**Julus ghilarovi** Gulička, 1963 s.str.: time to put an end to confusion (Diplopoda: Julida: Julidae)

**Julus ghilarovi** Gulička, 1963 s.str.: пора заканчивать путаницу (Diplopoda: Julida: Julidae)

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**Introduction**

In 1963 and 1972, the Czechoslovak myriapodologist Jan Gulička, of Bratislava, published the results of his studies on some millipede material from the former Soviet Union, mostly Siberia, that had been sent to him by Prof. M.S. Ghilarov, Head of the Laboratory of Soil Zoology at the A.N. Severtsov Institute of Animal Evolutionary Morphology and Ecology, USSR Academy of Sciences, Moscow (now the Institute for Problems of Ecology and Evolution, Russian Academy of Sciences, Moscow). Among the numerous Diplopoda then considered, Gulička [1963] described a new species of *Julus* Linnaeus, 1758 he dedicated to M.S. Ghilarov: *Julus ghilarovi* Gulička, 1963, from the Kemerovo Area, southwestern Siberia. That was the first valid record of a *Julus* in the Asian part of Russia, because the original description of *Julus profugus* Stuxberg, 1876, from between Tomsk and Kansk [Stuxberg, 1876], was too poor to be certain about its generic allocation.

*Julus Linnaeus, 1758* is a rather small, but common and widespread genus of the diplopod family Julidae; it counts 18 species or subspecies and covers much, but not all of the Palaearctic, ranging from Western Europe (east of both Ireland and the Iberian Peninsula) in the west, through the Caucasus, to southern Siberia and Mongolia in the east [Evsyukov et al., 2018].

A few years following the description of *J. ghilarovi*, Gulička [1972] distinguished two subspecies of that species: *J. g. ghilarovi* and *J. g. brachydactylus* Gulička, 1972. The latter subspecies he described from the Kurai Depression, SE Altai, was stated to differ from the nominotypical *J. g. ghilarovi* only by the structure of the opisthomere. In particular, this was depicted to lower and wider, with a notch/emargination between the lateral process of the opisthomere and the solenome being relatively shallow, only ca 1/3 as deep as opisthomere height. Subsequent records of *J. g. brachydactylus* from near Ust-Kan and in eastern Kazakhstan [Mikhaljova, Golovatch, 2001] added some more characters that distinguished these two subspecies even more clearly, but for a long time they all were regarded as demonstrating only intraspecific variations between these two forms [Mikhaljova, 2004]. The *J. g. ghilarovi – J. g. brachydactylus* pair of subspecies remained the sole in *Julus*. A few more records of *J. g. brachydactylus* from south of Lake Teletskoye [Nefedieva, Nefediev, 2008] were later re-identified as *J. insolitus* Mikhaljova, 2009 [Nefediev, Nefedieva, 2013; Nefedieva et al., 2014, 2015].
Only very recently has E.V. Mikhaljova [2017] reinstated the minimal variability in *J. ghiharovi* both in the shape of the outer lateral process of the opisthomere and the depth of its notch. She also pointed out the need to check the distribution area of this subspecies.

To solve the riddle, the type material of both subspecies of *J. ghiharovi*, now deposited in the collection of the Zoological Institute, St. Petersburg, Russia (ZIN), has been restudied. Additional material of *J. ghiharovi* s.str. from the collections of the Zoological Museum of the Lomonosov Moscow State University, Moscow (ZMUM) and the Federal Scientific Center of the East Asian Terrestrial Biodiversity, Far Eastern Branch of the Russian Academy of Sciences, Vladivostok (FSCB), both Russia, has also been re-examined. Fresh material from a typical territory of *J. g. brachydactylus* has been taken and considered as well. The present paper clarifies the status of both subspecies of *J. ghiharovi*, provides new records and refines the distribution area of the species involved.

The new material treated herein has mainly been deposited in the collection of the Altai State University, Barnaul, Russia (ASU), partly shared also between the ZMUM and FSCB collections.

The specimens were examined using MBS-1, MBS-9 and MBS-10 stereo microscopes, and stacks of colour images were manually generated using a Nikon Coolpix L22 digital camera. SEM micrographs were prepared at two labs: the Laboratory of Phylogeny and Faunogenesis, Institute of Systematics and Ecology of Animals, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia (ISEA) using a Hitachi TM-1000 scanning electron microscope; and the Laboratory of Aquatic Ecology, Institute for Water and Environmental Problems, Siberian Branch, Russian Academy of Sciences, Barnaul, Russia (IWE) using a Hitachi S-3400N scanning electron microscope. Digital images were prepared with the help of Helicon Focus 6 image stacking software. The distribution map was composed using QGIS 3.0.

**Taxonomic part**

Class Diplopoda

Order Julida

Family JULIDAE

*Julus ghiharovi* Gulička, 1963
Figs 1–5, 12, 14, 15, 18.


*Julus ghiharovi* pro parte — Mikhaljova, Nefediev, 2003: 84.

**NEW MATERIAL EXAMINED.** 1 — 1 2 subad. (ZMUM), [Russia, southwestern] Siberia, [Republic of Altai, Turochak District], Altai Mts., Lake Tekelyke, Altaiisky Nature Reserve, Korbu Waterfalls, *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 600 m, 17.07.1997, leg. S. Golovatch; 2 2 ad. (FSCB), [same Republic], Central Altai, E slope of Kyzylart Mt. Range, subalpine meadows, 2100–2300 m a.s.l., 18–19.07.2000, leg. A.V. Matalin; 6 6, 21 juv. (ASU), same Republic, Ulagan District, near Aktash, N slope of Mt Belbeken, *Pinus sibirica*, *Larix sibirica* and *Picea obovata* forest, 50.30605°N, 1390 m a.s.l., 16.07.2006; 4 subd., 13 subd., 9 subd., 8 subd. (ASU), same Republic, same District, near Aktash, foot of Mt Belbeken, *Pinus sibirica*, *Larix sibirica* and *Picea obovata* forest with *Caragana arborescens*, 50.30782°N, 1320 m a.s.l., 1.08.2006; 1 *C* subd. (ASU), same District, part of Aktash, foot of Mt Aktash, valley of Chibukha River, *Larix sibirica* forest with *Caragana arborescens*, 50.31715°N, 87.58705°E, 1300 m a.s.l., 3.08.2006; 2 2 (ASU), same locality, 50.31881°N, 87.59060°E, 1380 m a.s.l., 5.08.2006; 15 15, 23 23, 7 juv. (ASU), same Republic, same District, eastern slope of Mt Aktash, bush thicket along brook, 50.33388°N, 87.58120°E, 1700 m a.s.l., 5.08.2006; 4 4, 26 26, 1 1 subad., 1 1 subd., 1 1 subd., 21 juv., 1 fragm. (ASU), same Republic, same District, 3.7 km N of Aktash, summit of Mt Aktash, *Pinus sibirica* and *Larix sibirica* forest, 50.34949°N, 87.58598°E, 2110 m a.s.l., 5.08.2006; 4 4, 1 1, 1 1 subd., 3 3 subd., 1 1 juv. (ASU), same Republic, same District, eastern slope of Mt Aktash, bush thicket along brook, 50.33388°N, 87.58120°E, 1700 m a.s.l., 5.08.2006; 4 4; 2 2 (ASU), same locality, 50.31881°N, 87.59060°E, 1380 m a.s.l., 5.08.2006; 15 15, 23 23, 7 juv. (ASU), same Republic, same District, eastern slope of Mt Aktash, bush thicket along brook, 50.33388°N, 87.58120°E, 1700 m a.s.l., 5.08.2006; 4 4, 1 1, 1 1 subd., 3 3 subd., 1 1 juv. (ASU), same Republic, same District, eastern slope of Mt Aktash, bush thicket along brook, 50.33388°N, 87.58120°E, 1700 m a.s.l., 5.08.2006; 4 4.

**Figures.** Figs 1–5, 12, 14, 15, 18.

Figs 1–10. *Julus ghiharovi* Gulička, 1963, holotype *C*. 1 — jar with the specimen; 2 — vial with a label; 3 — midbody segments, lateral view; 4 — large coxal outgrowth of 2 leg pair 2, ventro-lateral view; 5 — gonopods, lateral view; *Julus ghiharovi* brachydactylus Gulička, 1963, *C*. holotype. 6 — jar with the specimen; 7 — labels; 8 — habitus, lateral view; 9 — large coxal outgrowth of 2 leg pair 2, ventro-lateral view; 10 — gonopods, caudo-lateral view. Pictures taken not to scale.


*Julus ghiharovi* pro parte — Михалькова, Нифедьев, 2003: 84.
Julus ghiilarovi s.str.

Julus ghiilarovi s.str. 

**TYPE MATERIAL RE-EXAMINED.** σ holotype of *Julus ghiilarovi* Gulička, 1963 (ZIN), labeled “*KemeroVo Area, Prokopievsk, waterworks, forest, 6IV.1960, Yu.B. Byzova, Z.V. Chadueva*”.

**REMARKS.** Despite the holotype of *Julus ghiilarovi* Gulička, 1963 remaining intact, I do not hesitate to confirm that the specimen belongs to a typical σ of *Julus ghiilarovi*. No dissection of the gonopods was necessary, because they protrude outside and can easily be examined in situ (see also below). In addition, the large coxal outgrowth of σ leg pair 2 is slender along all, with a posterior process (Figs 1–5).

**NEW MATERIAL EXAMINED.** 3 σ, 10 ψ, 10 σ ψ subad., 6 ψ subad., 1 juv. (ASU), Russia, southwestern Siberia, Republic of Altai, Ulagan District, 4.5 km SE of Aktash, Staroe Mon’no, near Kar-Tyt Spring, floodplain of Mionka River, Picea obovata forest with green mosses, 50.281032° N, 87.23075° E, 1140 m a.s.l., 20.07.2006; 8 ψ, 4 ASU (ASU), Russia, Altai Province, Zalesovo District, at border with KemeroVo Area, 54.235533° N, 85.375949° E, Betula forest with Ribes nigrum, 400 m a.s.l., 3.07.2018, all leg. P.S. Nefediev; 1 σ, 4 ASU (ASU), Russia, Novosibirsk Area, Toguchin District, Yurty, 14.08.2007, leg. A.S. Babenko.

**DISTRIBUTION.** One of the most widespread *Julus* species in SW Siberia, the distribution area of *Julus ghiilarovi* is restricted to the Novosibirsk and KemeroVo areas, the Republic of Khakassia, the Altai Province and the Republic of Altai (Fig. 18).

**Julus brachyactylus** Gulička, 1972, stat.n.

Figs 6–11, 13, 16–18.


**NEW MATERIAL EXAMINED.** 3 σ, 10 ψ, 10 σ ψ subad., 6 ψ subad., 1 juv. (ASU), Russia, southwestern Siberia, Republic of Altai, Ulagan District, 5.5 km SE of Aktash, Staroe Mon’no, near Kar-Tyt Spring, floodplain of Mionka River, Picea obovata forest with green mosses, 50.281032° N, 87.23075° E, 1410 m a.s.l., 20.07.2006; 8 ψ, 4 ASU (ASU), Russia, Republic, Ougdai District, 3.5 km SW of Belyi Bom, valley of Synam River, along the road to Naryn Nature Reserve, Ribes nigrum, 50.347834° N, 86.998210° E, 1165 m a.s.l., 21.07.2006; 1 σ, 4 ASU (ASU), Russia, Republic, same District, 9 km SSW of Belyi Bom.
near Achik Pass, sparse Pinus sibirica forest edge, 50.295678°N, 86.979943°E, 2120 m a.s.l., 5.08.2006; 4 өө, 3 ө, 1 juv. (ASU), same Republic, Kosh-Agach District, 15 km S of Belyi Bom, sparse Pinus sibirica forest with Larix sibirica, Betula rautindfolia and Lonicera, 50.238173°N, 87.003786°E, 1830 m a.s.l., 22.07.2006; 1 өө (ASU), same Republic, same District, 15.5 km S of Belyi Bom, Juniperus on cliff, 50.229991°N, 87.002996°E, 1725 m a.s.l., 22.07.2006; 7 өө (ASU), same Republic, same District, 15 km S of Belyi Bom, Larix sibirica forest, 50.339899°N, 87.004114°E, 1810 m a.s.l., 22.07.2006; 4 өө, 3 ө, 1 juv. (ASU), same Republic, same District, 15.5 km S of Belyi Bom, subalpine meadow, 50.250637°N, 87.002505°E, 1735 m a.s.l., under Pentaphylloides fruticosus, 22.07.2006; 9 өө, 26 ө, 1 ө subad., 3 ө subad., 10 juv. (ASU), same Republic, Ulagan District, 12 km N of Aktash, Pinus sibirica forest, 50.425335°N, 87.591517°E, 1960 m a.s.l., 31.07. 2006; 2 өө, 12 ө, 2 өө subad., 5 өө subad. (ASU), same Republic, same District, near Aktash, foot of Mt Belkenek, Pinus sibirica, Larix sibirica and Picea obovata forest with Caragana arborescens, 50.308720°N, 87.597905°E, 1325 m a.s.l., 1.08.2006; 12 өө, 5 ө, 1 ө subad., 1 ө subad., 1 juv. (ASU), same Republic, same District, near Aktash, N slope of Mt Belkenek, old fire-site with young Betula forest, Ribes nigrum, 50.304158°N, 87.582366°E, 1530 m a.s.l., 2.08.2006; 2 өө, 5 өө (ASU), same Republic, same District, near Aktash, raven on S slope of Mt Aktash, bush thicket along brook, 50.333888°N, 87.581207°E, 1765 m a.s.l., 5.08.2006; 29 өө, 33 ө, 4 өө subad., 5 өө subad., 4 juv. (ASU), same Republic, same District, 3.7 km N of Aktash, summit of Mt Aktash, Pinus sibirica and Larix sibirica forest, 50.349499°N, 87.585986°E, 2115 m a.s.l., 5.08.2006; 1 өө (ASU), same Republic, same District, near Aktash, foot of Mt Aktash, valley of Chibitka River, 50.318818°N, 87.599060°E, 1380 m a.s.l., 5.08.2006; 4 өө, 8 өө, 2 juv. (ASU), same Republic, Ongudai District, 6.5 km ESE of Belyi Bom, valley of Tutugoi River, Betula forest, 50.360284°N, 87.128623°E, 1200 m a.s.l., 9.08.2006; 1 өө, 3 өө (ASU), same locality, Betula and Larix sibirica forest, 50.359698°N, 87.126924°E, 1195 m a.s.l., 9.08. 2006; 2 өө (ASU), same Republic, same District, 9 km NWN of Tuetskaya valley, valley of Tuetskaya River, Larix sibirica forest with Ribes rubrum, Lonicera and rich herbaceous vegetation, 50.306284°N, 87.128623°E, 1095 m a.s.l., 12.08.2006; all leg. P.S. Nefediev, J.S. Nefediev; 1 өө, 1 ө (ASU), same Republic, Ulagan District, Aigulakskii Mt. Range, source of Sardyma River, scree under rocks in Larix sibirica forest, 50.2273°N 87.3322°E, 2200 m a.s.l., 29.07.2006; 1 өө, 4 өө, 1 juv. (ASU), same Republic, same District, Kuraiskii Mt. Range, watershed of Korumduary River and Yarlyamry River, mossy rocky wall of ravine in Larix sibirica forest, 50°19′N 87°42′E, 2000–2150 m a.s.l., 7.08.2006, all leg. A.A. Fomichev; 2 өө, 6 өө, 2 өө subad., 2 juv. (ASU), same Republic, same District, Aigulakskii Mt. Range, subalpine meadow with stony streams, 50°24′N, 87°33′E, 2400–2500 m a.s.l., 29.07.2006, leg. Yu.V. Dyachkov; 2 өө, 1 өө (ASU), same Republic, Ongudai District, 20 air-km W of Chibit, floodplain of Chuya River, near Shirlak Waterfall, right bank of the river, Betula forest with Larix sibirica, Caragana arborescens, low grasses and green mosses, 50.34358°N, 87.22225°E, ca 1015 m a.s.l., 23.07.2018; 1 өө (ASU), same locality, Picea obovata forest with Betula, Caragana arborescens, 50°20.670°N, 87°13.388°E, 1000 m a.s.l., sifting flood refuse and leaf litter at river banks and on slopes over 300 m, 23.07.2018, leg. V.I. Gusarov, M.F. Maurstad, V. Løveng; 1 өө (ASU), same locality, valley of Chuya River, Shirlak Waterfall, Betula forest with Alnus, Lonicera and tall grasses, along brook down the waterfall, 50.34542°N, 87.21915°E, 1081 m a.s.l., 23.07.2018, leg. P.S. Nefediev; 2 өө (ASU), same locality, Betula grove along creek, 50°20.690°N, 87°13.213°E, ca 1080 m a.s.l., sifting leaf litter over 40 m, 23.07.2018, leg. V.I. Gusarov, M.F. Maurstad, V. Løveng; 1 өө (ASU), same Republic, Ulagan District, 10 air-km ENE of Aktash, Kuraiskii Mt. Range, near summit with retranslator, alpine meadow with Dryas oymondota, 50.32598°N, 87.73575°E, ca 2570 m a.s.l., under stones, in litter, 23.07.2018, leg. P.S. Nefediev; 1 өө (ASU), same locality, alpine meadow with rich herbaceous vegetation, Poaceae, Dryas, moss and lichens, 50°19.539°N, 87°44.175°E, ca 2555 m a.s.l., sifting dead grass and moss over 50 m, 23.07.2018, leg. V.I. Gusarov, M.F. Maurstad, V. Løveng; 1 өө, 1 өө (ASU), same Republic, Ulagan District, 3 air-km NE of Aktash, valley of Yarlyamry River, Picea obovata taiga forest with Larix sibirica, Caragana arborescens and Alnus, 50°33.350°N, 87°64.925°E, 1575 m a.s.l., in green mosses, 24.07.2018, leg. P.S. Nefediev; 4 өө, 20 өө, 4 өө subad., 17 өө subad., 29 juv. (ASU), same locality, forest with Picea obovata, Larix sibirica, Pinus sibirica, Caragana arborescens, Lonicera, Ribes, moss, 50°20.027°N, 87°38.945°E, 1575 m a.s.l., sifting leaf litter and moss over 50 m, 24.07.2018, leg. V.I. Gusarov, M.F. Maurstad, V. Løveng; 1 өө, 7 өө, 1 juv. (ASU), same Republic, Ulagan District, 4 air-km NE of Aktash, valley of Yarlyamry River, Picea obovata taiga forest with Larix sibirica, Vaccinium vitis-idaea and Alnus, 50°33.167°N, 87.65897°E, ca 1615 m a.s.l., in green mosses, 24.07.2018, leg.
Julus ghilarovi s.str.


P.S. Nefedieff; 21 ♀♂, 12 ♂♂, 3 ♀♂ subad., 4 ♂♂ subad., 16 juv. (ASU), same locality, forest with *Picea obovata*, *Pinus sibirica*, *Larix sibirica*, *Vaccinium vitis-idaea*, *Equisetum*, *Lonicera*, 50°19.912′N, 87°39.539′E, ca 1640 m a.s.l., sifting leaf litter and moss, over 50 m, 24.07.2018, leg. V.I. Gusarov, M.F. Maurstad, V. Loveng; neotype ♀ (ZMUM, Rd 4128), topotypes: 5 ♀♂, 4 ♂♂, 1 ♀ subad., 5 ♂♂ subad., 1 juv. (ASU), same Republic, Kosh-Agach District, 5.5 air-km NNE of Kurai, S macroslope of Kurai Mt. Range, valley of Kuraika River, left bank of Kuraika River, 5.5 km up the river from Chuya Tract, *Larix sibirica* and *Picea obovata* forest with *Pinus sibirica*, *Caragana arborescens*, low grasses and green mosses, 25.07.2018; 2 ♀♂, 12 ♂♂ (ASU), same Republic, same District, 9.5 air-km NW of Belyashi (Dzhazator), W macroslope of Yuzhno-Chuiskii Mt. Range, ford on Ashik River, *Larix sibirica* forest with *Ribes nigrum*, 49.88194°N, 87.20650°E, ca 1560 m a.s.l., under stones, in green mosses, 29.07.2018; 3 ♀♂, 2 ♂♂, 8 juv. (ASU), same locality, *Larix sibirica* forest on W slope in stream valley, 49.88080°N, 87.20740°E, ca 1590 m a.s.l., in green...
mosses, 29.07.2018; 1 ♂, 1 ♀ subad., 10 juv. (ASU), same locality, *Larix sibirica* forest with *Alnus* and young *Betula*.

49.88201°N, 87.20499°E, 1545 m a.s.l., in green mosses, 29.07.2018; 6 ♂♂, 21 ♀♀, 13 ♀♀ subad., 4 juv. (ASU), same Republic, same District, 12.5 air-km NW of Belyashi (Dzhazator), W macroslope of Yuzhno-Chuiskii Mt. Range, *Larix sibirica* and *Caragana arborescens*, 49°45.799′N, 87° 16.114′E, ca 1785 m a.s.l., sifting leaf litter over 40 m, 29.07.2018; 2 ♂♂ (ASU), same Republic, same District, 20 air-km NW of Belyashi (Dzhazator), valley of Karasu River, *Larix sibirica* and *Pinus sibirica* and *Larix sibirica*, large trees, 49°50.122′N, 87°12.493′E, 1590 m a.s.l., sifting leaf litter and moss over 50 m, 29.07.2018, all leg. V.I. Gusarov, M.F. Maurstad, V. Løveng;

1 ♂ (ASU), same Republic, same District, 13 air-km ESE of Belyashi (Dzhazator), valley of Dzhazator River, *Larix sibirica*, *Picea obovata* and *Betula* stands with *Alnus*, *Lonicera* and *Ribes nigrum* in ravine with brook, 49.67255°N, 87.60155°E, ca 1685 m a.s.l., in leaf litter, 30.07.2018, leg. P.S. Nefediev.


**REMARKS.** A restudy of the ♂ holotypes of *J. ghilarovi* Gulička, 1963 and *J. g. brachydactylus* Gulička, 1972 shows that both males undoubtedly belong to one species: *Julus ghilarovi* Gulička, 1963. Although both are intact, their gonopods are well exposed, thus requiring no dissection and making their study easy in situ (see also above). The large coxal outgrowth of ♂ leg pair 2 is slender all along, with a posterior process; a thin longitudinal crest is present on the posterior face of the gonopodal promere (Figs 6–11).

According to the original descriptions [Gulička, 1963, 1972], all holotypes should have been deposited in the author’s collection in Bratislava, while paratypes in the ZIN collection. However, Gulička had not shared the promised paratypes until S.I. Golovatch requested their return to the USSR. Only after a scandal did Gulička finally return the holotypes to Golovatch who then rendered them to ZIN. Yet some vials contained deliberately wrong specimens (females instead of males), torsos without gonopods, incorrect labels, etc. (S.I. Golovatch, pers. comm.). Among Gulička’s returned diplopods, no paratypes of *J. ghilarovi* s.str. had come back, but he had labeled “*Julus ghilarovi brachydactylus* n. subspec. – Holotypus” and sent back an erroneous male of *J. ghilarovi* instead of *J. g. brachydactylus*. Besides this, the Kemerovo Area is a separate region which borders from the north only with the Republic of Altai, but the Kurai Depression is situated much more southeast of the Kemerovo Area, indicating a label error as well (Fig. 7).

**MATERIAL RE-EXAMINED** (specimens previously identified as *J. ghilarovi* and published by Mikhaljova, Nefediev [2003]).
Julus ghilarovi s.str.

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REMARKS. A restudy of ten $\mathbb{V}$ from the Altai Mts., Kuraiisky Mt. Range, near Aktash, 2500 m a.s.l., Betula nana + mountain tundra, under stones, 12–25.VII.2000, leg. O.G. Gorbunov, previously identified as J. ghilarovi by Mikhailjova & Nefediev [2003], and of four $\mathbb{V}$ from the same locality, previously determined as Pacifius amuren- sis (Gerstfeldt, 1859) by Mikhailjova & Nefediev [2003], shows that four $\mathbb{V}$ of the former species and all $\mathbb{V}$ of the latter one actually belong to J. brachydcactus stat.n.


REMARKS. A re-examination of all above specimens from eastern Kazakhstan and the environs of Ust-Kan, previously identified as J. brachydactylus by Mikhailjova, Golovatch [2001], shows that they belong to a new species, Julus sp. 3. It is noteworthy that all of these specimens are in very poor condition and most of them are completely broken into pieces. Very recently, I have collected more than 100 fresh specimens of this new species and its description will appear a forthcoming publication.

MATERIAL RE-EXAMINED (specimens previously identified as J. g. ghilarovi and published by Mikhailjova, Golovatch [2001]). 30 $\mathbb{V}$, 20 $\mathbb{V}$, 63 juv. (ZMUM), 2 $\mathbb{V}$ (FSCB), [Russia, southern Siberia, Republic of Altai, Ulagan District], Altai Mts., Lake Teletskoe, Altayisky Nature Reserve, Chiri, upper reaches of Chiri River, Picea obovata + Pinus sibirica taiga forest, 1350 m, 28–29.07.1997; 27 $\mathbb{V}$, 19 $\mathbb{V}$, 15 juv. (ZMUM), same locality, near Lake Chiri, subalpine belt (= goltsy), 1750–2000 m a.s.l., 29–30.07.1997; 7 $\mathbb{V}$, 4 $\mathbb{V}$, 7 juv. (FSCB), same locality, nr Lake Chiri, upper timberline of Picea obovata + Pinus sibirica taiga, mainly nr water, 1700–1750 m, 29.07.–1.08.1997, all leg. S. Golov- vatch & A. Tanasevich.

REMARKS. A restudy of the above material from south of Lake Teletskoe in the environs of the Chiri cordon, previously determined as J. g. ghilarovi by Mikhailjova, Golovatch [2001], shows that all these specimens belong to a new species (Julus sp. 2), same as all specimens identified as J. insolitus and published in Nefedieva et al. [2014, 2015]. Besides this, the records of J. insolitus from the Kemervo Area (Shorskii National Park) and the Republic of Altai (upper reaches of Chiri River), published by Mikhailjova [2016], appear to be morphologically similar to specimens of J. insolitus from Nefedieva et al. [2014, 2015] as well (E.V. Mikhailjova, pers. comm.), apparently also belong- ing to Julus sp. 2.

DISTRIBUTION. The distribution area of Julus brachydcactus stat.n. covers only the territory of the Republic of Altai (Fig. 18).

Discussion

A restudy of the holotypes of Julus ghilarovi Gulička, 1963 and J. g. brachydactylus Gulička, 1972, both deposited in ZIN, shows that these specimens belong to one species: J. ghilarovi. A mix-up must have hap-

pened to the holotype sample of J. g. brachydactylus before it joined the ZIN collection (see above). As Gulička’s J. g. brachydactylus is easy to recognize and the false “J. g. brachydactylus Gulička, 1972 Holotype” sample in ZIN actually contains a different species (J. ghilarovi), to overcome the mislabeled type option, I am inclined to designate a neotype of J. g. brachydactylus coming from a precise locality.

The illustration of the opisthomere of J. g. brachydactylus in the original description [Gulička, 1972] is so similar to that of J. insolitus Mikhailjova, 2009 (Figs 11, 13) that I do not hesitate to synonymize both these taxa and promote J. g. brachydactylus to a full species rank.

Since the gonopods and $\mathbb{V}$ leg pair 2 of both the species concerned, J. ghilarovi and J. brachydactylus, have never been shown in due detail, I provide their SEM micrographs (Figs 14–17).

Conclusions

Despite the considerable confusion as regards the taxonomy and distribution of the only pair of subspecies heretofore delimited within the genus Julus, i.e. the southern Siberian J. ghilarovi with the formal subspecies J. ghilarovi and J. g. brachydactylus, I believe that: (1) J. ghilarovi has no subspecific taxonomic and its full species status is revalidated; (2) the subspecies J. g. brachydactylus Gulička, 1972 is elevated to a full species rank, with J. insolitus Mikhailjova, 2009 being a junior synonym of J. brachydactylus Gulička, 1972, syn.n., stat.n.

The distribution of J. ghilarovi is mostly restricted to southwestern Siberia (the Novosibirsk and Kemero- vo areas, the Altai Province and the Republic of Altai), as well as to southeastern Siberia (the Republic of Khakassia), whereas the southern part of the Krasnoyarsk Province must be removed from the distribution ca 2000 m in. The distribution range of J. brachydactylus stat.n. spans only the Republic of Altai, where it can often be found living syntopically with J. ghilarovi.

At least three new species of Julus have been found when refining the taxonomy and distribution areas of J. ghilarovi and J. brachydactylus stat.n., their descriptions are to be deferred for the future.

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References


Bzyzova Yu.B., Chadaeva Z.V. 1965. [A comparative characteristic for study. also thankful to all collectors who donated me their material the ASU Herbarium, for the identification of plants. I am as well as to A.V. Dyachenko (IWEF, Barnaul, Russia) for Russia) and V.V. Kirillov (IWEF, Barnaul, Russia) who very much obliged to R.Yu. Dudko (ISEA, Novosibirsk, Russia, our experienced driver. I am


Mikal’jeva E.V. 2017. [The millipede fauna (Diplopoda) of the Asian part of Russia]. Vladivostok: Dalnauka Publ. 336 p. [in Russian, with English summary].


Nefediev P.S. 2002. [The fauna and ecology of myriapods (Myriapoda) of a relic little grove (village of Kuzedeyevo)] // Mate-

rialy XL Mezhduarodnoi nauchnoi studecheskoi konferen-


Nefediev P.S., Nefedieva J.S. 2006. [Regional peculiarities of mil-

lipede fauna (Diplopoda) in the south-east of Western Siberia] // Anyushinkin V.V. (ed.). Ekologiya Yuzhnoi Sibiri i supredel-

nykh territorii. Sbornik materialov X Mezhduarodnoi shkoly-

konferentsi studentov i molodzych uchionyk. Abakan: Khak-


vykar: Institute of Biology, Komi Scientific Center, Ural Divi-

sion of RAS Publ. P.139–140.

Nefediev P.S., Nefedieva J.S. 2007b. [Biogeographical character-

istic of the millipede fauna in the southeast of Western Siberia] // Ostroverkhova K.G. (ed.). Birozanobrazie bespovoznoch-

nykh zhivotnykh. Sbornik materialov II Vserossiiskoi shkoly-


Nefediev P.S., Nefedieva J.S. 2008a. [A historical review of fau-

nistic investigations of millipedes (Diplopoda) in western Si-

beria] // Vazhov V.M. (ed.). Altai: ekologiya i prirodopolo-

vanie. Trudy VII Rossiiskogo mongolskogo nauchnovo konferentsii molodzych uchionykh i studentov. Vol.1. Biysk: Biysk Pedag-

ogical State University Publ. P.117–120 [in Russian].

Nefediev P.S., Nefedieva J.S. 2008b. Zoogeographical analysis of the millipede fauna (Diplopoda) in the south-east of Western Siberia // Myriapoda and Onychophora of the World Diversity, Biology and Importance. Abstracts of 14th International Con-


Nefediev P.S., Nefedieva J.S. 2013. [Biodiversity and ecology of millipedes in the environs of Lake Teletskoye (Diplopoda)] // Izvestiya Altaiiskogo gosudarstvennogo universiteta. Biologi-


Nefedieva J.S., Nefedev P.S., Sakhnevech M.B., Dyachkov Iu.V. 2014. Distribution of millipedes (Diplopoda) along an altitudi-

nal gradient in the south of Lake Teletskoye, Altai Mts // Tuf I.H., Tajovsky K. (eds.). 16th International Congress of Myri-

apodology. Book of abstracts. Institute of Soil Biology, BC ASCR & Faculty of Science, Palacky University, Olomouc. P.65.

Nefediev J.S., Nefedev P.S., Sakhnevech M.B., Dyachkov Yu.V. 2015. Distribution of millipedes (Diplopoda) along an altitudi-


Stuxberg A. 1876. Myriopoder dö Sibieren und Waigatsch on samlade under Nordenskiöldsk expeditionen 1875 // Öfver-

P.S. Nefediev