

Notes on Pselaphinae (Coleoptera, Staphylinidae) from Norway, including *Centrotoma lucifuga* Heyden, 1849 new to the Nordic countries

FRODE ØDEGAARD

Ødegaard, F. 2021. New records of Pselaphinae (Coleoptera, Staphylinidae) from Norway, including *Centrotoma lucifuga* Heyden, 1849 new to the Nordic countries. *Norwegian Journal of Entomology* 68, 159–167.

The Pselaphinae *Centrotoma lucifuga* Heyden, 1849 is reported from Heggnes near Seljord in the Telemark region of Norway. One male was found in a malaise tent situated in a warm south faced slope. This is the first confirmed record of this species from the Nordic countries, and the new record expands the geographical range for this species substantially towards the north. The host ant *Tetramorium caespitum* (Linnaeus, 1758) was common at the site. A total of 42 native species of Pselaphinae have been recorded from Norway, but the current status of three of them, *Euplectus kirbii* Denny, 1825, *Bythinus burrellii* Denny, 1825, and *Reichenbachia juncorm* (Leach, 1817) are uncertain as they have not been recorded from the country for many years.

Key words: Coleoptera, Staphylinidae, Pselaphinae, *Centrotoma lucifuga*, Norway, Fennoscandia, new records.

Frode Ødegaard, Norwegian University of Science and Technology (NTNU), Department of Natural History, NO-7491 Trondheim, Norway. E-mail: frode.odegaard@ntnu.no

Introduction

The Pselaphinae form a characteristic group of beetles originally treated as a separate family within the infraorder Staphyliniformia, however, based on similarities with Staphylinidae, Omaliniae they are currently classified as a subfamily within Staphylinidae (Newton & Thayer 1995).

The Pselaphinae are small beetles (1–3.5 mm in our region) with shortened elytra leaving five tergites exposed. Different from other staphylinids, the segments of metasoma are immovable, and the tarsi normally 3-segmented. The head is often large with two ommatidia and two interocular grooves that might be connected in the region of the frontal lobes. The antennae are normally 11-segmented, and more or less claviform in shape. Maxillary palpi are normally 4-segmented and can be rather long. Pronotum of

different shape but often with basal grooves and lines. Elytra with basal grooves, complete sutural line and one or two shortened dorsal lines. Some species show pronounced sexual characters in the males, and species associated with ants can exhibit spectacular morphology (Jeannel 1950, Hansen 1968, Besuchet 1974, Chandler 2001, Parker 2016).

These beetles can be found in a wide variety of nature types. The most typical habitats are under bark, in decaying moss and leaf litter, flood refuse, compost heaps and seashores. Several species of Pselaphinae are more or less tightly associated with ants and can be found in ant colonies. Species in the genera *Euplectus*, *Trichonyx* and *Batrisodes* are not obligate ant guests, while species of *Claviger*, *Chennium* and *Centrotoma* are totally dependent on their host ants (Päivinen *et al.* 2002). All species are believed to be predaceous feeding

on microarthropods such as mites or springtails (Schomann et al. 2008).

This subfamily is a species rich group including almost 10 000 species distributed all over the World and dominating in tropical forests (Parker 2016). A total of 63 species are registered from the Nordic countries (Nordic Coleoptera Group 2021) and most species are limited to southern regions with warmer climate.

There is no separate publication about faunistics of Pselaphinae from Norway, but new species are steadily added to the fauna in general faunistic reports and catalogues. Lindroth *et al.* (1960) catalogized 29 species of Pselaphinae from Norway (of which 3 were reported in the correction and additions chapter), while Silfverberg (2010) reported 38 species. After this catalogue three new species of *Batrisodes*, not formally published as new to Norway are listed in a series of survey reports. In fact, several of the new species reported in catalogues are never or insufficiently published as separate records, and it is difficult to find data about some of these findings. Including the present report on *Centrotoma lucifuga* a total of 42 native and three introduced species of Pselaphinae are registered in Norway.

The aim of this paper is to summarize records and publications of rare and poorly collected species of Pselaphinae including the report of *Centrotoma lucifuga* new to the Nordic countries.

Material and methods

The specimen of *Centrotoma lucifuga* was collected in a malaise tent run by the author as a part of a larger survey of the insect fauna in Telemark in 2017. The morphological study of the specimen was conducted with Wild M10 stereomicroscope. The images were created using the photography technique of focus stacking. Several partially focused images were taken with a Nikon D850 mounted on a Nikon PB-4 Bellow with microscope objectives of different magnifications. The separate images were combined using Zerene Stacker 1.04 © (2009–2017) software. The specimen has been deposited in the NTNU, University Museum in Trondheim,

Norway. Material of the other reported species are obtained from literature, national museums and private collections.

Results

One male of *Centrotoma lucifuga* Heyden, 1849 was recorded with the following data: Norway, TELEMARKE [TEI], Midt-Telemark municipality: Heggnes, 59.44034°N–8.77887°E, 133 m asl., 15 June – 6 July 2017, 1♂, leg. Frode Ødegaard (Figure 1).

Centrotoma lucifuga belongs to the tribe Ctenistini Blanchard, 1845 which is characterized by a snout like expansion of the tubercles of frontoclypeus and scale like hairs of the body. *Centrotoma lucifuga* is easy to recognize by the maxillary palpi having a hairbearing spine attached laterally to segment 2, 3 and 4. The size is 1.8–2.0 mm and colour of body is brownish black. Another species of the same genus, *Centrotoma peniciliata* Schaufuss, 1863 can be found in southern Europe, however, this species has different genitalia, smaller size, and brownish red colour (Jeannel 1950). Otherwise, there are three more species in the genus with very restricted distribution in southern Europe (Löbl & Smetana 2004). Large spines of the maxillary palpi can also be found in the genus *Ctenistes* of which *Ctenistes palpalis* Reichenbach, 1816 occurs in central and southern Europe. However, this genus has even broader palpi, larger eyes and longer legs and antennae. The only other species of this tribe occurring in Scandinavia, *Chennium bituberculatum* Latrielle, 1807, has very small maxillary palpi without spines.

Centrotoma lucifuga is widely distributed in central Europe north to Germany and Poland. Hence, the new record expands the geographical range for this species substantially towards the north. The species has an obligatory association with the ant species *Tetramorium caespitum* (Linnaeus, 1758), and can be found in the host's colonies (Jeannel 1950, Besuchet 1974). This ant species is very common at the collecting site at Heggnes, where supercolonies covering several square meters along the roadsides, were found



FIGURE 1. Male of *Centrotoma lucifuga* Heyden, 1849 dorsal view. Photo: Arnstein Staverløkk/NINA.



FIGURE 2. The collection site for *Centrotoma lucifuga* Heyden, 1849 at TEI, Midt-Telemark, Heggnes in June 2017. Photo: Frode Ødegaard.

close to the malaise tent. The locality Heggnes is known as a hotspot for beetles (Ødegaard & Ligaard 2000) and Lepidoptera (Slagsvold 2017) due to the warm microclimate and the varied geology and botany.

Notes on other species of *Pselaphinae*

Euplectus sanguineus Denny, 1825

This species was first mentioned from Norway from SOGN OG FJORDANE [SFI] by Strand (1970). However, no details about the record was published. According to Andreas Stand's diary in Bergen Museum the specimen is collected by Gunnar Israelson in Flom, Aurland municipality. Otherwise, the only other confirmed records so far are from VESTFOLD [VE], Larvik, Tenvik, 59.03651°N–10.01728°E, 1 ex., 11 April 1992; 7 ex., 10 April 1993, leg. Stig Otto Hansen.

Euplectus kirbii Denny, 1825

This species has never been published as new to Norway, although it has appeared in several lists and catalogues as occurring in Norway. The species was collected several times in a large, warm compost heap in Frognerparken in Oslo back in the mid-1980s (P. Ottesen *pers comm.*). Data on Norwegian records are: AKERSHUS [AK], Oslo: Skøyen, Frognerparken 9 May 1985 (1 ex., leg. S.O. Hansen); 10 May 1985 (6 ex., leg. P. Ottesen); 8 May 1986 (1 ex., leg S.O. Hansen); 30 May 1986 (1 ex., leg S.O. Hansen); 13 Aug. 1986 (1 ex., leg. S. Ligaard). This compost heap has been removed a long time ago, and the species has never been recorded in Norway after this. The origin of the Norwegian population is unknown, and it cannot be excluded that the species has been introduced with humans. On the other hand, the species might have drifted naturally from populations in neighboring countries, although

distance is very far. The current existence of this species in Norway is uncertain and needs to be confirmed by new records.

Leptoplectus spinolae (Aubé, 1844)

This species was reported as new to Norway by Ødegaard *et al.* (2008). The first records date back to AUST-AGDER [AAY], Gjerstad, several ex. in window traps July–August 1990, leg. J. Stokland (coll. S. Ligaard). Several records have been reported recently (82 records) mainly in Telemark and the Oslo-region, however, there is also a new isolated record from OPPLAND [OS], Lillehammer in 2015 (Artsdatabanken 2021).

Plectophloeus nitidulus (Fairmaire, 1858)

This species was first reported from VESTFOLD [VE], Horten, Karljohansvern, 1 ex. window trap, 13 June – 13 July 2008 (Ødegaard *et al.* 2008). A second record is reported from VE, Larvik: Styggås, Ødegården, June–July 2013, leg. Hanne Eik Pilskog (Artsdatabanken 2021).

Bibloporus minutus Raffray, 1914

This species was first mentioned from Akershus in Norway without details, in the first corrections and additions of the 1960 catalogue (Lindroth *et al.* 1960 p. 467). The first specimens found in Norway are deposited in Bergen Museum with the following data: AKERSHUS [AK], Oslo: Røa, 28 July 1960; Bygdøy, 25 May 1964, leg. A. Strand. The species is currently widely distributed in southern Norway and represented with more than 80 records mostly after year 2000 (Artsdatabanken 2021).

Biblopectus tenebrosus (Reitter, 1880)

This species is only reported from AKERSHUS [AK], Nes Israelmåsan in 1992 by Ødegaard & Ligaard (2000).

Biblopectus spinosus Raffray, 1914

This species is only reported from ØSTFOLD [Ø], Hvaler: Arekilen in 1992 by Ødegaard & Ligaard (2000).

Biblopectus minutissimus (Aubé, 1833)

This species was first mentioned from

Akershus in Norway without details, in the corrections and additions of the 1960 catalogue (Lindroth *et al.* 1960 p. 467). The first specimens are deposited in Bergen Museum with the following data: AKERSHUS [AK], Oslo: Røa, 1 ex., 25 June 1952; 1 ex., 21 June 1960; 2 ex., 3 June 1961, leg. A. Strand. Later the species was found along the river Gaula in Trøndelag at SØR-TRØNDELAG [STI], Melhus: Udduvoll bru, 63.32513°N–10.26401°E, 1 ex., 10.VI. 1987, leg. O. Hanssen og V. Mahler (Andersen & Hansen 1994); Melhus S, 63.28016°N–10.27090°E, 2♂♂ in wet silty sand at the riverbanks 22 June 2001, leg. F. Ødegaard (Ødegaard & Hansen 2001). New records are from AK, Oslo: Nordre Gravlund, 1♂ pitfall trap, 1981, leg P. Ottesen; Sørkedalen, Solberg, 60.00770°N–10.61939°E, 1♂ pitfall trap 16–26 June 2010, leg. F. Ødegaard.

Trichonyx sulcicollis Chaudoir, 1845

This species was first mentioned from Akershus in Norway without details, in the first corrections and additions of the 1960 catalogue (Lindroth *et al.* 1960 p. 467). The specimens are deposited in Bergen Museum with the following data: AKERSHUS [AK], Oslo: Røa, 21 June 1960; 28 July 1960; 17 July 1964; Asker, Brønnøya, 17 May 1964; 29 May 1964, leg. A. Strand. In Natural History Museum, University of Oslo, there are two specimens from AK, Oslo, Røa 2 July 1961 leg. A. Strand. The species has been recorded later from AK, Oslo, Bygdøy 1999 (Ødegaard *et al.* 2008), and VESTFOLD [VE], Horten: Østøya 2005; Knutsrød 2018; Sandefjord: Melsomvik 2008, 2019; Tønsberg: Slagentangen 2008 (Artsdatabanken 2021).

Batrisodes hubenthalii Reitter, 1882

This species has been mentioned from Norway in several reports and catalogues, however it has never been formally published as new to Norway. The first record is from [STI], Melhus: Langdalen: Storåsen, 63.0736°N–10.2942°E, 20 March 2005, 1 ex. among *Lasius*-ants in the rotten spruce stump, leg. Christer Reiråskag. Other records: TELEMAR [TEY], Drangedal, Steinknapp NØ, 59.08031°N–9.02421°E, 2 ex. pitfall trap, 13 May–18 June 2008, leg. A.

Sverdrup-Thygeson (Sverdrup-Thygeson *et al.* 2011); Nome, Tyri, 59.26851°N –9.13148°E, 28 Aug. 2013, leg. S. Olberg & A. Laugsand (Reiso *et al.* 2014); Siljan: Brenndalsskarvene, 59.23935°N–9.85844°E, 1 ex. window trap, 15 June–20 July 2009, leg. A. Sverdrup-Thygeson & A. Endrestøl; VESTFOLD [VE], Larvik: Vedmannsås, 59.13318°N–9.94884°E, 1 ex. window trap, 15 May–15 June 2009, leg. A. Sverdrup-Thygeson & A. Endrestøl; Hvarnes, Grasås, 59.29045°N–9.98088°E, 8 July 2010, 2 ex. in *Lasius brunneus* colony in *Alnus glutinosa*, leg. A. Fjellberg; Sæteråsen, 59.13543°N–9.93662°E, 1 ex., 28 April 2015, leg. A. Fjellberg; Lysebo, 20 June 2020, leg. A. Sverdrup-Thygeson.

Batrissodes delaporti (Aubé, 1833)

This species has been mentioned from Norway in several reports and catalogues, however, it has never been formally published as new to Norway. The first record is from AKERSHUS [AK], Oslo: Montebello, 59.93086°N–10.66826°E, 1 ex. window trap, 22 May–20 June 2008, leg. A. Sverdrup-Thygeson. Other records from same locality: 2 ex. window trap, 6 May–21 June 2011, leg. A. Sverdrup-Thygeson (Sverdrup-Thygeson *et al.* 2011); Asker, Løkenesveien 55, 59.83127°N–10.48911°E, 9 Sept. 2013, leg. S. Olberg (Olberg 2016); VESTFOLD [VE], Larvik: Budalsåsen, 59.14065°N–10.02731°E, 1 ex. window trap, 21 July 2009, leg. A. Endrestøl; 1 ex. window trap, 16 June–21 July 2011, leg. A. Sverdrup-Thygeson & A. Endrestøl; Hvarnes, Grasås, 59.29045°N–9.98088°E, 6 ex. in *Lasius brunneus* colony in *Alnus glutinosa*, 8 July 2010, leg. A. Fjellberg; Hovet, 59.02825°N–10.20501°E, 2 ex. in *Lasius brunneus* colony in a white rotten *Populus tremulae*, 7 June 2014, leg. S. Olberg; TELEMARK [TEY], Kragerø: Berg Museum, 58.88480°N–9.38375°E, 2 ex. window trap, 21 June–28 July 2009, leg. F. Ødegaard & O. Hanssen.

Batrissodes adnexus (Hampe, 1863)

This species was published new to Norway by Strand (1937) based on a female collected at ØSTFOLD [Ø], Moss: Jeløya, 2 May 1934. However, this record was later omitted by Strand (1946) as a result of the general perception that

Batrissodes venustus (Reichenbach, 1816) was a varying species, and the only species in the group occurring in Scandinavia (Palm 1942). The current view of this complex (e.g. Löbl & Smetana 2004, Silfverberg 2010) follows Jeannel (1950), Palm (1953), Dahlgren (1961) and Besuchet (1974), considering *B. adnexus* a good species. Accordingly, the old record from Jeløya most likely belongs to *B. adnexus*. There are several new records from Norway: VESTFOLD [VE], Bøkeskogen, 59.05758°N–10.02380°E, 1 ex., 30 April 1990, leg. S.O. Hansen; Horten: Østøya, 59.44240°N–10.47182°E, 1 ex. window trap, 13 June–15 July 2005, leg. A. Sverdrup-Thygeson; TELEMARK [TEY], Drangedal, Steinknapp NØ, 59.08031°N–9.02421°E, 1 ex. window trap, 16 June–19 July 2004; 1 ex. window trap, 19 July–26 Aug. 2004; leg. A. Sverdrup-Thygeson & O. Hanssen; Steinknapp Ø, 59.08026°N–9.02349°E, 1 ex. pitfall trap, 13 May–18 June 2008, leg. A. Sverdrup-Thygeson; Kragerø: Berg Museum, 58.88480°N–9.38375°E, 1 ex. window trap, 21 June –28 July 2009, leg. F. Ødegaard & O. Hanssen; Berg Museum, 58.88520°N–9.38253°E, 2 ex. window trap, 21 June –28 July 2009, leg. F. Ødegaard & O. Hanssen; Kjølbrønn, 1 ex., 11 May 2018, 58.82621°N–9.24644°E, leg. F. Ødegaard; AUST-AGDER [AAI], Åmli: Simonstona, 58.81291°N–8.43403°E, 1 ex. window trap, 15 July–13 Aug. 2008, leg. A. Sverdrup-Thygeson.

Bythinus burrellii Denny, 1825

This species has been recorded from Norway a long time ago in HORDALAND [HOY], Bergen, Stend 1–31 Oct. 1911, coll. Bergen Museum (Münster 1920). According to Andreas Strand's diary in Bergen Museum there is also another old record from HOY, Os: Os (leg. Münster), however, this specimen was not found in any collection. The records from Norway are included in Lindroth *et al.* (1960) but have dropped out from Silfverberg (1979, 1992). Since there is no new record for more than 100 years, the current status of this species in Norway is uncertain.

Bryaxis curtisii (Leach, 1817)

This species was first reported from Norway by Hauge *et al.* (1975) from HORDALAND

[HOY], Osterøy, Skaftå 1974, and from TELEMARKE [TEY], Eidanger, Porsgrunn, 1983 (Hansen *et al.* 1998). In addition, from Eidanger, Porsgrunn, 1 ex., July 1991, leg. S. Ligaard. Otherwise, the species is found in TELEMARKE [TEI], Seljord, Heggenes, 1998, 4 ex. in pitfall traps, leg. F. Ødegaard; BUSKERUD [BØ], Sigdal, Trillemarka 1998, leg. B. Sagvolden; ROGALAND [RY], Sandnes, Røssdalen, 2000, leg. T.R. Nielsen; Bjerkreim, Gjeitattjørna, 2018, leg. S. Olberg; AKERSHUS [AK], Bærum, Ostøya, 2018, S. Olberg *et al.* (Artsdatabanken 2021).

Rybaxis longicornis (Leach, 1817)

This species was first reported from Norway by Hansen *et al.* (1998) and has been found along the coast in wetland habitats from ØSTFOLD [Ø], Hvaler to VEST-AGDER [VAY], Kristiansand (Artsdatabanken 2021).

Rybaxis laminata (Motschulsky, 1836)

This species was first reported from Norway by Ødegaard (2001), and has been found mainly in marshes along coast from ØSTFOLD [Ø], Hvaler to AUST-AGDER [AAY], Arendal, but also in wetlands of the interior parts of the country at BUSKERUD [BØ], Hole (Artsdatabanken 2021).

Reichenbachia juncorum (Leach, 1817)

This species has been recorded at only three sites in Norway: TELEMARKE [TEY], Kragere: Skåtøy, 4 ex., 1927, leg. Lysholm, coll. NTNU Vitenskapsmuseet; VEST-AGDER [VAY], Lyngdal, Lyngdal, leg. Holmboe, coll. Natural History Museum (NHM), Oslo (Münster 1920); ROGALAND [RY], Suldal, Jelsa, leg. Holmboe, coll. NHM (Strand 1970). Since there are no records after 1927, the current status of this species is uncertain.

Introduced species

A large number of beetle species have been introduced to Norway as hitchhikers with travel and imported goods. Particularly, imported plants with soil include many arthropods of foreign origin (Bruteig *et al.* 2017), and among them also

some Pselaphinae species. Bruteig *et al.* (2017) reported *Bythinus burrellii* and *Tychius* sp. (later identified to *Tychius pullus* Kiesenwetter, 1858). The latter a species native to southern Europe.

Ten specimens of *Pseudoplexus perplexus* (Jacquelin du Val, 1854) were found in pot soil samples, and one ex. in an indoor light-traps, that originate from plant material imported from South- and Central Europe to a company in southeast Norway in 2019 (Westergaard *et al.* 2019). This species is widely distributed in Central- and Southern Europe and might be able to establish in Norway in the future. There are also two old records from Sweden and Denmark (Lundberg 1984).

One specimen of *Euplectus infirmus* Raffray, 1910 was recorded from a pitfall trap at AK, Asker: Tofte havn, 29 Aug. 2019, leg. R. Jacobsen & A. Endrestøl, at a site where imported timber is stored for shorter periods (Jacobsen *et al.* 2020). Most likely this species has been introduced with plant material and may be established temporarily at the site. Accordingly, the species should be considered as an alien species in Norway.

Discussion

The present finding of *Centrotoma lucifuga* Heyden, 1849 represents the first confirmed record of the species from Fennoscandia. The record is quite surprising as the locality is very isolated from the nearest records in Germany and Poland. However, since the species has a very specialized way of living in the colonies of *Tetramorium caespitum*, it may very well be overlooked elsewhere in Fennoscandia. Including the present record, a total of 42 native species of Pselaphinae have been reported from Norway.

Based on the general distribution range of Pselaphinae in Fennoscandia, it is not likely that several species of this subfamily currently are overlooked in Norway. On the other hand, quite recently a new species, *Euplectus lapponicus* Löbl & Mattila, 2010, with a northern distribution pattern, was described new to science (Löbl & Mattila 2010). This species has been found both in northern Sweden and Finland. Otherwise, we

can never exclude that other species with patchy distribution, isolated occurrences and specialized habitats, such as *Centrotoma lucifuga*, might be found in Norway after more complete surveys. In the future, we also expect establishment of new species as a result of natural range expansions or increased frequency of introduced alien species.

Acknowledgements. The material of *Centrotoma lucifuga* was obtained as by-catch of the project PROCTONOR founded by the Norwegian Taxonomy Initiative hosted by the Norwegian Biodiversity Information Centre. Great thanks to Oddvar Hanssen/NINA for help in the field and with data on introduced species, and to Arnstein Staverløkk/NINA for processing the stacking image. I am grateful to Preben Ottesen, Sindre Ligaard, Arne Fjellberg, Christer Reiråskag for sharing their records. Thanks also to Steffen Roth, Bergen Museum for checking the data in the Andreas Strand collection, and to Lars Ove Hansen, Natural History Museum, Oslo, for confirming the status of requested objects in their collection.

References

Artsdatabanken 2021. Norway's Species Map Service. <https://artskart.artsdatabanken.no/> (Accessed 22.03.2021)

Besuchet, C. 1974. *Familie: Pselaphidae*. Pp. 305–362 in H. Freude, K. W. Harde, and G. A. Lohse (Eds). *Die Käfer Mitteleuropas*. Vol. 5, Staphylinidae II (Hypocyphtinae und Aleocharinae), Pselaphidae. Goecke & Evers, Krefeld.

Bruteig, I.E., Endrestøl, A., Westergaard, K.B., Hanssen, O., Often, A., Åström, J., Fossøy, F., Dahle, S., Staverløkk, A., Stabbetorp, O. & Ødegaard, F. 2017. *Fremmede arter ved planteimport – Kartlegging og overvåking 2014–2016*. 221 pp. NINA Rapport 1329. Norsk institutt for naturforskning.

Chandler, D.S. 2001. Biology, morphology, and systematics of the ant-like litter beetles of Australia (Coleoptera: Staphylinidae: Pselaphinae). *Memoirs on Entomology, International* 15, 1–560.

Dahlgren, G. 1961. Über einige *Batrisodes*-Arten (Col. Pselaphidae). *Opusula Entomologicae* 26, 141–144.

Hansen, L.O., Ligaard, S. & Sagvolden, B. 1998. Notes on Norwegian Coleoptera. 4. *Fauna norvegica Serie B* 45, 77–82.

Hansen, V. 1968. *Biller XXV. Ådselbiller Stumpbiller mm.* 353 pp. E.C. Gads Forlag. København.

Hauge, E., Meidell, T. & Solhøy, T. 1975. *Edelløvsog*

på Vestlandet, Bind I-III Evertebrater. Report, Zoological Museum, University of Bergen.

Jacobsen, R.M., Endrestøl, A., Magnussen, K., Fossøy, F., Brandsegg, H., Davey, M., Handberg, Ø.N., Hanssen, O., Majaneva, M.A.M., Navrud, S., Often, A., Sandercock, B.K., Åström, J. 2020. *Tidlig oppdagelse av nye fremmede arter i Norge - Uttesting og videreutvikling av overvåkingssystem for fremmede terrestriske karplanter og insekter*. 97 pp. NINA Rapport 1729. Norsk institutt for naturforskning.

Jannel, R. 1950. Coléoptères Pselaphides. *Faune de France* 53, 1–421.

Lindroth, C.H. (Red. Cur.). 1960. *Catalogus Coleopterorum Fennoscandiae et Daniae*. 476 pp. Entomologiska Sällskapet, Lund.

Löbl, I. & Smetana, A. 2004. *Catalogue of Palaearctic Coleoptera. Vol. 2. Hydrophiloidea, Histeroidea, Staphylinoidea*. 938 pp. Apollo Books, Stenstrup.

Löbl, I. & Mattila, J., 2010. *Euplectus lapponicus* (Coleoptera: Staphylinidae: Pselaphinae), a new species from boreal Finland. *Entomologica Fennica* 21, 181–186.

Lundberg, S. 1984. Bidrag till kännedom om svenska skalbaggar 22. *Entomologisk Tidskrift* 105 (3), 107–108.

Münster, T. 1920. Nye fund og findsteder. Coleoptera. *Norsk Entomologisk Tidsskrift* 1, 60–63.

Nordic Coleoptera Group (NCG). 2021. Website and database of the Nordic Coleoptera Group: <http://www.beetlebase.com> (Accessed 22.03.2021).

Ødegaard, F. 2001. Taxonomic status and geographical range of some recently revised complexspecies of Coleoptera in Norway. *Norwegian Journal of Entomology* 48, 237–249.

Ødegaard, F. & Hanssen, O. 2001. *Biller sør for Loddbekken*. Pp. 22-31 in Statkraft Grøner. Ny E6 i Melhus på strekningen fra Jagtøyen til Skjerdingsstad. Forundersøkelser innen naturmiljø og friluftsliv. Report.

Ødegaard, F. & Ligaard, S. 2000. Contribution to the knowledge of Norwegian Coleoptera. *Norwegian Journal of Entomology* 47, 7–19.

Ødegaard, F., Sverdrup-Thygeson, A., Hansen, L.O., Hanssen, O. & Öberg, S. 2009. *Kartlegging av invertebrater i fem hotspot-habitattyper. Nye norske arter og rødlistearter 2004-2008*. 102 pp. NINA Rapport 500. Norsk institutt for naturforskning.

Newton, A.F. & Thayer, M.K. 1995. Protopselaphinae new subfamily for *Protopselaphus* new genus from Malaysia, with a phylogenetic analysis and review of the Omaliine Group of Staphylinidae including

- Pselaphidae (Coleoptera). Pp. 219–320 in Pakaluk J. & Slipinski, S.A. (eds). *Biology, Phylogeny, and Classification of Coleoptera. Papers Celebrating the 80th Birthday of Roy A. Crowson*. Muzeum i Instytut Zoologii PAN, Warszawa.
- Olberg, S. 2016. Hule eiker i Oslo og Akershus. 48 pp. BioFokus-rapport 2016–10.
- Päivinen, J., Ahlroth, P. & Kaitala, V. 2002. Ant-associated beetles of Fennoscandia and Denmark. *Entomologica Fennica* 13, 20–40.
- Palm, T. 1942. Coleopterfaunaen vid nedre Dalälven. *Entomologisk Tidskrift* 63, 1–58.
- Palm, T. 1953. Är *Batrisodes adnexus* (Hampe) och *venustus* (Reich.) skilda arter? *Entomologisk Tidskrift* 74, 61–63.
- Parker, 2016. Myrmecophily in beetles (Coleoptera): evolutionary patterns and biological mechanisms. *Myrmecological News* 22, 65–108.
- Reiso, S., Olberg, S. & Solvang, R. 2014. *Kartlegging og status for utvalgt naturtype hul eik i Telemark 2009-2014*. 22 pp. BioFokus-rapport 2014–16.
- Schomann, A., Afflerbach, K. & Betz, O. 2008. Predatory behaviour of some Central European pselaphine beetles (Coleoptera: Staphylinidae: Pselaphinae) with descriptions of relevant morphological features of their heads. *European Journal of Entomology* 105, 889–907.
- Silfverberg, H. 1979. *Enumeratio Coleopterorum Fennoscandiae et Daniae*. Helsingfors Entomologiska Bytesförening, Helsingfors. 79 pp.
- Silfverberg, H. 2004. *Enumeratio nova Coleopterorum Fennoscandiae, Daniae et Baltiae*. *Sahlbergia* 9, 1–111.
- Silfverberg, H. 2010. *Enumeratio renovata Coleopterorum Fennoscandiae, Daniae et Baltiae*. *Sahlbergia* 16, 1–144.
- Slagsvold, P.K. 2017 Heggeneset i Seljord, Telemark – en hotspot for sommerfugler. *Insekt-Nytt* 42(1), 5–23.
- Strand, A. 1937. Koleopterologiske Bidrag II. *Norsk Entomologisk Tidsskrift* 5, 24–28.
- Strand, A. 1946. Koleopterologiske Bidrag IV. *Norsk Entomologisk Tidsskrift* 7, 175–184.
- Sverdrup-Thygeson, A., Bratli, H., Brandrud, T. E., Endrestøl, A., Evju, M., Hanssen, O., Skarpaas, O., Stabbetorp, O. & Ødegaard, F. 2011. *Hule eiker – et hotspot-habitat. Sluttrapport under ARKO-prosjektets periode II*. 47 pp. NINA Rapport 710. Norsk institutt for naturforskning.
- Westergaard, K.B., Endrestøl, A., Hanssen, O., Often, A., Åström, J., Fosøy, F., Majaneva, M.A.M., Davey, M., Brandsegg, H. & Staverløkk, A. 2020. *Monitoring the pathway import of horticultural plants – report for 2019*. 51 pp. NINA Report 1738. Norwegian Institute for Nature Research.

Received: 6 April 2021

Accepted: 21 May 2021