

Soft-winged flower beetles (Coleoptera, Cleroidea: Malachiidae) of the Sikhote-Alinskii Nature Reserve, the Russian Far East

Жуки-малашки (Coleoptera, Cleroidea: Malachiidae) Сихоте-Алинского заповедника на Дальнем Востоке России

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Ключевые слова: жуки-малашки, распространение, эндемик, Северное Приморье.

Abstract. 14 species from 10 genera and 4 tribes of two subfamilies of the family Malachiidae have been recorded in the Sikhote-Alin Nature Reserve. This represents almost half of all species known from the Far Eastern region of North Asia and a quarter of the total species diversity of the area. The overwhelming majority of species are of Far Eastern distribution; only one species, *Nepachys cardiaca* (Linnaeus, 1761), is widespread in the Palaearctic, while two species, *Cordylepherus facialis* (Gebler, 1832) and *Ebaeus (Ebaeus) transbaikalicus* Pic, 1912, extend into Eastern Siberia, Mongolia, and Northeast China. The fauna of the Sikhote-Alin Nature Reserve reflects the specificity of the Far Eastern region and differs significantly from other regions of North Asia.

Резюме. В Сихоте-Алинском заповеднике отмечено 14 видов жуков малашек из 10 родов, 4 триб двух подсемейств семейства Malachiidae. Это почти половина всех видов, известных в дальневосточной области Северной Азии и четверть всего видового разнообразия малашек области. Подавляющее большинство видов — дальневосточного распространения, только один вид, *Nepachys cardiaca* (Linnaeus, 1761), широко распространён в Палеарктике, а два вида: *Cordylepherus facialis* (Gebler, 1832) и *Ebaeus (Ebaeus) transbaikalicus* Pic, 1912 заходят в Восточную Сибирь, Монголию и Северо-Восточный Китай. Фауна Сихоте-Алинского заповедника отражает специфику Дальневосточной области и разительно отличается от остальных регионов Северной Азии.

Introduction

The soft-winged flower beetles belong to the family Malachiidae within the superfamily Cleroidea. These small to medium-sized beetles, ranging from 1 to 8 mm in length, are characterised by their soft bodies with freely articulated sclerites, which contribute to their high mobility. This structural specificities has allowed the Malachiidae to inhabit a wide range of ecosystems, from Arctic tundra to tropical coastlines and inland deserts.

The diversity of soft-winged flower beetles is greater in warmer regions, while their numbers are significantly reduced in the temperate zone of Eurasia. The larvae of soft-winged flower beetles have been recorded as predators [Shurovenkov, 1980; Švihla, 1984; Klausnitzer von, Constantin, 1996; Plonski et al., 2021], mainly on trees and grasses, and there is some evidence that they may also feed on moulds [Skvarla, 2019]. The family Malachiidae originated over 100 million years ago, with the oldest forms exhibiting typical features of male-specific structures known from Burmese amber inclusions mined in Myanmar, which are approximately 100 million years old and belong to the latest Albian to earliest Cenomanian of the mid-Cretaceous [Tshernyshev, Legalov, 2023]. The family is well known from the Eocene of the Paleogene, with beetles described from Baltic and Rovno amber, as well as from imprints in the Florissant deposit [Berendt, 1845; Klebs, 1910; Wickham, 1912; Spahr, 1981a,b; Majer, 1998; Mawdsley, 1999; Zherikhin, Ross, 2000; Kubisz, 2001; Kirejtshuk, Nel, 2008; Tshernyshev, 2012a, 2016, 2019, 2020; Kirejtshuk et al., 2018; Tihelka et al., 2021; Tshernyshev et al., 2023; Tshernyshev, Legalov, 2023].

In the northern part of the Asian continent, within the conventionally defined region of Northern Asia, soft-winged flower beetles are represented by nearly 60 species belonging to 25 genera across 6 tribes of 2 subfamilies [Tshernyshev, 2012b]. In the conventionally delineated region of the Far East, more than 30 species have been recorded, which constitutes over half of the total species diversity of soft-winged flower beetles in Northern Asia. Relatively recently, the following species have been described from this region: *Ebaeus (Ebaeus) legalovi* Tshernyshev, 2009, *Hypebaeus (Hypebaeus) cooteri* Tshernyshev, 1922, *Troglocollops (Troglocollops) sundukovi* Tshernyshev, 2007, *Intybia takaraensis* (Nakane, 1955), *Nepachys coreanus* Wittmer, 1989,

Anthocomus (Anthocomus) kurbatovi Tshernyshev, 2022, *Cordylepherys pseudofaustus* Tshernyshev, 2009, *Malachius (Malachius) glaucoviolaceus* Tshernyshev, 2009, *Haplomalachius (Flabellomalachius) ishiharai kasantsevi* Wittmer, 1996 and *H. (F.) transbaikalensis* Tshernyshev, 1999 [Nakane, 1955; Wittmer, 1989, 1996; Tshernyshev, 2007, 2009, 2022a, b]. The majority of the species recorded in the Far East region are found in Primorye [Tshernyshev, 2012 b,c], within which the Sikhote-Alin Nature Reserve is located. This study examines the species composition of soft-winged flower beetles collected from various parts of the reserve over five years of research. This is the first summary of the fauna of soft-winged flower beetles in the reserve, providing insights into the species composition of Malachiidae at nearly the southernmost point of the Russian Far East. The work was carried out as part of an ongoing study of the insect fauna of the Sikhote-Alin Nature Reserve [Lafer, 1996; Kazantsev, 1994; Kuznetsov, 2000; Sundukov, 2013; Smetana, Shavrin, 2018; Sergeev, 2019, 2020 a-c, 2021, 2022 a-c, 2023, 2024; Platia et al., 2020; Prosvirov, Sergeev, 2021; Sazhnev et al., 2021; Sazhnev, Sergeev, 2021; Sundukov, Sergeev, 2021; Legalov, Sergeev, 2022; Sergeev, Legalov, 2022; Tishechkin et al., 2022; Miroshnikov, Sergeev, 2023; Volkovitsh et al., 2023].

Materials and Methods

The Sikhote-Alin Nature Reserve is the largest protected natural reserve in the coniferous-deciduous forest belt of Eurasia and the Americas, established in 1935. It covers an area of over 400,000 ha and extends from the coast of the Sea of Japan inland, including the western and eastern foothills of the Sikhote-Alin mountain range [Utenkova, Labetskaya, 2006; Gromyko, 2010]. The flora of the Sikhote-Alin Nature Reserve includes 1,094 species of vascular plants from 504 genera and 135 families [Pimenova, 2016]. The significant altitude gradient has resulted in the vertical zonation of the vegetation. Seven altitude zones can be distinguished: coastal vegetation, coastal oak woodland zone, cedar broadleaf forest zone, fir-spruce forest zone, rocky birch forest zone, dwarf cedar zone and alpine tundra vegetation. Currently, one of the most important factors in the transformation of the vegetation cover of the reserve remains forest fires [Gromyko, 2010].

The material for this study consisted of collections made by M.E. Sergeev in 2015–2020 on the territory of the Sikhote-Alin Nature Reserve, as well as in the vicinity of the settlement of Terney, which is located close to the reserve boundaries. Collections will be carried out using the most effective methods: sweeping with a net over herbaceous and shrub vegetation, shaking branches of shrubs and trees on a screen, manual collection along routes and using Merike traps.

In the territory of the Sikhote-Alin Nature Reserve, material was collected from 11 sites (Fig. 1): **1** — *Abrek site*: floodplain of the Skrytaya River (45°06'29" N,

136°45'32" E); **2** — *near the settlement of Terney*: floodplain of the Serebryanka River, 45°03'12" N, 136°37'16" E; **3–4** — *Blagodatnoye site*: Upper course of the Sukhoy River, 44°58'57" N, 136°31'09" E, surroundings of Blagodatnoye Lake 44°57'12" N, 136°32'48" E; **5** — *Golubichnoye site*: surroundings of Golubichnoye Lake, 44°54'30" N, 136°31'36" E; **6** — *Kunaleyka site*: Khanov stream, 44°53'83" N, 136°20'24" E; **7** — *Kuruma site*: Kuruma river floodplain, 44°54'94" N, 136°12'75" E; **8** — *Ust-Serebryany site*: Serebryanka river floodplain, 45°08'25" N, 136°22'43" E; **9** — *Yasnaya site*: Zabolochennaya river floodplain, 45°16'59" N, 136°23'93" E; **10** — *Solontsovy site*: Zabolochennaya river floodplain, 45°18'88" N, 136°28'58" E; **11** — *Ust-Prokhnodnaya site*: natural solonchak «Kaplanovsky», 45°32'11" N, 136°13'28" E. All sites are traditionally designated areas of the reserve, associated with monitoring stations, and include parts of the basins of major rivers or large streams [Pimenova, 2016]. Additional material was collected in the Udege Legend National Park (45°45'34" N, 135°28'37" E), in the city of Vladivostok (43°13'20" N, 131°59'34" E), on Russkii Island (42°59'41" N, 131°55'30" E; 43°01'45" N, 131°52'26" E), near Barabash village, Barabashevka river floodplain (43°11'20" N, 131°30'59" E) and Kedrovaya Pad Reserve (43°10'18" N, 131°28'20" E).

The collected material is deposited at the Siberian Zoological Museum of the Institute of Systematics and Ecology of Animals, Siberian Branch of the Russian Academy of Sciences, Novosibirsk (ISEZ).

The present work is registered in ZooBank (www.zoobank.org) under LSID urn:lsid:zoobank.org:pub:D28D9E62-5A1B-4CBE-98C7-1B69B8024E5E

Results

Malachiidae Fleming, 1821

Carphurinae Champion, 1923

Carphuroides rosti (Pic, 1902)

Material. 3–4: 2.VIII.2018 — 1♂, 1♀, 9: 12.VII.2018 — 1♀.

Malachiinae Fleming, 1821:

Attalini Abeille de Perrin, 1890

Nepachys cardiaca (Linnaeus, 1761)

Material. 3–4: 2.VI.2016 — 1♂, 1♀.

Nepachys coreanus Wittmer, 1989

Material. 3–4: 3.VIII.2016 — 1♀.

Malachiini Fleming, 1821

Anhomodactylus albilabrus (Pic, 1914)

Material. 1: 3–5.VIII.2020 — 1♀; 2: 23.VI.2016 — 2♀♀; 3–4: 16.VI.2017 — 1♂, 1♀, 28.V.2017 — 2♀♀, 2.VIII.2016 — 3♀♀, 4.VIII.2018 — 1♂, 2.VI.2018 and 2.VI.2016 — 2♀♀; 5: 5.VIII.2019 — 1♀; 6: 24.V.2017 — 1♂; 7 — 6–9.VI.2020 — 2♀♀; 10: on window, 1.VI.2020 — 1♀; 11: 15.VII.2016 — 1♀, 17.VI.2015 — 2♀♀; Vladivostok: 8.V.2019 — 1♂; Barabashevka: 8.VI.2019 — 1♂.

Cordylepherys facialis (Gebler, 1832)

Material. 3–4: 1.VIII.2016 — 1♀.

Cordylepherus sibiricus (Kiesenwetter 1879)

Material. 3–4: 2.VI.2016 — 2♀; 11: 27.VIII.2016 — 2♀; Barabash: 8.VI.2019 — 1♀; Russkii Island: 31.V.2019 — 1♂, 1♀.

Cordylepherus pseudofaustus Tshernyshev, 2009

Material. 1: 7.VII.2017 — 1♂; 3–4: 25.VI.2016 — 1♀, 1♀; 5: 15.VII.2017 — 1♀.

Haplomalachius (Flabellomalachius) ishiharai kasantsevi Wittmer 1996

Material. 2: 16.VI.2017 — 1♀, 13.VI.2018 — 2♀, 23.VI.2018 — 1♂, 13.VI.2015 — 1♀, 13, 23.VI.2016 — 1♂, 6♀; 3–4: 2.VI.2018 — 1♂, 2.VI.2016 — 2♂♂, 8♀, 25.VI.2016 — 2♀; 5: 30.VI.2016 — 1♀; 6: 6.IV.2018 — 1♀; Russkii Island: 24.V.2019 — 3♀.

Malachius (Malachius) glaucoviolaceus Tshernyshev, 2009

Material. 6: 6.IV.2018 — 1♂, 2♀.

Cyrtosus christophi (Kiesenwetter, 1879)

Material. 1: 3–5.VIII.2020 — 1♂, 5♀; 24.VI.2015 — 1♀; 2: 23.VI.2016 — 1♂, 2♀; 3–4: 23.VI.2018 — 1♀, 1.VIII.2016, 4.VIII.2018 — 2♂♂, 1♀, 2.VI.2016 — 1♂; 5: 30.VI.2016 — 1♀; 17.VII.2017 — 1♀, 14.VII.2017 — 2♀; 7: 6–9.VI.2020 — 3♀; 8: 5.VI.2017 — 1♂, 23.VI.2018 — 1♀; Udege Legend National Park: 21.VIII.2015 — 1♀; Kedrovaya Pad Reserve: 8.V.2019 — 1♂; Barabash: 8.VI.2019 — 1♂; Russkii Island: 24.V.2019 — 2♂♂.

Ebaeini Portevin, 1931

Ebaeus (Ebaeus) transbaikalicus Pic, 1912

Material. 3–4: 2.VIII.2018 — 1♀, 3.VIII.2016 — 1♀, 9.VIII.2020 — 1♀.

Ebaeus (Ebaeus) legalovi Tshernyshev, 2009

Material. Vladivostok: 12.VI.2019 — 5♀.

Hypebeus (Hypebeus) cooteri Tshernyshev, 2022

Material. 3–4: 3.VIII.2016 — 1♀.

Apalochrini Mulsant and Rey, 1867

Intybia (Intybia) takaraensis (Nakane, 1955)

Material. 5: 5.VII.2019 — 2♀, 30.VI.2016 — 3♂♂, 1♀.

Thus, 14 species from 10 genera and 4 tribes of two subfamilies have been recorded in the Sikhote-Alin Nature Reserve. This represents almost half of all species known from the Far Eastern region of North Asia and a quarter of the total species diversity of the area. The overwhelming majority of species are of Far Eastern distribution; only one species, *Nepachys cardiaca* (Linnaeus, 1761), is widespread in the Palearctic, while two species, *Cordylepherus facialis* (Gebler, 1832) and *Ebaeus (Ebaeus) transbaikalicus* Pic, 1912, extend into Eastern Siberia, Mongolia, and Northeast China. The fauna of the Sikhote-Alin Nature Reserve reflects the specificity of the Far Eastern region and differs significantly from other regions of North Asia.

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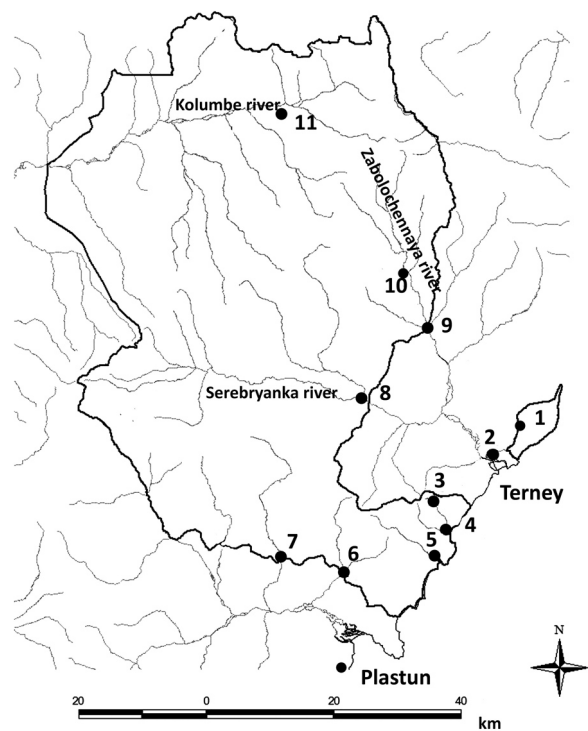


Fig. 1. Locality map of Malachiidae in the Sikhote-Alinskii Nature Reserve. For numbers see Material and methods.

Рис. 1. Карта районов сбора в Сихоте-Алинском заповеднике. Номера см. в разделе «Материал и методы».

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References

- Berendt G.C. 1845. Die organischen Bernstein-Einschlüsse im Allgemeinen. // Goepfert H.R., Berendt G.C. (Eds.): Der Bernstein und die in ihm befindlichen Pflanzenreste der Vorwelt. Bd.1. 1 plate. Berlin: Nicolai. S.41–60.
- Gromyko M.N. 2010. [Forest fire characteristic of ecosystems // Fires and their impact on the natural ecosystems of Central Sikhote-Alin]. Vladivostok: Dalnauka. P.86–103. [In Russian].
- Kazantsev S.V. 1994. Review of *Rhagonycha* species (Coleoptera, Cantharidae) of the Asian part of Russia // Zoologicheskii Zhurnal. Vol.73. Nos 7–8. P.71–100. [In Russian].
- Kirejtshuk A.G., Nel A. 2008. New beetles of the suborder Polyphaga from the Lowermost Eocene French amber (Insecta: Coleoptera) // Annales de la Société Entomologique de France. Vol.44. No.4. P.419–442.
- Kirejtshuk A.G., Ponomarenko A.G., Zherihin V.V. 2018. Taxonomic list of fossil beetles suborder Scarabaeina (part 4). Available online: <https://www.zin.ru/Animalia/Coleoptera/rus/paleosy3.htm>. Accessed on 10 November 2024.
- Klausnitzer B. von, Constantin R. 1996. 66. Familie: Malachiidae // Klausnitzer B. (Ed.): Die Larven Der Kafer Mitteleuropas. Bd.3. Polyphaga. Tl.2. S.204–217. Abb. 1–73.
- Klebs R. 1910. Über Bernsteinschlüsse im allgemein und die Coleopteren meiner Bernsteinsammlung // Schriften der

- Physikalisch-Ökonomischen Gesellschaft zu Königsberg im Prussia. Bd.51. No.3. S.217–242.
- Kubisz D. 2001. Beetles in the collection of the Museum of Amber Inclusions, University of Gdansk, with description of *Colotes sambicus* sp.n. (Coleoptera: Melyridae) // Polish Journal of Entomology. Vol.70. No.4. P.259–265.
- Kuznetsov V.N. 2000. Materialy k ocenke bioraznoobraziya nasekomyh // Rastitel'nyj mir Sihote-Alinskogo biosfernogo zapovednika: raznoobraziye, dinamika, monitoring. Vladivostok: BPIDVORAN. P.255–264. [In Russian].
- Lafer G.Sh. 1996. Sem. Sightheliniidae Lafer, fam.n. // Lehr P.A. (Ed.): Opredelitel' nasekomyh Dal'nego Vostoka Rossii. T.III. Zhestkokrylye, ilizhuki. Ch.3. Vladivostok: Dal'nauka. S.390–396.
- Legalov A.A., Sergeev M.E. 2022. A list of the Curculionidae (Coleoptera) from Sighthote-Alin Nature Reserve (Russian Far East) // Ecologica Montenegrina. Vol.51: 25–46. <https://doi.org/10.37828/em.2022.51.4>
- Majer K. 1998. Rhadalinae from the Baltic Amber (Coleoptera, Dasytidae), Deutsche Entomologische Zeitschrift. Vol.45. No.2. P.255–264. <https://doi.org/10.1002/mmnd.19980450210>
- Mawdsley J.R. 1999. Review of the extant and fossil Dasytinae (Coleoptera: Melyridae) of Colorado, U.S.A. // Transactions of the American Entomological Society. Philadelphia. No.125. P.251–267.
- Miroshnikov A.I., Sergeev M.E. 2023. Novye nahodki *Pseudogaurontina magnifica* (Plavilstshikov, 1958) (Coleoptera: Cerambycidae: Lepturinae: Rhagiini) v Primorskom i Khabarovskom krayah (Rossiya) s opisaniem ranee neizvestnogo samca // Kavkazskii entomologicheskii byulleten. Vol.19. No.1. P.57–70. [In Russian]. <https://doi.org/10.23885/181433262023191-5770>
- Nakane T. 1955. Marine insects of the Tokara Islands V. Three new species of the genus *Laius* Guerin from Kyushu and the Tokara Islands, with notes on a species from Mariana // Publications Seto Mariana Biological Laboratory. Vol.4. Nos 2–3. P.373–378. P.125.
- Pimenova E.A. 2016. [Vascular plants] // Plants, mushrooms and lichens of the Sighthote-Alin reserve. Vladivostok: Dalnauka. P.172–365. [In Russian].
- Platia G., Pulvirenti E., Ruzzante G. 2020. New species and new records of click beetles from the Palearctic region (Coleoptera, Elateridae) // Boletín de la Sociedad Entomológica Aragonesa (S.E.A.). No.66. P.19–32.
- Plonski I.S., Rădac I.A., Cassar Th. 2021. On larvae of soft-winged flower beetles (Coleoptera: Melyridae and Rhadalidae) found in oothecae of mantises (Mantodea: Mantidae) // Zeitschrift der Arbeitsgemeinschaft Osterreichischer Entomologen. Vol.73. P.25–30.
- Prosvirov A.S., Sergeev M.E. 2021. On the fauna and taxonomy of click-beetles (Coleoptera, Elateridae) of the Sighthote-Alin nature reserve and adjacent areas // Entomological review. Vol.100. No.9. P.1286–1348. <https://doi.org/10.1134/S0013873820090080>
- Sazhnev A.S., Prokin A.A., Sergeev M.E. 2021. New data on water beetles (Coleoptera: Gyrimidae, Haliplidae, Noteridae, Dytiscidae, Hydrophilidae, Elmidae) of Primorsky Krai (Russia) // Russian Entomological Journal. Vol.30. No.3. P.264–274. <https://doi.org/10.15298/rusentj.30.3.03>
- Sazhnev A.S., Sergeev M.E. 2021. Material to the fauna of marsh-beetles (Coleoptera: Scirtidae) of the Primorsky krai protected areas, with notes on synonymy // Inland water biology, 14(4): 469–475. <https://doi.org/10.1134/S1995082921040076>
- Sergeev M.E. 2019. Zhuki-zernovki (Coleoptera: Chrysomelidae, Bruchinae) Sighthote-Alinskogo zapovednika // Chteniya pamyati A.I. Kurencova. No.30. 122–128. [In Russian]. <https://doi.org/10.25221/kurentzov.30.10>
- Sergeev M.E. 2020a. Species composition and biotopic distribution of leaf beetles (Coleoptera: Megalopodidae, Chrysomelidae) in the Sighthote-Alin State Nature reserve (Russia) // Nature Conservation Research. Vol.5. No.2. P.80–88. [In Russian]. <https://doi.org/10.24189/ncr.2020.020>
- Sergeev M.E. 2020b. New data on anthophilous beetles of the superfamily Tenebrionoidea (Coleoptera) of Sighthote-Alin nature reserve, Russia // Euroasian Entomological Journal. Vol.20. No.2. P.97–105. <https://doi.org/10.15298/euroasentj.20.2.06>
- Sergeev M.E. 2020c. K faune zhukov-gorbatok (Coleoptera: Tenebrionoidea, Mordellidae) Sighthote-Alinskogo zapovednika // Chteniya pamyati A.I. Kurencova. No.31. P.151–164. [In Russian]. <https://doi.org/10.25221/kurentzov.31.13>
- Sergeev M.E. 2022a. Beetles of the superfamily Cantharoidea (Coleoptera) of Sighthote-Alin nature reserve, Russia // Euroasian Entomological Journal. Vol.21. No.1. P.37–45. <https://doi.org/10.15298/euroasentj.21.1.06>
- Sergeev M.E. 2022b. New records of leaf beetles (Coleoptera, Megalopodidae: Zeugophorinae) from Russia // Far Eastern Entomologist. No.460. P.11–14. <https://doi.org/10.25221/fee.460.2>
- Sergeev M.E. 2022c. Zhestkokrylye (Coleoptera) Sighthote-Alinskogo biosfernogo zapovednika. XVI siezd Russkogo entomologicheskogo obshchestva. C. 22. [In Russian].
- Sergeev M.E. 2023. To the fauna of superfamily Bostrichoidea Latreille, 1802 (Coleoptera) of the Central Sighthote-Alin (Primorskii Territory, Russia) // Amurian Zoological Journal. Vol.15. No.3. P.691–701. [In Russian]. <https://doi.org/10.33910/2686-9519-2023-15-3-691-701>
- Sergeev M.E. 2024. Novye dannye o rasprostraneni chuzherodnyh vidov zhukov listoedov v Primorskom krae // Zashchita i karantin rastenii. No.3. P.23–24. [In Russian]. https://doi.org/10.47528/10268634_2024_3_23
- Sergeev M.E., Legalov A.A. 2022. Review of leaf beetles of the family Megalopodidae (Coleoptera: Chrysomeloidea) from Siberia and the Russian Far East // Ecologica Montenegrina. Vol.57. P.44–70. <https://doi.org/10.37828/em.2022.57.6>
- Sundukov Yu.N., Sergeev M.E. 2021. Additions to the fauna of ground beetles (Coleoptera, Caraboidea) of the Sighthote-Alin Nature Reserve // Amurian Zoological Journal. Vol.13. No.2. P.282–313. [In Russian]. <https://doi.org/10.33910/2686-9519-2021-13-3-282-313>
- Shurovenkov B.G. 1980. Biologiya i znachenie malashek (Coleoptera, Melyridae) kak entomofagov na polyah Kurskoj oblasti // Entomologicheskoe obozrenie. T.59. No.3. P.535–543. [In Russian].
- Skvarla M.J. 2019. New information about *Anthocomus equestris* (Fabricius, 1781) (Coleoptera: Melyridae), a soft-winged flower beetle commonly found in homes // Proceedings of the Entomological Society of Washington. Vol.121. No.4. P.693–699.
- Smetana A., Shavrin A. 2018. Contribution to the knowledge of the genus *Quedius* STEPHENS, 1829 of Siberia and Russian Far East (Coleoptera: Staphylinidae: Staphylinini: Quediina) // Linzer Biologische Beiträge. Vol.50. No.1. P.825–836.
- Spahr U. 1981a. Bibliographie der Bernstein- und Kopal-Käfer (Coleoptera) // Stuttgarter Beiträge für Naturkunde. Ser.B. No.72. 22 S.
- Spahr U. 1981b. Systematischer Katalog der Bernstein- und Kopal-Käfer (Coleoptera) // Stuttgarter Beiträge für Naturkunde. Ser.B. No.80. 107 S.
- Švihla V. 1984. *Cephaloncus kubani* sp. n. from Soviet Central Asia (Coleoptera, Melyridae) // Acta Faunistica Entomologica Musei Nationalis Pragae. Vol.17. No.207. P.251–252.
- Sundukov Yu.N. 2013. Annotirovannyi katalog zhuzhelic (Coleoptera: Caraboidea) Sighthote-Alinya. Vladivostok: Dal'nauka. 271 s. [In Russian].
- Tihelka E., Huang D., Perrichot V., Cai Ch. 2021. A previously missing link in the evolution of dasytine soft-winged flower beetles from Cretaceous Charentese amber (Coleoptera, Melyridae) // Papers in Palaeontology Vol.7. No.4. P.1753–1764. <https://doi.org/10.1002/spp2.1360-insu-03196023>
- Tishechkin A.K., Zinchenko V.K., Sergeev M.E. 2022. New and little known Histeridae species (Coleoptera) from Russia with a synonymy note // Far Eastern Entomologist. No.467. P.11–16. <https://doi.org/10.25221/fee.467.2>
- Tshernyshev S.E. 2007. A new species of *Troglocollops* (Insecta: Coleoptera: Malachiidae) from southern Primorye, Russian Far East // Species Diversity. Vol.12. No.2. P.121–126.
- Tshernyshev S.E. 2009. A contribution to the fauna of soft winged flower beetles (Coleoptera, Malachiidae) of the Russian Far East // Euroasian Entomological Journal. Vol.8. No.1. P.31–44. P.1. [In Russian].
- Tshernyshev S.E. 2012a. *Aploceble (Chalcoaploceble) viridiaeneus* Tshernyshev — new subgenus and species of dasytid beetles

- (Coleoptera, Dasytidae) in Baltic Amber // Euroasian Entomological Journal. Vol.11. No.3. P.212, 213–218. Plt.II.
- Tshernyshev S.E. 2012b. A review of soft-winged flower beetle fauna (Coleoptera, Malachiidae) of North Asia // Euroasian Entomological Journal. Vol.11. No.6. C.575–587. [In Russian].
- Tshernyshev S.E. 2012c. On the fauna of soft-winged flower beetles (Coleoptera, Malachiidae) of Russia and adjacent territories // Proceedings of the Russian Entomological Society. Vol.83. No.1. Saint-Petersburg. P.102–111. [In Russian].
- Tshernyshev S.E. 2016. New Taxa of Soft-winged Flower Beetles (Coleoptera, Malachiidae) in Baltic and Rovno Amber // Paleontological Journal. Vol.50. No.9. P.953–962. <https://doi.org/10.1134/S0031030116090021>
- Tshernyshev S.E. 2019. New species of malachite beetles (Coleoptera, Dasytidae) in Baltic Amber // Paleontological Journal. Vol.53. No.10. P.1024–1035. <https://doi.org/10.1134/S0031030119100022>
- Tshernyshev S.E. 2020. New taxa of soft-winged flower beetles (Coleoptera, Malachiidae) in Baltic Amber // Paleontological Journal. Vol.54. No.3. P.67–75. <https://doi.org/10.1134/S0031030120030065>
- Tshernyshev S.E. 2022a. A review of species of the genus *Anthocomus* Erichson, 1840 (Coleoptera, Cleroidea Malachiidae) of North Asia with description of new species from South Primorie // Invertebrate Zoology. Vol.19. No.1. P.91–98. <https://doi.org/10.15298/invertzool.19.1.09>
- Tshernyshev S.E. 2022b. *Hypebaeus cooteri* sp. nov., the nemoral species of soft-winged flower beetles (Coleoptera, Malachiidae) in North Asia // Diversity. Vol.14. No.10. 875. P.1–9. <https://doi.org/10.3390/d14100875>
- Tshernyshev S.E., Georgy Yu. Lyubarsky G. Yu., Alekseev V., Bukejs A. 2023. Diversity phenomenon of the Danaceinae malachite beetle subfamily (Coleoptera: Dasytidae) in Eocene Baltic amber with new description of an extinct genus and species // Diversity. Vol.14. No.15. 1077. P.1–13. <https://doi.org/10.3390/d15101077>
- Tshernyshev S.E., Legalov A.A. 2023. First record of the family Malachiidae (Coleoptera: Cleroidea) from mid-Cretaceous Burmese amber with a description of *Burmalachius acroantennatus* gen. et spec. nov. // Life. Vol.13. No.1938. P.1–13. <https://doi.org/10.3390/life13091938>
- Utenkova A.P., Labetskaya N.I. 2006. Landscapes // Flora and fauna of the Sikhote-Alin reserve. Vladivostok: Primpoligrafkombinat. P.16–20. [In Russian]
- Volkovitch M.G., Sergeev M.Ye., Królik R.. 2023. Jewel Beetles (Coleoptera, Buprestidae) of the Central Sikhote-Alin Range, Primorskii Territory, Russia // Entomological Review. Vol.102. No.7. P.1004–1018. <https://doi.org/10.1134/S0013873822070107>
- Wickham H.F. 1912. A report of some recent collections of fossil Coleoptera from the Miocene shales of Florissant // Bulletin from the Laboratory National History, State University Iowa. Vol.6. P.1–38.
- Wittmer W. 1989. 42. Beitrag zur Kenntnis der indo-malaiischen Cantharidae und Malachiidae (Coleoptera) // Entomologica Basiliensia. Bd.13. S.207–237.
- Wittmer W. 1996. Zur Kenntnis der Familie Malachiidae (Coleoptera). Teil II // Mitteilungen der Schweizerischen Entomologischen Gesellschaft (= Bulletin de la Société Entomologique Suisse). Bd.69. S.297–327.
- Zherikhin V.V., Ross A.J. 2000. A review of the history, geology and age of Burmese amber (Burmite) // Bulletin of the Natural History Museum Geology. Vol.56. No.1. P.3–10.

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