

Corrections and comments to the Norwegian part of the Palaearctic list of bark beetles (Coleoptera, Curculionidae, Scolytinae)

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Pityogenes irkutensis irkutensis Eggers, 1910, *Trypophloeus dejevi* (Stark, 1936), *Carphoborus cholodkovskiyi* Spessivtsev, 1916 and *Cyclorhipidion bodoanus* (Reitter, 1913) are added to the Norwegian part of the Palaearctic list. *Ips amitinus* (Eichhoff, 1872) should be listed as intercepted to Norway, since it is recorded in imported timber but not documented as established in Norway. Seven species are deleted from the Norwegian part of the Palaearctic list of bark beetles: *Hylastes ater* (Paykull, 1800), *Hylurgus ligniperda* (Fabricius, 1787), *Phloeotribus rhododactylus* (Marshall, 1802), *Ernoporicus fagi* (Fabricius, 1798), *Pityogenes saalasi* Eggers, 1914, *Scolytus mali* (Bechstein & Scharfenberg, 1805) and *Scolytus multistriatus* (Marshall, 1802). Their faunistic history in Norway is presented, which shows that they are listed as Norwegian due to historically inherited mistakes. *Scolytus triarmatus* (Eggers, 1912) and *Orthotomicus longicollis* (Gyllenhal, 1827) are known from one single specimen respectively. Their faunistic history in Norway is presented and discussed. It is an unanswered question if these species have populations in Norway. *Scolytus scolytus* (Fabricius, 1775) is not listed as Norwegian in the Palaearctic catalogue. However, it is a part of the historical confusion and was earlier mentioned as recorded in Norway. The faunistic history is presented and discussed together with *S. triarmatus*. *Trypophloeus* Fairmaire, 1864 is a taxonomic and nomenclatorial problematic genus, which is strongly in need of a modern revision. We have included a presentation of some of the problems and a discussion related to the genus. The number of bark beetles species documented in Norway may be changed due to how the species are defined and the nomenclature chosen. The conclusion of the presented work is that the number of established, outdoor-living bark beetle species documented from Norway is 71. *Ips amitinus* (Eichhoff, 1872) is not included in this number since it is not documented as established in Norway.

Key words: Scolytinae, Norway, *Hylastes ater*, *Hylurgus ligniperda*, *Phloeotribus rhododactylus*, *Ernoporicus fagi*, *Scolytus mali*, *Scolytus multistriatus*, *Scolytus scolytus*, *Scolytus triarmatus*, *Pityogenes saalasi*, *Pityogenes irkutensis irkutensis*, *Ips amitinus*, *Orthotomicus longicollis*, *Trypophloeus dejevi*, *Carphoborus cholodkovskiyi*, *Xyleborus monographus*, *Cyclorhipidion bodoanum*, *Trypophloeus*, taxonomy, faunistics, nomenclature.

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Introduction

There are some disagreements between the different Coleoptera catalogues listing the bark beetles known from the Norwegian fauna (Silfverberg 2010, Knížek 2011, NCG (Nordic Coleoptera Group) 2014 and others). Mostly the disagreements are due to historical and inherited mistakes. However, some problems are linked to taxonomic and nomenclatural problems. We also include a discussion of taxa in need of revisions. None of the commented species has been mentioned in the corrections to the Palaearctic Coleoptera Catalogue (Löbl & Smetana 2013). The historical background for the mistakes and comments to the bark beetle fauna of Norway is presented. As far as possible, the historical literature on bark beetles has been studied. In the present paper, we also include some information on Swedish and Danish records in order to put the Norwegian records of the species in a broader context.

Species added to the list

Pityogenes irkutensis irkutensis Eggers, 1910 should be added to the Palaearctic list and the Fennoscandian list (Silfverberg 2010) as recorded in Norway. One specimen is deposited in the collection of Tromsø University. The specimen is a male collected in a window trap at Finmark County: Sør-Varanger, Skogfoss in Pasvik, 09.VI–29.VII.1999 and correctly identified. According to Johan Andersen and Stefan Olberg (both pers. com.) the specimen is identified by Frode Ødegaard, but the record has not been published. An old specimen in Tromsø University Museum is labelled Moss, TSZC 22266, *Pityogenes* sp. (*irkutensis/monacensis*)? This specimen is a misidentified specimen of *Orthotomicus suturalis* (Gyllenhal, 1827). It was probably collected by Hans Warloe, according to Robert Bergersen (pers. com.). Andreas Strand (handwritten notes) only mentioned *O. suturalis* from Moss collected by Helliesen. As a result, only one Norwegian specimen of *P. irkutensis irkutensis* is known. The species is mentioned in the Norwegian red list as

vulnerable (VU) (Ødegaard *et al.* 2010) based on this specimen.

Cyclorhipidion bodoanus (Reitter, 1913) was recorded in Norway in the town Horten, Vestfold County, in 2008 and 2011. The species is also known from Sweden and Denmark. *C. bodoanus* is originally an Asian species. (Ødegaard & Hanssen 2012), which is now established and widely distributed in Europe (Knížek 2011).

Trypophloeus dejevi (Stark, 1936) was recorded in 2012 at Jergul, Finmark County (Lindelöw & Kvamme 2013) and should be added to the Norwegian list.

Carphoborus cholodkovskiyi Spessivtsev, 1916 was recorded new to Norway in 2014, in Hedmark County (Kvamme & Lindelöw 2014).

Ips amitinus (Eichhoff, 1872) is neither listed as Norwegian in the Palaearctic Catalogue nor by Silfverberg (2010) or in the NCG's beetle base. *I. amitinus* was found for the first time in Norway outside Sarpsborg town, arriving in low quality timber imported from Estonia (Kvamme *et al.* 2003, Thunes *et al.* 2004). The species has later been found imported several times. Use of traps baited with pheromones for *Ips typographus* (Linnaeus, 1758) showed that *I. amitinus* successfully hibernated in the timber store (Økland *et al.* 2005). An established population in Sweden, outside ports, was first documented at Lainio (Norrbotten county) in 2013 (Lindelöw 2013). The first finding in Finland was in 1950 or 1951 (Nuorteva 1956, Lekander *et al.* 1977), but *I. amitinus* might have been established already in the 1940ies (Kopponen 1975). The species can be expected to occur in Norway since it is now distributed all over Finland up to the Norwegian border, as a result of a natural geographical expansion. *I. amitinus* should be listed as intercepted until an established population is confirmed in Norway.

Deleted species

Hylastes ater (Paykull, 1800). The history of *H. ater* in Scandinavia is long and confusing due to taxonomic and nomenclatorial confusion. The nomenclature used here follows Knížek

(2011), which means that Paykull, 1800, is regarded as the auctor of *H. ater*; not Fabricius, 1793 (not 1792) (see also Silfverberg 2010). Fabricius (1793) described *Hylastes ater* under the name *Bostrichus ater*. The species was later synonymized with *Pityogenes bidentatus* (Herbst, 1784) by Zimsen (1964), who studied the types in Fabricius' collection. She clearly stated that there were two specimens in the collection. One is *P. bidentatus* and one belongs to a different family. Therefore, Fabricius is not regarded as the author of *Hylastes ater*.

Siebke (1875) mentioned that *H. ater* was found in Christiania (= Oslo) rather frequent. He also mentioned a record from Hvaler referring to Collett. Schøyen (1879) added it from Dovre area. Grill (1896) mentioned *H. ater* from Norway up to Alta 70° N, referring to Staudinger. Helliesen (1916) mentioned *H. ater* as common in the pine forests of Rogaland County. In Hansen *et al.* (1939) *H. ater* was presented as distributed more or less all over Norway, while *H. brunneus* was not mentioned from Norway. Strand (1946a) listed *H. ater* from many localities in Nordland, Troms and Finnmark Counties. None of these early coleopterists mentioned *H. brunneus* Erichson, 1836.

Strand (1953) examined Norwegian specimens of *H. ater* and stated that they were all *H. brunneus* and that *H. ater* was never found in Norway. Hansen (1954, 1956) studied the *Hylastes* species in the Nordic countries, including Erichson's type, and reached the same conclusion as Strand (1953). He also simply stated that the two species have been confused. Lekander (1965a) studied the taxonomy of the two species and re-described *H. ater*. The conclusion about the distribution was the same as Strand's and Hansen's. Nunberg (1954), see Grocholski *et al.* 1976) stated that the morphological characters used for separating the two species were useless. This statement may have strengthened the confusion. A revised taxonomy was made by Grocholski *et al.* (1976), who studied the morphology of the species. They made a new identification key, which included all the Scandinavian *Hylastes* species. This work is the basis for the identification of the genus *Hylastes* today.

Pfeffer (1955, 1995) mentioned that *H. ater* is distributed throughout Europe including "Süd-Norwegen" plus in Siberia, while *H. brunneus* is only found in Central Europe and Bulgaria. Lekander *et al.* (1977) and Silfverberg (1979, 2004, 2010) did not list *H. ater* from Norway. However, Wood & Bright (1992a) inherited the mistake from older sources and included *H. ater* from Norway, referring to Grill (1896), Helliesen (1916), Münster (1922), Strand & Hanssen (1935) and Strand (1946a, 1953).

The map on the NCG (2014) website shows the distribution of *H. ater* from Rogaland, Troms and Finnmark Counties. The NCG map is based on lookup from species maps (Artskart, Artdatabanken in Norway). Five localities on Artskart are shown on the map, based on the following records: Finnmark County, Alta, 2 exx. (Coll. UiO) (intern no. 277045), 0/6–1924, Leg. A. Strand. Det. S. Ligaard; Troms County, Målselv, Rundhaug, 1 ex. (Coll. UiO) (intern no. 268783), 24/7–1916, Leg. T. Münster, Det. S. Ligaard; Rogaland County, Suldal, Jelsa, 2 exx. (Coll. UiO) (intern. no. 277266), no date, Leg. Anonymous, Det. S. Ligaard; Rogaland County, Hjelmeland, Årdal, 6 exx. (Coll. UiO) (intern no. m283254), 15/5–1932, Leg. Fritz Jensen, Det. S. Ligaard. The North-Norwegian localities are mentioned by Strand (1946a). However, Strand does not mention the record by Münster from Rundhaug, but only records by Strand, Jensen and Natvig. The last record on the NCG map is from Møre & Romsdal County, Rauma, Isfjorden, Hen, 2 exx. (intern. no. 494166), 21/3–1996, Det.?, species observation by Norwegian Entomological Society. According to Sindre Ligaard (pers. com.) he is wrongly mentioned as the identifier of these specimens, which he has never seen. It is thus not clear who has identified the specimens. We have not seen any specimens confirming that these records are *H. ater* and consequently delete them. Stated by many of the cited sources above, *H. ater* is a southern oriented species, mainly continental but reaching South-Sweden. Although *H. ater* is reported from several provinces in Sweden, there are actually no confirmed records outside Skåne (Lindelöv 2010), Halland (Franc pers. com.), Öland and Blekinge (Ericson 2014). The

identification key by Spessivtseff (1922) is one of the most used keys in Scandinavia and is still used. Spessivtseff does not mention *H. brunneus*, only *H. ater*. Therefore, many *H. ater* records in Scandinavia are misnamed *H. brunneus*.

It is possible that the species might occur in Norway, but we consider the basis for listing the species as Norwegian as too uncertain without new records. Consequently, NR (Norway) should be deleted in the Palaearctic Catalogue (Knížek 2011) and from NCG's map.

***Hylurgus ligniperda* (Fabricius, 1787).** Listed as recorded in Norway by Knížek (2011), based on Wood & Bright (1992a). Lekander *et al.* (1977) did not mention the species as recorded from Norway. Silfverberg (1979) listed it as N, but this is deleted in later editions (Silfverberg 2004, 2010). *H. ligniperda* was not listed as Norwegian by NCG (2014). A few specimens have been found close to the coast in eastern Skåne, Sweden, indicating anemochoric dispersal from the European continent. There are only two known inland records from Sweden. One specimen was found on the shore of Lake Vombsjön in Skåne 1.V.2012, Leg. Alan Dufberg (pers. com.) and one specimen caught in a pitfall trap in 1992, in Halland (Lindelöw unpubl.). The inland records may indicate a viable population in Sweden. Other records relate to imported timber. The nearest viable population seems to be on the islands Bornholm and Fyn, and the biogeographical region: Lolland, Falster and Møn in Denmark (Hansen 1996). Our conclusion is that *H. ligniperda* should be deleted since there are no records of the species in Norway.

***Phloeotribus rhododactylus* (Marsham, 1802).** It is listed as recorded in Norway by Knížek (2011). Wood and Bright (1992a) listed it as Norwegian, referring to Grill (1896). *P. rhododactylus* was published new to Norway by Schøyen (1879), referring to records in Kristiania area (= Oslo) by Moe, Münster & Helliesen. Grill (1896) listed *P. rhododactylus* from Christiania (= Oslo), referring to Münster. In the catalogue by Hansen *et al.* (1939), the species was listed as Norwegian. No details are mentioned except that it was sampled in the coastal region no. a, which is stretching from the border of Rogaland

County to the Swedish border. Strand (1946c) wrote that *P. rhododactylus* was wrongly listed as Norwegian (see Hansen *et al.* 1939). The assumption that the species occurs in Norway, was based on misidentified specimens of *P. spinulosus* (Marsham, 1802) (Alf Bakke pers. com.). It is not listed as Norwegian by Lindroth (1960), Lekander *et al.* (1977), Silfverberg (1979, 2004, 2010) and the NCG (2014). *P. rhododactylus* is known from Skåne County, Sweden, by two old records (Lundberg 1978). Although the specimens (Leg. C. Möller) in the Göteborg Natural History Museum (GNM) are correctly determined, the species is deleted as Swedish in the NCG (2014) database. Thomson (1865) wrote about *P. rhododactylus* (translated): "Rare; found in pine in Skåne, near Stockholm, in Upland and Ångermanland". This shows a basic misunderstanding of the species. Thomson's books were most important in Norway and had great impact. The nearest known viable population is from Denmark (Hansen 1996). The host plant *Cytisus scoparius* (L.) Link, grows along the southern coast of Sweden and Norway, so it might still be present in Sweden and eventually in Norway. However, we have found no Norwegian specimens or data from Norway and NR must be deleted in the Palaearctic catalogue.

***Ernoporicus fagi* (Fabricius, 1798).** Listed as recorded in Norway by Knížek (2011), based on Wood & Bright (1992b). We do not know the basis for this listing, but we suspect that Wood & Bright built on Stark (1952) who mentioned it from Norway. *E. fagi* was not mentioned from Norway by Siebke (1875), Schøyen (1879), Grill (1896), Hansen *et al.* (1939), Lindroth (1960), Lekander *et al.* (1977), Pfeffer (1995), Silfverberg (1979, 2004, 2010) and NCG (2014). The nearest localities are in South Sweden (the provinces of Skåne, Blekinge, Halland and Småland) (Lundberg & Gustafsson 1995, Ehnström & Axelsson 2002). Not found in Norway although being searched after in Norwegian beech forests. Consequently NR should be deleted.

***Pityogenes saalasi* Eggers, 1914.** Listed as recorded in Norway by Knížek (2011). Wood & Bright 1992a refer to Strand (1946a). Strand mention it, but not from Norway. It is not listed from Norway by neither Pfeffer (1995), Silfverberg

(2010) nor NCG (2014). *P. saalasi* should thus be deleted as found in Norway from the Palaearctic list. We do not know the background for the listing as Norwegian and we have no new evidence that the species has been found in Norway. *P. saalasi* can be expected to occur in Norway since the species is present in many sites in higher altitude Norway spruce forests in Northern Sweden (Lekander *et al.* 1977).

***Scolytus mali* (Bechstein & Scharfenberg, 1805).** Listed as recorded in Norway by Knížek (2011), based on Wood & Bright (1992a) who refer to Helliesen (1916) and Münster (1921). The old records of *S. mali* sampled by N. G. Moe, T. Helliesen and T. Münster are all *S. laevis* Chapuis, 1873, sampled at Tøyen, Oslo, from elm trees (Münster 1921). Schøyen (1879) mentioned *S. pruni* (Ratzeburg, 1837) as found on many localities in South-eastern Norway on *Ulmus*. *S. pruni* is a junior synonym of *S. mali*, but the specimens are misidentified *S. laevis*. Helliesen (1916) published the species under the name *Eccoptogaster mali*, based on specimens found at Vaage (= Våge), Suldal. Helliesen considered it rare in this area. Also these specimens are misidentified *S. laevis* (Münster 1935). Pfeffer (1995) listed 19 hostspecies, but *Ulmus* spp. are not among them. *S. mali* was listed from Norway by Hansen *et al.* (1939), although both Münster and Strand were co-authors of the catalogue. Michalski (1973) mentioned *S. mali* from “the whole of Europe, except northern Norway....” and thus indicating that it occurs in South-Norway. Pfeffer (1995) mentioned the species from “Südsandinavien”. *S. mali* was not listed from Norway by Lindroth (1960), Lekander *et al.* (1977), Silfverberg (1979, 2004, 2010) and the NCG (2014). *S. mali* might occur in Norway, but until new confirmed records are available NR should be deleted.

***Scolytus multistriatus* (Marsham, 1802)** Listed as recorded in Norway by Knížek (2011) based on Wood & Bright (1992a), who listed it from S Norway. *S. multistriatus* was published as new to Norway by Schøyen (1879), who mentioned that it was collected from elm trees at Tøyen in Oslo, by Moe and Münster. Grill (1896) mentioned it from Norway based on this. All

these specimens are misidentified *S. laevis*, also including the specimens collected by Helliesen (Münster 1921). However, *S. multistriatus* was not mentioned as found in Norway by Michalski (1973), Lekander *et al.* (1977), Pfeffer (1995), Silfverberg (1979, 2004, 2010) and NCG (2014). As far as we know, no new records from Norway have been made and NR should consequently be deleted.

Species with uncertain occurrence in Norway

***S. triarmatus* (Eggers, 1912)** was earlier accepted by many authors to be a synonym of *S. scolytus*. In Scandinavia, the two species have been treated as one species. However, Butovitsch (1927, see also 1929) studied and found morphological differences between *S. scolytus* and *S. triarmatus* and concluded that they were different species. Münster (1928) based his identification on Butovitsch and published *S. triarmatus* new to Norway. The single known specimen is from Kristiania (= Oslo), was in the collection of Esmark. Esmark is the collector of the specimen, which is also stated in the handwritten notes from Andreas Strand. Esmark, who lived from 1806 to 1884 (Sømme 2004). Michalski (1973) did not remove it from synonymy. Up to 1995, it was treated as a junior synonym in Scandinavia when Hansen *et al.* (1995) treated *S. triarmatus* as a valid species in Denmark.

Wood & Bright (1992a, see also Bright & Skidmore 2002) mention *S. triarmatus* from Norway, referring to Münster (1928). The identification of this specimen was confirmed by Lindelöw (2010) when he revised Norwegian *Scolytus* specimens. Only this old specimen of *S. triarmatus* is known from Norway. As far as we know, the species has not been found later and it is an open question if the species occurs in Norway today. The species might be overlooked but it is also possible that the record is a result of an occasional introduction by human activities or a mislabelled specimen. New data is needed to state the occurrence in Norway today

***Scolytus scolytus* (Fabricius, 1775)** is a part of the confusion of the elm living *Scolytus* species.

Wood & Bright (1992a) mentioned *S. scolytus* as Norwegian and referred to Münster (1928) and Hansen *et al.* (1939). Münster deleted *S. scolytus* from the Norwegian list (Münster 1928).

Wood & Bright (1992a) also treat *S. destructor* Olivier, 1795, as a synonym of *S. scolytus*, which is generally accepted today (see Knížek 2011). It was listed as found in Norway referring to Siebke (1875) who mention that it is rare in Christiania area, collected from *Betula*. Münster (1928) deleted *S. scolytus* from the fauna stating that Siebke's specimens are all *S. ratzeburgi*. Wood and Bright also referred to Sparre-Schneider (1889), who studied the beetles in arctic Norway. Schøyen (1879) mentioned *S. destructor* from Jondalen, Kongsberg, and Tøyen, Oslo. In these cases, the records are misnamed or misidentified *Scolytus ratzeburgi* Janson, 1856. *S. ratzeburgi* is the only Scandinavian species of the genus living in *Betula* spp., and it is the only *Scolytus* species in North-Norway (Lindroth 1960, see also Hansen *et al.* 1939). *S. scolytus* was listed as Norwegian, from Akershus County by Lindroth (1960). Michalski (1973) mentioned *S. scolytus* from “the whole Europe except the far north (up to the border of taiga)”, which means South-Norway is included. Lekander *et al.* (1977) mentioned one record of *S. scolytus/triarmatus*. Silfverberg (1979) listed *S. scolytus* from Norway, but deleted it later (Silfverberg 2004, 2010). The nearest known Swedish localities of *S. scolytus* are around Lake Mälaren. The northernmost finding is in Örebro, Närke (Hansson and Hallqvist unpubl.). Interestingly, during the last decade several records of *S. scolytus* have been made in southern Sweden (Lindelöw 2010). The probable expansion in Sweden during the last decade makes it more likely that *S. scolytus* might occur in Norway. Up to now, we have no data that document records of *S. scolytus* from Norway and thus it should be deleted from the list.

Is *Orthotomicus longicollis* (Gyllenhal, 1827) still a part of the Norwegian fauna? This is an unanswered question. The only Norwegian record was a dead specimen found by Münster (1928) at Kongsberg. The specimen is in the collection of Natural History Museum in Oslo. In the Norwegian national redlist, it is classified as Regional Extinct

(RE) (Ødegaard *et al.* 2010). The nearest certain localities in Sweden are the northern part of Öland and Gotska Sandön (Lekander *et al.* 1977). In Finland there are only two records (Lekander *et al.* 1977, Kari Heliövaara & Ilpo Mannerkoski pers. com.). A new record is needed in order to confirm the occurrence in Norway today.

Xyleborus monographus (Fabricius, 1792) is known only from one old specimen labelled “Chr.sand, Ullmann”. Axel Conradin Ullmann (1840–1923) lived in Kristiansand from 1896 to 1913 (Sømme 2004). The specimen is probably collected in this period. No other record of the species is known from Norway and Olberg (2007) supposed it is extinct in Norway. However, new records have been published by Ødegaard *et al.* (2009), which shows that the species is present in Norway. In the national redlist it is listed as CR (Critically Endangered) (Ødegaard *et al.* 2010).

The number of species and unanswered problems in the genus *Trypophloeus*

The determination of species within the genus *Trypophloeus* Fairmaire, 1864 has caused a lot of confusion among coleopterists due to many taxonomic mistakes made through history. This may be illustrated by comparing three of the latest catalogues containing lists of Norwegian bark beetles (Table 1). The understanding of species, subspecies and synonyms is far from uniform. All the species in the genus are minute and have mostly very vague morphological characters. The genus is widely distributed in the Palaearctic as well as Nearctic.

It is very uncertain what previously used name *T. asperatus* (Gyllenhal, 1813) should be called, when this species name is linked to *Cryphalus asperatus* (Gyllenhal, 1813) (= *Cryphalus abietis* (Ratzeburg, 1837)). Probably most (or all) of the specimens previously identified as *T. asperatus* are *T. binodulus* (Ratzeburg, 1837) (cf. Wood 1972) (Knížek pers. com.). *T. alni* (Lindemann, 1875), *T. bispinulus* Eggers, 1927 and *T. dejevi* Stark, 1936 are easily interpreted biological entities in the Scandinavian context. As we understand it, the Scandinavian specimens of *T.*

TABLE 1. The Scandinavian species, subspecies and synonyms of the genus *Trypophloeus* Fairmaire, 1864 as listed in the main, recent catalogues. On the horizontal lines of the table are written what we interpret as the same taxa when comparing the catalogues.

Silfverberg 2010	Knížek 2011	NCG 2014
<i>T. alni</i> (Lindemann, 1875)	<i>T. alni</i> (Lindemann, 1875)	<i>T. alni</i> (Lindemann, 1875)
not mentioned	<i>T. dejevi</i> Stark, 1936	<i>T. dejevi</i> Stark, 1936
not mentioned	<i>T. dejevi</i> Stark, 1936 syn. <i>T. dejevi</i> Eggers, 1942	Not mentioned
<i>T. bispinulus</i> Eggers, 1927	<i>T. bispinulus</i> Eggers, 1927	<i>T. bispinulus</i> Eggers, 1927
<i>T. granulatus</i> (Ratzeburg, 1837)	<i>T. granulatus</i> (Ratzeburg, 1837)	<i>T. granulatus</i> (Ratzeburg, 1837)
<i>T. granulatus</i> ssp. <i>granulatus</i> (Ratzeburg, 1837)	ssp. not mentioned	ssp. not mentioned
<i>T. granulatus</i> ssp. <i>grothii</i> (Hagedorn, 1904)	<i>T. binodulus</i> = syn. <i>grothii</i> (Hagedorn, 1904)	<i>T. grothii</i> (Hagedorn, 1904)
not mentioned	<i>T. binodulus</i> (Ratzeburg, 1837)	<i>T. binodulus</i> (Ratzeburg, 1837)
<i>T. asperatus</i> (Gyllenhal, 1813)	Species name used in <i>Cryphalus</i>	not mentioned
<i>T. discedens</i> Palm, 1950	not mentioned because it is nomen nudum and the Pal.Catalogue doesn't list unavailable names	not mentioned
<i>T. discedens</i> syn. <i>palmi</i> Hansen, 1955	<i>T. palmi</i> Hansen, 1956	<i>T. palmi</i> Hansen, 1956

asperatus (Gyllenhal, 1813) correspond with *T. binodulus* (Ratzeburg, 1837). *T. granulatus* (Ratzeburg, 1837) is listed as a good species in all three catalogues (Table 1). However, *T. grothii* (Hagedorn, 1904) is a synonym of *T. binodulus* the way names are used in the Palaearctic catalogue (Knížek 2011). In Silfverberg 2010 it is listed as subspecies of *T. granulatus* and as a valid species in the database of NCG (2014).

Discussion

A total of 71 outdoor living, established species of bark beetles (Scolytinae) have been documented from Norway (Table 2), while the number in Sweden is 90 species (Silfverberg 2010, Knížek 2011, Lindelöw 2013, Lindelöw & Kvamme 2013, NCG (Nordic Coleoptera Group) 2014, Kvamme & Lindelöw 2014). *I. amitinus* is not included in this figure since it is not documented that we have established populations in Norway. We use the term intercepted and not introduced. This is the common term for species found temporarily in a country, but not proven established.

Trypophloeus Fairmaire, 1864 is a taxonomic

and nomenclatorial problematic genus, which is strongly in need of a modern revision. Especially *T. asperatus*, *T. binodulus*, *T. grothii*, and *T. granulatus* needs a revision, including DNA studies. Due to the vague morphological characters that separate the species, DNA testing of the species is important. This may also uncover cryptic species. In order to make the nomenclature stable and uniform a revision of the genus in the whole Palaearctic region is necessary. The number of bark beetles species documented in Norway (as well as Sweden and Denmark) may be changed due to how the *Trypophloeus* species are defined taxonomic and the nomenclature chosen (Table 1).

Due to the difference in knowledge between Sweden and Norway, many more species are expected to be found in Norway.

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TABLE 2. The list shows the 71 species of outdoor living and established bark beetle species documented from Norway. The nomenclature and order of species follow Knížek (2011). Under “Comments” are references to the first published record or information of particular interest to Norway.

Curculionidae, Scolytinae	Comments
Hylastini	
<i>Hylastes angustatus</i> (Herbst, 1794)	Lekander 1965b
<i>H. attenuatus</i> Erichson, 1836	Lekander 1965b
<i>H. brunneus</i> Erichson, 1836	
<i>H. cunicularius</i> Erichson, 1836	
<i>H. opacus</i> Erichson, 1836	Lekander 1965b
<i>Hylurgops glabratus</i> (Zetterstedt, 1828)	
<i>H. palliatus</i> (Gyllenhal, 1813)	
Hylesinini	
<i>Hylesinus crenatus</i> (Fabricius, 1787)	
<i>H. wachtli</i> ssp. <i>orni</i> Fuchs, 1906	Strand 1963
<i>H. toranio</i> (D’Anthoine, 1788) (= <i>oleiperda</i> (Fabricius, 1792)	Bakke 1963a
<i>H. varius</i> (Fabricius, 1775) (= <i>fraxini</i> (Panzer, 1799))	
Hylurgini	
<i>Dendroctonus micans</i> (Kugelann, 1794)	
<i>Tomicus minor</i> (Hartig, 1834)	
<i>Tomicus piniperda</i> (Linnaeus, 1758)	
<i>Xylechinus pilosus</i> (Ratzeburg, 1837)	
Phloeotribini	
<i>Phloeotribus spinulosus</i> (Rey, 1883)	
Polygraphini	
<i>Carphoborus cholodkovskyi</i> Spessivtsev, 1916	Kvamme & Lindelöw 2014
<i>Polygraphus poligraphus</i> (Linnaeus, 1758)	Lekander 1959
<i>P. punctifrons</i> C.G. Thomson, 1886	Lekander 1959
<i>P. subopacus</i> C.G. Thomson, 1871	Lekander 1959
Corthylini	
<i>Pityophthorus glabratus</i> Eichhoff, 1878	Vik 1963
<i>P. lichtensteinii</i> (Ratzeburg, 1837)	
<i>P. micrographus</i> ssp. <i>micrographus</i> (Linnaeus, 1758)	
<i>P. pubescens</i> (Marsham, 1802)	Strand 1965
<i>P. traegardhi</i> Spessivtsev, 1921	Bakke & Kvamme 1977
Cryphalini	
<i>Cryphalus asperatus</i> (Gyllenhal, 1813) (= <i>abietis</i> (Ratzeburg, 1837))	
<i>C. saltuarius</i> Weise, 1891	
<i>Ernoporicus caucasicus</i> (Lindemann, 1876)	Bakke 1963b
<i>Ernoporus tiliae</i> (Panzer, 1793)	Bakke 1963b
<i>Trypophloeus alni</i> (Lindemann, 1875) (Table 1)	
<i>T. binodulus</i> (Ratzeburg, 1837) (Table 1)	

TABLE 2. continued

	Comments
<i>T. bispinulus</i> Eggers, 1927 (Table 1)	
<i>T. dejevi</i> Stark, 1936 (Table 1)	Lindelöw & Kvamme 2013
<i>T. granulatus</i> (Ratzeburg, 1837) (Table 1)	
Crypturgini	
<i>Crypturgus cinereus</i> (Herbst, 1794)	
<i>C. hispidulus</i> C.G. Thomson, 1870	
<i>C. pusillus</i> Gyllenhal, 1813	
<i>C. subcribrosus</i> Eggers, 1933	
Dryocoetini	
<i>Dryocoetes alni</i> (Georg, 1856)	
<i>D. autographus</i> (Ratzeburg, 1837)	
<i>D. hectographus</i> Reitter, 1913	
<i>D. villosus</i> ssp. <i>villosus</i> (Fabricius, 1792)	
<i>Lymanor coryli</i> (Perris, 1855)	Olberg & Andersen 2003
<i>Taphrorychus bicolor</i> (Herbst, 1794)	Ødegaard & Ligaard 2000
Ipini	
<i>Ips acuminatus</i> (Gyllenhal, 1827)	
<i>I. duplicatus</i> (C. R. Sahlberg, 1836)	
<i>I. sexdentatus</i> (Boerner, 1766)	
<i>I. typographus</i> (Linnaeus, 1758)	
<i>Orthotomicus laricis</i> (Fabricius, 1792)	
<i>O. longicollis</i> (Gyllenhal, 1827)	Münster 1928
<i>O. proximus</i> (Eichhoff, 1868)	
<i>O. suturalis</i> (Gyllenhal, 1827)	
<i>Pityogenes bidentatus</i> (Herbst, 1784)	
<i>P. chalcographus</i> (Linnaeus, 1760)	Not 1761: see Evenhuis 1997, Silfverberg 2010 and Knížek 2011
<i>P. irkutensis</i> ssp. <i>irkutensis</i> Eggers, 1910	Ødegaard et al. 2010
<i>P. quadridens</i> (Hartig, 1834)	
<i>P. trepanatus</i> (Nördlinger, 1848)	Bakke 1963b
Scolytini	
<i>Scolytus intricatus</i> (Ratzeburg, 1837)	
<i>S. laevis</i> Chapuis, 1869	Hansen et al. 1998
<i>S. ratzeburgi</i> E.W. Janson, 1856	
<i>S. rugulosus</i> (P.W.J. Müller, 1818)	Strand 1970
<i>S. triarmatus</i> Eggers, 1912	Lindelöw 2010
Xyleborini	
<i>Anisandrus dispar</i> (Fabricius, 1792)	
<i>Cyclorhipidion bodoanum</i> (Reitter, 1913)	Ødegaard & Hanssen 2012
<i>Xyleborinus saxesenii</i> (Ratzeburg, 1837)	Bakke 1999

TABLE 2. continued

	Comments
<i>Xyleborus cryptographus</i> (Ratzeburg, 1837)	
<i>X. monographus</i> (Fabricius, 1792)	Olberg 2007, Ødegaard et al. 2009
Xyloterini	
<i>Trypodendron domesticum</i> (Linnaeus, 1758)	
<i>T. laeve</i> Eggers, 1939 (= <i>piceum</i> Strand, 1946)	Strand 1946b, Kvamme 1988
<i>T. lineatum</i> (Olivier, 1795)	
<i>T. signatum</i> (Fabricius, 1792)	Kvamme 1988
Fägerström (Lund), Mikael Sörensson (Lund), Niklas Franc (Ljungskile), Sindre Ligaard (Vestby), Robert Bergersen (Tromsø), Kari Heliövaara (Helsinki) and Ilpo Mannerkoski (Helsinki) all contributed with information. Thanks to all.	<i>emendata et aucta. Secundum classes, ordines, genera, species adjectis synonymis, locis, observationibus, descriptionibus.</i> Tome 1. Pars 2. 538 pp. C.G. Proft, Hafniae. [Published 4th May 1793]
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