NEW RECORDS OF GEOPHILOMORPH CENTIPEDES (CHILOPODA: GEOPHILOMORPHA) FROM NATURAL AND ANTHROPOGENIC HABITATS OF SIBERIA

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Summary. New records allow for the distributions of seven geophilomorph centipede species from natural and anthropogenic localities of Siberia to be refined. Genus Tygarrup Chamberlin, 1912 and T. javanicus Attems, 1929 are reported from Russia for the first time. Family Mecistocephalidae is formally new to the fauna of Siberia. Geophilus proximus C.L. Koch, 1847 is new for Kemerovskaya oblast and Republic of Khakassia, Arctogeophilus macrocephalus Folkmanová et Dobroruka, 1960 and Escaryus japonicus Attems, 1927 are recorded from Republic of Khakassia for the first time, E. koreanus Takakuwa, 1937 is new for Novosibirskaya oblast, Republic of Khakassia and Irkutskaya oblast, and Strigamia pusilla (Sseliwanoff, 1884) is new for Republic of Sakha (Yakutia).

Key words: geophilomorph centipedes, Mecistocephalidae, Geophilidae, Linotaeniidae, Schendylidae, fauna, new records, Russia, Asia.

INTRODUCTION

The fauna of geophilomorph centipedes of Siberia encompasses at least 14 species from five genera and three families. Every recent paper (Nefediev et al., 2017a, b, c; 2018; Dyachkov, 2017) has supplemented and updated our knowledge on the range limits of Geophilomorpha species from southwestern Siberia. In general, the fauna of geophilomorph centipedes

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Резюме. Новые находки семи видов многоножек-землянок из естественных и антропогенных местообитаний Сибири позволяют уточнить их ареалы. Род Tygarrup Chamberlin, 1912 и вид T. javanicus Attems, 1929 впервые отмечены в России. Семейство Mecistocephalidae оказалось формально новым для фауны губоногих многоножек Сибири, Geophilus proximus C.L. Koch, 1847 впервые указан для Кемеровской области и Республики Хакасия; Arctogeophilus macrocephalus Folkmanová et Dobroruka, 1960 и Escaryus japonicus Attems, 1927 впервые приводятся для Республики Хакасия; E. koreanus Takakuwa, 1937 впервые указан для Новосибирской области, Республики Хакасия и Иркутской области, а Strigamia pusilla (Sseliwanoff, 1884) – для Республики Саха (Якутия).

Интервью. Фауна губоногих многоножек Сибири включает не менее 14 видов из пяти родов и трех семейств. Каждый последний публикация (Nefediev et al., 2017a, b, c; 2018; Dyachkov, 2017) дополняет и обновляет наши сведения о границах ареалов видов Geophilomorpha из северо-западной части Сибири. В общем, фауна губоногих многоножек
of Siberia is still being poorly studied. This paper continues our efforts to investigate the Siberian geophilomorphs mainly collected from natural and partly from urban localities.

The material treated herein has been deposited in the collection of the Altai State University, Barnaul, Russia.

NEW RECORDS

Order Geophilomorpha Pocock, 1895

Family Mecistoccephalidae Bollman, 1893

*Tygarrup javanicus* Attems, 1929

**MATERIAL.** Russia: *Altaiiskii krai*: Barnaul, Yuzhnyi, South Siberian Botanical Garden, hothouse, 18.V 2017, 1 ♀, leg. P.S. Nefediev.

**DISTRIBUTION.** Being East Asian in origin, this species inhabits from the Seychelles through southeast Asia to the Hawaiian Islands, also introduced to anthropogenic habitats, i.e. hothouses and urban sites, in European countries, such as Great Britain, Austria, Germany, Slovakia and the Czech Republic (Tuš et al., 2018).

**REMARKS.** Both the genus *Tygarrup* Chamberlin, 1912 and the species *T. javanicus* are formally new to Russia, as well as the family Mecistoccephalidae is recorded in Siberia for the first time. Now *T. javanicus* has been found introduced to a hothouse of the South Siberian Botanical Garden.

Family Geophilidae Cook, 1896

*Arctogeophilus macrocephalus* Folkmanová et Dobroruka, 1960

**MATERIAL.** Russia: *Republic of Khakassia*: Altaiiskii District, “Ochurskii Bor”, 53°09’33.5”N, 91°36’35.9”E, *Pinus sylvestris* forest, 30.IX 2008, 1 ♂, leg. D.I. Pogrebnyak; Altaiiskii krai: Krasnoschiokovskii District, near Tigirek, Tigirek State Nature Reserve, Khan-khara Site, Dragunsksii Brook, steppe on SW slope, *Rosa spinosissima*, 17.VIII 2016, 1 ♀; Charyshskii District, upper reaches of Belaya River, S macroslope, steppe on slope with bushes and sparse *Larix sibirica*, 20.VI 2017, 1 juv.; Charyshskii District, near Komendantka village, Altai State University Field Station “Goluboi Utios”, *Betula pendula* and *Populus tremula* forest on N slope, ca 520 m a.s.l., 20.VI 2017, 2 ♂, 1 ♀, all leg. P.S. Nefediev.

**DISTRIBUTION.** Originally described from the Tatar Republic in European Russia, this species is very widespread from European Russia through Siberia to the Russian Far East. In Siberia, *A. macrocephalus* has previously been recorded from Kemerovskaya oblast, Tomskaya oblast, Republic of Altai, Altaiiskii krai, and Krasnoyarskii krai (Nefediev et al., 2017c).

**REMARKS.** The above record of this species is new to Republic of Khakassia.

*Geophilus proximus* C.L. Koch, 1847

**MATERIAL.** Russia: *Republic of Khakassia*: Abakan, “Orbita” Gardening Partnership, bank of pond near Abakan–Solnogorsk road, in soil, under pebble, 17.V 2008, 1 ♀, leg. S.V. Dragan; Altaiiskii krai: Slavgorodskii District, Yarovoye, 20–27.VII 2016, 1 juv., leg. D.A. Efimov; Kemerovskaya oblast: Kemerovskii District, Lyapki village, 55°11’N, 86°23’E, *Betula pendula* and *Pinus sylvestris* forest, 12.VII 2017, 1 ♀, leg. D.A. Efimov.
DISTRIBUTION. The distribution of this species covers the northern part of the Palaeartic from northeastern Europe to Japan. In Siberia, *G. proximus* has previously been known from Tyumenskaya, Omskaya, Novosibirskaya and Tomskaya oblasts, as well as from Altaiiskii krai (Nefediev et al., 2017b).

REMARKS. This species has hitherto been recorded neither from Kemerovskaya oblast nor from Republic of Khakassia, both SW Siberia.

**Family Linotaeniidae Cook, 1904**

**Strigamia pusilla** (Sseliwanoff, 1884)

**MATERIAL.** **Russia: Republic of Sakha (Yakutia):** Lenskii Municipal District, ca 80 km N of Lensk, 61°37′44.30″N, 114°50′60.02″E, *Pinus sibirica*, *Pinus sylvestris* and *Larix sibirica* forest with small-leaved trees, *Vaccinium myrtillus*, *Vaccinium vitisidaea* and *Juniperus*, under moss, 22. VIII 2016, 1 ♀, leg. E.M. Kandrov, M.V. Krivoshapkin; **Altaiiskii krai:** Charyshskii District, 5 km S of Ust-Kumir, valley of Kumir River, 50°58′59.95″N, 84°17′41.5″E, forest with tall grass vegetation, ca 805 m a.s.l., sifting leaf litter, 1. VIII 2018, 1 ♂, leg. V.I. Gusarov, M.F. Maurstad, V. Løveng.

DISTRIBUTION. This species is highly widespread from the Sudetes, Carpathians and the Caucasus, through the Urals, to SW and central Siberia and N Mongolia (Nefediev et al., 2017a).

REMARKS. The above record of this species is new to Republic of Sakha (Yakutia).

**Family Schendylidae Cook, 1896**

**Escaryus japonicus** Attems, 1927

**MATERIAL.** **Russia: Republic of Khakassia:** Ust-Abakanskii District, valley of Uibat River, 53°82′57.65″N, 90°05′26.47″E, mixed forest, in litter, 18 VII 2012, 2 ♀, leg. A.P. Pavlov; Ust-Abakanskii District, valley of Uibat River, 53°82′57.65″N, 90°05′26.47″E, mixed forest, in litter, 18. VII 2018, 1 ♂, 4 ♀, leg. E.V. Gribanova; **Kemerovskaya oblast:** Krapivinskii District, 8 km SSW of Saltymakovo village, Kemerovo State University Field Station “Azhendarovo”, floodplain of Tom River, 50°38′59.17″N, 87°01′23.99″E, 7. IX 2017, 1 ♂, leg. D.A. Efimov; **Republic of Altai:** Ulaganskii District, 4 km NE of Aktash village, valley of Yarlyamy River, 50°33′17″N, 87°15′09″E, *Larix sibirica* and *Picea obovata* forest with *Alnus*, *Vaccinium vitis-idaea* and green mosses, ca 1615 m a.s.l., 24 VII 2018, 3 ♂, 1 ♀; Kosh-Agachskii District, 5.5 km NNE of Kurai village, S macroslope of Kuraiskii Mt. Range, valley of Kuraika River, left river bank, 50°28′25″N, 87°54′56″E, *Larix sibirica* and *Picea obovata* forest with *Pinus sibirica*, *Caragana*, small grass vegetation and green mosses, ca 1790 m a.s.l., in moss, under logs, 25 VII 2018, 1 juv.; Kosh-Agachskii District, 21 air-km NW of Belyashi (Dzhazar) village, S macroslope of Yuzhno-Chuiskii Mt. Range, ford on Karasu River, 49°35′54″N, 87°20′39″E, *Pinus sibirica* and *Picea obovata* forest with *Betula pendula*, *Alnus*, *Caragana*, *Ribes nigrum*, small grass vegetation and green mosses, ca 1605 m a.s.l., 19 VII 2018, 1 ♂, all leg. P.S. Nefediev; Kosh-Agachskii District, 20 km NE of Kokorya, Chikhachiova Mt. Range, Talduair massif, right bank of Salyugem River, 50°01′52″N, 89°14′55″E, floodplain *Larix sibirica* forest, under stones, 2225 m a.s.l., 26 VII 2018, 1 ♂, leg. V. Løveng; Ulaganskii District, 3 air-km NE of Aktash village, valley of Yarlyamy River, 50°20′02″N, 87°38′94″E, forest with *Picea obovata*, *Larix sibirica*, *Pinus sibirica*, *Caragana arborescens*, *Lonicera,*
Ribes, moss, 1575 m a.s.l., sifting leaf litter and moss over 50 m, 24.07.2018, 1 ♂, leg. V.I. Gusarov, M.F. Maurstad, V. Laveng; Ust-Kanskii District, 2 km SE of Ust-Kan, valley of Kutergen River, 50.90546°N, 84.73464°E, Picea obovata forest with Spiraea and green mosses on left river bank, ca 1180 m a.s.l., in and under moss, covering big stones, 19.VIII 2018, 6 ♂, 3 ♀, 1 subadult ♂, 3 juv.; Ust-Kanskii District, 1.7 km SE of Ust-Kan, 50.91142°N, 84.73499°E, Betula pendula and Picea obovata forest with green mosses and small grass vegetation on N slope, ca 1180 m a.s.l., in moss and rotten logs, 19.VIII 2018, 1 ♂, all leg. P.S. Nefediev.

DISTRIBUTION. This species widely occurs from Japan, northern China and the Russian Far East through Siberia and eastern Kazakhstan to the Ural and Volga region (Nefediev et al., 2017a; Dyachkov & Tuf, 2018).

REMARKS. This species is reported from Republic of Khakassia for the first time.

**Escaryus koreanus Takakuwa, 1937**

MATERIAL. **Russia: Novosibirskaya oblast**: Toguchinskii District, Kotorovo village, Populus tremula forest, soil samples, 18.VII 1988, 2 juv.; Toguchinskii District, Kotorovo village, glade in Populus tremula forest, pitfall traps, 18.VII 1988, 1 ♂, all leg. I. Martynenko; Toguchinskii District, Kotorovo village, Populus tremula forest, pitfall traps, 18.VII 1988, 1 ♂, leg. A.S. Babenko; **Altaiiskii krai**: Krasnoschikovskii District, near Tigirek village, Tigirek State Nature Reserve, Khankhara Site, 23.VII 2004, 1 ♀; Zmeinogorskii District, Tigirek State Nature Reserve, Beloretsk Site, cordon Beloretsk, chern taiga, in litter, 14.VI 2009, 1 ♂, 1 ♀, all leg. D.V. Kuzmenkin; Krasnoschikovskii District, Karaguzh village, Alnus, Viburnum opulus and Sorbus sibirica, 15.VIII 2016, 3 ♂, 1 ♀; Krasnoschikovskii District, near Tigirek, Tigirek State Nature Reserve, Khankhara Site, Dragunskii Brook, steppe on SW slope, Rosa spinosissima, 17.VIII 2016, 1 ♀, all leg. P.S. Nefediev; Togulskii District, valley of Uskunskaya River, near former village of Kutelyapka, chern taiga, 28.IV 2017, 1 ♂, 2 ♀, leg. L.V. Pozhidaev; Zarinskii District, Lipnyazhka area, Tilia forest, VII 2017, 1 ♀, leg. S.V. Vazhov; Charyshskii District, upper reaches of Belaya River, S macroslope, steppe on slope with bushes and sparse Larix sibirica, 20.VI 2017, 1 ♂; Charyshskii District, near Komendanika village, Altai State University Field Station “Golobii Utios”, Betula pendula and Populus tremula forest on N slope, ca 520 m a.s.l., 20.VI 2017, 4 ♀, 1 subadult ♂, 1 juv.; Zalesovskii District, at border with Kemerovskaya oblast, 54.23533°N, 85.375949°E, Betula forest with Ribes nigrum, 400 m a.s.l., 3.VII 2018, 1 juv., all leg. P.S. Nefediev; **Republic of Khakassia**: Ust-Abakanskii District, valley of Uibat River, 53.825765°N, 90.052647°E, mixed forest, in litter, 18.VII 2012, 1 ♀, leg. A.P. Pavlov; Askizskii District, valley of Askiz River, 53.418866°N, 89.749147°E, under stones, 11.VI 2018, 1 juv., leg. S.V. Dragan; Ust-Abakanskii District, valley of Uibat River, 53.825765°N, 90.052647°E, mixed forest, in litter, 18.VII 2018, 4 ♂, 3 ♀, leg. E.V. Gribanova; Kemerovskaya oblast: Krapivinskii District, floodplain of Beriozovka River, 55°04′N, 86°18′E, forest-steppe, 14.V 2017, 1 juv.; Krapivinskii District, 5–6 km of Taradanovo village, 54°40′N, 86°41′E, Populus tremula forest, in litter and rotten logs, 13.VIII 2017, 2 ♀, all leg. D.A. Efimov; Guriyevskii District, at border with Altaiskii krai, 54°16′59″N, 85°26′05″E, Betula pendula on hill slope, 15.VII 2017, 2 ♀, 1 juv., leg. P.S. Nefediev; Promyshlenovskii District, N of Salair Ridge, W bank of Pond Tanacev, 54°49′N, 85°09′E, Betula pendula and Pinus sylvestris forest, ca 160 m, 8.VIII 2018, 1 ♂; Kemerovskii District, 54°29′31.8″N, 86°12′58.2″E, Populus tremula and Pinus sylvestris forest, 14.VIII 2018, 1 ♀, 1 juv.; Kemerovskii District, 54°29′19.6″N, 86°13′09.5″E, Pinus sylvestris forest, 14.VIII 2018, 1 ♂; Kemerovskii District, near Andreevka
village, 54°27′11.3″N, 86°13′55.9″E, *Populus tremula, Pinus sibirica and Abies sibirica* forest, 14.VII 2018, 1 ♂; Izhmorskiy District, Simbirka village, 56°02′N, 87°10′E, *Pinus sylvestris* forest, 18.VIII 2018, 1 ♀, all leg. D.A. Efimov; **Republic of Altai**: Ulaganskii District, near Aktash village, summit of Mt. Belkenek, 50°15′N, 87°37′E, *Pinus sibirica and Larix sibirica* forest on N slope, 1.VII 2016, 1 ♂; Izhmorskiy District, near Balykcha, floodplain of Chulyshman River, 4.VII 2016, 1 ♀; Ulaganskii District, valley of Chulyshman River, Altai State Nature Reserve, Stone Mushrooms (Akkurum), *Betula pendula* forest, 5.VII 2016, 2 ♂, 1 juv., all leg. P.S. Nefediev; Gorno-Altaiy right bank of Maima River, *Salix*, 22.VI 2016, 1 juv., leg. J.S. Nefedieva; Ulaganskii District, ca 520 m a.s.l., 20.VI 2017, 3 ♂, 4 ♀, 3 juv.; Charyshskii District, near Komendantka village, Altai State University Field Station “Goluboi Utios”, *Betula pendula and Populus tremula* forest on N slope, ca 520 m a.s.l., 20.VI 2017, 3 ♂, 4 ♀, 3 juv.; Charyshskii District, near Komendantka village, Altai State University Field Station “Goluboi Utios”, 51°21′44.3″N, 83°37′42.6″E, *Pinus sylvestris and Betula pendula* forest with *Spiraea* and *Lonicera* on N slope, ca 620 m a.s.l., 23.VI 2017, 1 ♂, 1 ♀, leg. P.S. Nefediev; Republic of Altai: Ulaganskii District, ca 4 km SE of Topuchaya village, 51°05.990′N, 85°37.433′E, near spring, under logs and stones, ca 1270 m a.s.l., 22.VII 2018, 1 ♀, all leg. P.S. Nefediev; Republic of Altai, floodplain of Chuya River, near Shirlak Waterfall, 50.34461°N, 87.22323°E, *Betula pendula* forest on river bank, 1015 m a.s.l., 23.VII 2018, 2 ♂, leg. V.I. Gusarov; Ulaganskii District, near Aktash village, summit with retranslator, 50.33958°N, 87.74865°E, rocky mountain tundra, ca 2970 m a.s.l., under stones, 23.VII 2018, 2 ♂, 3 ♀, 1 juv., leg. P.S. Nefediev, V.I. Gusarov, M.F. Maurstad, V. Loveng; Republic of Altai, floodplain of Chuya River, near Shirlak Waterfall, 50.34461°N, 87.13′21″E, ca 1080 m a.s.l., sifting leaf litter over 40 m, 23.07.2018, 1 ♀, 1 juv., leg. V.I. Gusarov, M.F. Maurstad, V. Loveng; Ulagan District, 10 air-km ENE of Aktash village, Kuraiskii Mt. Range, near summit with retranslator, 50°19.539′N, 87°44.175′E, alpine meadow with rich herbaceous vegetation, Poaceae, *Dryas* moss and lichens, ca 2555 m a.s.l., sifting dead grass and moss over 50 m, 23.07.2018, 1 juv., leg. V.I. Gusarov, M.F. Maurstad, V. Loveng; Ulagan District, 10 air-km ENE of Aktash village, Kuraiskii Mt. Range, summit with retranslator, 50.33958°N, 87.74865°E, rocky mountain tundra, ca 2970 m a.s.l., under stones, 23.VII 2018, 1 ♀, leg. P.S. Nefediev, V.I. Gusarov, M.F. Maurstad, V. Loveng; Irkutsk oblast: Irkutsk, left bank of Angara River, Akademgorodok, 52°14′38.1″N, 104°15′13.4″E, *Betula and Populus tremula* park forest with *Pinus sylvestris, Alnus fruticosa* and *Swida alba*, ca 520 m a.s.l., 1 ♂, 1 ♀, 1 juv., 31.VIII 2018, leg. I.V. Enushchenko.

**DISTRIBUTION.** This species is rather widespread from Korea and the Far East of Russia in the east through central and SW Siberia to eastern Kazakhstan in the west (Nefediev et al., 2017c; Dyachkov & Tuf, 2018).

**REMARKS.** This species has hitherto been recorded neither from Novosibirskaya oblast nor from Republic of Khakassia, nor from Irkutskaya oblast, all Siberia.

*Escaryus retusidens* Attems, 1904

**MATERIAL.** Russia: Altaiiskii krai: Charyshskii District, near Komendantka village, Altai State University Field Station “Goluboi Utios”, *Betula pendula and Populus tremula* forest on N slope, ca 520 m a.s.l., 20.VI 2017, 3 ♂, 4 ♂, 3 juv.; Charyshskii District, near Komendantka village, Altai State University Field Station “Goluboi Utios”, 51°21′44.3″N, 83°37′42.6″E, *Pinus sylvestris and Betula pendula* forest with *Spiraea* and *Lonicera* on N slope, ca 620 m a.s.l., 23.VI 2017, 1 ♂, 1 ♂, leg. P.S. Nefediev; Republic of Altai: Ulaganskii District, ca 4 km SE of Topuchaya village, 51°05.990′N, 85°37.433′E, near spring, under logs and stones, ca 1270 m a.s.l., 22.VII 2018, 1 ♀, all leg. P.S. Nefediev; Ulaganskii District, floodplain of Chuya River, near Shirlak Waterfall, 50.34461°N, 87.22323°E, *Betula pendula* forest on river bank, 1015 m a.s.l., 23.VII 2018, 1 ♀, leg. V.I. Gusarov.

**DISTRIBUTION.** This species is very widespread from Moldova, Ukraine, the Crimea and the Caucasus in the west through SW Siberia and Central Asia to Cisamuria in the east (Nefediev et al., 2017c).

**REMARKS.** Despite the vast distribution area of *E. retusidens*, it is restricted in Siberia by Altaiiskii krai and Republic of Altai.
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