

New Notodontidae species for Mongolian Fauna (Lepidoptera)

НОВЫЕ ВИДЫ ХОХЛАТОК (Lepidoptera: Notodontidae) в фауне Монголии

P.S. Morozov¹, R.V. Yakovlev^{2,3}, V.V. Doroshkin⁴, U. Beket⁵
 П.С. Морозов¹, Р.В. Яковлев^{2,3}, В.В. Дорошкин⁴, У. Бекет⁵

¹ Barvikhinskaya 4–2–416, Moscow 121596, Russia.

¹ ул. Барвихинская 4–2–416, Москва 121596. E-mail: dr_morozzz@mail.ru

² Altai State University, Lenina 61, Barnaul 656049, Russia.

² Алтайский государственный университет, пр. Ленина 61, г. Барнаул 656049, Россия. E-mail: yakovlev_asu@mail.ru

³ Brat'ev Kashirinykh str., 151–49, Chelyabinsk 454004, Russia. E-mail: ural@kros-china.ru

³ ул. Братьев Кашириных 151–49, Челябинск 454004, Россия.

⁴ Khovd University (Bayan-Ulegej branch), Bayan-Ulegej, Mongolia. E-mail: beketu@yahoo.com

KEY WORDS: fauna, Notodontidae, Mongolian Altai.

КЛЮЧЕВЫЕ СЛОВА: фауна, Notodontidae, Монгольский Алтай.

ABSTRACT. Four new species records of Lepidoptera (Notodontidae) are reported for the Mongolian fauna: *Phalera bucephala* (Linnaeus, 1758), *Pheosia tremula* (Clerk, 1759), *Notodonta ziczac* (Linnaeus, 1758) and *Clostera curtula* (Linnaeus, 1758).

РЕЗЮМЕ. Для фауны Монголии указываются четыре новых вида Lepidoptera (Notodontidae): *Phalera bucephala* (Linnaeus, 1758), *Pheosia tremula* (Clerk, 1759), *Notodonta ziczac* (Linnaeus, 1758) и *Clostera curtula* (Linnaeus, 1758).

Introduction

The fauna of Lepidoptera of Mongolia in general and of the Mongolian Altai in particular is still poorly studied. There are only relatively detailed records available for Papilionoidea [Tshikolovets et al., 2009; Yakovlev, 2012], Sphingidae [Derzhavets, 1977; Yakovlev et al., 2015], Zygaenidae [Efetov et al., 2012], Cossidae [Yakovlev, 2004, 2015], Eupitecia (Geometridae) [Mironov, Galsworthy, 2014], Pterophoridae [Ustjuzhanin, Kovtunovich, 2008]. There are no detailed records for other Lepidoptera taxa. The known Notodontidae from Mongolia are 19 species [Schintlmeister, 2008]: *Cerura przewalskii* Alphéraky, 1882, *C. feline* Butler, 1877, *Furcula furcula sangaica* (Moore, 1877), *F. aeruginosa mongolica* Schintlmeister, 1998, *F. bicuspis* (Borkhausen, 1790), *F. bifida* (Brahm, 1787), *Notodonta torva* (Hübner, 1803), *N. dromedarius sibirica* Schintlmeister et Fang, 2001, *N. dembowskii* Oberthür, 1879, *Nerice davidi* Oberthür, 1881, *Pheosia rimosa* Packard, 1864, *Leucodonta bicoloria* (Denis et Schiffermüller, 1775), *Ptilodon capucina* (Linnaeus, 1758), *Odontosia brinikhi* Dubatolov, 2006, *Pygaera timon* Hübner, 1803, *Pterotes eugenia* Staudinger, 1896, *Clo-*

stera pigra (Hufnagel, 1766), *C. albosigma curtuloides* (Erschoff, 1870) and *C. anastomosis* (Linnaeus, 1758). During the expeditions to Mongolia in 2011 and 2015 four species of Notodontidae new for the Mongolian fauna were found.

Material and methods

The adult Notodontidae were collected using the combined light lamp Phillips–250 W mounted above the fabric screen, battery light traps with the lamp Philips TL 8W/05 and chloroform as the killing agent. The collected material is deposited in the private collection of the first author.

Results

Phalera bucephala (Linnaeus, 1758)

Figs 1, 5, 8.

MATERIAL. 11 ♂♂, SW Mongolia, Hovd Aimak, 36 km S Altai, 1280 m, Bodonchin-Gol River, N45°46' E92°12', 16–17.05.2015, leg. R. Yakovlev; 4 ♂♂, SW Mongolia, Hovd Aimak, Bodonchijn-Gol River Valley, 36 km SW Altai Somon (45°46'N; 92°12'E), 1280 m, 18.05.2015, leg. V. Doroshkin; 1 ♂, W. Mongolia, Hovd Aimak, Erdene-Buren-Somon Shurag-Gol valley, 1400 m 13.06.2011, leg. R. Yakovlev

This species has the amphi-Palaearctic geographical range; the nominotypical subspecies is widespread in Northern and Western Europe. Three other subspecies are widespread in eastern Europe, Siberia, Asia Minor, the Caucasus, the Russian Far East, Korea and northeastern China (ssp. *infulgens* Graeser, 1888); North Africa and South Spain (ssp. *bucephalina* Staudinger, 1901); Iran and Azerbaijan (ssp. *persica* Daniel, 1938) [Schintlmeister, 2013]. This is the first record for Mongolia. The moths are readily attracted to lights placed in the riparian woodlands with predominance of *Salix* spp. (Salicaceae) along the Bodonchijn-Gol River. Willow is probably the host plant for the larvae of *Ph. bucephala* in

Mongolia. In the riparian woodland on the Bodonchijn-Gol River three willow species occur, *Salix ledebouriana*, *S. turanica* and *S. tenuijulis*. In addition to this locality, 1 male was attracted to light in the Kobdo (Khovd) Region in the Shurag-Gol River Valley. It appears that *Ph. bucephala* is found two biogeographical areas in Mongolia, the Valley of the Great Lakes and Dzhungarian Gobi. The subspecies assignment of the populations from Mongolia needs to be clarified.

Pheosia tremula (Clerk, 1759)

Figs 2, 6, 8.

MATERIAL. 1 ♂, NW Mongolia, Bayan-Ulegej Aimak, Mongolian Altai, Elt-Gol basin, Khorabajn-Salaa Valley (48°07'N; 89°11'E), 2150 m, 11.07.2015, leg. R. Yakovlev.

The species has the western-Palaeartic geographic range, widespread in Europe, the Caucasus, Turkey, Western Siberia and SE Kazakhstan [Schintlmeister, 2008]. This is the first record for this species for Mongolia. This locality of the Mongolian Altai is characterized by high humidity and in fact it belongs to the Chinese Altai, because the Elt-Gol River drains the Black Irtysh Basin, i.e. to the Chinese (West) macroslope of the Mongolian Altai [Yakovlev, Doroshkin, 2006; Gus'kova, Yakovlev, 2011]. The general western and southwestern orientation of the mountain slopes results much greater annual precipitation in comparison to western Mongolia. The mark contrast between the local landscape and that of western Mongolia and the bordering biomes are evident in this region. Despite the close proximity of the Central Asian desert and steppe region, the studied area undoubtedly belongs to the so-called "humid Altai". Its landscapes are similar to some areas of the Central Altai (Chuya Alps and others). The previously compiled checklist of Papilionoidea

species [Yakovlev, Doroshkin, 2006] indicates a high similarity with Central Asia and probably the Chinese Altai. Several Euro-Siberian species and Altai endemics in Mongolia occur only here, such as *Erebria kindermanni* Staudinger, 1881, *Oeneis tarpeja* (Pallas, 1771) (Satyridae), *Plebejus pylaon* (Fischer de Waldheim, 1832) (Lycaenidae), *Oirata poculidactyla* (K. Nupponen et T. Nupponen, 2001) (Pterophoridae) and others. The collected specimen belongs to the nominotypical subspecies.

Notodonta ziczac (Linnaeus, 1758)

Figs 3, 5, 8.

MATERIAL. 1 ♂, SW Mongolia, Hovd Aimak, 36 km S Altai, 1280 m, Bodonchin-Gol River, N45°46' E92°12', 16–17.05.2015, leg. R. Yakovlev; 1 ♂, SW Mongolia, Hovd aimak, 30 km S Altai somon, Bodonchijn-Gol River Valley (under stream), Elkhony-Ekhen-Tal place, 1200 m, 45°43'N; 92°05'E; 7.06.2011, leg. R. Yakovlev.

The localities of collecting are described above.

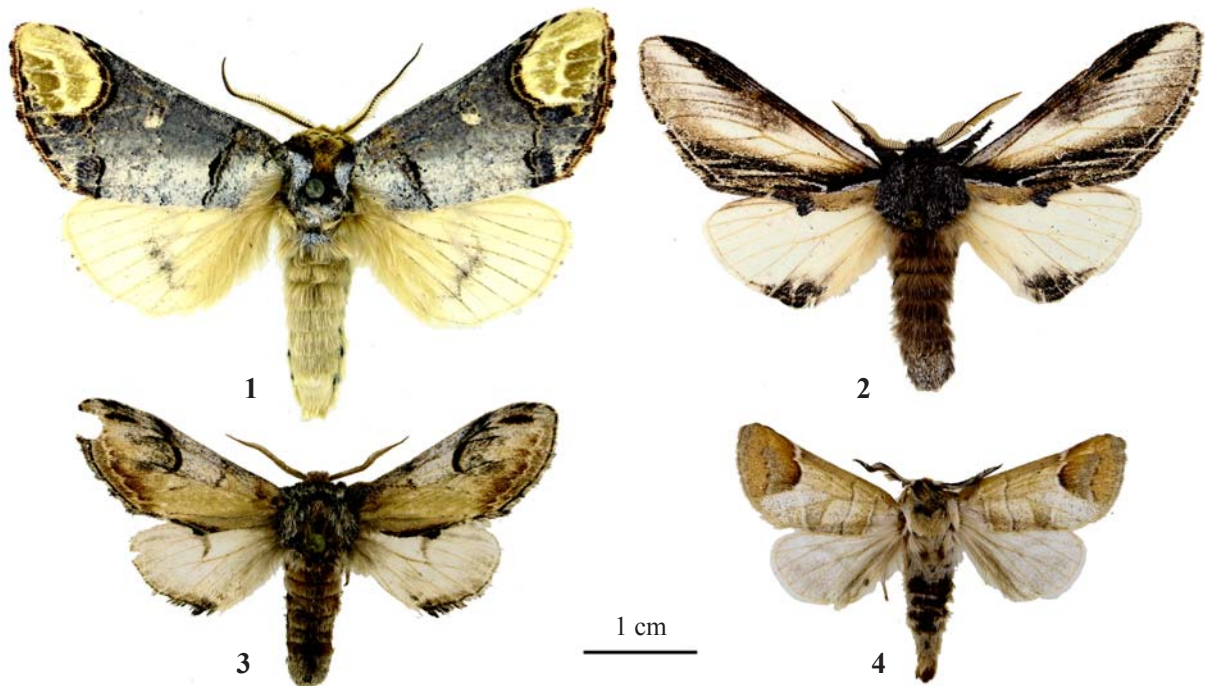
Clostera curtula (Linnaeus, 1758)

Figs 4, 7–8.

MATERIAL. 2 ♂♂, W Mongolia, Dzun-Dzhargalant-Khairkhan, Ar-Shatyn-Gol River, N47°44' E92°27', 26.06.2015, leg. R. Yakovlev

The above specimens were collected at one of the sites at Khar Us Nuur National Park, Jargalant Hairhan. The 850 000 hectare park is located 45 km to the southeast from the center of Khovd Aimak. Its area is. In the central part of the national park there are the lakes Khar Us Nuur, Khar Nuur and Durgun Nuur. The park includes the Chono Kharaih River and the eastern spurs of Jargalant Hairhan.

According to a new botanical-geographical zoning of Mongolia [Kamelin, 2010] the Jargalant Hairhan Ridge is



Figs 1–4. Habitus: 1 — *Phalera bucephala*; 2 — *Pheosia tremula*; 3 — *Notodonta ziczac*; 4 — *Clostera curtula*; all specimens from Mongolia.

Рис. 1–4. Внешний вид: 1 — *Phalera bucephala*; 2 — *Pheosia tremula*; 3 — *Notodonta ziczac*; 4 — *Clostera curtula*; экземпляры из Монголии.



Figs 5–7. Biotopes of Notodontidae in Mongolia: 5 — *Phalera bucephala* and *Notodonta ziczac*; 6 — *Pheosia tremula*; 7 — *Clostera curtula*. Photos by P. Kosachev

Рис. 5–7. Биотопы холаток в Монголии: 5 — *Phalera bucephala* и *Notodonta ziczac*; 6 — *Pheosia tremula*; 7 — *Clostera curtula*. Фото П.А. Косачёва.

located in the boreal region, steppe subregion of the Tuva-Mongolian Province, Khovd District. The eastern macroslope of the ridge borders the Lacustrine-Basin District and in the South the Shargyn Gobi exclav of the Gobi Subregion. The predominant type of the ridge vegetation is steppe with dry and desert areas reaching 3000 m.a.s.l. The role of desert plant species in this steppe is not great, in contrast to the Shargyn Gobi exclav steppe where they predominate. In the foothills and middle mountains of Jargalant Hairhan, the desert steppe is

widespread. They occupy plains and slopes of the mountains at the altitudes of 1700 (2100)–2250 (2300) m.a.s.l. The desert steppe communities include typical plant communities of: *Stipa glareosa*, *Agropyron cristatum*, *Agropyron nevskii* and Pebble-stipa desert steppes. The dominant species includes *S. glareosa*, mixed with other steppe grasses in small amounts (*Stipa krylovii*, *Agropyron cristatum*). These communities include *Plantago minuta*, *Panzeria lanata*, *Heteropappus hispidus*, *Convolvulus ammannii* and also the dwarf shrub *Ptylotri-*

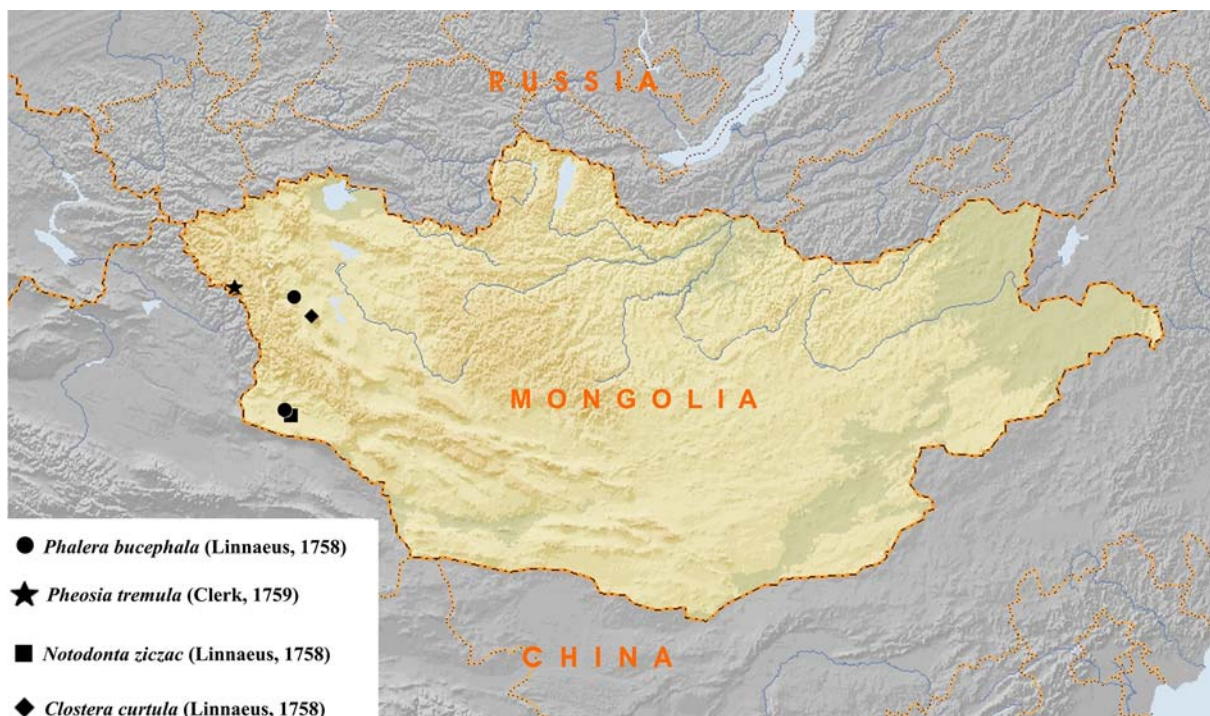


Fig. 8. Map of collecting localities.
Рис. 8. Карта точек сборов.

chum canescens. The steppe of *Agropyron nevskii*, species endemic to Mongolia, is widespread [Karamysheva et al., 1984]. The quack-grass steppe of *A. nevskii* refer to the petrophyte communities, so the petrophyllous species of grasses and dwarf shrubs (*Saussurea pricei*, *Ptylotrichum canescens*, *Allium eduardii*, *Artemisia rutifolia*, *Oxytropis tragacanthoides*, *Dracocephalum fruticosum*, *Stellaria dichotoma*, *Thalictrum foetidum*, *Goniolimon speciosum*) are important components. In addition to the dominant (*Agropyron nevskii*) this group of grasses includes in abundance the dry steppe species (*Agropyron cristatum*, *Cleistogenes squarrosa*, *Stipa krylovii*) and the desert steppe species (*Stipa glareosa*). The shrubs are characteristic (*Caragana bungei*, *N. pygmaea*, *Amygdalus pedunculata*). On the steep slopes of the ridge the petrophyte vegetation is developed, on the ravine bottoms and in valleys the pebble vegetation can be found, represented by such plants as *Astragalus mongolicus*, *Lagopsis marrubiastrum*, *L. darwiniana*, *Scrophularia incisa*, *Craniospermum subvillosum*, *Silenerepens*, and also *Dracocephalum origanoides*, *Bupleurum mongolicum*, *Scutellaria grandiflora*, *Stenocoelium athamantoides*, *Astragalus changaicus*, *Oxytropis heterophylla*, *O. tragacanthoides*, *Trifolium eximium*, *Minuartia verna*, *Plantago komarovii*, *Androsace fedtschenkoi*, *Valeriana petrophila*, *Potentilla exuta*, *Potentilla aphanes*, *Dichodonce rastoides*, *Veronica ciliata*, *Leiospora exscapa*, *Clausia aprica* [Pyak, 2006]. Poplar forests of *Populus laurifolia* and of shrubs *Lonicera microphylla* grow on the pebble along the river valleys; *Salix ledebouriana* and *Rhodiola krylovii* occur in narrow gorges. Such weeds as *Urtica cannabina* and the species of the genus *Chenopodium*, *Tribulus terrestris* are occasionally found there. The highland ridge belt is occupied by the kobresia and kobresia-sedge alpine heathlands and the cryophilic meadow-steppe, where *Papaver pseudotenellum*, *Pulsatilla bungeana*, *Pedicularis achilleifolia* are found.

Discussion

The number of the notodontid species recorded from the Mongolia has been increased by > 20%, to 23 species. All the new species records were from south-eastern areas of the county. However, Mongolia still remains poorly studied in regard to biological diversity for many insect groups. No doubt additional new records of Lepidoptera species may be expected in the mountains of bordering Dzungaria and in the Chinese and Russian border areas of the Mongolian Altai.

ACKNOWLEDGMENTS. The authors are grateful to A.I. Shmakov for his assistance in organizing the expedition, to P.A. Kosachev (Barnaul) for his help during the trip,

clarification on the willow species affiliation and a detailed description of the vegetation in the mountains Jargalant Hairhan, to A.K. Ustjuzhanina (Tomsk) for the translation of the article into English. The English text was corrected by Prof. Boris Kondratieff (Fort Collins, Colorado, USA).

References

- Derzhavets Y.A. 1977. Hawkmoths (Lepidoptera, Sphingidae) of Mongolia // Nasekomye Mongolii. Vol.5. P.642–648 [in Russian].
- Gus'kova E.V., Yakovlev R.V. 2011. Kara-Irtysh biogeographically region of Altai. Opinion of entomologist (provisory results) // Amurian zoological journal. Vol.3. No.2. P.196–198 [in Russian].
- Efetov K.A., Gorbunov O.G., Tarmann G.M. 2012. Zygaenidae of Mongolia (Lepidoptera) // Nachrichten des Entomologischen Vereins Apollo. N.F. Bd.32. S.159–164.
- Kamelin R.V. 2010. Mongolia on the map of the phytogeographical division of Palaearctics // Turczaninowia. Vol.13. No.3. P.5–11 [in Russian].
- Karamysheva Z.V., Buyan-Orshikh Kh., Beket U., Sumerina I.Yu. 1984. Vegetation of Dzhangalan-Ula // Izvestia AN MNR. Vol.3. P.44–56 [in Mongolian].
- Mironov V., Galsworthy A. 2014. A survey of *Eupithecia* Curtis, 1825 (Lepidoptera, Geometridae, Larentiinae) in Mongolia with descriptions of two new species // Zootaxa. Vol.3774. No.2. P.101–130.
- Pyak A.I. 2006. About species of Genus *Lagopsis* Bunge on the Altai // Sistematische zametki po materialam gerbariya im. P.N. Krylova pri Tomskom Gosudarstvennom Universitete. Vol.96. P.1–9 [in Russian].
- Schintlmeister A. 2008. Palaearctic Macrolepidoptera. Vol. 1. Notodontidae. Stenstrup: Apollo-Book. 482 pp.
- Schintlmeister A. 2013. World Catalogue of Insects. Vol. 11. Notodontidae & Oenosandridae (Lepidoptera). BRILL. 608 pp.
- Tshikolovets V., Yakovlev R., Kosterin O. 2009. The Butterflies of Mongolia. Kyiv-Pardubice: Tshikolovets-Press. 320 pp.
- Ustjuzhanin P.Ya., Kovtunovich V.N. 2008. Fauna of Plume Moths (Lepidoptera, Pterophoridae) of Mongolia // Altai zoological journal. Vol.2. P.34–46.
- Yakovlev R.V. 2004. Carpenter-moths (Lepidoptera, Cossidae) of Mongolia // Euroasian Entomological Journal. Vol.3. No.3. P.217–224.
- Yakovlev R.V. 2012. Checklist of Butterflies (Papilionoidea) of the Mongolian Altai Mountains, including descriptions of new taxa // Nota Lepidopterologica. Vol.35. No.1. P.51–96.
- Yakovlev R.V. 2015. The Cossidae of Mongolia // Check List. Vol.11. No.5. Article 1736.
- Yakovlev R.V., Doroshkin V.V. 2006. On the fauna of butterflies (Lepidoptera: Rhopalocera) of upper stream of Kara-Irtysh river (W. Mongolia) // Eversmannia. Vol.6. P.13–26 [in Russian].
- Yakovlev R.V., Guskova E.V., Doroshkin V.V., Titov S.V. 2015. Sphingidae of the Mongolian Altai (Lepidoptera: Sphingidae) // SHILAP Revista de lepidopterologia. Vol.43. No.171. P.467–478.