

Bark beetles (*Coleoptera, Scolytidae*) of Estonia: results of the examination of insect collections

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Over 15000 specimens of bark beetles collected since the middle of the 19th century are preserved in 20 insect collections in Estonia. The examination of insect collections indicates that the Estonian bark beetle fauna comprises 63 species. In addition, the relevant literature treats 9 species which are absent in the collections. The paper includes data on the collections and a check list of the bark beetles collected in Estonia, the number of the specimens for every species and data on the distribution of the species in the neighbouring countries.

Key words: *Scolytidae*, bark beetles, fauna, insect collections, Estonia.

Introduction

Information on the distribution of bark beetles (*Scolytidae*) in the Baltic countries, including Estonia, has long been available, particularly since the publishing of the works by J.B. Fischer (1784, 1791), J.G. Fleischer (1829), G. Seidlitz (1875, 1891), F. Sintenis (1900), H.v. Rathlef (1905, 1921). Notes on damages caused by bark beetles are available in the publications by A.F. Hueck (1845), A.v. Hagemester (1859), H.M. Willkomm (1874), W. Knersch (1882, 1883, 1901) et al. However, in many cases they are not provided with exact locality records, thus the distribution data on bark beetle species or damages caused by them are restricted to the historical province Livonia which at present includes Southern Estonia and the northern part of Latvia.

The Estonian bark beetle fauna was thoroughly investigated in the 1920s and 1930s (Zolk, 1924, 1932, 1935, 1937; Leius, 1939). At that time the largest collection of Estonian bark beetles was compiled. This collection (6265 specimens) now belongs to the Institute of Plant Protection, Estonian Agricultural University.

A number of papers containing information on bark beetles have been published later. A key for the identification of Estonian bark beetles includes 58 species considered to occur in Estonia (Rubel, 1964).

Since most bark beetles are small insects with specific concealed living habits, their investigation and identification requires a sound knowledge and experience on the part of those involved in the faunal study of scolytids. On the other hand, the systematics and

taxonomy of the *Scolytidae* have undergone further development: some former species have been separated into two species or, on the contrary, some species have been united with their names being listed among the synonyms, new morphological features for identification have been described etc. Therefore, published distribution data have to be critically reviewed. For instance, published records concerning the distribution of *Hylastes ater* in Estonia should be attributed to *Hylastes brunneus*, since all specimens in collections identified earlier as *H. ater* belong actually to *H. brunneus*.

Reliable information on the distribution of bark beetles can be obtained from insect collections. This material is available for checking and can completely confirm the occurrence of certain species in the local fauna.

This report presents the results of a faunal study of bark beetles in Estonia on the basis of the examination of specimens in museums, institutes and private collections.

Material and methods

The examination of the Estonian insect collections was conducted in 1993-1996. Over 15000 specimens of bark beetles collected during 1850-1996 are preserved in the insect collections of museums, universities, research institutes as well as in private collections. A total of 14938 specimens of *Scolytidae* supplied with adequate distribution data labels were examined from Estonia. Bark

beetles were examined from the following collections: Zoological Museum of the University of Tartu, Institute of Zoology and Botany, Estonian Agricultural University, Estonian Institute of Forestry and Nature Conservation (all in Tartu), Estonian Museum of Natural History (in Tallinn); private collections: T. Kesküla, S. Laanet, Ü. Luht, J. Luig, E. Merivee, G. Miländer, E. Mäe, V. Nagirnõi, R. Pedmanson, U. Roosileht, K. Sarv, I. Süda, T. Talvi, A. Tamm, H. Õunap. Complete collection data which include the species name, locality, 10x10 km UTM grid square sign, county, collecting time, the number of specimens, host speciality, the names of the collector and the identifier, the collection where the specimen is deposited and other information if obtained were saved in the computer database.

In taxonomy the recent catalogue of the northern European *Coleoptera* by H. Silfverberg (1992) was followed. For the identification of bark beetles the key to the Estonian bark beetles by S. Rubel (1964) was used along with other handbooks and publications containing identification keys or descriptions of *Scolytidae* (Nunberg, 1954; Hansen, 1956; Postner, 1974; Grocholski et al., 1976; Grüne, 1979; Schedl, 1981; Pfeffer, 1989, 1994; Muona, 1994; Старк, 1952; Криволицкая, 1965).

Results

A total of 15241 specimens of *Scolytidae* from 5 public institutions and from 15 private collections in Estonia have been examined as of 1996. Most of the specimens have been collected in Estonia with only a minor proportion originating from Latvia, Lithuania, Russia, Finland, Sweden, Czech Republic etc. The oldest bark beetle specimen preserved in the Zoological Museum of the University of Tartu is *Ips typographus* collected by A. Flor at Lodenhof (Latvia) on 24.05.1850.

In the following account we use the records of 14938 specimens collected in Estonia and labelled adequately. The oldest specimens of bark beetles from Estonia are preserved at the Zoological Museum, University of Tartu, and they are dated from the years 1880-1881. These are *Hylurgops palliatus* (Gyll.), *Hylastes brunneus* Er., *H. cunicularius* Er., *H. opacus* Er., *Tomicus piniperda* (L.), *Pityogenes quadridens* (Hart.), *Ips typographus* (L.) and *Dryocoetes autographus* (Ratz.). The largest collection of Estonian bark beetles collected by K. Leius (Zolk) in 1923-1939 belongs now to the Estonian Agricultural University (Tartu) and contains 6265 specimens of 53 species. The more recent

material collected since 1971 is mostly deposited in the collection of the Estonian Institute of Forestry and Nature Conservation. This is the second largest bark beetle collection in Estonia which comprises 4237 specimens of 55 species and will be replenished with new material during study courses carried out in the field of forest entomology. The number of bark beetle specimens and species in institutional and large private collections is given in Table 1.

Table 1. Large bark beetle collections in Estonia

Collection	Collecting period	No. of species	No. of specimens
Estonian Agricultural University	1923-1996	58	6996
Estonian Institute of Forestry and Nature Conservation	1971-1996	55	4237
Estonian Museum of Natural History	1939-1981	45	236
Institute of Zoology and Botany	1880-1979	43	771
Zoological Museum of the University of Tartu	1880-1994	28	410
Private collections:			
I. Süda	1973-1996	59	682
H. Õunap	1971-1996	55	878
U. Roosileht	1981-1993	31	163
V. Nagirnõi	1981-1995	29	226
G. Miländer	1953-1994	24	90
E. Merivee	1952-1963	20	77
E. Mäe	1963-1994	17	57

In accordance with the examination of insect collections, the Estonian bark beetle fauna comprises 63 species. The list of bark beetle species with the number of collected specimens is presented in Table 2. For comparison, the occurrence of bark beetle species in the neighbouring countries is given on the basis of the following publications: for Latvia (Šmits, 1960; Silfverberg, 1992; Barševskis, 1993), Lithuania (Mastauskis, Pileckis, 1959; Pileckis, 1976; Silfverberg, 1992), Sankt Petersburg district of Russia (Остен-Сакен, 1857; Горностаев, 1917; Старк, 1952), Finland and Sweden (Lekander et al., 1977; Lundberg, 1986; Silfverberg, 1992). In the insect collection of Estonian Institute of Forestry and Nature Conservation there is also a specimen of *Hylesinus varius* collected in Dotnuva-Akademija (Lithuania), April 18, 1996. In accordance with the available literature this is a new species for Lithuania.

Discussion

The examination of insect collections indicates that the Estonian bark beetle fauna comprises 63 species. The representatives of all these species are preserved in insect collections and are available for checking.

Table 2. Bark beetle in insect collections in Estonia and their distribution in the neighbouring countries

Species	No. of specimens in the collections in Estonia	Distribution in the neighbouring countries				
		Latvia	Lithuania	Finland	Sweden	Russia
<i>Hylurgops glabratus</i> (Zett.)	57	+	-	+	+	+
<i>Hylurgops palliatus</i> (Gyll.)	769	+	+	+	+	+
<i>Hylastes brunneus</i> Er.	382	+	-	+	+	+
<i>Hylastes cunicularius</i> Er.	257	+	+	+	+	+
<i>Hylastes attenuatus</i> Er.	1	+	+	-	+	-
<i>Hylastes opacus</i> Er.	224	+	+	+	+	+
<i>Hylesinus crenatus</i> (F.)	154	+	+	+	+	+
<i>Hylesinus fraxini</i> (Pz.)	238	+	+	+	+	+
<i>Hylesinus varius</i> (F.)	95	-	+	+	+	-
<i>Xylechinus pilosus</i> (Ratz.)	137	+	-	+	+	+
<i>Hylurgus ligniperda</i> (F.)	7	+	+	-	+	-
<i>Tomicus minor</i> (Hart.)	228	+	+	+	+	+
<i>Tomicus piniperda</i> (L.)	450	+	+	+	+	+
<i>Dendroctonus micans</i> (Kug.)	181	+	+	+	+	+
<i>Phloeotribus spinulosus</i> (Rey)	151	+	-	+	+	+
<i>Polygraphus subopacus</i> Thoms.	223	+	-	+	+	+
<i>Polygraphus poligraphus</i> (L.)	525	+	+	+	+	+
<i>Polygraphus punctifrons</i> Thoms.	224	-	-	+	+	-
<i>Carpoborus cholodkovskiy</i> Spess.	4	-	-	-	+	-
<i>Scolytus multistriatus</i> (Marsh.)	2	+	+	-	+	-
<i>Scolytus scolytus</i> (F.)	1	+	+	-	+	+
<i>Scolytus ratzeburgi</i> Jans.	180	+	+	+	+	+
<i>Scolytus laevis</i> Chap.	48	+	-	-	+	-
<i>Scolytus mali</i> (Bechst.)	63	+	+	+	+	-
<i>Scolytus intricatus</i> (Ratz.)	142	+	+	+	+	-
<i>Scolytus rugulosus</i> (Ratz.)	84	+	+	+	+	+
<i>Pityogenes chalcographus</i> (L.)	1219	+	+	+	+	+
<i>Pityogenes trepanatus</i> (Nördl.)	44	+	-	+	+	-
<i>Pityogenes quadridens</i> (Hart.)	735	+	+	+	+	+
<i>Pityogenes bidentatus</i> (Hbst.)	120	+	+	+	+	+
<i>Orthotomicus longicollis</i> (Gyll.)	2	-	-	+	+	+
<i>Orthotomicus proximus</i> (Eichh.)	310	+	+	+	+	+
<i>Orthotomicus suturalis</i> (Gyll.)	269	+	+	+	+	+
<i>Orthotomicus laricis</i> (F.)	313	+	+	+	+	+
<i>Ips acuminatus</i> (Gyll.)	25	+	+	+	+	+
<i>Ips sexdentatus</i> (Börn.)	352	+	+	+	+	+
<i>Ips duplicatus</i> (Sahlb.)	319	+	+	+	+	+
<i>Ips typographus</i> (L.)	844	+	+	+	+	+
<i>Ips amitinus</i> (Eichh.)	1316	+	+	+	-	-
<i>Lymantor coryli</i> (Perr.)	128	+	+	+	+	-
<i>Dryocoetes alni</i> (Georg)	168	+	-	+	+	+
<i>Dryocoetes autographus</i> (Ratz.)	421	+	+	+	+	+
<i>Dryocoetes hectographus</i> Reitt.	95	+	+	+	+	-
<i>Crypturgus subcribrosus</i> Egg.	137	+	+	+	+	+
<i>Crypturgus cinereus</i> (Hbst.)	367	+	+	+	+	+
<i>Crypturgus pusillus</i> (Gyll.)	192	+	+	+	+	+
<i>Crypturgus hispidulus</i> Thoms.	145	+	+	+	+	-
<i>Trypodendron domesticum</i> (L.)	207	+	+	+	+	+
<i>Trypodendron proximum</i> (Nij.)	24	-	-	+	+	-
<i>Trypodendron lineatum</i> (Ol.)	417	+	+	+	+	+
<i>Trypodendron signatum</i> (F.)	196	+	+	+	+	+
<i>Xyleborus dispar</i> (F.)	163	+	+	+	+	+
<i>Xyleborus cryptographus</i> (Ratz.)	192	+	-	+	+	+
<i>Trypophloeus alni</i> (Lind.)	26	-	-	+	-	+
<i>Trypophloeus bispinulus</i> Egg.	128	+	-	+	+	+
<i>Trypophloeus discedens</i> Palm	11	-	-	+	+	-
<i>Ernoporus tiliae</i> (Pz.)	138	+	-	+	+	+
<i>Cryphalus abietis</i> (Ratz.)	231	+	+	+	+	+
<i>Cryphalus saltuarius</i> Weise	90	+	-	+	+	+
<i>Pityophthorus micrographus</i> (L.)	649	+	+	+	+	+
<i>Pityophthorus lichtensteinii</i> (Ratz.)	73	-	+	+	+	+
<i>Pityophthorus morosovi</i> Spess.	43	+	-	-	+	-
<i>Pityophthorus traegardhi</i> Spess.	2	-	-	+	+	+

In recent years 7 bark beetle species have been reported from Estonia for the first time: *Hylesinus varius*, *Hylurgus ligniperda*, *Scolytus scolytus*, *Scolytus mali*, *Orthotomicus longicollis*, *Trypodendron proximum* and *Trypophloeus discedens*. These are not listed in the Catalogue by H. Silfverberg (1992).

In accordance with the published papers, 9 more species have been found in Estonia: *Hylastes ater*, *H. angustatus*, *Scolytus carpini*, *Lymantor aceris*, *Dryocoetes villosus*, *Trypophloeus asperatus*, *Xyleborus mono-graphus*, *Pityographus pityographus* and *P. glabratus* (Zolk, 1924, 1932; Lackschewitz, Mikutowicz, 1939; Leius, 1939; Szeliga-Mierzeyewski, 1942; Merivee, 1961; Rubel, 1964; Haberman, 1971, 1993; Silfverberg, 1992; Mäländer, 1993). These species have not been found in collections. Thus, according to the examination of insect collections we cannot confirm the occurrence of these 9 bark beetle species in Estonia.

The insect collections of Estonia include a few species of *Scolytidae* represented by a very small number of individuals: *Hylastes attenuatus*, *Carpophorus cholodkovskiy*, *Scolytus multistriatus*, *S. scolytus*, *Pityophthorus traegardhi*. Most of those species were collected in the 1930s. *Scolytus scolytus* (one dead damaged female) was found by Ilmar Süda on the island of Abruka in 1994. This species needs to be studied further. After H. Silfverberg (1992), *S. scolytus* (F.) and *S. triarmatus* (Eggers) are regarded as synonyms, whereas C. Holzschuh (1991) and A. Pfeffer (1994) have discussed them as separate species.

Conclusion

The examination of insect collections provides evidence that the Estonian bark beetle fauna comprises 63 species. However, the occurrence of some new species reported from the neighbouring countries (Finland, Latvia, Russia and Sweden) is quite probable. The faunistic research of forest insects should be continued with a focus on the western islands of Estonia.

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КОРОЕДЫ (*COLEOPTERA, SCOLYTIDAE*) ЭСТОНИИ: РЕЗУЛЬТАТЫ РЕВИЗИИ ЭНТОМОЛОГИЧЕСКИХ КОЛЛЕКЦИЙ

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Резюме

В 20 энтомологических коллекциях Эстонии сохраняется более 15000 экземпляров короедов, собранных начиная с середины 19-ого века. Наибольшая коллекция (6265 экземпляров, 53 вида), собранная в 1920-1930 годы, сохраняется в Институте защиты растений Эстонского сельскохозяйственного университета. Наибольшая современная коллекция, составленная в 1971-1996 гг., (94237 экземпляров, 55 видов) хранится в Эстонском институте лесного хозяйства и охраны природы. В результате ревизии коллекций для фауны Эстонии установлены 63 вида короедов. В литературе отмечается нахождение в Эстонии еще 9 видов короедов, однако подтверждающие экземпляры в энтомологических коллекциях отсутствуют. В статье приведены данные о коллекциях, список видов короедов, собранных в Эстонии, число сохраняемых экземпляров каждого вида и замечания о распространении этих видов в соседних странах.

Ключевые слова: *Scolytidae*, короеды, фауна, энтомологическая коллекция, Эстония.