krzywe Lake [DE65], 5 VIII–15 IX 1997, 1 ex., mixed forest, bait trap (fish), leg., coll. KK; Wigierski NP-Huta [FE39], 19 VI 1991, 1 ex. on carrion of wild boar, leg. coll. AMa

Wielkopolska-Kujawy Lowland: Biedrusko vic., military training ground [XU32], 30 V 2003, 1 ex. in pitfall trap in thick bushes *Pruno-Crataegetum*, leg. PS, coll. SK; Biskupice Ołoboczne [YT02], 10 V 1985, 1 ex., leg., coll. AM; Bydgoszcz-Stary Fordon [CD19], 8 VI 2014, 1 ex., on rotting plants, leg., coll., det. BP; Gołuchów [YT04], 26 V 1986, 1 ex., 30 V 1991, 29 exx., 1 V 1992, 1 ex., leg., coll. AM; Grodzisk Wielkopolski [WT98], 1910–1920, 7 exx., leg. Zemlerski, coll. NHC; Koło vic. [CC48], VIII 1991, 1 ex., cow excrement, leg. SCz, det., coll. AM; VIII 1989, 1 ex., leg TM, det., coll. AM; Kowal near Włocławek [CD72], 19 VII 1994, 2 exx., leg., coll. PJ; Lusowo [XU11], 25 VII 1998, 1 ex. in manure in the field, leg., coll. SK; Plewiska near Poznań [XU20], 26 IV 2008, 1 ex. leg., coll. SK; Poznań-Golęcin [XU21], 14 IV 1989, on carrion, leg., det. et coll. AMa; Poznań – Malta Zoo [XU30], 6 X 1993, 1 ex., leg., coll. PJ; Promno near Poznań [XU51], 14 IX 1997, 1 ex., leg., coll. PJ; Przedborów District [YT00], 12 VI 1995, 1 ex. scot pine forest in pitfall trap, leg. det. et coll. AMa; Osowo Stare near Szamotuły [XU13], 19–26 VI 1996, 1 ex., pitfall trap, leg. MBu, det., coll. AM; Owczary [VU71], 1 IX 1 ex., xerothermic flowering grassland, pitfall trap, leg. PS, det., coll. AM; Piła, Górne [XU19], 10 V 1999, 1 ex. in dung, leg., coll. RRu; Piła-Kalina vic. [XU28], 24 VI 2000, 1 ex. in birch sap, det. AM, leg., coll. RRu; Poznań-Morasko [XU31], 27 VII 1993, 1 ex., on the shore of the Pijany pond, in decaying plant remains, leg. PS, det., coll. AM; Sycyn Dolny [XU13], 25 V 1992, 1 ex. leg. MBu, det., coll. AMa; Trojanów [CC03], 15 VI 1985, 2 exx., cow excrement, leg. AM et SB, coll. AM; Włocławek [CD63], 26 VIII 2010, 1 ex., ex larva, imago 15 IX 2010, leg., coll. PJ; IX 2010, 1 ex., leg., coll. PJ

Mazovian Lowland: Bielany [DC99], 19 IX 1888, 1 ex., leg. WM, det. AM, coll. USM; Warszawa [EC08], 10 VI 1901, 1 ex., leg. WM, det. AM, coll. USM; Jabłonna [DD90], 4 VI 1893, 2 exx., leg. WM, det. AM, coll. USM; Rogów [DC24], 14 VI 1997, 1 ex. leg. et det. MS, coll. AMa; Warszawa-Kabaty [EC07], 16 IX 2018, 1 ex. under the rotting cabbage, leg., coll. JTD

Białowieża Primeval Forest: Białowieża [FD94], 1 VI 1994, 1 ex., leg. JMG, det., coll. AM; Białowieża, Hromadne [FD94], 19 VII 2000, 1 ex. in dung, det. AM, leg., coll. RRu; Grudki [FD94], 6 V 1993, 1 ex., leg., coll. AM

Podlasie: Białystok [FD48], 12 VIII 1995, leg. AL, det., coll. AM; Gołębiówka near Kałuszyn [EC68], 28 VIII 1963, leg. TPl, ex coll. AG, det. AM, coll. MNHW; Lubowierz [FC60], 30 VII 2014, 1 ex., meadow pitfall trap, leg. ŁN, coll. AM; Tyśmienica [FC21], 31 VII 2014, 1 ex., meadow pitfall trap, leg. ŁN, coll. AM

Lower Silesia: Burkatów [XS02], 10 V 1964, 1 ex., leg. TS, det. AM, coll. USM; Gogolin [BA89], 25 VIII 1924, 1 ex., leg. HN, det. AM, coll. USM; Ligota Otmuchów [XR59], 3 exx., leg. ED, det. AM, coll. USM; Wrocław-Swojczyce [XS46], 28 IV 1968, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW; Wrocław-Wojnów [XS56], 9 VI 1991, 1 ex. det. AM, leg., coll. MW; Zawiszów near Świdnica [XS03], 1 I 1951, 1 ex. leg. ex coll. AG, det. AM, coll. MNHW

Trzebnica Hills: Oborniki Śląskie [XS38], 12 VII 1958, 1 ex., leg. TS, det. AM, coll. USM

Upper Silesia: Brynek [CA39], 10 VI 2006 and 25 IV 2015, 2 exx., leg., coll. HS; Brynek-Park [CA39], 4 IX 2011 and 29 VI 2012, 2 exx., 3 VII 2017, 1 ex., leg., coll. HS; Bytom [CA57], VII 1910, 1 ex., 22 V 1912, 1 ex., leg. GR, 4 V 1924, 2 exx., 13 and 16 IV 1925, 4 exx., 21 IX 1927, 1 ex., 27 IV 1932, 1 ex., 4 IX 1934, 1 ex., 2 XII 1944, 1 ex., leg. FK, det. AM, coll. USM; Dąbrowa Górnicza [CA77], VII 1934, leg ST, det. AM, coll. USM; Świetej Anny Mt. [BA99], 22 IV 1924, 2 exx., leg. HN, det. AM, coll. USM; Komorzno near Wołczyn [BB96], 9 VIII 1951, 1 ex., leg., det. ex coll. AG, ver. AM, coll. MNHW; Konopiska vic. near Blachownia [CB62], 22 VI 2018, 1 ex., on the trunk of a cut birch, with leaking sap. Old mixed forest: pine, oak, birch, beech. Caught together with *Ontholestes haroldi*, leg., coll. TK; Lubliniec [CB31], 28 IV, 2 exx., 19 V 1994, 1 ex., 8 VI 1995, 1 ex., leg. RD, det. AM, coll. USM; 30 IV 1994, leg. RD, det., coll. AM; Łabędy [CA38], 8 VI 1926, 1 ex., leg. FK, det. AM, coll. USM; Połomia [CA39], 22 VIII 2011, 1 ex. and 5, 12 VI 2016, 3 exx., leg., coll. HS; nat. res. Segiet-buffer zone [CA48], 8 V 2010, 2 exx., leg., coll. HS; Strzelce Opolskie [CB00], 18 V 1927, 1 ex., leg. HN, det. AM, coll. USM; Szymiszów [CB00], 15 VII 1932, 1 ex., leg. HN, det. AM, coll. USM; Tarnowskie Góry [CA49], 2 VIII 1911, 1 ex., leg. GR, det. AM, coll. USM; Tworóg [CB30], 27 V 2017, 1ex., leg., coll. HS; Zabrze [CA47], 15 V 1914, 1 ex., leg. MK, det. AM, coll. USM

Kraków-Wieluń Upland: Cisie near Blachownia [CB52], 2 VI 2013, 2 exx. and 1 VI 2014, 1 ex., det. AM, leg., coll. ASl; Kraków-Las Wolski [DA14], 27 VIII 1949, 1 ex., leg., det. AG, ver. AM, coll. MNHW; Kraków [DA24], 7 VII 1902, 1 ex., leg. WM, det. AM, coll. USM; 21 IV 2014, 1 ex., leg., det. et coll. TW

Małopolska Upland: Grotniki [CC85], 6 VI 1999, leg. MM, det., coll. AM; Łask-Ostrów [CC71], 24 IV 2006, 3 exx., leg., coll. AK; Łódź-Lublinek [CC83], 26 VIII 1979, 2 exx. and 13 V 1981, 1 ex., det. AM, leg., coll. MW;

Pińczów-Skowronno [DA69], 10–15 V 1991, 4 exx., det., leg. LBo, coll. RRu; Skowronno nat. res. [DA69], 17–19 V 1991, 1 ex., leg. JKa, det., coll. AM; Włoszczowice near Kielce [DB71], 9 V 1991, 1 ex. det. AM, leg., coll. MW

Świętokrzyskie Mts.: Świętokrzyski NP: p.u. Dębno, for. comp. 100b, [DB93], 1 ex., 22 IV–5 V 2009, trap type IBL-2 "Trypodor", leg. LB & R. Matysek; p.u. Jastrzębi Dół, for. comp. 185b [DB93], 15–30 IX 2009, 1 ex., trap type IBL-2 "Trypodor", leg. LB & H. Bąk, p.u. Święty Krzyż, for. comp. 203a [DB93], 27 VII–17 VIII, 1 ex., trap type IBL-2 "Trypodor", leg. LB & P. Iwan, det., coll. AM

Lubelska Upland: Gródek near Hrubieszów [GB03], 7 VIII 1995, 1 ex. in cow excrement, leg. BS, coll. MCSU; Koczów [FB85], 3 VII, 1 ex. and 30 VII 2014 meadow pitfall trap, leg. AH/SS, coll. AM; Milejów [FB37], 15 IX 1987, 3 exx. in compost, leg. BS, coll. MCSU; nat. res. Skarpa Dobużańska near Łaszczów [FB90], 4 VII 2003, 1 ex. under the dry carrion of a magpie, leg., det. AM, coll. SK; Uhrusk [FB88], 6 V 1992, 1 ex. in horse droppings, leg. BS, coll. MCSU; Zakrzów [FB38], 5 IX 1991, 1 ex. in cow excrement, leg. BS., coll. MCSU

Roztocze: Czerkies [FB40], 15 VI 1990, 1 ex., det., leg. LBo, coll. RRu; Korhynie [FA78], 23 IV 1994, 1 ex. pitfall trap, leg. RR, coll MCSU; Krasnobród [FB50], 16–25 VI 1990, 1 ex., leg. LBo, coll. RRu; Zwierzyniec [FB41], 7 VI 1988, 1 ex., det., leg. LBo, coll. RRu

Sandomierska Lowland: Solska Forest, Borowiec [FA47], 15 VIII 1960, 1 ex., leg. WS, det. AM, coll. USM

Eastern Sudety Mts.: Śnieżnik Kłodzki [XR36], 21 IX 1926, 2 exx., leg. FK, det. AM, coll. USM

Western Beskid Mts.: Beskid Mały, Kocoń [CA80], 9 VI 2013, 1 ex., 7 IX 2013, 1 ex., 19 VIII 2013, 1 ex., 28 X 2013, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa; Beskid Żywiecki, Hala Boracza [CV69], 29 V 2011, 1 ex., 28 VI 2011, 1 ex., 19 VIII 2011, 1 ex., 12 V 2012, 1 ex., 22 V 2012, 1 ex., 5 VII 2012, 3 exx., 16 VIII 2012, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa; Żabnica [CV69], 12 V 2012, 1 ex., 18 VI 2012, 1 ex., 16 VIII 2012, 5 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Przełęcz Krowiarki [CV99], 10 V 2011, 1 ex., 9 VI 2012, 5 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Kamesznica [CV59], 9 X 2011, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa; Gorce, Lubomierz [DV49], 9 V 2012, 3 exx., 10 IX 2012, 9 exx., 29 IX 2012, 1 ex., 15 X 2012, 2 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Kamienica [DV59], 8 VI 2011, 3 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Przehyba [DV77], 10 IX 2012, 1 ex., 29 IX 2012, 1 ex., 15 X 2012, 2 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Gaboń [DV68], 8 VI 2011, 9 exx., 27 IX 2011, 1 ex., 14 X 2011, 1 ex. in cow faeces, leg. AGo, det., coll. AMa; Beskid Sądecki, Gołkowice Dolne [DV68], 9 VI 2011, 28 exx., 10 VII 2011, 5 exx., 10 IX 2012, 8 exx., 16 VI 2013, 3 exx., 5 VII 2013,

2 exx., 9 VIII 2013, 1 ex., 1 X 2013, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Naszacowiece [DV69], 9 V 2012, 5 exx., 27 VI 2012, 10 exx., 6 VII 2012, 6 exx., 29 VII 2012, 2 exx., 10 IX 2012, 3 exx. in sheep droppings and cow's faeces, leg. AGo, det. et coll AMa; Rytro [DV78], 20 V 2013, 9 exx., 16 VI 2013, 18 exx., 5 VII 2013, 12 exx., 9 VIII 2013, 7 exx., 1 X 2013, 3 exx. in sheep droppings, leg. AGo, det., coll. AMa; Uhryń [DV87], 18 V 2011, 5 exx., 10 IX 2012, 5 exx. in sheep droppings and cow's faeces, leg. AGo, det., coll. AMa; Foothillse Ciężkowskie, Polichty [DA91], 26 V 2011, 6 exx., 16 VII 2011, 1 ex., 11 IX 2011, 3 exx., 22 V 2012, 7 exx., 10 VI 2012, 15 exx., 27 VI 2012, 8 exx., 19 VII 2012, 23 exx., 10 VIII 2012, 3 exx. in cow's face, leg. AGo. det. et coll. AMa; Pleśna [DA93], 4 VI 2011, 12 exx., 30 VII 2011, 1 ex., 11 VIII 2011, 1 ex., 11 IX 2011, 6 exx., 23 IX 2011, 4 exx., 10 VI 2012, 3 exx., 11 VI 2012, 2 exx., 19 VII 2012, 16 exx. in cow's faeces, leg. AGo, det., coll. AMa; Tarnowiec [EA40], 19 VIII 2013, 1 ex., 7 IX 2013, 4 exx., in excrement pitfall trap, leg. AGo, det. et coll. AMa; Łopień Mt.-Myconiówka Glade [DA40], 19 V 2011, 1 ex., leg., det. et coll. TW; Wierchomla Mała [DV87], 18 VIII 2010, 1 ex., leg., det. et coll. TW; Wisła-Czarne [CV59], 27 VIII 2011, 1 ex., leg., coll. HS

Eastern Beskid Mts.: Beskid Niski, Krempna [EV38]; 14 VII 2011, 25 exx., 17 VIII 2011, 17 exx., 3 IX 2011, 5 exx., 21 IX 2011, 3 exx. *Arrhenatheretum alatioris*, in cow faeces, leg. AGo, det., coll. AMa; Ciechań [EV37], 21 V 2011, 6 exx., 18 VI 2011, 4 exx., 5 VII 2012, 1 ex., 13 IX 2012, 3 exx., 3 VII 2013, 7 exx., 30 VIII 2013, 5 exx., 17 IX 2013, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Rozstajne [EV38], 18 VI 2011, 1 ex., 3 VIII 2011, 1 ex., 17 VIII 2011, 7 exx., 5 X 2011, 2 exx., 27 V 2012, 22 exx., 8 VI 2012, 5 exx., 24 VIII 2012, 3 exx. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Nieznajowa [EV28], 13 VI 2013, 2 exx., 30 VIII 2013, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Korczyna near Krosno [EA50], X 1954, 1 ex. leg. AG, det. AM, coll. MNHW; Krosno [EA50], IX 1953, 1 ex. leg. ex coll. AG, det. AM, coll. MNHW; Pacław vic. [FV29], 15 VI 2012, 1 ex. on the meadow, in cow excrement, det. AM, leg., coll. TO; Siedliska [EA63], 5 V 1995, 1 ex. beech forest-litter, leg. BS, coll. MCSU; Pogórze Centralnobeskidzkie, Stasiówka [EA34], 13 VII 2011, 2 exx., 17 VIII 2011, 4 exx., 3 IX 2011, 3 exx., 21 IX 2011, 1 ex. in cow's faeces, leg. AGo, det. et coll. AMa; Góry Słonne, Paszowa [FV08], 31 VII 2011, 3 exx., 16 VIII 2011, 2 ex. in cow's faeces, leg. AGo, det., coll. AMa; Stefkowa [FV07], 23 VII 2011, 4 exx., 9 IX 2011, 2 exx. *Arrhenatheretum alatioris*, in cow's faeces, leg. AGo., det. et coll. AMa; Góry Sanocko-Turczyńskie, Serednica [FV08], 16 VII 2011, 3 exx., 23 VII 2011, 3 exx., 31 VII 2011, 7 exx., 23 VIII 2011, 5 exx., 2 IX 2011, 3 exx. *Arrhenatheretum alatioris*, in cow's faeces, leg. AGo., det. et coll. AMa; Krasiczyn District: Bełwin for. distr. [FA12], 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Prałkowce for. distr. [FA11], 16 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Bieszczady Mts.: Brzegi Górne [FV14], 28 V 2012, 1 ex., 25 VIII 2012, 1 ex., in excrement pitfall trap, leg. AGo, det., coll. AMa; Cisna [EV95], 10 V 2013, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Kalnica [FV04], 13 V 2011, 1 ex., 1 VI 2011, 3 exx., 15 VII 2011, 10 exx. *Arrhenatheretum alatioris*, in sheep droppings and cow faeces, leg. AGo, det. et coll. AMa; Łopienka [EV95], 10 V 2013, 5 exx., 20 V 2013, 3 exx., 10 VIII 2013, 5 exx., 18 X 2013, 7 exx., in excrement pitfall trap, leg. AGo, det. et coll. AMa; Tarnawa [FV34], 24 VI 2011, 1 ex. *Arrhenatheretum alatioris*, in horse excrement, leg. AGo, det et coll. AMa; Michniowiec [FV26], 3 VII 2013, 3 exx. in excrement pitfall trap, leg. AGo, det. et coll. AMa; trail Wołosate-Tarnica [FV23], 28 V 2014, from Wołosate to 1200 m, 1 ex., leg., PJ

Pieniny Mts.: Biała Woda [DV67], 15 VIII 3013, 3 exx. in sheep dropping and cow faeces, leg. AGo, det. et coll. AMa; Sromowce Niżne [DV57], 16 VIII 2012, 2 exx. 28 IX 2012, 3 ex. in sheep droppings, leg. AGo, det. et coll. AMa, 16 V 1994, Dunajec gravel pit, leg. det. et coll. AMa

Tatry Mts.: Kocioł Mułowy [DV25], 18 VIII 2012, 1 ex. leg. AGo, det., coll AMa; Kuźnice [DV 25], 15 VIII 2013, 2 exx., 5 IX 2013, 6 exx. in cow faeces, leg. AGo, det., coll. AMa; Upłazińska Kopa [DV25], 9 IX 2012, 5 exx., 18 X 2012, 8 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Skupniów Upłaz [DV25], 5 IX 2013, 7 exx., leg. AGo, det., coll. AMa; Zakopane [DV25], 15 VIII 2013, 1 ex., Kasprowy Wierch [DV25],15 VIII 2013, 1 ex leg. AGo, det. et coll. AMa

Previously recorded from:

Baltic Coast: Koszalin (Lüllwitz, 1916), Słowiński NP – Łebska Spit (Smoleński, 2000a; 2000b)

Pomeranian Lake District: Bielinek (Zumpt, 1931), Wierzchlas nat. res. (Błażejewski, 1956), Rzeczyca (Gutowski & Ruta, 2004), Kurze Grzędy nat. res. (Ciechanowski *et* al., 2009), Kuźnickie Lakes vic. (Ruta, 2009)

Masurian Lake District: Borecka Forest (Melke & Maciejewski, 1999), Olsztyn vic. (Komosiński, 2001a), Biebrzański NP (Gutowski *et* al., 2006), Piska Forest (Gutowski *et* al., 2010)

Wielkopolska-Kujawy Lowland: Lusowo (Konwerski & Melke, 2000), Skwierzyna vic. (Renner & Messutat, 2007), Biedrusko (Matuszewski *et* al., 2008), records without exact data (Uechtritz, 1844; Letzner, 1871; 1886; Szulczewski, 1922; Myrdzik, 1933), Skwierzyna (Arnold, 1936)

Mazowian Lowland: Warszawa-Bielany (Szujecki, 1968), Ostrów Mazowiecka (Burakowski *et* al., 1980), Kampinoski NP (Mazur S. *et* al., 2010)

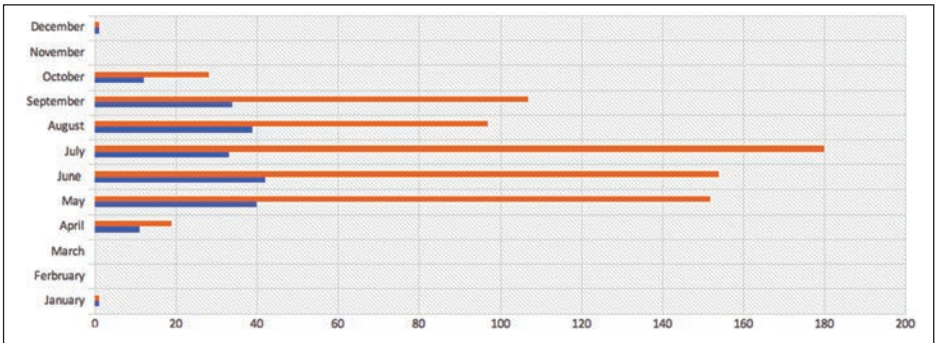
Podlasie: Kopna Góra near Supraśl (Kubisz & Szwałko, 1991), Sobibór Distr. (Tylkowski, 2014)

Białowieża Primeval Forest: Białowieża (Kubisz & Szwałko, 1991), Derunkov & Melke; 2001, Białowieża NP (Smoleński & Szujecki, 2001; Smoleński *et* al., 2004; Smoleński, 2006)
Lower Silesia: Muszkowicki Las Bukowy nat. res. (Mazur A., 2000a), records without exact data (Letzner, 1871; 1886)
Trzebnica Hills: records without exact data (Letzner, 1871; 1886)
Upper Silesia: records without exact data (Kelch, 1846; Roger, 1856; Letzner, 1871; 1886; Lgocki, 1908; Stefek, 1939)
Kraków-Wieluń Upland: Ojcowski NP and vic. (Pawłowski *et* al., 1994), Częstochowa, Konopiska (Kościelny, 2006), Częstochowa-Dźbów (Klasiński, 2013), records without exact data (Kotula, 1873; Lgocki, 1908)
Małopolska Upland: Pabianice vic. (Eichler W., 1929)
Lubelska Upland: Poleski NP – Bagno Bubnów, Zaułcze Stare (Staniec, 2010)
Roztocze: Panasówka and Florianka – Zamość Province (Tenenbaum, 1913)
Western Sudety Mts.: records without exact data (Letzner, 1871; 1886)
Eastern Sudety Mts.: records without exact data (Letzner, 1871; 1886)
Western Beskid Mts.: Babia Góra Mt. (Pawłowski & Szujecki, 1966; Pawłowski, 1967), Little Beskid Mts. (Paśnik, 1998), Babia Góra Massif (Kubisz & Szafraniec, 2003), records without exact data (Kotula, 1873; Stobiecki, 1883; Letzner, 1886)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929), Borek Stary near Rzeszów (Konieczna *et* al., 2012)
Bieszczady Mts.: Szujecki, 1996, Pawłowski *et* al., 2000
Pieniny Mts.: Ociemne (Mroczkowski, 1978)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Kulwieć, 1907; Łomnicki, 1913; Szujecki, 1980; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015), Prussia (Siebold, 1847; Lentz, 1857), Silesia (Weigel, 1806; Reitter, 1870b; Letzner, 1886; Gerhardt, 1910a; Kuhnt, 1912), Galicia (Łomnicki, 1884; 1886), Western Galicia (Nowicki, 1873), Carpathians (Nowicki, 1865; 1873); Krakow Province (Juszczyk, 1950).

Phenology and development. Beetles are found from the very beginning of spring until late autumn (from February to November). Analysis of faunistic data from Poland confirms this statement – no individuals were observed only in February and March as well as November. In contrast, single beetles were met in December and January. The highest number of observations of *O. murinus* is reported in June, while the greatest number of beetles was caught in July; on average 3.56 individuals were caught during a single observation (**Fig. 6.36**).

Results of studies conducted by Dekeirsschieter *et* al. (2013) indicate that *O. murinus* among Staphylinidae appearing on carrion in forest habitats is a typical spring species.



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	1	0	0	19	152	154	180	97	107	28	0	1
Number of records	1	0	0	11	40	42	33	39	34	12	0	1

Fig. 6.36. Frequency of *Ontholestes murinus* (L., 1758) in localities in Poland

A description of larval forms was presented by Paulian (1941). The pupation manner and site were described by Staniec (2004b).

Ontholestes tessellatus (Geoffroy, 1785)

General distribution. A trans-Palearctic species (Schillhammer, 2012) with a slightly narrower distribution than *O. murinus*. It inhabits the northern part of the Palearctic. In Europe it has been reported over the entire northern part of the continent, it is not found in the Mediterranean, while in the south it reaches the Pyrenees, northern Italy and the Balkans. In the east it is found in Ukraine, the Middle East, Siberia, Mongolia and northern China (Horion, 1965; Burakowski *et* al., 1980; Herman, 2001; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Ferreira, 2018).

Habitat preferences. It is found in the lowlands and in the mountains reaching the subalpine zone (Horion, 1965; Zanetti, 2015), where it inhabits both woodland and open areas – fields and meadows. To a greater extent than *O. murinus* it prefers forest habitats (Kočárek, 2003; Konieczna *et* al., 2012). Beetles stay in drying excrements, dung, manure heaps, on carrion as well as rotting mushrooms and decaying plants. There they hunt for flies and their larvae as well as coprophilous beetles. The greatest activity of *Ontholestes* hunting flies was recorded on excrement in the first 2–2.5 of feces drying (Psarev, 2002).

Ontholestes tessellatus was observed on fruiting bodies of giant polypore (*Meripilus giganteus* (Pers.) P. Karst.), which is one of the largest bracket fungi (Chachuła *et* al., 2019).

Occurrence in Poland. Ontholestes tessellatus (Polish szaroń, after Szujecki, 2017) in Poland is found throughout the country (**Fig. 6.37**).

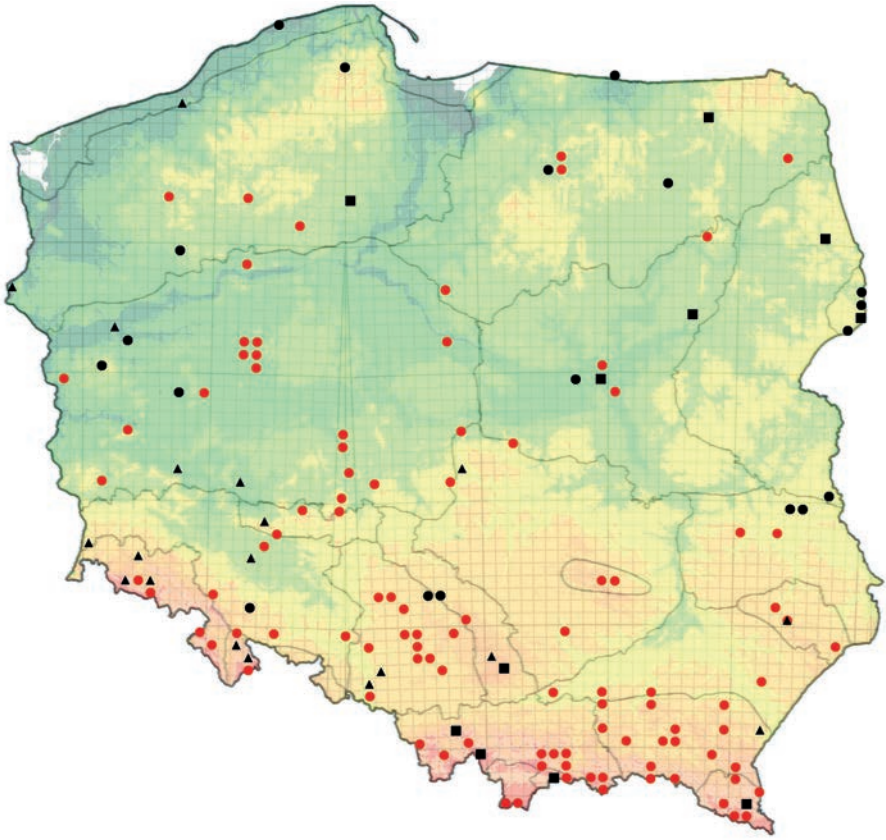


Fig. 6.37. Distribution of *Ontholestes tessellatus* (Geoffr., 1785) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

New records

Pomeranian Lake District: Okonek [XV23], 8 V 2003, 2 exx. On dried carrion, leg., det., coll. MAr; Zakrzewska Osada [XV61], IX 2012, 2 exx. and V 2013, 3 exx., the pitfall trap, leg., coll. DJT; Złocieniec [WV63], 25 VII 2016, 3 exx. in a composter, leg., coll. KR

Masurian Lake District: Augustów [FE36], 27 V 1980, 1 ex., leg. Jankowicz A., coll. HS; Dorotowo vic. [DE65], 4 VIII–17 IX 1999, 1 ex., wet meadow, bait trap (fish), leg., coll. KK; Dywity vic. [DE66], 26 VII–1 IX 1999 oak forest on the Wadąg River, a bait trap (fish), leg., coll. KK; Naglady vic. [DE55], 25 VII–29 VIII 1998, 1 ex., pine forest, bait trap (fish), leg., coll. KK; Olsztyn vic. (Kudypy Distr.) [DE55], 20 VII 2010, 1 ex., in a rotting mushroom, leg.,

coll. KK; Słupy ad Olsztyn [DE66], 28 VII 1997, 2 exx. on mushrooms, leg. MS, det. et coll. AMa; Kisielnica [EE70], 6 IX 2018, 1 ex. on the cow feces, leg., coll. JTD

Wielkopolska-Kujawy Lowland: Biedrusko vic., military training ground [XU22], 26 IV 1998, 1 ex. on the side of the road, leg., coll. SK; Brzeziny near Godziesze [CC11], 3 V 1987, 1 ex., leg. PSz, det., coll. AM; Gołuchów [YT04], 1 V 1992, 2 exx., 12 IV 1991, 4 exx., 25 X 1982, 2 exx., leg., coll. AM; Gołuchów vic. [YT05], 4 IX 1991, 3 exx., park-arboretum, leg., coll. AM; Grodzisk Wielkopolski [WT98], 1910–1920, leg. Zemlerski, coll. NHC; Kowal near Włocławek [CD72], 19 VII 1994., 1 ex., leg., coll. PJ; Masanów [BC92], 21 IV 1983, 1 ex. on the asphalt road, leg., coll. AM; Murowana Goślina-Potasze [XU32], 19 V 1989, 2 exx. in manure, leg., det. et coll. AMa; Piła-Kalina vic. [XU28], 24 VI 2000, 1 ex. in birch sap, det. AM, leg., coll. RRu; Poznań [XU31], 4 IX 1975, 1 ex. in rotting plants, leg. LB, leg., coll. AM; Poznań – Cytadela [XU30], 30 IV 1993, 1 ex. leg. PS, det., coll. AMa; Poznań-Darzybór [XU30], 12 V 1969, 2 exx., leg. ASz, coll. NHC; Poznań-Golęcin [XU21], 14 IV 1989, 1 ex. on carrion, leg., det. et coll. AMa; Przedborów District [YT00], 21 VIII 1995, 1 ex. scot pine forest in pitfall trap, leg. det. et coll. AMa; Rzepin [VT89], 27 V 1971, 1 ex. leg. PSt, det. et coll. AMa; Wymyślin near Włocławek [CD76], 17 VIII 1993, 3 exx., 16 VIII 1993, 1 ex., leg., coll. PJ; Zielona Góra – osiedle Forest [WT35], 16 V 2013, 1 ex. leg., coll. RO; Żary [WT11], 21 V 1973, 1 ex. to light, leg. PSt, det. et coll. AMa

Mazowiecka Lowland: Warszawa [EC08], 5 X 1889, 1 ex., leg. WM, det. AM, coll. USM; Jabłonna [DD90], 5 IX 1968, 1 ex., leg. MB, 20 VII 1970, 1 ex., leg. JC, det. AM, coll. USM

Białowieża Primeval Forest: Grudki [FD94], 6 V 1993, 2 exx. with sap leaking from the hornbeam trunk, leg., coll. AM

Lower Silesia: Bardo Ślaskie [XR29], 15 V 1928, 1 ex., leg. FK, det. AM, coll. USM; Borowa Oleśnicka [XS57], 14 IX 1969, 2 exx. det. AM, leg. ex. coll. AG, coll. MNHW; Gogolin [BA89], 10 V 1927, 1 ex., leg. HN, det. AM, coll. USM; Ligota Otmuchowska [XR59], 15 VII 1929, 4 exx., leg. ED, det. AM, coll. USM; Wieruszów near Świdnica [XS02], 23 IX 1960, 1 ex., 23 IX 1961, 2 exx., leg. TS, det. AM, coll. USM; Wrocław-Swojczyce [XS46], 26 IX 1949, 1 ex. leg., det. ex coll. AG, ver. AM, coll. MNHW; 28 IV 1968, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW

Trzebnica Hills: Twardogóra [XS79], 10 IX 1989, 1 ex., leg., coll. AM

Upper Silesia: Boruszowice [CA49], 18 IV 2000, 1 ex. leg., coll. HS; Brynek – park [CA39], 2 V 2016, 1 ex., leg., coll. HS; Bytom [CA57], VIII 1910, 1 ex., 5 V 1911, 1 ex., leg. GR, 20 V 1924, 1 ex., 10 V 1925, 2 exx., 10 VII 1931, 1 ex., leg. FK, 15 V 1984, 1 ex., leg. HD, det. AM, coll. USM; Dąbrowa Mysłowicka [CA66], 1 XI 1926, 4 exx., leg. FK and HN, det. AM, coll.

USM; Dobrodzień [CB12], 17 V 1974, 1 ex., leg. MB, det. AM, coll. USM; Gwoździany [CB22], 2 VII 1961, 2 exx., leg. LS, det. AM, coll. USM; Ligota Tworkowska [CA04], 26 IX 1948, 1 ex., leg. WY, det. AM, coll. USM; Lubliniec [CB31], 28 IV 1994, 1 ex., 25 V 1996, 1 ex., leg. RD, det. AM, coll. USM; Łaziska [CA04], V 1924, 1 ex., leg. WY, det. AM, coll. USM; Murcki [CA66], 6 VI 1928, 1 ex., leg. FK, det. AM, coll. USM; Pogrzebień [CA04], 18 IX 1932, 1 ex., leg. WY, det. AM, coll. USM; Połomia [CA39], 27 V 2015, 2 exx., leg., coll. HS; Pyrzowice [CA79], 11 VII 1991, 1 ex., leg. anonim, det. AM, coll. USM; Rozberk [CA48], 4 XI 1926, 2 exx., leg. FK, det. AM, coll. USM; Sławęcice [CA08], 15 V 1926, 1 ex., leg. HN, det. AM, coll. USM; Zabrze [CA47], 15 V 1914 and 2 V 1915, 3 exx., leg. MK, det. AM, coll. USM

Kraków-Wieluń Upland: Cisie near Blachownia [CB52], 19 V 2013, 2 exx., det. AM, leg., coll. ASl; Myszków [CB80], IX 1936, 4 exx., leg. ST, det. AM, coll. USM

Małopolska Upland: Grotniki [CC85], 17 IX 1997, 1 ex., leg. MM, det., coll. AM; Łask-Ostrów [CC71], 16 IV 2007, 6 exx., leg., coll. AK; Olszyna near Ostrzeszów [YS09], 22 IV 2000, 1 ex., leg., coll. AM; Pińczów-Skowronno [DA69], 10–15 V 1991, 3 exx., det., leg. LBo, coll. RRu; Skowronno nat. res. [DA69], 17–19 V 1991, 1 ex., leg. JKa, det., coll. AM; Rogów [DC24], 6 IX 2014, 1 ex., leg., coll. DJT

Świętokrzyskie Mts.: Świętokrzyski NP, p.u. Święta Katarzyna, for. comp. 195d [DB93], 12 V–25 VIII 2009, 1 ex. into a woodworm trap "Trypodor", det. AM, leg. LB & Sz. Rak, coll. LK; Świętokrzyski NP, Łysa Mt. [EB03], 3–16 X 2008, 3 exx., pitfall trap in *Abietetum polonicum*, leg. K. Dąbrowicz, coll. SK

Lubelska Upland: Klarów near Milejów [FB37], 21 IX 1984, 1 ex. in the deciduous forest, leg. BS, coll. MCSU; Lublin [FB07], 12 V 1997, 1 ex. in compost, leg. BS, coll. MCSU

Roztocze: Czerkies [FB40], 15 VI 1990, 1 ex., det., leg. LBo, coll. RRu; Jarczów [FA88], 20 VIII 1984, 1 ex., leg. RR., coll. MCSU; Kawęczynek [FB31], 23 VIII 2013, 1 ex., leg., det. et coll. TW

Sandomierska Lowland: Braciejowa [EA33], 30 IV 2005, 1 ex., det. AM, leg., coll. AT; Dębica [EA34], 19 V 2004, 1 ex., det. AM, leg., coll. AT; Niepołomicka Forest [DA54], 16 VII 2002, 1 ex. on carrion, leg., coll. TK, det. AMa; Radawa [FA25], 1–10 VI 1989, 2 exx., det. AM, leg., coll. JM; Tarnów [DA94], V 1931, 1 ex., leg. ST, det. AM, coll. USM

Western Sudety Mts.: Karkonosze – Podgórzyn Dolny [WS43], 23 VII 1995, 1 ex. in manure, 17 IX 1997, 1 ex. in cow faeces, leg., det. et coll. AMa; Karkonosze NP – Grzybowiec Mt. [WS43], 1 V 2002, in dropping of red deer, leg., det. et coll. AMa; Karkonosze NP – Przełęcz Okraj [WS52], 20 VI 1990, 4 exx. in manure, leg., det. et coll. AMa; Karkonosze NP – Śnieżka Mt. [WS52], 7 VIII 1979, leg. PSt, det. et coll. AMa; Stołowe Mts., Karłów

[WR99], 20 V 1976, 1 ex., det., leg. LBo, coll. RRu; Stołowe Mts. NP, Ostra Mt. [WR99], 7 VIII 1982, 1 ex., leg., coll. AM

Eastern Sudety Mts.: Kletno [XR36], 18 VIII 1975, 1 ex., det., leg. LBo, coll. RRu; Polanica Zdrój [XR08], IV 1940, 1 ex., leg. anonim, det. AM, coll. USM

Western Beskid Mts.: Hala Boracza [CV69], 23 V 2011, 2 exx., 29 V 2011, 1 ex., 28 VI 2011, 1 ex., 19 VIII 2011, 4 exx., 20 IX 2011, 4 exx., 12 V 2012, 18 exx., 22 V 2012, 5 exx., 12 VI 2012, 2 exx., 19 VI 2012, 1 ex., 25 VI 2012, 2 exx., 16 VIII 2012, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa; Żabnica [CV69], 12 V 2012, 1 ex., 22 V 2012, 3 exx., 18 VI 2012, 1 ex., 16 VIII 2012, 6 exx., in excrement pitfall trap, leg. AGo, det., coll. AMa; Kocoń [CA80], 18 V 2013, 2 exx., 9 VI 2013, 3 exx., 23 VI 2013, 6 exx., 27 VII 2013, 4 exx., 7 IX 2013, 2 exx., 28 X 2013, 3 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Przełęcz Krowiarki [CV99], 18 IX 2012, 3 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Lubomierz [DV49], 29 IX 2012, 3 exx., 15 X 2012, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa; Kamienica [DV59], 8 VI 2011, 3 exx., 9 IX 2011, 2 exx., 14 X 2011, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa; Gaboń [DV68], 8 VI 2011, 2 exx. in cow's faeces, leg. AGo, det., coll. AMa; Gołkowice Dolne [DV68], 9 VI 2011, 3 exx., 10 IX 2012, 2 exx., 5 VII 2013, 1 ex., 9 VIII 2013, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Naszacowiece [DV69], 9 V 2012, 1 ex., 27 VI 2012, 5 exx., 6 VII 2012, 7 exx., 10 IX 2012, 4 exx., 29 IX 2012, 2 exx. in sheep droppings and cow faeces, leg. AGo, det. et coll AMa; Uhryń [DV87], 18 V 2011, 3 exx., 8 VII 2012, 2 exx., 10 IX 2012, 2 exx., 29 IX 2012, 3 exx. in sheep droppings and cow's faeces, leg. AGo, det., coll. AMa; Polichty [DA91], 26 V 2011, 4 exx., 16 VII 2011, 3 exx., 30 VII 2011, 2 exx., 11 IX 2011, 9 exx., 23 IX 2011, 2 exx., 22 V 2012, 3 exx., 10 VI 2012, 5 exx., 27 VI 2012, 3 exx., 19 VII 2012, 2 exx., 10 VIII 2012, 2 exx. in cow's face, leg. AGo. det. et coll. AMa; Pleśna [DA93], 4 VI 2011, 2 exx., 11 IX 2011, 3 exx., 10 VI 2012, 9 exx., 19 VII 2012, 4 exx., 16 IX 2012, 2 exx., 25 X 2012, 1 ex. in cow's faeces, leg. AGo, det., coll. AMa; Krynica Zdrój, Czarnego Creek Valley [DV97], 15 VIII 1991, 2 exx., leg., coll. AM; Las Lipowy Obrożyska nat. res. near Muszyna Zdrój [DV96], 22 VIII 1997, 1 ex. on mushrooms hat, leg., coll. AM; Ochotnica Górna [DV48], 15 VII 2011, 1 ex., leg., det. et coll. TW; Wisła [CA40], V 1935, 3 exx., leg. ST, det. AM, coll. USM

Eastern Beskid Mts.: Barwinek [EV57], 13 II 2013, 1 ex., det. AM, leg., coll. JM; Biecz [EA10], 12 V 1944, 1 ex., leg. anonim, det. AM, coll. USM; Broduszurki nat. res. [EA91], 25 IX 2011, on the ground, det. AM, leg., coll. TO; Czarnorzeki [EA51], VII 1950, 4 exx., leg. ex coll. AG, det. AM, coll. MNHW; Korczyna near Krosno [EA50], 1 V 1955, 1 ex., leg. ex coll.

AG, det. AM, coll. MNHW; Krosno [EA50], VI 1953, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW; Sanok-Olchowce vic., [EV89], 5 VII 2012, 1 ex., leg. det. et coll. DT; Tarnowiec [EA40], 7 IX 2013, 4 exx., 31 X 2013, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa; Kąty [EV38], 21 IX 2011, 3 exx., 28 VII 2012, 1 ex. in cow's faeces, leg. AGo., det. et coll. AMa; Ciechań [EV37], 21 V 2011, 2 exx., 18 VI 2011, 1 ex., 4 X 2012, 1 ex., 30 VIII 2013, 5 exx., 17 IX 2013, 2 exx. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Rozstajne [EV38], 17 VIII 2011, 3 exx., 21 IX 2011, 1 ex., 5 X 2011, 1 ex., 27 V 2012, 2 exx., 24 VIII 2012, 1 ex. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Stasiówka [EA34], 3 IX 2011: 4 exx., 21 IX 2011, 3 exx. in cow faeces, leg. AGo, det. et coll. AMa; Paszowa [FV08], 9 IX 2011, 1 ex. in cow faeces, leg. AGo, det., coll. AMa; Serednica [FV08], 23 VIII 2011, 2 exx., 2 IX 2011, 2 exx., 19 IX 2011, 2 exx. *Arrhenatheretum alatioris*, in cow faeces, leg. AGo., det. et coll. AMa; Stefkowa [FV07], 23 VII 2011, 2 exx., 9 IX 2011, 1 ex., 19 IX 2011, 1 ex. *Arrhenatheretum alatioris*, in cow faeces, leg. AGo., det. et coll. AMa; Michniowiec [FV26], 3 VII 2013, 3 exx. in cow faeces, leg. AGo, det. et coll. AMa; Kańczuga District, Tarnawka for. distr. [EA93], 31 VIII 1984, on the ground, det. AM, leg., coll. TO

Bieszczady Mts.: Kalnica [FV04], 13 V 2011, 3 exx., 15 VII 2011, 5 exx. *Arrhenatheretum alatioris*, in sheep droppings and cow faeces, leg. AGo, det. et coll. AMa; Łopienka [EV95], 201 V 2013, 1 ex., 10 VIII 2013, 2 exx., 18 IX 2013, 2 exx. in excrement pitfall trap, leg. AGo, det. et coll. AMa; Brzegi Górne [FV14], 19 VI 2012, 1 ex., 6 VII 2012, 2 exx., 4 X 2012, 2 exx., 15 V 2013, 3 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Jabłonki [EV95], 8 V 1896, 1 ex., leg. WM, det. AM, coll. USM

Pieniny Mts.: Pieniński NP [DV57], 1 VI 1991, 1 ex., leg. RD, det. AM, coll. USM; Sromowce Wyżne [DV57], 2 VII 1994, 1 ex. leg., coll. MAr, det. AMa; Czerniawa [DV57], 30 VII 2017 in *Boletus reticulatus*, 1 ex.; Harczygrunt [DV57], 7 VIII 2017, 2 exx. in *Lactarius piperatus*; Wielka Dolina [DV57], 25 X 2017 in *Meripilus giganteus*, 1 ex. leg. PCh, leg. AM, coll. AM et PNP; Biała Woda [DV67], 15 VIII 2013, 2 exx. in sheep dropping and cow faeces, leg. AGo, det. et coll. AMa

Tatry Mts.: Kuźnice [DV25], 5 IX 2013, 3 exx. in cow faeces, leg. AGo, det., coll. AMa; Upłazińska Kopa [DV25], 18 X 2012, 6 exx. in excrement pitfall trap, leg. AGo, det., coll. AMa; Dolina Kościeliska [DV15], 1 VI 1965, leg. M. Gałuszka, det., coll. AN; 29 IX 2011, 1 ex., 16 X 2011, 3 exx. in sheep droppings, leg. AGo, det., coll. AMa; Skupniów Upłaz [DV25], 5 IX 2013, 1 ex., leg. AGo, det., coll. AMa

Previously recorded from:

Baltic Coast: Koszalin (Lüllwitz, 1916), Trójmiejski Landscape Park, Gdańsk vic. (Konopko & Wilga, 2014)
Pomeranian Lake District: Szczecin vic. (Dohrn, 1878), Wierzchlas nat. res. (Błażejewski, 1956), Człuchowska Forest (Szujecki, 1995), Kuźnickie Lakes vic. (Ruta, 2009)
Masurian Lake District: (Albien, 1905; Szujecki, 1967), Borecka Forest (Melke & Maciejewski, 1999), Olsztyn vic. (Komosiński, 2001a), Olsztyn and Olsztyńskie Lake District (Komosiński, 2004b), Piska Forest (Gutowski *et* al., 2010)
Wielkopolska-Kujawy Lowland: Wielkopolski NP (Podbylski & Nowosad, 2001; Stanoch-Podbylska & Nowosad, 2001), Biedrusko (Matuszewski *et* al., 2008), Kuźnik nat. res. (Ruta & Melke, 2011), records without exact data (Letzner, 1871; 1886; Albien, 1905; Koerth, 1916; Szulczewski, 1922)
Mazowian Lowland: Warszawa (Szujecki, 1968), Kampinoski NP – Czerwińskie Góry nat. res. (Kubisz *et* al., 2000), Kampinoski NP (Mazur S. *et* al., 2010)
Białowieża Primeval Forest: Białowieża NP (Smoleński & Szujecki, 2001; Smoleński *et* al., 2004; Smoleński, 2006), records without exact data (Karpiński, 1949; Derunkov & Melke, 2001)
Lower Silesia: Ziębice Śląskie (Smoleński 1996b), Muszkowicki Las Bukowy nat. res. (Mazur A., 2000a), Glogau (Głogów), Breslau (Wrocław; Letzner, 1871; 1886)
Trzebnica Hills: records without exact data (Letzner, 1871; 1886)
Upper Silesia: Rauden (Rudy; Kelch, 1846; Roger, 1856; Letzner, 1871; 1886; Stefek, 1939)
Kraków-Wieluń Upland: Ojcowski NP and vic. (Pawłowski *et* al., 1994), Kokocówka Mt., Konopiska, Kręciwilk (Kościelny, 2006), Złoty Potok (Słabikowski, 2006), Częstochowa-Dźbów (Klasiński, 2013), records without exact data (Jabłoński, 1869; Łomnicki, 1886; Lgocki, 1908; Eichler, 1914; Mroczkowski, 1950)
Małopolska Upland: Pabianice (Eichler W., 1929)
Świętokrzyskie Mts.: Burakowski *et* al., 1980, Świętokrzyski NP – Dębno for. distr. (Mokrzycki, 2007; 2011)
Roztocze: records without exact data (Tenenbaum, 1913)
Sandomierska Lowland: Tarnów vic. (Viertl, 1872)
Western Sudety Mts.: Karkonoski NP (Mazur A., 1993a; 1998), Hischberger Tal (Kotlina Jeleniogórska), Görlitz (Zgorzelec) (Letzner, 1871; 1886)
Eastern Sudety Mts.: Grafschft Glatz (Ziemia Kłodzka; Letzner, 1871; 1886)
Western Beskid Mts.: Babia Góra Mt. (Pawłowski, 1967), Little Beskid Mts. (Paśnik, 1998); Babia Góra Massif (Kubisz & Szafraniec, 2003), records

without exact data (Wachtl, 1870; Kotula, 1874; Stobiecki, 1883; Letzner, 1886; Stefek, 1939)

Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929), Rzeszów-Zalesie (Konieczna *et* al., 2013), Bednarka, Libusza (Taszakowski *et* al., 2018)

Bieszczady Mts.: Szujecki, 1996; Pawłowski, *et* al., 2000

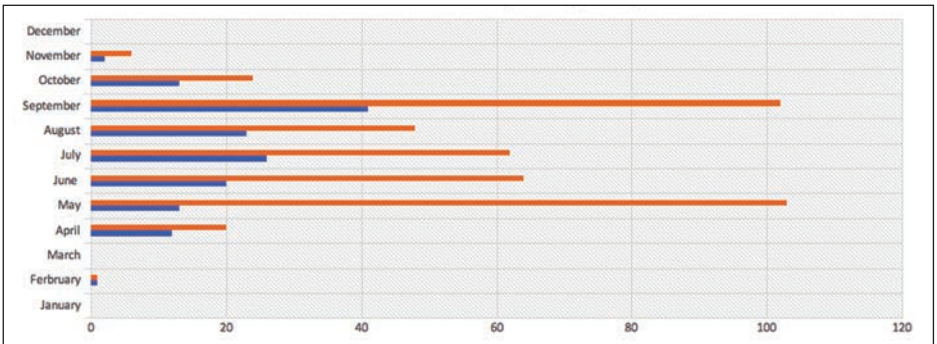
Pieniny Mts.: Ociemne (Mroczkowski, 1978)

Tatry Mts.: records without exact data (Nowicki, 1873)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Kulwieć, 1907; Łomnicki, 1913; Szujecki, 1980; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Prussia (Siebold, 1847; Lentz, 1857), Silesia (Weigel, 1806; Reitter, 1870b; Gerhardt, 1910a; Kuhnt, 1912), Galicia (Łomnicki, 1884), Western Galicia (Nowicki, 1873); Carpathians (Nowicki, 1873), Piotrków Province (Jakobson, 1909).

Phenology and development. Beetles are found from the very beginning of spring to late autumn (from February to November). The peaks in the number of individuals and the number of observations occur in May and September (Fig. 6.38). On average 2.37 individuals were recorded per locality.

The pupa morphology of the species was described by Staniec (2004b).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	1	0	20	103	64	62	48	102	24	6	0
Number of records	0	1	0	12	13	20	26	23	41	13	2	0

Fig. 6.38. Frequency of *Ontholestes tessellatus* (Geoffr., 1785) in localities in Poland

Platydracus Thomson, 1858

Compared to the subtribe, the genus *Platydracus* Thomson, 1858 is one of the most speciose, with 178 species inhabiting the Neotropical, Nearctic, Palaearctic, Ethiopian, Madagascan and Oriental Regions (Herman, 2001).

Platydracus chalcocephalus (Fabricius, 1801)

General distribution. The species is found mainly in central and south-eastern Europe. In the West it reaches France, Switzerland and northern Italy. It has been recorded from the Balkans, the Caucasus, southern Russia, Ukraine and Anatolia (Armenia, Nagorno Karabakh, Turkey). Farthest to the north it has been recorded in Denmark and Jutland as well as Lithuania (Burakowski *et* al., 1980; Löbl & Smetana, 2004; Gontarenko, 2005; Cibuļskis, 2007; Anlaş, 2009; Bordoni, 2010; Kleeberg & Uhlig, 2011; Assing, 2013; Mühlfeit, 2017; Assing & Schülke, 2019). This is a species with a Ponto-Mediterranean distribution (Kleeberg & Uhlig, 2011).

Habitat preferences. The species is found primarily in forests and their edges. Beetles are observed under decaying organic matter, excrement, on carrion and in rotting mushrooms; they also inhabit forest litter (Horion, 1965; Burakowski *et* al., 1980). In the Baltic dune Scots pine woods it is considered to be a eurytopic species (Smoleński, 2000a). Beetles of this species have also been recorded in xerothermic localities of the Slovakian Karst (Benedikt, 2014) with a share of *Quercus pubescens*, *Q. cerris* and *Cornus mas*. In oak forests of Hungary, in the Bukk National Park it belonged to a group of dominant species together with *Ocypus biharicus* and *Pseudocypus mus* (Brullé, 1832; Balog *et* al., 2008). In the nickel mine dump in Sereď (W Slovakia) it was found in greater numbers than in habitats unaffected by anthropopressure (Majzlan & Majzlan, 2011). In turn, in studies on the beetle assemblages associated with the forest habitats in the area of Mladá Boleslav it was a species preferring only forests and it was not found in meadows or ecotones (Boháč *et* Matějíček, 2009).

Occurrence in Poland. In Poland it has been recorded throughout the country; however, observations of greater numbers of individuals come only from the southern and eastern parts of Poland (**Fig. 6.39**).

New records

Lower Silesia: Bardo Śląskie [XR29], 1 VIII 1941, 1 ex., leg. FK, det. AM, coll. USM
Upper Silesia: Ruda Śląska, Lasy Bielszowskie [CA47], 11 VI 1991, 1 ex. leg., coll. JG, det AM

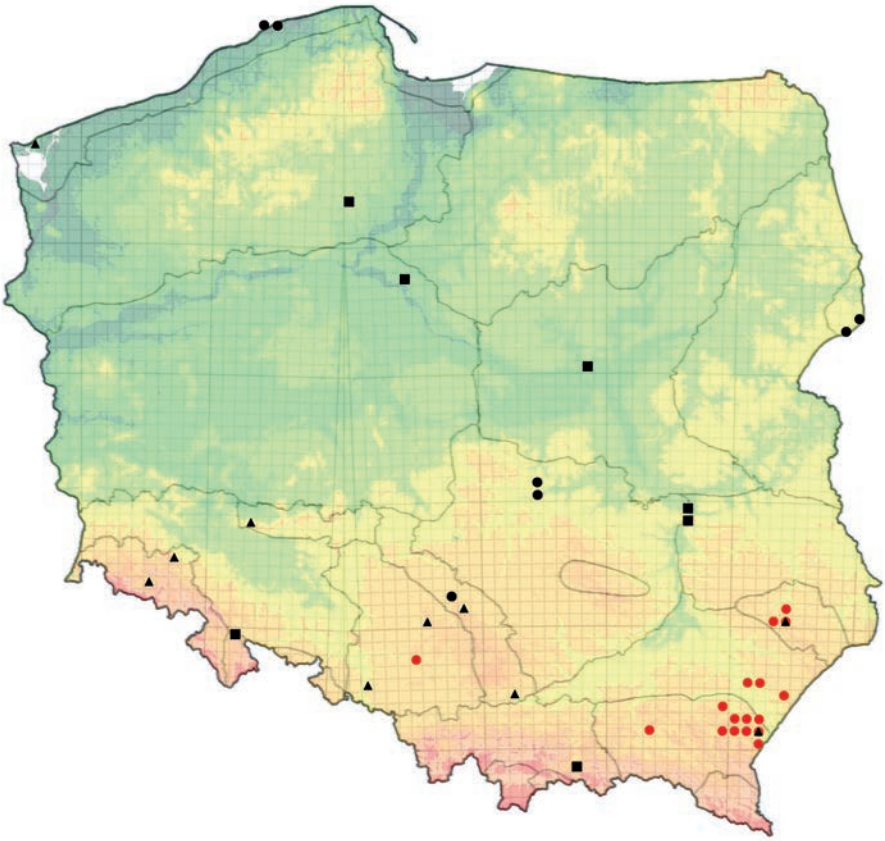


Fig. 6.39. Distribution of *Platydracus chalcocephalus* (Fabr., 1801) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

Roztocze: Roztoczański NP, Jarugi nat. res. [FB40], 15 VII 1988, 2 exx. in the entomological sieve, leg. BS, coll. MCSU; Roztoczański NP, Bukowa Góra [FB30], 2 VIII, 2 exx., 6 IX 2016, 6 exx. pitfall trap, det. AM, leg., coll. DMF; Horodzisko [FB41], 5 VIII 2016, 1 ex. pitfall trap, [FB40], 5 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Obrocz [FB40], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Słupy [FB41], VII, 16 exx., VIII , 1 ex., IX 2016, 1ex. pitfall trap, det. AM, leg., coll. DMF; Kosobudy [FB40], 26 VI 1902, 2 exx., leg. WM, det. AM, coll. USM

Sandomierska Lowland: Sieniawa District: Czerce for. distr. [FA15], VII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Czerwona Wola for. distr. [FA25], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jarosław District: Tuchola for. distr. [FA44], VII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF

Eastern Beskid Mts.: Kupiatycze [FA20], 4 V 2017, 1 ex., pitfall trap with wild boar feces, 23 VI 2017, 1 ex., pitfall trap with fallow deer feces, leg. Mariusz

Obszarny, det. et coll. TW; Łętownia for. distr. [FA21], 5 IX 2017, 1 ex., pitfall trap with horse feces, leg. M. Obszarny, det. et coll. TW; Bircza District: Brzuska for. distr. [FA01], 13 IX 2016,1 ex. pitfall trap, det. AM, leg., coll. DMF; Sierakośce for. distr. [FA20], 13 VII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Dynów District: Dąbrówka for. distr. [EA91], VII 2016, 29 exx. pitfall trap, det. AM, leg., coll. DMF; Dylągowa for. distr. [EA91], VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Wybrzeże for. distr. [EA91], VIII, 1 ex., IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kańczuga District: Borowiec for. distr. [FA12], 15 VII, 2 exx., 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kramarzówka for. distr. [FA02], 16 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Lipinki for. distr. [EA93], 18 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Śliwnica for. distr. [FA01], 18 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Węgierka for. distr. [FA12], 18 VII, 12 exx.,16 VIII, 1 ex., 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kołaczyce District: Bierówka for. distr. [EA31], 30 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Krasiczyn District: Bełwin for. distr. [FA22], 14 VII 2016, 2 exx. pitfall trap, [FA12], 13 VII, 2 exx., 14 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Korytniki for. distr. [FA11], 13 VII, 6 exx., 14 VII, 1 ex., 16 VIII, 8 exx., 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kupna for. distr. [FA01], 13 VII, 6 exx., 16 VIII, 9 exx., 15 IX, 2016, 1 ex. pitfall trap, [FA11], 16 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Średnia for. distr. [FA02], 16 VIII 2016, 1 ex. pitfall trap, [FA12], 14 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Wapowce for. distr. [FA11], 13 VII 2016, 1 ex. in Barber trap, [FA12], 18 VIII, 3 exx., 15 IX 2016, 18 exx. pitfall trap, det. AM, leg., coll. DMF

Previously recorded from:

Baltic Coast: Międzyzdroje (Habelmann, 1854), Słowiński NP (Smoleński, 2000a), Słowiński NP – Łebska Spit (Smoleński, 2000a)

Pomeranian Lake District: Wierzchlas nat. res. near Toruń (Błażejewski, 1956)

Wielkopolska-Kujawy Lowland: Toruń (Horion, 1965; Szujecki, 1980)

Mazowian Lowland: Jabłonna near Nowy Dwór Mazowiecki (Szujecki, 1968), Warszawa vic. (Szujecki, 1980)

Białowieża Primeval Forest: Białowieża NP (Smoleński & Szujecki, 2001; Smoleński, 2006)

Lower Silesia: Brzeźnica and Opolnica near Bardo Śląskie (Smoleński, 1996b), Hirschberg (Jelenia Góra), Bremberg (Żarek-Brachów near Jawor) (Letzner, 1886; Gerhardt, 1888; 1897; 1910a; Scholz R., 1935; Polentz, 1936)

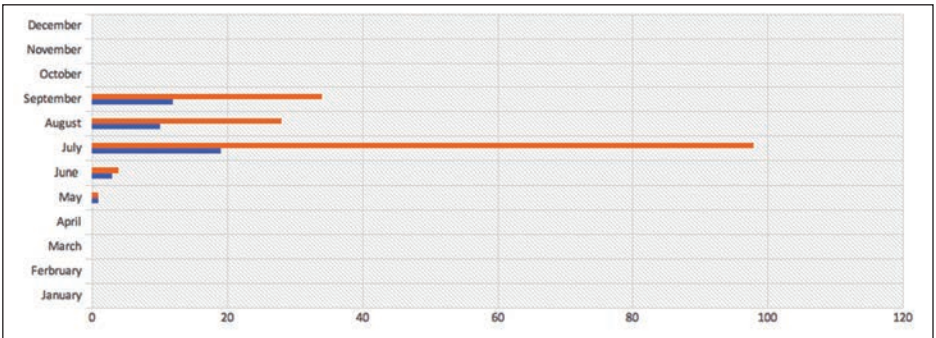
Trzebnickie Hills: records without exact data (Letzner, 1886), Racibórz (Ratibor), Zimna Wódka (Kalkwasser) (Gerhardt, 1910a)

Upper Silesia: records without exact data (Roger, 1856; Reitter, 1870b; Letzner, 1886; Gerhardt, 1910a)
Kraków-Wieluń Upland: Kraków vic. (Łomnicki, 1874), Creek Złoty – Częstochowa Province (Lgocki, 1908), Zielona Góra nat. res. (Kościelny, 2018)
Małopolska Upland: Konewka nat. res. and Spała nat. res. (Jaskuła *et* al., 2009)
Lubelska Upland: Puławy and Kazimierz Dolny (Szujecki, 1960b; 1980)
Roztocze: Obrocz – Zamość Province (Tenenbaum, 1913)
Western Sudety Mts.: Jelenia Góra (Letzner, 1886), Żarek-Brachów (Bremberg) near Jawor (Gerhardt, 1910a)
Western Beskid Mts.: Rytro-Roztoka Mała (Szujecki, 1960b)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Southern Poland (Szujecki, 1980), Pomerania (Horion, 1951), Silesia (Weigel, 1806; Letzner, 1871; Kuhnt, 1912; Noskiewicz, 1950), Galicia (Łomnicki, 1884), Piotrków Province (Jakobson, 1909, Jacentkovskij, 1912).

Phenology and development. Data on the phenology of *P. chalcocephalus* are scarce, mainly due to the rare catches of individuals. Horion (1965) reported that beetles were observed from May to August. New data from Poland confirm that fact: beetles were caught in the period from May to September, with a peak of observations in July (**Fig. 6.40**). In July also the highest number of individuals were caught (over 60% all individuals from the period of May–September).

The developmental stages were described by Boháč (1982). The larva overwinters in its third (L_3), last stage.



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	0	1	4	98	28	34	0	0	0
Number of records	0	0	0	0	1	3	19	10	12	0	0	0

Fig. 6.40. Frequency of *Platydracus chalcocephalus* (Fabr., 1801) in localities in Poland

Platydracus fulvipes (Scopoli, 1763)

General distribution. It is a species inhabiting the western and central Palearctic region. It is found throughout Europe, from the Iberian Peninsula throughout the entire European continent, mainly in its southern and central parts, while it is less frequent in the northern part, not being recorded in northern provinces of Scandinavia. It reaches Anatolia and central Siberia (Burakowski *et* al., 1980; Horion, 1965; Stan & Bacal, 2006; Bordoni, 2010; Kleeberg & Uhlig, 2011; Ferreira, 2018).

Habitat preferences. A species characteristic of mesic habitats: peatbogs, waterline sites, water-logged meadows and forests. It is found under stones, alluvia, fallen foliage, among heathers, mosses and peat mosses (Burakowski *et* al., 1980).

It is classified as tyrphophilous, muscicolous and humicolous – a species characteristic of peatbogs and transitional mires commonly found throughout Poland (Sławska & Smoleński, 2003). In the Pomerania region in the conifer swamp forest habitats it is a characteristic species and periodically highly numerous, preferring mossy forest cover. In the Białowieża Primeval Forest it is found in conifer swamp forest and mesic coniferous forest, mesic mixed coniferous forest and mixed conifer swamp forest, mixed mesic and swamp forests as well as mesic forest and alder swamp forest (Smoleński & Szujecki, 2001).

In the Karkonosze and the Izera Mts. It has been caught in large numbers in the alpine spruce forests in sod-covered sites (Mazur A., 2012). In the Bieszczady Mts. It is found in synanthropic habitats (Szujecki, 1996). It is also classified as a species strongly associated with natural forest habitats (Konieczna *et* al., 2013).

It has been recorded in the Slovakian Karst (Benedikt, 2014). In Belarus it has been found in peatbogs with a share of pine and birch (Sushko, 2016). Classified by Irmler & Gürlich (2007) to a group of indicator species for forests rich in humus (i.e. species of humus-rich woods) along with *Philothus decorus* (Grav., 1802), *Anthobium atrocephalum* (Gyll., 1827), *Quedius fuliginosus* (Grav., 1802) and *Tachinus pallipes* (Grav., 1806). A hygrophile also found accompanied by ants *Myrmica ruginodis* (Päivinen *et* al., 2002).

Occurrence in Poland. Platydracus fulvipes (Polish tyranka szafirokrywka, after Szujecki 2017) in Poland is a species observed only occasionally. Until 1980 the species was observed in the North of the country in single localities and in larger numbers in the southern part in the foothills and mountainous areas (**Fig. 6.41**).

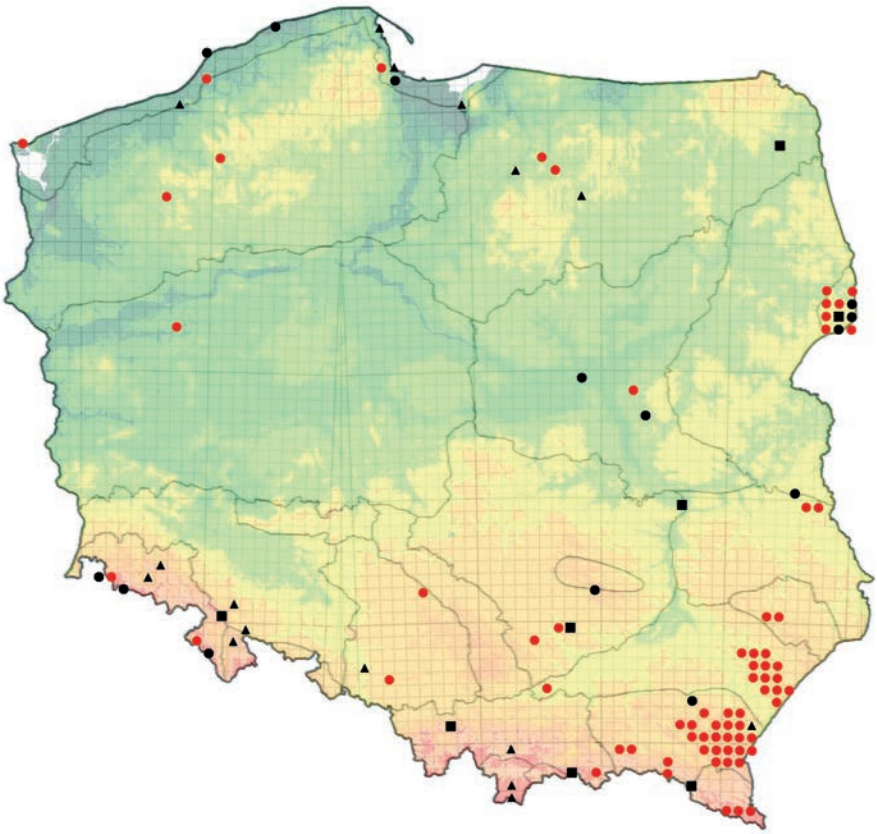


Fig. 6.41. Distribution of *Platydracus fulvipes* (Scop., 1763) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

New records

Baltic Coast: Gdańsk [CF33], 26 IV 2009, 1 ex., damp forest, leg., coll. DJT; "Słowińskie Błota" nat. res. [WA92], 4 V–10 VII 2017, pitfall trap, 21 exx., leg. PS & TR, coll. RRu; Świnoujście [VV57], 17 V 2007, 2 exx. and 14 VI 2007, 2 exx., by the sea, leg. PD, det. AM, ex coll. OA, coll. AM

Pomeranian Lake District: "Bagno Kusowo" nat. res. [XV06], 5 V–11 VII 2017, pitfall trap, 24 exx., leg. PS & TR, coll. RRu; Złocieniec [WV63], 28 V 2017, 1 ex. on the asphalt road, leg., coll. KR

Masurian Lake District: Jonkowo vic. [DE56], 17–23 VI 2002, 1 ex. and 2–18 V 2003, 1 ex., sphagnum moss, pitfall trap, leg. BB, coll. KK; Olsztyn-Słoneczny Stok [DE65], 25 V 2001, 1 ex. at the loft, leg., coll. KK

Wielkopolska-Kujawy Lowland: Sierakowski Landscape Park, Sieraków [WU73], 30 IV–31 V 2004, 1 ex. on the Jaroszewskie Lake, leg. MŚ, det., coll. AM

Mazovian Lowland: Miłosna [EC28], 22 X 1893, 1 ex., leg. WM, det. AM, coll. USM

Podlasie: transitional bog "Bukowski Las" [FB79], 11 XI 2007, 1 ex. pitfall trap, leg. TOd, coll. MCSU; Laski Bruskie [FC50], 31 VII 2014, 2 exx., meadow pitfall trap, leg. ŁN, coll. AM

Białowieża Primeval Forest: Białowieża District [FD83, FD84, FD85, FD93, FD94], pitfall trap, 4 V–14 VI 2016: 1 ex. (for. comp. 218Ac), 1 ex. (449Ca), 2 exx. (423Ch), 1 ex. (445Ag), 2 exx. (446Dc), 1 ex. (476Ba), 2 exx. (521Cd), 1 ex. (526Cd), 1 ex. (546Bc), 1 ex. (577Cd), 1 ex. (579Ca), 1 ex. (579Dc), 1 ex. (672Fb), 2 exx. (673Bc); 14 VI–10 VII 2016: 1 ex. (220Ca), 1 ex. (423Ch), 2 exx. (445Ag), 1 ex. (447Bc), 1 ex. (448Dd), 4 exx. (471Bd), 3 exx. (476Ba), 1 ex. (521Cd), 1 ex. (523Da), 1 ex. (577Cd), 6 exx. (579Dc), 1 ex. (580Ag), 1 ex. (641Dh); 10 VII–13 VIII 2016: 1 ex. (248Ak), 4 exx. (471Bd), 2 exx. (476Ba), 1 ex. (642Bm), 1 ex. (673Bc); 13 VIII–11 IX 2016: 1 ex. (336Ad), 1 ex. (423Ch), 1 ex. (673Bc), det. AM, leg., coll. DFP. Hajnówka District [FD73, FD74, FD75, FD83, FD84] pitfall trap: 4 V–14 VI 2016: 1 ex. (for. comp. 241Bc), 1 ex. (304Aa), 1 ex. (357Ca), 1 ex. (359Cc), 1 ex. (383Dd), 1 ex. (415Bb), 1 ex. (488Ab), 1 ex. (489Ci), 2 exx. (574Ai), 4 exx. (603Ba); 14 VI–10 VII 2016: 1 ex. (276Dh), 1 ex. (303Ba), 1 ex. (305Dd), 1 ex. (307Ai), 1 ex. (333Aa), 1 ex. (335Bf), 1 ex. (410Ch), 1 ex. (487Bb), 3 exx. (489Ci), 1 ex. (535Cf), 1 ex. (543Af), 4 exx. (603Ba), 1 ex. (627Dg); 10 VII–13 VIII 2016: 1 ex. (329Cf), 1 ex. (333Aa), 1 ex. (384Ca), 2 exx. (489Ci), 1 ex. (566Ad), 1 ex. (566Bc), 1 ex. (574Ai), 3 exx. (603Ba); 13 VIII–11 IX 2016: 2 exx. (243Ac), 1 ex. (274Cc), 1 ex. (483Db), 2 exx. (566Bc), det. AM, leg., coll. DFP. Browsk District [FD75, FD76, FD85, FD95, FD96] pitfall trap: 4 V–14 VI 2016: 1 ex. (for. comp. 9Ch), 1 ex. (24Dc), 1 ex. (41Bb), 1 ex. (48Cg), 2 exx. (53Ch), 2 exx. (62Aa), 1 ex. (83Cf), 1 ex. (83Da), 1 ex. (84Bb), 1 ex. (153Bc), 5 exx. (742Db), 2 exx. (746Bb), 1 ex. (747Aa), 1 ex. (752Bj), 1 ex. (756Ba); 14 VI–10 VII 2016: 6 exx. (9Ch), 9 exx. (26Dg), 1 ex. (28Ad), 1 ex. (42Ab), 1 ex. (49Ac), 1 ex. (53Ch), 2 exx. (59Ac), 1 ex. (62Aa), 1 ex. (65Bf), 2 exx. (83Da), 2 exx. (84Bb), 2 exx. (84Bb), 1 ex. (151Ac), 4 exx. (153Bc), 1 ex. (182Bb), 1 ex. (187Cd), 3 exx. (742Db), 2 exx. (746Bb); 10 VII–13 VIII 2016: 1 ex. (9Ch), 1 ex. (42Ab), 1 ex. (53Ch), 1 ex. (147Da), 2 exx. (153Bc), 1 ex. (186Dh), 4 exx. (742Db), 1 ex. (746Bb); 13 VIII–11 IX 2016: 1 ex. (150Cb), 1 ex. (180Ab), 3 exx. (742Db), 1 ex. (747Aa), det. AM, leg., coll. DFP. Białowieża NP [FD84, FD94, FD95] pitfall trap: 4 V–14 VI 2016: 1 ex. (for. comp. 108Af), 2 exx. (110Bf), 1 ex. (132Dg), 1 ex. (160Db), 2 exx. (161Cb), 1 ex. (163Cb), 1 ex. (164Cf), 4 exx. (165Ad), 3 exx. (193Ab), 4 exx. (229Bg), 1 ex. (255Bg), 4 exx. (260Cb), 1 ex. (340Ci); 14 VI–10 VII 2016: 1 ex. (105Ba), 1 ex. (107Cb), 2 exx. (108Af), 4 exx. (110Bf), 1 ex. (133Ca), 1 ex. (134Ag), 1 ex. (163Cb), 4 exx. (164Cf), 1 ex. (228Df), 2 exx. (229Bg), 1 ex. (255Bg), 5 exx. (260Cb), 2 exx. (290Bd); 10 VII–13 VIII 2016: 1

ex. (133Ca), 1 ex. (255Bg), 1 ex. (260Cb), 1 ex. (375Bg); 13 VIII–11 IX 2016: 1 ex. (260Cb), det. AM, leg., coll. DFP

Upper Silesia: designed nat. res. Głębokie Doły [CA25], 13 VII 2013, 1 ex., leg., coll. HS

Kraków-Wieluń Upland: Cisie near Blachownia [CB52], 19 V 2013, 1 ex., det. AM, leg., coll. Asl

Małopolska Upland: Daleszyce District, Cisów for. distr. [DB92], 1 ex., oak hollow, leg. A. Byk, det. AM, coll. TW; Pińczów-Skowronno [DA69], 10–15 V 1991, 2 exx., det., leg. LBo, coll. RRu; Giebułtów [DA48], 28 III–22 IX 2015, 1 ex., pitfall trap, leg., coll. JTD

Lubelska Upland: PGR Krychów [FB69], 24 VI 2014, 2 exx. and 30 VII 2014, 2 exx., meadow pitfall trap, leg. ŁN, coll. AM

Roztocze: Guciów near Zwierzyniec [FB40], 4 IX 2010, 1 ex. litter in the forest, leg. BS, coll. MCSU; Roztoczański NP, Bukowa Góra, [FB30], 6 X 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Horodzisko [FB40], 2 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Obrocz [FB40], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Sandomierska Lowland: Niepołomicka Forest, Stanisławice [DA54], 28 VI 1988, 1 ex., leg., det. DK, coll. AM; Jarosław District, Bór for. distr. [FA25], VII 2016, 4 rxx. pitfall trap, det. AM, leg., coll. DMF; Czerniawka for. distr. [FA44], VII 2016, 7 exx. pitfall trap, det. AM, leg., coll. DMF; Dąbrowa for. distr. [FA43], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kobylnica for. distr. [FA43], VII 2016, 2 exx. in barbers trap, [FA44], VII, 6 exx, VIII 2016, 5 exx. pitfall trap, [FA54], VII, 3 exx., VIII, 2 exx., IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Olchowa for. distr. [FA34], VII 2016, 5 exx. pitfall trap, det. AM, leg., coll. DMF; Tuchola for. distr. [FA44], VII, 1 ex., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Oleszyce District, Czerniakowa Buda for distr., [FA36], VII 2016, 8 exx. pitfall trap [FA26], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Futory for. distr. [FA46], VII, 2 exx., VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Lipina for. distr. [FA35], VII 2016, 5 exx. pitfall trap, [FA45], VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Miłków for. distr. [FA36], VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Stare Sioło for. distr. [FA36], VII, 3 exx., VIII, 3 exx., IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Sucha Wola for. distr. [FA45], VII, 1 ex., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Zabiała for. distr. [FA36], 22 VII, 1 ex., 22 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Sieniawa District, Chrapy for. distr. [FA26], VII 2016, 1 ex. pitfall trap, [FA36], VII, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Czerce for. distr. [FA26], VIII 2016, 1 ex. pitfall trap, [FA25], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Czerwona Wola for. distr. [FA25], VII, 2 exx., VIII, 1 ex., IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Majdan for. distr. [FA27], VII, 13 exx., VIII, 11 exx., IX 2016, 8 exx. pitfall trap, [FA37], VIII, 4 exx., IX 2016, 8 exx. pitfall trap, det. AM, leg., coll. DMF;

Pawłowa for. distr. [FA26], VII, 2 exx., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Przyjemek far. distr. [FA26], VII, 6 exx., VIII, 6 exx., IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Szegdy for. distr. [FA17], VII, 2 exx., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Szkółkarskie Pawłowa for. distr., VII 2016, 5 exx. pitfall trap, det. AM, leg., coll. DMF; Witoldówka for. distr. [FA26], VII, 7 exx., VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF

Western Sudety Mts.: Duszniki Zdrój [WR98], VII 1967, 1 ex., leg. SG, ex coll. AG, det. AM, coll. MNHW; Karkonosze [WS32], Karkonoski NP, for. com. 185a, 10 VII 2011, 3 exx., spruce forest, pitfall trap, leg., det. et coll. AMa, for. com 181a, 10 VII 2011, ski route, pitfall trap, leg., det. et coll. AMa

Western Beskid Mts.: Krynica-Czarny Creek [DV97], 28 V 1982, 1 ex. leg., det. TW, coll. AM; Beskid Sądecki Mts. – Runek Mt. [DV97], 13 VII 2018, 1 ex., on a forest road, 1050 m a.s.l., leg., det. et coll. TW

Eastern Beskid Mts.: Bykowce [EV98], 6 VI 2016, 1 ex. w puł. IBL-2, leg. AM, coll. HS; Stanisławice [DA54], 28 VI 1988, 1 ex. leg. DK, det., coll. AM; Bircza District, Brzuska for. distr. [FA01], 10 VIII 2016, 1 ex. pitfall trap, [FA11], 13 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jamna for. distr. [FV19], 13 VII, 2 exx., 16 VII, 1 ex.,15 VIII, 2 exx., 15 IX, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jureczkowa for. distr. [FV18], 14 VII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Krzywe for. distr. [FV09], 13 VII, 2 exx., 12 VIII 2016, 1 ex. pitfall trap, [FV19], 15 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Leszczawa for. distr. [FV09], 12 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Leszczyny for. distr. [FV29], 16 VIII, 1 ex., 14 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Łodzianka for. distr. [FA00], 13 VII, 3 exx., 13 IX 2016, 1 ex. pitfall trap, [FA10], 13 VII, 2 exx., 16 VIII, 1 ex., 13 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Malawa for. distr. [FA00], 13 VII, 1 ex., 12 VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Posada Rybotycka for. distr. [FA10], 12 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Sierakośce for. distr. [FA20], 13 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Trzcianiec for. distr. [FV09], 14 VII, 1 ex., 16 VIII, 1 ex., 14 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Wojtkówka for. distr. [FV19], 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Birchów District, Blizne for. distr. [EA71], 29 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dobra for. distr. [EA90], 26 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Grabownica for. distr. [EA70], 25 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Izdebki for. distr. [EA80], 28 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Przysietnica for. distr. [EA70], 28 VII, 2 exx., 29 VIII, 1 ex., 29 XI 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Sady for. distr. [EA90], 29 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Siemuszowa for. distr. [EV99], 30 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Trepcza for. distr. [EV89], 2 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Tyrawa Wołoska for. distr. [FV08],

28 VII 2016, 12 exx. pitfall trap, det. AM, leg., coll. DMF; Dukla District, Cergowa for. distr. [EV58], 29 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Zyndranowa for. distr. [EV57], 30 VII, 1 ex., 29 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dynów District, Dylągowa for. distr. [EA91], VII, 4 exx., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jabłonica for. distr. [EA80], VII 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Żohatyn for. distr. [EA90], 28 VII 2016, 1 ex. in Barber's trap, det. AM, leg., coll. DMF; Kańczuga District, Kramarzówka for. distr. [FA02], 16 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Szklary for. distr. [EA82], 18 VII, 1 ex., 16 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Węgierka for. distr. [FA12], 18 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kołaczyce District, Czarnorzeki for. distr. [EA61], 29 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Pagorzyna for. distr. [EV 19], 30 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Krasiczyn District, Bełwin for. distr. [FA12], VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Rokoszyce for. distr. [FA20], 14 VII, 2 exx., 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Magurski NP, Folusz [EV29], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Bieszczady Mts.: Bieszczady NP – Połonina Wetlińska Mts. [FV14], 29 VI 2010, 1 ex., leg., det. et coll. TW, [FV04], 14 VI 2013, 1 ex., obs. JTD; Ustrzyki Górne [FV24], 27 VI 1988, 1 ex., det. LBo, leg. MBu, coll. RRu.

Previously recorded from:

Baltic Coast: Słowiński NP (Smoleński, 2000a; 2000b); Słowiński NP – Łebska Spit (Smoleński, 2000a; Sławska & Smoleński, 2003), Nadforestry Sławno (Sławska & Smoleński, 2003), records without exact data (Pfeil, 1854; Helm, 1901; Üllwitz, 1916; Osterode (Ostróda), Gedwangen b. Johannesburg (Jedwabno; Horion, 1965), Trójmiejski Landscape Park, Gdańsk vic. (Konopko & Wilga, 2014)

Masurian Lake District: Augustowska Forest (Melke & Gutowski, 1995; Horion, 1965)

Mazowian Lowland: Szerokie Bagno (Sławska & Smoleński, 2003), Kampinoski NP (Mazur S. *et* al., 2010), records without exact data (Breymeyer, 1966; Szujecki, 1968)

Białowieża Primeval Forest: (Szujecki, 1960b; Derunkov & Melke, 2001), Białowieski NP (Smoleński & Szujecki, 2001; Sławska & Smoleński, 2003; Smoleński *et* al., 2004; Smoleński, 2006)

Lower Silesia: Jemna near Srebrna Góra (Smoleński, 1996b), records without exact data (Pietsch, 1897)

Upper Silesia: Rudy near Kuźnia Raciborska (Roger, 1856)

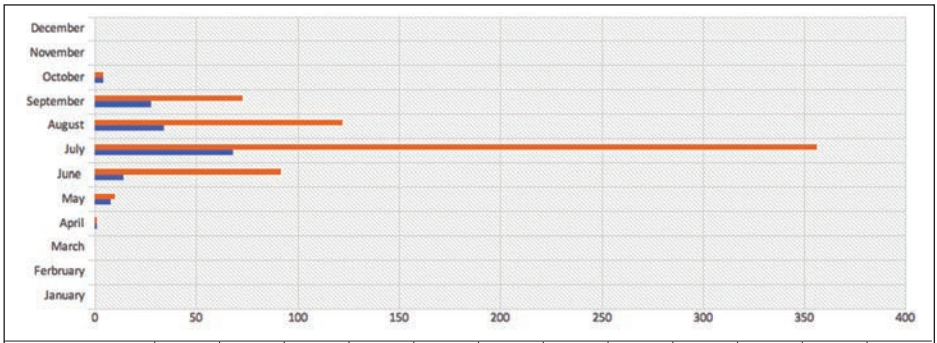
Małopolska Upland: Bogucice near Pińczów (Szujecki, 1960b)

Świętokrzyskie Mts.: Cisów Distr. and Trzemosna Distr. (Mokrzycki, 2007; 2011)

Lubelska Upland: Puławy (Kinelski & Szujecki, 1959), Poleski NP (Staniec, 2010)
Western Sudety Mts.: Katzbach Gebirge (Góry Kaczawskie), Hirschbergtal (Kotlina Jeleniogórska) (Rottenberg, 1868; Letzner, 1871; 1886; Scholz, 1902; Gerhardt, 1910a, Polentz, 1937), Góry Bystrzyckie, Torfowisko pod Zieleńcem (Sławska & Smoleński, 2003), Karkonosze and Góry Izerskie (Mazur A., 2012)
Eastern Sudety Mts.: Grafschaft Glatz (Ziemia Kłodzka), Reichenstein Złoty Stok (Zebe, 1852; Rottenberg, 1868; Letzner, 1871; 1886; Gerhardt, 1910a; Polentz, 1936)
Western Beskid Mts.: Skawa (Stobiecki, 1883; Pawłowski, 1964), Piwniczna (Szujecki, 1960b), Little Beskid Mts. (Paśnik, 1998)
Nowy Targ Basin: Zakopane (Łomnicki, 1886)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929), Rzeszów-Zalesie (Konieczna *et* al., 2013)
Bieszczady Mts.: Komańcza (Szujecki, 1960b; Szujecki, 1996; Pawłowski *et* al., 2000)
Tatry Mts.: records without exact data (Łomnicki, 1866; 1868; Nowicki, 1873; Scheerpeltz, 1933)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Szujecki, 1980; Löbl & Smetana, 2004; Löbl & Löbl, 2015), north Poland (Kleeberg & Uhlig, 2011), Prussia (Dommer, 1850; Zebe, 1852; Lentz, 1857); Silesia (Kuhnt, 1912), Galicia (Łomnicki, 1884).

Phenology and development. In Poland beetles were found from April to October, most numerous and most often in July (**Fig. 6.42**).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	1	10	92	356	122	73	4	0	0
Number of records	0	0	0	1	8	14	68	34	28	4	0	0

Fig. 6.42. Frequency of *Platydracus fulvipes* (Scop., 1763) in localities in Poland

Platydracus latebricola (Gravenhorst, 1806)

General distribution. A species of central and northern Europe, found from France to Ukraine. Not found in the Mediterranean. It has been recorded in England, France (except for the southern part), Switzerland, northern Italy, southern and central parts of Scandinavia, throughout central Europe, in the northern Balkans and in the European part of Russia (Burakowski *et* al., 1980; Horion, 1965; Herman, 2001; Kleeberg & Uhlig, 2011).

Habitat preferences. Beetles of this species have been found under stones and in rotting plant residue in various habitats, most often in forests and peatbogs (Szujecki, 1980). Observations reported by Horion (1965) indicate that *P. latebricola*, apart from the above-mentioned habitats, was observed both in peatbogs and heaths together with related species from the genera *Platydracus* (*P. fulvipes*, *P. stercorarius*) and *Staphylinus* (*S. erythropterus*). Beetles were also repeatedly caught during flight. In western Austria (Vorarlberg) recorded as a predator in a colony of ants *Formica rubra* (L., 1758) (Horion, 1965).

Occurrence in Poland. *Platydracus latebricola* (Polish tyranka kruszcowa after Szujecki, 1980; 2017) was recorded mainly in southern Poland, while single localities of this species were also recorded in the area of Warszawa, Gdańsk, and in the last 20 years in the Białowieża Primeval Forest and in the Masurian Lake District. New localities are concentrated within the regions of its previously reported occurrence (**Fig. 6.43**).

New records

Pomeranian Lake District: Raduń [VU47], 7 VII 2009, 1 ex., steep grassland, 8 VII 2011, 1 ex., xerothermic flowering grassland, pitfall trap, leg. PS, det., coll. AM

Masurian Lake District: Jonkowo vic. [DE56], 2–18 V 2003, 1 ex., Sphagnum moss, pitfall trap, leg. BB, coll. KK; Pilawa vic. [DC55], 21 VII 2015, 1 ex. pitfall trap on the edge of a wet and dry meadow, leg., coll. KK

Wielkopolska-Kujawy Lowland: Olszyna near Ostrzeszów [YS09], 15 IX 2007, 1 ex., leg., coll. AM

Białowieża Primeval Forest: Białowieża NP [FD94], 25 IV 1989, 1 ex., leg. JMG, coll. AM; Białowieża District [FD84, FD85, FD93] pitfall trap, 4 V–14 VI 2016: 2 exx. (for. comp. 446Dc), 1 ex. (526Cd); 14 VI–10 VII 2016: 1 ex. (471Bd); 10 VII–13 VIII 2016: 1 ex. (218Ac), 2 exx. (471Bd), det. AM, leg., coll. DFP. Hajnówka District [FD74, FD84] pitfall trap, 4 V–14 VI 2016: 1 ex. (for. comp. 276Dh); 14 VI–10 VII 2016: 2 exx. (243Ac), 1 ex. (276Dh), 1 ex. (332Ba); 10 VII–13 VIII 2016: 1 ex. (332Ba), det. AM, leg., coll. DFP. Browsk District [FD75, FD76, FD85, FD95] pitfall trap, 4 V–14 VI 2016: 1 ex. (for. comp. 47Ab), 1 ex. (50Db), 1 ex. (57Ci), 1 ex. (58Cf), 1 ex. (748Dh); 14 VI–10 VII 2016: 1 ex. (34Aa), 1 ex. (150Cb), 1 ex. (182Bb),

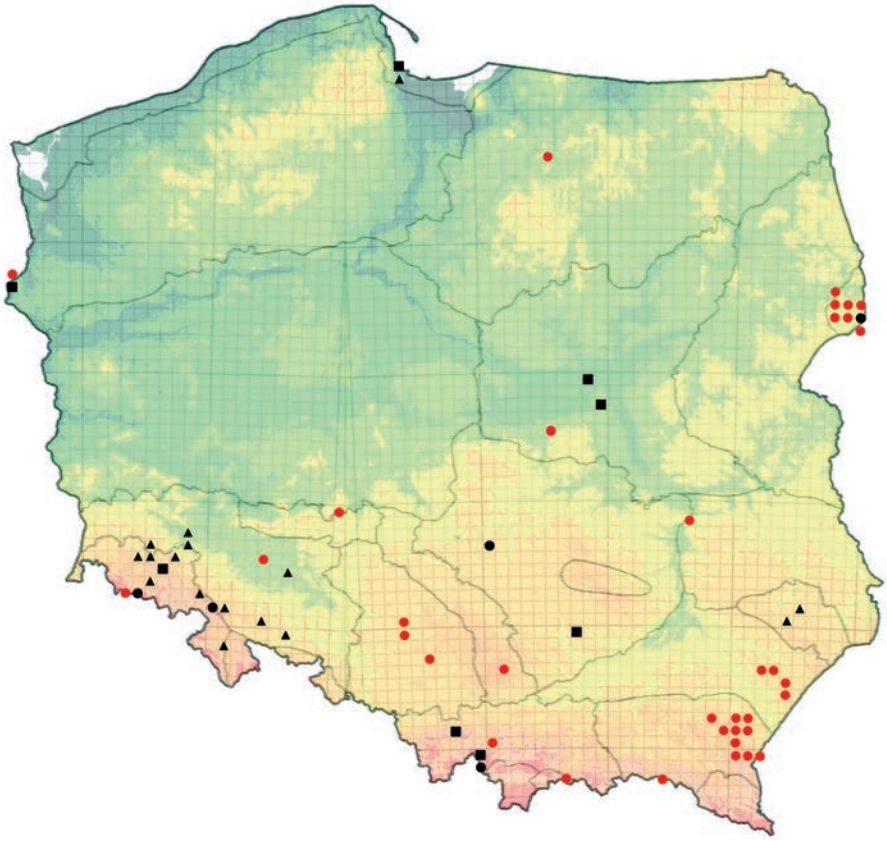


Fig. 6.43. Distribution of *Platydracus latebricola* (Grav., 1806) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

det. AM, leg., coll. DFP. Białowieża NP [FD94, FD95] pitfall trap, 4 V–14 VI 2016: 1 ex. (for. comp. 108Af), 1 ex. (133Ca); 14 VI–10 VII 2016: 3 exx. (339Cf), det. AM, leg., coll. DFP

Lower Silesia: Wrocław-Mokry Dwór [XS45], 26 VI 1988, 1 ex., det., leg. LBo, coll. RRu

Upper Silesia: Brynek [CA39], 31 V 1927, 1 ex., leg. HN, det. AM, coll. USM; Bytom [CA57], 19 VII 1934 and 11 VI 1938, 1 ex., leg. FK, det. AM, coll. USM; Tworóg [CB30], 8 VI 2004, 1 ex. leg., coll. HS

Kraków-Wieluń Upland: Ojców [DA16], 1ex., leg. WM, det. AM, coll. USM

Lubelska Upland: Mięćmierz [EB68], 11 V 2009, 6 exx., det., leg. BS, coll. MCSU

Sandomierska Lowland: Oleszyce District, Czerniakowa Buda for. distr. [FA36], VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Lipina for. distr. [FA45],

VII, 18 exx., VIII, 2 exx., XI 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Sieniawa District, Przyjemek for. distr. [FA26], VII, 1ex., VIII 2016, 2 exx. pitfall trap, , det. AM, leg., coll. DMF; Jarosław District, Tuchola for. distr. [FA44], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Western Sudety Mts.: Karkonosze Mts. [WS32], for. com. 185a, 10 VII 2011, 1 ex., spruce forest, pitfall trap, leg., det. et coll. AMa

Western Beskid Mts.: Białka-Maryniaki [DA00], 8 VI 2004, 1 ex. leg. P. Szafraniec, det., coll. AM

Eastern Beskid Mts.: Bircza District, Jasienica for. distr. [FA00], 10 VIII 2016, 1 ex. pitfall trap, [FA01], 14 VII, 1 ex., 10 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Krzywe for. distr. [FV09], 3 VII 2016, 1 ex. pitfall trap, [FV19], 15 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kuźmina [FV09], 14 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Leczszyny for. distr. [FV29], 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Malawa for. distr. [FA00], 13 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dynów District, Dylągowa for. distr. [EA91], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Piątkowa for. distr. [EA91], 26 VIII, 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Wybrzeże for. distr. [EA91], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kańczuga District, Kramarzowka for. distr. [FA02], 15 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Szklary for. distr. [EA82], 18 VII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Krasiczyn Distrect, Bełwin for. distr. [FA12], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Korytniki for. distr. [FA11], 13 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Magurski NP, Baranie [EV47], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Szczawnica [DV67], 1889, 1 ex., leg. WM, det. AM, coll. USM

Previously recorded from:

Baltic Coast: Gdańsk (Lentz, 1879; Szujecki, 1980)

Pomeranian Lake District: Bielinek nat. res. (Kubisz & Melke, 1996)

Mazowian Lowland: Warszawa (Horion, 1965; Szujecki, 1980), Kampinoska Forest – Sieraków (Breymeyer, 1966)

Białowieża Primeval Forest: Białowieża NP (Smoleński & Szujecki, 2001; Smoleński *et* al., 2004; Smoleński, 2006)

Lower Silesia: Charlottenbrunn (Jedlina Zdrój), Eulengebirge (Góry Sowie), Reindörfel (Nieszków), Liegnitz (Legnica), Neisse (Nysa), Breslau (Wrocław), Ohlau (Oława) (Rottenberg, 1868; Letzner, 1871; 1886; Gerhardt, 1910a; Kolbe, 1931; Polentz, 1942b; 1943)

Upper Silesia: records without exact data (Kolbe, 1924; 1928; Polentz, 1936)

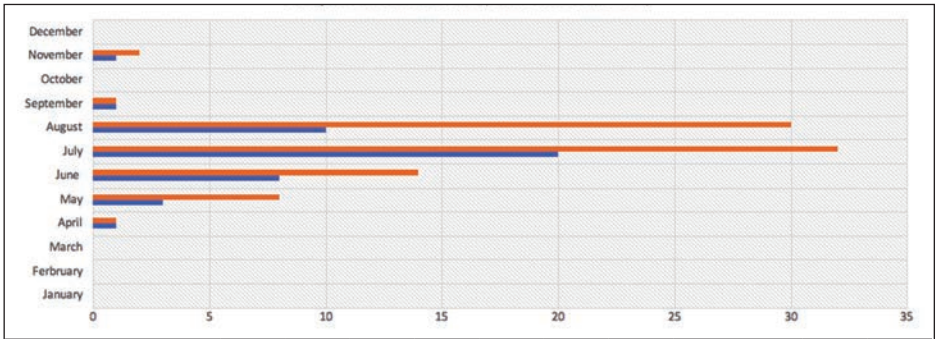
Małopolska Upland: Bogucice near Pińczów (Kubisz & Melke, 1994), Rogów Distr. – Gutkowice sacred spot (Byk *et* al., 2013)

Roztocze: Korhynie – Zamość Province (Łomnicki, 1886)
Western Sudety Mts.: Karkonosze Mts., Sowie Mts. (Mazur A., 2012), Hirschberger Tal (Kotlina Jelioniogórska), Ketschdorf (Kaczorów), Heßberge (Górzyca), Moisdorf (Myślibórz), Brechelshof (Brachów), Gröditzberg (Grodziec) (Letzner, 1871; 1886; Gerhardt, 1866; Gerhardt, 1910a; Fein & Haase, 1881)
Eastern Sudety Mts.: Grafschft Glatz (Ziemia Kłodzka; Letzner, 1886; Gerhardt, 1910a)
Western Beskid Mts.: Babia Góra (Pawłowski & Szujecki, 1966; Pawłowski, 1967; Szujecki, 1980), Little Beskid Mts. (Paśnik, 1998), Babia Góra Massif (Kubisz & Szafraniec, 2003), records without exact data (Reitter, 1870b; Letzner, 1886; Gerhardt, 1910a)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Southern Poland (Horion 1965), Prussia (Siebold, 1847; Zebe, 1852; Lentz, 1857), Silesia (Kuhnt, 1912; Szujecki, 1980), Galicia (Łomnicki, 1884).

Phenology and development. Beetles in Poland were observed from April to November (with no data from October). Imagines were most often observed and most numerous in July (**Fig. 6.44**). These data are consistent with information and phenology of this species from Mecklenburg-Western Pomerania (Kleeberg & Uhlig, 2011).

A description of the morphology of larvae in this stage and a re-description of second stage larvae were provided by Pietrykowska-Tudruj & Staniec (2012). Differences in the structure of larvae in *P. latebricola* and *Staphylinus erythropterus* indicate that the separation of the genus *Platydracus* from the genus *Staphylinus s. lato* was justified.



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	1	8	14	32	30	1	0	2	0
Number of records	0	0	0	1	3	8	20	10	1	0	1	0

Fig. 6.44. Frequency of *Platydracus latebricola* (Grav., 1806) in localities in Poland

Platydracus stercorarius stercorarius (Olivier, 1795)

General distribution. A European species, in the East reaching western Siberia, western Russia, Anatolia, the Caucasus, Georgia, Turkestan, Azerbaijan, Tadjikistan, Armenia and Nagorno Karabakh and Iran. In the European continent it inhabits mainly the central part, in the South it is recorded from Portugal, through Italy, the Balkans (except for Greece) to Turkey. In the North of Europe it reaches far provinces, beyond the Arctic Circle (Horion, 1965; Burakowski *et* al., 1980; Herman, 2001; Anlaş & Newton, 2010; Bordoni, 2010; Ferreira, 2018; Assing & Schülke, 2019).

Habitat preferences. Beetles inhabit sandy soils, most often in heaths and xerothermic meadows. It also inhabits edges of pine forests, being found under stones, feces and decaying organic matter. In xeric meadows frequently found under clumps of grass, while in heaths of Holstein (Germany) it is one of the most often found species from the genus *Staphylinus s. l.* (Horion, 1965). Occasionally observed in peat soils, in patches of peat mosses overgrown with heathers (*Calluna*) and heaths (*Erica*) (Kleeberg & Uhlig, 2011, after Mossakowski, 1964). In pine stands it is a species characteristic to insolated glades and for young forest cultures (Szujecki, 1966d). In Belarus in the area of Minsk it has been observed most often in the youngest age classes of pine stands (11 years; Derunkov, 2005). In the Swiss Alps it is found up to an altitude over 2000 m a.s.l. (Comellini, 1974).

Platydracus stercorarius is also mentioned as an efficient predator of ants, hunting mainly for worker ants, rather than pupae of such species as *Tetramorium caespitum* and *Lasius alienus;* in England observed also in nests of ants of the genus *Myrmica* (Horion, 1965).

Occurrence in Poland. *Platydracus stercorarius* (Polish tyranka wrzosowiskowa, after Szujecki, 2017) is found throughout Poland, although it has not been commonly observed (**Fig. 6.45**).

New records

Baltic Coast: Karwieńskie Błota [CF17], 6–7 VIII 2007, 1 ex., leg., det. et coll. TW; Świbno [CF62], 4 IX 2010, 1 ex., dry sandy edge of the forest, leg., coll. DJT; Trzebież [VV64], 10 IX 1994, 1 ex., stubble, leg. RaK, coll. AM

Pomeranian Lake District: Cedynia nat. res. [VU45], 29 VII 2010, 1 ex., stipa grassland, [VU46], 30 VIII 2010, 3 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Dobiegniew [WU56], 17 VII 1988, 1 ex., leg., det. TM, coll. AM; Kępice [XA84], 31 V 2007, 1 ex., Fagus forest, leg. M. Kaczkowska, det. AM, ex coll. OA, coll. AM; Krajnik Dolny [VU57], 1 X 2010, 1ex., 4 VIII., 1 ex., 30 VIII, 7 exx., 4 X 2011, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Raduń [VU47], 29 VII, 2 exx., 30 VIII 2010, 3 exx., 5 VIII 2011, 1 ex., stipa grassland, 7 VII, 2 exx., 1 VIII, 11 exx., 1 IX 2009, 25 exx., 29 VII,

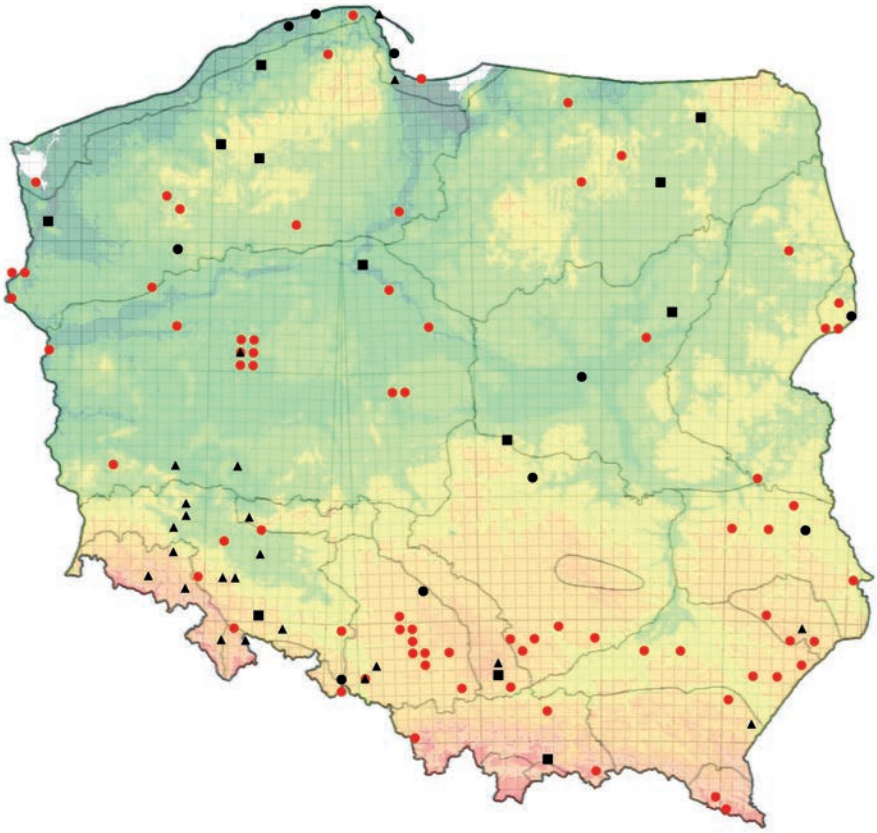


Fig. 6.45. Distribution of *Platydracus stercorarius stercorarius* (Ol., 1795) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

2 exx., 30 VIII 2010, 5 exx., 8 VII, 7 exx., 5 VIII, 21 exx., 30 VIII, 19 exx., 4 X 2011, 2 exx., xerothermic flowerig grassland, pitfall trap, leg. PS, det., coll. AM; Wrzosowiska Cedyńskie nat. res. [VU45], 6 X 2009, 1 ex., moor, pitfall trap, leg. PS, det., coll. AM; Sośnica nat. res. [WV72], 13 VIII 2012, 1 ex., leg., coll. KR; Zakrzewska Osada [XV61], 13 IX 2012, 1 ex. dry sandy meadow, leg., coll. DJT; Złocieniec [WV63], 7 IX 2013, 1 ex., leg., coll. KR

Masurian Lake District: Krzywonoga [DE84], 12 VIII 2007, 3 exx., pitfall trap on the border of pine forest, leg. AP, coll. KK; Lidzbark Warmiński [DF70], 20 X 1984, 1 ex., leg. TM, coll. AM; Mrągowo [EE16], 10 VI 2004, 1 ex., triticale field, det. AM, leg., ex coll. OA, coll. AM

Wielkopolska-Kujawy Lowland: Biedrusko vic. [XU32], 24 IX 1997, 1 ex. and 6 VII 1999, 1 ex. in *Potentillo albae-Quercetum*, leg., coll. SK; Bogu-

szyniec [CC48], 30 VIII 1982, 1 ex., a pine forest, leg. TM, coll. AM; Golęczewo vic., military training ground – Napoleona Mt. [XU22], 30 VII 2000, 2 exx., pitfall trap, leg. PS., coll. SK; Grudziądz vic. [CE42], 27 VIII 2003, 1 ex., in oak forest, leg., coll. KK; Koło [CC38], VIII 1989, 1 ex., leg. TM, coll. AM; Laski [VU71], 1 VIII 2009, 1 ex., 30 VII, 4 exx., 31 VIII 2010, 3 exx., xerothermic flowerig grassland, 7 VII, 6 exx., 1 VIII, 7 exx., 1 IX, 14 exx., 6 X 2009, 1 ex., 30 VII, 4 exx., 31 VIII 2010, 23 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Owczary [VU71], 1 VIII, 4 exx., 1 IX, 24 exx., 1 IX, 14 exx., 6 X 2009, 1 ex., 31 VII, 7 exx., 2 X 2010, 1 ex., mixed xerothermic grassland, 1 VIII, 6 exx., 1 IX 2009, 4 exx., 30 VII, 8 exx., 31 VIII, 9 exx., xerothermic flowerig grassland, pitfall trap, leg. PS, det., coll. AM; Pamięcin nat. res. [VU71], 7 VII, 2 exx., 1 VIII 2009, 3 exx., 30 VII, 1 ex., 21 VIII 2010, 2 exx., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Plewiska near Poznań [XU20], VII 2015, 1 ex., 3 IX 2016, 1 ex. in the garden, leg., coll. SK; Pobiedziska near Poznań [XU51], 22 IX 1996, 1 ex., leg., coll. PJ; Poznań – Cytadela [XU30/31], 23 VIII 1994, leg., coll. SK; Poznań-Morasko [XU21], 24 V 2006, 1 ex. on a sandy road, leg., coll. SK; Poznań: Piątkowo-Winogrady [XU31], 20–25 IX 2017, 1 ex., leg., coll. PJ; Promno near Poznań [XU51], 20 IX 1998, 2 exx., leg., coll. PJ; Sierakowski Landscape Park, Sieraków [WU73], 10–20 VIII 2004, 1 ex. on the Warta River, pitfall trap, leg. MŚ, det., coll. AM; Toruń vic., military training ground, Żymierski Hill [CD36/37], 12 IX 2012, 1 ex., leg., coll., det. BP; Włocławek vic. [CD63], 11 VIII 1998, 1 ex., leg., coll. PJ; Żagań-Karliki [WT22], 27 VII 1990, 1 ex., leg. CzG, coll. AM

Mazovian Lowland: Szumin [ED32], 7–9 VIII 1987, 1 ex., leg. TM, coll. AM

Podlasie: Białystok vic. [FD49], V 2000, 1 ex., litter of deciduous forest, leg., coll. KK; Tyśmienica [FC21], 31 VII 2014, 1 ex., meadow pitfall trap, leg. ŁN, coll. AM

Białowieża Primeval Forest: for. comp. 494 [FD94], 1986 no exact date, 1 ex., leg. K. Wołk, coll. AM; Białowieża District [FD83, FD94], pitfall trap, 14 VI–10 VII 2016: 2 exx. (for. comp. 578Ad); 10 VII–13 VIII 2016: 18 exx. (477Ac), 1 ex. (523Da), 4 exx. (578Ad); 13 VIII–11 IX 2016: 2 exx. (477Ac), 1 ex. (578Ad), det. AM, leg., coll. DFP. Hajnówka District [FD73] pitfall trap, 10 VII–13 VIII 2016: 3 exx. (for. comp. 539Am); 13 VIII–11 IX 2016: 3 exx. (724Cgx), det. AM, leg., coll. DFP. Browsk District [FD85], pitfall trap, 4 V–14 VI 2016: 1 ex. (for. comp. 47Ab); 10 VII–13 VIII 2016: 4 exx. (187Bg); 13 VIII–11 IX 2016: 4 exx. (187Bg), det. AM, leg., coll. DFP

Lower Silesia: Bardo Śląskie [XR29], 15 and 20 VII 1930, 2 exx., leg. FK, det. AM, coll. USM; Gogolin [BA89], 1 VIII 1929, 1 ex., leg. HN, det. AM, coll. USM; Środa Śląska [XS16], 11 VII 1953, 1 ex., leg. TS, det. AM, coll. USM; Świebodzice [WS93], 10 IX 1994, 1 ex., det., leg. LBo, coll. RRu; Wrocław-Pawłowice [XS47], 10 VIII 2004, 1 ex. leg. JJ, det. et coll. AMa

Upper Silesia: Brynek-Park [CA39], 13 VII 2012, 1 ex., leg., coll. HS; Bytom [CA57], 19 VII 1934 and 11 VI 1938, 1 ex., leg FK, det. AM, coll. USM; Dąbrowa Górnicza [CA77], VII 1934, 1 ex., VIII 1935, 1 ex., leg. ST, det. AM, coll. USM; Jamna [CA56], 23 VIII 1977, 1 ex., leg. ST, det. AM, coll. USM; Przeciszów [CA84], VIII 2016, 1 ex., leg. Joanna Jaszczyk, det. et coll. TW; Racibórz [CA05], 29 VIII 1938, 1 ex., leg. HN, det. AM, coll. USM; Segiet estate [CA48], 4 VIII 2012, 1 ex., leg. coll. HS; Tarnowskie Góry [CA49], 2 VIII 1911, 2 exx., leg. GR, det. AM, coll. USM; Tworóg [CB30], 28 VIII 2005, 1 ex., leg., coll. HS; Ruda Śląska Wirek [CA47], 12.08.2002 – 1 ex., leg. JG, det. AM

Kraków-Wieluń Upland: Kraków-Prądnik Biały [DA24], 20 VII 2012, 1 ex., in ruderal habitat in flight, leg., det. et coll. TW

Małopolska Upland: Kików [DA98], 14 VII 1994, 1 ex., leg. RD, det. AM, coll. USM; Pińczów [DA69], 11 VII 1996, 1 ex., xerothermic grassland, leg., det. et coll. TW; Ilkowice [DA48], Cybowa Góra, 28 III–22 IX 2015, 1 ex., xerothermic slope, pitfall trap, leg., coll., JTD; Chodów [DA28] Chodów vic., 28 III–22 IX 2015, 1 ex., pitfall trap, leg., coll. JTD; Giebułtów [DA48], 28 III–22 IX 2015, 6 exx., pitfall trap, leg., coll. JTD; Szczepanowice vic. [DA37], 28 III–22 IX 2015, 21 exx., xerothermic slope, pitfall trap, leg., coll. JTD; Kalina Mała [DA37], 28 III–22 IX 2015, 4 exx., xerothermic slope, pitfall trap, leg., coll. JTD; Pstroszyce Drugie [DA28], 28 III–22 IX 2015, 18 exx., xerothermic slope, pitfall trap, leg., coll. JTD; Uniejów Parcela [DA28], 28 III–22 IX 2015, xerothermic slope, 22 exx., pitfall trap, leg., coll. JTD

Lubelska Upland: Biała Góra [FA25], 25 VII 1994, 2 exx. and 5 VIII 1995, 1 ex. pitfall trap, leg. RR, coll. MCSU; Ciechanki Łańcuchowskie [FB37], 17 VIII 2005, 4 exx. the pitfall trap in the xerothermic communities of the Nadwieprzański Landscape Park, leg. JKo, coll. MCSU; Gródek near Hrubieszów [GB03], 2–6 VIII 1995, 1 ex., det. AM, leg. LBo, coll. RRu; Lublin [FB07], 3 IX 1987, 1 ex. in the Academic Park – on the sidewalk, leg. BS, coll. MCSU; Wereszczyn [FB59], 27 VIII 2014, 1 ex., meadow pitfall trap, leg. AH, coll. AM

Roztocze: Korhynie [FA78], 19 IX 1993 – 1 ex., 20 VIII 1994 – 3 exx., 23 IX 1995 – 1 ex. pitfall trap in a xerothermic site, leg. RR, coll. MCSU; Sochy [FB30], 18–20 VIII 2013, 1 ex., pine forest, leg., det. et coll. TW

Sandomierska Lowland: Kolbuszowa District: Lipnica for. distr. [EA67], 1 ex. 4 VII and 1 ex. 1 IX 2017, pitfall trap, det. AM, leg., coll. DMF; Lubaczów District: Polanka for. distr. [FA66], 11 exx., 30 VIII 2017, pitfall trap, det. AM, leg., coll. DMF; Mielec District: Malinie for. distr. [EA37], 2 exx., 30 VIII 2017, pitfall trap, det. AM, leg., coll. DMF; Mościska for. distr. [EA37], 1 ex., 29 VIII 2017, pitfall trap, det. AM, leg., coll. DMF; Narol District: Huta Różaniecka for. distr. [FA58], 2 exx., 31 VIII 2017, pitfall trap, det. AM, leg., coll. DMF; Oleszyce District: Sucha Wola for. distr. [FA45], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Eastern Sudety Mts.: Gipsowa Góra [YR14], 15.08.1998 – 1 ex., leg., coll. JG, det. AM

Western Beskid Mts.: Krynica Zdrój [DV97], 18 IX 1993, 1 ex., leg., coll. AM; Łąkta [DA52], VII 1935, 1 ex., leg. ST, det. AM, coll. USM; Wisła [CA40], 6 VIII 1970, 1 ex., leg. JC, det. AM, coll. USM

Eastern Beskid Mts.: Kańczuga District: Roźwienica for. distr. [FA03], 17 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Bieszczady Mts.: Żubracze vic. [EV95], 17 VIII 2015, 1 ex. on the forest path, leg., coll. AM; Smerek vic., Smerek river valley [FV04], 11 VII 2018, leg., coll. JTD

Previously recorded from:

Baltic Coast: Gdańsk (Lentz, 1879), Chałupy near Władysławów (Węgrzecki, 1932), Słowiński NP (Smoleński, 2000a; 2000b), Słowiński NP – Łebska Spit (Smoleński, 2000a), Gdynia-Kępa Redłowska (Konopko *et* al., 2017)

Pomeranian Lake District: Klęskowo near Chaetae (Cykowski, 1977), Bielsko – Słupsk Province (Burakowski *et* al., 1980), Człuchowska Forest (Szujecki, 1995; Łęgowski *et* al., 1995), Niedźwiady Distr. (Smoleński, 1995a); Wisielcze Jeziorka nat. res. (Gutowski & Ruta, 2004)

Masurian Lake District: Piska Forest – Szeroki Bór (Szujecki, 1966f), Borecka Forest (Melke & Maciejewski, 1999)

Wielkopolska-Kujawy Lowland: Solec Kujawski Distr. (Smoleński, 1993; Szujecki, 1995), Poznań, Rawicz (Szulczewski, 1922), Glogau (Głogów; Letzner, 1871; 1886; Gerhardt, 1910a; Kolbe, 1928)

Mazowian Lowland: Ostrów Mazowiecka (Szujecki, 1966c; 1995), Kampinoski NP (Mazur S. *et* al., 2010)

Białowieża Primeval District: Derunkov & Melke, 2001; Białowieża NP (Smoleński & Szujecki, 2001; Smoleński *et* al., 2004; Smoleński, 2006)

Lower Silesia: Ziębice Śląskie (Smoleński, 1996b), Liegnitz (Legnica), Breslau (Wrocław), Neisse (Nysa), Wättrisch (Sokolniki), Lüben (Lubin), Költschenberg (Kiełczyn), Krummlinde (Fanggraben) (Lipiny), Raszówka (Letzner, 1871; 1886; Gerhardt, 1898; 1907; 1910; Kolbe, 1924)

Trzebnickie Hills: Oborniki Śląskie (Polentz, 1943)

Upper Silesia: Gipsowa Góra nat. res. (Melke & Grzywocz, 2002), Rauden (Rudy), Ratibor (Racibórz; Kelch, 1846; Roger, 1856; Letzner, 1871; 1886; Kolbe, 1927; 1928; Stefek, 1939)

Kraków-Wieluń Upland: Ojców (Eichler W., 1914), Ojcowski NP and vic. (Pawłowski *et* al., 1994, Kubisz & Pawłowski, 1998), Konopiska (Kościelny, 2006)

Małopolska Upland: Rogów near Koluszki (Burakowski *et* al., 1980), Spała (Jaskuła *et* al., 2009)

Lubelska Upland: Stawska Góra nat. res. near Chełm (Staniec, 2002)

Roztocze: Szarowola – Zamość Province (Tenenbaum, 1913)

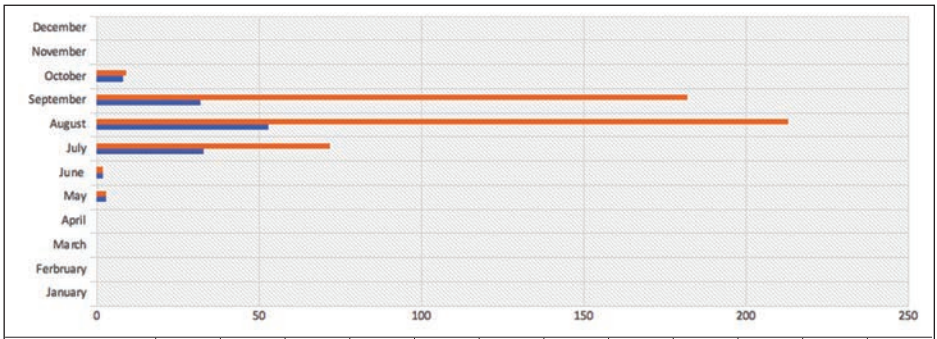
Western Sudety Mts.: Hierschberger Tal (Kotlina Jeleniogórska), Wättrisch (Sokolniki), Bögenberge (Góra Górzec), Męcinka, Salzbrunn (Szczawno-Zdrój) (Letzner, 1871; 1886; Gerhardt, 1910a; Kolbe, 1927)
Eastern Sudety Mts.: Reichenstein (Złoty Stok), Grafschaft Glatz (Hrabstwo Kłodzkie) (Letzner, 1871; 1886; Gerhardt, 1910a)
Western Beskid Mts.: Ochotnica Dolna-Brysiówka (Wojas, 1994), records without exact data (Wachtl, 1870; Stefek, 1939)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Szujecki, 1966b; 1980; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Prussia (Siebold, 1847; Lentz, 1857), Silesia (Kuhnt, 1912), Beskidy Mts. (Szujecki, 1980); Galicia (Łomnicki, 1884), Carpathians (Nowicki, 1873).

Phenology and development. In Poland beetles are observed from May to October. The greatest numbers are recorded from July to September, with a peak in August (**Fig. 6.46**). During that period beetles are caught in relatively large numbers of individuals within a locality (on average 3.71 individuals were observed per locality).

The first developmental stages of larvae were described by Szujecki (1966c) and Boháč (1982).

According to Szujecki (1980), beetles deposit eggs to the soil in August. Larvae live in tubular, vertical burrows from September to June the next year, from which they hunt for small invertebrates, particularly ants. Larvae L_3 overwinter and need to live through a period of low temperatures for further development (Boháč, 1982).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	0	3	2	72	213	182	9	0	0
Number of records	0	0	0	0	3	2	33	53	32	8	0	0

Fig. 6.46. Frequency of *Platydracus stercorarius stercoraius* (Ol., 1795) in localities in Poland

Staphylinus Linnaeus, 1758

This genus comprises 6 confirmed Palearctic species of which 4 occur in Central Europe (Schillhammer, 2011), and a large number of doubtful taxa still residing in Staphylinus but mostly belong to other (Szujecki, 1980; Smetana & Davies, 2000).

Staphylinus caesareus caesareus Cederhjelm, 1798

Within this species, onesubspecies *Staphylinus caesareus corporaali* Sainte-Claire Deville, 1927, is distinguished, known from single localities in the Pyrenees (Puerto de Pajares, Itxassou) and south-eastern France (Herman, 2001; Löbl & Löbl, 2015).

General distribution. A species with an extensive distribution in Europe, covering the Mediterranean, central European and Baltic countries as well as northern Europe (Karelia, Finland, Sweden and Norway). In the east its range comprises Ukraine, Turkey, Georgia, Armenia, Iran, Syria, Lebanon and Cyprus (Löbl & Smetana, 2004; Anlaş, 2009; Anlaş & Newton, 2010; Ferreira, 2018; Assing & Schülke, 2019). Recorded also from Algeria (Bordoni, 2010). Its occurrence in North America (Horion, 1965; Szujecki, 1980) has been questioned (Löbl & Smetana, 2004; Japoshvili & Anlaş, 2011).

Habitat preferences. According to Horion (1965) this species inhabits open habitats, where it is found in midfield roads, mesic meadows, fallowland under stones and any type of decaying organic matter (carrion, feces, manure, etc.). In forest habitats it prefers light and insolated sites (Horion, 1965; Szujecki, 1980; Kleeberg & Uhlig, 2011).

In the Alps it has been found in mountain meadows at altitudes of 900–1000 m a.s.l. (Zanetti, 2015).

It is also found in synanthropic habitats. In Ukrainian cities it was recorded next to *Drusilla canaliculata* (Fabr.) as an eudominant (Puchkov *et* al., 2020). In wheat fields in Hungary (Balog & Markó, 2007a) it is one of the most often found species of Staphylinidae.

Occurrence in Poland. In Poland until the end of the 20th century *Staphylinus caesareus caesareus* (Polish: kusak cezarek after Szujecki 2017) was observed more frequently in the southern part of the country (Burakowski *et* al., 1980; Szujecki, 1980). The new data confirm the existing information on the distribution of this species (**Fig. 6.47**).

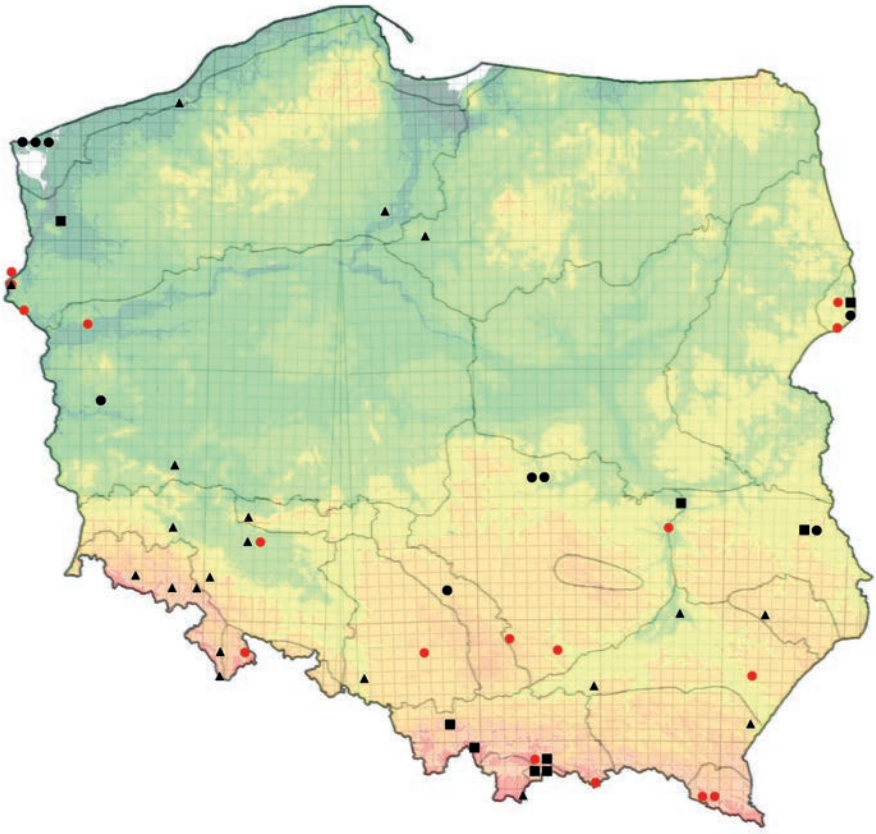


Fig. 6.47. Distribution of *Staphylinus caesareus caesareus* Ced., 1798 in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

New records

Pomeranian Lake District: Bielinek nat. res. [VU46], 7 VII, 1 ex., 6 X, 1 ex., 1 IX 2009, 2 exx., 28 VI, 1 ex., 30 VIII 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; 1 XI 2009, 1 ex. and 29 IV 2010, 2 exx., stipa grassland, pitfall trap, leg. PS, coll. PJ; Gozdowice [VU54], stipa grassland, 28 V 2010, 3 exx., leg. PS, coll. PJ; Raduń [VU47], 28 IV, 14 exx., 30 V, 24 exx., 8 VII, 4 exx., 5 VII, 3 exx., 30 VIII 2011, 1 ex., beech forest on the embankment of the Odra River pitfall trap, leg. PS, det., coll. AM; Raduń vic. [VU47], 30 V 2011, 3 exx., beech growing on the embankment of the Odra River, leg. PS, det. AM, coll. KK

Wielkopolska-Kujawy Lowland: Bogdaniec [WU03] 13 VI 1993, 1 ex. leg. J. Stawińska, det., coll. AMa

Białowieża Primeval Forest: Białowieża District [FD83] pitfall trap, 4 V–14 VI 2016: 1 ex. (for. Comp. 523Ca), 1 ex. (578Ad), det. AM, leg., coll. DFP. Browsk District [FD85], pitfall trap, 4 V–14 VI 2016: 1 ex. (for. Comp. 153Bc); 10 VII–13 VIII 2018: 1 ex. (128Ca), det. AM, leg., coll. DFP

Lower Silesia: Wrocław [XS46], 17 IV 1949, 1 ex. leg., det., ex coll. AG, ver. AM, coll. MNHW

Upper Silesia: Bytom [CA57], 10 VI 1944, 1 ex., leg. FK, det. AM, coll. USM

Eastern Sudety Mts.: Lądek Zdrój [XR37], 1–3 VII 1996, 1 ex., det. AM, leg. Lbo, coll. Rru

Małopolska Upland: Machów [EB57], 25 VII 1995, 1 ex. in the pitfall trap, leg. BS, coll. MCSU; Pełczyna near Pińczów [DA67], 14 V 2010, 1 ex. leg. ŁM, det. AM, coll. JM; Pstroszyce Drugie [DA28], 28 III–22 IX 2015, 8 exx., xerothermic slope, pitfall trap, leg., coll. JTD

Lubelska Upland: Biała Góra [FA25], 27 V and 5 VIII 1995, 2 exx. in the pitfall trap, leg. BS, coll. MCSU

Western Beskid Mts.: Gorce Mts. – Ochotnica Górna [DV48], 9–10 VII 2002, 1 ex., leg., det. et coll. TW; Majdan near Muszyna [DV96], 4 V 2000, 1 ex., leg. Piotr Piotrowski, coll. AM

Bieszczady Mts.: Dołżyca [EV95], VII 1965, 1 ex. leg. SG, ex coll. AG, det. AM, coll. MNHW; Mików [EV85], 4 VIII 1975, 1 ex., leg. LB, coll. AM

Previously recorded from:

Baltic Coast: Koszalin (Lüllwitz, 1916), Międzyzdroje, Świnoujście, Wisełka (Wolender & Zych, 2007)

Pomeranian Lake District: Świecie (Allgemeiner Bericht…, 1912), Bielinek (Engel, 1938), Wielgowo near Szczecin (Cykowski, 1977)

Masurian Lake District: Wąbrzeźno (Albien, 1905)

Wielkopolska-Kujawy Lowland: Gryżyński Landscape Park (Zając *et* al., 2005; Ruta *et* al., 2016), Glogau (Głogów; Letzner, 1871; 1886), records without exact data (Uechtritz, 1844; Albien, 1905; Koerth, 1916; Szulczewski, 1922; Gruhl, 1933; Myrdzik, 1933; Arnold, 1936; Oko, 1963)

Białowieża Primeval Forest: records without exact data (Karpiński, 1949; Derunkov & Melke, 2001)

Lower Silesia: Liegnitz (Legnica), Breslau (Wrocław) (Letzner, 1871; 1886; Schwarz & Letzner, 1874; Kolbe, 1928)

Trzebnica Hills: records without exact data (Letzner, 1871; 1886)

Upper Silesia: records without exact data (Kelch, 1846; Roger, 1856; Letzner, 1871; 1886; Stefek, 1939)

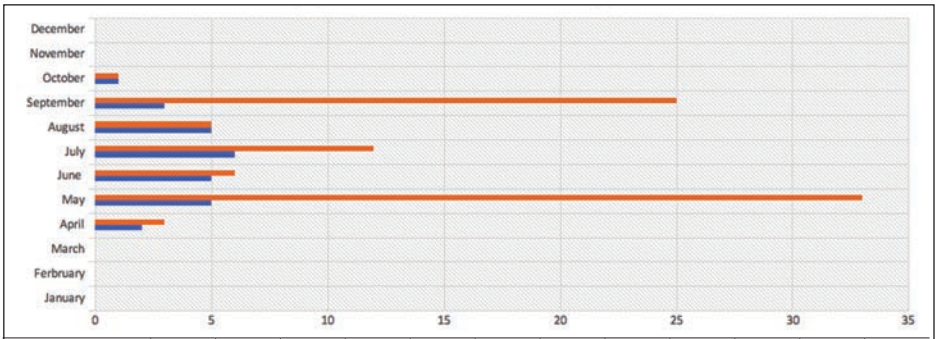
Kraków-Wieluń Upland: Zielona Góra nat. res. near Kusięta (Kościelny, 2018), records without exact data (Kotula, 1873; Lgocki, 1908; Stefek, 1939; Szujecki, 1960b)

Małopolska Upland: Spała Distr. – Konewka nat. res. and Żądłowice nat. res. (Rutkiewicz *et* al., 2013), records without exact data (Lgocki, 1908; Eichler, 1929; Karczewski, 1961)
Lubelska Upland: Puławy (Szujecki, 1960b; 1980), Stawska Góra nat. res. near Chełm Lubelski (Honczarenko, 1962; Staniec, 2002)
Roztocze: Zwierzyniec – Zamość Province (Tenenbaum, 1913)
Sandomierska Lowland: Tarnów vic. (Viertl, 1872), Kotowa Wola (Jachno, 1880)
Western Sudety Mts.: Landeshut (Kamienna Góra), Hirschberger Tal (Kotlina Jeleniogórska), Charlottenbrunn (Jedlina Zdrój) (Letzner, 1871; 1886; Polentz, 1942a)
Eastern Sudety Mts.: Freiwalde (Lesica), Grafschaft Glatz (Hrabstwo Kłodzkie; Letzner, 1871; 1886)
Western Beskid Mts.: Babia Góra Mt. (Pawłowski, 1967), Kluszkowce, Tylmanowa (Wojas, 1994), Little Beskid Mts. (Paśnik, 1998), Babia Góra Massif (Kubisz & Szafraniec, 2003), records without exact data (Wachtl, 1870; Stobiecki, 1883; Letzner, 1886; Warzecha, 1927)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929)
Pieniny Mts.: Ociemne (Mroczkowski, 1978; Szujecki, 1960b)
Tatry Mts.: records without exact data (Łomnicki, 1866; 1868; Nowicki, 1873)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Kulwieć, 1907; Łomnicki, 1913; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015), Southern Poland (Horion, 1965; Szujecki, 1980), Prussia (Siebold, 1847; Lentz, 1853; 1857; 1879), Silesia (Letzner, 1854; Reitter, 1870b; Gerhardt, 1910a; Kuhnt, 1912; Polentz, 1936), Galicia (Łomnicki, 1884; 1886), Carpathians (Nowicki, 1873); Western Galicia (Nowicki, 1873), Krakow Province (Juszczyk, 1950).

Phenology and development. Its developmental stages were described by Thomson (1860, after Kleeberg and Uhlig, 2011) and Boháč (1982). Characteristics distinguishing larvae of *S. caesareus* from *S. erythropterus* are given by Pietrykowska-Tudruj & Staniec (2012). Characteristics of pupae of the species from the genus *Staphylinus* are listed in a study by Staniec & Pietrykowska-Tudruj (2019).

In newly reported localities in Poland it is observed from April to October with the highest frequency of occurrence in July. However, the greatest number of recorded individuals showed two culminations – in May and September (**Fig. 6.48**). The second, September culmination may result from the gradation of young beetles starting from August (Kleeberg & Uhlig, 2011).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	3	33	6	12	5	25	1	0	0
Number of records	0	0	0	2	5	5	6	5	3	1	0	0

Fig. 6.48. Frequency of *Staphylinus caesareus caesareus* Ced., 1798 in localities in Poland

Staphylinus dimidiaticornis Gemminger, 1851

General distribution. A European species, found in the central, southern and northern parts of the continent, in England and Ireland, the Baltic states, as well as the northern, European part of Russia and in Ukraine. In the southern part of the continent it is found from the Iberian Peninsula to the Balkans. It was also recorded in Kashmir (Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015).

Habitat preferences. It prefers open spaces, it is less frequent in light forests. It is a thermophilous species, reported in the habitat of subcontinental fresh coniferous forest *Peucedano-Pinetum* (Szujecki, 1995; Nowosad & Mazur, 2010). Beetles are highly predatory and are found under stones, in feces and in the leaf litter (Szujecki, 1980). Rare in peatbogs in Belarus (Sushko, 2016). There are numerous records from the Alps (Kofler, 2015), in the area of Trentino it is found in mountain meadows at altitudes of 900 m a.s.l. (Zanetti, 2015), and even above the tree line (Passo Rolle, 1989 m a.s.l., the author's observation, 9 VII 2021, AMa).

Occurrence in Poland. Staphylinus dimidiaticornis (Polish kusak podkamieniec, after Szujecki, 2017) in the period from 1928 to 1945 was recorded in the western parts of present-day Poland (Goleniów, Skwierzyna, Lower Silesia and the Sudety Mts.). In the central and eastern parts of the country it was recorded only after WWII, while original data indicate the occurrence of this species throughout Poland (**Fig. 6.49**), with the number of new localities considerably exceeding those previously known. A similar increase in the number of localities was recorded in Latvia, where *S. dimidiaticornis* was reported for the first time in 1979, whereas at present it is caught in numerous localities (Cibuļskis, 2007).

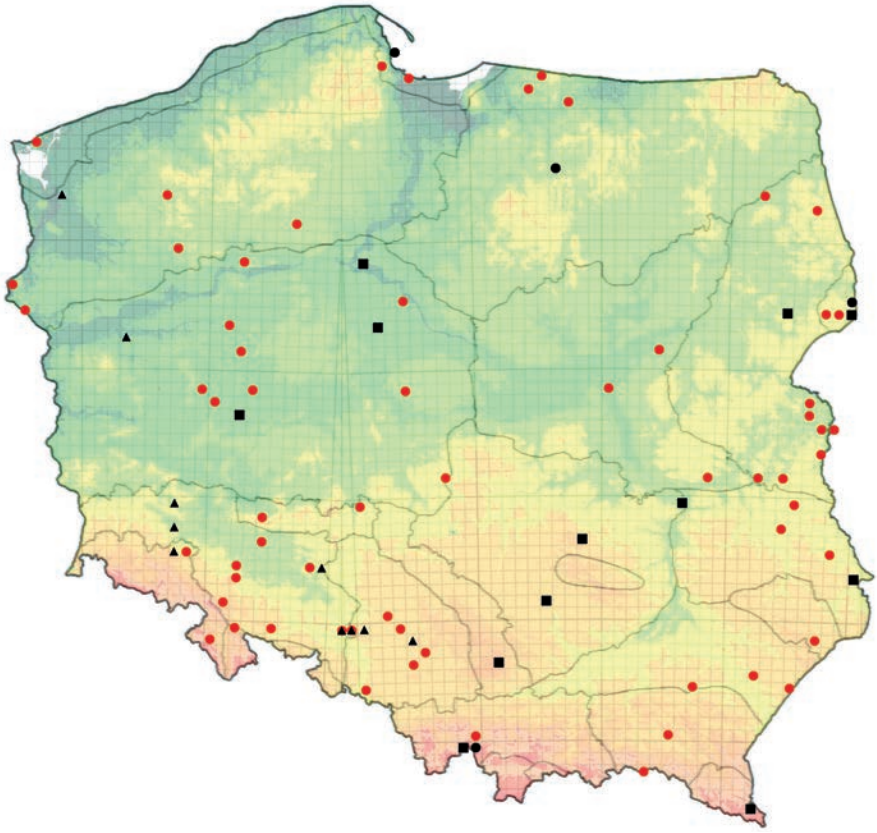


Fig. 6.49. Distribution of *Staphylinus dimidiaticornis* Gemm., 1851 in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

New records

Baltic Coast: Gdańsk vic. [CF33], 28 VIII 2009, 2 exx., in the entomological sieve, Trójmiejski Landscape Park, leg., coll. DJT; Gdańsk [CF33], 22 VII 2017, 1 ex., fallow in the city, leg., coll. DJT; Sobieszewo [CF52], 7 VIII 1961, 1 ex., leg. TS, det. AM, coll. USM; Wolin island, Wapnica [VV67], 9 VIII 1991, 1 ex. det. AM, leg., coll. MW

Pomeranian Lake District: Bielinek nat. res. [VU46], 1 VII–1 VIII 2009, 1 ex., leg. PS., coll. PJ; 1 X 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Gozdowice [VU54], 28 VI 2010, 1 ex., moor pitfall trap, leg. PS, det., coll. AM; Zakrzewska Osada [XV61], 12 IX 2010, 1 ex., the pitfall trap, leg., coll. DJT; Złocieniec [WV63], 9 IX 2012, 1 ex. on the way and 6 V 2015, 1 ex. on railway tracks, leg., coll. KR

Masurian Lake District: Biebrza NP, Wilcza Mt. [FE23], 31 V 1999, 1 ex., det. AM, leg., coll. MW; Dębowiec vic. [DF41], 20 IV 2003, 1 ex., leg. BB, coll. KK; Głębock [DF52], 3 V 2013, 1 ex., leg. P. Grochalski, det. et coll. TW; Lidzbark Warmiński [DF70], 6 IX 1985, 1 ex., leg. TM, coll. AM; Tuczno [WU79], 21 V 2011, 1 ex., xerothermic grassland, leg., coll. JTD

Wielkopolska-Kujawy Lowland: Dziembowo vic. [XU28], edge of Noteć river valley, 31 III 2002, 1 ex. under stone, leg., coll. RRu; Grodzisk Wielkopolski [WT98], 1910–1920, 3 exx., leg. Zemlerski, det. AM, coll. NHC; Koło [CC48], 23 VII 1990, 2 exx., leg. TM, coll. AM; Krajkowo nat. res. [XT38], 29 VII 2000, leg. PS, coll. AM; Poznań-Rusałka [XU21], 20 VI 1988, 1 ex. leg., det., coll. AN; Sepno near Kamieniec [XT07], 25 IX 2007, leg. MBu, coll. PJ; Uroczysko Koneck nat. res. [CD45], 2015 (no exact date), 1 ex., leg., coll., det. BP; Uścikowiec near Oborniki Wielkopolskie [XU13], 2 VI–23 VI 2007, 2 exx., pitfall trap, leg. TSz, det., coll. AM

Mazovian Lowland: Anielówka [EC81], 24 VI 2014, 6 exx., meadow pitfall trap, leg. IH, coll. AM; Urle [ED41], 8 VII 1909, 1 ex., leg. WM, det. AM, coll. USM; Warszawa [EC08], 1 V 1891, 1 ex., leg HN, det. AM, coll. USM; Warszawa – ogród Saski [EC08], 4 X 1893, 1 ex., leg. WM, det. AM, coll. USM

Podlasie: Dereczanka [FC67], 4 VI 2014, 1 ex., meadow pitfall trap, leg. AH, coll. AM and 24 VI 2014, 1 ex., meadow pitfall trap, leg. ŁN, coll. AM; Hanna [FC73], 27 VIII 2014, 5 exx., meadow pitfall trap, leg. ŁN, coll. AM; Kijowiec Kol. [FC67], 4 VI 2014, 4 exx., meadow pitfall trap, leg. AH, coll. AM; and 24 VI 2014, 5 exx., meadow pitfall trap, leg. ŁN, coll, AM; Kodeń [FC75], 27 VII 2014, 1 ex., meadow pitfall trap, leg. ŁN and TP, coll. AM; Kropiwki [FC41], 3 VII 2014, 3 exx., meadow pitfall trap, leg. AH, coll. AM; and 3 VII, 2 exx., 29 VII 2014, 3 exx., meadow pitfall trap, leg. ŁN, coll. AM; Kuzawka [FC73], 3 VII 2014, 1 ex., and 29 VII 2014, 1 ex., meadow pitfall trap, leg. ŁN, coll. AM; 30 IV 2014, 10 exx., cereal crop pitfall trap leg. AH, coll. AM; 3 VI 2014, 2 exx., cereal crop pitfall trap, leg. PW, coll. AM; Okoczyn [FC85], 24 VI 2014, 1 ex., meadow pitfall trap, leg. ŁN, coll. AM; Sławatycze [FC73], 30 IV 2014, 5 exx., cereal crop pitfall trap, leg. AH, coll. AM, 3 VI 2014, 2 exx., cereal crop pitfall trap, leg PW, coll. AM, 27 VI 2014, 2 exx., leg PR, coll. AM; Sokółka [FE62], 2003 (no exact date), 1 ex., leg., coll., det. BP; Tyśmienica [FC21], 31 VII 2014, 1ex., meadow pitfall trap, leg. ŁN, coll. AM; Zahorów [FC66], 30 IV 2014, 2 exx., cereal crop pitfall trap, leg. AH, coll. AM

Białowieża Primeval Forest: Białowieża vic. [FD84], 2 V 1994, 1 ex., leg. JMG, coll. AM; 7 V 1993, 1 ex., leg. JMG et AM, coll. AM; Białowieża [FD94], 1 VIII 1988, 1 ex. leg. A. Szczerba, det., coll. AMa; Białowieża clearing [FD94], 8 V 1993, 1 ex., leg., coll. AM; Hajnówka District [FD74], pitfall trap, 4 V–14 VI 2016: 1 ex. (for. comp. 384Ca), det. AM, leg., coll. DFP

Lower Silesia: Bardo Śląskie [XR29], 24 IX 1926, 1 ex., leg. FK, det. AM, coll. USM; Bielawskie Hills near Dzierżoniów [XS11], 20 III 1954, 1 ex. under stone, leg., det. ex coll. AG, ver. AM, coll. MNHW; Gogolin [BA89], 19 IX 1924, 1 ex., 30 IV 1928, 1 ex., leg. HN, det. AM, coll. USM; Kamienna Mt. [BA99], 17 X 1938, 1 ex., leg. HN, det. AM, coll. USM; Ligota Otmuchowska [XR59], 20 IV 1920, 1 ex., leg. ED, det. AM, coll. USM; Sobótka [XS24], 18 IV 1948, 1 ex., det., leg. J. Złotorzycki, ex coll. AG, ver. AM, coll. MNHW; Sulistrowiczki [XS23], 16 VIII 1976, 1 ex., det., leg. LBo, coll. RRu; Stobrawa [XS84], 6 II 1920, 1 ex., leg. HN, det. AM, coll. USM; Wrocław-Swojczyce [XS46], 8 V 2004, 1 ex., leg. Zdzisław Klukowski, coll. AM

Trzebnica Hills: Trzebnica [XS48], VI 1935, 1 ex., leg. FK, det. AM, coll. USM

Upper Silesia: Brynek [CA39], 5 IV 1937, 1 ex., leg. HN, det. AM, coll. USM; Bytom [CA57], 1 IX 1931, 1 ex., VIII 1935, 1 ex., 28 X 1938, 1 ex., 20 V 1942, 1 ex., 3 VI 1944, leg. FK, det. AM, coll. USM; Góra Św. Anny Mt. [BA99], 29 IV 1929, 1 ex., 15 IV 1938, 1 ex., leg. HN, det. AM, coll. USM; Kielcza [CB20], 24 IV 1927, leg. FK, det. AM, coll. USM; Ligota Tworkowska [CA04], 7 IV, 1 ex., 16 IV 1936, 1 ex., leg. WY, det. AM, coll. USM; Pogrzebień [CA04], 30 VI 1934, 1 ex., leg. WY, det. AM, coll. USM; Ruda Śląska – Halemba Forest [CA46], 11 VII 1924, 1 ex., leg. MK, det. AM, coll. USM; Szymiszów [CB00], 31 V 1928, 1 ex., leg HN, det. AM, coll. USM

Małopolska Upland: Łask-Ostrów [CC71], 1–15 IX 2007, 1 ex. caught in the pitfall trap, leg., coll. AK

Lubelska Upland: Białka near Milejów [FB47], 10 IV 1983, 2 exx. in a pine forest, leg. BS, coll. MCSU; Koczów [FB85], 27 V 2014, 7 exx. and 3 VII 2014, 1 ex., meadow pitfall trap, leg. AH, coll. AM and 25 VI 2014, 1 ex., meadow pitfall trap, leg. IH, coll. AM; Leszczyna [FB85], 27 V 2014, 9 exx., 3 VII 2014, 6 exx., 28 VIII 2014, 2 exx., meadow pitfall trap, leg. AH, coll. AM and 30 VII 2014, 2 exx., meadow pitfall trap, leg. SŠ and TP, coll. AM; Sęków [FB59], 27 VIII 2014, 2 exx., meadow pitfall trap, leg. AH, coll. AM

Roztocze: Korhynie [FA78], 23 IX 1993, 1 ex. in the pitfall trap, leg. RR, coll. MCSU

Sandomierska Upland: Radawa [FA25], 1–10 VI 1989, 1 ex., det. AM, leg., coll. JM; Rzeszów [EA74], 23 IV 2016, 1 ex., municipal greenery, det. AM, leg., coll. JM; Lubaczów District: Łukawiec for. distr., 352a for. comp. [FA54], 1 ex., 31 V 2017, pitfall trap, det. AM, leg., coll. DMF

Western Sudety Mts.: Jawor [WS85], 29 IV–4 V 2016, 1 ex., leg. anonim, det. et coll. TW

Eastern Sudety Mts.: Polanica Zdrój [XR08], IV 1940, 1 ex., leg. anonim, det. AM, coll. USM

Western Beskidy Mts.: Zawoja [CA90], 19 V 1960, 1 ex., leg. ASk, det. AM, coll. USM

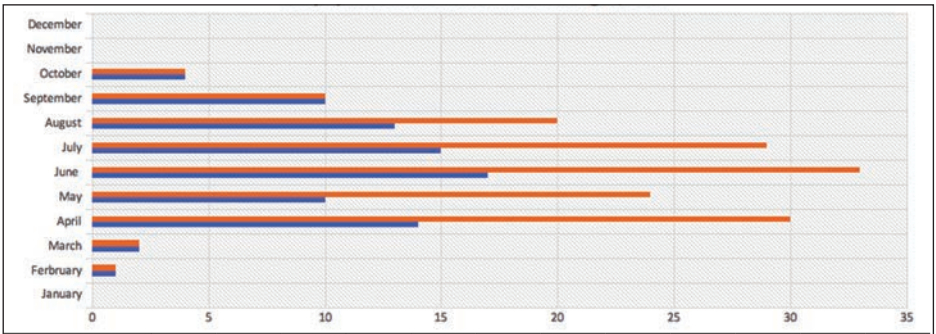
Eastern Beskid Mts.: Humniska (Mała Strona) [EA70], 18 VIII 2010, 1 ex., leg. det. et coll. DT; Krosno [EA50], VIII 1954, 1 ex., det. AM, leg. AG, coll. MNHW; Ożenna [EV37], 21 VIII 2010, 1 ex., potatoes field, Barber trap, leg. ASze, det. AM, coll. TO
Bieszczady Mts.: Ustrzyki Górne [FV24], 14 IX 1976, 1 ex. leg., det., coll. AN

Previously recorded from:

Baltic Coast: Gdynia-Kępa Redłowska (Konopko *et* al., 2017)
Pomeranian Lake District: Goleniów (Kleine, 1940b)
Mazurian Lake District: Olsztyn (Salmonowicz, 2001)
Wielkopolska-Kujawy Lowland: Skwierzyna (Arnold, 1936), Kopaszewo – Leszno Province (Mackiewicz, 1971), Solec Kujawski District (Smoleński, 1993; Szujecki, 1995)
Mazowian Lowland: Biała Forest (Szujecki, 1995), records without exact data (Tenenbaum, 1926; Szujecki, 1966b; Szujecki, 1968)
Podlasie: Bielsk Podlaski (Burakowski *et* al., 1980)
Białowieża Primeval Forest: Białowieża NP (Borowiec *et* al., 1992), Derunkov & Melke, 2001
Lower Silesia: Liegnitz (Legnica), Heßberge (Gorzyca near Lubin), Brechelshof (Żarek near Jawor, Męcinka) (Kolbe, 1928), records without exact data (Kolbe, 1931; Rüschkamp, 1931)
Upper Silesia: records without exact data (Kolbe, 1931)
Kraków-Wieluń Upland: Ojcowski NP and vic. (Pawłowski *et* al., 1994)
Małopolska Upland: Jędrzejów Distr. (Karczewski, 1961)
Świętokrzyskie Mts.: Blizyn, Świętokrzyski NP (Burakowski *et* al., 1980)
Lubelska Upland: Puławy, Hrubieszów (Burakowski *et* al., 1980)
Western Sudety Mts.: records without exact data (Kolbe, 1928; Polentz, 1942a)
Western Beskid Mts.: Babia Góra Mt. (Pawłowski, 1964; 1967), Babia Góra Massif (Kubisz & Szafraniec, 2003)
Bieszczady Mts.: Ustrzyki Górne (Nowosad, 1990)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Szujecki, 1960b; 1980; Horion, 1965; Nowosad, 2000; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Silesia (Polentz, 1936).

Phenology and development. Developmental stages were described by Szujecki (1966a). Beetles have been caught from February to October, with the greatest numbers and frequency in July (**Fig. 6.50**). A high frequency of beetles is observed from April to August.



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	1	2	30	24	33	29	20	10	4	0	0
Number of records	0	1	2	14	10	17	15	13	10	4	0	0

Fig. 6.50. Frequency of *Staphylinus dimidiaticornis* Gemm., 1851 in localities in Poland

Staphylinus erythropterus erythropterus Linnaeus, 1758

In Europe, apart from the nominative species, one subspecies is distinguished – *Staphylinus erythropterus springeri* G. Müller 1923, which is known from Austria, Slovenia and Croatia (Herman, 2001). In Poland only the nominative subspecies is found.

General distribution. A species widely distributed in Europe and Asia. In the European continent it inhabits the central and northern parts, reaching far north, where it is not frequently observed. It is found in much larger numbers throughout central Europe. In the south it reaches southern France and northern Italy. In the east its range covers western Russia – from Karelia to Ukraine, Azerbaijan, Anatolia and Iran. It is recorded in Siberia and China (Horion, 1965; Burakowski *et* al., 1980; Löbl & Smetana, 2004; Anlaş & Newton, 2010; Bordoni, 2010; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015). Its occurrence in North America was not confirmed by Löbl & Smetana (2004).

Habitat preferences. It inhabits lowland and mountain areas, reaching the subalpine zone – in the mountains of Europe it is found from the Alps to southern Carpathian Mts. (Szujecki, 1996). It prefers forest habitats (Szujecki, 1980), it is less frequently found in open habitats, where beetles stay under stones, in feces and among dead plant residue (Horion, 1965; Burakowski *et* al., 1980; Mądra *et* al., 2014). In forests it typically prefers moist sites. Among dominant species in epigeic assemblages of Staphylinidae in the Białowieża Forest it has been reported in mesic coniferous forest, mesic mixed coniferous forest (with dominance over 13%), mixed swamp coniferous forest, mixed swamp forest, mesic forest, ash-alder swamp forest and alder swamp forest (Smoleński & Szujecki, 2001; Nowosad & Mazur, 2010). In mesic coniferous forests it is

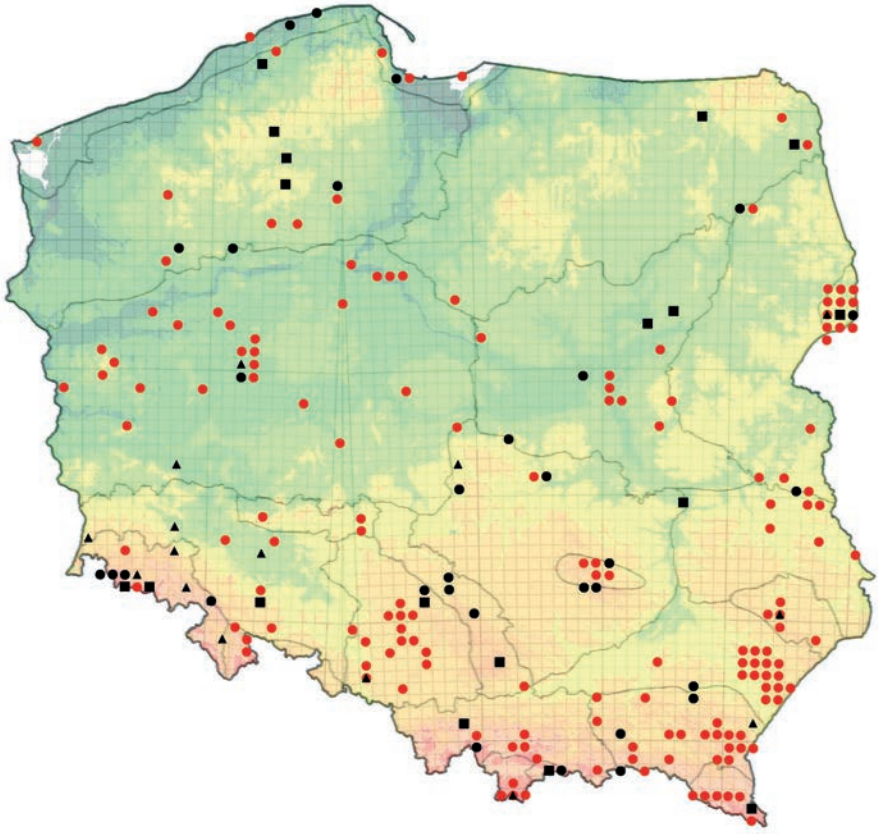


Fig. 6.51. Distribution of *Staphylinus erythropterus erythropterus* L., 1758 in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

a subdominant species (Szujecki, 2017). In xeric localities in pine forests beetles were found in greater numbers in locally more moist substrate (Kleeberg & Uhlig, 2011). Incidentally found in caves (as a trogloxene; Kocot-Zalewska & Melke, 2021).

Staphylinus erythropterus is a predatory species, typically attacking in response to movement of its prey, among which there are wireworms (larvae of click beetles) as well as larvae and pupae of phytophagous species periodically staying in the leaf litter (Szujecki, 2017). In Połonina Wetlińska predation was observed in relation to *Amara nigricornis* Thoms. (Carabidae; Wojas, 2012).

Occurrence in Poland. This species is found throughout the country and it is one of the most frequently observed large Staphylinina species (**Fig. 6.51**).

New records

Baltic Coast: Gdynia vic. [CF34], 26 VI 2015, 1 ex., in the forest, Trójmiejski Landscape Park, leg., coll. DJT; Krynica Morska [CF92], 1 VI 2013, 3 exx., forest by the sea, leg., coll. DJT; Orzechowo [XA25], 11 VIII 1988, 1 ex., det., leg. LBo, coll. RRu; Słowiński NP – Gardno Lake [XA56], 26 VI 2005, 1 ex., det. AM, leg., ex coll. OA, coll. AM; Sobieszewo [CF52], 7 VIII 1961, 3 exx., leg. TS, det. AM, coll. USM; Wolin [VV67], 15 VII 1975, 1 ex. in beech forest, leg. PSt, det., coll. AMa

Pomeranian Lake District: Bory Tucholskie – Świt for. distr. near Cekcyn [XV93], 11 XI 1990, 2 exx., leg. KHM, coll. AM; Damnica [XA44], 15 V 2007, 1 ex., overgrowing meadow, leg. EJ, det. AM, ex coll. OA, coll. AM; Drawieński NP [WU68], 26 VI 1997, 1 ex., on a forest road, leg., coll. SK; Mały Smólsk lake vic. [XV41], 6 VII 1997, 1 ex., leg., coll. RRu; Piła, Gładyszewo [XU19], 17 V 1997, 1 ex., leg., coll. RRu; Zakrzewska Osada [XV61], 19 IX 2016, 1 ex., sown from leaves in the forest leg., coll. DJT; Złocieniec [WV63], 18 IV 2010, 2 exx. on the meadow, 25 VIII 2013, 4 exx. in the beech forest, 21 IX 2013, 2 exx. on the moor, 21 IV 2014, 3 exx. on the way and 25 V 2014, 4 exx. in a fox burrow, leg., coll. KR

Mazurian Lake District: Augustowska Forest, Mikaszówka [FE57], 16 VIII 1976, 1 ex. det. AM, leg., coll. MW; Wigierski NP, Huta [FE39], 19 VI 1991, 1 ex. leg., det., coll. AMa

Wielkopolska-Kujawy Lowland: Biedrusko vic., military training ground [XU32], 17 VII 2005, 1 ex. in pitfall trap in thick bushes *Pruno-Crataegetum*, leg. PS, coll. SK; Bielawy vic. [BD95], 21 VI–21 VII 2016, 1 ex. in the pitfall trap, leg., coll. SK; on Lake Buszno near Sulęcin [WU20], 14 V 2012, 1 ex., leg., coll. RO; Bolechowo [XU32], 1 IX 1989, 4 exx. leg. W. Krzywański, det., coll. AMa; Cierpice vic. [CD27], 17 VI 2017, 2 exx., pitfall trap, leg., coll. AM; Czeszewo-Żerków Lanskape Park, Czeszewski Las [XT77], 17 IX 2008, 2 exx., leg. PRu, coll. NHC; Dobrygość near Łęka Opatowska [CB08], 16 VIII 1984, 1 ex., leg. A. Pokojowczyk, coll. NHC; Gołuchów [YT04], 26 IV 1991, 1 ex., 3 I 1983, 1 ex., leg., coll. AM; Gościm [WU54], 5 VI 2014, 1 ex., lwg., coll. RO; Grodzisk Wielkopolski [WT98], 1910–1920 (no exact date), 2 exx., leg. Zemlerski, coll. NHC; Jeziory [WT48], 22 VI 2011, 1 ex. leg., coll. RO; Koło [CC48], VIII 1989, 1 ex. leg. TM, coll. AM; Obrzycko near Zielonagóra [XU04], 14 VI 1992, 1 ex., leg., det., coll. AN; 8 VI 1994, 1 ex., leg., coll. SK; Pawski Ług nat. res. [WT19], 3 VII 2007, 1 ex., leg., coll. RO; Piła [XU19], Pomorska street, 30 IV 1999, 1 ex., leg., coll. RRu; Poznań [XU30], 16 V 2002, 1 ex., leg., det., coll. AN; Poznań-Darzybór [XU30], 27 IV 1983, 1 ex., leg. ASz, coll. NHC; Zielonka Forest, Potasze [XU32], 6 V 1989 3 exx., 10 V 1989, 1 ex., 25 V 1993, 1 ex. in Scots pine forest, leg., det., coll. AMa; Puszczykowo [XT29], 5 VI 1994, 1 ex., 24 IV 1994, 1 ex.,

23 VI 1994, 1 ex., leg., coll. PJ; Radojewo vic. [XU21], 6 VII 1999, 1 ex., military training ground, sandy road, leg., coll. SK; Radojewo vic. [XU31/32], 14 VII 2004, 3 exx., lowered area covered with reeds, leg. K. Rosiak, coll. SK; Siemianice [CB07], 20 VI 1980, 2 exx., leg. PSt, det., coll. AMa; Sierakowski Landscape Park, Sieraków [WU73], 31 V–10 VI 2004, 1 ex. on the Jaroszewskie Lake, leg. MŚ, det., coll. AM; Sulęcin District, for. comp. 124j, [WU11], 15 V 1995, 3 exx., 5 VI 1995, 2 exx., 27 VI 1995, 2 exx., 9 VII 1995, 16 exx. in scot pine forest, leg. W. Gorączka, det., coll. AMa; Toruń-Barbarka [CD37], 1 V 1992, 1 ex., on the forest road, leg. KHM, coll. AM; Toruń-Stawki, military training ground [CD47], 30 IV 2012, 1 ex., leg., coll., det. BP; Wielkopolski NP, Kątnik vic. [XT39], 16 V 2003, 1 ex., 5 V 2009, 1 ex., leg., coll. SK; Wielkopolski PN, Szreniawa vic. [XT29], 27 VII 1997, 1 ex. on a forest road, leg., coll. SK; Urad near Cybinka [VT88], 6 XII 2017, 1 ex. in pine litter, det. AM, leg., coll. WK; Uścikowiec near Oborniki Wielkopolskie [XU13], 19 V–28 VII 2007, 3 exx., pitfall trap, leg. TSz, det., coll. AM; Wypaleniska near Bydgoszcz [CD08], 17 VI 2017, 1 ex., pitfall trap, leg., coll. AM; Wymyślin [CD85], 17 VIII 1993, 1 ex., 16 VIII 1998, 1 ex., leg., coll. PJ; Zielona Góra – osiedle Forest [WT35], 13 VI 2013, 1 ex., leg., coll. RO

Mazovian Lowland: Kampinoski NP, Izabelin [DC89], 29 V 2010, 1 ex., on stairs in front of Kampinoski NP Directorate, leg., coll., det. BP; Krzywy Kołek near Soczewka [DD02], 3 V 2012, 1 ex., forest pathway, leg., coll., det. BP; Marcelin [EC09], 7 VII 1894, 1 ex., leg. WM, det. AM, coll. USM; Natolin [EC09], 27 IV, 1 V and 5 V 1888, 3 exx., 6 IV and 14 VI 1893, 2 exx., leg. WM, det. AM, coll. USM; Świder [EC17], 12 VII 1899, 5 exx., leg. TS, det. AM, coll. USM; Trąbki [EC45], VI 1902, 1 ex., leg. WM, det. AM, coll. USM; Urle [ED41], 8 VII 1909, 1 ex., leg. WM, det. AM, coll. USM; Warszawa [EC08], 21 V 1891, 1 ex., leg. WM, det. AM, coll. USM; Warszawa-Kabacki Forest [EC07], 31 III 2005, 1 ex., leg., coll. JTD; 14 V 2005, 1 ex., leg., coll. JTD; Warszawa – Natoliński Forest [EC07], 24 V 2016, 1 ex., leg., coll. JTD; Kampinoska Forest – Sieraków [DC89], 9 IX 2009, 1 ex., pupa, leg., coll. JTD

Podlasie: transitional bog "Bukowski Las" [FB79], 18 V and 23 VII 2007, 2 exx. pitfall trap, leg. TOd, coll. MCSU; Kropiwki [FC41], 3 VII 2014, 4 exx., and 31 VII 2014, 1 ex., meadow pitfall trap, leg. ŁN, coll. AM; Laski Bruskie [FC 50], 31 VII 2014, 2 exx., meadow pitfall trap, leg. ŁN, coll. AM; Osowiec – Twierdza [FE12], 19 VII 1999, 1 ex. near Carska road and Łosia Biel peatbog, det. AM, leg., coll. MW; Połoski [FC65], 3 VI 2014, 1 ex., cereal crop pitfall trap, leg. PR, coll. AM; Suchawa [FC60], 30 IV 2014, 1ex., cereal crop pitfall trap, leg. ŁN, coll. AM; Tyśmienice [FC21], 27 V 2014, 4 exx., meadow pitfall trap, leg. AH, coll. AM and 31 VII 2014, 2 exx., meadow pitfall trap, leg. ŁN, coll. AM

Białowieża Primeval Forest: Białowieża NP [FD94], 30 VI 1991, 1 ex. for. comp. 398, leg., det., coll. MW; Białowieża District [FD83, FD84, FD85, FD93, FD94], pitfall trap, 4 V–14 VI 2016: 1 ex. (for. comp. 217Cc), 2 exx. (218Ac), 8 exx. (219Df), 5 exx. (220Bc), 16 exx. (220Ca), 1 ex. (248Ak), 1 ex. (251Aa), 1 ex. (277Bd), 1 ex. (312Aa), 1 ex. (337Ci), 10 exx. (337Dc), 5 exx. (338Cg), 2 exx. (339Ag), 3 exx. (363Ak), 3 exx. (364Dk), 6 exx. (365Ab), 24 exx. (367Da), 12 exx. (392Cg), 11 exx. (394Df), 2 exx. (395Ab), 1 ex. (403Bd), 8 exx. (422Ab), 2 exx. (423Ch), 7 exx. (426Cj), 1 ex. (426Db), 1 ex. (445Ag), 1 ex. (446Cb), 21 exx. (446Dc), 2 exx. (448Dd), 3 exx. (452Bb), 1 ex. (469Bf), 8 exx. (471Cc), 3 exx. (472Ab), 8 exx. (476Ba), 2 exx. (494Dd), 5 exx. (338Cg), 4 exx. (495Bg), 1 ex. (498Bo), 1 ex. (501As), 3 exx. (520Dn), 6 exx. (521Bd), 4 exx. (521Cd), 3 exx. (522Ab), 1 ex. (524Ab), 4 exx. (526Cd), 1 ex. (526Df), 1 ex. (527Ad), 2 exx. (544Ah), 1 ex. (545Dj), 1 ex. (546Bc), 2 exx. (548Ca), 2 exx. (549Ac), 3 exx. (551Cg), 2 exx. (551Db), 7 exx. (577Bb), 1 ex. (579Ca), 2 exx. (580Ag), 2 exx. (581Do), 6 exx. (582Ca), 5 exx. (583Ah), 1 ex. (583Bi), 2 exx. (606Aa), 3 exx. (606Bc), 3 exx. (607Dc), 6 exx. (608Bh), 7 exx. (608Cb), 3 exx. (609Ab), 1 ex. (641Dh), 5 exx. (642Bm), 4 exx. (671Ak), 3 exx. (672Fb), 5 exx. (673Bc), 5 exx. (674Ab); 14 VI–10 VII 2016: 1 ex. (217Cc), 1 ex. (218Ac), 8 exx. (219Df), 7 exx. (220Bc), 13 exx. (220Ca), 5 exx. (252Ca), 1 ex. (279Cd), 1 ex. (280Af), 14 exx. (309Ah), 1 ex. (309Bc), 13 exx. (337Dc), 1 ex. (338Cg), 1 ex. (367Da), 3 exx. (368Dh), 7 exx. (392Cg), 2 exx. (394Df), 3 exx. (402Ba), 1 ex. (402Ca), 3 exx. (404Db), 2 exx. (423Ch), 1 ex. (424Ba), 2 exx. (426Db), 1 ex. (429Ch), 4 exx. (446Cb), 10 exx. (447Ab), 2 exx. (447Bc), 1 ex. (448Db), 1 ex. (471Bd), 1 ex. (472Ab), 2 exx. (473Da), 28 exx. (476Ba), 1 ex. (477Ac), 2 exx. (493Ba), 1 ex. (494Dd), 1 ex. (495Ca), 2 exx. (502Ak), 3 exx. (520Dn), 10 exx. (521Bd), 6 exx. (521Cd), 1 ex. (522Ab), 2 exx. (523Da), 5 exx. (524Ab), 5 exx. (526Cd), 1 ex. (526Df), 2 exx. (544Ah), 7 exx. (546Bc), 4 exx. (549Ac), 2 exx. (551Cg), 1 ex. (551Db), 2 exx. (577Cd), 1 ex. (579Ca), 1 ex. (579Dc), 8 exx. (582Ca), 2 exx. (583Ah), 9 exx. (606Aa), 5 exx. (608Bh), 2 exx. (502Cb), 5 exx. (609Ab), 4 exx. (638Dg), 1 ex. (648Dh), 1 ex. (642Ag), 12 exx. (671Gc), 1 ex. (673Bc), 1 ex. (674Ab); 10 VII–13 VIII 2016: 2 exx. (218Ac), 2 exx. (219Df), 1 ex. (220Bc), 4 exx. (220Ca), 1 ex. (248Ak), 4 exx. (309Ah), 1 ex. (336Ad), 1 ex. (336Bc), 5 exx. (392Cg), 2 exx. (394Df), 3 exx. (395Ab), 1 ex. (404Db), 3 exx. (422Ab), 1 ex. (423Ch), 23 exx. (426Cj), 1 ex. (428Cb), 1 ex. (429Ch), 4 exx. (430Ad), 1 ex. (446Dc), 1 ex. (447Ab), 1 ex. (450Aa), 2 exx. (471Bd), 25 exx. (471Cc), 3 exx. (473Da), 9 exx. (476Ba), 1 ex. (477Ac), 1 ex. (502Ak), 1 ex. (521Cd), 2 exx. (526Df), 2 exx. (551Db), 1 ex. (607Dc), 1 ex. (608Cb), 1 ex. (638Dg), 1 ex. (640Aa), 3 exx. (642Bm), 1 ex. (673Bc); 13 VIII–11 IX 2016: 1 ex. (218Ac), 1 ex. (220Bc), 1 ex. (220Ca), 1 ex. (279Cd), 1 ex. (337Dc), 1 ex. (339Ag), 1 ex. (393Aa), 2 exx. (394Df), 1 ex. (423Ch), 2 exx. (471Cc), 3 exx. (473Da), 2 exx. (526Df), 1 ex. (549Ac), 1 ex. (582Ca), 1 ex. (608Cb), 1 ex. (642Bm), 2 exx. (671Gc), 2 exx. (673Cd), det. AM, leg., coll. DFP. Hajnówka

District [FD72, FD73, FD74, FD83, FD84, FD85] pitfall trap, 4 V–14 VI 2016: 4 exx. (for. comp. 212Bc), 8 exx. (215Bg), 2 exx. (242Bg), 13 exx. (244Cf), 8 exx. (244Dj), 10 exx. (245Aj), 7 exx. (245Ba), 11 exx. (247Ch), 2 exx. (247Df), 4 exx. (271Cb), 10 exx. (272Aa), 2 exx. (272Bb), 3 exx. (273Df), 2 exx. (274Bk), 4 exx. (274Cc), 2 exx. (276Dh), 1 ex. (303Cb), 13 exx. (304Aa), 2 exx. (305Dd), 31 exx. (306Ad), 1 ex. (307Ai), 10 exx. (333Aa), 6 exx. (334Cb), 7 exx. (356Df), 1 ex. (357Bb), 1 ex. (358Aa), 4 exx. (359Cc), 1 ex. (359Db), 1 ex. (360Aa), 2 exx. (360Bb), 2 exx. (383Dd), 1 ex. (389Bj), 19 exx. (384Ca), 1 ex. (386Bj), 1 ex. (410Ch), 9 exx. (410Eh), 2 exx. (413Ch), 11 exx. (415Bb), 1 ex. (435Eb), 1 ex. (436Ai), 1 ex. (436Bb), 1 ex. (439Bf), 9 exx. (440Dd), 1 ex. (442Ac), 2 exx. (443Da), 3 exx. (443Eb), 10 exx. (460Bj), 3 exx. (463Bo), 1 ex. (463Cd), 3 exx. (464Ab), 3 exx. (465Db), 1 ex. (466Bb), 1 ex. (468Ep), 4 exx. (483Db), 6 exx. (487Bb), 5 exx. (487Ca), 18 exx. (488Ab), 16 exx. (489Ci), 2 exx. (490Aa), 2 exx. (512Da), 8 exx. (515Cc), 1 ex. (517Dg), 2 exx. (518Bl), 22 exx. (519Ag), 5 exx. (534Bd), 15 exx. (535Da), 1 ex. (536Ab), 4 exx. (537Di), 3 exx. (540Fg), 8 exx. (541Aj), 8 exx. (542Dn), 1 ex. (566Bc), 1 ex. (568Ca), 2 exx. (568Db), 1 ex. (571Cf), 3 exx. (571Db), 3 exx. (572Af), 2 exx. (573Dkx), 1 ex. (574Ai), 1 ex. (574Bd), 10 exx. (594Cs), 1 ex. (594Dl), 14 exx. (595Ak), 1 ex. (595Bb), 1 ex. (596Dd), 1 ex. (597Bb), 2 exx. (598Aa), 5 exx. (599Dg), 2 exx. (600Bk), 1 ex. (602Bl), 3 exx. (603Af), 11 exx. (603Ba), 6 exx. (627Dg), 6 exx. (628Bf), 2 exx. (628Cf), 3 exx. (629Ac), 2 exx. (630Cb), 1 ex. (631Ac), 2 exx. (633Cg), 3 exx. (633Df), 5 exx. (634Ac), 3 exx. (634Ba), 7 exx. (634Fk), 5 exx. (637Aa), 5 exx. (662Ba), 1 ex. (665Ag), 2 exx. (667Bi), 5 exx. (667Cd), 4 exx. (668Ap), 1 ex. (669Dd), 4 exx. (695Da), 7 exx. (696Aa), 1 ex. (698Cd), 1 ex. (698Dc), 1 ex. (699Ac), 6 exx. (699Bb), 1 ex. (701Bb), 2 exx. (702Ab), 2 exx. (724Bd), 2 exx. (724Cgx), 1 ex. (726Bb), 3 exx. (728Bg), 2 exx. (728Ca), 6 exx. (729Bb), 10 exx. (732s), 4 exx. (733f), 18 exx. (734f); 14 VI–10 VII 2016: 2 exx. (210Ad), 2 exx. (214Cj), 6 exx. (215Bg), 1 ex. (242Bg), 12 exx. (243Ac), 1 ex. (244Cf), 5 exx. (245Aj), 4 exx. (245Ba), 4 exx. (247Ch), 1 ex. (247Df), 1 ex. (271Cb), 3 exx. (272Aa), 1 ex. (272Bb), 2 exx. (303Cb), 28 exx. (305Dd), 4 exx. (306Ad), 17 exx. (307Ai), 9 exx. (329Cf), 15 exx. (333Aa), 2 exx. (334Cb), 2 exx. (335Bf), 1 ex. (335Cf), 3 exx. (357Ca), 2 exx. (359Cc), 7 exx. (360Aa), 1 ex. (360Bb), 3 exx. (383Dd), 2 exx. (384Ca), 1 ex. (387Bf), 1 ex. (389Bj), 7 exx. (410Eh), 1 ex. (411Aa), 1 ex. (413Bf), 7 exx. (413Ch), 3 exx. (415Bb), 11 exx. (435Eb), 1 ex. (439Ac), 4 exx. (440Dd), 3 exx. (443Eb), 11 exx. (444Aj), 2 exx. (459b), 2 exx. (460Cf), 3 exx. (461Aa), 1 ex. (463Bo), 1 ex. (464Ab), 16 exx. (465Db), 4 exx. (466Ac), 2 exx. (483Db), 7 exx. (484Ai), 2 exx. (487Bb), 4 exx. (487Ca), 6 exx. (488Ab), 14 exx. (489Ci), 1 ex. (490Aa), 8 exx. (512Cf), 3 exx. (512Da), 6 exx. (515Cc), 1 ex. (516An), 16 exx. (516Bb), 4 exx. (517Dg), 2 exx. (518Bl), 2 exx. (519Ag), 9 exx. (534Bd), 1 ex. (535Cf), 8 exx. (535Da), 6 exx. (536Ab), 2 exx. (537Di), 6 exx. (540Fg), 2 exx. (540Gn), 6 exx. (541Aj), 1 ex. (542Ca), 6 exx. (542Dn), 3 exx. (543Af), 1 ex. (566Bc), 1 ex. (568Ca), 1 ex. (568Db),

1 ex. (571Cf), 1 ex. (571Db), 1 ex. (572Af), 2 exx. (573Dkx), 3 exx. (574Ai), 9 exx. (574Bd), 11 exx. (594Cs), 1 ex. (594Dl), 1 ex. (595Ak), 1 ex. (596Db), 2 exx. (598Aa), 3 exx. (599Dg), 1 ex. (601Ab), 6 exx. (602Bl), 6 exx. (603Af), 2 exx. (627Dg), 10 exx. (628Bf), 1 ex. (628Cf), 1 ex. (629Ac), 7 exx. (631Ac), 2 exx. (634Ba), 9 exx. (634Fk), 2 exx. (636Am), 17 exx. (636Ba), 6 exx. (637Aa), 3 exx. (662Ba), 14 exx. (664Dg), 3 exx. (665Bd), 1 ex. (667Bi), 2 exx. (667Cd), 1 ex. (669Dd), 3 exx. (669Bb), 1 ex. (692Df), 1 ex. (694Aa), 2 exx. (695Ca), 6 exx. (695Da), 4 exx. (696Aa), 1 ex. (698Dc), 4 exx. (701Bb), 1 ex. (702Ab), 1 ex. (724Bd), 2 exx. (728Ca), 1 ex. (733f), 3 exx. (734f); 10 VII–13 VIII 2016: 1 ex. (212Bc), 3 exx. (214Cj), 1 ex. (242Bg), 1 ex. (244Cf), 2 exx. (245Aj), 1 ex. (247Df), 6 exx. (271Cb), 1 ex. (272Bb), 7 exx. (274Bk), 15 exx. (274Cc), 1 ex. (276Dh), 2 exx. (302Dc), 5 exx. (304Aa), 5 exx. (305Dd), 3 exx. (306Ad), 8 exx. (329Cf), 1 ex. (333Aa), 1 ex. (334Cb), 4 exx. (335Bf), 2 exx. (359Cc), 1 ex. (384Ca), 1 ex. (387Bf), 2 exx. (389Bj), 1 ex. (410Ch), 2 exx. (412Cc), 2 exx. (416Ba), 6 exx. (435Eb), 1 ex. (440Dd), 2 exx. (443Eb), 6 exx. (459b), 6 exx. (460Bj), 4 exx. (460Cf), 1 ex. (461Aa), 3 exx. (465Db), 1 ex. (466Bb), 1 ex. (487Ca), 2 exx. (484Ai), 1 ex. (488Ab), 2 exx. (489Ci), 1 ex. (490Ba), 1 ex. (516Bb), 2 exx. (519Ag), 4 exx. (534Bd), 13 exx. (536Bh), 1 ex. (537Di), 1 ex. (566Ad), 2 exx. (568Ca), 1 ex. (571Cf), 1 ex. (571Db), 7 exx. (594Cs), 1 ex. (596Db), 2 exx. (599Dg), 1 ex. (601Ab), 5 exx. (627Dg), 2 exx. (628Bf), 1 ex. (628Cf), 1 ex. (630Cb), 2 exx. (634Fk), 1 ex. (636Am), 1 ex. (668Ap), 1 ex. (669Dd), 3 exx. (695Da), 1 ex. (698Cd), 2 exx. (701Bb), 1 ex. (724Bd), 3 exx. (724Cgx), 1 ex. (726Bb), 2 exx. (728Ca), 2 exx. (732s), 2 exx. (733f), 4 exx. (734f); 13 VIII–11 IX 2016: 1 ex. (214Cj), 3 exx. (243Ac), 3 exx. (274Bk), 1 ex. (274Cc), 2 exx. (333Aa), 1 ex. (389Bj), 1 ex. (385Cb), 2 exx. (435Eb), 1 ex. (487Ca), 2 exx. (489Ci), 1 ex. (512Cf), 2 exx. (519Ag), 1 ex. (574Bd), 3 exx. (594Cs), 1 ex. (596Db), 4 exx. (627Dg), 1 ex. (628Bf), 2 exx. (631Ac), 1 ex. (633Df), 1 ex. (634Fk), 1 ex. (636Ba), 1 ex. (698Cd), 1 ex. (698Dc), 2 exx. (733f), 1 ex. (734f), det. AM, leg., coll. DFP, Browsk District [FD75, FD76, FD85, FD86, FD95, FD96], pitfall trap, 4 V–14 VI 2016: 1 ex. (for. comp. 1Ad), 6 exx. (3Ab), 2 exx. (4Bc), 1 ex. (6Ch), 1 ex. (9Ch), 8 exx. (9Df), 5 exx. (14Ba), 27 exx. (16Bg), 9 exx. (16Cd), 8 exx. (17Af), 3 exx. (22Bbx), 2 exx. (23Bc), 16 exx. (23Db), 2 exx. (26Dg), 9 exx. (27Ca), 17 exx. (28Ad), 9 exx. (28Bc), 3 exx. (34Aa), 1 ex. (34Bf), 3 exx. (38Ba), 3 exx. (38Cg), 2 exx. (39Aa), 1 ex. (42Ab), 9 exx. (44Cj), 20 exx. (44Dd), 6 exx. (47Ab), 9 exx. (48Cg), 14 exx. (50Ci), 3 exx. (50Db), 6 exx. (53Ch), 2 exx. (56Bc), 11 exx. (56Dm), 19 exx. (57Ci), 8 exx. (57Df), 4 exx. (58Bi), 3 exx. (59Ac), 12 exx. (60Cb), 15 exx. (61Ah), 20 exx. (61Bd), 1 ex. (62Aa), 10 exx. (64Dc), 7 exx. (65Bf), 2 exx. (74Dd), 2 exx. (79Db), 26 exx. (80Ca), 2 exx. (81Ba), 34 exx. (83Cf), 8 exx. (83Da), 8 exx. (84Ah), 18 exx. (84Bb), 20 exx. (85Dp), 1 ex. (92Ad), 7 exx. (92Ab), 1 ex. (94Bg), 3 exx. (95Aa), 3 exx. (96Dd), 1 ex. (101Cb), 6 exx. (102Aa), 1 ex. (102Bj), 3 exx. (103Ei), 7 exx. (118An), 1 ex. (119Da), 22 exx. (120Ag),

8 exx. (120Bc), 5 exx. (122Ca), 1 ex. (123Aa), 1 ex. (125Af), 10 exx. (128Aa), 14 exx. (147Cb), 1 ex. (148Ad), 6 exx. (150Cb), 17 exx. (152Dd), 21 exx. (153Bc), 1 ex. (153Cd), 4 exx. (178Da), 5 exx. (179Cc), 1 ex. (181Da), 14 exx. (182Ag), 7 exx. (182Bb), 1 ex. (184Db), 1 ex. (185Ab), 3 exx. (185Ba), 3 exx. (188Aa), 3 exx. (742Db), 5 exx. (743Ca), 10 exx. (746Bb), 11 exx. (748Dh), 1 ex. (749Cb), 3 exx. (751Df), 20 exx. (752Bj), 3 exx. (752Cb), 6 exx. (753Bc), 1 ex. (755Cc), 2 exx. (755Dd), 6 exx. (756Ba), 1 ex. (759Bj), 1 ex. (770Ab), 4 exx. (770Bg), 3 exx. (773Ad), 24 exx. (773Bc), 1 ex. (775Cg), 3 exx. (775Dc), 27 exx. (776Ac), 1 ex. (776Bc), 2 exx. (778Cb), 5 exx. (780Di), 1 ex. (781Cd), 2 exx. (782Bg); 14 VI–10 VII 2016: 10 exx. (3Ab), 19 exx. (6Ch), 4 exx. (6Da), 7 exx. (9Ch), 3 exx. (9Df), 2 exx. (13Bc), 4 exx. (14Ak), 7 exx. (14Ba), 17 exx. (15Dd), 2 exx. (16Bg), 6 exx. (16Cd), 10 exx. (17Af), 1 ex. (23Bc), 13 exx. (23Db), 9 exx. (24Cf), 5 exx. (24Dc), 22 exx. (25Ah), 3 exx. (34Aa), 2 exx. (34Bf), 10 exx. (38Ba), 17 exx. (26Dg), 9 exx. (27Ca), 9 exx. (28Ad), 3 exx. (28Bc), 2 exx. (38Cg), 6 exx. (39Aa), 1 ex. (41Bb), 2 exx. (42Ab), 4 exx. (44Cj), 12 exx. (44Dd), 1 ex. (45Ax), 3 exx. (47Ab), 2 exx. (48Bj), 29 exx. (48Cg), 2 exx. (49Ac), 14 exx. (50Ci), 2 exx. (50Db), 13 exx. (51Ba), 5 exx. (53Ch), 1 ex. (55Bh), 1 ex. (56Bc), 7 exx. (56Dm), 2 exx. (57Ci), 3 exx. (57Df), 1 ex. (58Bi), 11 exx. (59Ac), 4 exx. (60Cb), 5 exx. (61Bd), 5 exx. (62Aa), 16 exx. (64Dc), 4 exx. (65Bf), 1 ex. (74Dd), 1 ex. (77Ba), 3 exx. (79Db), 18 exx. (80Ca), 2 exx. (82Ac), 12 exx. (83Cf), 6 exx. (83Da), 4 exx. (84Ah), 4 exx. (84Bb), 16 exx. (85Dp), 2 exx. (92Ad), 3 exx. (94Bg), 2 exx. (95Aa), 2 exx. (96Dd), 1 ex. (98Cb), 1 ex. (99Da), 1 ex. (101Db), 3 exx. (102Aa), 2 exx. (102Bj), 23 exx. (103Ei), 7 exx. (118An), 3 exx. (120Ag), 6 exx. (120Bc), 2 exx. (122Ca), 1 ex. (123Aa), 8 ex. (128Aa), 2 exx. (148Ad), 6 exx. (149Dd), 1 ex. (151Ac), 3 exx. (152Dd), 10 exx. (153Bc), 1 ex. (155Db), 1 ex. (156Ba), 2 exx. (179Cc), 1 ex. (180Ab), 3 exx. (182Ag), 1 ex. (182Bb), 2 exx. (184Ch), 1 ex. (185Ba), 1 ex. (186Dh), 1 ex. (187Cd), 1 ex. (188Aa), 3 exx. (742Db), 6 exx. (743Ca), 9 exx. (746Bb), 4 exx. (748Dh), 2 exx. (749Cb), 6 exx. (751Df), 2 exx. (752Cb), 19 exx. (753Bc), 4 exx. (755Cc), 1 ex. (755Dd), 1 ex. (759Bj), 2 exx. (760Bf), 2 exx. (764Dd), 2 exx. (765Ab), 3 exx. (765Ba), 2 exx. (766Aa), 2 exx. (771Dl), 2 exx. (773Ad), 25 exx. (773Bc), 1 ex. (774Cn), 7 exx. (775Cg), 1 ex. (775Dc), 25 exx. (776Ac), 4 exx. (776Bc), 1 ex. (778Cb), 1 ex. (780Di), 2 exx. (781Dc); 10 VII–13 VIII 2016: 4 exx. (6Ch), 1 ex. (6Da), 4 exx. (9Ch), 2 exx. (9Df), 1 ex. (14Ba), 2 exx. (15Dd), 1 ex. (16Bg), 7 exx. (16Cd), 2 exx. (17Af), 5 exx. (23Db), 2 exx. (24Dc), 8 exx. (25Ah), 3 exx. (26Dg), 3 exx. (27Ca), 2 exx. (28Ad), 2 exx. (28Bc), 1 ex. (34Aa), 1 ex. (42Ab), 2 exx. (44Dd), 1 ex. (48Cg), 6 exx. (51Ba), 1 ex. (55Bh), 1 ex. (55Cf), 1 ex. (56Dm), 2 exx. (59Ac), 2 exx. (60Cb), 3 exx. (61Bd), 40 exx. (80Ca), 1 ex. (81Ba), 1 ex. (83Cf), 1 ex. (83Da), 1 ex. (84Ah), 1 ex. (84Bb), 1 ex. (85Dp), 1 ex. (92Ad), 1 ex. (96Cc), 2 exx. (96Dd), 2 exx. (102Aa), 1 ex. (102Bj), 2 exx. (103Ei), 1 ex. (118An), 3 exx. (120Ag), 1 ex. (127Bd), 1 ex. (127Ca), 2 exx. (150Cb), 7 exx. (152Dd), 9 exx. (153Bc), 1 ex. (155Db), 2 exx. (178Da), 2 exx. (182Bb),

2 exx. (185Ab), 1 ex. (187Bg), 1 ex. (188Aa), 7 exx. (743Ca), 7 exx. (746Bb), 1 ex. (748Cf), 3 exx. (748Dh), 2 exx. (752Bj), 3 exx. (753Bc), 4 exx. (760Bf), 3 exx. (764Db), 5 exx. (766Aa), 1 ex. (770Bg), 11 exx. (771Dl), 11 exx. (774Cn), 4 exx. (775Cg), 3 exx. (776Ac), 1 ex. (777Cb), 5 exx. (778Cb), 4 exx. (781Dc); 13 VIII–11 IX 2016: 1 ex. (6Ch), 1 ex. (9Ch), 1 ex. (9Df), 1 ex. (16Bg), 1 ex. (23Db), 1 ex. (25Ah), 1 ex. (28Bc), 2 exx. (44Dd), 2 exx. (51Ba), 1 ex. (55Cf), 1 ex. (56Dm), 1 ex. (59Ac), 1 ex. (60Cb), 1 ex. (61Bd), 2 exx. (80Ca), 1 ex. (81Ba), 1 ex. (83Da), 1 ex. (84Bb), 1 ex. (102Aa), 1 ex. (102Bj), 1 ex. (120Ag), 1 ex. (147Da), 1 ex. (149Dd), 1 ex. (152Dd), 1 ex. (153Bc), 1 ex. (182Ag), 1 ex. (186Dh), 1 ex. (748Cf), 1 ex. (749Cb), 2 exx. (752Bj), 1 ex. (753Bc), 2 exx. (756Ba), 3 exx. (764Dd), 2 exx. (765Ab), 1 ex. (770Ab), 1 ex. (771Dl), 7 exx. (773Bc), det. AM, leg., coll. DFP. Białowieża NP [FD84, FD85, FD94, FD95] pitfall trap, 4 V–14 VI 2016: 1 ex. (for. comp. 105Ba), 3 exx. (107Bi), 8 exx. (107Cb), 1 ex. (108Af), 4 exx. (110Bf), 10 exx. (111Ad), 5 exx. (130Cf), 8 exx. (132Dg), 14 exx. (134Ag), 2 exx. (134Ba), 1 ex. (135Db), 4 exx. (136Bh), 1 ex. (158Da), 1 ex. (160Db), 1 ex. (161Bc), 1 ex. (162Ac), 17 exx. (163Cb), 3 exx. (164Bn), 1 ex. (166Cd), 14 exx. (190Bd), 14 exx. (193Ad), 2 exx. (195Cg), 2 exx. (221Bc), 8 exx. (226Ba), 3 exx. (228Df), 1 ex. (229Bg), 4 exx. (255Bg), 2 exx. (260Cb), 4 exx. (285Cg), 11 exx. (290Bd), 7 exx. (313Db), 5 exx. (315Db), 4 exx. (316Bf), 5 exx. (339Cf), 8 exx. (340Ci), 1 ex. (342Cb), 4 exx. (343Af), 1 ex. (346Ad), 6 exx. (371Db), 3 exx. (372Bh), 1 ex. (375Bg); 14 VI–10 VII 2016: 6 exx. (108Af), 6 exx. (108Af), 6 exx. (108Af), 3 exx. (110Bf), 8 exx. (111Ad), 3 exx. (132Dg), 1 ex. (135Db), 2 exx. (136Bh), 6 exx. (136Ca), 2 exx. (160Db), 1 ex. (162Ac), 4 exx. (163Cb), 1 ex. (164Bn), 33 exx. (164Cf), 2 exx. (190Bd), 3 exx. (193Ad), 4 exx. (193Bb), 7 exx. (195Cg), 3 exx. (196Aa), 4 exx. (225Cb), 5 exx. (226Ba), 12 exx. (228Df), 2 exx. (229Bg), 1 ex. (253Bh), 3 exx. (254Da), 5 exx. (255Bg), 2 exx. (257Ca), 1 ex. (260Cb), 3 exx. (285Cg), 2 exx. (289Ad), 19 exx. (290Bd), 4 exx. (313Db), 8 exx. (315Db), 2 exx. (316Bf), 3 exx. (339Cf), 1 ex. (340Dd), 1 ex. (342Cb), 9 exx. (343Af), 2 exx. (368Ef), 1 ex. (370Ad), 1 ex. (372Bh); 10 VII–13 VIII 2016: 1 ex. (110Bf), 1 ex. (133Ca), 4 exx. (134Ag), 9 exx. (136Ca), 1 ex. (158Ca), 1 ex. (164Bm), 1 ex. (193Bb), 10 exx. (228Df), 1 ex. (229Bg), 1 ex. (255Bg), 1 ex. (257Ca), 1 ex. (315Db), 1 ex. (339Cf), 1 ex. (342Cb), 1 ex. (343Af), 1 ex. (368Ef), 1 ex. (370Ad), 1 ex. (375Bg); 13 VIII–11 IX 2016: 1 ex. (136Bh), 1 ex. (226Ba), 1 ex. (229Bg), 1 ex. (290Bd), 1 ex. (340Ci), 1 ex. (343Af), det. AM, leg., coll. DFP

Lower Silesia: Bardo Śląskie [XR29], 20 VII 1930, 1 ex., leg. FK, det. AM, coll. USM; Ligota Otmuchowska [XR59], VI 1912, 1 ex., leg. ED, det. AM, coll. USM; Strzelin [XS42], 12 VII 1956 and 9 VII 1970, 2 exx., leg. TS, det. AM, coll. USM; Środa [XS16], 11 VII 1953, 1 ex., leg. TS, det. AM, coll. USM; Wrocław-Wojnów [XS56], VI 1990, 2 exx., det., leg. LBo, coll. RRu; 11 IV 1971, 3 exx., leg. AG, 21 VII 1971, 1 ex., leg. Ewa Gruszka, det. AM, coll. MNHW

Trzebnica Hills: Trzebnica [XS48], 3 VIII 1950, 1 ex., leg. TS, det. AM, coll. USM

Upper Silesia: Brynek [CA39], 15 V 1929, 2 exx., leg. HN, det. AM, coll. USM; 18 V 2007 and 14 IV 2012, 3 exx. leg., coll. HS; Brynek-Park [CA39], 9 VII 2013, 1 ex., leg., coll. HS; Bytom [CA57], 15 V 1984, 1 ex., 10 VII 1987, 1 ex., leg. HD, det. AM, coll. USM; Góra Św. Anny Mt. [BA99], 7 IV 1928, 1 ex., leg. FK, det. AM, coll. USM; Kalety [CB40], 7 VII 2012, 3 exx., leg. Kocot P., coll. HS; Kiełcza [CB20], 24 IV 1927, 1 ex., leg. FK, det. AM, coll. USM; Kochłowice [CA56], 8 VII 1979–6 VIII 1991, 10 exx., leg. JK, Lubliniec [CB31], 28 IV, 1 ex., 24 V 1994, 1 ex., leg. RD, det. AM, coll. USM; Łabędy [CA38], 6 V 1923, 1 ex., leg. WM, det. AM, coll. USM; Łącza [CA27], 31 I 1926, 3 exx., leg. FK, det. AM, coll. USM; Nędza [CA06], 11 VI 22, 1 ex., leg./HN, det. AM, coll. USM; Połomia [CA39], 4 IV 2010, 2 exx., leg., coll. HS; Pusta Kuźnica [CB30], 6 VI 2010, 1 ex., leg., coll. HS; Przezchlebie [CA38], 18 VII 1893, 1 ex., leg. FK, det. AM, coll. USM; Racibórz [CA05], 10 VI 1912, 1 ex., leg. MK, det. AM, coll. USM; Segiet nat. res. [CA48], 1 V 2010, 1 ex., leg., coll. HS; Sławęcice [CA08], 11 XI 1924, 2 exx., leg. FK, det. AM, coll. USM; Tworóg [CB30], 24 V 1935, 4 exx., leg. HN, det. AM, coll. USM; Żory [CA34], 3 V 2005, 1 ex., leg., coll. HS

Kraków-Wieluń Upland: Kraków – Las Mogilski [DA34], 1 VI 2014, 1 ex. leg. A. Żaba, det. AMa, coll FE UAK

Małopolska Upland: Grotniki near Zgierz [CC85], 2 V 1999, 1 ex., leg. MM, coll. AM; Spała [DC41], 26 VI 1955, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW

Świętokrzyskie Mts.: Świętokrzyski PN – p.u. Chełmowa Góra, for. comp. A-1g [EB03], 15–30 VI 2012, 3 exx., pitfall trap, leg. LB & S. Kuroś; p.u. Dąbrowa, for. comp. 50a, 30 IV–15 VI, 4 exx., pitfall trap, leg. LB & Z. Jankowicz and R. Lach; p.u. Klonów, for. comp. 258 f [DB84], 15–31 V 2012, 1 ex., pitfall trap; for. comp. 261a, 15 V–15 VI 2012, 3 exx., pitfall trap, leg. LB & S. Pajdo; for. comp. 258 f [DB84], 30 IV–15 V 2012, 16 exx., IBL-2 bis trap, leg. LB & S. Pajdo; p.u. Podgórze, for. comp. 44a [DB94], 15 IV–31 V 2012, 9 exx, pitfall trap, leg. PL & M. Wiśniewski; p.u. Święta Katarzyna, for. comp. 190d [DB93], 15–31 V 2012, 1 ex., pitfall trap, leg. LB & A. Danielski, det., coll. AM

Lubelska Upland: Brzeziczno [FB39], 6 IX 1993, 1 ex. raised bog, edge, leg. BS, coll. MCSU; Ciechanki Łańcuchowskie [FB37], 7 IV, 22 VI and 17 VII, 4 exx. in the pitfall trap in the xerothermic communities of the Nadwieprzański Landscape Park, leg. JKo, coll MCSU; Jaszczów near Milejów [FB37], 6 X 1994, leg. BS, coll. MCSU; Janostrów [GB05], 24 VII 2014, 1 ex., cereal crop pitfall trap, leg. ŁN, coll. AM; Krychów [FB69], 28 VIII 2014, 1 ex., meadow pitfall trap, leg. ŁN, coll. AM; Puławy [EB69], 1 ex. 2 VI 1958, leg., det. AS, ex coll. Department of Forest Protection SGGW, coll. AN; Rożdżałów Kol.

[FB76], 27 V 2014, 1 ex., meadow pitfall trap, leg. AH, coll. AM and 25 VI 2014, 3 exx., meadow pitfall trap, leg. IH, coll. AM

Roztocze: Korhynie [FA78], 12 V 1998, 1 ex. pitfall trap, leg. RR, coll. MCSU; Roztoczański NP, Bukowa Góra [FB40], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kruglik [FA49], 3 VIII 2016, 7 exx. pitfall trap, det. AM, leg., coll. DMF; Obrocz [FB40], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Słupy [FB41], IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Zwierzyniec [FB30], 3 VI 1964, 1 ex., leg. TPl, ex coll. AG, det. AM, coll. MNHW

Sandomierska Lowland: Radawa [FA25], 1–10 VI 1989, 1 ex., det. AM, leg., coll. JM; Oleszyce District, Czerniakowa Buda for. distr. [FA26], VII 2016, 6 exx. pitfall trap, [FA36], VII 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Dzików for. distr. [FA37], VIII, 2 exx., [FA46], VII, 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Futory for. distr. [EA46], VII, 1 ex., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Lipina for. distr. [FA45], VII, 16 exx., VIII 2016, 1 ex., [FA45], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Miłków for. distr. [FA36], VII, 3 exx., VIII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Stare Sioło for. distr. [FA35], VII, 3 exx., [FA36], VII, 5 exx., IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Sucha Wola for. distr. [FA45], VII 2016, 34 exx. pitfall trap, det. AM, leg., coll. DMF; Zabiała for. distr. [FA46],VII, 2 exx., VIII, 2 exx., 22 VII, 4 exx., 22 VIII, 4 exx., [FA36], VII, 1 ex., 22 VII, 9 exx., 22 VIII 2016, 6 exx. pitfall trap, det. AM, leg., coll. DMF; Sieniawa District, Białobrzeżki for. distr. [FA15], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Chrapy for. distr. [FA36], VIII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Czerce for. distr, [FA26], VII, 2 exx., [FA25], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Czerwona Wola for. distr. [FA25], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kot for. distr. [FA16], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Majdan for. distr. [FA37], VII, 2 exx., IX, 1 ex., [FA27], VII, 4 exx., VIII 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Pawłowa for. distr. [FA26], VII 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Przyjemek for. distr. [FA26], VII, 2 exx., VIII, 4 exx., IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Szegdy for. distr. [FA17], VII, 3 exx., VIII, 10 exx., IX 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Witoldówka for. distr. [FA26], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jarosław District, Bór for. distr. [FA25], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Czerniawka for. distr. [FA44], VII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Dąbrowa for. distr. [FA33], VII, 1 ex., VIII, 1 ex., [FA43], VII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Kobylnica for. distr. [FA44], VII, 20 exx., VIII, 18 exx., IX, 1 ex., [FA54], VII, 6 exx., VIII, 4 exx., IX, 3 exx., [FA43], VII, 18 exx., VIII 2016, 23 exx. pitfall trap, det. AM, leg., coll. DMF; Korzenica for. distr. [FA34],

VII, 7 exx., VIII 2016, 7 exx. pitfall trap, det. AM, leg., coll. DMF; Lichacze for. distr. [FA35], VII 2016, 7 exx. pitfall trap, det. AM, leg., coll. DMF; Olchowa for. distr. [FA34], VII, 4 exx., VIII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Radawa for. distr. [FA25], VII, 11 exx., VIII, 1 ex., IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Stubno for. distr. [FA43], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Surmaczówka for. distr. [FA35], VII, 11 exx., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Tuchola for. distr. [FA44], VII 2016, 10 exx. pitfall trap, det. AM, leg., coll. DMF; Zapałów for. distr. [FA35], VII, 14 exx., VIII 2016, 2 ex. pitfall trap, det. AM, leg., coll. DMF

Western Sudetes Mts.: Izerskie Mts., massif Kamienica Mt., [WS33], 20 VI 2010, 1 ex. on the forest path, leg., det. AM, coll. LK; Karkonoski NP [WS42], 21 V 2016, 1 ex., tourist trail from the Wang Temple to Polana, leg., coll. RO; Lubomierz [WS35], 18 IV 1995, 1 ex. under stone, leg. A. Sieniuć, coll. SK; Góry Izerskie Mts., Jakuszyce, Bagnisko [WS33], 27 VIII 1996, 1 ex. pitfall trap, leg., det., coll. AMa

Eastern Sudetes Mts.: Bialskie Mts., Zawada Mt. [XR37], 1 V 1990, 1 ex., leg., coll. AM; Lądek Zdrój [XR38], IX 1936, 1 ex., leg. anonim, det. AM, coll. USM

Western Beskid Mts.: Babia Góra [CV99], 26 V 1961, 1 ex., leg. ASk, det. AM, coll. USM; Gorce Mts. – Ochotnica Górna [DV48], 9–10 VII 2002, 1 ex., leg., det. et coll. TW; Jaworzyna massif, Kryściówski Creek Valley [DV97], 8 IX 1987, 1 ex., leg., coll. AM; Krynica Zdrój, Czarny Creek Valley [DV97], 3 VII 1990, 1 ex., leg., coll. AM; Krynica [DV97], 28 V 1912, 1 ex., leg. ST, det. AM, coll. USM; Mszana Dolna [DA30], 6 V 1999, 1 ex., leg. AF, coll. AM; Ponice [DV29], 24 VII 1996, 4 exx., leg. WŻ, det. AM, coll. USM; Szczepanowice [DA93], 7 VI 1996, 1 ex., leg. WŻ, det. AM, coll. USM; Turbacz Mts.[DV39], 6 VIII 1993, 1 ex., meadow, leg. RaK, coll. AM; Zawoja [CA90], 19 V 1960, 1 ex., leg. ASk, det. AM, coll. USM

Eastern Beskid Mts.: Biecz [EA10], 17 V 1944, 1 ex., leg. anonim, det. AM, coll. USM; Bircza [FV19], 10 VI 1956, 1 ex., leg. MB, det. AM, coll. USM; Krosno [EA50], X 1949, 1 ex. leg. AG, det. AM, coll. MNHW; Magurski NP, Huta Polańska [EV58], 8 VII 1992, leg. MBu, coll. AM; Niedźwiada [EA33], 19 VIII 1999, 1 ex., det. AM, leg., coll. AT; Osławica vic. [EV75], 12 VI 2017, 2 exx., pitfall trap, leg., coll. AM; Ożenna [EV37], 3 VII 2010, 1 ex., woodlot, pitfall trap, leg. ASze, det. AM, coll. TO; Paleśnica [DA91], 2 VI 1999, 1 ex., det. AM, leg., coll. AT; Pacław vic. [FV29], 23 V – 1 ex. and 17 VII 2015 – 3 exx. with lonely oak, 4 VII 2015, 1 ex. in the tree planting, pitfall trap, leg. TO, det., coll. AM; Polichty [DA91], 26 X 1995, 1 ex., det. AM, leg., coll. AT; Załuż [EV98], 31–14 VI 2012, 2 exx., leg. det. et coll. DT; Bircza District, Borysławka for. distr. [FV19], 15 VII 2016, 6 exx. pitfall trap, det. AM, leg., coll. DMF; Dobrzanka for. distr. [EA90], 16 VIII 2016, 1 ex.

pitfall trap, det. AM, leg., coll. DMF; Jamna for distr. [FV19], 13 VII, 2 exx., 16 VII, 2 exx., 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Krzywe for. distr. [FV09], 13 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Leszczawa for. distr. [FV09], 14 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Łodzinka for. distr. [FV09], 13 VII 2016, 1 ex. pitfall trap, [FA00], 16 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Malawa for. distr. [FA00], 13 VII, 3 exx., 13 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Pechniów for. distr. [FV19], 13 VII, 1 ex., 14 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Trójca for. distr. [FA10], 13 VII, 4 exx., 16 VIII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Wojtkówka for. distr. [FV19], 14 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Birchów District, Podlesie for. dostr. [EA60], 26 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dukla District, Cergowa for. distr. [EV58], 29 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kamionka for. distr. [EV58], 29 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Zyndranowa for. distr. [EC57], 29 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dynów District, Dylągowa for. distr. [EA91], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jabłonica for. distr. [EA80], VII, 5 exx., VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Kołaczyce District, Pagorzyna for. distr. [EV29], 30 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Krasiczyn District, Olszany for. distr. [FA10], 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Magurski NP, Folusz [EV29], VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Świątkowa [EV28], VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF

Bieszczady Mts.: Jabłonki [EV95], 30 VI 1965, 2 exx., leg. JB, 25 V 1967, 1 ex., leg. MB, det. AM, coll. USM; Rozsypaniec–Halicz–Tarnica trail [FV23], 29 V 2014, 14 exx., leg., coll. PJ; Stuposiany [FV24], 6 V 1968, 1 ex. riverside of Wołosaty, leg., det. A. Szujecki, coll. AN; Ustrzyki Górne [FV24], V 1971, 1 ex. leg., det. ex coll. AG, coll. MNHW; 12 and 15 VII 1963, 2 exx., leg. TPl, ex coll. AG, det. AM, coll. MNHW; 8 VI 1960 1 ex., leg. ASk, det. AM, coll. USM; Wańkowa [FV08], 19 VII 1966, 1 ex., leg. MB, det. AM, coll. USM; Wetlina [FV05], 14 VI 2010, 1 ex., det. AM, leg., coll. JM; Wola Michowa [EV85], 14 VII 1974, 4 exx. leg. PSt, det., coll. AMa; Wołosate–Tarnica trail [FV23], 28 V 2014, 3 exx., from Wołosate to 1200 m, leg., coll. PJ; Zatwarnica [FV15], 15 VII 1974, 3 exx., 21 VII 1974, 2 exx., det., leg. LBo, coll. RRu; records without exact data, 23 VII 1956, 1 ex. leg. ex coll. AG, det. AM, coll. MNHW; 1976 (no exact data), 1 ex. leg. A. Głazaczow, det., coll. AN; Łopienka [EV95], 10 V 2013, 1 ex., in excrement pitfall trap, leg. AGo, det. et coll. AMa

Pieniny Mts.: Czorsztyn [DV57], 4 V 1993, 1 ex. leg., det., coll. AMa; Pieniny [DV57], 10–17 VII 1953, leg. ex coll. AG, det. AM, coll. MNHW; Pieniński NP, Kras [DV57], 29 V 2017, in *Stecchierinum fimbriatum*, 1 ex., leg. PCh,

det. AM, coll. PNP; Małe Pieniny [DV67], 4 VII 1959, 1 ex., leg. ASK, det. AM, coll. USM

Tatry Mts.: Zakopane-Bystre [DV26], 17 VII 1995, 1 ex. leg. M Gałuszka, det., coll. AN; Tatrzański NP, Kościeliska Valley [DV15], 1 VI 1965, leg. M. Gałuszka, det., coll. AN; 17 VI 1991, 1 ex., leg., coll. AM; Tatrzański NP, Morskie Oko vic. [DV35], 20 VI 2008, 1 ex., leg., coll. SK; Skupniów Upłaz [DV25], 5 IX 2013, 1 ex., leg. AGo, det., coll. AMa.

Previously recorded from:

Baltic Coast: Słowiński NP – Łebska Spit (Smoleński, 2000a), Trójmiejski Landscape Park, Gdańsk vic. [CF42] (Konopko & Wilga, 2014); Gdynia-Kępa Redłowska (Konopko *et* al., 2017), records without exact data (Lüllwitz, 1916; Dreyfeldt, 1933; Bartoszyński, 1937; Burzyński, 1971; 1973)

Pomeranian Lake District: Bielsko – Słupsk Province (Burakowski *et* al., 1980), Stara Brda Pilska (Smoleński, 1995a); Bielinek nat. res. (Kubisz & Melke, 1996); Człuchowska Forest (Szujecki, 1995; Łęgowski *et* al., 1995), Niedźwiady Distr. (Smoleński, 1995a), Wisielcze Jeziorka nat. res. (Gutowski & Ruta, 2004), Bory Tucholskie (Gutowski *et* al., 2006), Kuźnickie Lakes vic. (Ruta, 1996), records without exact data (Dohrn, 1878; Grentzenberg, 1896; Błażejewski, 1956; Cykowski, 1977)

Masurian Lake District: Augustowska Forest (Melke & Gutowski, 1995), Borecka Forest (Melke & Maciejewski, 1999), Biebrzański NP (Gutowski *et* al., 2006), records without exact data (Siebold, 1847; Lentz, 1857; 1879; Szujecki, 1960c; 1966c)

Wielkopolska-Kujawy Lowland: Wielkopolski NP (Podbylski & Nowosad, 2001; Stanoch-Podbylska & Nowosad, 2001), Poznań (Szulczewski, 1922), Glogau (Głogów) (Letzner, 1871; 1886; Myrdzik, 1933; Ignatowicz, 1974)

Mazowian Lowland: Biała Forest and Ostrów Mazowiecka Distr. (Szujecki, 1995); Kampinoski NP (Mazur S. *et* al., 2010), records without exact data (Kaczmarek, 1963; Breymeyer, 1966; Szujecki, 1966b; 1966e; 1968; 1971)

Białowieża Primeval Forest: Białowieża (Roubal, 1910; Melke & Gutowski, 1995; Derunkov & Melke, 2001; Smoleński & Szujecki, 2001; Rutkiewicz, 2001; 2002; 2004; Byk, 2001a; 2001b; Smoleński *et* al., 2004), Białowieża Distr. (Gutowski *et* al., 2006), Białowieża NP (Smoleński, 2006; Byk *et* al., 2006)

Lower Silesia: Henryków, Ziębice Śląskie (Smoleński, 1996b), Breslau (Wrocław), Görlitz (Zgorzelec), Liegnitz (Legnica; Letzner, 1871; 1886)

Upper Silesia: cave „W Zielonej Górze" (Kocot-Zalewska & Melke, 2021), Ratibor (Racibórz; Kelch, 1846; Roger, 1856; Letzner, 1871; 1886; Lgocki, 1908)

Kraków-Wieluń Upland: Ojcowski NP and vic. (Pawłowski *et* al., 1994), Jaskrów, Konopiska, Kręciwilk, Kusięta, Mirów (Kościelny, 2006), Poczesna-Zawodzie (Klasiński, 2015a), records without exact data (Jabłoński, 1869; Eichler W., 1914; Haber, 1957)

Małopolska Upland: Pabianice (Eichler W., 1929), Jędrzejów Distr. (Karczewski, 1961), Spała nat. res., Teofilów (Jaskuła *et* al., 2009), Rogów (Mokrzycki, 2011), Spalsko-Rogowskie forests (Mokrzycki *et* al., 2013; Mazur & Perliński, 2013), Spała District – Spała nat. res. and Żądłowice nat. res. (Byk A. *et* al., 2013), Spała District-Żądłowice nat. res. and Rogów District-Jasień for. distr. (Rutkiewicz *et* al., 2013)

Świętokrzyskie Mts.: Trzemosna for. distr., Świętokrzyski NP – Podgórze for. distr. (Rutkiewicz, 2007), Cisów for. distr. and Trzemosna for. distr. (Mokrzycki, 2007; 2011)

Lubelska Upland: Puławy (Burakowski *et* al., 1980), Poleski NP (Staniec, 2010)

Roztocze: records without exact data (Tenenbaum, 1913)

Western Sudety Mts.: Karkonoski NP (Mazur A., 1993a), Karpacz Wilcza Poręba (Mazur A., 1998), Izerskie Mts., Świeradów for. distr., Jakuszyce, Sowie Mts., Jugów for. distr., Wielka Sowa (Mazur A., 2012), Riesengebirge, Schwarze Koppe (Karkonosze, Czarna Kopa), Cieplice, Waldenburgen-Gebirge (Góry Wałbrzyskie), Eulengebirge (Góry Sowie), Bögenberge (Góra Górzec) (Letzner, 1871; 1886)

Eastern Sudety Mts.: Grafschft Glatz (Hrabstwo Kłodzkie; Letzner, 1871; 1886)

Western Beskid Mts.: Little Beskid Mts. (Paśnik, 1998), Babia Góra Massif (Kubisz & Szafraniec, 2003), records without exact data (Wachtl, 1870; Stobiecki, 1883; Letzner, 1886; Warzecha, 1927; Pawłowski, 1967; Kowalczyk-Rożek, 1972)

Nowy Targ Basin: Zakopane (Łomnicki, 1886)

Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929), Borek Stary near Rzeszów (Konieczna & Czerniakowski, 2010; Konieczna *et* al., 2012), Rzeszów-Zalesie (Konieczna *et* al., 2013), Folusz, Libusza, Wysowa Zdrój (Taszakowski *et* al., 2018)

Bieszczady Mts.: Burakowski *et* al., 1980, Stuposiany (Nowosad, 1990), Szujecki, 1996; Pawłowski *et* al., 2000

Pieniny Mts.: Ociemne (Mroczkowski, 1978), Pieniński NP – Trzy Korony Mt. (Mazur A., 2000b)

Tatry Mts.: records without exact data (Miller, 1859; Nowicki, 1864; 1865; 1873; Łomnicki, 1866; 1868; Reitter, 1870a)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Kulwieć, 1907; Łomnicki, 1913; Szujecki, 1966c; 1980;

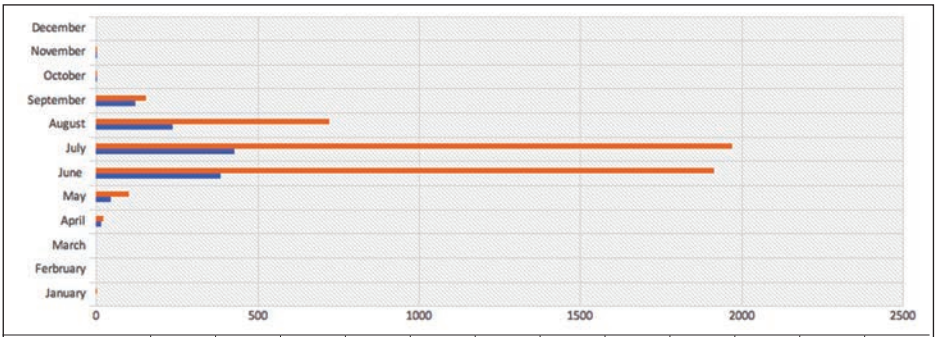
Nowosad, 2000; Löbl & Smetana, 2004; Löbl & Löbl, 2015), Prussia (Lentz, 1853), Silesia (Weigel, 1806; Reitter, 1870b; Gerhardt, 1910a; Kuhnt, 1912; Horion, 1965), Galicia (Łomnicki, 1884), Western Galicia (Nowicki, 1873), Carpathians (Nowicki, 1873).

Phenology and development. Developmental stages were described by Szujecki (1966d). The description of the all larval instars and pupal stage was provided by Pietrykowska-Tudruj & Staniec (2012). They reported two larval instars in this species, a state unique within the tribe Staphylinini.

In the opinion of Szujecki (1980) it appears in larger numbers every several years. Swarming and egg deposition take place in May and June, while pupation in August. During the swarming period beetles copulate every 6–10 days. Eggs are deposited to the surface soil layer, 1–2 eggs daily, a total of approx. 25. Embryo development lasts 8–10 days. Larvae of stage I moult after 6 days, while moulting of those of stage II lasts further 7–9 days. The entire larval development (together with the embryo development) lasts 4 weeks. Prior to pupation the activity of predatory larvae declines. Larvae press an adequate size burrow in the soil, where they pupate. The prepupal stage lasts 2 days, while the pupal stage is 12 days. The total length of the development period on average is 36 days (Szujecki, 2017).

According to the observations of Pietrykowska-Tudruj & Staniec (2012), the laying of eggs by this species took place in the first decade of May, and the end of development (pupation) took place at the end of July.

Young individuals appear from the first decade of June to the turn of September and October (Szujecki, 1996; 2017). Young beetles overwinter. In newly identified localities beetles were caught from April to September, most numerously in June and July (**Fig. 6.52**).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	3	0	1	23	101	1914	1971	723	156	3	4	1
Number of records	1	0	1	15	46	387	429	239	121	3	2	1

Fig. 6.52. Frequency of *Staphylinus erythropterus erythropterus* L., 1758 in localities in Poland

Tasgius Stephens, 1829

The genus was previously treated as a subgenus within the genus *Ocypus* Leach, or in part as a separate genus *Alapsodus* by Coiffait (1974). It differs from *Ocypus* in the structure of mandibles, being markedly elongated and sickle-shaped. Currently the genus comprises 44 species (Herman, 2001), inhabiting the Palearctic and Nearctic regions, of which 8 are found in Central Europe (Schillhammer, 2011). The European species are classified to two subgenera: *Rayacheila* Motschulsky, 1845 and *Tasgius s. str*. Stephens, 1829 (Herman, 2001; Löbl & Löbl, 2015).

Tasgius globulifer globulifer (Geoffroy, 1785)

Within this species 2 subspecies are distinguished: *Tasgius globulifer globulifer* (Geoffr., 1785) found in Poland and other countries, and *Tasgius globulifer sicanus* Coiffait, 1964 described from Sicily (Herman, 2001).

General distribution. The species is found mainly in western, southern and central Europe, in the North reaching only southern Denmark, Sweden, Estonia and Latvia. It has also been recorded in England and Ireland, Belgium, the Netherlands, all of France, Portugal and Switzerland. In Poland and in Czechia, as well as Italy it is a species with scattered localities (Kleeberg & Uhlig, 2011; Ferreira, 2018). In the south of Europe the area of its occurrence includes also Corsica and Sicily as well as the entire Balkan Peninsula and Greece. In the east it reaches through southern Russia and Ukraine to the Caucasus, Georgia, Azerbaijan, Iran, Turkey and Syria (Horion, 1965; Löbl & Smetana, 2004; Bordoni, 2010). Its occurrence in Canada and the USA was considered doubtful by Herman (2001).

Habitat preferences. It prefers xeric and open biotopes, gardens and meadows, clay pits, sand mines and gravel pits. It is found less frequently in forests (Horion, 1965, Kleeberg & Uhlig, 2011). It is found under stones, mosses and fallen foliage.

Occurrence in Poland. Until the 1950s in present-day Poland it was recorded mainly in the south-western part with single localities in the North and South of the country (**Fig. 6.53**). Most recent faunistic studies confirm localities of *T. globulifer* only in the Bieszczady Mts., which makes this species one of the less frequently observed large Staphylininae in Poland.

New records

Eastern Beskid Mts.: Bircza District, Jureczkowa for. distr. [FV18], 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Bieszczady Mts.: Połonina Wetlińska Mt. [FV14], 25 V 2016, 1 ex. on the tourist trail, leg., coll. KR

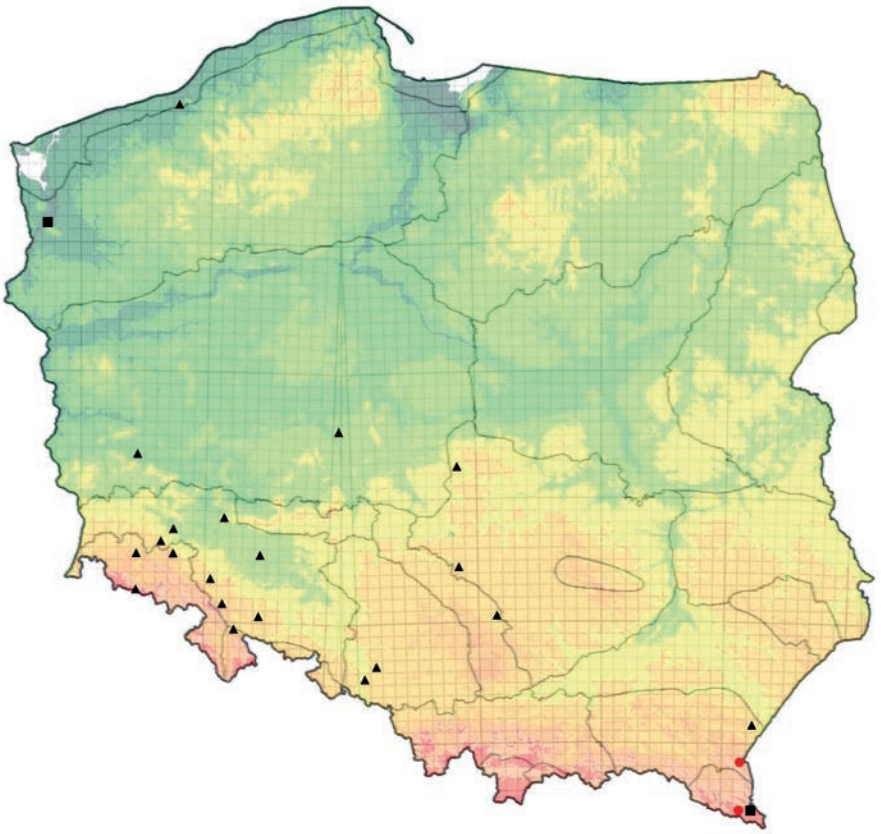


Fig. 6.53. Distribution of *Tasgius globulifer globulifer* (Geoffr., 1785) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

Previously recorded from:

Baltic Coast: Koszalin (Lüllwitz, 1916)
Pomeranian Lake District: Szczecin vic. (Cykowski, 1977)
Wielkopolska-Kujawy Lowland: records without exact data (Letzner, 1886; Gerhardt, 1905; Gerhardt, 1910a – Neusalz (Nowa Sól), Szulczewski, 1922 – Grodzisk
Lower Silesia: records without exact data (Letzner, 1886; Gerhardt, 1910a – Breslau (Wrocław), Wohlau (Wołów), Liegnitz (Legnica), Goldberg (Złotoryja), Heßberg (Góra Górzec), Lähn (Wleń), Schweidnitz (Świdnica), Reichenbach (Dzierżoniów), Münsterberg (Ziębice)

Upper Silesia: records without exact data (Letzner, 1886; Gerhardt, 1910a – Rauden (Rudy k. Kuźni Raciborskiej)), Ratibor (Racibórz; Scholz, 1935; Stefek, 1939)
Kraków-Wieluń Upland: records without exact data (Lgocki, 1908)
Małopolska Upland: Kłomnice – Częstochowa Province (Lgocki, 1908), Pabianice (Eichler W., 1929), Łódzka Upland (Szujecki, 1980)
Western Sudety Mts.: records without exact data (Gerhardt, 1910a – Wartha (Bardo Śląskie), Riesengebirge (Karkonosze)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929)
Bieszczady Mts.: Szujecki, 1980

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Horion, 1965; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015), Silesia (Kuhnt, 1912; Kolbe, 1928), Galicia (Łomnicki, 1884).

Phenology and development. Observations from Mecklenburg indicate that beetles are found practically throughout the year, from January to November. The greatest numbers of individuals were caught in May and from September to November (Kleeberg & Uhlig, 2011). Also Horion (1965) reported that beetles are most numerously observed in August and that they are active throughout the winter season, with temperatures below 0°C causing no decline in their activity. Moreover, it seems that also larvae overwinter (data from southern Sweden, after Horion, 1965).

Individuals in the Bieszczady Mts. were caught in May (1 individual) and September (1 individual).

Tasgius melanarius melanarius (Heer, 1839)

Within this species, one other subspecies is distinguished, *Tasgius melanarius sahlbergi* G. Müller, 1926, inhabiting Turkestan (Herman, 2001).

General distribution. A widely distributed European species. It is found over the entire central part of the continent from Belgium and France to Russia. In northern Europe it was recorded in the British Isles as well as southern and central Scandinavia and the Baltic states.

Distribution in southern Europe according to Horion (1965) is ambiguous and covers Italy and the Balkans (Bosnia and Hercegovina, Dalmatia and Albania). Herman (2001) as well as Löbl & Smetana (2004) clarified and supplemented data on its distribution to include Bulgaria, Greece, Slovenia, Croatia and Romania. It is also found in Ukraine, Moldova, Belarus as well as

south-central part of Russia, in the Caucasus, Turkey and Kazakhstan (Stan & Bacal, 2006). It was unintentionally introduced to Canada and the USA (Newton, 1987; Bordoni, 2010), where it was already observed (in Canada) as early as the 1930s (Klimaszewski & Brunke, 2018).

Habitat preferences. It is considered a flightless species (Deichsel, 2006). An eurytopic species preferring forested habitats (Irmler & Gürlich, 2007). It is found both in forests in light and moist localities, and in open areas such as meadows, fields and gardens (Horion, 1965; Kleeberg & Uhlig, 2011).

Beetles are found under stones, in mosses, under decaying organic matter, in compost (Horion, 1965; Burakowski *et* al., 1980), also on carrion (Kočárek, 2003).

Beetles were also observed in cities (as indicated by data below from Poznań, Gdynia and literature data – Horion, 1965) when wandering on pavements and streets. It is a co-dominant species in parks and forests of urban agglomerations in Ukraine (Puchkov *et* al., 2020).

A phyto- and humicolous species (Staniec & Petrykowska, 2005).

Occurrence in Poland. It is found throughout the country, from the Baltic coast to the Tatra Mts., where it was found on Giewont (1894 m a.s.l.; **Fig. 6.54**).

New records

Baltic Coast: Łazy near Koszalin [WA71], 18–28 VIII 2001, 1 ex. on the dune, leg., coll. SK; Międzyzdroje [VV67], 20 VIII 1961, 1 ex., leg, ASk, det. AM, coll. USM; Rewal [WV09], 18–25 VII 1990, 1 ex., det., leg. LBo, coll. RRu; Rozewie [CF28], 13 X 1999, 1 ex., leg., coll. HS; Skowronki near Sztutowo [CF82], 4 IX 1964, 2 exx., leg. TPl, ex coll. AG, det. AM, coll. MNHW; Świnoujście [VV57], 17 V 2007, 1 ex., by the sea, leg. PD, det. AM, ex coll. OA, coll. AM; Trzebież [VV64], 30 IV 1993, 1 ex. in the garden; 2 IV 1985, 1 ex., meadow, stumps, leg. RaK, coll. AM

Pomeranian Lake District: Bonin near Koszalin [WA80], 20 VIII 1991, 1 ex., historic park, under the bark, leg. PS, coll. AM; Cedynia nat. res. [VU45], 1 X 2010, 1 ex., moor pitfall trap, leg. PS, det., coll. AM; Damnica [XA44], 7 VI 2007, 1 ex., overgrowing meadow, leg. EJ, det. AM, ex coll. OA, coll. AM; Lisewo Kaszubskie [CF06], 1–25 X 1985, 1 ex., leg., coll. AM; Raduń [VU47], 27 IV 2011, 1 ex., ols over the stream, 30 V, 1 ex., 5 VII, 1 ex., 30 VIII, 1 ex., 4 X, 2 exx., 12 XI 2011, 1 ex., beech forest on the embankment of the Odra River pitfall trap, leg. PS, det., coll. AM; Sławno [XA02], 20 VIII 1944, 1 ex. leg., HN, det. AM, coll. USM; Złocieniec [WV63], 7 IX 2013, 2 exx. from screenings, leg., coll. KR

Masurian Lake District: Olsztyn vic. Kortowskie forest [DE65], 4 VIII–13 IX 1999, 1 ex., oak forest by the stream, bait trap (fish), leg., coll. KK; Olsztyn-Kortowo [DE65], 4 IX 2006, 1 ex. in the Park, under the Board, leg.

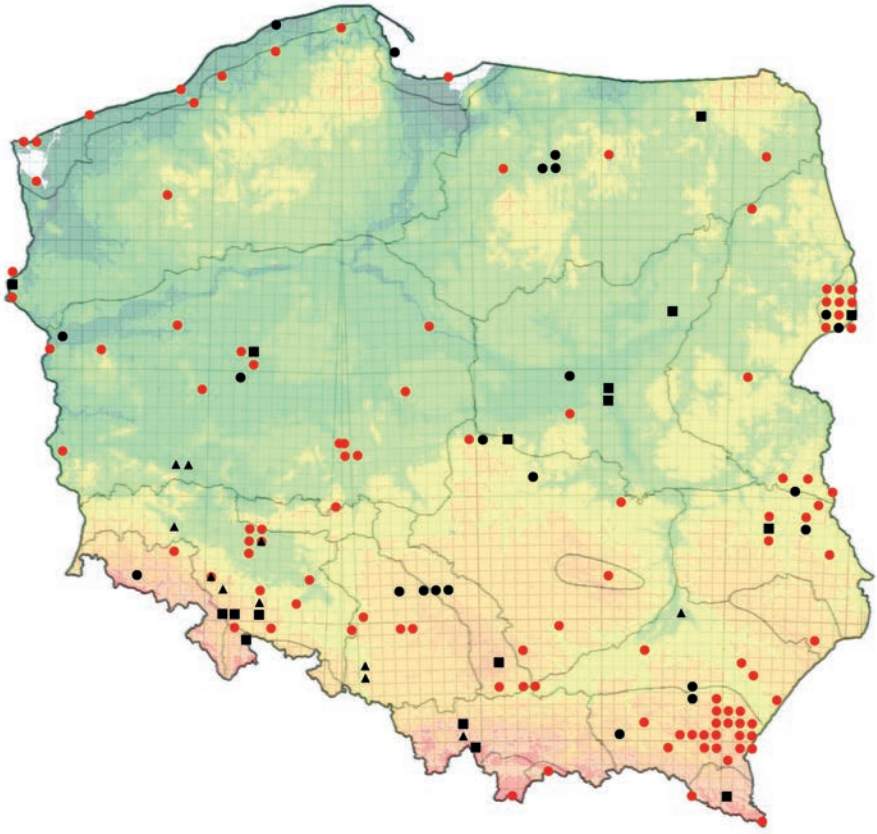


Fig. 6.54. Distribution of *Tasgius melanarius melanarius* (Heer, 1839) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

A. Włodarczak-Komosińska, coll. KK; Ostróda vic. [DE25], 9 IX 1997, 1 ex. under the tree trunk, leg., coll. KK; Parleza Wielka vic. [EE06], 1 VIII–13 IX 1999, 1 ex., wet meadow, bait trap (fish), leg., coll. KK; Uścianki near Augustów [FE26], 12 VIII 2004, 1 ex. in barley, det. AM, leg., ex coll. OA, coll. AM

Wielkopolska-Kujawy Lowland: Jeziory Wysokie vic. [VT83], 26 VIII 2016, 1 ex., in a decayed trunk, leg., coll. SK; Gołuchów [YT04], 11 XI 1996, 1 ex., in the forest, on the road, 30 IV 1994, 1 ex., VIII 1992, 2 exx., 5 I 1991, 1 ex., leg., coll. AM; Grodzisk Wielkopolski [WT98], 1910–1920, 1 ex., leg. Zemlerski, det. AM, coll. NHC; Kalisz [CC03], 7 IV 1985, 1 ex., Braci Niemojowskich street, leg. AM et SB, coll. AM; Kalisz [BC93], 13 V 2003, 1 ex., Kazimierzowska street, leg., coll. AM; 4 V 1992, 1 ex. and 8 V 1985, 1 ex., leg., coll.

AM; Kalisz-Szczypiorno [BC93], 11 V 2010, 1ex. on the gardens, leg., det. AM, coll. LK; Koło [CC48], 9 VI 1989, 1 ex., leg. TM, coll. AM; Kościelna Wieś [BC94], 21 III 1993, 1 ex., leg., coll. AM; Olszyna [YS09], VIII 1993, 1 ex., leg. AM et KL, coll. AM; Owczary [VU71], 14 V 2009, 1 ex., xerothermic flowerig grassland, pitfall trap, leg. PS, det., coll. AM; Poznań [XU31], 15 VII 1990, 1 ex. behind Lechicka street, under the stones, leg. PS, coll. AM; Poznań – Cytadela [XU30/31], 1 IV 2000, 1 ex., rotten trunk in a shady moat, leg., coll. SK; Poznań-Golęcin [XU21], 15 VI 1989, 1 ex. in alder forest, leg. W. Krzywański, det., coll. AMa; Poznań-Malta [XU30], 19 IV 2000, 1 ex., leg. MP, coll. AM; Sierakowski Landscape Park, Sieraków [WU73], 28 III–24 X 2004, 5 exx. on the Jaroszewskie Lake, leg. MŚ, det., coll. AM; Sulęcin District [WU11], for. comp. 125b, 15 V 1995, 1 ex. in mixed forest, for. comp. 126b, 27 VI 1995, 1 ex. in mixed forest, leg. W. Gorączka, det., coll. AMa; Włocławek vic. [CD63], 28 VII 1993, 1 ex., leg., coll. PJ

Mazovian Lowland: Janinów near Grodzisk [DC76], 15 IX 1953, 1 ex. leg. A. Maciejewski, ex coll. AS, coll. MIZ; Natolin [EC07], 16 VI 1889, 1 ex., leg. WM, det. AM, coll. USM; Radom-Rajec Letnisko [EB19], 25 IV 2005, 1 ex. on the road, det. AM, leg., coll. MaM; Warszawa [EC08], 19 IV 1911, 1 ex., leg. WM, det. AM, coll. USM

Podlasie: transitional bog "Bukowski Las" [FB79], 18 V and 26 VI 2007, 2 exx. pitfall trap, leg. TOd, coll. MCSU; Kropiwki [FC41], 31 VII 2014, 1 ex. and 31 VIII 2014, 1 ex., meadow pitfall trap, leg. ŁN, coll. AM; Osowiec – Twierdza [FE12], 19 VII 1999, 1 ex. near Carska road and Łosia Biel peat-bog (a freshly transformed specimen with yellow legs), det. AM, leg., coll. MW; Sobibór [FC80], 28 VII 2001, 1 ex., leg., det., coll. MW, ver. AM; Wyryki [FC61], 30 VII 2014, 1 ex., meadow pitfall trap, leg. ŁN and TP, coll. AM

Białowieża Primeval Forest: for. comp. 156 [FD94], 26 VI 1991, 1 ex., leg. TM, coll. AM; Białowieża District [FD83, FD84, FD93, FD94], pitfall trap, 4 V–14 VI 2016: 1 ex. (for. comp. 220Bc), 1 ex. (220Ca), 1 ex. (337Dc), 1 ex. (393Aa), 1 ex. (426Db), 2 exx. (445Ag), 1 ex. (452Bb), 1 ex. (501As), 4 exx. (545Dj), 1 ex. (582Ca), 1 ex. (608Bh), 1 ex. (608Cb); 14 VI–10 VII 2016: 1 ex. (337Dc), 1 ex. (445Ag), 2 exx. (471Bd), 1 ex. (545Dj); 10 VII–13 VIII 2016: 1 ex. (311Db), 2 exx. (471Bd), 1 ex. (477Ac), 2 exx. (502Ak); 13 VIII–11 IX 2016: 1 ex. (220Ca), 1 ex. (339Ag), 1 ex. (392Cg), 1 ex. (395Ab), 1 ex. (402Ca), 1 ex. (423Dd), 1 ex. (426Cj), 1 ex. (448Dd), 1 ex. (474Ca), 1 ex. (496Ac), 1 ex. (500Db), 1 ex. (501As), 3 exx. (502Ba), 1 ex. (580Bb), 1 ex. (582Ca), 1 ex. (608Bh), 1 ex. (640Aa), det. AM, leg., coll. DFP. Hajnówka District [FD73, FD74, FD83, FD84, FD85], pitfall trap, 4 V–14 VI 2016: 1 ex. (for. comp. 215Bg), 1 ex. (244Cf), 1 ex. (247Df), 2 exx. (356Df), 1 ex. (413Ch), 2 exx. (415Bb), 1 ex. (487Ca), 1 ex. (538Cd), 2 exx. (541Aj), 1 ex. (542Dn), 1 ex. (571Cf), 1 ex. (571Db), 1 ex. (573Dkx), 4 exx. (595Ak), 1 ex. (734f); 14 VI–10 VII 2016: 1 ex. (542Ca), 1 ex. (603Af); 10 VII–13 VIII

2016: 5 exx. (274Bk), 1 ex. (332Ba), 1 ex. (333Aa), 2 exx. (389Bj), 3 exx. (542Dn), 1 ex. (566Bc), 1 ex. (573Dkx), 1 ex. (601Ab), 1 ex. (670Cc); 13 VIII–11 IX 2016: 3 exx. (274Bk), 1 ex. (331Ga), 1 ex. (384Ca), 2 exx. (484Ai), 1 ex. (512Cf), 2 exx. (542Ca), 7 exx. (542Dn), 1 ex. (566Bc), 1 ex. (576Ci), 2 exx. (600Cd), 1 ex. (667Bi), 5 exx. (670Cc), det. AM, leg., coll. DFP. Browsk District [FD75, FD76, FD85, FD86, FD95, FD96], pitfall trap, 4 V–14 VI 2016: 1 ex. (for. com. 28Bc), 1 ex. (39Aa), 1 ex. (47Ab), 1 ex. (62Aa), 1 ex. (65Bf), 1 ex. (78Cb), 1 ex. (83Cf), 1 ex. (96Cc), 2 exx. (96Dd), 2 exx. (120Bc), 1 ex. (125Af), 1 ex. (148Ad), 1 ex. (150Cb), 1 ex. (153Bc), 1 ex. (773Ad), 1 ex. (773Bc), 1 ex. (775Dc); 14 VI–10 VII 2016: 1 ex. (764Dd), 1 ex. (781Dc); 10 VII–13 VIII 2016: 1 ex. (3Ab), 1 ex. (6Da), 1 ex. (14Ba), 1 ex. (41Bb), 1 ex. (56Bc), 1 ex. (80Ca), 1 ex. (95Aa), 1 ex. (96Dd), 1 ex. (764Dd), 1 ex. (774Cn), 2 exx. (781Dc); 13 VIII–11 IX 2016: 1 ex. (6Ch), 1 ex. (23Db), 2 exx. (28Bc), 1 ex. (147Cb), 2 exx. (749Cb), 1 ex. (755Cc), 1 ex. (756Ba), 1 ex. (764Dd), 1 ex. (778Cb), det. AM, leg., coll. DFP. Białowieża NP [FD94, FD95], pitfall trap, 4 V–14 VI 2016: 2 exx. (for. com. 107Cb), 1 ex. (190Bd), 2 exx. (226Ba), 2 exx. (371Db); 13 VIII–11 IX 2016: 2 exx. (136Bh), 1 ex. (166Cd), 2 exx. (282Df), 3 exx. (313Db), 5 exx. (339Cf), det. AM, leg., coll. DFP

Lower Silesia: Bardo Śląskie [XR29], 26 IX 1935, 1 ex., leg. FK, det. AM, coll. USM; Dębina nat. res. [XS71], 11 VI 2017, 1 ex., on decaying oak trunk, leg. Rafał Rogowski, det. et coll. TW; Dębniki ad Strzelin [XS42], 1 IV 1997, 1 ex. in alder forest, leg., det., coll. AMa; Łosiów near Brzeg [XS83], 29 IX 2004, 1 ex. leg. JJ, det., coll. AMa; Ligota Otmuchowska [XR59], VI 1906, 1 ex., VIII 1906, 1 ex., 17 V 1926, 1 ex., leg. ED, det. AM, coll. USM; Mokronos near Wrocław [XS35], X 1963, 1 ex., leg. ex coll. AG, det. AM, coll. MNHW; Opoczka [XS03], 27 V 1909, 1 ex., leg. TS, det. AM, coll. USM; Strzelin [XS42], 17 VII 1991, 1 ex. in home garden, leg., det., coll. AMa; Wrocław-Biskupin [XS46], 8 IX 1991, 1 ex., det. AM, leg., coll. MW; Wrocław-Kozanów [XS36], 18 XI 2016, Las Pilczycki, sifted *Glyceria maxima* rush & old river bed shore, leg. MW, coll. PJ; Wrocław-Pawłowice [XS47], 17 IX 2002, 2 exx. leg. JJ, det., coll. AMa; Wrocław-Świniary [XS37], mixed forest along Widawa, 13 X 2017, 1 ex., leg., coll. PJ

Upper Silesia: Brynek-Park [CA39], 12 IX 2012, 1 ex., leg., coll. HS; Góra Św. Anny Mt. [BA99], 7 IV 1926, 2 exx., leg. FK, det. AM, coll. USM; Kamieniec [CA49], 11 VI 1926, 1 ex., leg. FK, det. AM, coll. USM; Szymiszów [CB00], 14 V 1889, 1 ex., leg. HN, det. AM, coll. USM

Kraków-Wieluń Upland: Kraków – Las Mogilski [DA34], 14 VI 2014, 1 ex., 10 VII 2014, 3 exx., 9 IX 2014, 3 exx. leg. A. Żaba, det. AMa, coll FE UAK; Kraków-Mogiła [DA34], 1 ex., urban greenery, leg., det. et coll. TW; Kraków-Skotniki [DA14], 1 ex., ruderal habitat, leg., det. et coll. TW; Kusięta near Olsztyn [CB72], 11 IX–4 XII, 3 exx., pitfall trap near the cave (Towarna), leg. JKZ, det. AM, coll. TK

Małopolska Upland: Łódź-Łagiewniki [CC94], 15 IV 2007, 1 ex., leg., coll. AK; Pińczów [DA69], 11 VII 1996, 2 exx., leg. TW, coll. AM; Radom-Firlej [EB19], 23 IV 2012, 1 ex., Warszawska street, det. AM, leg., coll. MaM; Radom-Gołębiów [EB19], 4 IV 2011, 1 ex., det. AM, leg., coll. MaM; Rogów [DC24], 6 IX 2014, 1 ex., under a stone in the garden, leg., coll. DJT; Spała [BC31], 16 VI 2009, 1 ex., leg. Piotr Radlikiewicz, det. AM, coll. AK; Poradów [DA37], 28 III–22 IX 2015, 2 exx., xerothermic slope, pitfall trap, leg., coll. JTD; Sławice Szlacheckie [DA37], 28 III–22 IX 2015, 2 exx., xerothermic slope, pitfall trap, leg., coll. JTD

Świętokrzyskie Mts.: Cząstków near Nowa Słupia [EB03], 29 VIII 1958, 1 ex., leg., det. AS, coll. MIZ; Świętokrzyski NP, p.u. Chełmowa Góra, for. comp. A-1g [EB03], 15–30 VI 2012, leg. LB & S. Kuroś, det., coll. AM

Lubelska Upland: Biała Góra [FA25], 26 VIII 1995, 1 ex. pitfall trap, leg. BS, coll. MCSU; Ciechanki Krzesimowskie [FB38], 6 VIII 1985, 1 ex. under willow bark, leg. BS, coll. MCSU; Ciechanki Łańcuchowskie [FB37], 22 VI, 17 VIII, 13 IX and 13 X 2005, 10 exx. in the pitfall trap in the xerothermic communities of the Nadwieprzański Landscape Park, leg. JKo, coll MCSU; Ciechanki-Łańcuchów [FB38], 4 V 2011, 1 ex. warm tree stand at the base of xerothermic habitat, leg. BS, coll. MCSU; Fajsławice [FB36], VI and VII 2004, 2 exx. growing of herbs pitfall trap, leg. WCz, coll. MCSU; Górne [FB37], 29 IX 1991, 3 exx. in old palace park, leg. BS, coll. MCSU; Jaszczów [FB37], 15 X 1984 and 31 VII 1985, 2 exx. under rotting plants in the field, leg. BS, coll. MCSU; Kazimierz Dolny [FB68], 27 IV 1989, 1 ex., leg. J. Siekierski, coll. AM; Koczów [FB85], 27 V 2014, 2 exx. and 28 VIII 2014, 3exx., meadow pitfall trap, leg. AH, coll. AM; Łańcuchów [FB38], 12 VIII 1995, 1 ex., BS, coll. MCSU; Łęczna vic. the bank of the Mogielnica River near the estuary to the Wieprz River [FB38], 17 VI–28 X 2008, 4 exx. pitfall trap, leg. BS, coll. MCSU

Roztocze: Korhynie [FA78], 1 X 1994, 1 ex. pitfall trap, leg. BS, coll. MCSU

Sandomierska Lowland: Malinie near Mielec [EA37], 8–22 V 2016, 2 exx., in the park, pitfall trap, leg. MKŚ, det. et coll. AM; Niepołomice [DA44], 11 IV 1954, 1 ex., det., leg. ex coll. AG, ver. AM, coll. MNHW; Rzeszów-Zalesie [EA73], 27 VI 2013, 1 ex. in the apartment, Zelwerowicza street, det. AM, leg., coll. TO; Sieniawa District, Szegdy for. distr. [FA16], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jarosław District, Stubno for. distr. [FA43], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Western Sudety Mts.: Myślibórz [WS75],], 16–21 VIII 1996, 1 ex., det., leg. LBo, coll. RRu

Eastern Beskid Mts.: Hołubla near Przemyśl [FA11], 4 VI 1997, 1 ex., sifted, det. AM, leg., coll. MW; Osławica vic. [EV75], 17 VI 2017, 3 exx., pitfall trap, leg., coll. AM; Pacław vic. [FV29], 17 X 2015, 1 ex. in the tree planting, pitfall trap, leg. TO, det., coll. AM; Bircza District: Borysławka for. distr. [FA10], 13 IX

2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Brzuska for. distr. [FA11], 10 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jamna for. distr. [FV19], 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Krzywe for. distr. [FC19], 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Birchów District, Bykowce for. distr. [EV99], 31 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dębna for. distr. [EV89], 28 VIII, 1 ex., 28 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dobra for. distr. [EA90], 29 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dydnia for. disr. [EA80], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Podlesie for. distr. [EA60], 29 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Przysietnica for. distr. [EA70], 29 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Siemuszowa for. distr. [EV99], 27 VII, 1 ex., 29 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Trepcza for. distr. [EV89], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Tyrawa Wołoska for. distr. [FV08], 27 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Wola Krecowska for. distr. [EV99], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dukla District, Iwonicz for. distr. [EV59], 30 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dynów District, Dąbrówka for. distr. [EA91], VIII, 1 ex., IX 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Wybrzeże for. distr. [FA01], VII, 1 ex., [EA91], VIII, 1 ex., IX 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Kańczuga District, Borowiec for. distr. [FA12], 15 IX, 1 ex., [FA02], 15 IX 2016, 1 ex. in pitfall trap, det. AM, leg., coll. DMF; Kramarzówka for. distr. [FA02], 16 IX 2016, 1 ex.pitfall trap, det. AM, leg., coll. DMF; Lipinki for. distr. [EA93], 18 VII, 1 ex., 17 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Rączyna for. distr. [EA92], 16 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Węgierka for. distr. [FA12], 25 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kołaczyce District, Bierówka for. distr. [EA31], 30 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Krasiczyn District, Cisowa for. distr. [FA10], 13 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Grochowce for. distr. [FA21], 16 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Korytniki for. distr. [FA11], 15 VII, 2 exx., 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kupna for. distr. [FA01], 13 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Prałkowce for. distr. [FA11], 16 IX 1 ex., [FA21], 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Rokoszyce for. distr. [FA10], 17 VIII, 1 ex., [FA20], 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Średnia for. distr. [FA11], 14 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Bieszczady Mts.: Kińczyk Bukowski Mt. [FV33], 9 VIII 2012, 1 ex., leg., det. et coll. TW

Pieniny Mts.: Pieniny [DV57], 25 VII 1966, 2 exx., leg. ex coll. AG, det. AM, coll. MNHW

Tatry Mts.: Tatrzański NP, Giewont Mt. [DV25], 22 VII 1985, 1 ex., leg., coll. AM

Previously recorded from:

Baltic Coast: Słowiński NP – Łebska Spit (Smoleński, 2000a), Gdynia-Kępa Redłowska (Konopko *et* al., 2017), records without exact data (Dommer, 1850; Lentz, 1857; 1879; Bartoszyński, 1937)

Pomeranian Lake District: Bielinek nat. res. (Kubisz & Melke, 1995)

Masurian Lake District: Borecka Forest (Melke & Maciejewski, 1999), Olsztyn vic. (Komosiński, 2001a), Olsztyn, Ostróda, Parleza Wielka (Komosiński, 2001b), Olsztyn and Olsztyńskie Lake District (Komosiński, 2004)

Wielkopolska-Kujawy Lowland: Głogów (Letzner, 1871), Poznań (Olejnik, 1994), Wielkopolski NP (Podbylski & Nowosad, 2001), Park Narodowy Ujście Warty (Jankowski & Mazur, 2019)

Mazowian Lowland: Warszawa-Łazienki, Warszawa-Natolin (Szujecki, 1968), Ostrów Mazowiecka (Burakowski *et* al., 1980), Kampinoski NP (Mazur S. *et* al., 2010)

Białowieża Primeval Forest: Białowieża NP (Melke & Gutowski, 1995; Derunkov & Melke, 2001; Smoleński & Szujecki, 2001; Borowski, 2001; Byk, 2001a; Smoleński *et* al., 2004; Smoleński, 2006)

Lower Silesia: Olbrachcice Wielkie near Ząbkowice Śląskie, Srebrna Góra, Ziębice Śląskie, Złoty Stok (Smoleński 1996b), Breslau, Glogau, Liegnitz, Schweidnitz (Świdnica), Reichenbach (Dzierżoniów), Münsterberg (Ziębice) (Letzner, 1871)

Upper Silesia: Rauden (Rusy koło Kuźni Raciborskiej), Ratibor, records without exact data (Kelch, 1846; Roger, 1856; Letzner, 1871; Polentz, 1938)

Kraków-Wieluń Upland: Ojcowski NP and vic. (Pawłowski *et* al., 1994, Kubisz & Pawłowski 1998), Konopiska (Kościelny, 2006), Kochcice (Słabikowski, 2006), Częstochowa-Błeszno, Częstochowa-Kucelin, Siedlec Mirowski (Klasiński, 2015b)

Małopolska Upland: Rogów near Koluszki (Burakowski *et* al., 1980), Parowy Janinowskie nat. res., Struga Dobieszkowska nat. res. (Jaskuła *et* al., 2010), Spalsko-Rogowskie forests (Mokrzycki *et* al., 2013)

Lubelska Upland: Jaszczów near Lublin (Staniec, 1991), Stawska Góra nat. res. near Chełm (Staniec, 2002), Poleski NP (Staniec, 2010)

Sandomierska Lowland: Kotowa Wola – Tarnobrzeg Province (Jachno, 1880)

Western Sudety Mts.: Karkonosze Mts. Chojnik (Mazur A. *et* al., 2016)

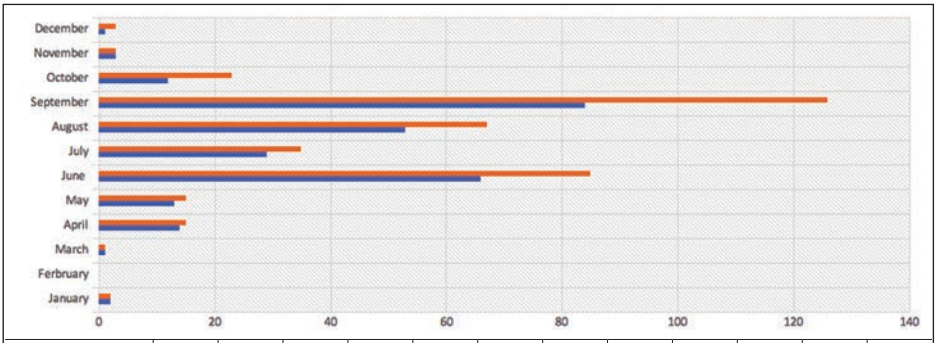
Western Beskid Mts.: the basin of the Soła and Koszarawa (Wachtl, 1870), Babia Góra Mt. (Pawłowski, 1967), Little Beskid Mts. (Paśnik, 1998)

Eastern Beskid Mts.: Borek Stary near Rzeszów (Konieczna *et* al., 2012), Rzeszów-Zalesie (Konieczna *et* al., 2013), Libusza, Wysowa Zdrój (Taszakowski *et* al., 2018)

Bieszczady Mts.: Burakowski *et* al., 1980, Szujecki, 1996, Pawłowski *et* al., 2000

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Horion, 1965; Szujecki, 1980; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015), Silesia (Kolbe, 1928), Galicia (Gravenhorst, 1847).

Phenology and development. In Poland it is recorded practically year round, data are lacking only from February (**Fig. 6.55**). Beetles are found most often and most numerously in September, as well as in June. The pupa of *T. melanarius* was decribed by Staniec & Pietrykowska (2005), while eggs were described by Staniec & Pietrykowska-Tudruj (2007).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	2	0	1	15	15	85	35	67	126	23	3	3
Number of records	2	0	1	14	13	66	29	53	84	12	3	1

Fig. 6.55. Frequency of *Tasgius melanarius melanarius* (Heer, 1839) in localities in Poland

Tasgius morsitans (Rossi, 1790)

General distribution. A European species, inhabiting the entire continent, including the western part of Russia, Ukraine, Turkey, Syria and Cyprus (Herman, 2001; Bordoni, 2010). In the south of Europe recorded from Spain and Portugal, through Corsica, Sardinia and Sicily, through Italy, the Balkans to Greece. In western and Central Europe it is found in France, Belgium and the Netherlands, while in the North from the British Isles including Ireland, through southern Scandinavia and Denmark. In contrast, it has not been recorded in Finland and Karelia or the Baltic states (Horion, 1965; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Ferreira, 2018).

Habitat preferences. It prefers warm and isolated biotopes, also with calcareous substrates. It is found in deciduous (beech, oak) forests, where it stays in the leaf litter, decaying logs and stumps as well as old fruiting bodies of bracket fungi (Horion, 1965; Szujecki, 1980). In Hungary it is found more frequently in the

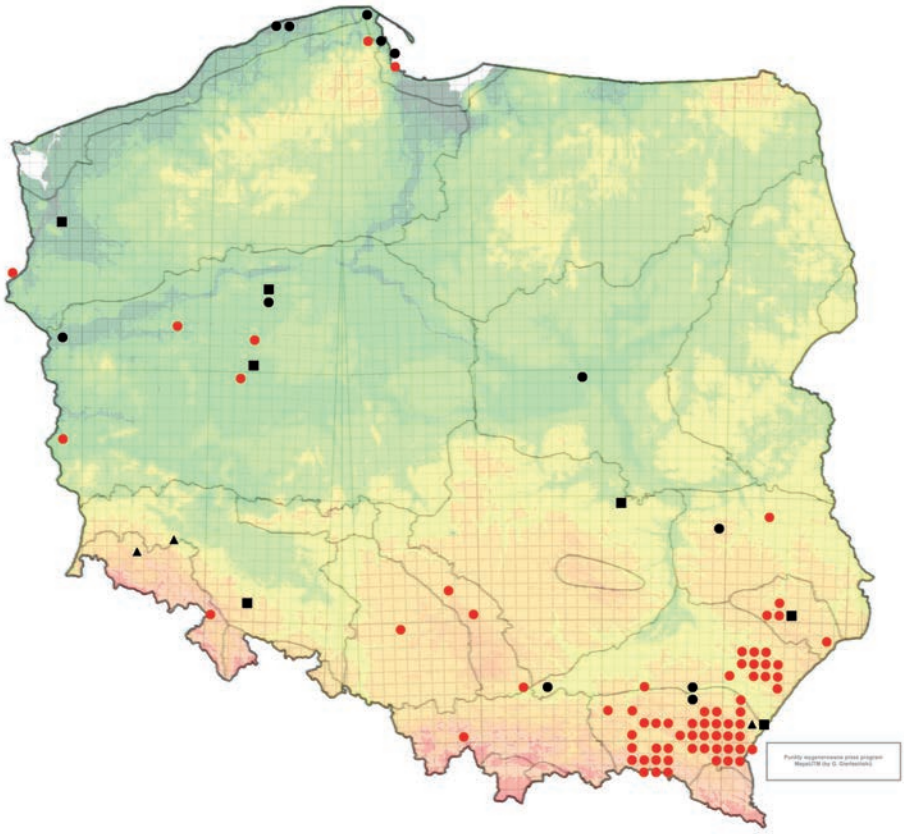


Fig. 6.56. Distribution of *Tasgius morsitans* (Rossi, 1790) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

ecotone zone and in oak forests than in meadows (Tóthmérész *et* al., 2014). The presence of this species was recorded also in a naturally formed river valley in Moravia (Nakládal, 2011). In the Alps it has been recorded at altitudes of 450–1000 m a.s.l. in warm oak subalpine forests (Zanetti, 2015).

Occurrence in Poland. Considered to be a species characteristic of forests and plant communities of natural structure (Mazur, 1993b; Konieczna *et* al., 2013; Wojas, 2016). Entered in the Polish Red List of Threateend and Endangered Animals (Pawłowski *et* al., 2002) in the category DD – data deficient. The presence of this species was not recorded in the north-eastern part of the country (**Fig. 6.56**).

New records

Baltic Coast: Gdynia-Kolibki [CF43], 9 VIII 2008, 1 ex., park, det. AM, leg., coll. MW; Mechelinki [CF35], 24 VI 2011, 1 ex., under the cliff, leg., coll. DJT; Oksywie [CF44], 31 VIII 2017, 1 ex., under the cliff, leg., coll. DJT; Wejherowo vic. [CF25], 16 VII–20 VIII 2006, 1 ex., 20 VIII–17 IX 2006, 2 exx., beech, pitfall trap, leg. I. Miotk, coll. KK

Pomeranian Lake District: Raduń [VU47], 8 VII, 1 ex., 5 VIII, 1 ex., 8 VIII, 1 ex., 4 X 2011, 4 exx., beech forest on the embankment of the Odra River pitfall trap, leg. PS, det., coll. AM

Wielkopolska-Kujawy Lowland: Biedrusko vic., military training ground [XU32], 3 VIII 2008, 1 ex., leg. SK, coll. AM; Jasienica near Luboszyce [VT84], 27 VIII 2011, 1 ex., in rotting wood, in an old, oak park, leg., coll. SK; Puszczykowo [XT29], 4 IX 1994, 1 ex. leg. det. PJ; Sierakowski Landscape Park, Sieraków [WU73], 1 VII–31 X 2004, 63 exx. on the Jaroszewskie Lake, pitfall trap, leg. MŚ, det., coll. AM

Upper Silesia: Brynek-Park [CA39], 13 IX 2017, 1 ex., leg., coll. HS

Kraków-Wieluń Upland: Kostkowice near Kroczyce [CB90], 19 IX–11 X 2015, 3 exx., pitfall trap near the cave (Kroczycka), leg. JKZ, det. AM, coll. TK; Kraków-Las Mogilski [DA34], 23 IX 2014, 1 ex. leg. A. Żaba, det. AMa, coll. FE UAK; Zielona Góra near Olsztyn [CB72], 20 IX 2015, 6 exx., pitfall trap near the cave (Zielona Góra), leg. JKZ, det. AM, coll. TK

Lubelska Upland: Ciechanki-Łańcuchów [FB38], 4 VI 2011, 1 ex. warm tree stand at the base of xerothermic habitat, leg. BS, coll. MCSU

Roztocze: Machnów [FA88], 9 V 1996, 1 ex. on carrion *Capreolus* sp., leg. BS, coll. MCSU; Roztoczański NP, Bukowa Góra [FB30], 6 IX, 3 exx., 6 X 2016, 6 exx. pitfall trap, det. AM, leg., coll. DMF; Horodzisko [FB41], 2 IX, 1 ex., [FB40], 5 IX, 1 ex., 7 X 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kruglik [FB40], 4 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Obrocz [FB40], VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Słupy [FB41], VII, 1 ex., [FB40], VII, 1 ex., IX 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF

Sandomierska Lowland: Lipówka nat. res. [DA54], 21 V 2012, 1 ex., pitfall trap, leg. Magdalena Ranocha, det. et coll. TW; Niepołomicka Forest, for. com. 185 [DA54], 26 IX 1994, 1 ex., pitfall trap, leg. Przemysław Szwałko, coll. AM; Stasiówka [EA34], 2 X 2005, 1 ex. in rotting grass, det. AM, leg., coll. AT; Oleszyce District, Futory for. distr. [FA46], IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Miłków for. distr. [FA36], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Stare Sioło for. distr. [FA36], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Sucha Wola for. distr. [FA45], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Zabiała for. distr. [FA36], 22 VIII, 2 exx., XI 2016, 6 exx. pitfall trap, det. AM, leg., coll. DMF; Sieniawa

District, Białobrzeżki for. distr. [FA05], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Chrapy for. distr. [FA36], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Czerwona Wola for. distr. [FA25], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kot for. distr. [FA16], IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Majdan for. distr. [EA37], IX, 1 ex., [FA27], IX 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Przyjemek for. distr. [FA26], VII, 1 ex., VIII 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Szegdy for. distr. [FA17], VII, 1 ex., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jarosław District, Czerniawka for. distr. [FA44], IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Olchowa for. distr. [FA35], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Radawa for. distr. VII, 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Western Sudety Mts.: Nowa Ruda [XS00], 3 VI 2015, 1 ex., leg. Magdalena Paradowska, det. et coll. TW

Western Beskid Mts.: Kocoń [CA80], 7 IX 2013, 1 ex. in excrement pitfall trap, leg. AGo, det., coll. AMa

Eastern Beskid Mts.: Sanok-Olchowce vic., [EV89], 29 VI 2011, 1 ex., 5 VII 2011, 1 ex., 8 VII 2011, 1 ex., 17 VIII 2011, 1 ex., 22 VIII 2011, 1 ex., leg. det. et coll. DT; Bircza District: Arłamów for. distr. [FV19], 16 VIII, 2 exx., 15 IX, 1 ex., [FV29], 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Borysławka for. distr. [FA10], 10 VIII, 3 exx., [FV19], 9 VIII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Brzuska for. distr. [FA01], 13 IX, 1 ex., [FA11], 13 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Dobrzanka for. distr. [FA00], 14 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jamna for. distr. [FV19], 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jasienica for. distr. [FA01], 10 VIII, 1 ex., 12 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jureczkowa for. distr. [FV18], 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Leszczawa for. distr. [FA00], 10 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Leszczyny for. distr. [FV29], 16 VIII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Łodzinka for. distr. [FA00], 13 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Malawa for. distr. [FA00], VIII, 1 ex., 12 IX, 1 ex., 13 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Posada Rybotycka for. distr. [FA10], 11 VIII 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Trzcianiec for. distr. [FV09], 14 VII, 1 ex., 12 VIII, 7 exx., 15 VIII, 1 ex., 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Trójca for. distr. [FV19], 13 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Birchów District, Blizne for. distr. [EA71], VIII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Bykowce for. distr. [EV99], 31 VIII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Dębna for. distr. [EV89], VIII, 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dobra for. distr. [EA90], 26 VIII, 1 ex., 29 VIII, 1 ex., [EV99], 27 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dydnia for. distr. [EA80], 29 VIII

2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Grabownica for. distr. [EV79], 28 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Izdebki for. distr. [EA81], 26 VIII, 1 ex., [EA80], VII, 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Podlesie for. distr. [EA70], 29 VIII, 1 ex., [EA60], 29 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Przysietnica for. distr. [EA70], 27 VII, 1 ex., 29 IX 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Sady for. distr. [EV99], 27 VII, 2 exx., [EV99], 28, VIII, 1 ex., [FV09], 30 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Siemuszowa for. distr. [EV99], 30 VIII, 3 exx., 29 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Tyrawa Wołoska for. distr. [EV98], 29 VIII, 1 ex., [FV08], 28 VII 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Dukla District, Barwinek for. distr. [EV47], 29 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Cergowa for. distr. [EV58], 29 VII, 3 exx., 30 VIII 2016, 3 ex. pitfall trap, det. AM, leg., coll. DMF; Daliowa for. distr. [EV57], 29 IX 2016, 1 ex. ib pitfall trap, det. AM, leg., coll. DMF; Franków for. distr. [EV49], 29 VIII, 2 exx., [EV48], 30 VIII 2016, 1 ex. pitfall trap, coll. DMF; Iwonicz for. distr. [EV59], 30 VIII, 1 ex., [EV58], 30 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jabłonica for. distr. [EA90], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Mszana for. distr. [EV48], 30 VIII, 1 ex., 28 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Zyndranowa for. distr. [EV57], 30 VII 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Dynów District, Dabrówka for. distr. [EA91], IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Dylagowa for. distr. [EA91], VII, 1 ex., IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Jabłonica for. dystr. [EA80], VIII, 2016, 4 exx. pitfall trap, det. AM, leg., coll. DMF; Piątkowa for. distr. [FA01], 27 IX, 1 ex., [EA91], 29 VIII, 1 ex., 27 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Siedliska [EA91], VIII, 1 ex., [EA90], 28 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Wybrzeże for. distr. [FA01], VIII, 1 ex., IX, 1 ex., [EA91], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Ulucz for. distr. [EA90], VII, 1 ex., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Żohatyn for. distr. [EA90], 26 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kańczuga District, Kramarzówka for. distr. [EA02], 16 VIII, 1 ex., 16 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Roźwienica for. distr. [FA13], 13 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Szklary for. distr. [EA82], 17 VIII, 3 exx., [EA92], 17 VIII, 2016, 3 exx. pitfall trap, det. AM, leg., coll. DMF; Kołaczyce District, Bierówka for. distr. [EA41], 29 VIII, 4 exx., [EA31], 30 VII, 1 ex., 30 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Czarnorzeki for. distr. [EA51], 1 VIII, 1 ex., 1 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Lisów for. distr. [EA22], 29 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Odrzykoń for. distr. [EA51], VII, 1 ex., 1 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Pagorzyna for. distr. [EA20], 29 VIII, 1 ex., 29 IX 2016, 1 ex. pitfall trap, det. AM, leg.,

coll. DMF; Pietrusza Wola [EA41], 29 VII, 1 ex., 29 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Krasiczyn District, Bełwin for. distr. [FA12], 14 VII, 1 ex., 10 VIII, 1 ex., 15 IX 2016, 2 exx. pitfall trap, det. AM, leg., coll. DMF; Korytniki for. distr. [FA11], 15 IX 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Prałkowce for. distr. [FA11], 15 VII, 1 ex., 16 VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Wapowce for. distr. [FA11], 13 VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Magurski NP, Baranie for. distr. [EV47], VII, 2 exx., VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Folusz for. distr. [EV29], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Hałbów for. distr. [EV38], VII, 1 ex., 5 X 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Kamień for. distr. [EV38], VIII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Polany for. distr. [EV37], VIII 2016, 1 ex. in Barbers trap, det. AM, leg., coll. DMF; Rozstajne for. distr. [EV38], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Światkowa for. distr. [EV28], VII, 1 ex., [EV38], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF; Żydowskie for. distr. [EV38], VII 2016, 1 ex. pitfall trap, det. AM, leg., coll. DMF

Previously recorded from:

Baltic Coast: Słowiński NP – Łebska Spit (Smoleński, 2000a), Rewa (Komosiński, 2001b), Jastrzębia Góra, Karwieńskie Błota (Wojas, 2008), Gdynia-Kępa Redłowska (Konopko *et* al., 2017)

Pomeranian Lake District: Bielinek (Neresheimer & Wagner, 1939; Szujecki, 1980), Wielgowo near Szczecin (Cykowski, 1977), Bielinek nat. res. (Kubisz & Melke, 1996)

Wielkopolska-Kujawy Lowland: Poznań (Olejnik, 1994), Dębina nat. res. near Wągrowiec (Lubawa *et* al., 2001), Park Narodowy Ujście Warty (Jankowski & Mazur, 2019)

Mazowiecka Lowland: Kampinoski NP (Mazur S. *et* al., 2010)

Lower Silesia: Brechelshof (Żarek near Jawor; Gerhardt, 1910a), Muszkowicki Las Bukowy nat. res. (Mazur A., 1993b; 2000a), records without exact data (Kolbe, 1918; Scholz, 1932; 1935)

Kraków-Wieluń Upland: Niepołomice Forest, nat. Res. „Lipówka" (Wojas, 2016)

Małopolska Upland: Klawatka Królewska near Radom (Nowosad, 1990), Lubelska Lowland – Radawiec near Lublin (Staniec 2006)

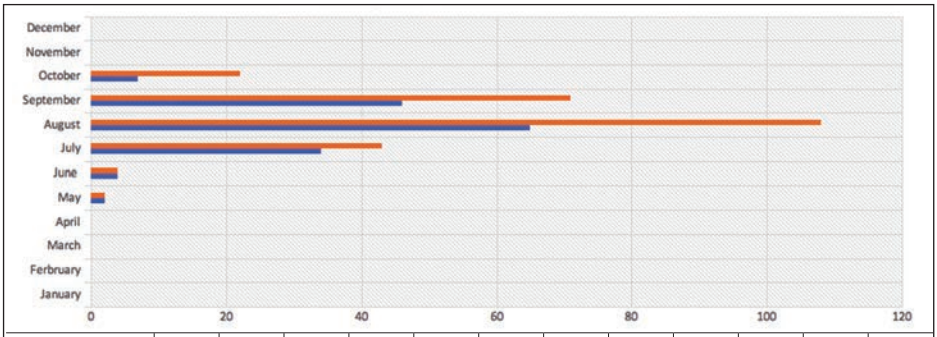
Roztocze: Biała Góra (Staniec, 1996b)

Western Sudety Mts.: Wleń (Gerhardt, 1887; 1899; 1910a; Letzner, 1887; Scholz, 1932)

Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929; Szujecki, 1980), Borek Stary near Rzeszów (Konieczna *et* al., 2012), Rzeszów-Zalesie (Konieczna *et* al., 2013)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Horion, 1951; 1965; Nowosad, 2000; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015), Western Pomeranian (Horion, 1951), Silesia (Gerhardt, 1891; Kuhnt, 1912; Horion, 1965; Szujecki, 1980).

Phenology and development. In Poland recorded from May to October with a culmination in numbers in August. The greatest number of observations was also recorded in August (**Fig. 6.57**). Beetles were typically caught single, also to Barber traps a maximum of several individuals were caught.



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	0	2	4	43	108	71	22	0	0
Number of records	0	0	0	0	2	4	34	65	46	7	0	0

Fig. 6.57. Frequency of *Tasgius morsitans* (Rossi, 1790) in localities in Poland

Tasgius winkleri (Bernhauer, 1906)

General distribution. A species found almost throughtout Europe, although most extensively distributed in the southern and central part of the continent. It is found in the Mediterranean – from Portugal, through France, Italy, the Balkans, Moldova, Greece to Turkey and Liban. It inhabits Madeira, Corsica, Sardinia and Sicily. In the north of Europe the area of its occurrence includes Great Britain, Germany, Denmark and southern Sweden; in the latter it is a very rare species (Horion, 1965; Herman, 2001; Löbl & Smetana, 2004; Stan & Bacal, 2006; Kleeberg & Uhlig, 2011; Ferreira, 2018).

Introduced to North America and Canada (Herman, 2001; Bordoni, 2010). Erroneously reported from Armenia and Azerbaijan (Assing & Schülke, 2019). Unintentionally introduced to Canada in the 1930s (Newton, 1987; Klimaszewski & Brunke, 2018).

Habitat preferences. Identified as a species characteristic of the ecotone (oak forest, meadow) in studies conducted in Hungary (Tóthmérész *et* al., 2014).

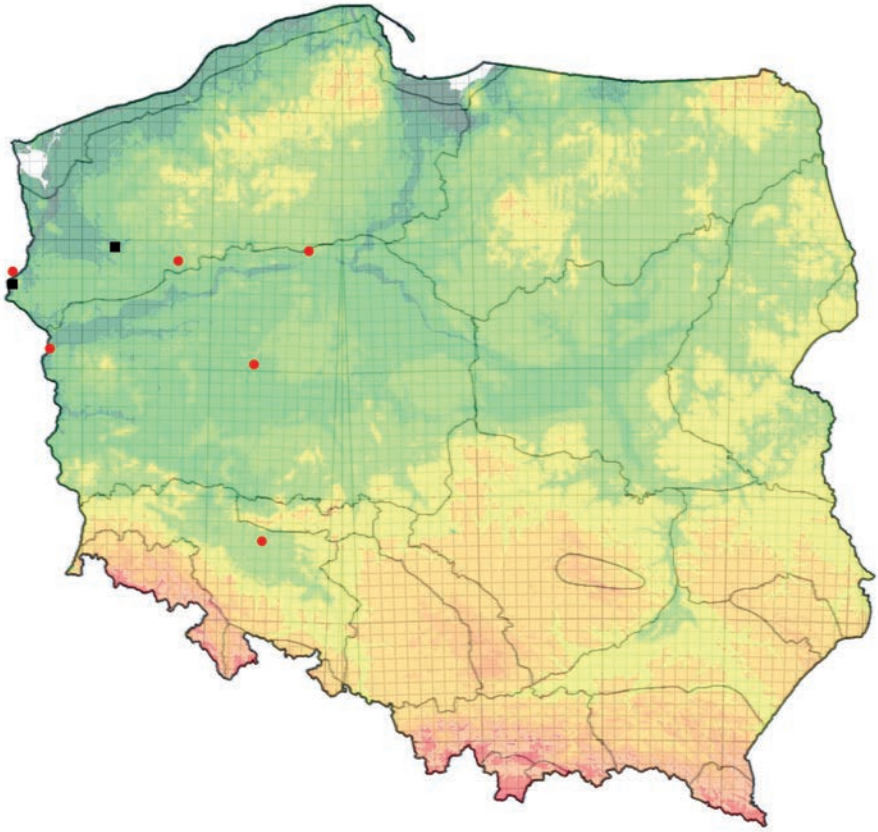


Fig. 6.58. Distribution of *Tasgius winkleri* (Bernh., 1906) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

In horticulture in northern Italy, it was found both on areas with and without pesticide treatments (weed control). Described as a phytodetritus predator in meadows (Lupi *et* al., 2006)

Occurrence in Poland. Distribution in Poland is based mainly on original data (see below), which are consistent with sparce data from recent years (**Fig. 6.58**). The species was identified for the first time from Poland in 1996 (Kubisz & Melke, 1996). Beetles were observed in western Poland – in Lower Silesia, the Wielkopolsko-Kujawska Lowland and in Western Pomerania.

New records

Pomeranian Lake District: Raduń [VU47], 2 XI 2009, 2 exx., 29 IV, 1 ex., 28 VI 2010, 2 exx., flowering turf, 27 IV 2011, 1 ex., ols over the stream, 28 IV, 1 ex., 30 V, 2 exx., 8 VII, 1 ex., 4 X, 1 exx., 12 XI 2011, 1 ex., beech forest on the embankment of the Odra River pitfall trap, leg. PS, det., coll. AM; Raduń vic. [VU47], 4 X 2011, 1 ex. beech growing on the embankment of the Odra River, leg. PS, det. AM, coll. KK; nat. res. Stary Załom [WU78], pitfall trap, 16 V–12 VI 2009, 1 ex., det. AM, leg. PS & RRu, coll. RRu

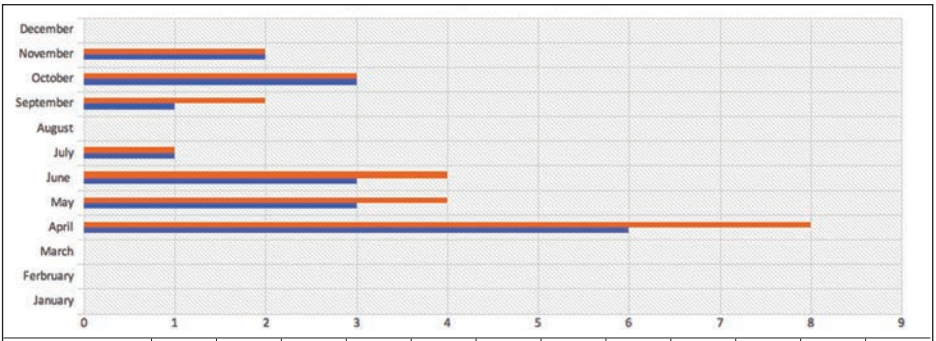
Wielkopolska-Kujawy Lowland: Laski [VU71], 29 IV 2010, 1 ex., xerothermic flowering grassland, pitfall trap, leg. PS, det., coll. AM; Owczary [VU71], 29 IV, 3 exx., 28 VI, 1 ex., 2 X, 1 ex., 4 XI 2010, 2 exx., xerothermic flowering grassland, pitfall trap, leg. PS, det., coll. AM; Poznań [XU30], 23 IV 2014, 1 ex. leg., coll. PJ; Ślesin vic. near Nakło [XU79], 1 V 2008, 1 ex., det. AM, leg., coll. RRu

Lower Silesia: Wrocław [XS46], 4 V 1949, 1 ex., leg. ex. coll. AG, det. AM, coll. MNHW

Previously recorded from:

Pomeranian Lake District: Bielinek (Kubisz & Melke, 1996), Choszczno (Paśnik, 1999), **Poland** (Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015).

Phenology and development. In Poland caught from April to November. No data are available on the occurrence of beetles in August (**Fig. 6.59**), which may indicate that young beetles appear in autumn (September to November), next they overwinter and in the spring they start reproducing.



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	8	4	4	1	0	2	3	2	0
Number of records	0	0	0	6	3	3	1	0	1	3	2	0

Fig. 6.59. Frequency of *Tasgius winkleri* (Bernh., 1906) in localities in Poland

Subgenus *Tasgius* Stephens, 1829

Tasgius ater (Gravenhorst, 1802)

General distribution. A species of southern and central Europe, found also in the southern parts of Scandinavia and Great Britain as well as north-eastern Africa (Morocco). In the East it reaches Turkey, Iran, Syria, Israel and Egypt. It has also been found in some Mediterranean islands (Corsica, Sardinia, Sicily) and the Canary Islands (Horion, 1965; Burakowski *et* al., 1980; Herman, 2001; Anlaş, 2009; Anlaş & Newton, 2010; Bordoni, 2010; Kleeberg & Uhlig, 2011). Unintentionally introduced in Canada in the early 19th century (Majka & Klimaszewski, 2008; Klimaszewski & Brunke, 2018) and in the USA (Herman, 2001).

Habitat preferences. In many regions its occurrence has been reported from coastal areas and from synanthropic habitats (Horion, 1965), such as gardens, fields, meadows, where beetles were found under stones, giant algae and in compost heaps. Cases were also recorded of beetles flying into houses or flats, they were found wandering on pavements and streets (Horion, 1965; Kleeberg & Uhlig, 2011); they were also found in cellars (Szulczewski, 1922).

Beetles were found at lower altitudes – in the Erzgebirge Mts. at altitudes of 600 m a.s.l. (Gollkowski, 2003), in Saxony at elevations from 400 to 500 m a.s.l. (Horion, 1965). Data from Spain (Sierra de Guadarrama Mts.) indicate that *T. ater* was found in cow dung at altitudes of 1700 m a.s.l. (Fernández *et* al., 2010).

Occurrence in Poland. Recorded in the western and north-eastern parts of the country. No data are available on its occurrence in the entire south-eastern Poland. In the area of Przemyśl it was recorded almost 100 years ago (**Fig. 6.60**), while contemporary data come from central and western Poland.

New records

Baltic Coast: Trzebież [VV64], 30 VIII 1994, 1 ex. in the backyard, leg. RaK, det., coll. AM

Pomeranian Lake District: Stary Kostrzynek [VU45], 2 XI 2009, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM

Wielkopolska-Kujawy Lowland: Bielawy vic. [BD95], 21 VI–21 VII 2016, 3 exx. in the pitfall traps, leg., coll. SK; Boguszyniec near Koło [CC48], 11 IX 1990, 1 ex., leg. SCz, coll. AM; Laski [VU71], 6 X 2009, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Osieczna [XT15], 23 VII 1991, 1 ex., leg. WMi, coll. AM; Plewiska near Poznań [XU20], 20 IX 2008, 1 ex. at home, det. AM, leg., coll. SK; Poznań [XU20], 2 VII 2015, 1 ex. stadium INEA vic., leg., coll. SK; Poznań [XU30], 3 VI 1993, 1 ex., leg., coll. PJ; Poznań-Sołacz [XU21], 4 X 2004, 1 ex. at home, det. AM, leg., coll. RRu; Zielona Góra [WT35], 22 VII 2016, 1 ex. female in the Castorama car park, leg. RO, det. et coll. AM

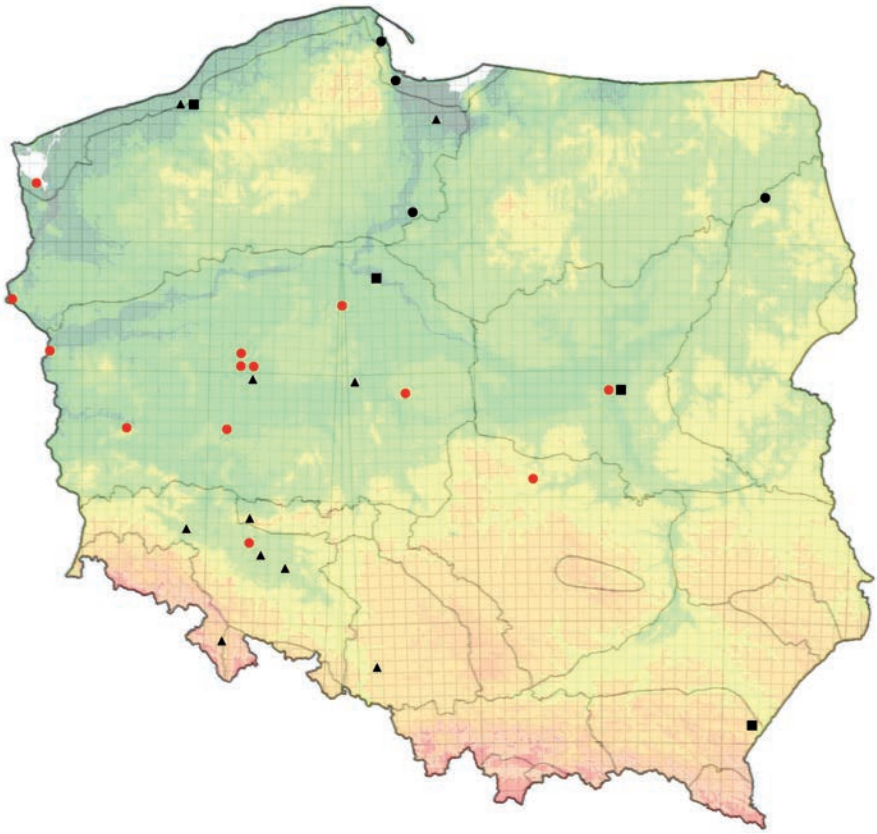


Fig. 6.60. Distribution of *Tasgius ater* (Grav., 1802) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

Mazovian Lowland: Warszawa [EC08], 4 X 1888, 1 ex., 16 VII 1892, 1 ex., leg. WM, det. AM, coll. USM

Lower Silesia: Wrocław-Popowice [XS36], 29 VII 2013, 1 ex. on the sidewalk, leg., coll., PJ

Małopolska Upland: Spała [DC41], 16 VI 2009, 1 ex. on the sidewalk in the center of the village, leg., coll. AK

Previously recorded from:

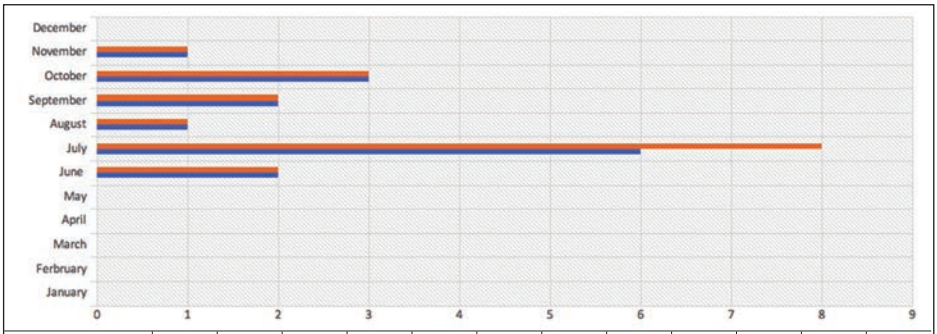
Baltic Coast: Koszalin (Lüllwitz, 1916; Szujecki, 1980), Rewa (Komosiński, 2001b); Trójmiejski Landscape Park, Gdańsk vic. (Konopko & Wilga, 2014)

Pomeranian Lake District: Kaczynos near Malbork (Lentz, 1879), Grudziądz (Komosiński, 2001b)

Masurian Lake District: Biebrzański NP (Gutowski *et* al., 2006)
Wielkopolska-Kujawy Lowland: Poznań (Szulczewski, 1922; Szujecki, 1980), Dębina – Konin Province (Myrdzik, 1933), Toruń (Szujecki, 1980)
Mazowian Lowland: Warszawa (Szujecki, 1968; 1980)
Lower Silesia: Ohlau (Oława), Breslau (Wrocław), Liegnitz (Legnica) (Rottenberg, 1868; Letzner 1871; 1886; Gerhardt, 1910a)
Trzebnica Hills: Obernigk (Oborniki Śląskie) (Letzner, 1871; 1886; Müller E., 1895; Gerhardt, 1898; 1910a)
Upper Silesia: Rauden (Rudy) records without exact data (Roger, 1856; Reitter, 1870b; Letzner, 1886; Gerhardt, 1910a)
Western Sudety Mts.: records without exact data (Letzner, 1871; 1886; Gerhardt, 1910a)
Eastern Sudety Mts.: Grafschaft Glatz (Kłodzko county, Kłodzko region), records without exact data (Zebe, 1852; Letzner, 1871; 1886; Gerhardt, 1910a)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929; Szujecki, 1980)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913; Horion, 1965; Löbl & Smetana, 2004; Kleeberg & Uhlig, 2011; Löbl & Löbl, 2015); Pomerania (Zebe, 1852); Prussia (Siebold, 1847; Zebe, 1852; Lentz, 1853; 1857); Silesia (Kuhnt, 1912; Szujecki, 1980); Galicia (Łomnicki, 1884).

Phenology and development. From Poland observations of beetles come from the period of June to November, with the highest number of observations and the largest number of beetles recorded in July (**Fig. 6.61**).



	January	Ferbruary	March	April	May	June	July	August	September	October	November	December
Number of individuals	0	0	0	0	0	2	8	1	2	3	1	0
Number of records	0	0	0	0	0	2	6	1	2	3	1	0

Fig. 6.61. Frequency of *Tasgius ater* (Grav., 1802) in localities in Poland

These data are consistent with observations from Saxony (Gollkowski, 2003) and Mecklenburg (Kleeberg & Uhlig, 2011).

Tasgius pedator pedator (Gravenhorst, 1802)

Within the species two additional subspecies are distinguished: *Tasgius pedator siculus* (Aubé, 1842) is found in Sicily, while from France *Tasgius pedator bonnairei* (Scheerpeltz, 1933) was described initially as an aberration and later as a subspecies (Herman, 2001). Today it is again not treated as a subspecies, but as a synonym (Löbl & Löbl, 2015).

General distribution. It inhabits southern and central Europe (Horion, 1965); moreover, it has been recorded from the British Isles, southern Sweden, the Caucasus and Anatolia, Azerbaijan, Turkey, Iran and Algeria (Burakowski *et* al., 1980; Herman, 2001; Anlaş & Newton, 2010; Bordoni, 2010; Ferreira, 2018).

Habitat preferences. It inhabits fields, meadows and gardens, where it is found under stones and decaying organic matter (Burakowski *et* al., 1980). According to Gerhardt (1910a), it inhabits forests, where it is found on fungi and under stones.

Occurrence in Poland. Rarely found in Poland (**Fig. 6.62**). Present-day localities are situated in the lower Odra river valley and in the area of Kolbuszowa and Mielec. The species was not found in the entire central and north-eastern parts of the country.

New records

Pomeranian Lake District: Bielinek nat. res. [VU46], 30 VIII 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Gozdowice [VU54], 28 VI 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM; Raduń [VU47], 5 VII, 1 ex., 30 VIII 2011, 1 ex, beech forest on the embankment of the Odra River, pitfall trap, leg. PS, det., coll. AM; Stary Kostrzynek [VU45], 30 VIII, 1 ex., 1 X 2010, 1 ex., stipa grassland, pitfall trap, leg. PS, det., coll. AM

Sandomierska Lowland: Kolbuszowa District – Wilcza Wola for. distr. [EA68], 1 ex. in the culture of pine trees aged about 15 years, 28 VII 2017, pitfall trap, det. AM, leg., coll. DMF; Mielec District – Szydłowiec for. distr. [EA47], 1 ex., 27 VII 2017, pitfall trap, det. AM, leg., coll. DMF

Previously recorded from:

Baltic Coast: Koszalin vic. and Wolin (Horion, 1965; Szujecki, 1980; Kleeberg & Uhlig, 2011), Gdynia-Kępa Redłowska (Konopko *et* al., 2017), records without exact data (Kraatz, 1857; Bach, 1860; Labler, 1920; Kleine, 1940a; Horion, 1965)

Pomeranian Lake District: Klęskowo near Szczecin (Cykowski, 1977)

Wielkopolska-Kujawy Lowland: Skwierzyna above Warta vic. (Koerth, 1916)

Lower Silesia: Legnica vic. (Szujecki, 1980)

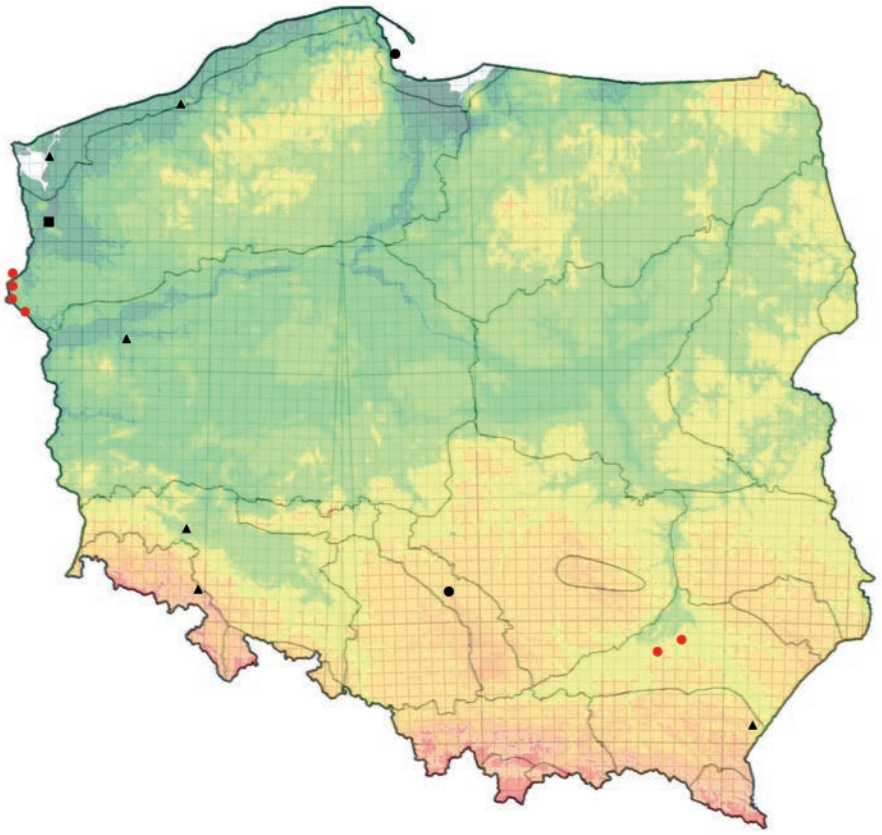


Fig. 6.62. Distribution of *Tasgius pedator pedator* (Grav., 1802) in Poland: ● – new localities, ● – localities reported after 2000, ■ – localities reported in the years 1945–1999, ▲ – localities before 1945

Kraków-Wieluń Upland: Częstochowa-Kucelin (Klasiński, 2015b)
Western Sudety Mts.: Wałbrzych vic. (Szujecki, 1980), Waldenburg (Wałbrzych) and records without exact data (Rottenberg, 1868; Letzner, 1871; 1886; Gerhardt, 1910a)
Eastern Beskid Mts.: Przemyśl vic. (Trella, 1929; Szujecki, 1980)

Additionally, this species has been recorded without exact collecting data from Poland: **Poland** (Łomnicki, 1913), Pomerania (Schilsky, 1888; Horion, 1951), Prussia (Horion, 1951; 1965), Silesia (Kuhnt, 1912).

Phenology and development. Data from Poland concerning only a few individuals come from the period of June to October: in July and August greater numbers of individuals were observed, with additional observations recorded in September.

7. Discussion and conclusions

by Andrzej Mazur & Andrzej Górz

Within the boundaries of Poland the occurrence of 33 species from the subtribe Staphylinina has been reported. From the neighbouring countries or from areas lying directly at the boundaries of Poland the number of reported species is slightly lower. From Mecklenburg-Pomerania in the period of 1847–2009 a total of 24 species from this tribe were recorded (Kleeberg & Uhlig, 2011). Saxony is inhabited by 27 Staphylinina species (Gollkowski, 2003; Hornig & Lorenz, 2018), while from the entire territory of Germany 36 species are known (Köhler & Klausnitzer, 1998; http://www.colkat.de/de/fhl/?w=1860&h=800 Entomofauna Germanica, 2021).

From Orlické hory (Góry Orlickie, neighbouring with Poland) J. Jelínek (2001) when listing Staphylinini and Quediini mentions 24 out of the 33 Staphylinini species known from the Czech Republic (Boháč, 1993). A review of data on the occurrence of species from this subtribe was conducted in Latvia showing 23 species (Cibuļskis, 2007).

Poland, lying in the centre of the European continent, covers areas of occurrence for species of diverse distribution. *Creophilus maxillosus* is the species with the greatest area of occurrence, comprising the Holarctic region. The Palearctic species include *Ontholestes murinus*, *Platydracus stercorarius*, *Staphylinus caesareus*, *Ocypus ophthalmicus*, *O. picipennis*, *O. fulvipennis* and *Tasgius ater*. The Euro-Caucasian species are *Platydracus chalcocephalus*, *Ocypus nitens*, *Ocypus brunnipes*, *Tasgius pedator*, *T. melanarius* and *T. globulifer*. The Euro-Siberian species include *Ontholestes tessellatus*, *Platydracus fulvipes*, *Staphylinus erythropterus* and *Ocypus fuscatus*. The group of European species comprises *Dinothenarus pubescens*, *D. fossor*, *Platydracus latebricola*, *Staphylinus dimidiaticornis*, *Ocypus aeneocephalus*, *O. macrocephalus*, *Ontholestes haroldi* and *Tasgius winkleri* (Herman, 2001; Löbl & Smetana, 2004).

Special elements of the Polish fauna include southern-European species such as *Abemus chloropterus*, *Emus hirtus*, *Ocypus biharicus* as well as eastern-Carpathian species such as *Ocypus ormayi*. Among them *A. chloropterus* and *O ormayi* are species, which have not been caught for over 50 years. The occurrence of *O. biharicus* concentrates in the entire Beskidy range. An interesting species, not only in terms of its distribution, is *Emus hirtus*. It has been recorded throughout the country; however, new localities are situated mainly in northern Poland and in

mountainous areas. This may confirm observations that in warmer periods individuals of this beautiful Staphylininae are observed farther north from the centre of the occurrence of the species, which is south-eastern Europe (Horion, 1965; Krawczynski *et* al., 2010).

For three European species in Poland a line may be marked, outside which these species either are not found or are found much less frequently. *Dinothenarus fossor* inhabits southern Poland, not crossing the Poznań–Pabianice–Jędrzejów–Rzeszów line. *Ocypus olens* is frequently observed in the entire western part of the country, not crossing the Wisła line. Similarly, *Tasgius winkleri* is found in single lowland localities in the Wielkopolska region, in Western Pomerania and Lower Silesia.

For most Staphylinina species the faunistic data listed in this study to a considerable extent supplement information on their distribution (Table 7.1). The information is based on data comprising 11 991 individuals. Over the last several decades *Abemus chloropterus* and *Ocypus ormayi* were not observed again in Poland (Fig. 7.1). The first of the two mentioned is a thermophilous species inhabiting southern Europe and in present-day Poland it was observed in the second half of the 19th century in the Beskid Żywiecki Mts. and in the area of Przemyśl in the 1930s. In turn, *O. ormayi* is a stenotopic mountain species inhabiting the eastern and southern Carpathian Mts., it was recorded in the Bieszczady only at one locality in the 1960s and not observed again. These beetles may be used as excellent indicator species (bioindicators) of changes occurring in specific ecosystems, since *A. chloropterus* is associated with natural forests, while *O. ormayi* inhabits high zones of the Carpathian Mts. At the known distribution of both species, an increase or decline of the localities may indicate the direction and causes for changes in the natural environment.

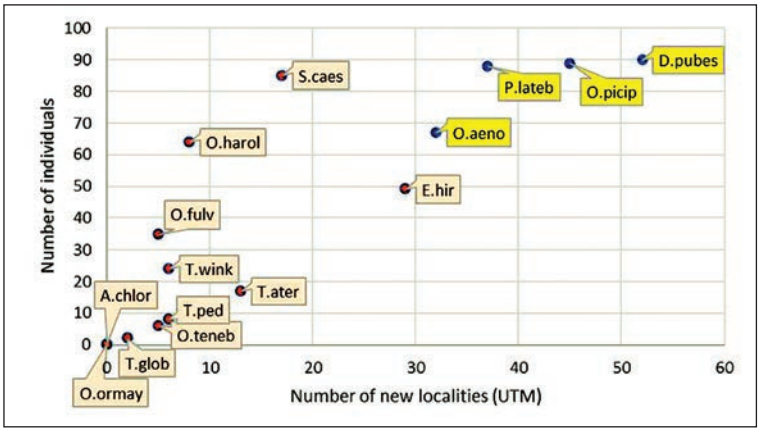


Fig. 7.1. Frequency of observations of Staphylinina species showing frequencies in new localities with max. 100 individuals (labels show abbreviated species names)

Among the Staphylinina species found in Poland 8 may be considered as very rarely observed. They are almost all of the genus *Tasgius*, i.e. *T. globulifer*, *T. predator*, *T. ater* and *T. winkleri* as well as *Ocypus tenebricosus*, *O. fulvipennis*, *Ontholestes haroldi* and *Staphylinus caesareus* (Fig. 7.1). *Platydracus chalcocephalus* may also be classified as a rare species (Fig. 7.2). Although it is a species caught in large numbers (164 individuals), it is only very locall (Fig. 6.38) – in the Roztocze, the Sandomierz Lowland and in the Eastern Beskidy Mts. In the case of this species we observe no new localities in the rest of the country, despite the high number of historical localities and their scattered occurrence in all regions of Poland. The only locality in Lower Silesia in the category (new localities) was recorded *de facto* in 1941.

Emus hirtus is a species, whit a number of new localities des not exceeding 30 (Fig. 7.1). The number of its localities recorded until the year 2000 is twice greater than that of new localities (60 historical vs. 29 new ones). The new localities are regularly distributed over the entire territory of Poland; however, a very small number of observed individuals is disturbing and shows trends towards a decline of local populations. Causes of this phenomenon may be connected first of all with the decline of grazing of farm animals, which is manifested in the disappearance of specific microhabitats (absence of feces) and reduction of biomass and diversity of coprophages (Górz, 2019). This results in a whole series of environmental changes (Risch *et* al., 2018), the consequences of wich may also include the decline of large predators hunting coprophagous species developing on feces. This phenomenon is also described in relation to other Staphylinina species, such as *Dinothenarus fossor*, *Ocypus ophthalmicus* and *Philonthus intermedius* (Boháč & Jahnova, 2014).

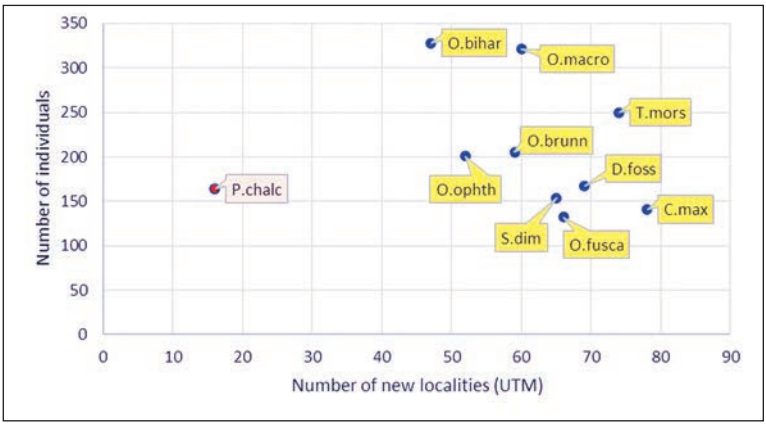


Fig. 7.2. Frequencies of observations of Staphylinina species showing frequencies in new localities with max. 350 individuals (labels show abbreviated species names)

Species more frequently observed (the number of new localities over 30), but caught in small numbers (frequency of max. 100 individuals) include *Dinothenarus pubescens*, *Platydracus latebricola*, *Ocypus aenocephalus* and *O. picipennis* (Fig. 7.1).

Species frequently observed (the number of new localities 30–80) and caught in large numbers (frequency of 100–350 individuals) are mainly species of the genus *Ocypus*: *O. fuscatus*, *O. ophthalmicus*, *O. brunnipes*, *O. macrocephalus* and *O. bharicus* as well as *Dinothenarus fossor*, *Tasgius morsitans*, *Staphylinus dimidiaticornis* and *Creophilus maxillosus* (Fig. 7.2).

Species frequently observed and caught in very large numbers (frequency of 350–1000 individuals) include *Ocypus olens*, *Platydracus stercorarius* and *P. fulvipes* (Fig. 7.3). *Staphylinus erythropterus* is a species frequently observed and most numerously caught (40.8% of all individuals). Species caught in very large numbers of individuals, at the same time very frequently observed include *Ontholestes tessellatus*, *O. murinus* (the species with the greatest frequency of occurrence at 7.5%) and *Tasgius melanarius*. *Ocypus nitens* is a species, which was very frequently observed and is one of the most numerous (10.4% of all individuals).

A marked increase in the number of new localities has been recorded for *Ocypus bharicus*, *O. macrocephalus*, *Ontholestes haroldi*, *Platydracus fulvipes*, *Staphylinus dimidiaticornis*, *S. erythropterus*, *Tasgius morsitans* and *T. winkleri*. Within this group of species there are both rare species, for which new reports expands the area of their occurrence in Poland with new regions (*Tasgius winkleri* and *T. morsitans*, *Ontholestes haroldi*, *Ocypus bharicus*, *O. macrocephalus*, *Staphylinus dimidiaticornis*) as well as common species such as *Staphylinus erythropterus*, for which we obtain more comprehensive data on the distribution and habitat preferences.

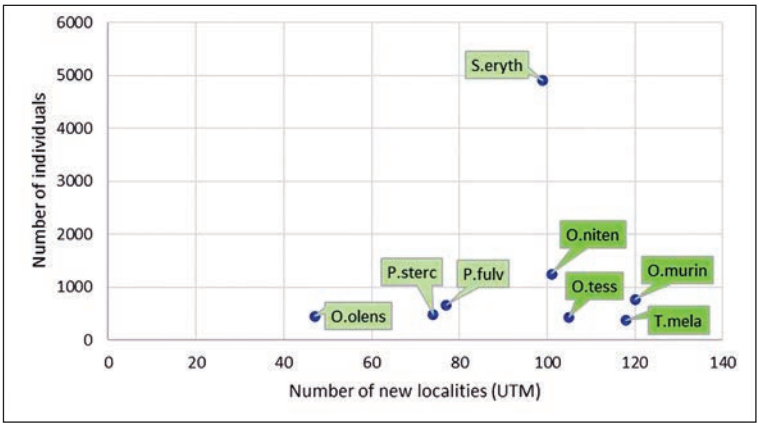


Fig. 7.3. Frequencies of observations of Staphylinina species showing frequencies in new localities exceeding 350 individuals (labels show abbreviated species names)

A reduction in the number of contemporary localities in relation to the historical localities is evident in the case of four species – *Ocypus fulvipennis*, *O. tenebricosus*, *Platydracus chalcocephalus* and *Tasgius globulifer*. The very rarely observed species are *Ocypus tenebricosus* (6 individuals), *Tasgius pedator* (8 individuals) and the above-mentioned *T. globulifer* (2 individuals).

It is likely that other species may also be found in Poland. These may potentially be *Tasgius falcifer falcifer* (Nordm., 1837), *Platydracus flavopunctatus* (Latr., 1804), *Dinothenarus flavocephalus flavocephalus* (Goeze, 1774) and *Ocypus mus* (Brullé, 1832). They are species found in southern Europe and Anatolia, while their closest localities are known from the neighbouring countries – Germany, Czechia, Slovakia and Ukraine (Herman, 2001).

In the Red List of threatened and endangered animals in Poland from the subtribe Staphylinina four species are mentioned. These are *Emus hirtus* (NT – near threatened), *Abemus chloropterus* (CR – critically endangered), *Ocypus compressus* (properly *Tasgius morsitans*, see List of species; DD – data deficient) and *Ocypus ormayi* (VU – vulnerable) (Pawłowski *et* al., 2002). A previously published and local Red Book of beetles (Coleoptera) of Upper Silesia mentioned only *Abemus chloropterus* in the category of extinct species (EX; Kubisz *et* al., 1998). A newer version of the Red Book of beetles of the Śląskie province (Greń *et* al., 2012) slightly changes the categories: to which the species were classified: *A. chloropterus* was entered in the category of critically endangered species (both in the Śląskie province, in Poland and the Czech Republic), while *Emus hirtus* is near threatened.

In view of the obtained data, very rarely observed (*Tasgius globulifer*, *T. pedator*, *T. ater* and *T. winkleri*, *Ocypus tenebricosus*, *O. fulvipennis*, *Ontholestes haroldi*, *Staphylinus caesareus*) and rarely observed species (*Platydracus chalcocephalus*) in Poland (Fig. 7.1, 7.2) may be considered endangered and near threatened.

The postulates to enter numerous Staphylinina species in the Red Books come also from Saxony. In that federal sate of Germany *Emus hirtus* has not been observed since the second half of the 1930s – it is the only species classified in the category of extinct and close to extinction[1]. Species close to extinction include *Dinothenarus pubescens*, *Ocypus picipennis*, *O. tenebricosus*, *Platydracus chalcocephalus*, *Staphylinus caesareus* and *Tasgius ater*. In turn, critically endangered species include *Ocypus brunnipes*, *O. fuscipennis*, *Platydracus latebricola*, *Staphylinus dimidiaticornis* and *Tasgius winkleri*. Threatened species are *Ocypus macrocephalus*, *O. olens*, *O. ophthalmicus* and *Platydracus fulvipes*. No potentially threatened species were indicated (Gollkowski, 2003).

Detailed observations of the fauna in Mecklenburg-Pomerania recorded since the mid-19 century (Kleeberg & Uhlig, 2011) apart from the identification of categories of threat to Staphylinina species, made it also possible to

[1] *Emus hirtus* was observed again in Saxony (Oberlausitz) in 2009 (Tietz, 2010).

Table 7.1. Distribution of Staphylinina species in regions following the system applied in the Catalogue of Polish Fauna (Burakowski *et* al., 1980)

Species		Baltic	Baltic Coast	Pomeranian Lake District	Masurian Lake District	Wielkopolska-Kujawy Lowland	Mazovian Lowland	Podlasie	Białowieża Forest
number*	name	1	2	3	4	5	6	7	7a
1749	*Abemus chloropterus* (Panz., 1796)								
1744	*Creophilus maxillosus* (L., 1758)		+/•	+/•	+/•	+/•	+/•	+/•	+/•
1754	*Dinothenarus pubescens* (De Geer, 1774)		•	+/•	+/•	+/•	+/•		+/•
1755	*Dinothenarus fossor* (Scop., 1771)					+/•			
1748	*Emus hirtus* (L., 1758)		•	+/•	+/•	+/•	+/•	+/•	+/•
1760	*Ocypus brunnipes* (Fabr., 1781)		+/•	+/•	+/•	+/•	+/•	+	+/•
1759	*Ocypus biharicus* (G. Müll., 1926)								
1761	*Ocypus macrocephalus* (Grav., 1802)								
-	*Ocypus nitens* (Schrk., 1781)		+/•	+/•	+/•	+/•	+/•	+/•	+/•
1764	*Ocypus ormayi* (Reitt. 1887)								
1766	*Ocypus tenebricosus* (Grav., 1846)				•				
1762	*Ocypus olens* (O.F. Müll., 1764)		+/•	+/•	•	+/•			•
1763	*Ocypus ophthalmicus* (Scop., 1763)		+/•	+/•	•	+/•	+/•		+/•
1767	*Ocypus aeneocephalus* (De Geer, 1774)		+/•	+/•		+/•	+/•		•
1768	*Ocypus fulvipennis* (Er., 1840)					•			+/•
1769	*Ocypus fuscatus* (Grav., 1802)		•	+	+/•	+/•	+/•	+	+
1770	*Ocypus picipennis* (Fabr., 1793)		•	+/•	+/v	+/•	+/•	+/•	+/•
1745	*Ontholestes haroldi* (Epp., 1884)						•		
1746	*Ontholestes murinus* (L., 1758)		+/•	+/•	+/v	+/•	+/•	+/•	+/•
1747	*Ontholestes tessellatus* (Geoffr., 1785)		•	+/•	+/•	+/•	+/•		+/•
1750	*Platydracus chalcocephalus* (Fabr., 1801)		•	•		•	•		•
1751	*Platydracus fulvipes* (Scop., 1763)		+/•	+	+/•	+	+/•	+	+/•
1752	*Platydracus latebricola* (Grav., 1806)		•	+/•	+		•		+/•
1753	*Platydracus stercorarius* (Ol., 1795)		+/•	+/•	+/v	+/•	+/•	+	+/•
1756	*Staphylinus caesareus* (Ced., 1798)		•	+/•	v	+/•			+/•
1757	*Staphylinus dimidiaticornis* (Gem., 1851)		+/v	+/•	+/•	+/•	+/•	+/•	+/•
1758	*Staphylinus erythropterus* (L., 1758)		+/•	+/v	+/v	+/•	+/•	+	+/•
1774	*Tasgius globulifer* (Geoffr., 1785)		•	•		•			
–	*Tasgius melanarius* (Heer, 1839)		+/•	+/v	+/•	+/v	+/•		+/•
–	*Tasgius morsitans* (Rossi, 1790)		+/•	+/v		+/•			
–	*Tasgius winkleri* (Bernh., 1906)			+/•		+			
1771	*Tasgius ater* (Grav., 1802)		+/•	+/•	•	+/•	+/•		
1772	*Tasgius pedator* (Grav., 1802)		•	+/•		•			

*Species number according to the Catalogue of Polish Fauna (Burakowski *et* al., 1980).
+ – new records, • – previously recorded from.

Lower Silesia	Trzebnica Hills	Upper Silesia	Kraków- Wieluń Upland	Małopolska Upland	Świętokrzyskie Mts.	Lubelska Upland	Roztocze	Sandomierska Lowland	Western Sudety Mts.	Eastern Sudety Mts.	Western Beskid Mts.	Nowy Targ Basin	Eastern Beskid Mts.	Bieszczady Mts.	Pieniny Mts..	Tatra Mts.
8	8a	9	10	11	11a	12	13	14	15	16	17	17a	18	19	20	21
											•		•			
+/•		+/•	+/•	+/•		+/•	•	+	+/•	+/•	+/•		•	•		+/•
+/•		+/•	+/•	+	+	+	+/•	•	+/•	+/•	+/•	+	+/•	+	+	+/•
+/•	+	+	+/•	+/•	•			•	+	+/•	+/•	+	+/•	+/•	•	
+/•	•	+/•	+/•	+/•	•	+/•	•	•	•	+	•		+/•	+/•		+
+/•		+	+	+		+/•	•		•	•	•					
+								+		+			+	+/•		
+/•		+	•					+	+/•	•	+/•		+/•	+/•	+	+/•
+/•	+	+/•	+/•	+/•	+/•	+/•	+/•	+/•	+/•	+/•	•		+/•			+/•
											+			+		
+/•									+/•	+/•	+/•		+/•			•
+/•	+/•	•		•			•	+	+/•	•	+/•					
+/•	•	+/•	+/•	+		•		+/•	+		•		•			
+/•		+/•	•	+/•		+/•	•	•	+/•	+/•	+/•	•	•			•
	•					•	+/•		•	•		•	•			•
+/•	•	+/•	+/•	+/•		+/•	•	•	+/•	+/•	+/•	•	+	+/•	+/•	+/•
+/•	•	+/•	•	+		+/•	+/•		•	•		•	•		+	•
		+									+		+/•	+	+	
+/•	+/•	+/•	+/•	+/•	+	+/•	+/•	+	•	+/•	+/•		+/•	+/•	+/•	+
+/•	+/•	+/v	+/•	+/•	+/•	+	+/•	+/•	+/•	+/•	+/•		+/•	+/•	+/•	+/•
+/•	•	+/•	•	•		•	+/•	+			•	•		+/•		
•		+/•	+	+/•	•	+/•	+	+	•	+/•	+/•	•	+/•	+/•		•
+/•		+/•	+	•		+	•	+	+/•	•	+/•		+			
+/•	•	+/•	+/•	+/•		+/•	+/•	+	•	+/•	+/•		+/•	+		
+/•	•	+/•	•	+/•		+/•	•	•	•	+	+/•		•	+	•	•
+/•	+	+/•	•	+/•	•	+/•	+	+	+/•	+	+/•		+	+/•		
+/•	+	+/•	+/•	+/•	+/•	+/•	+/•	+	+	+/•	+/•	•	+/•	+/•	+/•	+/•
•		•	•	•					•				+/•	+/•		
+/•		+/•	+/•	+/•	+	+/•	+	+/•		+/•	•		+/•	+/•	+	+
•		+	+/•	•		+	+/•	+	+/•		+		+/•			
+																
+/•	•	•		+					•	•			•			
•			•					+	•				•			

indicate dynamic trends in their populations and limits of their ranges. Among the 23 species observed in that region of Germany 15 are considered as permanently found in the period of observations (autochthonous species). Species not observed for many years now include 3 species: *Staphylinus caesareus* – not observed since circa 1900, *Platydracus chalcocephalus* – with strong fluctuations in the population, not observed since 1985, and *Dinothenarus fossor* – observed only in three localities, with no reports after 1999. For five species the time of their occurrence within that province was determined, while they were termed "migrants". These are *Tasgius morsitans*, observed until 1913, *Platydracus fulvipes* – since 1930, *T. winkleri* – since 1931, *T. globulifer* – observed from 1968 to 1999, probably more widely distributed, and *Staphylinus dimidiaticornis* – recorded since 1942. Threatened species include 16 species, the main causes for their threatened status being specified.

A reduction in the population size of insects, their biomass and diversity is a trend observed in many regions, not only in Europe. Results of an almost 30-year monitoring conducted in protected areas in Germany indicate a drastic decline in the biomass of flying insects, observed since 2013 (Hallmann *et* al., 2017). A decrease in the mean biomass is calculated at 75% in relation to the beginning of the monitoring period. Causes for this phenomenon are associated with the application of biocides in agriculture, intensification of agricultural, forestry and grassland production systems, eutrophication of habitats, their transformation as a result of land reclamation, extraction of minerals and peat, regulation of rivers and streams and construction of hydraulic structures. The development of the road system (roads, bicycle paths), increasing tourism and natural succession also have an impact on the populations of large Staphylininae (Kleeberg & Uhlig, 2011). All these phenomena may be considered as manifestations of broadly understood anthropopressure on the natural environment.

When analysing Table 7.1, which contains published data on the occurrence of species within roughly defined zoogeographic regions, following the *Catalogue of Polish Fauna* it may be stated that for 15 species a decrease was recorded in the number of zoogeographic regions with new localities in relation to the regions, in which the species was recorded. These changes may be related to trends towards a reduction of the area of their occurrence. Dramatic examples are *Tasgius globulifer* and *Ocypus fulvipennis* recorded in new localities in only two regions, while their range covered 10 regions located in south-western and western Poland (Fig. 6.53) as well as southern Poland (Fig. 6.27). Similarly marked trends towards a lack of new data from regions where a given species was found may be observed for *Tasgius pedator* and *T. ater*. For five species no changes were recorded, while for 12 species the number of new localities came from a larger number of regions than these species were previously recorded (Table 7.2). This pertains particularly to such species as *Ocypus biharicus*, *Tasgius winkleri* and *Ontholestes haroldi*, for which the primary area of occurrence are regions of Europe located south of Poland.

Table 7.2. Changes in the distribution of Staphylinina species on the basis of observations in zoogeographic lands adopted according to the Catalog of Polish Fauna (Burakowski *et* al., 1980)

Number*	Species	Number of regions with new localities (+)	Number of regions with published data (•)	Index (+/•)
1749	*Abemus chloropterus* (Panz., 1796)	0	2	0
1764	*Ocypus ormayi* (Reitt., 1887)	0	1	0
1774	*Tasgius globulifer* (Geoffr., 1785)	2	10	0.2
1768	*Ocypus fulvipennis* (Er., 1840)	2	10	0.2
1772	*Tasgius pedator* (Grav., 1802)	2	7	0.29
1750	*Platydracus chalcocephalus* (Fabr., 1801)	5	15	0.33
1771	*Tasgius ater* (Grav., 1802)	6	11	0.55
1756.	*Staphylinus caesareus* (Ced., 1798)	10	18	0.56
1767	*Ocypus aeneocephalus* (De Geer, 1774)	11	18	0.61
1762	*Ocypus olens* (O.F. Müll., 1764)	8	13	0.62
1770	*Ocypus picipennis* (Fabr., 1793)	12	18	0.67
1766	*Ocypus tenebricosus* (Grav., 1846)	5	7	0.71
1748	*Emus hirtus* (L., 1758)	15	20	0.75
1763	*Ocypus ophthalmicus* (Scop., 1763)	11	14	0.79
1744	*Creophilus maxillosus* (L., 1758)	17	18	0.94
1751	*Platydracus fulvipes* (Scop., 1763)	17	18	0.94
1769	*Ocypus fuscatus* (Grav., 1802)	18	19	0.95
1760	*Ocypus brunnipes* (Fabr., 1781)	12	12	1
1761	*Ocypus macrocephalus* (Grav., 1802)	8	8	1
–	*Ocypus nitens* (Schrk., 1781)	20	20	1
1747	*Ontholestes tessellatus* (Geoffr., 1785)	21	21	1
1752	*Platydracus latebricola* (Grav., 1806)	11	11	1
1753	*Platydracus stercorarius* (Ol., 1795)	18	17	1.05
1755	*Dinothenarus* fossor (Scop., 1771)	12	11	1.09
1746	*Ontholestes murinus* (L., 1758)	22	20	1.1
1758	*Staphylinus erythropterus* (L., 1758)	23	20	1.15
1757	*Staphylinus dimidiaticornis* (Gem., 1851)	19	16	1.19
–	*Tasgius melanarius* (Heer, 1839)	19	16	1.19
–	*Tasgius morsitans* (Rossi, 1790)	11	9	1.22
1754	*Dinothenarus pubescens* (De Geer, 1774)	20	16	1.25
1745.	*Ontholestes haroldi* (Epp., 1884)	5	2	2.5
–	*Tasgius winkleri* (Bernh., 1906)	3	1	3
1759.	*Ocypus biharicus* (G. Müll., 1926)	5	1	5

* Species number according to the Catalogue of Polish Fauna (Burakowski *et* al., 1980).

A wide diversity of the natural environment in Poland provides conditions for the occurrence of 33 species from the subtribe Staphylinina. Among them there are species preferring forest and field, mesic and xeric, mountainous and lowland habitats. Basic faunistic studies constitute a valuable source of data on the distribution, ecology and biology of species. Moreover, they make it possible to assess trends for changes in the distribution of species on a historical scale, indicating commonly found species, as well as rare and locally found species, requiring concern and protection of their natural habitats.

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References

Ahn, K.-J., Cho, Y.-B., Kim, Y.-H., Yoo, I.-S., & Newton, A. F. (2017). Checklist of the Staphylinidae (Coleoptera) in Korea. *J. Asia-Pac. Biodiv.*, **10**(3), 279–336. https://doi.org/10.1016/j.japb.2017.06.006

Albertini, A., Marchi, S., Ratti, C., Burgio, G., Petacchi, R., & Magagnoli, S. (2018). *Bactrocera oleae* pupae predation by *Ocypus olens* detected by molecular gut content analysis. *BioControl*, **63**(2), 227–239. https://doi.org/10.1007/s10526-017-9860-6

Albien, W. (1905). Sammelbericht über meine im Sommer 1903 ausgeführte Exkursion in die Kreise Thorn und Briesen. *Ber. Westpr. Bot.-Zool. Ver.*, **26–27**, 13–25.

Aleksandrowicz, O. (2009a). Zmiany składu gatunkowego i struktury ekologicznej zgrupowań chrząszczy epigeicznych brzegów rzek Kwacza i Słupia pod wpływem zabiegów renaturalizacyjnych. In: K. Obolewski (Ed.), Krótkoterminowe ekologiczne efekty renaturalizacji niewielkich rzek nizinnych na przykładzie rzeki Kwaczy (pp. 239–262). Słupsk: Park Kraj. „Dolina Słupi", APSL.

Aleksandrowicz, O. (2009b). Жужелицы (Coleoptera, Carabidae) на поле овса в Мазовецком воеводстве [Žuželicy (Coleoptera, Carabidae) na pole ovsa v Mazoveckom voevodstve]. *Zašč. Rast.*, **33**, 244–253.

Allgemeiner Bericht über die vierunddreissigste Jahresversammlung des Westpreussischen Botanisch-Zoologischen Vereins, am 7. Juni 1911 in Schwetz (1912). *Ber. Westpr. Bot.-Zool. Ver.*, **34**, 1–4.

Ambrožová, L., Sládeček, F. X. J., & Čížek, L. (2019). Dung beetles (Scarabaeidae & Geotrupidae) and their response to antiparasitic treatment of livestock in selected localities of the Bohemian Forest. *Silva Gabreta*, **25**, 15–24.

Anlaş, S. (2009). Distributional checklist of the Staphylinidae (Coleoptera) of Turkey, with new and additional records. *Linzer Biol. Beitr.*, **41**(2007), 215–342. http://www.landesmuseum.at/biophp/pdf_verk_de/chart_pdf.php?action=add&artikel=102276

Anlaş, S., & Newton, A. F. (2010). Distributional checklist of the Staphylinidae (Coleoptera) of Iran, with new and additional records. *Linzer Biol. Beitr.*, **42**(1), 335–388.

Apfel, W., Flügel, H., Angersbach, R., & Cloos, T. (2006). Die Kurzflügelkäfer (Coleoptera: Staphylinidae) aus den Barberfallen vom Halberg bei Neumorschen (Nordhessen, Fuldatal). *Philippia*, **12**/3, 294–254.

Arnold, W. (1936). 2. Beitrag zur Käferfauna in der Grenzmark Posen-Westpreussen. *Abh. Ber. Grenzmärk. Ges. Nat. Wiss. Abt.*, **11**, 85–89.

Assing, V. (2008). A revision of Othiini. XVI. Four new species of Othius from the Himalaya and China, and additional records (Coleoptera: Staphylinidae, Staphylininae). *Koleopterol. Runds.*, **78**, 245–263.

Assing, V. (2010). A revision of Othiini. XVII. A new species from China and additional records (Coleoptera: Staphylinidae: Staphylininae). *Linzer Biol. Beitr.*, 42, 1077–1091.

Assing, V. (2013). On the Staphylinidae (Coleoptera) of Turkey IX. Five new species, a new synonymy, and additional records. *Stutt. Beitr. Naturkd* A, **6**, 103–125.

Assing, V., & Schülke, M. (2001). Supplemente zur mitteleuropäischen Staphylinidenfauna (Coleoptera, Staphylinidae). II. *Ent. Bl.*, **97**, 121–176.

Assing, V., & Schülke, M. (2007). Supplemente zur mitteleuropäischen Staphylinidenfauna (Coleoptera, Staphylinidae). III. *Ent. Bl.*, **102**, 1, 1–78.

Assing, V., & Schülke, M. (2011). Freude-Harde-Lohse-Klausnitzer – Die Käfer Mitteleuropas. Band 4. Staphylinidae I. Zweite neubearbeitete Auflage. Heidelberg: Spektrum Akademischee.

Assing, V., & Schülke, M. (2019). The Staphylinidae of Armenia and Nagorno-Karabakh (Coleoptera). *Contr. Entomol.*, **69**(1), 091–173. https://doi.org/10.20248/contrib.entomol.69.1.091-173

Bacal, S. (2007). The synecological analyses of the edaphic beetles (Coleoptera) from the mixed forest (elm, ash and field maple) from the "Codrii Tigheciului" landscape reserve. Muzeul Olteniei Craiova. Oltenia. Studii şi comunicări. *Ştiinţ. Nat.*, **23**, 65–69.

Bach, M. (1860). Käferfauna für Nord- und Mitteldeutschland mit besonderer Rücksicht auf die preussischen Rheinlande. IV Band. Coblenz.

Balog, A., & Markó, V. (2007a). Chemical disturbances effects on community structure of rove beetles (Coleoptera : Staphylinidae) in Hungarian agricultural fields. *Northwest. J. Zool.*, **3**, 67–74.

Balog, A., & Markó, V. (2007b). Rove Beetles (Coleoptera : Staphylinidae) in Central European Apple and Pear Orchards – Comparative Studies of Species Richness, Abundance and Diversity. *Diversity*, **47**(3), 309–320.

Balog, A., Marko, V., & Adam, L. (2008). Rove beetles (Coleoptera: Staphylinidae) collected during the long term ecological research in a Hungarian oak forest. *J. Environ. Biol.*, **29**(2), 263–266.

Balog, A., Szenasi, A., Szekeres, D., & Kiss, J. (2010). Staphylinids (Coleoptera: Staphylinidae) in genetically modified maize ecosystems: species densities and trophic interactions. *IOBC/WPRS Bull.*, **52**, 9–15. http://www.iobc-wprs.org/pub/bulletins/bulletin_2010_52_table_of_content s_abstracts.pdf ER

Banaszak, J., Buszko, J., Czachorowski, S., Czechowska, W., Hebda, G., Liana, A., Pawłowski, J., Szeptycki, A., Trojan, P., & Węgierek, P. (2004). A review of inventory research on insects in the national parks of Poland. *Wiad. Entomol.*, **23**, Supl. 2, 5–56.

Barkowski, B. (1933). *Ilyobates mech* Baudi. *Ent. Bl.*, **29**, 43.

Bartoszyński, A. (1937). Studia koleopterologiczne na wybrzeżu polskim Bałtyku. Dalszy ciąg badań nad chrząszczami Helu. *Fragm. Faun.*, **3**, 69–80.

Benedikt, S. (2014). Příspěvek k poznání fauny brouků (Coleoptera) Jelšavského krasu (Slovensko) [Contribution to the knowledge of beetles (Coleoptera) from the Jelšavský kras (karst) (Slovakia)]. *Západočes. Entom. Listy*, **5**, 32–90.

Bernhauer, M., & Schubert, K. (1914). Staphylinidae IV. Coleoptm Cat., **5**(57), 289–408.

Bidas, M. (2012). Rzadkie chrząszcze (Coleoptera) Góry Rzepki w Górach Świętokrzyskich. *Naturalia*, **1**, 133–135.

Biel, P., Krawczynski, P., Lysakowski, B., & Wagner, H.-G. (2014). *Emus hirtus* in Niedersachsen (Germany) and Europe: contribution to the knowledge of the ecology and distribution of a locally endangered rove-beetle (Coleoptera: Staphylinidae). *Entomol. Ber.*, **74** (1–2), 75–80.

Błażejewska, A. (1960). Studia nad biologią słodyszka rzepakowego. *Stud. Soc. Sci. Tor.*, E, **5**,119–188.

Błażejewski, F. (1956). Chrząszcze trupożerne rezerwatu cisowego Wierzchlas. *Zesz. Nauk. UMK, Biol.*, **1**, 63–88.

Boháč, J. (1982). The larval characters of Czechoslovak species of the genera *Abemus* Muls. et Rey, *Staphylinus* L. and *Ocypus* Sam. (Staphylinidae, Coleoptera). *Studie CSAV*, **4**.

Boháč, J. (1993). Staphylinidae. In: J. Jelínek (Ed.), Check-list of Czechoslovak inscets IV (Coleoptera) (pp. 39–62). *Folia Heyrovs.*, suppl. **1**.

Boháč, J., & Jahnova, Z. (2014). Land use changes and landscape degradation in Central and Eastern Europe in the last decades: Epigeic invertebrates as bioindicators of landscape changes. *Environ. Ind.*, 395–420. https://doi.org/10.1007/978-94-017-9499-2_24

Boháč, J., & Matějíček, J. (2004). Biodiversity of staphylinid beetles (Coleoptera, Staphylinidae) in the Bohemian Forest – recent state, endangered species and their biotopes. *Aktual. Šumav. Výzk.*, **II**, 218–220.

Boháč, J., & Matějíček J. (2009). Communities of beetles (Insecta, Coleoptera) in forests in the vicinity of Luštěnice near Mladá Boleslav and its anthropogenic interference. *Bohemia Centr.*, **29**, 111–126.

Boháč, J., Matějíček, J., & Rous, R. (2006). Checklist drabčíkovitých (Coleoptera, Staphylinidae) České republiky se zařazením druhů do skupin podle jejich ekologických nároků a citlivosti k antropogenním vlivům a podle stupně ohrožení. Retrieved December 27, 2011, http://www.jaroslavbohac. wz.cz/download/checklist_staphylinidae.pdf.

Bonacci, T., Massolo, A., Brandmayr, P., & Brandmayr, T. Z. (2006). Predatory behaviour on ground beetles (Coleoptera: Carabidae) by *Ocypus olens* (Müller) (Coleoptera: Staphylinidae) under laboratory conditions. *Entomol. News*, **117**(5), 545–551. https://doi.org/10.3157/0013-872x(2006)117[545:pbogbc]2.0.co;2

Bordoni, A. (2010). Catalogue of the Staphylinidae of Cyprus and Asia Minor. *Fragm. Entomol.*, **42**(1), 35–348.

Borowiec, L. (1990). New records of Polish Staphylinidae (Coleoptera). *Pol. Pismo Entomol.*, **59**, 817–820.

Borowiec, L., Kania, J., & Wanat, M. (1992). Chrząszcze (Coleoptera) nowe dla Puszczy Białowieskiej. *Wiad. Entomol.*, **11**(3), 133–141.

Borowski, J. (2001). Próba waloryzacji lasów Puszczy Białowieskiej na podstawie chrząszczy (Coleoptera) związanych z nadrzewnymi grzybami. In: A. Szujecki (Ed.), Próba szacunkowej waloryzacji lasów Puszczy Białowieskiej metodą zooindykacyjną (pp. 287–317). Warszawa: Wyd. SGGW.

Brandstetter, C. (1992). Gibt es unter den Käfern Wanderer? (Insecta, Coleoptera). *Atalanta*, **23**(3/4), 417–422.

Breymeyer, A. (1966). Relations between wandering spiders and other epigeic predatory Arthropoda. *Ekol. Pol.*, A, **14**, 27–71, 11.

Brischke, C. G. A. (1894). Entomologische Beobachtungen im Jahre 1892. *Schr. Naturf. Ges. Danzig*, **8**(3–4), 52–59.

Brunke, A. J., Chatzimanolis, S., Schillhammer, H., & Solodovnikov, A. (2015). Early evolution of the hyperdiverse rove beetle tribe Staphylinini (Coleoptera: Staphylinidae: Staphylininae) and a revision of its higher classification. *Cladistics*, **32**(4), 427–451. https://doi.org/10.1111/cla.12139

Brunke, A. J., Hansen, A. K., Salnitska, M., Kypke, J. L., Predeus, A. V., Escalona, H., Chapados, J. T., Eyres, J., Richter, R., Smetana, A., Ślipiński, A., Zwick, A., Hájek, J., Leschen, R. A. B., Solodovnikov, A., & Dettman, J. R. (2021). The limits of Quediini at last (Staphylinidae: Staphylininae): a rove beetle mega-radiation resolved by comprehensive sampling and anchored phylogenomics. *Systemat. Entomol.*, **46**(2), 396–421.

Brunke, A. J., & Smetana, A. (2019). A new genus of Staphylinina and a review of major lineages (Staphylinidae: Staphylininae: Staphylinini). *Systemat. Biodiv.*, **17**(8), 745–758.

Brunke, A. J., & Solodovnikov, A. (2013). Alesiella gen. n. and a newly discovered relict lineage of Staphylinini (Coleoptera: Staphylinidae). *Systemat. Entomol.*, **38**(4), 689–707.

Buchholz, L., & Melke, A. (2018). Owady – chrząszcze *Coleoptera*. In: M. D. Boćkowski (Ed.), Projektowany Turnicki Park Narodowy. Stan walorów przyrodniczych – 35 lat od pierwszego projektu parku narodowego na Pogórzu Karpackim (pp. 314–377). Nowosiółki Dydyńskie: Fundacja Dziedzictwo Przyrodnicze.

Burakowski, B., Mroczkowski, M., & Stefańska J. (1980). Chrząszcze – Coleoptera. Kusakowate – Staphylinidae, cz. 2. Katalog Fauny Polski, XXIII, 7. Warszawa: PAN.

Burzyński, J. (1971). Badania entomofauny drzewostanów sosnowych na terenach wydmowych. *Pr. Inst. Bad. Leśn.*, **404**, 3–90.

Burzyński, J. (1973). Entomofauna glebowa na wydmach śródlądowych i nadmorskich. *Pol. Pismo Entomol.*, **43**, 139–153.

Byk, A. (2001a). Próba waloryzacji drzewostanów starszych klas wieku Puszczy Białowieskiej na podstawie struktury zgrupowań chrząszczy (Coleoptera) związanych z rozkładającym się drewnem leżących pni i pniaków. In: A. Szujecki (Ed.), Próba szacunkowej waloryzacji lasów Puszczy Białowieskiej metodą zooindykacyjną (pp. 369–393). Warszawa: Wyd. SGGW.

Byk, A. (2001b). Próba waloryzacji drzewostanów starszych klas wieku Puszczy Białowieskiej na podstawie struktury zgrupowań chrząszczy (Coleoptera) związanych z rozkładającym się drewnem pni martwych drzew stojących i dziupli. In: A. Szujecki (Ed.), Próba szacunkowej waloryzacji lasów Puszczy Białowieskiej metodą zooindykacyjną (pp. 333–367). Warszawa: Wyd. SGGW.

Byk, A., Borowski, J., Mokrzycki, T., Mazur, S., & Rutkiewicz, A. (2013). Waloryzacja lasów Leśnego Kompleksu Promocyjnego „Lasy Spalsko-Rogowskie" na podstawie struktury zgrupowań chrząszczy saproksylicznych. *Stud. Mat. Cent. Eduk. Przyr.-Leśn. Rogow.*, **35**(4), 82–129.

Byk, A., & Byk, S. (2004). Chrząszcze saproksylofilne próchnowisk rezerwatu „Dęby w Krukach Pasłęckich". *Parki Nar. Rez. Przyr.*, **23**(4), 555–580.

Byk, A., Mokrzycki, T., Perliński, S., & Rutkiewicz, A. (2006). Saproxylic beetles – in the monitoring of anthropogenic transformations of Białowieża Primeval Forest. In:

A. Szujecki (Ed.), Zooindication-based monitoring of anthropogenic transformations in Białowieża Primeval Forest (pp. 325–397). Warsaw: Warsaw Agricultural University Press.

Chachuła, P., Melke, A., Ruta, R., & Szołtys, H. (2019). Beetles (Coleoptera) collected from polyporoid fungi in the Pieniny National Park [Chrząszcze zebrane z owocników grzybów poliporoidalnych w Pienińskim Parku Narodowym]. *Wiad. Entomol.*, **38**(1), 5–46.

Chani-Posse, M., Brunke, A., Chatzimanolis, S., Schillhammer, H., & Solodovnikov, A. (2018). Phylogeny of the hyper-diverse rove beetle subtribe Philonthina with implications for classification of the tribe Staphylinini (Coleoptera: Staphylinidae). *Cladistics*, **34**, 1–40.

Chatzimanolis, S. (2014). Phylogeny of xanthopygine rove beetles (Coleoptera) based on six molecular loci. *Systemat. Entomol.*, **39**, 141–149.

Chatzimanolis, S., Cohen, I. M., Schomann, A. S., & Solodovnikov, A. (2010). Molecular phylogeny of the mega-diverse rove beetle tribe Staphylinini (Insecta, Coleoptera, Staphylinidae). *Zool. Scripta*, **39**, 436–449.

Cibuļskis, R. (2007). A review of the subtribe Staphylinina Latreille, 1802) (Coleoptera: Staphylinidae) in the fauna of Latvia. *Baltic J. Coleopterol.*, 7(1), 99–120.

Ciechanowski, M., Rozwałka, R., Staniec, B., Zieliński, S., Buczyński, P., Dominiak, P., Gosik, R., Jaskuła, R., Kowalczyk, J. K., Leśniewska, M., Olejniczak, I., & Oleksa, A. (2009). Fauna. Grupy bezkręgowców nie objęte szczegółowymi badaniami. In: J. Herbich, M. Ciechanowski (Eds.), Przyroda rezerwatów Kurze Grzędy i Staniszewskie Błoto na Pojezierzu Kaszubskim (pp. 217–236). Gdańsk: Fund. Rozw. Uniw. Gdańsk.

Clarke, D. (2011). Testing the phylogenetic utility of morphological character systems, with a revision of *Creophilus* Leach (Coleoptera: Staphylinidae). *Zool. J. Linnean Soc.*, **163**, 723–812.

Coiffait, H. (1974). Coleopteres Staphylinidae de la region palearctique occidentale II. Sous-famille Staphylininae, Tribus Philonthini et Staphylinini. *Nouvelle Revue de Entomologie*, Supplement, (4), 1-593.

Comellini, A. (1974). Notes sur les Coléopteres Staphylinides de haute-altitude. *Rev. Suisse Zool.*, **81**, 511–539.

Cykowski, R. K. (1977). Wpływ lasów na występowanie biegaczy (*Carabus* L.) i kusaków (*Staphylinus* L.) na łąkach. In: H. Sandner (Ed.), Entomologia a ochrona środowiska (pp. 133–134). Warszawa: PWN.

Da Silva, P. M., Aguiar, C. A. S., Niemelä, J., Sousa, J. P., & Serrano, A. R. M. (2009). Cork-oak woodlands as key-habitats for biodiversity conservation in Mediterranean landscapes: A case study using rove and ground beetles (Coleoptera: Staphylinidae, Carabidae). *Biodivers. Conserv.*, **18**(3), 605–619. https://doi.org/10.1007/s10531-008-9527-9

Daccordi, M. & Zanetti, A. (1989). Studi sulla palude del Busatello (Veneto-Lombardia). Provincia di Verona, 346 pp.

Dajoz, R., & Caussanel, C. (1968). Morphologie et biologie d'un Coléoptères prédateur *Creophilus maxillosus* (Staphylinidae). *Cahiers Nat. Bull. Nat. Paris.*, **24**(3), 65–102.

Deichsel, R. (2006). Species change in an urban setting-ground and rove beetles (Coleoptera: Carabidae and Staphylinidae) in Berlin. *Urban Ecosyst.*, **9**(3), 161–178. https://doi.org/10.1007/s11252-006-8588-3

Dekeirsschieter, J., Frederick, C., Verheggen, F. J., Drugmand, D., & Haubruge, E. (2013). Diversity of forensic rove beetles (Coleoptera, Staphylinidae) associated with decaying pig carcass in a forest biotope. *J. Forensic Sci.*, **58**, 1032–1040. https://doi.org/10.1111/1556-4029.12095

Della Rocca, F., Stefanelli, S., Cardarelli, E., Bogliani, G., Bracco, F. (2021). Contribution to the knowledge of the arthropods community inhabiting the winter-flooded meadows (marcite) of northern Italy. *Biodiversity Data Journal*, **9**: e57889. https://doi.org/10.3897/BDJ.9.e57889

Derunkov, A. V. (2005). Changes in species diversity of rove beetles (Coleoptera, Staphylinidae) depending on the age of pine plantations in central Belarus. *Russ. J. Ecol.*, **36**, 277–284.

Derunkov, A., Melke, A. (2001). Familia (rodzina): Staphylinidae bez Micropeplinae i Pselaphinae. In: J.M. Gutowski, B. Jaroszewicz (Eds.), Katalog fauny Puszczy Białowieskiej Catalogue of the Fauna of Białowieża Primeval Forest (pp. 133–147). Warszawa: Instytut Badawczy Leśnictwa.

Dietl, A. (1903). Von Herrn Friedrich Zacher gefundenen Käfer. *Z. Ent. NF.*, **28**, 20–21.

Dobosz, R. (1994). Nowe stanowisko *Emus hirtus* (L.) (Coleoptera: Staphylinidae) na Górnym Śląsku. *Acta Ent. Siles.*, **2**, 24.

Dohrn, C. A. (1878). Eine Moos-Excursion. *Stett. Ent. Ztg*, **39**, 284–287.

Dommer, A. (1850). Nachtrag zu dem Verzeichniss der Käfer Preussens. Von Prof E. v. Siebold. *N. Preuss. Prov.-Bl.*, **9**, 199–214, 276–283.

Dreyfeldt, A. (1933). Beiträge zur Biologie und Käferforschung der Lebanehrung. *Dohrniana*, **12**, 58–68.

Drugescu, C., & Geacu, A. (2004). Contributions to the knowledge of Submediterranean fauna in Romania. *Biol. Anim.*, **1**, 195–201.

Drugmand, D. (1998). Systematics and biogeography of the European subspecies of *Ocypus ophthalmicus* (Scopoli, 1763) (Coleoptera : Staphylininae). *Ann. Soc. Entomol. Fran.*, **34**(1), 45–61

Eckelt, A., Müller, J., Bense, U. Brustel, H., Bußler, H., Chittaro, Y., …, & Seibold, S. (2017). "Primeval forest relict beetles" of Central Europe: a set of 168 umbrella species for the protection of primeval forest remnants. *J. Ins. Conserv.*, **22**(1), 15–28. doi:10.1007/s10841-017-0028-6

Eichler, R., & Gollkowski, V. (2005). Faunistische Notizen 821. *Emus hirtus* (Linné, 1758) ein aktueller Nachweis für Sachsen (Col., Staphylinidae). *Entomol. Nachr. Bericht.*, **49** (3/4), 236–237.

Eichler, W. (1914). Przyczynek do tęgopokrywych Ojcowa. *Pam. Fizyjogr.*, **22**(III), 138––149.

Eichler, W. (1929). Tęgopokrywe okolic Pabjanic (obok Łodzi). Część II. *Czas. Przyr. Ilustr.*, **3**, 48–51.

Elven, H., Buchmann, L., & Gusarov, V. I. (2010). Phylogeny of the tribe Athetini (Coleoptera: Staphylinidae) inferred from mitochondrial and nuclear sequence data. *Mol. Phylogenet. Evol.*, **57**, 84–100. https://doi.org/10.1016/j.ympev.2010.05.023

Endler, F.G., & Scholz, F.P. (1819). Der Naturfreund oder Beiträge zur Schlesischen Naturgeschichte. Neunter Band. Breslau.

Engel, H. (1938). Beiträge zur Flora und Fauna der Binnendüne bei Bellinchen (Oder). *Märk. Tierw.*, **3**(4), 229–294.

Eremeev, E. A. (2021). Some aspects of the ecology of the species *Creophilus maxillosus* Linnaeus, 1758 and *Emus hirtus* Linnaeus, 1758 (Coleoptera: Staphylinidae) in southwestern part of the North Asia. *IOP Conf. Ser.: Earth Environ. Sci.*, **848**.

Fein, A., Haase, E. (1881). Beobachtungen über Fundorte und Fangzeiten einiger interessanteren oder selteneren schlesischen Käfer. *Z. Ent. N.F.*, **8**, 18–27.

Fernández, V., Gamarra, P., Outerelo, R., Cifrián, B., & Baz, A. (2010). Distribución de estafilíninos necrófilos (Coleoptera, Staphylinidae, Staphylininae) a lo largo de un gradiente altitudinal en la Sierra de Guadarrama, España [Necrophiliac Staphylinids (Coleoptera, Staphylinidae, Staphylininae) distribution along an altitudinal gradient in the Sierra Guadarrama, Spain]. *Bolet. Real Soc. Españ. Hist. Nat.*, **104**, 61–86.

Ferreira, R. N. (2018). New records and distributional data on the subtribe Staphylinina (Coleoptera: Staphylinidae) from Portugal. *Fragm. Faun.*, **61**(2), 89–97. https://doi.org/10.3161/00159301FF2018.61.2.089

Folwaczny, B. (1937). Beitrag zur Verbreitung einiger Käferarten in Deutschland. *Ent. Bl.*, **33**, 343–345.

Forest Data Bank (Bank Danych o Lasach), https://www.bdl.lasy.gov.pl/portal/en; access on 2.11.2022

Franc, V. (2002). Beetles (Coleoptera) of the Veľká Fatra Mts. with special reference to bioindicatively significant species. *Matthias Belivs Univ. Proc.*, Supplement, **2**(1), 165–177.

Frątczak-Łagiewska, K., Grzywacz, A., & Matuszewski, S. (2020). Development and validation of forensically useful growth models for Central European population of *Creophilus maxillosus* L. (Coleoptera: Staphylinidae). *Int. J. Legal Med.*, **134**, 1531––1545.

Frenzel, G., Hedicke, H. (1940). *Emus hirtus* L. (Col. Staph.). *Märk. Tierw.*, **4**, 230.

Gajdoš, P., & Majzlan, O. (2018). Spiders (*Araneae*) and beetles (*Coleoptera*) of locality Lackovce – Veľký vrch near Humenné (eastern Slovakia). *Entomofauna Carpath.*, **30**(1), 25–41.

Gamarra, P., & Outerelo, R. (2008). Catálogo Iberobalear de los Staphylinidae (Coleoptera: Staphylinidae). *Bolet. Soc. Entomol. Aragon.*, **42**, 197–251 [New Revision, 30 December, 2010].

Ganglbauer, L. (1895). Die Käfer von Mitteleuropa. Die Käfer der österreichisch-ungarischen Monarchie, Deutschlands, der Schweiz, sowie des französischen und italienischen Alpengebietes. II. Familienreihe Staphylinoidea. 1. Theil: Staphylinidae, Pselaphidae. Wien.

Gerhardt, J. (1866). Sammelberichte [aus Schlesien]. *Berl. Ent. Z.*, **10**, 295–298.

Gerhardt, J. (1887). Sammelbericht pro 1886. *Dtsch. Ent. Z.*, **31**, 219–223.

Gerhardt, J. (1888). Sammelbericht pro 1887. *Dtsch. Ent. Z.*, 1888, 356–360.

Gerhardt, J. (1889). Sammelbericht pro 1888. *Dtsch. Ent. Z.*, 1889, 397–400.

Gerhardt, J. (1891). Zum Nummerus der schlesischen Käferarten. *Z. Ent., N.F.*, **16**, 436–438.

Gerhardt, J. (1896). Neue Fundorte seltener schlesischer Käfer. *Z. Ent., N.F.*, **21**, 16–22.

Gerhardt, J. (1897). Der Wasserwald bei Kaltwasser Kreis Lüben. Eine coleopterologische Skizze. In: Fest-Schrift zur Feier des fünfzigjährigen Bestehens des Vereins für schlesische Insectenkunde in Breslau. 1847–1897 (pp. 25–31). Breslau.

Gerhardt, J. (1898). Neue Fundorte seltenerer schlesischer Käfer aus dem Jahre 1897. *Z. Ent., N.F.*, **23**, 1–11.

Gerhardt, J. (1899). Neuheiten der schlesischen Käferfauna aus dem Jahre 1898. *Z. Ent., N.F.*, **24**, 14–19.

Gerhardt, J. (1904). Neue Fundorte seltenerer schlesischer Käfer aus dem Jahre 1903 nebst Bemerkungen. *Z. Ent., N.F.*, **29**, 71–76.

Gerhardt, J. (1905). Neue Fundorte seltenerer schlesischer Käfer aus dem Jahre 1904. *Z. Ent., N.F.*, **30**, 1–5.

Gerhardt, J. (1907). Neue Fundorte seltenerer schlesischer Käfer aus dem Jahre 1906. *Z. Ent., N.F.*, **32**, 1–8.

Gerhardt, J. (1909a). Neuheiten der schlesischen Käferfauna aus dem Jahre 1908, geordnet nach dem Katalog europäischer Käfer von 1906. *Dtsch. Ent. Z.*, **1909**, 415–422.

Gerhardt, J. (1909b). Neuheiten der schlesischen Käferfauna aus dem Jahre 1908. *Jh. Ver. Schles. Ins.*, **2**, 1–10.

Gerhardt, J. (1910a). Verzeichnis der Käfer Schlesiens preussischen und österreichischen Anteils, geordnet nach dem Catalogus coleopterorum Europae vom Jahre 1906. Dritte, neubearbeitete Auflage. Berlin: Julius Springer.

Gerhardt, J. (1910b). Neuheiten der schlesischen Käferfauna aus dem Jahre 1909 (Col.). *Dtsch. Ent. Z.*, **1910**, 554–557.

Ghilarov, M. S. (Ed.) (1964). Keys for the identification of soil-inhabiting insect larvae. [In Russian]. Moscow, Institute of Soil Zoology of the Academy of Sciences, 920 pp.

Gladitsch, S. (1970). *Ontholestes haroldi* EPPH. in Vorarlberg und Funde einiger anderer in Tirol und Vorarlberg seltener Käferarten. *Entomol. Nachricht.*, **17**(2), 62–63.

Głowaciński, Z., & Nowacki, J. (Eds., 2004). Polska Czerwona Księga Zwierząt. Bezkręgowce. Kraków: Instytut Ochrony Przyrody PAN.

Gollkowski, V. (2003). Kommentierter Verbreitungsatlas der Staphylinina Letreille, 1802 von Sachsen mit einem Vorschlag für eine Rote Liste (Insecta: Coleoptera: Staphylinidae). *Faunist. Abhandl.*, **24**, 43–136.

Gontarenko, A. V. (2005). Contribution to the fauna of the rove beetles of the subfamily Staphylininae s. str. (Coleoptera: Staphylinidae) of Ukraine. *Kharkov Entomol. Soc. Gaz.*, **12**, 1–2, 61–67.

Goos, M. H. (1973). Wpływ zabiegów mszycobójczych stosowanych w uprawie buraków cukrowych na stawonogi. I. Badania nad chrząszczami z rodzin Carabidae Staphylinidae. *Pol. Pismo Entomol.*, **43**, 535–559.

Górz, A. (2019). Dung Beetles of the Polish Carpathians. Kraków: Wyd. Nauk. Uniw. Pedag.

Gravenhorst, J. L. C. (1847). Ueber *Staphylinus olens* und dessen nächste Verwandte. *Übers. Arb. Ver. Schles. Ges. Vaterl. Cult.*, 1846, 94–100.

Greene, G. L. (1996). Rearing techniques for *Creophilus maxillosus* (Coleoptera: Staphylinidae), a predator of fly larvae in cattle feedlots. *J. Econ. Entomol.*, **89**(4), 848–851. https://doi.org/10.1093/jee/89.4.848

Grentzenberg, M. (1896). Bericht über die Haase'sche Excursion im Kreise Karthaus mit besonderer Berücksichtigung der Myriapoden. *Schr. Naturf. Ges. Danzig*, **9**(1), 236–253.

Greń, C., Królik, R., & Szołtys, H. (2012). Czerwona lista chrząszczy (Coleoptera) Województwa Śląskiego. In: Raporty i Opinie 6. Strategia ochrony przyrody województwa śląskiego do roku 2030. Raport o stanie przyrody województwa śląskiego. 4. Czerwone listy wybranych zwierząt bezkręgowych (pp. 37–70). Katowice: Centrum Dziedzictwa Przyrody Górnego Śląska.

Griep, E. (1937). Ein Besuch im Naturschutzgebiet Bellinchen a. d. O. *Dtsch. Ent. Z.*, **51**, 331–333.

Gruhl, K. (1933). Käfergräben. Ein Beitrag zur Kenntnis der Grünberger Tierwelt. *Grünberger Hauskalender*, **24**, 92–100.

Gruttke, H. (1992). Zur Ökologie und städtischen Verbreitung von *Ocypus olens* (Müller). *Verh. Ges. Ökol.*, **21**, 79–82.

Gutowski, J. M., & Ruta, R. (2004). Waloryzacja przyrodnicza gminy Tuczno (Pojezierze Zachodniopomorskie) w oparciu o wyniki wstępnych badań nad chrząszczami (Insecta: Coleoptera). *Nowy Pam. Fizjogr.*, **3**, 27–60.

Gutowski, J. M., Buchholz, L., Kubisz, D., Ossowska, M., & Sućko, K. (2006). Chrząszcze saproksyliczne jako wskaźnik odkształceń ekosystemów leśnych borów sosnowych. *Leśn. Pr. Bad.*, **4**, 101–144.

Gutowski, J. M., Kubisz, D., Sućko, K., & Zub, K. (2010). Sukcesja saproksylicznych chrząszczy (Coleoptera) na powierzchniach pohuraganowych w drzewostanach sosnowych Puszczy Piskiej. *Leśn. Pr. Bad.*, **71**, 279–298.

Habelmann, P. (1854). Eine neue Art der Käfergattung *Teredus* Dej. *Stett. Ent. Ztg.*, **15**, 27–29.

Haber, A. (1957). Badania nad rolą płazów w biocenozach lasów objętych gradacją szkodliwych owadów i akcjami chemicznymi w latach 1948–1949. *Rocz. Nauk Roln. Leśn.*, **20**, 3–91.

Hallmann, C. A., Sorg, M., Jongejans, E., Siepel, H., Hofland, N., Schwan, H., Stenmans, W., Müller, A., Sumser, H., Hörren, T., Goulson, D., & De Kroon, H. (2017). More than 75 percent decline over 27 years in total flying insect biomass in protected areas. *PLoS ONE*, **12**(10). https://doi.org/10.1371/journal.pone.0185809

Hartlieb, W. (1827). *Staphylinus hirtus* in Schlesien. *Übers. Arb. Ver. Schles. Ges. Vaterl. Cult.*, 1826, 21.

Helm, O. (1901). 1897 und 1898 bei Zoppot gefangene Käfer. *Schr. Naturf. Ges. Danzig*, **10**(2–3), 14–15.

Herman, L. H. (2001). Catalog of the Staphylinidae (Insecta: Coleoptera). 1758 to the end of the Second Millenium. VI. Staphylininae Group (Part 3) Staphylininae: Staphylinini (Quediina, Staphylinina, Tanygnathinina, Xanthopygina), Xantholinini. *Bullet. Am. Mus. Nat. Hist.*, **265**, 3021–3840.

Hinton, H. E. (1945). A monograph of the beetles associated with stored products. London: British Museum – Natural History.

Hinton, H. E. (1981). Biology of insects eggs. Vol. 2. Oxford: Pergamon Press.

Honczarenko, J. (1962). Badania nad entomofauną glebową w rezerwacie Stawska Góra pod Chełmem Lubelskim. *Pol. Pismo Entomol.*, B, **27–28**, 165–182.

Honěk, A., Kocian, M., Martinková, Z. (2012). Rove beetles (Coleoptera: Staphylinidae) in an apple orchard. *Plant Protect Sci.*, **48**, 116–122.

Horák, J. (2011). Response of saproxylic beetles to tree species composition in a secondary urban forest area. *Urban For. Urban Gree.*, **10**, 213– 222 https://doi.org/10.1016/j.ufug.2011.04.002

Horion, A. (1938). Studien zur deutschen Käferfauna. II. Die periodischen Klimaschwankungen und ihr Einfluss auf die thermophilen Käfer in Deuschland [sic!]. *Ent. Bl.*, **34**, 127–140.

Horion, A. (1951). Verzeichnis der Käfer Mitteleuropas (Deutschland, Österreich, Tschechoslovakei) mit kurzen faunistischen Angaben. 1–2. Stuttgart.

Horion, A. (1965). Faunistik der mitteleuropäischen Käfer. Band X: Staphylinidae 2. Teil Paederinae bis Staphylininae. Überlingen-Bodensee. http://www.zpcse.cz/entolisty/entolisty.html, 21-8-2014

Hornig, U. & Lorenz, J. Ö. R. G. (2018). Neues aus der Käferfauna Sachsens (Coleoptera)–6. Beitrag. *Entomologische Nachrichten und Berichte*, **62**(1), 37-47.

Hubenthal, W. (1916). *Staphylinus brunnipes* F. *Ent. Bl.*, **12**, 208.

Hussein, M. L.-A., Scholze, P., Jung, M., & Schöne, A. (2004). Rote Liste der Kurzflügler (Coleoptera: Staphylinidae). *Ber. Landes. Umweltsch. Sachsen-Anhalt*, **39**, 272–286.

Ignatowicz, S. (1974). Nowe dane o występowaniu roztoczy (Acarina) na owadach w Polsce. *Pol. Pismo Entomol.*, **44**, 705–713.

Irmler, U., & Gürlich, S. (2007). What do rove beetles (Coleoptera: Staphylinidae) indicate for site conditions? *Faunist.-Ökol. Mitteil.*, **8**, 439–455.

Irmler, U., Klimaszewski, J., & Betz, O. (2018). Introduction to the biology of rove beetles. In: O. Betz, U. Irmler, & J. Klimaszewski (Eds.), Biology of rove beetles (Staphylinidae): Life history, evolution, ecology and distribution. Crow: Springer. https://doi.org/10.1007/978-3-319-70257-5

Jabłoński, W. (1869). Przyczynek do fauny chrząszczów krajowych. *Spraw. Kom. Fizyogr.*, **3**, 68–73.

Jacentkovskij, A. V. (1912). Materialy po entomologičeskoj faune Bessarabii. Žestkokrylyja. VII. Staphylinidae. Trudy Bessar. *Obšč. Est. Ljub. Est.*, **2**, 149–164.

Jachno, J. (1880). Chrząszcze zebrane w okolicy Kotowéj Woli. *Spraw. Kom. Fizyogr.*, **14**, 251–253.

Jakobson, G. G. (1909). Zhuki Rossii i Zapadnoi Evropy. Vyp. VII. S.-Peterburg.

Jałoszyński, P., & Wanat, W. (2021). Nowe stanowiska *Ontholestes haroldi* (Eppelsheim) w Polsce (Coleoptera: Staphylinidae). *Acta Entomol. Siles.*, **29**, 1–4. http://doi.org/10.5281/zenodo.5195584

Jankowski, T., & Mazur, A. (2019). Chrząszcze kusakowate (Coleoptera, Staphylinidae) wybranych środowisk Parku Narodowego „Ujście Warty". *Acta Sci. Pol. Silv. Coledar. Ratio Ind. Lignar.*, **18**(1), 41–48. http://dx.doi.org/10.17306/J.AFW.2019.1.5

Japoshvili, G., & Anlaş, S. (2011). Notes on the family Staphylinidae (Coleoptera) collected by pitfall traps in Gölcük Natural Park, Isparta province of Turkey. *J. Entomol. Res. Soc.*, **13**, 41–48.

Jaskuła, R., Przewoźny, M., & Melke, A. (2009). Chrząszcze (Coleoptera). In: R. Jaskuła, G. Tończyk (Eds.), Owady (Insecta) Spalskiego Parku Krajobrazowego. Część I (pp. 27–59). Spała: Mazowiecko-Świętokrzyskie Towarzystwo Ornitologiczne.

Jaskuła, R., Przewoźny, M., Melke, A., & Soszyńska-Maj, A. (2010). Chrząszcze (Coleoptera). In:, R. Jaskuła & G. Tończyk (Eds.), Owady (Insecta) Parku Krajobrazowego Wzniesień Łódzkich. Łódź: Park Krajobrazowy Wzniesień Łódzkich, Mazowiecko-Świetokrzyskie Towarzystwo Ornitologiczne.

Jászay T., & Hlaváč, P. (2016). Checklist of rove beetles of Slovakia (Insecta: Coleoptera: Staphylinidae). *Fol. Faunist. Slov.*, **21** (2), 131–216.

Jelínek, J. (2001). The Staphylinid beetles of the subfamily Staphylininae (Coleoptera: Staphylinidae), tribus Staphylinini and Quediini from regions Orlické hory and Podorlicko (Czech Republic). *Acta Musei Reginaehrad.*, A, **28**, 189–206.

Juszczyk, W. (1950). The food of the aquatic frog *Rana esculenta* L. in the natural water reservoirs and in the artificial fish ponds. *Bull. Int. Acad. Pol. Sci. Lett. Cl. Math. Nat.*, B., 1950, 31–80.

Kaczmarek, W. (1963). An analysis of interspecific competition in communities of the soil macrofauna of some habitats in the Kampinos National Park. *Ekol. Pol.*, A, **11**, 421–483.

Karczewski, J. (1961). Przyczynek do znajomości fauny rowków szeliniakowych. *Fol. For. Pol.*, A, **6**, 49–83.

Karpiński, J. J. (1949). Materiały do bioekologii Puszczy Białowieżaej. *Rozpr. Spraw. Inst. Bad. Leśn.*, **56**.

Kasule, F. K. (1970). The larvae of Paederinae and Staphylinidae (Coleoptera: Staphylinidae) with keys to the known British genera. *Trans. Royal Entomol. Soc. Lond.*, **122**, 49–80.

Kelch, A. (1846). Grundlage zur Kenntniss der Käfer Oberschlesiens, insonders der Umgegend von Ratibor. In: Zu der öffentlichen Prüfung aller Classen des Königlichen Gymnasiums zu Ratibor den 4. und 7. April, und dem mit Entlassung der Abiturienten verbundenen Redeactus den 20. April laden ergebenst ein Director und Lehrer-Collegium (pp. I–II + 1–54). Ratibor.

Keshavarzi, D., Fereidooni, M., Moemenbellah-Fard, M. D., Nasiri, Z., Soltani, Z., Dabaghmanesh, T., & Montazeri, M. (2015). Preliminary data on life cycle of *Creophilus maxillosus* Linnaeus (Coleoptera: Staphylinidae) and new report of this species on a human corpse, south of Iran. *Int. J. Forensic Sci. Pathol.*, **3**(7), 144–147.

Khaschikov, E. A. (2005). Internal structure of genitals of some species of genus *Ocypus* Leach, 1819 and *Tasgius* Stephens, 1829 (Coleoptera: Staphylinidae) with the description of new taxa from the genus *Ocypus*. *Kavkazskij èntomologičeskij bûlleten'*, **1**, 19-32. DOI:10.23885/1814-3326-2005-1-1-19-32

Kim, T.-K., Song, J.-H., Thayer, M. K., & Ahn, K. (2019). Molecular phylogeny of Omaliinae (Coleoptera: Staphylinidae) and its implications for evolution of atypically long elytra in rove beetles. *Syst. Entomol.*, 45, 1, 20–32. https://doi.org/10.1111/syen.12372

Kinelski, S., & Szujecki, A. (1959). Materiały do poznania chrząszczy (Coleoptera) fauny krajowej. *Pol. Pismo Ent.*, **29**(1), 215–250.

Klasiński, J. (2013). Chrząszcze (Coleoptera) parku miejskiego w Częstochowie – Dźbowie. *Biul. Część. Koła Entomol.*, **11**(1), 19–22.

Klasiński, J. (2015a). Użytek ekologiczny „Zapadliska II" w Poczesnej-Zawodziu. Badania chrząszczy (Coleoptera). Biul. Część. Koła Entomol., **13**, 3–8.

Klasiński, J. (2015b). *Ocypus* (*Tasgius*) *pedator* (Grav.), (Staphylinidae) i inne chrząszcze (Coleoptera) znalezione na Wyżynie Krakowsko-Wieluńskiej. *Biul. Część. Koła Entomol.*, **13**, 21–22.

Kleeberg, A., & Uhlig, M. (2011). Die Staphylinina (Insecta, Coleoptera, Staphylinidae) in Mecklenburg-Vorpommern, 1847–2009: Erforschungsgeschichte, kommentierte Artenliste, Verbreitung und Enteurf einer Roten Liste. *Insecta*, **13**, 5–137.

Kleine, R. (1940a). *Emus hirtus* L. und *Potosia Fieberi* Kr. in Pommern. *Ent. Bl.*, **36**, 191.

Kleine, R. (1940b). Übersicht über die in Pommern gefundenen Käfer, die im Verzeichnis von Albert Lüllwitz nicht enthalten sind. Nebst einigen Bemerkungen über schon genannte Arten. *Dohrniana*, **19**, 3–28.

Kletke, P. (1889). Einige Käfer aus Schlesien und Ostsee. *Z. Ent. N.F.*, **14**, 15.

Klimaszewski, J., & Brunke, A. J. (2018). Canada's adventive rove beetle (Coleoptera, Staphylinidae) fauna: A long-term case study on the detection, origin, introduction pathways, and dynamic distribution of non-native beetles. In: O. Betz, U. Irmler, J. Klimaszewski (Eds.), Biology of rove beetles (Staphylinidae): Life history, evolution, ecology and distribution (pp. 65–79). Cham: Springer. https://doi.org/10.1007/978-3-319-70257-5_5

Kniephof, J. (1913). Neuheiten der pommerschen Käferfauna. (Col.). *Dtsch. Ent. Z.*, **1913**, 185–190.

Kočárek, P. (2000). *Emus hirtus* in Slovakia – on the recent occurrence of endangered species (Coleoptera: Staphylinidae). *Entomofauna Carpat.*, **12**, 34–36.

Kočárek, P. (2003). Decomposition and Coleoptera succession on exposed carrion of small mammal in Opava, the Czech Republic. *Eur. J. Soil Biol.*, **39**(1), 31–45. https://doi.org/10.1016/s1164-5563(02)00007-9

Kocot-Zalewska, J., & Melke, A. (2021). The rove beetles (Coleoptera: Staphylinidae) form caves in the Częstochowa Upland. *Ann. Upper Siles. Mus. Bytom*, **30**, 1–8. http://doi.org/10.5281/zenodo.5801116

Koerth, A. (1916). Beiträge zur Fauna der Umgegend von Schwerin a. W. *Z. Naturw. Abt. Dtsch. Ges. Posen*, **23**(1), 36–43.

Kofler, A. (2015). Zur Kenntnis der Käferfauna Osttirols – Teil XIV (Staphylinidae, Teil 1). *Carinthia* II, **125**, 573–638.

Köhler, F., Klausnitzer, B. (Eds., 1998). Verzeichnis der Käfer Deutschlands. *Entomol. Nachricht. Ber.*, **4**, 1–185.

Kolbe, W. (1892). Unter Moos lebende Käfer. *Z. Ent. N.*F., **17**, 4–12.

Kolbe, W. (1914). Beiträge zur schlesischen Käferfauna. *Jh. Ver. Schles. Ins.*, **7**, 1–7.

Kolbe, W. (1918). Beiträge zur schlesischen Käferfauna. *Ent. Mitt.*, **7**, 200–211.

Kolbe, W. (1924). Beiträge zur schlesischen Käferfauna. *Jh. Ver. Schles. Ins.*, **14**, 40–55.

Kolbe, W. (1927). Beiträge zur schlesischen Käferfauna. *Z. Ent. N.F.*, **15**(1), 2–14.

Kolbe, W. (1928). Beiträge zur schlesischen Käferfauna. *Z. Ent. N.F.*, **16**(2), 1–10.

Kolbe, W. (1931). Beiträge zur schlesischen Käferfauna. *Z. Ent. N.F.*, **17**(2), 8–17.

Kollár, J., & Cunev, J. (2019). Results of faunistic research on the beetles (Coleoptera) of Mlyňany Arboretum. *Klapalekiana*, **55**, 41–72.

Komosiński, K. (2001a). Nekrofilne Staphylinidae zebrane w okolicach Olsztyna. In: Materiały konferencyjne. Drugie Sympozjum Staphylinidae „Badamy, aby chronić" (pp. 23–24). 16–18 marca 2001, Poznań-Jeziory.

Komosiński, K. (2001b). Nowe w Polsce stanowiska przedstawicieli z rodzaju *Ocypus* Samouelle, 1819. In: Materiały konferencyjne. Drugie Sympozjum Staphylinidae, „Badamy, aby chronić" (pp. 28). 16–18 maraca 2001. Poznań-Jeziory.

Komosiński, K. (2004). Porównanie struktury jakościowej i ilościowej chrząszczy nekrofilnych (Insecta, Coleoptera) Olsztyna i terenów niezurbanizowanych Pojezierza Mazurskiego. In: P. Indykiewicz & T. Barczak (Eds.), Fauna miast Europy Środkowej 21. wieku (pp. 199–212). Bydgoszcz: Wyd. LOGO.

Konieczna, K., Melke, A., & Olbrycht, T. (2012). Bioróżnorodność drapieżnych biegaczowatych (Col., Carabidae) i kusakowatych (Col., Staphylinidae) zasiedlających pola uprawne i zadrzewienia śródpolne. *Prog. Plant Prot. / Post. Ochr. Rośl.*, **52**(2), 340–346.

Konieczna, K., & Czerniakowski, Z. (2010). Drapieżne kusakowate (Coleoptera: Staphylinidae) w wybranych biotopach południowo-wschodniej Polski. *Prog. Plant Prot. / Post. Ochr. Rośl.*, **50**(3), 1499–1503.

Konieczna, K., Melke, A., & Olbrycht, T. (2013). Unexploited willow s plantation (*Salix viminalis*) as a reservoir of epigeic ground beetles (Col ., Carabidae) and rove beetles (Col ., Staphylinidae). *Prog. Plant Prot. / Post. Ochr. Rośl.*, **53**(2), 319–326.

Konopko, D., Kowalczyk, J. K., Komosiński, K., Sienkiewicz, P., Aleksandrowicz, O., Przewoźny, M., Konwerski, S., Mocarski, Z., Lasecki, R., & Buchholz, L. (2017). Materiały do znajomości chrząszczy (Insecta: Coleoptera) Kępy Redłowskiej w Gdyni. *Przegl. Przyr.*, **28**(3), 45–72.

Konopko, D., & Wilga, M. S. (2014). Przyczynek do poznania chrząszczy (Coleoptera) Trójmiejskiego Parku Krajobrazowego. *Przegl. Przyr.*, **25**(1), 64–71.

Konwerski, S., & Melke, A. (2000). Staphylinidae Obszaru Chronionego Krajobrazu rynny Jeziora Lusowskiego. In: Materiały konferencyjne. Pierwsze Sympozjum Staphylinidae. Rola chrząszczy kusakowatych (Coleoptera, Staphylinidae) w funkcjonowaniu i ochronie ekosystemów leśnych (pp. 45–46). 10–12 listopada 1999, Rogów.

Korczyński, I., Łakomy, P., Skrzecz, I., Sierpińska, A., & Mazur, A. (2016). Drapieżność dużych kusakowatych w stosunku do foliofagów sosny – rzeczywistość czy fikcja? In: Aktualne problemy ochrony lasu – 2016. Międzynarodowa konferencja naukowa organizowana przez Komisje Zasobów leśnych PTL, IBL i RDLP w Poznaniu. 17–20 października 2016, Będlewo.

Kościelny, T. (2006). Badania nad kusakowatymi Wyżyny Krakowsko-Wieluńskiej (Coleoptera, Staphylinidae), Część III. *Biul. Część. Koła Entomol.*, **5**, 3–4.

Kościelny, T. (2018). Nowe dane o występowaniu dwóch gatunków rzadkich kusaków (Coleoptera: Staphylinidae, Staphylininae) na Wyżynie Krakowsko-Wieluńskiej. *Biul. Część. Koła Entomol.*, **16**(2), 19–21.

Kotula, B. (1873). Przyczynek do fauny chrząszczów Galicyi. *Spraw. Kom. Fizyogr.*, **7**, 53–90.

Kotula, B. (1874). Przyczynek do fauny chrząszczów galicyjskich. *Spraw. Kom. Fizyogr.*, **8**, 18–26.

Kowalczyk, J. K., & Watała, C. (1988). Interesujące chrząszcze (Insecta, Coleoptera) na Wyżynie Łódzkiej. *Przegl. Zool.*, **32**, 543–546.

Kowalczyk-Rożek, M. (1972). Chrząszcze (Coleoptera) warstwy dna żwirowisk potoku Zubrzyca na Orawie. *Zesz. Nauk. UJ*, Zoologia, **18**, 147–167.

Kraatz, E. G. (1857). Naturgeschichte der Insecten Deutschlands, 1 abt. Coleoptera, Bd. II, Lief. 3–4 (bogen 25–48, pp. 377–768). Berlin.

Kramer, S. (1955). Notes and observations on the biology and rearing of *Creophilus maxillosus* L. (Coleoptera, Staphylinidae). *Ann. Entomol. Soc. Am.*, **48**, 375–380.

Krawczynski, R., Fuellhaas, U., Bellmann, A., & Biel, P. (2010). Neuer Fund von *Emus hirtus* (Coleoptera: Staphylinidae) in Huntlosen (Landkreis Oldenburg) sowie Überblick zum Vorkommen in den Ländern Niedersachsen und Bremen. *Drosera*, 63–70.

Krooss, S. (1994). Überleben eines räuberischen Käfers in der Agrarlandschaft: Vergleich von Labor- und Freilandbeobachtungen zum Lebenszyklus von *Ocypus similis* (F.) (Coleoptera: Staphylinidae). *Zool. Beitr. N.F.*, **35**(2), 185–197.

Krooss, S., & Schaefer, M. (1998). How predacious are predators? A study on *Ocypus similis*, a rove beetle of cereal fields. *Ann. Appl. Biol.*, **133**(1), 1–16. https://doi.org/10.1111/j.1744-7348.1998.tb05797.x

Kubisz, D., & Melke, A. (1994). Rzadkie i nowe dla fauny Polski Staphylinidae (Coleoptera). Część II: Staphylininae. *Wiad. Entomol.*, **13**(1), 33–40.

Kubisz, D., & Melke, A. (1996). Der Erkenntnisszustand über die Kurzflüglerfauna (Coleoptera, Staphylinidae) von Bellinchen an der Oder (Nord-West Polen). *Acta Ent. Siles.*, **3**, 16–26.

Kubisz, D., & Pawłowski, J. S. (1998). Suplement do znajomości chrząszczy (Coleoptera) Ojcowskiego Parku Narodowego i jego otuliny (w 145 rocznicę rozpoczęcia inwentaryzacji faunistycznej w Ojcowie). *Pr. Mat. Muz. W. Szafera Prądn.*, **11–12**, 293–323.

Kubisz, D., & Szafraniec, S. (2003). Chrząszcze (Coleoptera) masywu Babiej Góry [Beetles (Coleoptera) of the Babia Góra Massif]. In: B.W. Wołoszyn, D.Wołoszyn, & W. Celary (Eds.), Monografia fauny Babiej Góry (pp. 163–221). Kraków: Komitet Ochrony Przyrody PAN.

Kubisz, D., & Szwałko, P. (1991). Nowe dla Podlasia i Puszczy Białowieskiej gatunki chrząszczy (Coleoptera). *Wiad. Entomol.*, **10**(1), 5–14.

Kubisz, D., Hilszczański, J., & Garbaliński, P. (2000). Chrząszcze (Coleoptera) rezerwatów „Czerwińskie Góry" I i II i ich otuliny w Puszczy Kampinoskiej. *Parki Nar. Rez. Przyr.*, **19**(4), 83–89.

Kubisz, D., Kuśka, A., & Pawłowski, J. (1998). Czerwona lista chrząszczy (*Coleoptera*) Górnego Śląska. In: Raporty i Opinie 3 (pp. 8–68). Katowice: Centrum Dziedzictwa Przyrody Górnego Śląska. https://slaskie-przyroda.pl/images/pobierz_PDF/czerwona_lista_chrzaszczy_1998.pdf

Kuhnt, P. (1912). Illustrierte Bestimmungs-Tabellen der Käfer Deutschlands. Ein Handbuch zum genauen und leichten Bestimmen aller in Deutschland vorkommenden Käfer. Lieferung 2–16. Stuttgart.

Kulczyński, W. (1873). Chrząszcze z okolic Miechowa w Królestwie Polskiém i Krakowa. *Spraw. Kom. Fizyogr.*, **7**, 98–109.

Kulwieć, K. (1907). Chrząszcze Polskie. Klucz do określania owadów tęgopokrywych dla użytku młodzieży, amatorów i ogrodników. Warszawa.

Labler, K. (1920). Erster Nachtrag zu A. Lüllwitz' Verzeichnis der im Regierungsbezirk Köslin in Pommern aufgefundenen Käfer. *Stett. Stett. Ent. Ztg.*, **81**, 145–148.

Labler, K. (1921). *Staphylinus brunnipes*. *Ent. Bl.*, **17**, 44.

Larsson, S. G., & Gigja, G. (1959). Coleoptera 1. Synopsis of the species. In: The zoology of iceland 3(46a, pp. 1–218). Copenhagen: Ejnar Munksgaard.
Legorsky, F. J. (2007). Zur Käferfauna von Wien. *Wiss. Mitt. Niederösterr. Landesmus.*, **18**, 47–261. www.biologiezentrum.at
Łęgowski, D., Mazur, S., & Smoleński, M. (1995). A contribution to the know ledge of the predatorous epigeic artropoda in an ecotonic fieldforest zone. *Acta Univ. N. Copern.*, Biol., **46**, 13–30.
Lentz, F. L. (1853). Preussische Käfer, für die sammelnde Jugend beschrieben. Königsberg.
Lentz, F. L. (1857). Neues Verzeichniss der Preussischen Käfer. Königsberg.
Lentz, F. L. (1879). Catalog der Preussischen Käfer neu bearbeitet. *Beitr. Naturk. Preuss.*, **4**.
Letzner, K. (1842). Seltene Käfer in Schlesien gefangene. *Übers. Arb. Ver. Schles. Ges. Vaterl. Cult.*, 1841, 108–109.
Letzner, K. (1854). Die Fauna der nächsten Umgebung von Meran. *Jb. Schles. Ges. Vaterl. Cult.*, **31**, 175–176.
Letzner, K. (1871). Verzeichniss der Käfer Schlesiens. *Z. Ent. N.F.*, **2**, I–XXIV + 328.
Letzner, K. (1880). Ueber den Status der schlesischen Coleoptern-Fauna am Ende des Jahres 1879. *Jb. Schles. Ges. Vaterl. Cult.*, **57**, 351–353.
Letzner, K. (1886). Fortsetzung des Verzeichnisses der Käfer Schlesiens. *Z. Ent. N.F.*, **11**, 69–148.
Letzner, K. (1887). Status der Coleoptern-Fauna Schlesiens Ende des Jahres 1886. *Jb. Schles. Ges. Vaterl. Cult.*, **64**, 228–229.
Lgocki, H. (1908). Chrząszcze (Coleoptera) zebrane w okolicy Częstochowy w Królestwie Polskiem w latach 1899–1903. *Spraw. Kom. Fizyogr.*, **41**, II, 18–151.
Lincoln, D. C. R. (1961). The oxygen and water requirements of the egg of *Ocypus olens* Müller (Staphylinidae, Coleoptera). *J. Insect Physiol.*, **7** (3–4), 265–272.
Löbl, I., & Löbl, D. (Eds., 2015). Catalogue of Palaearctic Coleoptera. Hydrophiloidea-Staphylinoidea (vol. 2. Revised and updated edition). Brill.
Löbl, I., & Smetana, A. (2004). Catalogue of Palaearctic Coleoptera. Vol. 2. Hydrophiloidea, Histeroidea, Staphylinoidea. Apollo Books.
Lupi, D., Colombo, M., & Zanetti, A. (2006). The rove beetles (Coleoptera Staphilinidae) of three horticultural farms in Lombardy (Northern Italy). *Bull. Zool. Agr. Bachic.*, **38**(2), 143–165.
Łomnicki, M. A. (1866). Przyczynek do fauny chrząszczów galicyjskich. Kraków.
Łomnicki, M. A. (1868). Wykaz chrząszczów tatrzańskich według rozsiedlenia pionowego. *Spraw. Kom. Fizyogr.*, 2, 152.
Łomnicki, M. A. (1884). Catalogus Coleopterorum Haliciae. Leopoli.
Łomnicki, M. A. (1886). Muzeum Imienia Dzieduszyckich we Lwowie. Dział I. Zoologiczny Oddział zwierząt bezkręgowych. IV. Chrząszcze, czyli tęgoskrzydłe (Coleoptera). Lwów.
Łomnicki, M. A. (1913). Wykaz chrząszczów czyli Tęgopokrywych (Coleoptera) ziem polskich. (Catalogus coleopterorum Poloniae). *Kosmos*, A, **38**, 21–155.
Lubawa, J., Luterek, R., & Mazur, A. (2000, 2001). Nowe dane o dwóch gatunkach kusakowatych (Coleoptera: Staphylinidae) w Wielkopolsce. *Wiad. Entomol.*, **19**(3–4), 195–196.

Lüllwitz, A. (1916). Verzeichnis der im Regierungsbezirk Köslin aufgefundenen Käfer. *Stett. Ent. Ztg.*, **76**, 205–264.

Lutz, L., Amendt, J., & Moreau, G. (2018). Carcass concealment alters assemblages and reproduction of forensically important beetles. *Forensic Sci. Int.*, **291**, 124–132. https://doi.org/10.1016/j.forsciint.2018.08.014

Mackiewicz, S. (1971). Wpływ aldryny i lindanu, stosowanych w formie mieszanek z nawozami, na entomofaunę pól uprawnych. *Biul. Inst. Ochr. Rośl.*, **48**, 217–231.

Mądra, A., Konwerski, S., & Matuszewski, S. (2014). Necrophilous Staphylininae (Coleoptera: Staphylinidae) as indicators of season of death and corpse relocation. *Forensic Sci. Int.*, **242**, 32–37. https://doi.org/10.1016/j.forsciint.2014.06.011

Magura, T., Nagy, D., & Tóthmérész, B. (2013). Rove beetles respond heterogeneously to urbanization. *J. Ins. Conserv.*, **17**, 715–724. https://doi.org/10.1007/s10841-013-9555-y

Majka, C. G., & Klimaszewski, J. (2008). Adventive Staphylinidae (Coleoptera) of the Maritime Provinces of Canada: further contributions. In: C. G. Majka & J. Klimaszewski (Eds.), Biodiversity, biosystematics, and ecology of Canadian Coleoptera. *ZooKeys*, **2**, 151–174. https://doi.org/10.3897/zookeys.2.5

Majzlan, O. (2005). The beetle (Coleoptera) assemblages in various biotopes in the surroundings of the Domica cave (National Park Slovenský kras). *Folia Oecol.*, **32**(2), 90–102.

Majzlan, O. (2006). Beetles (Coleoptera) of Brusno and Liptovská Teplička in Nízke Tatry National Park. *Nat. Tutela*, **10**, 33–42.

Majzlan, O., & Majzlan, J. (2011). Beetle (Coleoptera) assemblages at the nickel mine dump in Sereď. *Nat. Tutela*, **15**(1), 27–37.

Matuszewski, S., & Szafałowicz, M. (2013). Temperature-dependent appearance of forensically useful beetles on carcasses. *Forensic Sci. Int.*, **229**, 92–99.

Matuszewski, S. (2011). Estimating the Preappearance Interval from Temperature in *Creophilus maxillosus* L. (Coleoptera: Staphylinidae). *J. Forensic Sci.*, **57**(1), 136–145. https://doi.org/10.1111/j.1556-4029.2011.01958.x

Matuszewski, S., Bajerlein, D., Konwerski, S., & Szpila, K. (2008). An initial study of insect succession and carrion decomposition in various forest habitats of Central Europe. *Parki Nar. Rez. Przyr.*, **180**, 61–69.

Mazur, A. (1993a). Kusakowate (Coleoptera, Staphylinidae) wybranych pasm górskich Sudetów Zachodnich. *Wiad. Entomol.*, **12**(4), 243–250.

Mazur, A. (1993b). Rzadkie gatunków kusaków (Col., Staphylinidae) rezerwatu Muszkowicki Las Bukowy. *Przegl. Przyr.*, **4**(3), 165–169.

Mazur, A. (1998). Chrząszcze kusakowate (Coleoptera, Staphylinidae) w faunie polskiej części Karkonoszy. In: J. Sarosiek, J. Strusa (Eds.), Geoekologiczne Problemy Karkonoszy III. Materiały z sesji naukowej w Przesiece 15–18 X 1997 (pp. 53–61). Poznań: Acarus.

Mazur, A. (2000a). Przyczynek do poznania kusakowatych (Coleoptera, Staphylinidae) Pienin. In: Materiały konferencyjne. Pierwsze Sympozjum Staphylinidae. Rola chrząszczy kusakowatych (Coleoptera, Staphylinidae) w funkcjonowaniu i ochronie ekosystemów leśnych (pp. 24–28). 10–12 listopada 1999, Rogów.

Mazur, A. (2000b). Różnorodność gatunkowa zgrupowań kusakowatych (Coleoptera, Staphylinidae) lasów bukowych w rejonie Pogórza Sudeckiego. In: Materiały

konferencyjne. Pierwsze Sympozjum Staphylinidae. Rola chrząszczy kusakowatych (Coleoptera, Staphylinidae) w funkcjonowaniu i ochronie ekosystemów leśnych (pp. 20). 10–12 listopada 1999, Rogów.

Mazur, A. (2010). Chrząszcze kusakowate (Coleoptera: Staphylinidae) Karkonoszy – stan poznania i perspektywy badań. In: J. Nowacki, M. Bunalski, & L. Buchholz (Eds.), Ochrona owadów w Polsce. Entomofauna górska – stan aktualny oraz perspektywy jej ochrony w Polsce (pp. 65–71). *Wiad. Entomol.*, **29**, Supl.

Mazur, A. (2012). Waloryzacja górnoreglowych borów świerkowych w Sudetach metodą zooindykacyjną z zastosowaniem zgrupowań epigeicznych kusakowatych (Coleoptera, Staphylinidae). Poznań: Wyd. UP.

Mazur, S., Borowski, J., Łęgowski, D., Perliński, S., & Skłodowski, J. (2010). Monitoring wybranych grup stawonogów w Kampinoskim Parku Narodowym. Typescript.

Mazur, A., Klejdysz, T., Dobrowolski, M., Konwerski, S., Królik, R., Łabędzki, A., Mazur, M. M., & Przewoźny, M. (2016). Chrząszcze sapriksyliczne Karkonoszy. Część I – wykaz gatunków. *Acta Sci. Pol. Silv. Colendar. Ratio Ind. Lignar.*, **15**(4), 269–295. https://doi.org/10.17306/J.AFW.2016.4.29

Mazur, S., & Perliński, S. (2013). Waloryzacja ekosystemów Leśnego Kompleksu Promocyjnego „Lasy Spalsko-Rogowskie" na podstawie chrząszczy próchnowisk. *Stud. Mat. Cent. Eduk. Przyr.-Leśn. Rogow.*, (6) **35**, 160–175.

Melis, C., Teurlings, I., Linnell, J. D. C., Reidar A., & Bordoni, A. (2004). Influence of a deer carcass on Coleopteran diversity in a Scandinavian boreal forest: a preliminary study. *Eur. J. Wildl. Res.*, **50**, 146–149. https://doi.org/10.1007/s10344-004-0051-2

Melke, A., & Grzywocz, J. (2002). Kusakowate (Coleoptera: Staphylinidae) odłowione w rezerwacie kserotermicznym „Gipsowa Góra" na Górnym Śląska. *Rocz. Nauk. PTOP „Salamandra"*, **6**, 49–56.

Melke, A., & Gutowski, J. M. (1995). Zmiany fauny kusakowatych (Coleoptera: Staphylinidae) środowiska leśnego jako element monitoringu ekologicznego w północnowschodniej Polsce. *Pr. Inst. Bad. Leśn.*, **790–800**, 87–105.

Melke, A., & Maciejewski, K. H. (1999). Badania nad chrząszczami (Coleoptera) Puszczy Boreckiej. Część V. Kusakowate (Staphylinidae). *Wiad. Entomol.*, **18**(3), 143–151.

Merkl, O., Makranczy, G., Németh, T., Podlussány, A., & Szél, G. (2011). Further data to the beetle fauna of Maramureş, Romania (Coleoptera). *Stud. Univ.Vasile GOLDIŞ, Ştiinţele Vieţii*, **21**, 861–876.

Migliorini, M., Pigino, G., Bianchi, N., Bernini, F., & Leonzio, C. (2004). The effects of heavy metal contamination on the soil arthropod community of a shooting range. *Environ. Poll.*, **129**(2), 331–340. https://doi.org/10.1016/j.envpol.2003.09.025

Mihailov, I., & Derjanschi, V. (2011). The fauna of Stafilinids (Coleoptera, Staphylinidae) from "Zăbriceni" oak forest (mixed with ash and maple). *Stud. Comun.*, **24**, 50–55.

Mihailov, I., & Derjnaschi, V. (2010). The ecological aspects of roove-beetles (Coleoptera, Staphylinidae) from the Republic of Moldova. *Stud. Comun.*, **23**, 90–97.

Mihailov, I. (2016). Rove beetles predatory of the *Ontholestes* Ganglbauer, 1895 genus (Coleoptera, Staphylinidae, Staphylininae): their importance and distribution in the Republic of Moldova. In: Conferinţa "Sustainable use, protection of animal world and forest management in the context of climate change" (pp. 265–266). 12–13 octombrie 2016, Chişinău, Moldova.

Miłkowski, M. (2017). Przyczynek do poznania chrząszczy (Insecta: Coleoptera) Parku Zdrojowego w Nałęczowie. *Przegl. Przyr.*, **28**(1), 91–100.

Miller, L. (1859). Eine Excursion in das Tatra-Gebirge. (Schluss.). *Wien. Ent. Monatschr.*, **3**, 353–366.

Miller, L. (1868). Eine entomologische Reise in die ostgalizischen Karpathen. *Verh. Zool.-Bot. Ges. Wien*, **18**, 3–34.

Mokrzycki, T. (2007). Waloryzacja ekosystemów leśnych Gór Świętokrzyskich na podstawie struktury zgrupowań chrząszczy związanych z pniakami. In: J. Borowski, & S. Mazur (Eds.), Waloryzacja ekosystemów leśnych Gór Świętokrzyskich metodą zooindykacyjną (pp. 148–193). Warszawa: Wyd. SGGW.

Mokrzycki, T. (2011). Zgrupowania saproksylicznych chrząszczy (Coleoptera) w pniakach wybranych gatunków drzew – studium porównawcze. Warszawa: Wyd. SGGW.

Mokrzycki, T., Borowski, J., Byk, A., & Rutkiewicz, A. (2013). Waloryzacja ekosystemów Leśnego Kompleksu Promocyjnego „Lasy Spalsko-Rogowskie" na podstawie struktury zgrupowań chrząszczy (Coleoptera) zasiedlających pniaki. *Stud. Mat. Centr. Eduk. Przyr.-Leśn. Rogow.*, (3) **35**, 48–82.

Mossakowski, D. (1964). Über Verbreitung und Ökologie einiger Käfer in Mooren und Heiden Schleswig-Holsteins (Coleptera: Carabidae et Staphylinidae). *Faunist. Mitteilun. Norddeutsch.*, **2**(4), 106–111.

Mroczkowski, M. (1950). Uwagi o kolejnym pojawianiu się kilku gatunków rodzaju *Nicrophorus* Fabr. i *Neonicrophorus* Hatch (Col., Silphidae). *Pol. Pismo Entomol.*, **19**(3–4), 196–199.

Mroczkowski, M. (1978). Staphylinoidea nekrofagiczne Pienin (Coleoptera). *Fragm. Faun.*, **22**, 235–245.

Mroczkowski, M., & Stefańska, J. (1991). *Coleoptera* – Chrząszcze. In: J. Razowski (Ed.), Checklist of animals of Poland. Vol. III, Part XXXII/22, 23 *Insecta*: *Coleoptera*, Strepsiptera (pp. 7–197). Kraków: Krakowskie Wydawnictwo Zoologiczne.

Mühlfeit, M. (2017). First records of 16 beetles to the fauna of Albania (Coleoptera: Staphylinidae, Biphyllidae, Colydiidae, Melandryidae, Scarabaeidae, Rhynchitidae and Curculionidae). *Elateridarium*, **11**, 13–16.

Müller, E. (1895). Käfer aus Pappelhof (Kr. Trebnitz). *Z. Ent. N.F.*, **20**, 13.

Müller, J. (1926). Untersuchungen über europäische Staphylinus-Arten. *Col. Centralbl.*, **1**, 5–24.

Myczkowski, S. (1954). O biologicznym zwalczaniu szkodników wywołujących zamieranie wiązów. *Chr. Przyr. Ojcz.*, **10**(6), 3–20.

Myrdzik, K. (1933). Materiały do fauny chrząszczy lądowych województwa Poznańskiego. *Pr. Kom. Biol. Wydz. Mat.-Przyr. PTPN*, **6**, 173–194.

Nakládal, O. (2011). Results of beetles (Coleoptera) survey of Zástudáncí National Nature Reserve (Central Moravia) 2008 – part 1. *Acta Musei Siles., Scientiae Naturales*, **60**, 1, 63–78. https://doi.org/10.2478/v10210-011-0008-5

Neresheimer, J., & Wagner, H. (1939). Beiträge zur Coleopterenfauna der Mark Brandenburg. XVII. *Märk. Tierw.*, **4**, 1–30.

Newton, A. F. (1987). Four *Staphylinus* (sensu lato) Species New to North America, with Notes on Other Introduced Species (Coleoptera: Staphylinidae). *The Coleopterists Bulletin*, **41**(4), 381–384. http://www.jstor.org/stable/4008525

Newton, A. F. Jr., & Thayer, M. K. (1992). Current classification and family-group names in Staphyliniformia (Coleoptera). *Fieldiana: Zoology* (N. S.), **67**, 1–92.
Nield, C. E. (1976). Aspects of the biology of *Staphylinus olens* (Müller), Britain's largest Staphylinid beetle. *Ecol. Entomol.*, **1**(2), 117–126.
Noskiewicz, J. (1950). Charakterystyka faunistyczna Śląska. In: R. Kobendza, J. Kobendzina, Z. Kaczorowska, J. Noskiewicz (Eds.), Fizjografia ziem zachodnich i północnych (pp. 17). Gospodarstwo Wiejskie na Ziemiach Zachodnich, nr 12. Warszawa: Państwowy Instytut Wydawnictw Rolniczych.
Nowicki, M. (1864). Przyczynek do owadniczej fauny Galicyi. Kraków.
Nowicki, M. (1865). Insecta Haliciae Musei Dzieduszyckiani. Cracoviae.
Nowicki, M. (1868). Zapiski z fauny tatrzańskiéj. *Spraw. Kom. Fizyogr.*, **2**, 77–91.
Nowicki, M. (1870). Zapiski faunicze. *Spraw. Kom. Fizyogr.*, **4**, 1–28.
Nowicki, M. (1873). Verzeichniss galizischer Käfer. In: Beiträge zur Insektenfauna Galiziens (pp. 7–52). Krakau.
Nowosad, A. (1990). Staphylinidae (Coleoptera) gniazd kreta – *Talpa europaea* L. w Polsce. Ser. Zoologia, 15. Poznań: Wyd. Naukowe UAM.
Nowosad, A. (2000). Wstępne wyniki badań nad chrząszczami kusakowatymi Staphylinidae (Micropeplinae – Tachyporinae) gniazd ptaków i ssaków. In: Materiały konferencyjne. Pierwsze Sympozjum Staphylinidae. Rogów, 10-12 listopada 1999. Rola chrząszczy kusakowatych (Coleoptera, Staphylinidae) w funkcjonowaniu i ochronie ekosystemów leśnych (pp. 29–40). Poznań, Bogucki Wyd. Naukowe S.C. 10–12 listopada 1999, Rogów.
Nowosad, A., & Mazur, A. (2010). Różnorodność gatunkowa chrząszczy kusakowatych (Coleoptera, Staphylinidae) w ekosystemach leśnych i ich ochrona. In: S. Mazur, H. Tracz (Eds.), Ochrona lasów wyzwaniem cywilizacyjnym XXI wieku (pp. 77––100). Warszawa: Wyd. SGGW.
Ocypus olens (O.F.Müller, 1764) in GBIF Secretariat (2022). GBIF Backbone Taxonomy. Checklist dataset https://doi.org/10.15468/39omei accessed via GBIF.org on 2022-12-06
Oko, Z. (1963). Pożywienie kuropatw dorosłych (*Perdix perdix* L.) w cyklu rocznym na terenie województwa Poznańskiego w latach 1960–1961. *Pr. Kom. Nauk Roln. Leśn. PTPN*, **14**(1), 39–96.
Olejnik, E. (1994). Żarlinki – Paederinae, wydłużaki – Xantholininae i kusaki – Staphylininae (Staphylinidae, Coleoptera) wybranych parków Poznania. *Bad. Fizjogr. Pol. Zach.*, C – Zool., **41**, 5–15.
Orth, R. E., Moore, I., Fisher, T. W., & Legner, E. F. (1975). A rove beetle, *Ocypus olens*, with potential for biological control of the Brown Garden Snail, *Helix aspersa*, in California, including a key to the Nearctic species of *Ocypus*. *Can. Entomol.*, **107** (10), 1111–1116. https://doi.org/10.4039/ent1071111-10
Orth, R. E., Moore, I., Fisher ,T. W., & Legner, E. F. (1976). Biological notes on *Ocypus olens*, a predator of Brown Garden Snail, with descriptions of the larva and pupa (Coleoptera: Staphylinidae). *Psyche*, **82**(3/4), 292–298.
Otto, A. (1890). Zur Synonymie des *Ocypus olens* Müll. *Wien. Ent. Z.*, **9**, 62–64.
Özgen, İ., Yaman, S., & Örgel, S. (2017). Some additional notes on the genus *Ocypus* Stephens in Turkey (Coleoptera: Staphylinidae: Staphylininae). *Munis Entomol. Zool.*, **12**(1), 332–335.

Pacuk, B., Melke, A., & Kozłowski, M. W. (2011). Nowe stanowiska *Emus hirtus* (Linnaeus, 1758) (Coleoptera: Staphylinidae: Staphylininae) w Polsce. *Wiad. Entomol.*, **30**(1), 58–60 [549].

Päivinen, J., Ahlroth, P., & Kaitala, V. (2002). Ant-associated beetles of Fennoscandia and Denmark. *Entomol. Fen.*, **13**, 20–40.

Paśnik, G. (1997). Interesujące i rzadkie dla fauny krajowej gatunki kusakowatych 1 (Coleoptera: Staphylinidae). *Wiad. Entomol.*, **16**(2), 69–74.

Paśnik, G. (1998). Kusakowate (Coleoptera: Staphylinidae) Beskidu Małego. *Rocz. Muz. Górnośl.*, *Przyroda*, **15**, 57–78.

Paśnik, G. (1999). Nowe i rzadkie w faunie Polski gatunki kusakowatych (Coleoptera: Staphylinidae). *Wiad. Entomol.*, **17**(3–4), 151–156.

Paulian, R. (1941). Les premiers états des Staphylinoides (Coleoptera. étude de morphologie comparée. *Mém. Mus. Nat. Hist. Nat.*, (n. sér), **15**, 1–361.

Pawlikiewicz, P., & Krupicki, A. (2008). Nowe stanowiska *Emus hirtus* (Linnaeus, 1758) i *Ocypus ophthalmicus* (Scopoli 1763) (Coleoptera: Staphylinidae: Staphylininae) w Polsce. *Wiad. Entomol.*, **27**(2), 114 [474].

Pawłowski, J. S. (1963). Bezkręgowce lądowe. In: W. Szafer (Ed.), Babiogórski Park Narodowy (pp. 196–208). Kraków: Zakł. Ochr. Przyr. PAN.

Pawłowski, J. S. (1964). Nowe dla Babiej Góry gatunki chrząszczy (Coleoptera). *Fragm. Faun.*, **11**, 103–113.

Pawłowski, J. (1967). Chrząszcze (Coleoptera) Babiej Góry. *Acta Zool. Cracov.*, **12**, 419––665.

Pawłowski, J. (2006). Szkic rozwoju zoologii na ziemiach polskich. *Kosmos*, **55**(1), 5–44.

Pawłowski, J. S., & Szujecki, A. (1966). Nowe dla Babiej Góry gatunki chrząszczy (Coleoptera). II. Staphylinidae. *Fragm. Faun.*, **12**, 373–384.

Pawłowski, J. S., Mazur, M., Młynarski, J. K., Stebnicka, Z., Szeptycki, A., & Szymczakowski, W. (1994). Chrząszcze (Coleoptera) Ojcowskiego Parku Narodowego i terenów ościennych. Ojców: Muzeum W. Szafera Prądnik.

Pawłowski, J. S., Petryszak, B., Kubisz, D., & Szwałko, P. (2000). Chrząszcze (Coleoptera) Bieszczadów Zachodnich. *Monogr. Bieszcz.*, **8**, 9–143.

Pawłowski, J., Kubisz, D., & Mazur, M. (2002). Coleoptera Chrząszcze. In: Z. Głowaciński (Ed.), Czerwona lista zwierząt ginących i zagrożonych w Polsce (pp. 88–110). Kraków: Instytut Ochrony Przyrody PAN.

Pax, F. (1921). Die Tierwelt Schlesiens. Jena.

Petrenko, A. A. (2013). About hunting methods of predatory rove beetles using *Ontholestes murinus* (Linné, 1758) (Coleoptera: Staphylinidae: Staphylininae) as an example. *Kharkov Entomol. Soc. Gaz.*, **21**(2), 9–11.

Pfeil, O. (1854). Einige Käfer-Arten aus Misdroy. *Stett. Ent. Ztg.*, **15**, 30.

Pfeil, O. (1866). Zwei entomologische Riesengebirgs-Excursionen. *Berl. Ent. Z.*, **9**, 219–233.

Pietrykowska-Tudruj, E., & Staniec, B. (2012). Comparative larval morphology of *Platydracus* and *Staphylinus* (Staphylinidae: Staphylinini: Staphylinina) with notes on their biology and redescription of the pupa of Staphylinus. *Zootaxa*, **3580**, 24–42. https://doi.org/10.11646/ zootaxa.3580.1.2

Pietsch, P. (1897). Für Schlesien neue Käfer. *Z. Ent. N.F.*, **22**, 23–25.

Podbylski, M., & Nowosad, A. (2001). Materiały do znajomości chrząszczy kusakowatych (Staphylinidae, Coleoptera) Wielkopolskiego Parku Narodowego (Rejon badawczy: Luboń, Czapury, Wiórek, Łęczyca). In: Materiały konferencyjne. Drugie Sympozjum Staphylinidae „Badamy, aby chronić" (pp. 26–27). 16–18 marca 2001, Poznań-Jeziory.

Polentz, G. (1936). Beiträge zur schlesischen Käferfauna. *Z. Ent. N.F.*, **18**, 1, 2–9.

Polentz, G. (1937). Beiträge zur schlesischen Käferfauna. *Z. Ent., Breslau*, **18**, 2, 6–15.

Polentz, G. (1938). Beiträge zur schlesischen Käferfauna. *Mitt. Ent. Ges. Halle*, **16**, 48–60.

Polentz, G. (1942a). Beiträge zur schlesischen Käferfauna. *Z. Ent. N.F.*, **19**, 1, 4–11.

Polentz, G. (1942b). *Scaphidium quadrimaculatum* Ol. und *Apion rubens* Steph. bei Guentherbrücke, *Staphylinus latebricola* Grv. aus Ransern und *Stenus nitidiusculus* Steph. aus dem Riesengebirge. *Z. Ent. N.F.*, **19**, 1–2.

Polentz, G. (1943). Beiträge zur schlesischen Käferfauna. *Z. Ent. N.F.*, **19**, 2, 6–9.

Pototskaya, V. A. (1966). Nekotoryje licinki zukov roda *Staphylinus* L. (sensu lato) (Coleoptera, Staphylinidae). *Entomol. Obozr.*, **65**, 354–363.

Pototskaya, V. A. (1967). Opredelitel' lichinok korotkonadkrylykh zhukov evropeiskoi chasti SSSR. Moskva: Acad. Nauk SSSR, Izd. Nauka.

Pototskaya, V. A. (1971). The role of larval characters in the systematics of Staphylinidae. International Congress of Entomology, 13th, Moscow, 1968. Trudy. 1, 283–284.

Psarev, A. M. (2001a). Trophic groups of Scatobiont insects in Gornyi Altai Pastures. *Entomol. Rev.*, **81**, suppl. 1, 156–159.

Psarev, A. M. (2001b). Succession of the beetle assemblage in cow and horse dung on mountain pastures. *Entomol. Rev.*, **3**, 125–130.

Psarev, A. M. (2002). Succession in a insects community inhabiting horse dung. *Russian Entomol. J.*, **11**(3), 287–290.

Puchkov, A. V., Brygadyrenko, V. V., Faly, L. I., & Komaromi, N. A. (2020). Staphylinids (Coleoptera, Staphylinidae) of Ukrainian metropolises. *Biosyst. Div.*, **28**(1), 41–47. https://doi.org/10.15421/012007

Reitter, E. (1909). Fauna Germanica. Die Käfer des Deutschen Reiches. II. Band. Schr. Dtsch. Stuttgart: Lehrerver. Naturk.

Reitter, E. (1870a). Eine Excursion in's Tatragebirge im Jahre 1869. *Verh. Nat. Ver. Brünn.*, **8**, 1, 3–25.

Reitter, E. (1870b). Uebersicht der Käfer-Fauna von Mähren und Schlesien. *Verh. Nat. Ver. Brünn.*, **8**, 2, III–VIII, 1–195.

Renner, K., & Messutat, J. (2007). Untersuchungen zur Käferfauna der Umgebung von Skwierzyna im westlichen Polen (Wielkopolska). *Coleo*, **8**, 16–20.

Riedel, M. P. (1892). Beitrag zur Käferfauna der Provinz Posen. *Dtsch. Ent. Z.*, **6**, 106–107.

Riedel, M. P. (1893). Beitrag zur Käferfauna der Provinz Posen. *Ent. Nachr.*, **19**, 345–349.

Risch, A. C., Ochoa-Hueso, R., van der Putten, W. H., Bump, J. K., Busse, M. D., Frey, B., Gwiazdowicz, D. J., Page-Dumroese, D. S., Vandegehuchte, M. L., Zimmermann, S., & Schütz, M. (2018). Size-dependent loss of aboveground animals differentially affects grassland ecosystem coupling and functions. *Nature Comm.*, **9**, 3684. https://doi.org/10.1038/s41467-018-06105-4

Roger, J. (1856). Verzeichniss der bisher in Oberschlesien aufgefundenen Käferarten. *Z. Ent. N.F.*, **10**, Coleoptera, 1–132.

Rotermund, W. (1833). Seltene Käfer in Schlesien gefunden. *Übers. Arb. Ver. Schles. Ges. Vaterl. Cult.*, **1832**, 69.

Rottenberg, A. (1864). Eine Excursion nach Albendorf in der Grafschaft Glatz. *Berlin. Ent. Z.*, **8**, 394–395.

Rottenberg, A. (1868). Sammelbericht aus Schlesien. *Berl. Ent. Z.*, **11**, 411–415.

Roubal, J. (1910). K faune zhestkokrylykh Litvy. *Rus. Ent. Obozr.*, **10**, 195–204.

Roubal, J. (1930). Katalog Coleopter (Brouků) Slovenska a Podkarpatska na základě bionomickém a zoogeografickém a spolu systematický doplněk Ganglbauerových «Die Käfer von Mitteleuropa» a Reitterovy «Fauna germanica». *Díl. Pr. Uč. Spol. Šafař. Bratisl.*, **3**, 527.

Rüschkamp, F. (1931). Zur Rheinischen Käferfauna XI. *Ent. Bl.*, **27**, 134–141.

Ruta, R., & Melke, A. (2011). Materiały do znajomości chrząszczy (Insecta: Coleoptera) rezerwatu przyrody „Kuźnik" koło Piły. *Wiad. Entomol.*, **30**(2), 84–98.

Ruta, R. (2007). Chrząszcze (Insecta: Coleoptera) kserotermicznych Wzgórz Byszewickich w Dolinie Noteci. *Nowy Pam. Fizjogr.*, **5**, 49–107.

Ruta, R. (2009). Chrząszcze (Insecta: Coleoptera) Rynny Jezior Kuźnickich ze szczególnym uwzględnieniem rezerwatu „Kuźnik". In: P.M. Owsianny (Ed.), Rynna Jezior Kuźnickich i rezerwat przyrody „Kuźnik" – bioróżnorodność, funkcjonowanie, ochrona i edukacja (pp. 150–177). Piła: Muzeum Stanisława Staszica.

Ruta, R., Orzechowski, R., Aleksandrowicz, O., Borowski, J., Buchholz, L., Komosiński, K., Lubecki, K., & Przewoźny, M. (2016). Chrząszcze (Insecta: Coleoptera) Gryżyńskiego Parku Krajobrazowego. *Przegl. Przyr.*, **27**(2), 28–62.

Rutkiewicz, A. (2001). Próba waloryzacji lasów Puszczy Białowieskiej metodą zooindykacyjną na przykładzie niefitofagicznych chrząszczy podkorowych (Coleoptera). In: A. Szujecki (Ed.), Próba szacunkowej waloryzacji lasów Puszczy Białowieskiej metodą zooindykacyjną (pp. 319–332). Warszawa: Wyd. SGGW.

Rutkiewicz, A. (2002). Waloryzacja lasów Puszczy Białowieskiej na podstawie chrząszczy podkorowych. In: VII Sympozjum ochrony ekosystemów leśnych. Zadania gospodarcze lasów a funkcje ochrony przyrody (pp. 231–245). Rogów, 25–27 marca 2002. Warszawa: Wyd. SGGW.

Rutkiewicz, A. (2004). An attempt of valorization of woods of the Bialowieża Primeval Forest using the zooindication method on the basis of underbark beetles. *Baltic J. Coleopterol.*, **4**(2), 125–136.

Rutkiewicz, A. (2007). Waloryzacja lasów Gór Świętokrzyskich na podstawie struktury zgrupowań chrząszczy saproksylicznych powierzchni pni drzew. In: J. Borowski & S. Mazur (Eds.), Waloryzacja ekosystemów leśnych Gór Świętokrzyskich metodą zooindykacyjną (pp. 20–56). Warszawa: Wyd. SGGW.

Rutkiewicz, A., Borowski, J., Byk, A., & Mokrzycki, T. (2013). Waloryzacja lasów Leśnego Kompleksu Promocynego „Lasy Spalsko-Rogowskie" na podstawie zgrupowań chrząszczy saproksylicznych powierzchni pni drzew. *Stud. Mat. Centr. Eduk.--Przyr. Leśn. Rogow.*, (5) **35**, 129–160.

Salmonowicz, M. (2001). Nowe gatunki chrząszczy kusakowatych (Coleoptera, Staphylinidae) dla Pojezierza Mazurskiego. In: Materiały konferencyjne. Drugie Sympozjum Staphylinidae „Badamy, aby chronić" (pp. 24–26). Poznań-Jeziory, 16–18 marca 2001.

Schaitter, I. (1870). Motyle i chrząszcze z okolic Rzeszowa. *Spraw. Kom. Fizyogr.*, **4**, 30–36.

Schatz, I., & Zanetti, A. (2017). Rove beetles (Coleoptera, Staphylinidae) in the LTS-ER-research area in Mazia/Matsch (South Tyrol, Prov. Bolzano, Italy) – Investigations in the frame of the research week 2016. *Gledreriana*, **17**, 205–215.

Schatz, I. (2008). Kurzflügelkäfer (Coleoptera : Staphylinidae) im Naturpark Schlern – Rosengarten (Südtirol, Italien). *Gredleriana*, **8**, 377–410.

Scheerpeltz, O. (1933). Staphylinidde VII. In: S. Schenkling & W. Junk (Eds.), Coleopterorum Catalogus, 6, 129 (pp. 989–1500). Berlin.

Schillhammer, H. (2009). Notes on some West Palearctic Staphylinini, with description of a new species from Spain (Coleoptera: Staphylinidae: Staphylininae). *Koleopterol. Rundsch.*, **79**, 97–116.

Schillhammer, H. (2011). Subtribus Staphylinina Laterille, 1802. In: V. Assing, & M. Schülke (Eds.), Freude-Harde-Lohse-Klausnitzer – Die Käfer Mitteleuropas. Band 4. Staphylinidae I. Zweite neubearbeitete Auflage (I–XII, pp. 484–507). Heidelberg: Spektrum Akademischer.

Schillhammer, H. (2012). Studies on the *Eucibdelus* lineage 3. Revision of *Rhyncocheilus* Fauvel (Coleoptera: Staphylinidae: Staphylininae). *Koleopterol. Rundsch.*, **82**, 189–217.

Schilsky, J. (1888). Systematisches Verzeichnis der Käfer Deutschlands mit besonderer Berücksichtigung ihrer geographischen Verbreitung. Zugleich ein Käfer-Verzeichnis der Mark Brandenburg. Berlin.

Schilsky, J. (1909). Systematisches Verzeichnis der Käfer Deutschlands und Deutsch-Oesterreichs. Mit besonderer Angabe der geographischen Verbreitung aller Käferarten in diesem Faunengebiete. Zugleich ein Käferverzeichnis der Mark Brandenburg. Stuttgart.

Scholz, R. (1902). Auf der Hohen Iser. (Entomologische Erinnerung.). *Ins.-Börse*, **19**, 83–84, 91–92.

Scholz, R. (1924). *Eremotes elongatus* Gyll. und *sculpturatus* Waltl. *Ent. Bl.*, Berlin, **20**, 188–189, – F.

Scholz, R. (1932). *Staphylinus compressus* Marsh. *Ent. Bl.*, **28**, 138.

Scholz, R. (1935). Coleopterologische Mitteilungen. *Z. Ent. N.F.*, **17**(4), 3–5.

Schülke, M. & Smetana, A. (2015). Staphylinidae. In: Löbl, I., & Löbl, D. (Eds.). Catalogue of Palaearctic Coleoptera. Hydrophiloidea-Staphylinoidea (vol. 2. Revised and updated edition). Brill, Leiden/Boston.

Schwaller, W. (1973). Die larve von *Parabemus fossor* (Col., Staphylinidae). *Entomol. Zeitschr.*, **83**(5), 49–51.

Schwarz, E., & Letzner, K. (1874). Verzeichniss der während der Frühjahrs-Uberschwemmung im Jahre 1871 bei Breslau gefangenen Käferarten. In: Entomologische Miscellen. Herausgegeben von dem Verein für schlesische Insektenkunde (pp. 45–53). Breslau.

Seidlitz, G. (1889). Fauna Transsylvanica. Die Kaefer Siebenbuergens. III und IV. Lieferung. Königsberg. XLI–XLVIII, 49–128 [Gattungen], 241–544 pp.

Sharova, I. Kh. & Pototskaya, V. A. (1972). Parallelism & convergence in larvae of Carabidae & Staphylinidae (Coleoptera). *Zhur. Obshch. Biol.*, **33** (2), 187-195.

Siebold, C. Th. E. von (1847). Beiträge zur Fauna der wirbellosen Thiere der Provinz Preussen (Zehnter Beitrag). Die preussischen Käfer. *N. Preuss. Prov.-Bl.*, **3**, 203–219, 350–367, 419–451.

Sienkiewicz, P., & Staniec, B. (2006). Nowe dane o występowaniu gatunków z rodzaju *Dyschirius* Bon. (Coleoptera: Carabidae) w środkowo-wschodniej Polsce z uwzględnieniem związanych z nimi kusakowatych z rodzaju *Bledius* Leach (Coleoptera: Staphylinidae). *Wiad. Entomol.*, **25**(2), 69–78.

Silfverberg, H. (1992). Enumeratio coleopterorum Fennoskandiae, Daniae et Baltiae. Helsinki: Helsingin Hyönteisvaihtoyhdistys.

Słabikowski, A. (2006). Dane o występowaniu przedstawicieli Staphylinidae (Coleoptera) na Wyżynie Krakowsko-Wieluńskiej. *Biul. Część. Koła Entomol.*, **4**, 3–7.

Sławska, M., & Smoleński, M. (2003). Skoczogonki (Collembola) i kusakowate (Staphylinidae) torfowisk wysokich. Warszawa: Wyd. SGGW.

Smetana, A., & Davies, A. (2000). Reclassification of the north temperate taxa associated with *Staphylinus sensu lato*, including comments on relevant subtribes of Staphylinini (Coleoptera: Staphylinidae). *Am. Mus. Novit.*, **3287**, 1–88. https://doi.org/10.1206/0003-0082(2000)287<0001:rotntt>2.0.co;2

Smetana, A., & Herman, L. H. (2001). Brief history of taxonomic studies of the Staphylinidae including biographical scetches of the investigators. In: L.H. Herman (Ed.), Catalog of the Staphylinidae (Insecta: Coleoptera). 1758 to the end of the second millenium. I. Introduction, history, biographical sketches, and omaliinae group. *Bull. Am. Mus. Nat. Hist.*, **265**, 17–159.

Smetana, A., & Shavrin, A. (2013). New species of the genus *Ontholestes* Ganglbauer, 1895 (Coleoptera: Staphylinidae: Staphylininae) from Yakutia. *Zootaxa*, **3721** (3), 296–299 http://dx.doi.org/10.11646/zootaxa.3721.3.7

Smetana, A. (1958). Fauna ČSR. Staphylinidae I. Staphylininae. Praha.

Smoleński, M. (1993). Wstępna analiza materiału dotyczącego chrząszczy z rodziny Staphylinidae (Coleoptera) z pożarzysk w nadl. Solec Kujawski. In: A. Szujecki (Ed.), Stan i prognoza występowania glebowej makrofauny. Warszawa: SGGW.

Smoleński, M. (1995a). Antropogeniczne przeobrażenia zgrupowań kusakowatych (Coleoptera, Staphylinidae) w ekosystemach borów sosnowych Polski. Strefy ekotonowe. In: A. Szujecki (Ed.), Antropogeniczne przeobrażenia epigeicznej i glebowej entomofauny borów sosnowych. Warszawa: Fund. Rozwój SGGW.

Smoleński, M. (1995b). Kusakowate (Coleoptera, Staphylinidae) wykazane z olsu z terenu środkowego Pojezierza Pomorskiego. *Wiad. Entomol.*, **14**(2), 123 [119].

Smoleński, M. (1996a). Wykaz chrząszczy z rodziny kusakowatych (Coleoptera, Staphylinidae) zebranych w 1993 roku w okolicach Starej Brdy Pilskiej (UTM XV47). *Wiad. Entomol.*, **14**(3), 183–184.

Smoleński, M. (1996b). Kolekcja M. Kłapacza – Coleoptera – Staphylinidae. Część II. *Wiad. Entomol.*, **15**(1), 13–22.

Smoleński, M. (2000a). Model naturalnego, epigenicznego zgrupowania kusakowatych (Coleoptera: Staphylinidae) w zastosowaniu do oceny wartości przyrodniczej borów bażynowych (*Empetro-nigri Pinetum*). Warszawa.

Smoleński, M. (2000b). Kusakowate (Coleoptera: Staphylinidae) borów bażynowych (*Empetro-nigri Pinetum*) Mierzei Łebskiej w Słowińskim Parku Narodowym. *Wiad. Entomol.*, **18**(4), 207–222.

Smoleński, M. (2006). Zooindication-based monitoring of anthropogenic transformations in Białowieża Primeval Forest. Rove beetles (Staphylinidae). In: A.

Szujecki, (Ed.), Zooindication-based monitoring of anthropogenic transformation in Białowieża Primeval Forest (pp. 171–236). Warszawa: Wyd. SGGW.

Smoleński M., & Szujecki, A. (2001). Waloryzacja lasów Puszczy Białowieskiej na podstawie struktury zgrupowań Staphylinidae (Coleoptera). In: A. Szujecki (Ed.), Próba szacunkowej waloryzacji lasów Puszczy Białowieskiej metodą zooindykacyjną (pp. 105–176). Warszawa: Wyd. SGGW.

Smoleński, M., Szujecki, A., & Kwiatkowski, W. (2004). The successional model of forest landscapes valorisation. *Baltic J. Coleopterol.*, **4**(2), 89–116.

Solodovnikov, A., & Schomann, A. (2009). Revised systematics and biogeography of 'Quediina' of sub-Saharan Africa: new phylogenetic insights into the rove beetle tribe Staphylinini (Coleoptera: Staphylinidae). *Syst. Entomol.*, **34**(3), 443–466.

ANONIM Spisy chrząszczów. 2. Z okolicy Bochni (chrząszcze zebrane przez P. Graczyńskiego, oznaczone przez Łomnickiego) (1867). *Spraw. Kom. Fizyogr.*, 1, 143–144.

Stan, M. (2002). Rove beetles (Coleoptera: staphylinidae) from Maramures (Romania). *Trav. Mus. Hist. Nat. Grigore Antipa*, **44**, 209–248.

Stan, M. (2004). Checklist of Staphylinids (Coleoptera: Staphylinidae) of Romania. *Trav. Mus. Hist. Nat. Grigore Antipa*, **46**, 83–108.

Stan, M. (2009). Rove beetles (Coleoptera: Staphylinidae) from Mehedinþi Plateau Geological Park (Mehedinþi County, Romania). *Trav. Mus. Hist. Nat. Grigore Antipa*, **52**, 233–247.

Stan, M. (2010). On the species of *Ocypus* Leach of the Carpathian basin with special reference to the species of Romania (Coleoptera: Staphylinidae: Staphylininae: Staphylinini). *Acta Entomol. Serb.*, **15**(2), 171–193.

Stan, M., & Bacal, S. (2006). Noi contributii la cunoasterea stafilinidelor (Coleoptera: Staphylinidae) din rezervatia peisagistica Codrii Tigheciului (Republica Moldova) *Oltenia-studii si comunicari stiintele naturii*, **22**, 155–159.

Staniec, B. (1991). Rzadkie Staphylinidae (Coleoptera) ze wschodniej Polski. *Wiad. Entomol.*, **10**(4), 207–213.

Staniec, B. (1994). Materiały do poznania kusakowatych (Coleoptera, Staphylinidae) Wyżyny Lubelskiej. Część I. *Wiad. Entomol.*, **13**(2), 95–99.

Staniec, B. (1996a). Kusakowate (Coleoptera, Staphylinidae) nowe dla Roztocza. *Wiad. Entomol.*, **15**(1), 55–56 [139].

Staniec, B. (1996b). Materiały do poznania kusakowatych (Coleoptera, Staphylinidae) Wyżyny Lubelskiej. Część II. *Wiad. Entomol.*, **15**(1), 23–30.

Staniec, B. (1996c). Morphology of the pupa of *Quedius plagiatus* Mannerheim (Coleoptera: Staphylinidae). *Pol. Pismo Entomol.*, **65**, 113–118.

Staniec, B. (1999). A description of the pupae of *Quedius fumatus* (Stephens), *Q. humeralis* Stephens, *Q. mesomelinus* (Marsham) and *Q. fuliginosus* (Gravenhorst) (Coleoptera: Staphylinidae: Staphylininae). *Genus*, **10**(1), 47–57.

Staniec, B. (2002). Staphylinidae (Coleoptera) wybranych zbiorowisk roślinnych rezerwatu kserotermicznego „Stawska Góra" koło Chełma. *Parki Nar. Rez. Przyr.*, **21**(3), 299–310.

Staniec, B. (2004a). Kusakowate (*Staphylinidae*). In: W. Bogdanowicz, E. Chudzicka, I. Pilipiuk, & E. Skibińska (Eds.), Fauna of Poland – characteristics and checklist of species (pp. 153–155, 162–176). Warszawa: Muzeum i Instytut Zoologii PAN.

Staniec, B. (2004b). The pupae of *Ontholestes murinus* (Linnaeus, 1758), *Philonthus rectangulus* Sharp, 1874 and a supplement to the pupal morphology of *Philonthus succicola* Thomson, 1860 (Coleoptera, Staphylinidae). *Genus*, **15**(1), 37–46.

Staniec, B. (2010). Contribution to the knowledge of the rove-beetles (Coleoptera: Staphylinidae) of the Polesie National Park. Part I – Staphylinini. *Wiad. Entomol.*, **29**(1), 15–23.

Staniec, B., & Pietrykowska, E. (2005). The pupae of *Tasgius* (= *Ocypus* sensu lato) *melanarius* (Herr, 1839) and *Quedius cruentus* (Olivier, 1795) (Coleoptera: Staphylinidae). *Genus*, **16**, 19–28.

Staniec, B., & Pietrykowska-Tudruj, E. (2007). Comparative morphology of the eggs of sixteen Central European species of Staphylininae (Coleoptera, Staphylinidae). *Dtsch. Entomol. Zeitsch.*, **54**, 235–252.

Staniec, B., & Pietrykowska-Tudruj, E. (2019). Pupae of the mega-diverse rove beetle tribe Staphylinini (Coleoptera, Staphylinidae): their traits and systematic significance. *ZooKeys*, **877**, 133–159. https://doi.org/10.3897/zookeys.877.35715

Staniec, B., Pilipczuk, J., & Pietrykowska-Tudruj, E. (2009). Morphology of developmental stages and notes on biology of *Ocypus fulvipennis* (Erichson, 1840) (Coleoptera, Staphylinidae). *Ann. Zool.*, 59, 47–66. https://doi.org/10.3161/000345409X432583

Stanoch-Podbylska, M., & Nowosad, A. (2001). Materiały do znajomości chrząszczy kusakowatych (Staphylinidae, Coleoptera) Wielkopolskiego Parku Narodowego (Rejon badawczy: Mosina, Niwka, Sowiniec). In: Materiały konferencyjne. Drugie Sympozjum Staphylinidae „Badamy, aby chronić" (pp. 29–30). 16–18 marca 2001, Poznań-Jeziory.

Staphylinus caesareus subsp. *corporaali* Sainte-Claire Deville, 1927 in GBIF Secretariat (2021). GBIF Backbone Taxonomy. Checklist dataset https://doi.org/10.15468/39omei accessed via GBIF.org on 2021-07-21.

Stefek, K. (1939). Przyczynek do fauny tęgopokrywych (coleoptera) ze Śląska i okolic sąsiednich. *Pr. Oddz. Przyr. Muz. Śl.*, **1**, 125–174.

Stobiecki, S. A. (1883). Do fauny Babiéj Góry. Sprawozdanie z wycieczek entomologicznych na Babią Górę w latach 1879 i 1880. *Spraw. Kom. Fizyogr.*, **17**, 1–84.

Sushko, G. (2016). Species composition and zoogeography of the rove beetles (Coleoptera: Staphylinidae) of raised bogs of Belarus. *North-West. J. Zool.*, **12**(2), 220–229.

Šustek, Z., & Tóth, L. (1986). Bionomical and ecological notes on *Ontholestes haroldi* (Eppelsheim, 1884), (Coleoptera, Staphylinidae). *Biologia* (*Bratislava*), **41**(6), 557–561.

Szołtys, H., & Grzywocz, J. (2014). Materiały do poznania entomofauny Polski – Coleoptera. *Acta Entomol. Siles.*, **22** (009), 1–18.

Szujecki, A. (1960a). Materiały do poznania Staphylinidae (Coleoptera) Polski. *Fragm. Faun.*, **8**, 321–334.

Szujecki, A. (1960b). Obserwacje nad rozwojem i biologią *Othius punctulatus* (Goeze) (Coleoptera, Staphylinidae). *Pol. Pismo Ent.*, **30**(2), 431–441.

Szujecki, A. (1960c). Poczwarka *Staphylinus erythropterus* L. (Coleoptera, Staphylinidae). *Pol. Pismo Ent.*, **30**(25), 423–426.

Szujecki, A. (1960d). The pupa of *Staphylinus erythropterus* L. (Coleoptera, Staphylinidae). *Pol. Pismo Ent.*, 30(2), 423–426.

Szujecki, A. (1963). Materiały do poznania Staphylinidae (Coleoptera) Polski. II. *Fragm. Faun.*, **11**, 31–39.

Szujecki, A. (1966a). Description of the first larval stage of *Staphylinus* (*Platydracus*) *stercorarius* Ol. (Coleoptera, Staphylinidae) and notes on the biology of this species. *Bull. Acad. Pol. Sci.*, *Sci. Biol.*, **14**(4), 241–245.

Szujecki, A. (1966b). First Larval Stage of *Staphylinus dimidiaticornis* Gemm., and *Staphylinus erythropterus* L. (Coleoptera, Staphylinidae). *Bull. Acad. Pol. Sci.*, *Sci. Biol.*, **14**(4), 233–239.

Szujecki, A. (1966c). Kształtowanie się stosunków ilościowych i jakościowych wśród ściółkowych kusakowatych (Coleoptera Staphylinidae) borów sosnowych świeżych pod wpływem zrębów zupełnych. Warszawa: Wyd. SGGW.

Szujecki, A. (1966d). Notes on the appearance and biology of eggs of several Staphylinidae (Coleoptera) species. *Bull. Acad. Pol. Sci., Sci. Biol.*, **14**(3), 169–175.

Szujecki, A. (1966e). Notes on the morphology of larvae of *Ocypus similis semialatus* (J. Müll.) (Coleoptera, Staphylinidae). *Bull. Acad. Pol. Sci.*, *Sci. Biol.*, **14**(3), 177––180.

Szujecki, A. (1966f). Zależność między wilgotnością wierzchniej warstwy gleb leśnych a rozmieszczeniem kusakowatych (Staphylinidae, Col.) na przykładzie nadleśnictwa Szeroki Bór w Puszczy Piskiej. *Fol. For. Pol.*, A, **12**, 5–156.

Szujecki, A. (1967). Kusakowate (Staphylinidae, Col.) różnych środowisk leśnych Szerokiego Boru w Puszczy Piskiej. *Fol. For. Pol.*, A, **13**, 237–256.

Szujecki, A. (1968). Wstęp do znajomości kusakowatych (Staphylinidae, Col.) Niziny Mazowieckiej na podstawie zbioru W. Mączyńskiego. *Pol. Pismo Ent.*, **38**, 693–752.

Szujecki, A. (1970). Edaficzne Staphylinidae (Coleoptera) połonin Bieszczadów Zachodnich. *Pol. Pismo Ent.*, **40**, 591–599.

Szujecki, A. (1971). Wpływ rębni zupełnej na zgrupowanie ściółkowych kusakowatych (Col., Staphylinidae) borów sosnowych świeżych. *Fol. For. Pol.* A, **18**, 5–45.

Szujecki, A. (1976). Kusakowate – *Staphylinidae*: Wydłużaki – *Xantholininae*. Klucze do Oznaczania Owadów Polski, część XIX, z. 24d. Warszawa: PWN.

Szujecki, A. (1980). Kusakowate – *Staphylinidae*: Kusaki – *Staphylininae*. Klucze do Oznaczania Owadów Polski, część XIX, z. 24e. Warszawa: PWN.

Szujecki, A. (1995). Zgrupowania kusakowatych (Col. Staphylinidae) borów sosnowych świeżych i ich antropogeniczne przeobrażenia. In: A. SZUJECKI (Ed.), Antropogeniczne przeobrażenia epigeicznej i glebowej entomofauny borów sosnowych. Warszawa: Fund. Rozwój SGGW.

Szujecki, A. (1996). Kusakowate (Coleoptera: Staphylinidae) Bieszczadów Zachodnich. Warszawa: Fund. Rozwój SGGW.

Szujecki, A. (Ed., 2001). Próba szacunkowej waloryzacji lasów Puszczy Białowieskiej metodą zooindykacyjną. Warszawa: Wyd. SGGW.

Szujecki, A. (Ed., 2006). Zooindication-based monitoring of anthropogenic transformation in Białowieża Primeval Forest. Warszawa: Wyd. SGGW.

Szujecki, A. (2008). Wstęp oraz podrodziny: Micropeplinae, Piestinae, Osoriinae, Pseudopsiinae, Phloeocharinae, Olisthaerinae, Proteininae, Omaliinae, Oxytelinae, Oxyporinae. Kusakowate – Staphylinidae. Chrząszcze – Coleoptera. Klucze do oznaczania owadów Polski, cz. XIX, z. 24a. Toruń: PTE

Szujecki, A. (2017). Kusakowate (Staphylinidae) lasów Polski. Aspekt różnorodności i monitoringu zooindykacyjnego. Warszawa: CILP.

Szulczewski, J. W. (1922). Chrząszcze Wielkopolski. *Pr. Kom. Mat.-Przyr. PTPN*, ser. B., **1**, 3–4, 183–243.

Szwałko, P. (1994). A propos *Emus hirtus* (L.) (Coleoptera: Staphylinidae). *Acta Ent. Siles*., **2**, 46.

Szwałko, P. (2001). Rzeź poświętnikowatych (Coleoptera: Scarabaeidae) na krowieńcu przejawem troski o potomstwo u *Creophilus maxillosus* (L.) (Coleoptera: Staphylinidae)? In: Materiały konferencyjne. Drugie Sympozjum Staphylinidae „Badamy, aby chronić" (pp. 20–21). 16–18 marca 2001, Poznań-Jeziory.

Szwejda, J. (1974). Wrogowie naturalni śmietki kapuścianej – *Hylemya brassicae* (Bouché) (Diptera, Anthomyiidae). *Pol. Pismo Ent*., **44**, 845–863.

Taszakowski, A., Kaszyca, N., & Szołtys, H. (2018). Materiały do znajomości Staphyliniformia (Coleoptera) Beskidu Wschodniego. *Acta Ent. Siles*., **26**, 1–10.

Telnov, D., & Kalnins, M. (2003). To the knowledge of Latvian Coleoptera. 3. *Latv. Entomol*., **40**, 21–33.

Telnov, D., Vilks, K., Piterāns, U., Kalniņš, M., & Fägerström, C. (2011). Contributions to the knowledge of Latvian Coleoptera. 9. *Latv. Entomol*., **50**, 20–26.

Tenenbaum, Sz. (1913). Chrząszcze (Coleoptera) zebrane w Ordynacyi Zamojskiej w gub. Lubelskiej. *Pam. Fizyjogr*., **21**, III, 1–72.

Tenenbaum, Sz. (1926). Nowe dla Polski gatunki i odmiany chrząszczy. III. *Pol. Pismo Ent*., **5**(1–2), 78–81.

Tietz, O. (2010). Neues aus der Natur der Oberlausitz für 2009. *Ber. Nat. Gesellsch. Oberl*., **18**, 141–152.

Topp, W. (1978). Bestimmungstabelle für dis Larven der Staphylinidae. In: B. Klausnitzer (ed.), Ordnung Coleoptera (Larven). Akademia Verl., Berlin, pp. 304–334.

Topp, W., Kappes, H., & Rogers, F. (2008). Response of ground-dwelling beetle (Coleoptera) assemblages to giant knotweed (*Reynoutria* spp.) invasion. *Biological Invasions*, **10** (4), 381–390. https://doi.org/10.1007/s10530-007-9137-6

Tóthmérész, B., Nagy, D. D., Mizser, S., Bogyó, D., & Magura, T. (2014). Edge effects on ground-dwelling beetles (Carabidae and Staphylinidae) in oak forest-forest edge-grassland habitats in Hungary. *Eur. J. Entomol.*, **111**(5), 686–691. https://doi.org/10.14411/eje.2014.091

Trella, T. (1923). Trzy gatunki dla fauny Polski nowych chrząszczy. *Pol. Pismo Ent*., **2**(1), 19.

Trella, T. (1929). Chrząszcze Przemyśla i okolicy. Staphylinidae, Pselaphidae, Clavigeridae. *Pol. Pismo Ent*., **8**(1–4), 75–88.

Trella, T. (1936). Wykaz chrząszczów okolic Przemyśla. Uzupełnienie dotychczasowych wykazów. *Pol. Pismo Ent*., **13**(1–4), 85–97.

Trella, T. (1939). Notatki koleopterologiczne z okolic Przemyśla. I. *Pol. Pismo Ent*., **16–17**, 59–86.

Tykarski, P. (2006). Beetles associated with scolytids (Coleoptera, Scolytidae) and the elevational gradient: diversity and dynamics of the community in the Tatra National Park, Poland. *For. Ecol. Mgmt*., **225**, 146–159.

Tylkowski, S. (2014). Sosnowe bory bagienne jako refugium występowania chrząszczy (Coleoptera) saproksylicznych. *Stud. Mat. Centr. Eduk. Przyr.-Leśn. Rogow.*, **41**(4), 308–321.

Uechtritz, M. (1844). Bei Protsch, einem Dorfe bei Sulau, gefangene Käfer. *Übers. Arb. Ver. Schles. Ges. Vaterl. Cult., Breslau*, **1843**, 175–178.

Uhlig, M., Vogel, J., & Herger, P. (2006). Zur Kurzflüglerfauna der Schweiz (Coleoptera: Staphylinidae). *Entomol. Ber. Luzern*, **56**, 21–64. https://doi.org/10.1515/9783110193992.1 M4-Citavi

Varendorff, E. (1917). Entomologische Forschungen in Polen. *Ent. Bl.*, **13**,196–198.

Vávra, J. Ch., Janák, J., & Šíma, A. (2017). Staphylinidae (Drabčíkovití). In: R. Hejda, J. Farkač & K. Chobot (Eds.), Červený seznam ohrožených druhů České republiky. Bezobratlí (pp. 421–442) [Red List of threatened species of the Czech Republic. Invertebrates (pp. 421–442)]. Praha: Příroda [in Czech].

Viertl, A. (1872). Przyczynek do fauny Galicyi. b) Chrząszcze (Coleoptera) z okolicy tarnowskiéj. *Spraw. Kom. Fizyogr.*, **6**, 65–69.

Wachtl, F. (1870). Spis chrząszczów z dorzecza Soły i Koszarawy. Sprawozd. Kom. Tow. Nauk. Krak. […] *Mat. Fizyogr. Galic.*, **4**, 246–262.

Wanka, Th. v. (1917). Zweiter Beitrag zur Coleopterenfauna von Österr.-Schlesien. *Wien. Ent. Z.*, **36**, 276–282.

Warzecha, J. (1927). Fauna rowków pułapkowych i ich użyteczność. *Rocz. Nauk Roln. Leśn.*, **17**, 56–114.

Watson-Horzelski, E. J. (2012). Survival and Time of Development for *Creophilus maxillosus* (L.) (Coleoptera: Staphylinidae) at three constant temperatures. *Coleopt. Bull.*, **66**(4), 365–370. doi:10.1649/072.066.0415

Weigel, J. A. V. (1806). Geographische, naturhistorische und technologische Beschreibung des souverainen Herzogthums Schlesien. Zehnter Theil. Verzeichniss der bisher entdeckten, in Schlesien lebenden Thiere. Berlin.

Węgrzecki, M. (1932). Studja koleopterologiczne na wybrzeżu Polskiem. I. Dotychczasowe wyniki badań nad chrząszczami Helu. *Fragm. Faun.*, **1**, 465–505.

Wojas, T. (1994). Interesujące gatunki kusakowatych (Coleoptera, Staphylinidae) z Gorców. *Wiad. Entomol.*, **13**, 101–105.

Wojas, T. (2006). Nowe stanowiska kusakowatych (Coleoptera: Staphylinidae: Xantholininae, Staphylininae, Tachyporinae) w południowej Polsce. *Wiad. Entomol.*, **25**, 219–224.

Wojas, T. (2008). Nowe stanowiska kilku rzadkich gatunków kusakowatych (Coleoptera: Staphylinidae) w Polsce. *Wiad. Entomol.*, **27**, 167.

Wojas, T. (2012). Chrząszcze (Insecta: Coleoptera) nowe dla Bieszczadów Zachodnich. *Wiad. Entomol.*, **31**(1), 5–16.

Wojas, T. (2016). Rezerwat leśny „Lipówka" ostoją rzadkich i reliktowych gatunków chrząszczy (Coleoptera). In: L. Buchholz, M. Bunalski, P. Sienkiewicz (Eds.), 50 Zjazd Polskiego Towarzystwa Entomologicznego oraz Ogólnopolska Konferencja Naukowa. 16–18 września 2016 r., Sękocin Stary.

Wolender, M., & Zych, A. (2007). Beetles (Coleoptera) from seaside beach and dunes in the regions of Świnoujście, Międzyzdroje and Wisełka (Poland) located along the southern coast of the Baltic Sea. *Baltic J. Coleopterol.*, **7**, 61–71.

Zając, K., Kokurewicz, T., Bistuła-Prószyński, G., Woźniak, A., & Weigle, A. (2005). Plan ochrony Gryżyńskiego Parku Krajobrazowego. Operat Ochrony Zwierząt. Warszawa: Narodowa Fundacja Ochrony Środowiska.

Zanella, L. (1995). Phenology of *Ocypus olens* (Müller, 1764) from a urban park in Venice (Coleoptera, Staphylinidea). *Boll. Mus. Civ. St. Nat. Venezia*, **44** (1993), 59–62.

Zanetti, A. (2015). Second contribution to the knowledge of the rove beetles (Coleoptera: Staphylinidae) of Val di Non/Nonstal (Trentino/Südtirol, Italy). *Gredleriana*, **15**, 77–110.

Zanetti, A., Sette, A., Poggi, R. & Tagliapietra, A. (2016) «Biodiversity of Staphylinidae (Coleoptera) in the Province of Verona (Veneto, Northern Italy)», *Memorie della Società Entomologica Italiana*, **93**(1-2), pagg. 3–237. doi: 10.4081/MemorieSEI.2016.3.

Zanetti, A. & Tagliapietra, A. (2005). Studi sulle taxocenosi a Staphylininae in boschi di latifoglie italiani (Coleoptera, Staphylinidae). *Studi Trent. Sci. Nat., Acta Biol.*, **81** (2004), 207–231.

Zebe, G. (1852). Synopsis der bisher in Deutschland aufgefundenen Coleoptera. *Stett. Ent. Ztg*., **13**, 129–136, 161–176, 209–216, 241–256, 289–296, 329–336, 369–376, 409–416, 455–462.

Zumpt, F. (1931). Die Koleopterenfauna des Steppenheidebiotops von Bellinchen (Oder) und Oderberg (Fauna marchica). Eine ökologisch-geographische Studie. *Beitr. Nat*., **14**, 363–449.

Żyła, D., & Solodovnikov, A. (2020). Multilocus phylogeny defines a new classification of Staphylininae (Coleoptera, Staphylinidae), a rove beetle group with high lineage diversity. *Syst. Entomol.*, **45**(1), 114–127.

The first Staphylinidae species described, named and classified in the 10th edition of "Systema Naturae" by Carl Linné (Linnaeus) was *Staphylinus hirtus*, i.e. presently *Emus hirtus* (Linnaeus, 1758). Along with 18 other species, classified by the author to one genus *Staphylinus*, these taxa provided a certain foundation for the further classification of Staphylinidae. At present these species are classified to 15 genera, among others from the subfamilies Staphylininae (genera *Emus*, *Ontholestes*, *Creophilus*, *Staphylinus*, *Philonthus*, *Quedius*), as well as Oxyporinae, Paederinae, Tachyporinae, Steninae, Aleocharinae and Omaliinae. Carl Linnaeus in the next years (1761 and 1767) described seven other species. In the period from mid-18th century to the end of the 20th century (specifically in the years 1758–2000) a total of 45 700 Staphylinidae species were described, which accounted for 14% of all beetles and 5% of all animals. In turn, only within the 20 years of the 21st century the number of described Staphylinidae species increased to 63 000, which makes this family of beetles one of the most speciose families worldwide, not only among insects, but all animals.

[from the Introduction]

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