

Sphaeritidae (Coleoptera, Histeroidea) - a new beetle family to the fauna of Kazakhstan

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False clown beetle *Sphaerites glabratus* (Fabricius, 1792) is firstly recorded from Kazakhstan. The records of the beetles from family Sphaeritidae were absent for Kazakhstan. The spider *Philodromus poecilus* (Thorell, 1872) is cited for the first time as a natural enemy of this species.

Acta Biologica Sibirica 10: 611–618 (2024) doi: 10.5281/zenodo.12279425

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Academic editor: R. Yakovlev | Received 5 May 2024 | Accepted 25 May 2024 | Published 24 June 2024

<http://zoobank.org/B1FC4C69-E6D8-4DCF-988A-5F5A46FEDEEF>

Citation: Temreshev II (2024) Sphaeritidae (Coleoptera, Histeroidea) - a new beetle family to the fauna of Kazakhstan. Acta Biologica Sibirica 10: 611–618. <https://doi.org/10.5281/zenodo.12279425>

Keywords

Sphaerites glabratus, false clown beetles, new records, Central Kazakhstan

Introduction

False clown beetles (Sphaeritidae) include only one genus *Sphaerites* Duftschmidt, 1805 and seven species in the world fauna (Beutel et al 2016; Ryndevich and Lundyshev 2017). Almost all species distributed in the Palaearctic Region, except *Sphaerites politus* Mannerheim, 1846 in the Nearctic Region (Gusakov 2004; Háva 2014; Löbl 2015; Newton 2016; Gusakov 2017; Ryndevich and Lundyshev 2017). They are small, 4.5–7 mm, with oval bodies, black but with a slight bluish-green sheen. The Sphaeritidae commonly are found in association with rotting fungi (Beutel et al 2016; Newton 2016). Beetles of this family may also be found by dung, carrions, fermenting fruit or in association with sap of dying trees (Lackner 2015; Mazur 1973; Wu & Sun 2012; Newton 2016; Pražák 2021).

Sphaerites glabratus (Fabricius, 1792) is recorded in woodland among rotting wood, fermenting sap and from tree mushrooms *Fomitopsis* spp. and another species of fungi on birch (*Betula* spp.) or maple (*Acer* spp.). In addition, the beetle was found in rotting mushrooms, dung, on human and wild animal excrement, carrion, dead snails and in caves (Kryzhanovsky and Reichardt 1976; Kryzhanovsky 1989; Lackner 2010; Borowski and Mazur 2015; Mlejnek et al 2015; Newton 2016).

There are suggestions that it mainly consumes dipteran larvae (Newton 2016; Rose and Megrat 2017). Adults are found from April to August, have been recorded in flight during hot weather. Eggs laid in sap-soaked nearby soil trees with fungi. The larvae have a short generation span, developing into adults within a month. Pupation occurs in soil. First larval instar of *S. glabratus* has been described. There is almost no information about his other life characteristics (Nikitsky 1976; Hansen 1997; Newton and Spangler 1991; Lackner 2010; Newton 2016). This beetle is a very local and generally rare species and is considered to be threatened in some countries (British Red Data Books: 2. Insects 1987; Russia Red List 2008; Lane 2017; Ruchin and Khapugin 2019).

Materials and methods

The material was collected by manual method from 2023 in Central Kazakhstan, Ulytau Oblast. Standard techniques (Fasulati 1971) used in entomology were used during the collection of the material. The following sources (Jacobson 1905–1915; Kryzhanovsky and Reichardt 1976; Nikitsky 1976; Kryzhanovsky 1989; Hansen 1997; Newton and Spangler 1991; Gusakov 2004; Lackner 2010; Háva 2014; Borowski and Mazur 2015; Löbl 2015; Mlejnek et al 2015; Newton 2016; Gusakov 2017; Rose and Megrat 2017; Ryndevich and Lundyshev 2017) were used for species determination of the beetles, clarification of their taxonomic position, biology and the distribution. Studied specimens are kept in the private collection of I.I. Temreshev (Almaty, Kazakhstan).

Photographs of *S. glabratus* were taken with a camera Canon EOS 50 D by author (Fig. 1). Photographs of the mushrooms and habitat of *S. glabratus* were taken with a camera Redmi 7 by author (Fig. 2). Descriptions and body measuring were performed using a Micromed MC var 1-C dissecting stereomicroscope and Digital microscope G 1200.

The mushrooms that the material was collected were determined using the materials from the site "Mushrooms of Kazakhstan" ("Mushroom classification", n.d.).

The spiders that the material was collected were determined using the following sources (Azheganova 1968).

Result

Superfamily Histeroidea Gyllenhal, 1808

Family Sphaeritidae Shuckard, 1839

Genus *Sphaerites* Duftschmidt, 1805

Sphaerites glabratus (Fabricius, 1792)

Figure 1

Material examined. 2 ex. – 25.08.2023, Central Kazakhstan, Ulytau Oblast, Ulytau District, neighborhoods Korgasyn village, N 49°14'4.02" E 66°39'23.48", birch grove, dead in Red-Banded Polypore (*Fomitopsis pinicola* (Sw.) P. Karst.) on the trunk of European white birch *Betula pendula* Roth., I.I. Temreshev; 1 ex. – 15.05.2024, Central Kazakhstan, Ulytau Oblast, Ulytau District, neighborhoods Ulytau village, N 48°38'47.27" E 66°59'32.04", mixed aspen-birch grove, under the bark of European white birch *B. pendula*, dead in the remains of spider *Philodromus poecilus* (Thorell, 1872) prey, I.I. Temreshev (Fig. 2).

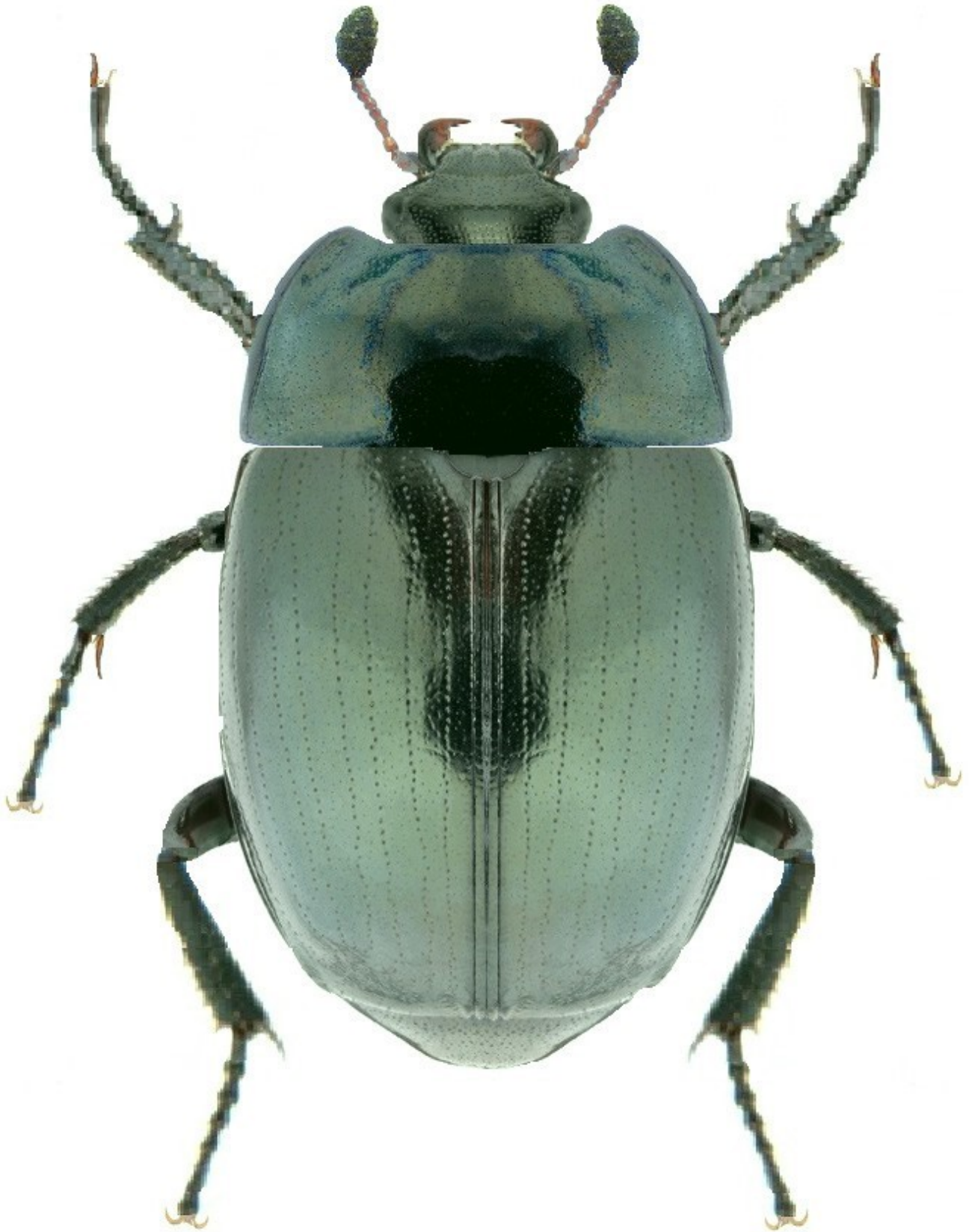


Figure 1. *Sphaerites glabratus*, habitus. Central Kazakhstan.

Remarks. *Sphaerites glabratus* is distributed in Europe (Austria, Belgium, Belarus, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Italy, Latvia,

Liechtenstein, Lithuania, Luxemburg, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Sweden, Switzerland, Ukraine), and Asia (China, Far East, Japan, Mongolia, Siberia) (Jacobson 1905- 1915; Kryzhanovsky and Reichardt 1976; Kryzhanovsky 1989; Gusakov 2004; Lackner 2010; Háva 2014; Löbl 2015; Newton 2016; Gusakov 2017; Rose and Megrat 2017; Ryndevich and Lundyshv 2017) (Fig. 3). The records of *S. glabratus* and species from family Sphaeritidae were absent for Kazakhstan (Löbl 2015).

Note. The spider *Philodromus poecilus* (Thorell, 1872) is cited for the first time as a natural enemy of this species. The species was found along with pleasing fungus beetles (Erotylidae) – *Dacne bipustulata* (Thunberg, 1781), *Triplax russica* (Linnaeus, 1758), hairy fungus beetles (Mycetophagidae) – *Mycetophagus multipunctatus* Fabricius, 1792, and weevil *Dryophthorus corticalis* (Paykull, 1792) (Curculionidae) for which is also a new distribution records in Kazakhstan (Temreshev 2019; 2022; 2023; 2024a,b).

**A****B****C****D**

Figure 2. Habitat of *Sphaerites glabratus*: European white birch grove, neighborhoods Korgasyn village (**A**), mixed aspen-birch grove, neighborhoods Ulytau village (**B**), mushroom Red-Banded Polypore *Fomitopsis pinicola* on the trunk of European white birch *Betula pendula* (**C**) and spider *Philodromus poecilus* with remains of prey under the bark of dead European white birch *B. pendula* (**D**). Central Kazakhstan.

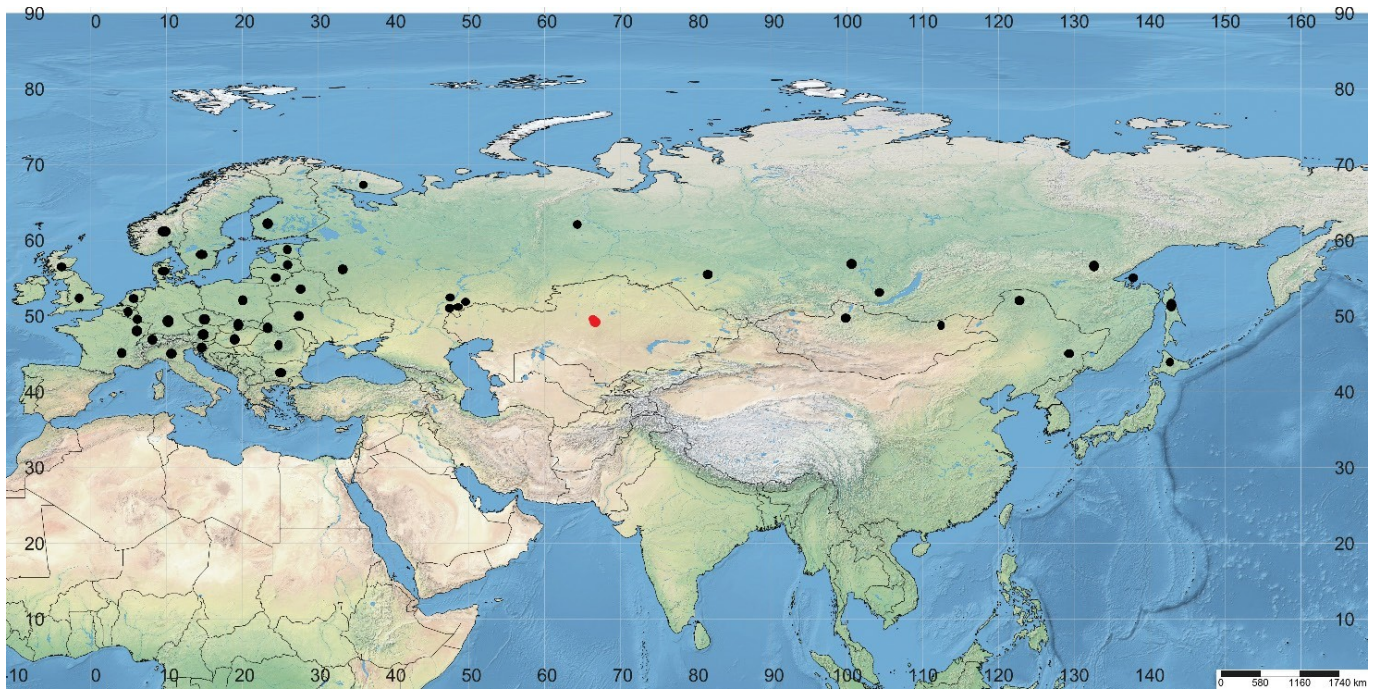


Figure 3. Distribution of *Sphaerites glabratus*. New record in Kazakhstan is indicated as red circle. Known ones indicated as black circles.

Discussion

One species of false clown beetles (Sphaeritidae) *Sphaerites glabratus* is recorded for Kazakhstan. Previously, representatives of this family were not found in country. Since the species was discovered in Central Kazakhstan, it can be assumed that in the future it will be found in the west, north and east of the country. These regions of the country border with the regions of the Russian Federation in which the *S. glabratus* was recorded.

Acknowledgement

The work was carried out within the framework of the project "Comprehensive assessment of the state of the environment and health of the population of the cities of Zhezkazgan, Satpayev and Ulytau district of the Ulytau region with the formation of an environmental electronic geographic information system".

Author thanks to Azamat Beysaly (Ulytau, Kazakhstan) for help in organizing the expedition in neighborhoods Korgasyn village and anonymous reviewers the valuable comments that improved the manuscript.

References

- Azheganova NS (1968) A brief guide to spiders (Aranei) of the forest and forest-steppe fauna of the USSR. Nauka, Leningrad, 147 pp. [In Russian]
- Beutel RG, Newton AF, Kovarik PW, Caterino MS (2016) 13. Histeroidea Gyllenhal, 1808. In: Handbook of Zoology: Coleoptera, Beetles. Morphology and Systematics. Vol. 1. Second Edition. De Gruyter, Berlin, Boston, 273–314.
- Borowski J, Mazur S (2015) Beetles (Coleoptera) of the Rogów region. Part IV – clown beetles

(Histeridae) and false clown beetles (Sphaeritidae). International Letters of Natural Sciences 37: 10–17. <https://doi.org/10.56431/p-df4156>

British Red Data Books: 2. Insects. (1987) Shirt DB (Ed.) Coordinated by the Insect Red Data Book Committees in collaboration with the Institute of Terrestrial Ecology (NERC), the International Union for Conservation of Nature and Natural Resources the Joint Committee for the Conservation of British Insects, the Nature Conservancy Council and the Royal Society for Nature Conservation. Nature Conservation Council 402.

Fasulati KK (1971) Field study of terrestrial invertebrates. Higher school, Moscow, 424 pp. [In Russian]

Gusakov AA (2004) A review of species of the family Sphaeritidae (Coleoptera). Euroasian Entomological Journal 3: 179–183.

Gusakov AA (2017) New species of false clown beetles *Sphaerite perforatus* (Coleoptera: Sphaeritidae) from the highlands of Yunnan province, China. Gumanitarnoe prostranstvo [Humanitarian space] 6 (1): 6–11. [In Russian]

Jacobson GG (1905–1915) Beetles of Russia and Western Europe. Publication A.F. Devrient, St. Petersburg, 1024 pp. [In Russian]

Háva J (2014) Faunistic contribution to the genus *Sphaerites* Duftschmid, 1805 in China (Coleoptera: Sphaeritidae). Boletín de la Sociedad Entomológica Aragonesa 54: 157–158.

Hansen M (1997) Phylogeny and classification of the staphyliniform beetle families (Coleoptera). Biologiske skrifter 48: 1–339.

Kryzhanovsky OL (1989) Family Sphaeritidae. In: Ler PA (Ed.) Keys to the Insects of the Far Eastern USSR in Six Volumes. Vol. 3. Coleoptera or Beetles. Part 1. Nauka, Leningrad, 294–310. [In Russian]

Kryzhanovsky OL, Reichardt AN (1976) Beetles of superfamili Histeroidea (Family Sphaeritidae, Histeridae, Synteliidae). Fauna SSS. Beetles. Vol. 5. No. 4. Nauka, Leningrad, 434 pp. [In Russian]

Lackner T (2010) Review of the Palaearctic genera of Sapriniinae (Coleoptera: Histeridae). Acta Entomologica Musei Nationalis Pragae 50: 1–254.

Lane SA (2017) A review of the status of the beetles of Great Britain. The clown beetles and false clown beetles – Histeridae and Sphaeritidae. Species Status No. 32. <http://publications.naturalengland.org.uk/>

Löbl I (2015) Family Sphaeritidae Shuckard, 1839. In: Löbl I, Löbl D (Eds) Catalogue of Palaearctic Coleoptera. Revised and updated edition. Volume 2/1. Hydrophiloidea- Staphylinoidea. Leiden-Boston, 76.

Mazur S (1973) Sphaeritidae i Gniliniki – Histeridae. Klucze Do Oznaczania Owadów Polski 79: 1–74. [In Polish]

Mlejnek R, Hamet A, Růžička J (2015) Beetles (Coleoptera) in caves and chasms of the Czech Republic. Acta Speleologica 6: 1–109. [In Czech]

Mushroom classification (n.d.). In: Mushrooms of Kazakhstan, from http://fungi.su/infusions/advanced_articles_sort/fungi_cl.php (Retrieval date: 7.12.2023). [In Russian]

Newton AF (2016) 13.1 Sphaeritidae Shuckard, 1839. In: Beutel RG, Leschen RAB (Eds)

Handbook of Zoology, Arthropoda: Insecta. Coleoptera, Beetles. Vol. 1: Morphology and Systematics (Archostemata, Adephaga, Myxophaga, Polyphaga partim). Second Edition. Walter de Gruyter, Berlin, Boston, 274–277.

Newton AF, Spangler PJ (1991) Hydrophilidae (Hydrophiloidea), Sphaeritidae (Hydrophiloidea), Synteliidae (Hydrophiloidea), Histeridae (Hydrophiloidea). In: Immature Insects. Volume 2. Kendall/Hunt Publishing Company, Dubuque, Iowa, 355–364.

Nikitsky NB (1976) On the morphology of a larva *Sphaerites glabratus* and the phylogeny of Histeroidea. Zoologicheskii Zhurnal 55: 531–537. [In Russian]

Pražák JS (2021) Evolution of histeroid beetles (Coleoptera: Histeroidea): phylogenetics, fossil record and life histories. Bachelor's thesis. Prague, Charles University, 40 pp.

Ruchin AB, Khapugin AA (2019) Red data book invertebrates in a protected area of European Russia. Acta Zoologica Academiae Scientiarum Hungaricae 65 (4): 349–370. <https://doi.org/10.17109/AZH.65.4.349.2019>

Russia Red List of Specially Protected Rare and endangered animals and plants (2008) Issue 2. Part 2. Invertebrate animals. Laboratory Red Data Book of the All-Russian Scientific Research Institute of Nature Conservation, Moscow, 512 pp.

Rose O, Megrat R (2017) *Sphaerites glabratus* (F., 1792) en France: nouvelles données, distribution en France et biologie (Coleoptera Sphaeritidae). L'Entomologiste 73 (2): 127–130. [In French]

Ryndevich SK, Lundyshev DS (2017) New data on *Sphaerites perforatus* and *S. nitidus* (Coleoptera: Sphaeritidae): additional diagnostic characters and records from China. Zoosystematica Rossica 26 (2): 315–324. <https://doi.org/10.31610/zsr/2017.26.2.315>

Temreshev II (2019) Hairy Fungus beetles (Coleoptera, Mycetophagidae) of the Almaty oblast (South-East Kazakhstan). Acta Biologica Sibirica 5(1): 63–70. <https://doi.org/10.14258/abs.v5.i1.5193>[In Russian]

Temreshev II (2022) Review of the genus *Dacne* Latr. (Coleoptera, Erotylidae) from Kazakhstan. Acta Biologica Sibirica 8: 367–380. <https://doi.org/10.5281/zenodo.7703397>

Temreshev II (2023) First record of *Triplax russica* (Linnaeus, 1758) (Coleoptera, Erotylidae) from Kazakhstan. Acta Biologica Sibirica 9: 147–155. <https://doi.org/10.5281/zenodo.7825636>

Temreshev II (2024a) Biphyllidae (Coleoptera, Cucujoidea) – a new beetle family to the fauna of Kazakhstan. Acta Biologica Sibirica 10: 1–7. <https://doi.org/10.5281/zenodo.10475177>

Temreshev II (2024b) Weevils (Coleoptera, Curculionoidea) of the State National Natural Park "Ulytau" and adjacent territories, Kazakhstan. Report 1. Acta Biologica Sibirica 10: 117–146. <https://doi.org/10.5281/zenodo.10874628>

Wu XW, Sun SC (2012) Artificial warming advances egg-laying and decreases larval size in the dung beetle *Aphodius erraticus* (Coleoptera: Scarabaeidae) in a Tibetan alpine meadow. Annales Zoologici Fennici 49(3): 174–180. <http://dx.doi.org/10.5735/086.049.0305>