

# New records of geometrid moths of the subfamily Larentinae (Lepidoptera: Geometridae) from the Amurskaya Oblast, Russian Far East

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An annotated list of 12 species of geometrid moths of the subfamily Larentiinae (Lepidoptera: Geometridae) found for the first time on the territory of Amurskaya Oblast, the Russian Far East, is given. There are: *Brabira artemidora* (Oberthür, 1884), *Acasis bellaria* (Leech, 1891), *Trichopteryx polycommata* ([Denis et Schiffermüller], 1775), *Idiotephria debilitata* (Leech, 1891), *Idiotephria evanescens* (Staudinger, 1897), *Thera variata* ([Denis & Schiffermüller], 1775), *Ecliptopera umbrosaria* (Motschulsky, 1861), *Triphosa dubitata* (Linnaeus, 1758), *Triphosa sericata* (Butler, 1879), *Operophtera relegata* Prout, 1908, *Hydrelia parvulata* (Staudinger, 1897), and *Venusia semistrigata* (Christoph, 1881). From them, for 9 East Asian species these finds strongly expand to north-west their previously known areas.

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## Keywords

Palaeartic, biodiversity, border of the Euro-Siberian and East Asian zoogeographic subregions mixed broadleaved – Korean pine forests, Geometridae, Larentinae.

## Introduction

This publication continues a series of articles devoted to the fauna of the geometrid moths in the Amurskaya Oblast. Earlier, results of multi-year collections were published for the Blagoveshchensky district (Beljaev, Kuzmin, 2015), as well as for the southern territories of the region (Kuzmin, Beljaev, 2017, 2021). As a result of these studies, 75 species of these moths new to this territory were identified, and by now the total number of species of the family, taking into account the data in the Catalog of Lepidoptera of Russia (Beljaev, Mironov, 2019), has reached 400 species. This publication adds 12 more species new for the Oblast from the subfamily Larentiinae.

## Material and methods

The collection of moths was carried out in 2018–2021 at the following points in the southeast of the Amurskaya Oblast (Fig. 1):

1. «Natal'ino». Blagoveshchenskii District, 6 km north of the village Natal'ino. Forest of *Pinus sylvestris* with isolated trees of *Populus tremula* and with *Euonymus maackii* and *Rhododendron dauricum* in the undergrowth, in depressions with *Alnus hirsuta* and with *Salix* sp. 51°01'52.9"N 127°50'12.0"E.
2. «Blagoveshchensk». Blagoveshchensk, north-eastern suburb of the city. *dahurica* with *Quercus mongolica* and *Pinus sylvestris*, with undergrowth of *Lespedeza bicolor*. 50°18'15.1"N 127°33'44.8"E.
3. «Bureja». Burejskii District, left bank of the Bureja river, floodplain forest with *Alnus hirsuta*, *Prunus padus*, *Prunus maackii* and *Maackia amurensis*, with thicket *и* *Sorbaria sorbifolia* along the edges. 49°46'34.6"N 129°56'01.4"E
4. «Domikan». Arkharinskii District, the valley of the Krivoi Domikan river. The edge of the *Betula dahurica* forest with the presence of *Betula platyphylla* and individual *Pinus koraiensis* trees, with undergrowth of *Lespedeza bicolor* and forbs, in depressions with scattered tufts of *Carex* sp. 49°33'00.7"N 130°05'43.5"E.
5. «Gribovka». Arkharinskiy District, 5 km northeast of the Gribovka village. A northern exposure hillside covered with *Quercus mongolica* forest with *Larix gmelinii* and undergrowth of *Sorbaria sorbifolia*, *Acer tegmentosum*. 49°31'53.7" N, 130°17'08" E.
6. «Rachi». Amur Region, Arkharinskiy District, 4.5 km north-west of the Rachi railway station. *Quercus mongolica* forest with *Betula platyphylla*, with undergrowth of *Juglans mandshurica*, *Corylus sieboldiana*, *Eleutherococcus senticosus*. 49°17'19" N, 130°24'42" E.
7. «Tarmanchukan»: Arkharinskiy District, 7 km north of Tarmanchukan railway station. Mixed forest near the hill's top with *Tilia amurensis*, *Acer pictum* and *Pinus koraiensis*, with *Eleutherococcus senticosus* in the undergrowth, and with *Alnus hirsuta* at the forest edge. 49°14'14"N, 130°38'54" E.
8. «Karapcha»: Arkharinskiy District, Khingan nature reserve, Karapcha cordon, 2 km west of Kundur railway station, 49°06'45"N, 130°43'48" E. Valley forest with *Tilia amurensis*, *Ulmus japonica* and *Pinus koraiensis*.

The moths collected at night by attracting on the light 125 W mercury lamp, powered by a portable electric generator. The specimens are kept in the private collection of the first author. Latin names, the order of genera and the number of species by region are given in accordance with the Catalog of Lepidoptera of Russia (Beljaev, Mironov, 2019), the order of species in genera and distribution, added by Amurskaya Oblast, – according to the Annotated catalogue of the insects of Russian Far East (Beljaev, 2016).



**Figure 1.** Map of the of collection localities. See the text for designations.

Typification of ranges was carried out on the basis of the zonal-sectoral principles adopted to Far Eastern geometroid moths by Beljaev (2011).

## Results

### List of species

1. *Brabira artemidora* (Oberthür, 1884).

**Material examined.** 1♂ Rachi, 11.07.2020; 2♂ Rachi, 01.07.2021.

**Distribution.** Russia (SE Amurskaya Oblast, S Khabarovskiy Krai, Primorskiy Krai, Sakhalin Island, S Kuril Islands), Japan, Korea, Myanmar, Nepal, India. East Asian subboreal-subtropical forest species.

## **2. *Acasis bellaria* (Leech, 1891).**

**Material examined.** 3♂ Gribovka, 15.05.2019.

**Distribution.** Russia (SE Amurskaya Oblast, S Khabarovskiy Krai, Primorskiy Krai), Japan, Korea. East Asian subboreal forest species.

## **3. *Trichopteryx polycommata* ([Denis et Schiffermüller], 1775).**

**Material examined.** 1♂ Tarmanchukan, 10.04.2020;

**Distribution.** Russia (SE Amurskaya Oblast, Kamchatka, S Khabarovskiy Krai, Primorskiy Krai, Sakhalin Island, S Kuril Islands; Baikalia, Transbaikalia, Altai, Sayans, W Siberia, Urals, European part of Russia, N Caucasus), Japan (Hokkaido), Korea, China. Trans-Eurasian temperate forest species.

**Notes.** The examined specimen belongs to morphologically well-defined subspecies *Trichopteryx polycommata anna* Inoue, 1957, distributed in south of Russian Far East, Japan (Hokkaido only), Korea and N China (Gansu).

## **4. *Idiotephria evanescens* (Staudinger, 1897).**

**Material examined.** 1♂ Gribovka, 15.05.2019; 1♂ Rachi, 17.04.2020; 4♂ Rachi, 09.05.2020; 8♂ Domikan, 22.04.2020; 2♂ Domikan, 28.04.2020; 3♂, 4♀ Rachi, 07.05.2021.

**Distribution.** Russia (SE Amurskaya Oblast, S Khabarovskiy Krai, Primorskiy Krai), Japan, Korea. East Asian subboreal forest species.

## **5. *Idiotephria debilitata* (Leech, 1891).**

**Material examined.** 2♂ Gribovka, 15.05.2019; 3♂, 4♀ Rachi, 17.04.2020; 3♂ Rachi, 17.04.2020; 1♂ Domikan, 22.04.2021; 1♂, 2♀ Domikan, 28.04.2021;

**Distribution.** Russia (SE Amurskaya Oblast, S Khabarovskiy Krai, Primorskiy Krai), Japan, Korea, China. East Asian subboreal forest species.

## **6. *Thera variata* ([Denis et Schiffermüller], 1775).**

**Material examined.** 2♂ Tarmanchukan, 12.06.2018; 1♂ Karapcha, 09-10.06.2019.

**Distribution.** (SE Amurskaya Oblast, ?Kamchatka, S Khabarovskiy Krai, Primorskiy Krai, Sakhalin Island, S Kuril Islands; Transbaikalia, Cisbaikalia, Altai, Sayans, W Siberia, European part of Russia, N Caucasus), Japan, Korea, China, Kazakhstan, Kyrgyzstan, Tajikistan, ?Transcaucasia, Turkey, Cyprus, Lebanon, Europe. Trans-Eurasian temperate forest species.

## **7. *Ecliptopera umbrosaria* (Motschulsky, 1861).**

**Material examined.** 2♂ Rachi, 14.06.2021; 1♂ Tarmanchukan, 12.08.2021.

**Distribution.** Russia (SE Amurskaya Oblast, S Khabarovskiy Krai, Primorskiy Krai, S Sakhalin Island, S Kuril Islands), Japan, Korea, China. East Asian subboreal-subtropical forest species.

**8. *Triphosa dubitata* (Linnaeus, 1758).**

**Material examined.** 1♂ Domikan, 07.05.2021.

**Distribution.** (SE Amurskaya Oblast, S Khabarovskiy Krai, Primorskiy Krai, Urals, European part of Russia, N Caucasus), Japan, Korea, China, Transcaucasia, Turkey, Europe. Amphi-Eurasian subboreal-subtropical forest species.

**9. *Triphosa sericata* (Butler, 1879).**

**Material examined.** 1♂ Natal`ino, 21.09.2018.

**Distribution.** Russia (SE Amurskaya Oblast, S Khabarovskiy Krai, Primorskiy Krai), Japan, Korea; China. East Asian subboreal-subtropical forest species.

**10. *Operophtera relegata* Prout, 1908.**

**Material examined.** 1♂ Blagoveshchensk, 03.10.2020; 1♂ Blagoveshchensk, 30.09.2021.

**Distribution.** Russia (SE Amurskaya Oblast, S Khabarovskiy Krai, Primorskiy Krai, S Sakhalin Island), Japan, Korea, China. East Asian subboreal forest species.

**11. *Hydrelia parvulata* (Staudinger, 1897).**

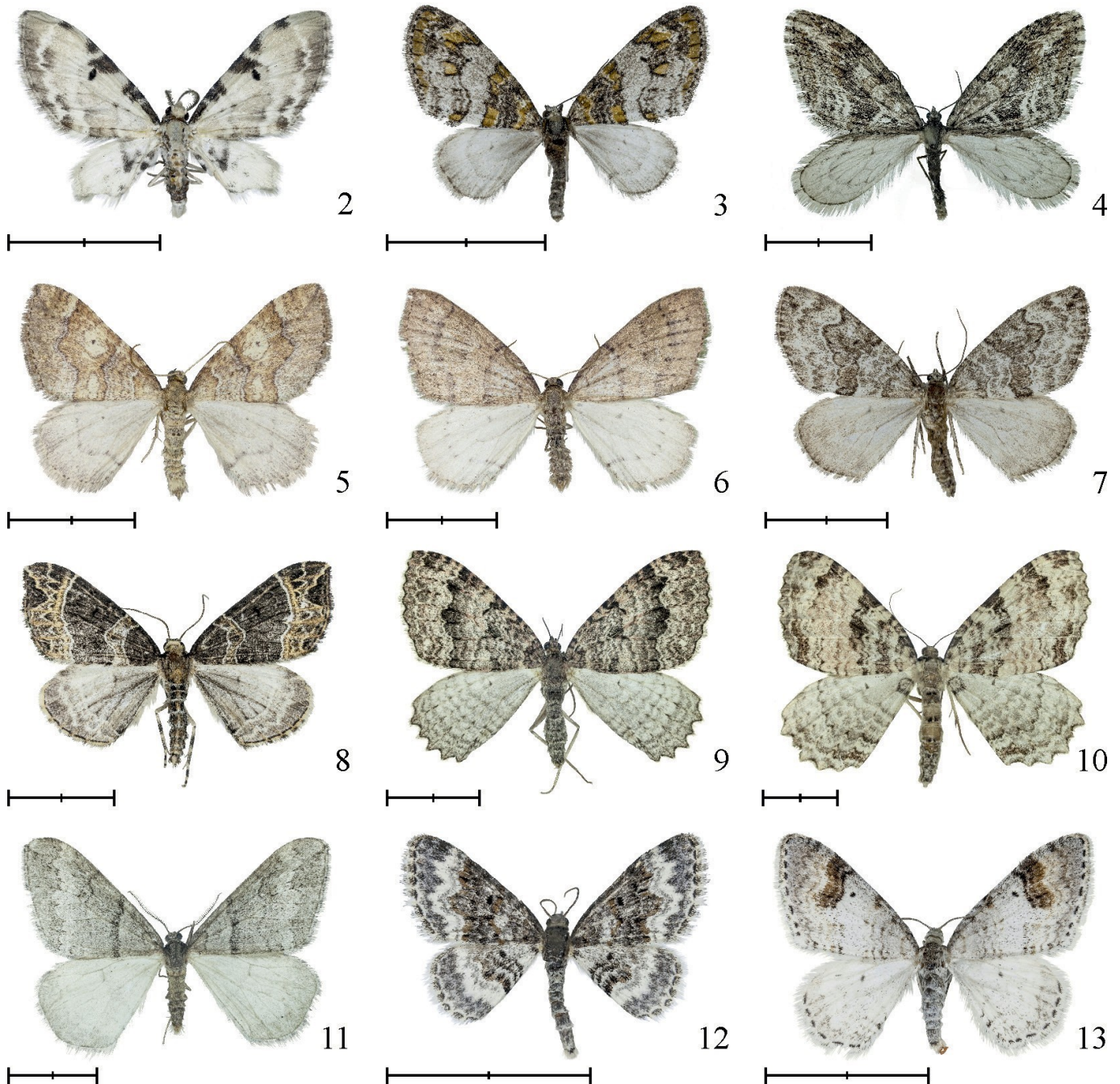
**Material examined.** 2♂ Rachi, 01.07.2021.

**Distribution.** Russia (SE Amurskaya Oblast, S Khabarovskiy Krai, Primorskiy Krai), Korea, China. East Asian subboreal forest species.

**12. *Venusia semistrigata* (Christoph, 1881).**

**Material examined.** 5♂ Domikan, 28.04.2020; 4♂, 2♀ Domikan, 07.05.2021; 1♂ Domikan, 19.05.2021; 1♀ Bureja, 19.05.2021.

**Distribution.** Russia (SE Amurskaya Oblast, S Khabarovskiy Krai, Primorskiy Krai), Japan, Korea. East Asian subboreal forest species.



**Figure 2. Figures 2-13.** 2 - *Brabira artemidora*; 3 - *Acais bellaria*; 4 - *Trichopteryx polycommata*; 5 - *Idiotephria evanescens*; 6 - *Idiotephria debilitata*; 7 - *Thera variata*; 8 - *Ecliptopera umbrosaria*; 9 - *Triphosa dubitata*; 10 - *Triphosa sericata*; 11 - *Operophtera relegata*; 12 - *Hydrelia parvulata*; 13 - *Venusia semistrigata*. Scale 10 mm.

## Discussion

Of the 12 species of Larentiinae given here for the first time for the Amurskaya Oblast, 9 have the East Asian type of ranges, 2 are trans-Eurasian and 1 is amphi-Eurasian. This ratio is not surprising, since the main collections of materials were carried out in the poorly explored southeastern part of the Amurskaya Oblast, at the northern border of the growth of the nemoral East Asian formation of mixed broadleaved - Korean pine (*Pinus koraiensis*) forests. For East Asian species, newly discovered habitats are located at a distance of 200-400 km northwest from the previously known ones in the Khabarovskii Krai and the Jewish Autonomous Oblast, which significantly expands the previously known their ranges. It is notable that most of the finds, with

the exception of *T. sericata* and *O. relegata*, do not go beyond the zone of broadleaved – Korean pine forests, indicating a close connection of these species with the distribution area of this plant formation. Findings of species with trans-Eurasian ranges significantly reduce the gap in the known ranges of these moths.

Considering the species indicated in this article, the number of geometrid species recorded in the Amurskaya Oblast reaches 412 species. In the neighboring regions, currently known species of these moths are 169 - in Yakutia, 372 - in Zabaikalskii Krai, 488 - in Khabarovskii Krai, and 532 - in Primorskii Krai. So, the species richness of geometrids in Amurskaya Oblast is intermediate between the Siberian and Far Eastern territories. In future, new species of geometrid moths for Amurskaya Oblast can be expected mainly in the southeast and in the extreme west of the territory. Also, the north-east territories, especially the highlands, where a few high boreal and subarctic species can be expected, remain unexplored yet. However, these additions hardly can increase radically the total number of geometrid species in Amurskaya Oblast.

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