

The beetle fauna (Coleoptera) of the arctic mainland of Norway

Pål A. Olsvik, Frode Ødegaard & Oddvar Hanssen

Published on paper: 2001.
Published online: 2024-10-11.
ISSN 1502-4873 (paper).
ISSN 1891-5396 (electronic).
doi: <https://doi.org/10.5324/fn.v21i0.5994>.

Olsvik, P. A., Ødegaard, F. & Hanssen, O. 2001. The beetle fauna (Coleoptera) of the arctic mainland of Norway. - *Fauna norvegica* 21: 17-24.

This paper is the first attempt to summarize the beetles present in the arctic region of the mainland of Norway since 1946. In 1995 and 1998 beetles were collected by pitfall traps and other methods in Vardø municipality on the Varanger Peninsula in Finnmark county. This area is part of the small section of the Norwegian mainland that belongs to the southern arctic vegetation zone. A total number of 159 species from 18 families were recorded, including earlier findings by others. This probably covers a substantial part of the beetle fauna present in this marginal environment. Rove beetles (Staphylinidae) are the most abundant group and made up 46% of the recorded species, whereas diving beetles (Dytiscidae) and ground beetles (Carabidae) made up 16% and 15% of the species, respectively. Considering the regional distribution of these species in Norway, 8% are found only in northern Norway (Nordland/Troms/Finnmark), 19% have mainly an alpine distribution, 27% are mainly restricted to boreal areas, whereas 53% are common all over Norway. *Diacheila polita* and *Simplocaria elongata* belong to a characteristic arctic beetle community, and the present records of these two species are the only ones from Scandinavia. The study indicates that there are very few beetles that belong entirely to the arctic mainland of Norway.

Key words: Coleoptera, Palaearctic, Arctic Mainland Norway, Vardø, Zoogeography.

Pål A. Olsvik*, Department of Zoology, NTNU, N-7491 Trondheim, Norway
Oddvar Hanssen and Frode Ødegaard, Norwegian Institute for Nature Research, Tungasletta 2, N-7485 Trondheim, Norway

*Corresponding author

INTRODUCTION

The northern and eastern parts of Vardø municipality, situated at the eastern part of the Varanger Peninsula in northeast Finnmark county, are located in an area that belongs to the arctic region (average temperature <10°C in July) (Aune 1993). In mainland Norway, this region is only found in a narrow coastal area between North Cape and Vardø, facing the Barents Sea. The vegetation in this region belongs to the southern arctic vegetation zone (Moen 1998). A floristic boundary used to delimit the terrestrial arctic is the treeline, the northern limit beyond which trees do not grow. More accurately, this region in Finnmark is a transition zone between continuous boreal forest or treeless alpine area and tundra, with isolated stands of trees. Because this is a rare vegetation zone in northern Europe, the region represents a very interesting area both with regards to the fauna and the flora. The beetle fauna in this vegetation zone in Norway is still poorly known (Strand 1946, Lindroth 1949, Hanssen & Olsvik 1998). This vegetation zone also appears in the northernmost parts of Russia, but this region has been heavily militarized and its access restricted after World War II. However, Mäklin (1881), Poppius (1905, 1908, 1909) and Hellén (1930) have ear-

lier reported the beetle fauna in various regions in northwestern Russia (i.e. the Kola Peninsula, the Kanin Peninsula and Novaja Zemlja). The alpine beetle fauna of Southern Norway is better known, and several papers have listed and discussed mountainous species (e.g. Fjellberg 1972, Østbye & Hågvar 1996, Ottesen 1997, Hanssen et al. 1998). Generally, beetles do not thrive in the far north, and only a few species can be termed truly arctic (Böcher 1988).

Andreas Strand listed the beetles of northern Norway, and according to him 56 species were reported in Vardø municipality (Strand 1946). The former Vardø municipality (Vardø herred) also included today's Båtsfjord municipality; hence some of these species may have been found there. P.W. Deinboll studied the coleoptera fauna in Vardø between 1819-1824, but his writing is currently unknown. H.J. Sparre Schneider visited the area several times in the 1870-80's, and his findings are reported in Strand (1946). R. Collett, T. Münster, T. Soot-Ryen, A.B. Wessel and the Oxford University Lappland Expedition in 1930 all visited Vardø, and have reported some findings of beetles in the

vicinity of Vardø City. Iversen & Iversen (1989) found 10 species of beetles on Reinøya, an island being part of the Reinøya and Hornøya nature reserve, in the 1980ties. From the present investigation the carabid beetle *Diacheila polita* (Faldermann, 1835) has previously been reported as new to the Norwegian fauna (Hanssen & Olsvik 1998).

In this paper we list the beetles found in Vardø municipality (including Sandfjorden and Hamningberg in Båtsfjord municipality) during four surveys made in 1995 and 1998. Species reported by Strand (1946) and Iversen & Iversen (1989), but not re-found in the current surveys are also listed. Obviously introduced species are left out of the list. This paper is therefore the first attempt to summarize the beetles present in the arctic region of the mainland of Norway since Strand (1946).

MATERIALS AND METHODS

Most of the material described in this paper originates from eight pitfall traps operated (by PAO) throughout the snow-free season of 1995 (June-October) in seven different vegetation types in Vardø municipality. These traps were placed at locations which represent the most common vegetation types in Vardø; Svartnes: a stony meadow with tufted hair-grass close to the shoreline, Barvikmyra: ombrotrophic palsa bog vegetation, Persfjord: dry dune meadow with established sand dune vegetation, Domen: alpine oligotrophic heath with dwarf birch/crowberry vegeta-

tion, Trollbukta: poor tall-herb meadow and scrub vegetation, Komagvær: open rush sand dune vegetation and finally common scurvygrass ornithocoprophilous vegetation below the seabird colony at Hornøya. The locations of the traps operated in 1995 are shown in Fig. 1 (locations 1-7). The ATM-coordinates and the vegetation types of these locations are shown in Table 1.

Beetles from other locations in Vardø municipality were collected by various techniques in different habitats (beneath stones, in *Sphagnum* peat mosses, in ponds etc.) several times during the field season of 1995 (termed location 8 in Table 1). In 1998, we (OH/FØ) (5-10 July 1998) and others (Sindre Ligaard (1-3 July 1998) and Viggo Mahler/Palle Jørum (19-22 July 1998)) collected beetles during three surveys to the region. At Barvikmyra (location 2), several pitfall traps were operated in the period between 10 July and 1 Sept. 1998. Species found in 1995 and 1998 at Barvikmyra (location 2), Persfjord (location 3) and Komagvær (location 6) are listed together, even though the UTM-location and vegetation type described in Table 1 may not be exactly equivalent for the different surveys. For example, all the diving beetles reported from Barvikmyra were caught in small ponds near Barvikvatnet, situated at the edge of Barvikmyra. Some of the species collected in 1998 reported from Komagvær (location 6), were not found on the sand dunes as described in Table 1, but rather in different habitats (bog/fen, *Salix* scrub) in areas adjacent to the sand dunes. The ombrotrophic bog Hollamyra, with ponds (location 11), situated approximately 2 km northwest of the sampling site at Komagvær

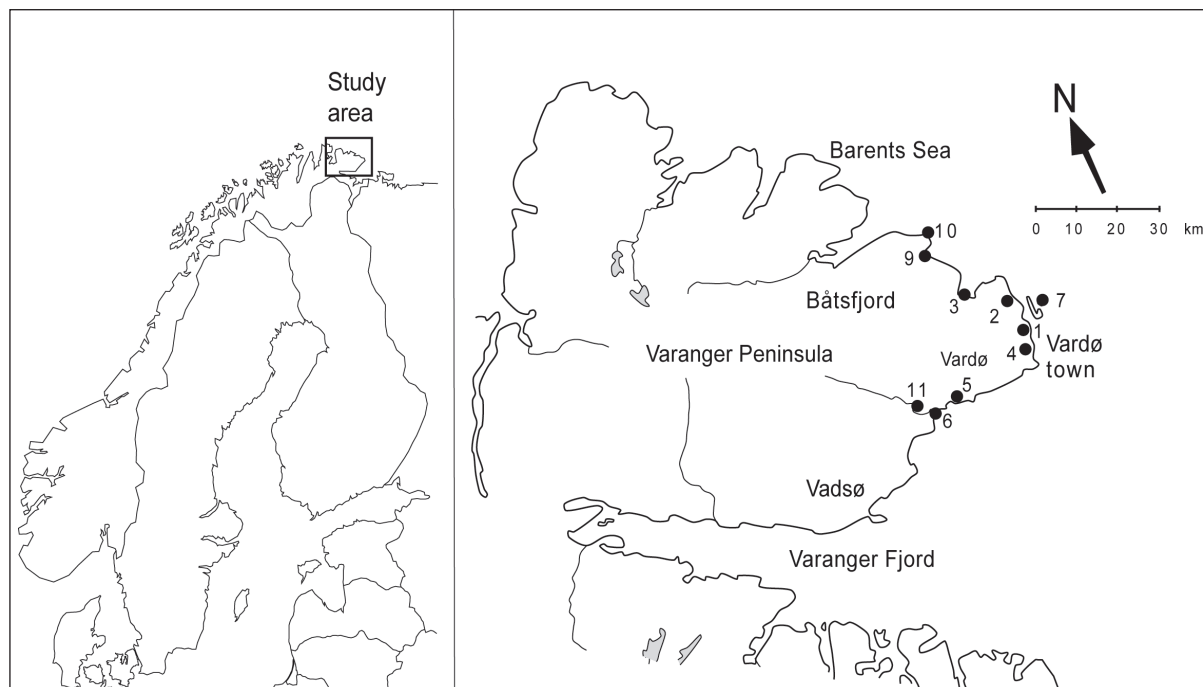


Figure 1
Map showing the locations of the pitfall traps in Vardø municipality and the two locations in Båtsfjord municipality (Sandfjorden and Hamningberg). See Table 1 for description of the various locations.

Table 1. Number, vegetation classification (Fremstad 1997) and UTM coordinates of the pitfall trap locations and the other locations where beetles were collected in 1995 and 1998.

No.	Location	Vegetation classification	Map	UTM coordinates
1	Svartnes	Anthropogenous grassland (G3)	2535 IV Vardø	36WVD269071
2	Barvikmyra, including Barvikvatnet	Ombrotrophic bog (J2)/small lake	2535 IV Vardø	36WVD233118
3	Persfjord	Sanddune vegetation (W2b)/grasland	2535 IV Vardø	36WVD147153
4	Domen	Alpine ridge vegetation (R2c)	2535 IV Vardø	36WVD256020
5	Trollbukta	Early snow patch vegetation (S6b/S7a)	2435 I Langryggen	36WVC091956
6	Komagvær	Sanddune vegetation (W4a)/Salix scrub	2435 II Ekkerøy	36WVC053938
7	Hornøya	Ornithocrophilous vegetation (X2b)	2535 IV Vardø	36WVD307101
8	Vardø, various locations	Various vegetation types		
9	Sandfjorden	Various vegetation types	2436 II Syltefjord	36WVD100240
10	Hamningberg	Anthropogenous grassland (G)	2436 II Syltefjord	36WVD105281
11	Hollamyra, including ponds	Ombrotrophic bog (J2)/ponds	2435 II Ekkerøy	36WVC040952

(location 6), was examined in 1998 and has been added as a separate location. Included in the material are species found in Sandfjorden (location 9) and Hamningberg (location 10), situated in Båtsfjord municipality. These locations belong both climatically and faunistically/floristically to the adjacent areas in Vardø municipality (see the map in Fig. 1). Vegetation classification follows Fremstad (1997), and nomenclature of beetles follows Silfverberg (1992). Climatic details of the region are given in Hanssen & Olsvik (1998).

RESULTS AND DISCUSSION

A total number of 1551 individuals, representing 100 species, were collected in Vardø during 1995. Additionally 46 species were found in 1998, whereas 13 species have previously been reported from this region (Strand 1946, Iversen & Iversen 1989). All of these 13 species (phytophagous, dung beetles etc.) have a wide distribution, and they were not rediscovered in this survey because their habitats were not thoroughly searched. The total number of individuals collected in 1998 has not been calculated. Poppius (1905) considered 52 out of a total number of 1054 species, reported from the Kola Peninsula and the Enare Lappmark, to be truly arctic. Twenty-one (40%) of these species were also found in the Vardø region. However, many of these 52 species (especially the diving and the rove beetles) have later turned out to be present in a wider geographical area, and are not considered to have a strictly arctic distribution today. Many of the species Poppius (1905) considered to be arctic, which are not reported by us, are found in other parts of Norway. Hellén (1930) reported 33 species from the northern and eastern parts of the Kola Peninsula, and 8 (24%) of these species are reported in the present study. The Coleoptera fauna of the Kanin Peninsula was surveyed in 1903, and 198 species were reported from this corresponding area of Russia (Poppius 1909). Out of these, 40% of the species are present both in the Vardø region and on the

Kanin Peninsula. Most of the alpine/boreal species reported from the arctic region of northwestern Russia, but not listed in Table 2, are found in other areas of Norway. Only 33 of the species reported from this region of Russia (Poppius 1905, 1909, Hellén 1930) have not yet been found in Norway. Therefore, all together the 159 species from 18 families listed in Table 2 probably make up a substantial part of the beetle fauna inhabiting the southern arctic vegetation zone in the mainland of Norway. It can be argued that three of the selected locations, Trollbukta (location 5), Komagvær (location 6) and Hollamyra (location 11) belong to the alpine vegetation zone rather than to the arctic vegetation zone (Moen 1998). However, most of the species found at these locations are also present in sites situated in the arctic zone, suggesting that they should be included in the listed material as being from the arctic vegetation zone.

Rove beetles (Staphylinidae) made up 46% of the species in this region, and therefore seem to be more dominant in terms of species richness than in Norway as a whole (28%). The large number of rove beetles reported may in part be the result of the sampling techniques, but the dominance of ground dwelling species seems logical considering this area is a treeless region. Diving beetles (Dytiscidae) made up 16% of the species in the studied region, compared to only 4% of the species in the entire country of Norway. Ground beetles (Carabidae) made up 15% of the species, whereas they constitute 8% of the species in Norway. The other 15 Coleoptera families listed in Table 2 were represented only by a few species. This reflects the dominance of predacious species in the north (Poppius 1905, 1909, Hellén 1930).

Strand (1946) listed the longhorn beetle (Cerambycidae) *Monochamus galloprovincialis*, although it has no habitats in the area. This species may have been introduced from the White Sea region in Russia, either via the intense Pomor trade between Archangels and Vardø, which lasted for centuries, or later trade. We have not listed *M. galloprovincialis* in Table 2.

Table 2. List of species. The location numbers refer to Table 1. Nomenclature of beetles follows Silfverberg (1992). Vegetation zones (Moen 1998): 1 = arctic, 2 = alpine, 3 = boreal, 4 = boreonemoral/wide distribution. N denotes species only found in Northern Norway (Nordland/Troms/Finmark).

Species	1	2	3	4	5	6	7	8	9	10	11	Veg. zone
DYTISCIDAE												
<i>Hydroporus acutangulus</i> Thomson, 1856		●										2
<i>Hydroporus planus</i> (Fabricius, 1781)							●	●				4
<i>Hydroporus obscurus</i> Sturm, 1835								●			●	4
<i>Hydroporus geniculatus</i> Thomson, 1854		●							●			4
<i>Hydroporus morio</i> Aubé, 1838		●						●	●			4
<i>Hydroporus notabilis</i> LeConte, 1850		●						●			●	2
<i>Hydroporus lapponum</i> (Gyllenhal, 1808)		●				●		●				2
<i>Hydroporus palustris</i> (Linnaeus, 1761)						●		●				4
<i>Hydroporus melanarius</i> Sturm, 1835		●				●		●		●		4
<i>Hydroporus memnonius</i> Nicolai, 1822		●									●	4
<i>Oreodytes sanmarkii</i> (Sahlberg, 1826)		●										3
<i>Oreodytes alpinus</i> (Paykull, 1798)								●				3
<i>Agabus wasastjernai</i> (Sahlberg, 1824)		●						●				3
<i>Agabus erichsoni</i> Gemminger & Harold, 1868		●						●			●	3
<i>Agabus guttatus</i> (Paykull, 1798)								●				4
<i>Agabus bipustulatus</i> (Linnaeus, 1767)								●				4
<i>Agabus serricornis</i> (Paykull, 1799)											●	3
<i>Agabus arcticus</i> (Paykull, 1798)		●				●		●	●			3
<i>Agabus zetterstedti</i> Thomson, 1856		●				●			●		●	2 N
<i>Agabus lapponicus</i> (Thomson, 1869)		●				●		●	●	●	●	2
<i>Agabus thomsoni</i> (J.Sahlberg, 1871)		●				●		●	●		●	2 N
<i>Agabus confinis</i> (Gyllenhal, 1808)		●				●						2
<i>Ilybius angustior</i> (Gyllenhal, 1808)		●				●		●				3
<i>Rhantus suturellus</i> Macleay, 1825		●				●					●	4
<i>Colymbetes dolabratus</i> (Paykull, 1798)		●									●	3
<i>Dytiscus lapponicus</i> Gyllenhal, 1808								●				4
CARABIDAE												
<i>Nebria rufescens</i> (Ström, 1768)							●	●				3
<i>Pelophila borealis</i> (Paykull, 1790)		●			●	●		●	●	●		3
<i>Notiophilus aquaticus</i> (Linnaeus, 1758)	●	●	●	●		●		●	●			4
<i>Notiophilus germinyi</i> Fauvel, 1863	●		●			●						4
<i>Diacheila arctica</i> (Gyllenhal, 1810)		●				●					●	2 N
<i>Diacheila polita</i> (Faldermann, 1835)		●		●								1 N
<i>Miscodera arctica</i> (Paykull, 1798)				●				●				4
<i>Patrobus septentrionis</i> Dejean, 1828		●	●			●	●	●		●		3
<i>Patrobus assimilis</i> Chaudoir, 1844	●	●	●	●	●			●		●		4
<i>Bembidion bipunctatum</i> (Linnaeus, 1761)						●						4
<i>Bembidion fellmani</i> Mannerheim, 1823									●			2
<i>Bembidion hyperboreaorum</i> Munster, 1923									●			3 N
<i>Bembidion hasti</i> Sahlberg, 1827									●			2
<i>Calathus melanocephalus</i> (Linnaeus, 1758)	●		●			●	●	●		●		4
<i>Calathus micropterus</i> Duftschmid, 1812							●	●				4
<i>Agonum consimile</i> (Gyllenhal, 1810)	●					●						2
<i>Amara nigricornis</i> Thomson, 1857	●					●						3
<i>Amara quenseli</i> (Schönherr, 1806)						●						4
<i>Amara brunnea</i> (Gyllenhal, 1810)	●											4
<i>Amara torrida</i> (Panzer, 1797)	●		●				●	●		●		3 N
<i>Amara alpina</i> (Paykull, 1790)		●		●	●	●		●		●		2
<i>Trichocellus cognatus</i> (Gyllenhal, 1827)	●					●		●				4
<i>Cymindis vaporariorum</i> (Linnaeus, 1758)		●										4

cont. next page

Table 2. Continued.

Species	1	2	3	4	5	6	7	8	9	10	11	Veg. zone
LEIODIDAE												
<i>Hydnobius spinipes</i> (Gyllenhal, 1813)			●									3
<i>Colon arcticum</i> Munster, 1911	●											2
<i>Choleva septentrionis</i> Jeannel, 1923	●				●		●					4
<i>Catops alpinus</i> Gyllenhal, 1827						●	●	●			●	3
<i>Catops tristis</i> (Panzer, 1793)							●					4
<i>Catops morio</i> (Fabricius, 1787)					●	●						4
SILPHIDAE												
<i>Thanatophilus lapponicus</i> (Herbst 1793)							●					2
STAPHYLINIDAE												
<i>Phyllodrepa puberula</i> (Bernhauer, 1903)						●						4
<i>Omalius laeviusculum</i> Gyllenhal, 1830							●					4
<i>Omalius septentrionis</i> Thomson, 1857						●						4
<i>Omalius caesum</i> Gravenhorst, 1806				●		●						4
<i>Cylletron nivale</i> Thomson, 1859		●										2
<i>Mannerheimia arctica</i> (Erichson, 1840)		●		●	●							2
<i>Deliphrum tectum</i> (Paykull, 1789)	●				●	●	●					4
<i>Olophrum fuscum</i> Gravenhorst, 1806		●				●						3
<i>Olophrum boreale</i> (Paykull, 1792)	●	●			●	●	●	●		●	●	3
<i>Olophrum consimile</i> Gyllenhal, 1810		●										3
<i>Olophrum rotundicolle</i> (Sahlberg, 1830)		●				●			●		●	3
<i>Arpedium quadrum</i> (Gravenhorst, 1806)	●		●									4
<i>Eucnecosum brachypterum</i> (Gravenhorst, 1802)	●	●	●	●	●	●		●	●			4
<i>Eucnecosum tenue</i> (LeConte, 1863)		●				●						2
<i>Eucnecosum brunnescens</i> (J.Sahlberg, 1871)		●		●	●	●			●			2
<i>Acidota crenata</i> (Fabricius, 1792)	●											4
<i>Acidota quadrata</i> (Zetterstedt, 1838)	●	●				●						3
<i>Geodromicus longipes</i> Mannerheim, 1830										●		3
<i>Anthophagus alpinus</i> (Paykull, 1790)	●	●				●		●		●		3
<i>Anthophagus omalinus</i> Zetterstedt, 1828						●		●				4
<i>Boreaphilus henningsianus</i> Sahlberg, 1832		●		●								3
<i>Oxytelus laqueatus</i> (Marshall, 1802)					●							4
<i>Stenus strandi</i> Benick, 1937									●			3
<i>Stenus carbonarius</i> Gyllenhal, 1827						●						4
<i>Stenus hyperboreus</i> Sahlberg, 1876		●										3 N
<i>Stenus impressus</i> Germar, 1824					●							4
<i>Stenus geniculatus</i> Gravenhorst, 1806								●				4
<i>Lathrobium fulvipenne</i> Gravenhorst, 1806	●											4
<i>Philonthus nigriventris</i> Thomson, 1867					●			●				4
<i>Quedius mesomelinus</i> Marshall, 1802								●				4
<i>Quedius molochinus</i> (Gravenhorst, 1806)			●							●		4
<i>Quedius sublimbatus</i> Mäklin, 1853					●			●		●		2 N
<i>Quedius limbatooides</i> Coiffat, 1963										●		4
<i>Quedius fellmani</i> (Zetterstedt, 1838)	●	●	●		●	●		●				3 N
<i>Quedius fulvicollis</i> (Stephens, 1833)		●	●		●					●		4
<i>Quedius boopoides</i> Munster, 1923		●				●		●		●	●	4
<i>Quedius boops</i> (Gravenhorst, 1802)	●	●	●			●		●		●		4
<i>Othius lapidicola</i> Kiesenwetter, 1848	●				●			●		●		3
<i>Othius angustus</i> Stephens, 1833			●					●				4
<i>Mycetoporus mulsanti</i> Ganglbauer, 1895					●			●				3
<i>Mycetoporus monticola</i> Fowler, 1888				●	●	●						3
<i>Mycetoporus erichsonianus</i> Fagel, 1965						●		●				2

cont. next page

Table 2. Continued.

Species	1	2	3	4	5	6	7	8	9	10	11	Veg. zone
<i>Mycetoporus lepidus</i> (Gravenhorst, 1806)	●				●							4
<i>Mycetoporus nigrans</i> Mäklin, 1853		●	●				●					2
<i>Ischnosoma splendidum</i> (Gravenhorst, 1806)						●					●	4
<i>Bryoporus rugipennis</i> (Pandelle, 1869)	●											3
<i>Tachinus pallipes</i> (Gravenhorst, 1806)					●		●	●				4
<i>Tachinus proximus</i> Kraatz, 1855							●	●				4
<i>Tachinus marginellus</i> (Fabricius, 1781)					●							4
<i>Tachinus elongatus</i> Gyllenhal, 1810	●				●							3
<i>Gymnusa variegata</i> Kiesenwetter, 1845						●						3
<i>Oxypoda procerula</i> Mannerheim, 1830		●			●	●		●		●	●	4
<i>Oxypoda funebris</i> Kraatz, 1856								●				4
<i>Oxypoda islandica</i> Kraatz, 1857	●											3
<i>Oxypoda annularis</i> (Mannerheim, 1830)						●						4
<i>Cephalocousya nivicola</i> (Thomson, 1871)	●					●		●				2
<i>Mniusa grandiceps</i> (J.Sahlberg, 1876)											●	2
<i>Gnypeta caerulea</i> Sahlberg, 1831										●		3
<i>Liogluta micans</i> (Mulsant & Rey, 1852)	●		●		●							4
<i>Liogluta alpestris</i> (Heer, 1839)		●	●		●	●		●	●	●		3
<i>Philhygra arctica</i> (Thomson, 1856)		●		●		●		●		●		4
<i>Atheta</i> (sg. <i>Mocyta</i>) <i>fungi</i> (Gravenhorst, 1806)	●		●		●		●	●				4
<i>Atheta</i> (sg. <i>Boreophilia</i>) <i>islandica</i> (Kraatz, 1857)	●			●				●				2
<i>Atheta</i> (sg. <i>Boreophilia</i>) <i>hyperborea</i> Brundin, 1840		●						●				2
<i>Atheta</i> (sg. <i>Boreophilia</i>) <i>fusca</i> (Sahlberg, 1831)		●										2
<i>Atheta</i> (sg. <i>Dimetrota</i>) <i>aeneipennis</i> (Thomson, 1856)					●							4
<i>Atheta</i> (s.str.) <i>atramentaria</i> (Gyllenhal, 1810)			●					●				4
<i>Atheta</i> (s.str.) <i>hypnorum</i> (Kiesenwetter, 1850)			●									4
<i>Atheta</i> (s.str.) <i>graminicola</i> (Gravenhorst, 1806)		●	●	●	●		●	●				4
<i>Atheta</i> (sg. <i>Bessobia</i>) <i>monticola</i> (Thomson, 1852)					●							4
<i>Atheta</i> (sg. <i>Thinobaena</i>) <i>vestita</i> (Gravenhorst, 1806)								●				4
<i>Anopleta depressicollis</i> (Fauvel, 1872)						●	●	●				3
SCARABAEIDAE												
<i>Aphodius lapponum</i> Gyllenhal, 1806			●					●		●		3
<i>Aphodius piceus</i> Gyllenhal, 1808		●			●		●	●				3
HELOPHORIDAE												
<i>Helophorus sibiricus</i> (Motschulsky, 1860)		●						●	●			2
<i>Helophorus glacialis</i> Villa, 1833		●							●	●		2
HYDROPHILIDAE												
<i>Cercyon melanocephalus</i> (Linnaeus, 1761)								●				4
<i>Cryptopleurum minutum</i> (Fabricius, 1775)								●				4
BYRRHIDAE												
<i>Simplocaria semistriata</i> (Fabricius, 1794)	●		●					●				4
<i>Simplocaria elongata</i> J. Sahlberg, 1903			●									1 N
<i>Byrrhus fasciatus</i> (Forster, 1771)		●	●					●				4
<i>Byrrhus pilula</i> (Linnaeus, 1758)		●										4
ELATERIDAE												
<i>Hypnoidus rivularius</i> (Gyllenhal, 1808)	●	●	●			●		●		●		3
<i>Liotrichus affinis</i> (Paykull, 1800)					●	●						3

cont. next page

Table 2. Continued.

Species	1	2	3	4	5	6	7	8	9	10	11	Veg. zone
CANTHARIDAE												
<i>Absidia schoenherri</i> (Dejean, 1837)		●	●			●						4
NITIDULIDAE												
<i>Epuraea aestiva</i> (Linnaeus, 1758)											●	4
CRYPTOPHAGIDAE												
<i>Cryptophagus setulosus</i> Sturm, 1845			●									4
<i>Atomaria nitidula</i> (Marsham, 1802)								●				4
<i>Atomaria semitestacea</i> Reitter, 1887	●		●				●					3
CORTICARIIDAE												
<i>Corticaria umbilicata</i> (Beck, 1817)						●						4
CHRYSOMELIDAE												
<i>Chrysolina staphylaea</i> (Linnaeus, 1758)	●						●	●		●		4
<i>Chrysolina marginata</i> (Linnaeus, 1758)										●		4
<i>Chrysomela lapponica</i> Linnaeus, 1758								●				2
<i>Phratora vitellinae</i> (Linnaeus, 1758)								●				4
BRENTIDAE												
<i>Apion frumentarium</i> (Linnaeus, 1758)								●				4
<i>Apion brundini</i> Wagner, 1943			●									3 N
CURCULIONIDAE												
<i>Otiorhynchus arcticus</i> (O.Fabricius, 1780)		●	●			●		●		●		4
<i>Otiorhynchus nodosus</i> (Müller, 1764)	●	●	●	●		●	●	●		●		4
<i>Strophosoma capitatum</i> (De Geer, 1775)							●					4
<i>Hypera diversipunctata</i> (Schrank, 1798)								●				4
<i>Notaris aethiops</i> (Fabricius, 1792)		●				●		●				4
<i>Dorytomus taeniatus</i> (Fabricius, 1781)						●						4
<i>Rhynchaenus flagellum</i> (Ericson, 1902)		●	●		●							2

When the regional distribution of the listed species is considered, it is evident that most of the beetles in the arctic region of the Norwegian mainland have a wide geographical distribution (Table 3). Beetles mainly distributed above the treeline and in the mountain birch belt, have been termed alpine (category 2). The definitions of the species as being alpine or boreal are based on the authors judgment, and this distinction may be somewhat arbitrary. Species mainly found in the boreal vegetation zone have been termed boreal (category 3). However, many of these species may also be found in the alpine zone. Category 4 includes species with wide geographic distribution, including the boreonemoral zone, although some may be found in the boreal or alpine zones, or in coastal areas. As few as 8% of the listed species have a distinct northern distribution, found only in northern Norway (Nordland, Troms and Finnmark). Nineteen percent of the species have an alpine distribution, whereas 27% have a boreal distribution. By botanical means, it is difficult to draw the boundary between the alpine and the arctic vegetation zone in Finnmark (Moen 1998). The current investigation

suggests that the same situation is valid for the beetle fauna. Several species living on tundra habitats in northwestern Russia (especially the Kola Peninsula and the Kanin Peninsula) make up a characteristic arctic beetle community (Poppius 1905, 1909, Hellén 1930). Some of these species are circumpolar, and their range may touch the arctic region of the Norwegian mainland. This is indicated by the findings of *Diacheila polita* (see Hanssen & Olsvik 1998) and *Simplocaria elongata* J. Sahlb.

Table 3. Norwegian vegetation zone distribution of the beetle species listed from the southern arctic vegetation zone. See the text for further explanations.

Vegetation zone	Number of species (%)
Arctic	2 (1)
Alpine + mountain birch area	30 (19)
Boreal	43 (27)
Wide distribution	84 (53)

(category 1). The present findings of these species represent the first records in Fennoscandia. The circumpolar *S. elongata* is known to inhabit moist environments beneath mosses, and its nearest earlier reported locations are the Kanin Peninsula, Russia, to the east, and Greenland, to the west (Poppius 1910, Böcher 1988). The present finding of *S. elongata* will be discussed later in a separate paper. Accordingly, it could be hypothesized that this area should house more species belonging to the characteristic arctic beetle community, which can only be proved by further investigations. Especially the palsa bog/intermediate fen area Barvikmyra, which is part of the Barvikmyra and Blodskytodden nature reserve, may have similarities with corresponding areas on the Kola Peninsula and eastward, and therefore represents an unique and very interesting location in Norway (Vorren 1979, Aakra et al. 2000).

ACKNOWLEDGEMENT

The authors wish to thank Sindre Ligaard, Viggo Mahler and Palle Jørum for valuable information from their trips to the studied region, and Hans M. Hansen for operating pitfall traps at Barvikmyra in 1998.

SAMMENDRAG

Billefaunaen (Coleoptera) i arktisk fastlands-Norge

Dette arbeidet er det første siden 1946 som forsøker å beskrive billefaunaen i den sørarktiske klimasonen i fastlands-Norge. Biller ble fanget med fallfeller i Vardø kommune på Varangerhalvøya i Øst-Finnmark under hele feltsesongen 1995, samt under tre reiser i 1998. Det meste av arealet i Vardø kommune ligger i den sørarktiske vegetasjonssonen, en marginal sone i fastlands-Norge som strekker seg fra Nordkapp til Vardø i kystnære områder mot Barentshavet. Med tidligere undersøkelser er det nå påvist tilsammen 159 billearter i denne regionen, noe som sannsynlig utgjør en relativt stor del av den totale billefaunaen i denne regionen. Kortvingene dominerte både antallsmessig og artsmessig (46%), mens vannkalvene og løpebillene utgjorde henholdsvis 16% og 15% av artene. Bare 8% av artene som er påvist i Vardø-området har en markert nordlig utbredelse (innenfor Norges grenser bare påvist i Nord-Norge). 19% av artene har hovedsakelig en alpin utbredelse, mens 27% har hovedsakelig en boreal utbredelse. *Diacheila polita* og *Simplocaria elongata* tilhører et karakteristisk arktisk billesamfunn, og de to artene er kun kjent fra dette området i Skandinavia. De fleste av artene (53%) har en vid utbredelse og er vanlige over det meste av Norge.

REFERENCES

- Aakra, K., Hanssen, O. & Ødegaard, F. 2000. A collection of spiders (Araneae) from palsa bogs in the vicinity of Vardø, northern Norway. - *Fauna norv.* 20: 43-47.
- Aune, B. 1993. Temperaturnormaler. Normalperiode 1961-1990. - DNMI Report 02/93: 1-55. (In Norwegian)
- Böcher, J. 1988. The Coleoptera of Greenland. *Meddelelser om Grønland*. - Bioscience, 26: 1-100.
- Fjellberg, A. 1972. Coleoptera from Hardangervidda. - *Fauna of the Hardangervidda No. 1*: 1-74. Universitetsforlaget, Bergen.
- Fremstad, E. 1997. Vegetasjonstyper i Norge. - NINA Temahefte 12: 1-279. (In Norwegian with English summary)
- Hanssen, O., Bretten, A. & Aagaard, K. 1997. Effekter av brenning på invertebratfaunaen. - Pp. 34-49 in Pedersen, H.C. Brenning og kutting av alpin heivevegetasjon: Effekter på lirype, vegetasjon og invertebratfauna. NINA Fagrapport 16. (In Norwegian)
- Hanssen, O. & Olsvik, P.A. 1998. *Diacheila polita* (Faldermann, 1835) (Col. Carabidae) new to Norway. - *Fauna norv. Serie B*. 45: 116-118.
- Hellén, W. 1930. Verzeichnis der in Ostfennoskandien nur aus den russischen und norwegischen Teilen bekannten Käferarten nebst Bemerkungen über ihr heutiges Vorkommen in Finnland. - *Not. Ent.*, 10: 1-17.
- Iversen, J.I. & Iversen, S.T. 1989. Reinøya naturreservat, Vardø kommune. - Fylkesmannen i Finnmark, Miljøvernavdelingen, Rapport 29: 1-24.
- Lindroth, C.H. 1949. Die fennoscandischen Carabidae. 3. - *Gøteborgs K. Vetensk. - o. Vitterh.-Samh. B*, 4: 1-911.
- Mäklin, F.W. 1881. Coleoptera insamlade under den Norden-skiold'ske expeditionen 1875 på några öar vid Norges nordvest-kust, på Novaja Semlja och ön Waigatsch samt vid Jenissej i Sibirien. - *Kongl. Svenska Vetenskaps-Akademiens Handlingar Bd. 18, No 4*: 1-48. (In Swedish)
- Moen, A. 1998. Nasjonalatlas for Norge: Vegetasjon. - Statens kartverk. Hønefoss. (In Norwegian)
- Ottesen, P. 1996. Niche segregation of terrestrial alpine beetles (Coleoptera) in relation to environmental gradients and phenology. - *Journal of Biogeography*. 23: 353-369.
- Poppius, B. 1905. Kola-halföens och Enare Lappmarks Coleoptera. - *Festschr. f. Palmén*, No 12. (In Swedish)
- Poppius, B. 1908. Weitere beträge zur kenntnis der Coleoptera-fauna des Nordöstlichen Europäischen Russlands. - *Acta Societatis pro Fauna et Flora Fennica*. No 31, 6.
- Poppius, B. 1909. Die Coleopteren-Fauna der Halbinsel Kanin. - *Acta Societatis pro Fauna et Flora Fennica*. No 31, 8.
- Poppius, B. 1910. Die Coleopteren des arktischen Gebietes. - *Fauna Arctica* 5(1): 289-447.
- Silfverberg, H. 1992. Enumeratio Coleopterorum Fennoscandiae, Daniae et Baltiae. - Helsingfors Entomologiska Bytesförening, Helsingfors.
- Strand, A. 1946. Nord-Norges Coleoptera. - *Tromsø museums årshefter, Naturhistorisk avd.* 67 (1): 1-629. (In Norwegian)
- Vorren, K.D. 1979. Myrinventeringer i Nordland, Troms og Finnmark, sommeren 1976, i forbindelse med den norske myreservatplanen. - *Tromsø Naturvitenskap* 3: 1-118. (In Norwegian)
- Østbye, E. & Hågvar, S. 1996. Pit-fall catches of surface-active arthropods in high mountain habitats at Finse, south Norway. IV. Coleoptera. - *Fauna norv. Ser. B* 43: 1-18.