Rove beetles of the subfamily Aleocharinae (Coleoptera: Staphylinidae) from the Hutsulshchyna National Nature Park

S. V. Glotov*, K. V. Hushtan***

*State Museum of Natural History, National Academy of Sciences of Ukraine, Lviv, Ukraine
**Ecological College of Lviv National Agrarian University, Lviv, Ukraine

Ecological College of Lviv National Agrarian University, Zamiastenstvoi st., 167, Lviv, 79068, Ukraine. Tel.: +38-050-370-23-85. E-mail: katrinantonyuk@gmail.com

Introduction

Staphylinidae beetles are a widely spread beetle family. At present, there are over 63,500 species in 3,762 genera and 32 subfamilies in the world fauna (Herman, 2001; Klimeszewska et al., 2011). There are over 1,100 species of Staphylinidae beetles in the Ukraine fauna (Nikitenko & Petrenko, 1992). Among them, Aleocharinae is the largest subfamily, which includes about 16,700 valid species in 1,318 genera currently organized in 62 tribes (Klimeszewska et al., 2018). At the same time, according to preliminary estimates, several dozens of thousands of Aleocharinae species have not yet been described (Hlavac et al., 2009, 2011; Elven et al., 2010, 2012; Assing 2015a, b, c). Representatives of the subfamily, widespread in all natural areas of the planet, inhabit almost all terrestrial natural biotopes, play an active part in the life of natural and artificial biogeocenoses. Larvae and imagines of Aleocharinae actively inhabit forest cover, plant and animal residues, animal excrement, fungi. A number of progressive adaptive features have led to the emergence of specialized forms that successfully coexist with other animals, living in caves, mammal burrows, in nests of birds as well as those of social insects; and in vegetation, plant and animal residues, animal excrement, fungi. A number of geocenoses. Larvae and imagoes of Aleocharinae actively inhabit forest formations, which occupy 60% in the mountains and about 24% in the foothills. In the lowlying part, deciduous forests prevail, mostly oak forests. In the low tree layer, apart from oaks there are also beech, whereas in more humid places there are ash, birch, elm, and in the underwood there are hazel, hawthorn, elder, and other species. Low-mountain ranges are covered with beech and hornbeam forests with additions of fir, spruce, sycamore maple, birch; higher ranges – with spruce and beech forests as well as spruce forests; and the slopes of the highest ranges – with secondary spruce forests that occur starting from 450-650 m.a.s.l. The forest territory is covered with numerous rivers and streams. The largest of them are the Lysachka, Pitsynka, Rybnitsya, Cheremosh, which are right affluents of the River Prut. In the mountainous areas and areas adjacent to the mountains, the rivers form natural barriers, stretches, waterfalls. The main biotope types are presented in Figure 1.

Keywords: fauna; new species; new records; State Museum of Natural History; Lviv.

This work is the first attempt to make up an inventory of the fauna of rove beetles in the Hutsulshchyna National Natural Park (Ukraine, Ivano-Frankivsk Oblast), which was created in 2002 and has an area of 32,271 hectares. The modern territory of the park has never been the object of special scientific research on the fauna of rove beetles of the Aleocharinae subfamily. As a result, information about the finds of representatives of the Aleocharinae subfamily has been obtained from the study of the largest collection of rove beetles in Ukraine, which contains both modern collections and collections of the late 19th and early 20th centuries. The collection was formed by Marian-Aloiz Lomnitski and was further developed and replenished with collections from different parts of Ukraine and the world by several generations of Ukrainian and European entomologists. For the moment, the collection is kept in the funds of the State Museum of Natural History of the National Academy of Sciences of Ukraine and contains more than 1,500 specimens, which belong to more than 300 species and are of great historical and scientific value. As a result of the conducted studies, 30 species belonging to 18 genera are reported for the first time for the fauna of the Hutsulshchyna National Nature Park, of which 4 species (Atheta corvina (Thomson, 1856), Schistoglossa viduata (Erichson, 1837), Leptusa puellaris puellaris (C. Hampe, 1863), Silusa rubra (Erichson, 1839)) are reported for the first time for the territory of Ukraine. The species and specimens (with references, data of their distribution in Europe, as well as substrate and biotope preferences of adults) are listed. The obtained data will later on provide an opportunity to expand the understanding of the distribution of species – specifically for faunal research, as well as for biogeographic modelling.

Material and methods

The collection of the beetles of the subfamily Aleocharinae (Coleoptera, Staphylinidae) is one of the richest and most famous collections of Ukraine. A great part of this collection consists of dry mounted specimens, containing about 2500 specimens, including about 290 species, housed in the State Museum of Natural History (Lviv) of the National Academy of Sciences of Ukraine.
Sciences of Ukraine. This material was partly mounted, reordered, and catalogued. In this paper, we present a catalogue of these specimens collected by several generations of entomologists in the early 20th century from the territory and outskirts of the Hutsulshchyna National Nature Park (according to label data, Fig. 2). Samples were collected from: 1. Kosiv – Ivano-Frankivsk Region, Kosivskyi District, Kosiv city, (48.319828º N, 25.097768º E); 2. Pistin – Ivano-Frankivsk Region, Kosivskyi District, Pistin village (48.356373º N, 25.019105º E, Fig. 3).

Commonly accepted identification keys were used (Ganglbauer, 1895; Reitter, 1909; Lohse, 1964, 1974; Palm, 1968, 1970, 1972; Strand & Vik, 1964, 1965, 1968; Assing et al, 1998; Klimaszewski et al., 2018) as well as the reference material from the museum collections of the Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Kyiv, Ukraine (SIZK), Naturkunde Museum, Berlin, Germany (ZMHH), Naturhistorisches Museum, Vienna, Austria (NMW), Zoological Museum of Taras Shevchenko National University, Kyiv, Ukraine (ZMTSSN), Zoological Museum of Natural History, Museum of Denmark, Copenhagen, Denmark (ZMUK), and private collection of S. Glotov, Lviv. The list of Staphylinidae was formed in compliance with last nomenclatural corrections (Schülke & Smetana, 2015).

Results

1. *Aleochara intricata* Mannerheim, 1830
   Synonymy: *Aleochara biguttata* Heer, 1839; *Aleochara celeris* Stephens, 1832; *Aleochara cinctipennis* Motschulsky, 1858; *Aleochara terminata* Stephens, 1832; *Aleochara croatica* Penecke, 1901.
   Material examined. Ukraine: Ivano-Frankivsk Prov.: Pistin [Pištyn], date not specified, 1 ex.
   Distribution. Palearctic (including Ukraine) (Schülke & Smetana, 2015).

Biology. The species occurs in forests and in open steppe and meadow areas, in foothills, where it lives in fungi, in animal dung, in animal cadavers, and in decaying plant residues. Adults occur in V–IX (Horion, 1967).

2. *Aleochara brevipennis* Gravenhorst, 1806
   Synonymy: *Aleochara conicolor* Stephens, 1832; *Aleochara curta* C. R. Sahlberg, 1831; *Aleochara aurivilliosa* Jekel, 1873; *Aleochara morosa* Heer, 1841; *Aleochara nigrovillosa* Bernhauer, 1901.
   Material examined. Ukraine: Ivano-Frankivsk Prov.: Pistin [Pištyn], 28.5 [year not specified], 1 ex.

Biology. The species occurs in forests and on open steppe and meadow areas, in foothills and high in the mountains, where it lives in decaying plant residues, in fungi, often under the bark of trees. Adults occur in V–IX (Horion, 1967).
3. Aleochara funata Gravenhorst, 1802
Synonymy: Baryodma affluens Casey, 1906; Aleochara brunnipennis Motschulsky, 1858; Baryodma defecta Casey, 1906; Baryodma lata Thomson, 1860; Aleochara mycetophaga Kraatz, 1856.
Material examined. Ukraine: Ivano-Frankivsk Prov.: Pistin [Pištyn], date not specified, 1 ex.
Distribution. Holartic (including Ukraine) (Schülke & Smetana, 2015), reported for the first time from Ukraine and from the Hutsulshchyna National Nature Park.
Biology. The species occurs in mixed and deciduous forests, in the mountains, where it lives in forest cover, decaying organic residues, and in moss. Adults occur in V–IV (Roubal, 1930).

4. Aliaanta incana (Erichson, 1837)
Material examined. Ukraine: Ivano-Frankivsk Prov.: Kosiv [Kossiw], date not specified, 1 ex.
Distribution. Europe (including Ukraine), North Africa (Schülke & Smetana, 2015).
Biology. The species occurs in mixed and deciduous forests, on open steppe and meadow areas, in foothills and high in the mountains, where it lives in forest cover, in decaying organic residues, in fungi, in rotten wood, and on effluent tree sap. Adults occur in V–IV (Bogdanov, 1985; Semenov et al., 2018).

5. Atheta corvina (Thomson, 1856)
Synonymy: Homalota hodierna Sharp, 1869; Atheta nigrita Fenyes, 1909; Atheta oriphila Keys, 1933; Gyrophaena rugicollis Hochhuth, 1872; Homalota vicina Kraatz, 1856.
Material examined. Ukraine: Ivano-Frankivsk Prov.: Pistin [Pištyn], date not specified, 1 ex.
Distribution. Europe (including Ukraine), North Africa, Asia Minor, Kazakhstan (Schülke & Smetana, 2015).
Biology. The species occurs in forests and on open steppe and meadow areas, in foothills and high in the mountains, where it lives in forest cover, in decaying plant residues, in fungi, in burrows of rodents, in ant hills, and on effluent tree sap. Adults occur in V–IX (Bogdanov, 1985; Semenov et al., 2018).

6. Atheta zosterae (Thomson, 1856)
Synonymy: Homalota hodierna Sharp, 1869; Atheta nigrita Fenyes, 1909; Atheta oriphila Keys, 1933; Gyrophaena rugicollis Hochhuth, 1872; Homalota vicina Kraatz, 1856.
Material examined. Ukraine: Ivano-Frankivsk Prov.: Kosiv [Kossiw], date not specified, 1 ex.
Distribution. Europe (including Ukraine), North Africa, Asia Minor, Kazakhstan (Schülke & Smetana, 2015).
Biology. The species occurs in forests and on open steppe and meadow areas, in foothills and high in the mountains, where it lives in forest cover, in decaying plant residues, in fungi, in burrows of rodents, in ant hills, and on effluent tree sap. Adults occur in V–IX (Bogdanov, 1985; Semenov et al., 2018).
9. *Atheta vestita* Gravenhorst, 1806

**Synonymy:** Aleochara elongata Stephens, 1832; Aleochara quisqualis Gravenhorst, 1810; Aleochara sericoperta Stephens, 1832.

**Material examined:** Ukraine: Ivanov-Frankivsk Prov.: Kosiv [Kossiw], date not specified, 1 ex.

**Distribution:** Europe (including Ukraine), North America (Schülke & Smetana, 2015).

**Biology:** The species occurs in deciduous and mixed forests, in foot-hills, where it lives in fungi. Adults occur in V–VIII (Horion, 1967).

10. *Hydrosmecta gracilicornis* (Erichson, 1839)

**Synonymy:** Atheta flavipes Bernhauer, 1901; Thinocia libitina Mulsant & Rey, 1873.

**Material examined:** Ukraine: Ivanov-Frankivsk Prov.: Pistin [Pistyri], date not specified, 1 ex.

**Distribution:** Central and Southern Europe (including Ukraine), Cau-casus (Schülke & Smetana, 2015).

**Biology:** Mixed and deciduous forests. Adults occur in VI–VIII (Horion, 1967).

11. *Schiastoglossa aubei* (Brisout de Barville, 1860)

**Synonymy:** Homalota approximarese Eppelsheim, 1886; Atheta brevis cerc Thomson, 1867; Homalota dispersa Motschulsky, 1860; Schistoglos-sa impressiceps Scherpelitz, 1967.

**Material examined:** Ukraine: Ivanov-Frankivsk Prov.: Pistin [Pistyri], date not specified, 1 ex.; same locality but, 31.5 [year not specified], 1 ex.

**Distribution:** Europe (including Ukraine), Caucasus, East Siberia, Far East (Schülke & Smetana, 2015).

**Biology:** The species occurs in mixed and deciduous forests, in foot-hills, where it lives in forest cover, along the banks of rivers and water bodies, in decaying plant residues. Adults occur in IV–VII (Horion, 1967).

12. *Schiastoglossa viduata* (Erichson, 1837)

**Synonymy:** Protoskissia paradoxosa Bernhauer, 1900.

**Material examined:** Ukraine: Ivanov-Frankivsk Prov.: Pistin [Pistyri], date not specified, 1 ex.

**Distribution:** Europe. (Schülke & Smetana, 2015), reported for the first time from Ukraine and from the Hutsulschyyna National Nature Park.

**Biology:** The species occurs in mixed and deciduous forests, in the mountains, where it lives mainly in xylotroph fungi as well as in terraneous fungi. Imagoes are active from June till September (Rusch, 1990; Horion, 1967; Bogdanov, 1985).

13. *Euroysa brachycephylia* Kiesewetter, 1851

**Synonymy:** Euroysa breviceps Motschulsky, 1858.

**Material examined:** Ukraine: Ivanov-Frankivsk Prov.: Pistin [Pistyri], date not specified, 2 ex.

**Distribution:** Central Europe (including Ukraine) (Schülke & Smetana, 2015).

**Biology:** The species occurs in mixed and deciduous forests, in forests and on open steppe plots, in open steppe meadow areas, in foot-hills and high in the mountains, on sandy and calciphilous soils as well as on alkalized plots, where it lives in forest cover, in decaying plant residues, in ant hills, and in nests of small mammals. Adults occur in V–VIII (Horion, 1967; Lapeva-Gjonova & Ilieff, 2012; Assing, 2016).

18. *Brachida exigua* (Heer, 1839)

**Synonymy:** Eucaphes krauztii Hochhuth, 1872; Homalota notia Erichson, 1839; Gyropheana pilla C. Hampe, 1850.

**Material examined:** Ukraine: Ivanov-Frankivsk Prov.: Pistin [Pistyri], [year not specified], 1 ex., leg. Dr. Lokay.

**Distribution:** Europe (including Ukraine), Caucasus, Asia Minor, Middle Asia, West Siberia (Schülke & Smetana, 2015).

**Biology:** The species occurs in deciduous and mixed forests, in open steppe meadow areas, in foot-hills and high in the mountains, on sandy and calciphilous soils as well as on alkalized plots, where it lives in forest cover, in decaying plant residues, in ant hills, and in nests of small mammals. Adults occur in V–VIII (Horion, 1967; Lapeva-Gjonova & Ilieff, 2012; Assing, 2016).

19. *Gyropheana manica* Erichson, 1839

**Synonymy:** Aleochara angustata Stephens, 1832; Gyropheana puncticollis Hochhuth, 1872.

**Material examined:** Ukraine: Ivanov-Frankivsk Prov.: Pistin [Pistyri], date not specified, 2 ex.

**Distribution:** Europe (including Ukraine), Caucasus, Siberia (Schülke & Smetana, 2015).

**Biology:** The species occurs in deciduous and mixed forests, in forests and on open steppe plots, in foot-hills and high in the mountains, where it lives in fungi. Adults occur in III–XI (Glotov et al., 2011a).

20. *Gyropheana minima* Erichson, 1837

**Material examined:** Ukraine: Ivanov-Frankivsk Prov.: Pistin [Pistyri], date not specified, 1 ex.

**Distribution:** Europe (including Ukraine), Asia Minor, Siberia (Schülke & Smetana, 2015).

**Biology:** The species occurs in deciduous and mixed forests, in forests and on open steppe plots, in the mountains, where it lives mainly in xylotroph fungi as well as in terraneous fungi. Imagoes are active from June till September (Rusch, 1990; Horion, 1967; Glotov et al., 2011a). Adults occur in IV–X (Horion, 1967).

21. *Silusa rubra* Erichson, 1839

**Synonymy:** Silusia brevicornis Wasmann, 1902; Silusa ruga Heer, 1839.

**Material examined:** Ukraine: Ivanov-Frankivsk Prov.: Pistin [Pistyri], date not specified, 1 ex.

**Distribution:** Central and Southern Europe, Asia Minor (Schülke & Smetana, 2015), reported for the first time from Ukraine and from the Hutsulschyyna National Nature Park.

**Biology:** The species occurs in deciduous and mixed forests, where it lives in forest cover, in residues of plant origin, in moss, under the bark of trees and under stones along the banks of rivers and water bodies, in fungi. Adults occur in VII–X (Horion, 1967).

22. *Pella similis* (Märkel, 1844)

**Material examined:** Ukraine: Ivanov-Frankivsk Prov.: Pistin [Pistyri], date not specified, 1 ex.
**Distribution.** Europe (including Ukraine), Asia Minor (Schülke & Smetana, 2015).

**Biology.** The species occurs in open steppe and meadow areas, in deciduous and mixed forests, in floodplain forests, and in artificial stands, where it lives in leafage, in residues of plant origin, and together with ants. Adults occur in IV–VIII (Horion, 1967; Maruyama, 2006).

**Material examined.** Ukraine: Ivano-Frankivsk Prov.: Pstín [Pštýr], date not specified, 1 ex.

**Distribution.** Europe (including Ukraine) (Schülke & Smetana, 2015).

**Biology.** The species occurs in deciduous and mixed forests, in the mountains, where it lives in forest and meadow cover, in decaying plant residues, under stones, along the banks of rivers and water bodies. Adults occur in V–VI (Horion, 1967).

**Material examined.** Ukraine: Ivano-Frankivsk Prov.: Pstín [Pštýr], date not specified, 1 ex.

**Distribution.** Central and Southern Europe (including Ukraine), North Africa (Schülke & Smetana, 2015).

**Biology.** The species occurs in deciduous and mixed forests as well as in open steppe and meadow areas, in foothills and high in the mountains, where it lives in forest and meadow cover, in decaying plant residues, in moss, under stones, along sandy and oozy banks of rivers and water bodies, in nests of mammals (Horion, 1967).

**Material examined.** Ukraine: Ivano-Frankivsk Prov.: Pstín [Pštýr], date not specified, 2 ex.

**Distribution.** Europe (including Ukraine) (Schülke & Smetana, 2015).

**Biology.** The species occurs in forests as well as in open steppe and meadow areas, in foothills and high in the mountains, where it lives in forest and meadow cover, in decaying plant residues, in moss, under stones, along sandy and oozy banks of rivers and water bodies, in nests of mammals (Horion, 1967).

**Material examined.** Ukraine: Ivano-Frankivsk Prov.: Pstín [Pštýr], date not specified, 1 ex.

**Distribution.** Europe (including Ukraine) (Schülke & Smetana, 2015).

**Biology.** The species occurs in deciduous and mixed forests as well as in open steppe and meadow areas, in foothills and high in the mountains, where it lives in forest and meadow cover, in decaying plant residues, in moss, under stones, along sandy and oozy banks of rivers and water bodies, in nests of mammals (Horion, 1967).

**Material examined.** Ukraine: Ivano-Frankivsk Prov.: Pstín [Pštýr], date not specified, 1 ex.

**Distribution.** Europe (including Ukraine) (Schülke & Smetana, 2015).

**Biology.** The species occurs in deciduous and mixed forests, in the mountains, where it lives in forest and meadow cover, in decaying plant residues, under stones, along the banks of rivers and water bodies. Adults occur in V–VI (Horion, 1967; Klimaszewski et al., 2011).

**Material examined.** Ukraine: Ivano-Frankivsk Prov.: Pstín [Pštýr], date not specified, 1 ex.

**Distribution.** Europe (including Ukraine), Asia Minor, Siberia (Schülke & Smetana, 2015).

**Biology.** The species occurs in forests, at foothills, where it lives along the banks of rivers and streams, on swamped plots, in forest cover and in residues of plant origin. Adults occur in IV–VIII (Horion, 1967; Pašnik, 2006a).

**Discussion.**

As a result of the elaboration of the collection from the main stock, 32 specimens of staphylinid beetles belonging to 30 species, 18 genera, were identified for the territory of the Hutsulschyna National Nature Park and 4 species (Atheta corvina (Thomson, 1856), Schistoglossa vidua (Erichsen, 1837), Leptusa puellaris puellaris (C. Hampe, 1863), Silous rubra (Erichsen, 1839)) were recorded in Ukraine for the first time. Among the identified species, 6 species were also noted (Hydrostepho scabricollis (Erichsen, 1839), Leptusa fumida (Erichsen, 1839), Leptusa puellaris puellaris (C. Hampe, 1863), Brachida exigua (Heer, 1839), Dryopsypeta velata (Erichsen, 1837), Apineta multidens (Ganglbauer, 1895)), which are very rare and poorly studied in the entire area (Lohse, 1974; Pace, 1989; Schülke & Smetana, 2015).

**Conclusion.**

On the basis of the research collection, an attempt to inventory the taxonomic composition of the rove beetles of the subfamily Aleocharinae of the Hutsulschyna National Nature Park has been carried out for the first time. The results of the study of species diversity are not ultimate and can be significantly supplemented and clarified in the future by conducting special research on the territory of the Hutsulschyna National Natural Park and its surroundings. Nevertheless they fully demonstrate the diversity of the Aleocharinae subfamily in this area. The obtained results can be used in compiling the fauna cadaster of Ukraine, for comparative faunal studies, in analyzing the distribution of species, as well as in biogeographical modelling, in conducting ecological monitoring and forecasting the effects of anthropogenic factors on natural ecosystems.

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**References.**


**Synonymy.** Homodota labilis Erichson, 1839, Atheta paludicola Poppius, 1909.

**Material examined.** Ukraine: Ivano-Frankivsk Prov.: Pstín [Pštýr], date not specified, 1 ex.

**Distribution.** Holarctic (including Ukraine) (Schülke & Smetana, 2015).

**Biology.** The species occurs along the banks of rivers and water bodies, in sediment loads as well as in residues of plant origin, in fungi; in the twilight it flies to the light of ultraviolet lamps. Adults occur in VI–VII (Horion, 1967; Klimaszewski et al., 2011).