

A review of the millipede fauna of Siberia (Diplopoda)

Обзор двупарноногих многоножек фауны Сибири (Diplopoda)

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КЛЮЧЕВЫЕ СЛОВА: Diplopoda, фауна, распространение, таксономия, новый вид, новое семейство, Сибирь, Россия.

ABSTRACT: A new review of the millipede fauna of Siberia, Russia is provided, with 46 species or subspecies involved. Numerous new faunistic records are given. *Sibiriulus multiricus* sp.n. is described as new, while *Altajella pallida* Gulička, 1972 and *Teleckophoron montanum* Gulička, 1972, both redescribed based on new material, as well as the oligotypic Central Asian genus *Elongeuma* Golovatch, 1982 are assigned to a new family, Altajellidae fam.n. The following new synonymy is advanced: *Craspedosoma dahuricum* Gerstfeldt, 1859 = *Orientylla mikhailjovae* (Shear, 1990) = *Orientylla dahurica* (Gerstfeldt, 1859), syn.n. Variation in both subspecies of *Julus ghilarovi* Gulička, 1963 is elucidated and discussed. Both *Cylindroiulus latestriatus* (Curtis, 1845) and *Asiatyella communicantis* (Golovatch, 1977) are formally new to the fauna of Siberia. A brief zoogeographical analysis is presented.

РЕЗЮМЕ: Дан новый обзор фауны многоножек-диплопод Сибири (Россия), где обнаружено 46 видов и подвидов. Приведены многочисленные новые фаунистические данные. Вид *Sibiriulus multiricus* sp.n. описан как новый для науки, а *Teleckophoron montanum* Gulička, 1972 и *Altajella pallida* Gulička, 1972, переопределяемые по новому материалу, помещены наряду с олиготипическим среднеазиатским родом *Elongeuma* Golovatch, 1982 в состав нового семейства Altajellidae fam.n. Предложена следующая новая синонимика: *Craspedosoma dahuricum* Gerstfeldt, 1859 = *Orientylla mikhailjovae* (Shear, 1990) = *Orientylla dahurica* (Gerstfeldt, 1859), syn.n. У обоих подвидов *Julus ghilarovi* Gulička, 1972 прослежена морфологическая изменчивость. Виды *Cylindroiulus latestriatus* (Curtis, 1845) и *Asiatyella communicantis* (Golovatch, 1977) формально впервые указаны для территории Сибири. Представлен краткий зоогеографический анализ.

Introduction

Knowledge of the diplopod fauna of Siberia, Russia is still highly incomplete and fragmentary, although the first

relevant publications appeared long ago, in the 19th century [Gerstfeldt, 1859; Stuxberg, 1876a, b; Haase, 1880]. Later, Lohmander [1933] indirectly mentioned a few forms from that territory, followed by the works of Gulička [1963, 1972], Hoffman [1975], Lokšina & Golovatch [1979], Mikhailjova [1979, 1981, 1984, 1998a, 2000], Golovatch [1979, 1992], Enghoff [1985], Shear [1988, 1990], and Shelley [1998]. Mikhailjova [1993] provided a review of the diplopod fauna of Siberia and the Russian Far East, with 36 species listed in Siberia alone. In addition, the ecology of some of Siberian millipedes has been addressed [Kozlovskaya, 1965; Rybalov, 1991; Vorobiova, 1999]. Finally Mikhailjova [1998b], in her newest review of the fauna of the Far East of Russia, referred to a few species shared with the fauna of Siberia.

The present paper focuses on the diplopod fauna of Siberia, an extremely vast territory lying between the Ural Mountains and the Russian Far East [cp. Mikhailjova, 1993, 1998b], as based on abundant material accumulated during the last few years. A few old samples have been located and properly treated here as well. All illustrations have been executed by the first author.

Material

Material treated herein has been collected by and/or received through S.K. Alekseyev (S.A.) (Kaluga), E. Anisova (E.A.) (Moscow), A.E. Brinev (A.B.) (Moscow), N. Chumerina (N.Ch.) (Moscow), R.Yu. Dudko (R.D.) (Moscow), S.I. Golovatch (S.G.) (Moscow), V.G. Gratshev (V.G.) (Moscow), D.H. Kavanaugh (D.K.) (San Francisco, California, U.S.A.), D.V. Logunov (D.L.) (Novosibirsk), I. Lyubchansky (I.L.) (Moscow), Yu.M. Marusik (Y.M.) (Magadan), A.V. Matalin (A.M.) (Moscow), D.V. Obyedov (D.O.) (Moscow), S.V. Ovchinnikov (S.O.) (Bishkek), L.B. Rybalov (L.R.) (Moscow), A.B. Ryvkin (A.R.) (Moscow), A.V. Tanasevitch (A.T.) (Moscow), and I.A. Ushakov (I.U.) (Moscow). These collections have been returned to or shared with the Zoological Museum of the State University of Moscow (ZMUM), Institute of Biology and Soil Science, Vladivostok (IBSV), Siberian Zoological Museum, Novosibirsk (ZMUN), Department of Entomology, California Academy of Sciences (CAS).

Taxonomic part

Angarozonium amurense (Gerstfeldt, 1859)

Polyzonium germanicum — Stuxberg, 1876a: 36; 1876b: 317.

Polyzonium cyathiferum Mikhajlova, 1981: 781, figs.

Polyzonium cyathiferum — Rybalov, 1991: 87; Mikhajlova, 1993: 8, map.

Angarozonium amurense — Shelley, 1998: 29; Mikhajlova, 1998a: 4; 1998b: 12, map, figs.

Material: 23 ♂♂, 12 ♀♀, 5 juv. (IBSV) 15 ♂♂, 3 ♀♀, 6 juv. (ZMUM), Russia, Krasnoyarsk Prov., Turukhansk Distr., Mirnoe, 13-23.VI.1988. — 5 ♂♂, 3 ♀♀ (IBSV), same locality, 8-18.VIII.1988. — 1 ♀ (ZMUM), same locality, 10-20.VIII.1988. — 10 ♂♂, 6 ♀♀ (ZMUM), same locality, 8-18.VI.1989. — 21 ♂♂, 12 ♀♀ (IBSV), 5 ♂♂, 3 ♀♀, 2 juv. (ZMUM), same locality, pitfall traps, 9-19.VI.1989. — 5 ♂♂, 2 ♀♀ (ZMUM), same locality, pitfall traps, 10-20.VI.1989. — 7 ♂♂, 10 ♀♀, 15 juv. (ZMUM), same locality, 1-11.VII.1989. — 3 ♂♂, 5 ♀♀, 1 juv. (ZMUM), same locality, 2-12.VII.1989. — 1 ♂, 1 juv. (ZMUM), same locality, 3.VII.1989. — 1 ♂, 3 ♀♀, 2 juv. (ZMUM), same locality, 4.VII.1989. — 13 ♂♂, 13 ♀♀, 4 juv. (ZMUM), same locality, 5-15.VIII.1989. — 1 ♀, 4 juv. (ZMUM), same locality, 6.VIII.1989. — 2 ♂♂, 1 ♀ (ZMUM), same locality, 7.VIII.1989. — 4 ♂♂, 2 ♀♀, 1 juv. (ZMUM), same locality, 9.VIII.1989. — 57 ♂♂, 37 ♀♀, 20 juv. (ZMUM), same locality, 18-28.VI.1990. — 20 ♂♂, 7 ♀♀, 3 juv. (ZMUM), same locality, 19-29.VI.1990. — 10 ♂♂, 13 ♀♀, 9 juv. (ZMUM), same locality, 20-30.VI.1990. — 2 ♀♀, 7 juv. (ZMUM), same locality, 23.VI.1990. — 1 ♂, 1 juv. (ZMUM), same locality, 25.VI.1990. — 1 ♂, 3 ♀♀, 4 juv. (ZMUM), same locality, 26.VI.1990. — 1 juv. (ZMUM), same locality, 4.VII.1990. — 2 juv. (ZMUM), same locality, 8.VII.1990. — 9 ♂♂, 5 ♀♀, 3 juv. (ZMUM), same locality, 6-17.VII.1990. — 7 ♂♂, 6 ♀♀ (ZMUM), same locality, 6-20.VII.1990. — 1 ♀ (ZMUM), same locality, 7.VII.1990. — 9 ♂♂, 2 ♀♀ (ZMUM), same locality, 1-11.VIII.1990. — 1 juv. (ZMUM), same locality, 13.VIII.1990. — 1 ♂, 2 ♀♀, 3 juv. (ZMUM), same locality, 4.VIII.1990. — 5 ♂♂, 2 ♀♀, 2 juv. (ZMUM), same locality, 2-12.VIII.1990. — 7 ♂♂, 1 ♀, 1 juv. (ZMUM), same locality, 8.VIII.1990. — 1 ♂, 1 juv. (ZMUM), same locality, VI.1991. — 6 ♂♂, 4 ♀♀, 1 juv. (ZMUM), same locality, 12-22.VI.1991. — 2 ♂♂ (ZMUM), same locality, 5-15.VII.1991. — 4 ♂♂, 3 ♀♀, 3 juv. (IBSV), same locality, Elogui, 7-17.VII.1989. — 1 ♂, 4 ♀♀, 4 juv. (ZMUM), same locality, 23.VII.1990. — 3 ♂♂, 2 ♀♀ (ZMUM), same locality, environs of Bakhta, 12-15.VII.1995. — 1 ♀, 2 juv. (ZMUM), same locality, 13.VII.1995. — 10 ♂♂, 13 ♀♀ (ZMUM), same locality, environs of Goroshikha, 24-30.VIII.1994. — 18 ♂♂, 14 ♀♀ (ZMUM), same locality, 25-31.VIII.1994. — 2 ♀♀ (ZMUM), same locality, 27.VIII.1994. — 4 ♀♀ (ZMUM), same locality, 18-22.VII.1995. — 2 ♂♂ (ZMUM), same locality, 21.VII.1995. — 1 ♀ (ZMUM), same Province, Yeniseysk Distr., environs of Ust-Pit, 29-30.VII.1994. — 51 ♂♂, 49 ♀♀, 6 juv. (ZMUM), same locality, 30.VII-6.IX.1994. — 1 ♀ (ZMUM), same locality, 6.IX.1994. — 18 ♂♂, 10 ♀♀ (ZMUM), same locality, 7-6.IX.1994. — 3 ♂♂, 1 ♀, 1 juv. (ZMUM), same locality, 8.IX.1994. — 6 ♂♂, 6 ♀♀ (ZMUM), same locality, 2-10.VII.1995. — 2 ♂♂, 4 ♀♀, 4 juv. (ZMUM), same locality, 9.VII.1995. — 4 ♂♂, 11 ♀♀, 2 juv. (ZMUM), same locality, 10.VII-26.VIII.1995. — 3 ♂♂, 1 ♀ (ZMUM), same Province, Predvinsk, VI.1995. — 1 ♀ (ZMUM), same Province, Evenkiya, Birebchana River, 13-23.VII.1989. — 1 ♂, 1 ♀ (ZMUM), same locality, 14-23.VII.1989. — 1 ♂, 1 ♀ (ZMUM), same locality, 14-24.VII.1990. — 3 ♂♂, 3 ♀♀ (ZMUM), same locality, 15-25.VII.1990. — 3 ♂♂, 5 ♀♀ (ZMUM), same locality, 16-26.VII.1990; all leg. L.R. — 1 ♂ (ZMUM), same Province, Tungusko-Chumsk Distr., Tungusky Nature Reserve, Kulik's huts, 28.VIII.1994. — 2 ♂♂, 2 ♀♀, 1 juv. (ZMUM), same locality, near Vanavara, 19.VIII.1994. — 1 ♂, 1 ♀ (ZMUM), same locality, 21.VIII.1994; all leg. A.R. — 1 ♀ (ZMUM), same Prov., Turukhansk Distr., Central Siberian Biosphere Nature Reserve, Yuzhnyi, 7.X.1994. — 1 ♂, 1 ♀ (ZMUM), same locality, 8.X.1994. — 1 ♂, 1 ♀, 1 juv. (ZMUM), same locality, near Komsa, 10.IX.1994; all leg. I.U. — 6 ♂♂, 3 ♀♀ (ZMUM), central Yakutia, Nizhny Bestyakh, Tomtor, 62°9'N 130°1'E, *Abies* forest, 8-27.VII.1990, leg. S.A.

REMARKS: Originally described as *Platydesmus amurensis* from near the mouth of Songari River, China [Gerstfeldt, 1859], then transferred to *Polyzonium* [Mikhajlova, 1981], finally reassigned to *Angarozonium* and also considered as a senior subjective synonym of *Polyzonium cyathiferum* Mikhajlova, 1981 [Shelley, 1998].

Cylindroiulus latestriatus (Curtis, 1845)

Material: 1 ♂ (IBSV), 1 ♂, 4 ♀♀ (ZMUM), Altai Mts, Chonbilibiuli, 27.VII.1988; leg. S.O.

REMARKS: This anthrochorous species widely distributed in Europe and introduced to the Americas is herewith recorded in mainland Asia for the first time. In Asia, *C. latestriatus* has hitherto been reported only from the Kunashir Island, Kuriles [Mikhajlova, 1998a, b]. Both Asian records are definitely introductions through human agency.

Julus ghilarovi ghilarovi Gulička, 1963

Julus ghilarovi Gulička, 1963: 521, figs

Julus ghilarovi ghilarovi — Lokšina & Golovatch, 1979: 386; Mikhajlova, 1993: 11, figs.

Material: 3 ♂♂, 4 ♀♀, 1 juv. (ZMUM), Russia, Krasnoyarsk Prov., Sayano-Shushensky Nature Reserve, mouth of Ottug-Sug River, 8-19.VII.1990. — 4 ♂♂, 33 ♀♀, 3 juv. (ZMUM), same locality, 12.VII.1990. — 1 ♂, 2 ♀♀, 6 juv. (ZMUM), same locality, 27.VII-6.VIII.1990. — 1 ♂, 5 ♀♀, 39 juv. (ZMUM), same locality, 7-17.VII.1991. — 2 ♂♂, 6 ♀♀, 21 juv. (ZMUM), same locality, 5-15.VIII.1991. — 2 ♂♂, 1 juv. (ZMUM), same locality, 6.VII.1992. — 3 ♀♀, 2 juv. (ZMUM), same locality, 2-12.VII.1992. — 1 ♂, 10 juv. (ZMUM), same locality, 5-15.VII.1993. — 3 ♀♀ (ZMUM), same locality, Lake Ekspeditsionnoe, 14.VII.1992. — 1 ♂, 5 ♀♀ (ZMUM), same locality, 25.VII-20.VIII.1993; all leg. L.R. — 1 ♀ (ZMN), Republic Khakassia, Shira Distr., ca. 1 km S of Kommunar, 1,300-1,400 m a.s.l., montane moss-stony tundra, 23.VII.1990. — 4 ♂♂, 3 ♀♀, 1 juv. (ZMN), Novosibirsk Area, 30-35 km E of Novosibirsk, Koltsovo, humid glades in *Betula* woodland, 2.IX.1994. — 5 ♂♂, 8 ♀♀, 8 juv. (ZMN), same Area, Iskitim Distr., Malinovka, mesophytous meadow, 15.VIII.1987; all leg. D.L. — 1 ♂ (ZMUM), Kemerovo Area, Tashtagol, 17.VIII.1990; leg. N.Ch. & E.A. — 1 ♀ (ZMUM), same Area, near Belogorsk, Kuznetsky Alatau Nature Reserve, near mouth of Bezymianka River, 14.VII.1994. — 2 ♂♂, 5 ♀♀ (ZMUM), same locality, 16.VII.1994. — 1 ♂, 1 ♀, 19 juv. (ZMUM), same locality, 1.5-2 km upstream of Bezymianka River mouth, Kiya River, 17.VII.1994; all leg. A.R. — 3 ♂♂, 5 ♀♀, 23 juv. (ZMUM), same locality, ca. 16 air-km SW Belogorsk, Kiya River, Bezymianka River delta, riverine taiga, 14-17.VII.1994; leg. S.G. & A.R. — 22 ♂♂, 17 ♀♀, 25 juv. (ZMUM), same locality, Mt. Bolshaya Tserkovnaya, 26 air-km SSW Belogorsk, 1,300-1,450 m a.s.l., upper timberline, 26.VIII.1993. — 17 ♂♂, 11 ♀♀, 25 juv. (ZMUM), same locality, delta of Malaya Bezymianka River, ca. 19 air-km SSW of Belogorsk, *Abies* + *Pinus* taiga, 500 m a.s.l., 27-31.VIII.1993. — 1 ♀ (ZMUM), same locality, ca. 16 air-km SW of Belogorsk, *Abies* + *Pinus* taiga with *Betula*, *Salix* etc. along stream, 420 m a.s.l., 1-5.IX.1993; all leg. S.G. & V.G. — 4 juv. (ZMUM), same locality, Mt. Tigirtish, upper reaches of Amzas River, 1,000 m a.s.l., taiga, 26.IX.1997; leg. R.D. & I.L. — 2 ♀♀ (ZMUM), same Area, Novokuznetsk Distr., *Tilia* insular forest (= Lipovyi ostrov), Malyy Tesh River, ca. 10 km E of Kuzedeyevo, 19.VII.1994. — 2 ♂♂, 9 ♀♀, 7 juv. (ZMUM), same locality, 20.VII.1994; leg. A.R. — 5 ♂♂, 18 ♀♀, 103 juv. (ZMUM), same locality, 20-24.VII.1994; leg. S.G. & A.R. — 1 ♂ (IBSV), 8 ♂♂, 5 ♀♀, 4 juv. (ZMUM), same locality, 21.VII.1994; all leg. A.R. — 1 ♀ (ZMUM), same locality, environs of Mezhdurechensk, right bank of Us River, 3 km upstream of mouth, 23.IX.1997; leg. R.D. & I.L. — 1 ♀ (ZMUM), Altai Mts, Pass Seminsky, 27.VII.1990. — 4 ♀♀ (ZMUM), Altai Mts, Altaiskoe, VI.1992; all leg. S.O. — 1 ♂, 2 ♀♀ (ZMUM), Altai Mts, environs of Gorno-Altai, 29.V.1996. — 4

juv. (ZMUM), same locality, dry *Pinus* woodland, litter, 31.V.1998. — 2 ♂♂, 2 ♀♀, 1 juv. (ZMUM), Altai Mts, environs of Aktash, ca. 600 m a.s.l., 30.V.1996; all leg. A.M. & A.B. — 1 ♂, 1 ♀, 1 juv. (ZMUM), Altai Mts, Lake Teletskoe, Artybash, 21.VII.1990; leg. S.O. — 7 ♂♂, 15 ♀♀, 48 juv. (ZMUM), 2 ♂♂, 2 ♀♀ (IBSV), same locality, *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 500–800 m a.s.l., 13–24.VII.1997. — 3 ♀♀, 8 juv. (ZMUM), same locality, high bog in *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 800 m a.s.l., 20.VII.1997; all leg. S.G. & A.T. — 27 ♂♂, 19 ♀♀, 15 juv. (ZMUM), same locality, near Lake Chiri, subalpine belt (= goltsy), 1,750–2,000 m a.s.l., 29–30.VII.1997. — 7 ♂♂, 4 ♀♀, 7 juv. (ZMUM), same locality, upper timberline of *Picea obovata* + *Pinus sibirica* taiga, mainly near water, 1,700–1,750 m a.s.l., 29.VII–1.VIII.1997. — 30 ♂♂, 20 ♀♀, 63 juv. (ZMUM), 2 ♂♂ (IBSV), same locality, Chiri, upper reaches of Chiri River, *Picea obovata* + *Pinus sibirica* taiga forest, 1,350 m a.s.l., 28–29.VII and 2.VIII.1997; all leg. S.G. & A.T.

REMARKS: This subspecies, originally described from the Kemerovo Area [Gulička, 1963] and, later, redescribed from new samples [Mikhaljova, 1993], appears to be rather variable. Body coloration varies from dark brown via reddish castaneous to light brown. The flagella of the anterior gonopods are very long and well projecting beyond the gonopod tips in specimens from both Iskitim District, Novosibirsk Area and Altaisky Nature Reserve (near Lake Chiri), Altai Mts, in contrast to short flagella in the males from other places of the Novosibirsk Area and the Altai as well as the Kemerovo Area, the Republic of Khakassia, and the Krasnoyarsk Province. The shape of the outer outgrowth of the opisthomerite varies from styletiform to relatively broad, while the notch between both outgrowths is as deep as 1/3 to 2/3 opisthomerite height. The large coxal process of ♂ leg 2 is provided with a posterior uncus which is absent from both subadult males and *J. g. brachydactylus*. The vulva is quite constant in shape and structure.

Julus ghilarovi brachydactylus Gulička, 1972

Figs 1–3.

Julus ghilarovi brachydactylus Gulička, 1972: 44, figs.

Julus ghilarovi brachydactylus — Lokšina & Golovatch, 1979: 386; Mikhaljova, 1993: 10.

Material: 2 ♂♂, 3 ♀♀, 2 juv. (ZMUM), W-Altai, Ivanovsky Mt. Range, Mt. "Rossypnoi Belok", 2,000–2,300 m a.s.l., mountainous tundra, 1–2.VI.1996. — 2 ♀♀ (ZMUM), same locality, Gromotukha River, 1,400–1,600 m a.s.l., sparse *Larix* forest, 3–5.VI.1996; all leg. R.D. — 2 ♀♀ (ZMUM), Altai, Ust-Kan, ca. 1,400 m a.s.l., 27.VII.1994; leg. A.R. — 4 ♂♂, 2 ♀♀, 4 juv. (IBSV), 4 ♂♂ (ZMUM), same locality, E slope of Korgon Mt. Ridge, lower flow of Kuterghen River, 2 km S of Ust-Kan, ca. 1,200 m a.s.l., 12.VI.1998. — 3 ♂♂, 15 juv. (ZMUM), same locality, lower flow of Kuterghen River, 25 km S of Ust-Kan, ca. 2,000 m a.s.l., 15.VI.1998; all leg. A.M.

REMARKS: This subspecies, described from the Southwest Siberia, was stated to only differ from the nominotypical *J. ghilarovi ghilarovi* by the shorter and broader outer opisthomerite outgrowth coupled with the relatively shallow (only as deep as 1/3 opisthomerite height) notch between both outgrowths of the opisthomerite [Gulička, 1972]. The fresh material from the West Altai displays the following variation in opisthomerite shape: the notch is a little deeper than shown in the illustrations accompanying the original description. In addition, the ♂ telopodite 1 is setose throughout, not only externally (Fig. 1): the large coxal process of ♂ leg 2 is devoid of a posterior uncus both in adults and subadults, while the second coxal process is short and very slender (Figs 2, 3). The vulva is not distinguishable from that of *J. g. ghilarovi*.

It still remains to be proved that both Southwest Siberian forms of *Julus* are indeed subspecies, not just varieties of a

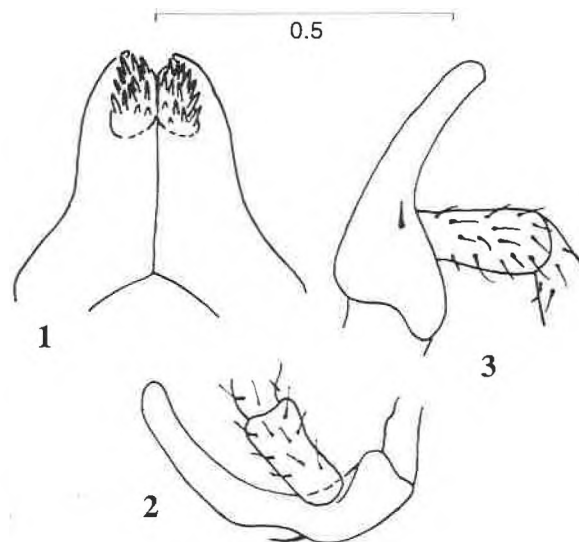


Fig. 1–3. *Julus ghilarovi brachydactylus* Gulička, 1972, ♂: 1 — leg-pair 1; 2, 3 — coxal processes of leg pair 2 (lateral and front views, respectively). Scale bar in mm.

Рис. 1–3. *Julus ghilarovi brachydactylus* Gulička, 1972, ♂: 1 — пара ног 1; 2, 3 — коксальные отростки пары ног 2 (соответственно снаружи и спереди). Масштаб в мм.

single species. More material is necessary to reveal the variation range, both individual and geographical, of these two taxa, as the distinctions between them are quite shaky [cp. Mikhaljova, 1993].

Megaphyllum aff. *sjaelandicum* (Meinert, 1868)

Megaphyllum aff. *sjaelandicum* — Golovatch, 1992: 380; Mikhaljova, 1993: 12.

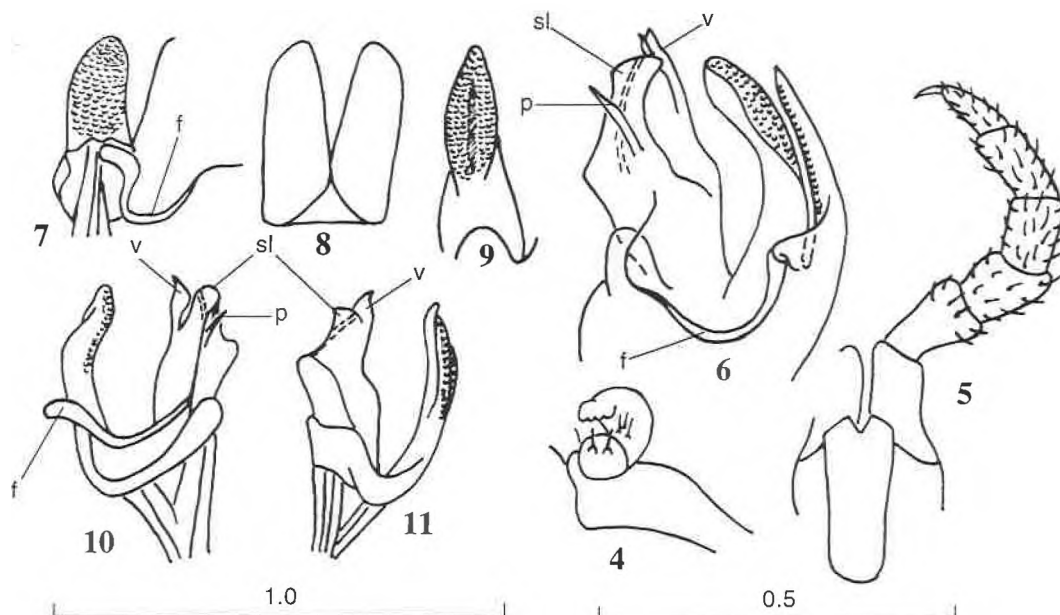
REMARKS: The only record of this still undescribed species is in the West (= Rudnyi) Altai, East Kazakhstan [Golovatch, 1992]. Formally, this administrative area lies a little beyond Siberia proper but biogeographically as well as geologically it definitely belongs to the Altai system.

Pacifiulus amurensis (Gerstfeldt, 1859)

Pacifiulus imbricatus — Mikhaljova, 1993: 12

Pacifiulus amurensis — Mikhaljova, 1998a: 5; 1998b: 64, map, figs.

Material: 2 ♂♂, 23 ♀♀, 11 juv. (ZMN), Republic Tuva, Pit-Khem Distr., Uyuksky Mt. Range, 800–1,000 m a.s.l., *Larix-Betula* forest, 21–23.V.1989; leg. D.L. — 1 ♂ (IBSV), Altai Mts, Lake Teletskoe, Altaisky Nature Reserve, near Lake Chiri, upper timberline of *Picea obovata* + *Pinus sibirica* taiga, mainly near water, 1,700–1,750 m a.s.l., 29.VII–1.VIII.1997; leg. S.G. & A.T. — 1 ♂, 1 ♀ (ZMUM), Krasnoyarsk Prov., Ermakovo Distr., West Sayan, 2–3 km N of Aradan, shingly bank of Belyi Us River, 840–850 m a.s.l., 8–9.VII.1990. — 2 ♂♂, 2 ♀♀ (ZMN), same locality, Oisky Mts, 8–10 km S of Lake Oiskoe, 1,600–1,700 m a.s.l., subalpine meadow + montane tundra, 10–11.VII.1990; leg. D.L. — 5 ♂♂, 2 ♀♀, 6 juv. (IBSV), 2 ♀♀ (ZMUM), same locality, Arghidzhek Station, 11.VIII.1994. — 6 ♂♂, 3 ♀♀ (IBSV), same locality, 13.VIII.1994. — 2 ♂♂, 2 ♀♀, 2 juv. (ZMUM), same locality, 15.VIII.1994; all leg. I.U. — 3 ♂♂, 7 ♀♀, 3 juv. (ZMUM), Sayano-Shushensky Nature Reserve, mouth of Ottug-Sug River, 12.VII.1990. — 2 ♂♂, 2 ♀♀ (ZMUM), same locality, 19.VII–26.VII.1990. — 1 ♂, 2 juv. (ZMUM), same locality, 9.VII.1991. —



Figs 4–11. *Sibirius multiricus* sp.n., ♂ paratype: 4 — leg pair 1 (caudal view); 5 — leg pair 2 (caudal view); 6 — gonopods (mesal view); 7 — promerite (caudal view); 8 — same (front view); 9 — mesomerite (front view); 10 — mesomerite and opisthomerite (mesal view); 11 — same (lateral view); f — flagellum; p — process of opisthomerite; sl — "solenomerite"; v — velum. Scale bar in mm.

Рис. 4–11. *Sibirius multiricus* sp.n., ♂ паратип: 4 — пара ног 1 (вид сзади); 5 — пара ног 2 (вид сзади); 6 — гониподии (вид изнутри); 7 — промерит (вид сзади); 8 — то же (вид спереди); 9 — мезомерит (вид спереди); 10 — мезомерит и опистомерит (вид изнутри); 11 — то же (вид сбоку); f — жгутик; p — отросток опистомерита; sl — соленомерит; v — велум. Масштаб в мм.

1 ♂ (ZMUM), same locality, 5–15.VIII.1991. — 2 ♂♂, 2 ♀♀, 13 juv. (ZMUM), same locality, 2–12.VII.1992. — 3 juv. (ZMUM), same locality, 31.VII–10.VIII.1992. — 1 ♀, 4 juv. (ZMUM), same locality, 17–27.VII.1993. — 2 ♂♂, 2 ♀♀ (IBSV), 21 ♂♂, 40 ♀♀, 34 juv. (ZMUM), same locality, Lake Ekspeditsionnoe, 14.VII.1992. — 3 ♂♂ (IBSV), 1 ♂, 3 ♀♀ (ZMUM), same locality, 14–19.VII.1992. — 10 ♂♂, 5 ♀♀, 18 juv. (ZMUM), 2 ♀♀, 5 juv. (IBSV), same locality, 18.VII.1992; all leg. L.R.

REMARKS: This species is widespread in Asian Russia, with *P. imbricatus* [cp. Mikhajlova, 1982] being its junior synonym [Mikhajlova, 1998a]. In the Far East of Russia, only parthenogenetic populations have been revealed while in Siberia, from the Altai Mts to the Republic of Tuva, only bisexual populations are known to occur. The above synonymy is currently reconfirmed based on type material (see below Remarks under *Orientyla dahurica*).

Sibirius altaicus Gulička, 1972

Cylindroiulus (Sibirius) altaicus Gulička, 1972: 44, fig.

Sibirius altaicus — Lokšina & Golovatch, 1979: 387; Mikhajlova, 1993: 13.

REMARKS: Originally described from the environs of Lake Ayu-Kol, southeastern Altai [Gulička, 1972], this species seems to be restricted to its terra typica.

Sibirius dentiger Gulička, 1963

Cylindroiulus (Sibirius) dentiger Gulička, 1963: 519, figs.

Sibirius dentiger — Lokšina & Golovatch, 1979: 386; Mikhajlova, 1993: 14, figs.

Material: 1 ♂, 1 ♀ (ZMN), Novosibirsk, near Koltsovo, *Betula* forest, litter, 26.IV.1987. — 3 ♂♂, 6 ♀♀ (ZMN), 30–35 km E of Novosibirsk, Koltsovo, humid glades in *Betula* woodland, 2.IX.1994. — 1 ♂, 1 ♀ (ZMN), same locality, *Betula* forest, litter, 26.IV.1987; all leg. D.L. — 3 ♂♂, 20 ♀♀, 13 juv. (ZMUM), Kemerovo Area,

Kuznetsky Altai Nature Reserve, Mt. Bolshaya Tserkovnaya, 26 air-km SSW Belogorsk, 1,300–1,450 m a.s.l., upper timberline, 26.VIII.1993. — 5 ♂♂, 9 ♀♀, 13 juv. (ZMUM), same locality, delta of Malaya Bezymianka River, ca. 19 air-km SSW of Belogorsk, *Abies + Pinus sibirica* taiga, 500 m a.s.l., 27–31.VIII.1993. — 1 ♂, 2 ♀♀, 5 juv. (ZMUM), same locality, ca. 16 air-km SW of Belogorsk, *Abies + Pinus sibirica* taiga with *Betula Salix* etc. along the stream, 420 m a.s.l., 1–5.IX.1993; all leg. S.G. & V.G. — 2 ♂♂, 9 juv. (ZMUM), same locality, near mouth of Bezymianka River, 14.VII.1994. — 1 ♀ (ZMUM), same locality, 1 km upstream of Kiya River mouth, 15.VII.1994. — 1 ♂, 6 ♀♀, 9 juv. (ZMUM), same locality, mouth of Bezymianka River, 16.VII.1994. — 1 ♀ (ZMUM), same locality, Kiya River, 1.5–2.0 km upstream of Bezymianka River mouth, 17.VII.1994; all leg. A.R. — 5 ♂♂, 5 ♀♀, 9 juv. (ZMUM), same locality, ca. 16 air-km SW of Belogorsk, Kiya River, Bezymianka River delta, riverine taiga, 14–17.VIII.1994; leg. S.G. & A.R. — 1 ♂, 8 juv. (ZMUM), same Area, Novokuznetsk Distr., ca. 10 air-km E of Kuzedeyevo, *Tilia* insular forest (= Lipovyi ostrov), 450–550 m a.s.l., 19.VII.1994; leg. A.R. — 1 ♂, 5 ♀♀, 14 juv. (ZMUM), same locality, 20–24.VII.1994; leg. S.G. & A.R. — 1 ♂, 1 ♀, 1 juv. (ZMUM), same locality, 23.VII.1994. — 1 ♀ (ZMUM), same locality, 23.VIII.1994; all leg. A.R.

REMARKS: This species, originally described from near Prokopyevsk, Kemerovo Area, Siberia [Gulička, 1963], has already been redescribed elsewhere [Mikhajlova, 1993]. It appears to be quite widespread in West and Southwest Siberia.

Sibirius multiricus Mikhajlova, sp.n.

Figs 4–11.

Holotype: 1 ♂ (ZMUM), Altai Mts, Katunsky Mt Range, Katunsky Nature Reserve, near Multa, Lake Sredneye Multinskoye, ca. 30 air-km SE of Ust-Koksa, 1,600–2,200 m a.s.l., 30.VII–5.VIII.1994; leg. S.G. & A.R. — Paratypes: 1 ♂, 5 ♀♀, 3 juv. (IBSV), same locality, together with holotype. — 1 ♀ (ZMUM), Altai Mts, upper reaches of Charysh River, Ust-Kan, 1,400 m a.s.l., *Larix + Picca* forest, litter and rotten wood, 27.VII.1994; all leg.

S.G. & A.R. — 2♀♀, 2 juv. (ZMUM), same locality, Lake Teletskoe, near delta of Chulyshman River, *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 650 m a.s.l., 13–24.VII.1997. — 1 ♀ (ZMUM), same locality, Altai Nature Reserve, Korbu Waterfalls, *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 600 m a.s.l., 17.VII.1997; all leg. S.G.

NAME: The specific epithet refers to the locus typicus (Lake Sredneye Multinskoye near Multa).

DIAGNOSIS: Differs from congeners by the absence of setae on nearly all metazonites except for a few in front of the telson, the absence of a massive inner process in the distal part of the opisthomerite, and the unmodified apex of the mesomerite.

DESCRIPTION: Male body 15–17 mm long, 0.8–0.9 mm in diameter, with 41(–1) to 42(–1) segments regardless of telson. Female body 17–18.5 mm long, 1.1–1.2 mm in diameter. Coloration in alcohol from dark brown with reddish tinge to pale brown; venter paler. A thin, dark, axial line on dorsum distinguishable. Each ring with a dark spot level to ozopore. Pro- and metazonites with oval marble spots closer to venter. Collum almost entirely marble brown, only fore and rear margins dark brown. Legs pale brown. Antennae brown.

Ca. 30 black ocelli in a subquadrate-rounded eye on each side of head. Vertigial setae 1+1. Antennae medium-sized, rather slender and clavate. Male and female antennomere 5 with an incomplete distodorsal corolla of six minute sensory bacilli.

Cardo not swollen, without setae, rather poorly visible when head viewed from above. Gnathochilarium normal, with 1 seta on outer sides and with several short setae in mesal part of stipites, lamellae linguales contiguous, each with 2 long distal setae.

Body somewhat compressed laterally, slightly tapering toward telson. Suture dividing pro- and metazona thin, rather well constricting both zonites. Ozopores small, lying behind suture without touching latter. Metazona entirely striate longitudinally, with striae failing to reach hind margin; 5 striae in a lateral square with its side equal to midbody metazonital length. Prozonital surface smooth, only on male somite 7 delicately striate ventrally. Most of metazonites bare, only 2–3 metazona immediately in front of telson with a few thin setae subventrally; a thin seta at hind tergal edge on each of metazonites 1, 3, 4 or 5 just in front of telson. Telson with several thin setae on preanal ring. Anal valves densely setose, with a short, cylindrical, straight epiproct carrying a small claw directed caudad and somewhat ventrad. Anal scale subtriangular, setose only along caudad edge.

Legs thin, short; claws normal. ♂ leg 1 (Fig. 4) unciform, setose ventrally, papillate apically. ♂ legs 2 (Fig. 5) unmodified, penes flattened, notched triangularly at tip.

Gonopods with meso- and opisthomerites of subequal height (Fig. 6). Promerite (Figs 7, 8) flattened, caudally papillate, its flagellum (f) filiform distally. Mesomerite (Fig. 9) slightly and regularly bent caudad, its front surface papillate, its apex simple. Opisthomerite (Figs 10, 11) with a simple and broad solenomerite (sl). Velum (v) membranous with a pointed tip. A midway mesal styliform process (p) (?phylacum) on inner side of opisthomerite.

Orinisobates microthylax Enghoff, 1985

Orinisobates microthylax Enghoff, 1985: 51, figs.

Orinisobates microthylax — Mikhailova, 1993: 12, map. 16: 1998b: 73, map. figs.

REMARKS: This parthenogenetic species is widespread over the Far East of Russia (Kamchatka, Sakhalin, Kuriles, Maritime and Khabarovsk provinces), also recorded in Buryatia. East Siberia [Enghoff, 1985; Mikhailova, 1993, 1998b].

Orinisobates sibiricus (Gulička, 1963)

Isobates sibiricus Gulička, 1963: 522, figs.

Isobates (Orinisobates) sibiricus — Gulička, 1972: 45, fig.

Orinisobates sibiricus — Lokšina & Golovatch, 1979: 387; Enghoff, 1985: 53, figs; Mikhailova, 1993: 16.

Material: 1 ♂, 1 ♀, 1 juv. (ZMN), Republic Tuva, Pit-Khem Distr., Uyuksky Mt. Range, 800–1,000 m a.s.l., *Larix* + *Betula* forest, 21–23.V.1989. — 13 ♂♂, 6 ♀♀, 4 juv. (ZMN), same locality, ca. 5 km NW of Sesslerig, 1,000–1,100 m a.s.l., mixed forest, litter, 24–25.VII.1989. — 3 ♂♂, 1 ♀ (IBSV), 2 ♂♂, 2 ♀♀, 1 juv. (ZMUM), same Republic, Todzhinskoe Upland, NW environs of Lake Azas, ca. 900 m a.s.l., under barks of *Betula*, *Populus tremula* and *Larix dahurica*, 19–23.VI.1989; all leg. D.L. — 2 juv. (ZMUM), S. Altai Mts, Katunsky Nature Reserve, 1–3.VII.1994; 1 juv. (ZMUM), same locality, 1.VIII.1994; all leg. A.R. — 1 ♂, 2 ♀♀ (ZMUM), Altai Mts, Ust-Kan Distr., Tyuguryuk Mt. Range, Pass Akhsas, ca. 15 air-km SE of Yabogan, 1,700 m a.s.l., *Larix dahurica*, *Picea obovata* & *Pinus sibirica* taiga, 28–29.VIII.1996; leg. S.G. — 1 ♂ (IBSV), Krasnoyarsk Prov., "Stolby" Nature Reserve, Canyon Synzhup, 12.VIII.1994; leg. A.R. — 1 ♂ (ZMUM), same locality, 18.VIII.1994. — 1 ♂ (IBSV), same locality, 22.VIII.1994; all leg. I.L. — 1 ♀ (ZMUM), Kemerovo Area, Novokuznetsk Distr., *Tilia cordata* insular forest (= Lipovyi ostrov), 10 km E of Kuzedeyevo, Malyi Tesh River, 19.VII.1994. — 2 ♂♂, 5 ♀♀, 1 juv. (ZMUM), same locality, 20.VII.1994; all leg. A.R.

REMARKS: Originally described from the Kemerovo Area [Gulička, 1963], this species appears to be widespread in Siberia (Krasnoyarsk Province, Altai Mts and Chita Area) [Mikhailova, 1993] as well as in the Dzhungarsky Alatau Mts, East Kazakhstan and Tian-Shan Mts, Kirghizia. Redescribed in due detail by Enghoff [1985].

Ghilarovia kygae Gulička, 1972

Ghilarovia kygae Gulička, 1972: 40, figs.

Ghilarovia kygae — Lokšina & Golovatch, 1979: 383; Shear, 1988: 55, figs; Mikhailova, 1993: 16.

Material: 7 ♂♂, 18 ♀♀, 46 juv. (ZMUM), Kemerovo Area, Kuznetsky Alatau Nature Reserve, Mt. Bolshaya Tserkovnaya, 26 air-km SSW of Belogorsk, 1,300–1,450 m a.s.l., upper timberline, 26.VIII.1993; leg. S.G. & V.G. — 2 ♂♂, 3 ♀♀, 4 juv. (IBSV), same locality, near mouth of Bezymianka River, 14.VII.1994. — 5 ♂♂, 7 juv. (ZMUM), same locality, 16.VII.1994. — 1 ♂, 1 ♀ (ZMUM), same locality, 1.5–2.0 km upstream of Bezymianka River mouth, 17.VII.1994; all leg. A.R. — 3 ♂♂, 10 ♀♀, 32 juv. (ZMUM), same locality, ca. 16 air-km SW of Belogorsk, Kiya River, Bezymianka River delta, riverine taiga, 14–17.VII.1994; leg. S.G. & A.R. — 1 ♀ (ZMUM), same locality, *Abies sibirica* + *Pinus sibirica* taiga with *Betula*, *Salix* etc. along the stream, 420 m a.s.l., 1–3.IX.1993; leg. S.G. & V.G. — 3 ♂♂, 17 ♀♀, 25 juv. (ZMUM), same Area, Novokuznetsk Distr., ca. 10 air-km N of Kuzedeyevo, *Tilia* insular forest (= Lipovyi ostrov), 450–550 m a.s.l., 20–24.VII.1994; leg. S.G. & A.R. — 20 ♀♀, 6 juv. (ZMUM), same locality, 20.VII.1994. — 1 juv. (ZMUM), same locality, 23.VII.1994; all leg. A.R. — 4 ♂♂, 10 ♀♀, 15 juv. (ZMUM), Altai Mts, Ust-Kan Distr., Tyuguryuk Mt. Range, Pass Akhsas ca. 15 air-km SE of Yabogan, 1,700 m a.s.l., *Larix*, *Picea obovata* & *Pinus sibirica* taiga, 28–29.VIII.1996. — 2 ♀♀, 27 juv. (ZMUM), Altai Mts, Lake Teletskoe, near delta of Chulyshman River, *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 650 m a.s.l., 13–24.VII.1997; all leg. S.G. — 7 ♂♂, 25 ♀♀, 70 juv. (ZMUM), same locality, near Artybash, *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 500–800 m a.s.l., 13–24.VII.1997; leg. S.G. & A.T. — 1 ♂, 8 ♀♀, 20 juv. (ZMUM), same locality, high bog in *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 800 m a.s.l., 20.VII.1997. — 9 juv. (ZMUM), same locality, Altai Nature Reserve, Korbu Waterfalls, *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 600 m a.s.l., 17.VII.1997; all leg. S.G. — 3 ♂♂, 7 ♀♀, 1 juv. (ZMUM), same locality, near Lake Chiri, subalpine belt (= goltsty), 1,750–

2,000 m a.s.l., 29–30.VII.1997. — 12 ♂♂, 5 ♀♀, 7 juv. (ZMUM), same locality, upper timberline of *Picea obovata* + *Pinus sibirica* taiga, mainly near water, 1,700–1,750 m a.s.l., 29.VII–1.VIII.1997. — 31 ♂♂, 30 ♀♀, 39 juv. (ZMUM), same locality, Lake Chiri, upper reaches of Chiri River, *Picea obovata* + *Pinus sibirica* taiga forest, 1,350 m a.s.l., 28–29.VII and 2.VIII.1997; all leg. S.G. & A.T.

REMARKS: Up to now, this species has only been known from the environs of Lake Teletskoe, Altai [Gulička, 1972] whence it has since been adequately redescribed by Shear [1988] as based on topotypes. As the above material shows, this species is quite widely distributed in the Altai Mts as well as in the Kuznetsky Alatau Mts and Gornaya Shoriya, southwestern Siberia.

Gulička [1972], when proposing his new genus *Ghilarovia*, assigned it to the new monotypic family Ghilaroviidae, with its diagnosis coinciding with that of the genus. By transferring *Ghilarovia* to Anthroleucosomatidae, Shear [1988] has implicitly synonymized the Ghilaroviidae with the Anthroleucosomatidae.

Ghilarovia novosibirica Shear, 1988

Ghilarovia novosibirica Shear, 1988: 56, figs.

Ghilarovia novosibirica — Mikhajlova, 1993: 16.

Material: 1 ♂ (IBSV), 2 ♂♂, 4 ♀♀ (ZMN), Novosibirsk Area, Iskitim Distr., Malinovka, mesophytous meadow, 15.VIII.1987; leg. D.L.

REMARKS: This species has hitherto been known only from the terra typica (Toguchin Distr., Novosibirsk Area) [Shear, 1988]. The above is a second locality, yet both seem to be confined to the northwestern spurs of Salair Mts.

Altajosoma bakurovi (Shear, 1990)

Diplomaragna bakurovi Shear, 1990: 23, figs.

Diplomaragna bakurovi — Mikhajlova, 1993: 18.

Altajosoma bakurovi — Mikhajlova, 2000: 161.

Material: 3 ♂♂, 3 ♀♀ (ZMN), Novosibirsk Area, Iskitim Distr., Malinovka, mesophytous meadow, 15.VIII.1987; leg. D.L. — 1 ♂, 1 ♀, 2 juv. (ZMUM), Krasnoyarsk Prov., Sayano-Shushensky Nature Reserve, Lake Ekspeditsionnoe, pitfall traps, 14–19.VII.1992; leg. L.R. — 3 ♂♂, 1 ♀ (IBSV), Kemerovo Area, Novokuznetsk Distr., ca. 10 air-km E of Kuzedeyev, Tilia insular forest (= Lipovy ostrov), 450–550 m a.s.l., 20–24.VII.1994; leg. S.G. & A.R. — 1 ♂ (IBSV), Altai Mts, Pass Seminsky, 27.VII.1990; leg. S.O. — 3 ♂♂, 3 ♀♀, 2 juv. (ZMUM), Altai Mts, Lake Teletskoe, near Artybash, *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 500–800 m a.s.l., 13–24.VII.1997. — 4 ♂♂ (IBSV), 1 ♂ (ZMUM), same locality, high bog in *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 800 m a.s.l., 20.VII.1997; all leg. S.G. & A.T.

REMARKS: This species, originally described in *Diplomaragna* [Shear, 1990] and, later, transferred to *Altajosoma* [Mikhajlova, 2000], is currently known from the Novosibirsk Area, Altai Mts and Krasnoyarsk Province, Siberia. There are two subspecies differing mainly in length of the front angiocoxal process of the posterior gonopods. The subspecies *longiprocessum* Mikhajlova, 2000 is known to occur in the Sayano-Shushensky Nature Reserve, West Sayan Mts, Krasnoyarsk Province.

Altajosoma coxale (Shear, 1990)

Diplomaragna coxalis Shear, 1990: 25, figs.

Diplomaragna coxalis — Mikhajlova, 1993: 18.

Altajosoma coxale — Mikhajlova, 2000: 161.

REMARKS: This species, originally described in *Diplomaragna* [Shear, 1990] and, later, transferred to *Altajosoma*

[Mikhajlova, 2000], is only known from the original description from the Irkutsk Area, eastern Siberia.

Altajosoma deplanatum (Stuxberg, 1876)

Craspedosoma deplanatum Stuxberg, 1876a: 34, figs.

Craspedosoma deplanatum — Stuxberg, 1876b: 317; Lokšina & Golovatch, 1979: 382.

Altajosoma pinetorum Gulička, 1972: 37, fig.

Altajosoma pinetorum — Lokšina & Golovatch, 1979: 382.

Diplomaragna deplanata — Shear, 1990: 20, figs; Mikhajlova, 1993: 22.

Diplomaragna pinetorum — Shear, 1990: 38; Mikhajlova, 1993: 25.

Altajosoma deplanatum — Mikhajlova, 2000: 160.

Material: 2 ♂♂, 2 ♀♀ (ZMN), Novosibirsk Area, Iskitim Distr., Malinovka, mesophytous meadow, 15.VIII.1987; leg. D.L.

REMARKS: This species, originally described as *Craspedosoma deplanatum* from between Achinsk, Krasnoyarsk Prov. and Mariinsk, Kemerovo Area [Stuxberg, 1876a], has since been redescribed and transferred first to *Diplomaragna* [Shear, 1990] and, very recently, to the resurrected *Altajosoma*, with *A. pinetorum*, a species described from the Altai Mts, serving as its junior subjective synonym [Mikhajlova, 2000]. Hitherto reported from the Kemerovo and Novosibirsk areas, the Krasnoyarsk Province and Altai Mts.

Altajosoma golovatchi (Shear, 1990)

Diplomaragna golovatchi Shear, 1990: 23, figs.

Diplomaragna golovatchi — Mikhajlova, 1993: 24.

Altajosoma golovatchi — Mikhajlova, 2000: 161.

REMARKS: This species, originally described in *Diplomaragna* [Shear, 1990] and, later, transferred to *Altajosoma* [Mikhajlova, 2000], is currently known from the Krasnoyarsk Province, Siberia as well as in the Urals (Republic of Bashkiriya as well as both Ekaterinburg and Chelyabinsk areas) and Cisuralia (Perm Area).

Altajosoma katunicum Mikhajlova, 2000

Altajosoma katunicum Mikhajlova, 2000: 162, figs.

REMARKS: The species is only known from the original description from the Katunsky Nature Reserve, southern Altai Mts, Siberia.

Altajosoma kemerovo (Shear, 1990)

Diplomaragna kemerovo Shear, 1990: 20, figs.

Diplomaragna kemerovo — Mikhajlova, 1993: 25.

Altajosoma kemerovo — Mikhajlova, 2000: 161.

Material: 1 ♂, 1 ♀, 1 juv. (IBSV), Altai, Lake Teletskoe, Artybash, 21.VII.1990; leg. S.O. — 1 ♂, 2 ♀♀, 1 juv. (ZMUM), same locality, *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 500–800 m a.s.l., 13–24.VII.1997. — 1 ♂, 1 ♀, 9 juv. (ZMUM), same locality, Altaisky Nature Reserve, near Lake Chiri, upper timberline of *Picea obovata* + *Pinus sibirica* taiga, mainly near water, 1,700–1,750 m a.s.l., 29.VII–1.VIII.1997; all leg. S.G. & A.T. — 1 ♂, 2 ♀♀ (ZMUM), Krasnoyarsk Prov., Predivinsk, pitfall traps, 29.VI–19.VIII.1995. — 3 ♂♂, 7 ♀♀, 6 juv. (ZMUM), same Province, Yeniseysk Distr., environs of Ust-Pit, pitfall traps, 30.VII–6.IX.1994. — 1 ♀, 2 juv. (ZMUM), same locality, 2–10.VII.1995. — 1 ♂ (ZMUM), same locality, 1995; all leg. L.R.

REMARKS: Originally described in *Diplomaragna* [Shear, 1990], this species is now in *Altajosoma* [Mikhajlova, 2000], and is known from the Kemerovo and Novosibirsk areas, the Altai and the Krasnoyarsk Province. At Artybash, a single male has been taken which differs a little from the

typical form in shape of the side lamella of the lateral sheath process of the posterior gonopods.

Altajosoma shilenkovi (Shear, 1990)

Diplomaragna shilenkovi Shear, 1990: 23, figs.

Diplomaragna shilenkovi — Mikhajlova, 1993: 28.

Altajosoma shilenkovi — Mikhajlova, 2000: 161.

Material: 1 ♂, 1 ♀ (CAS), Republic Buryatia, Tunkinskie Mountains, eastern branch of Kingarga River, 1,500–1,520 m a.s.l., 51°58'N 102°26'E, 21.VII.1995. — 1 ♂ (CAS), Irkutsk Area, Lake Baikal, Bolshie Koty, 480 m a.s.l., 51°54.9'N 105°4.3'E, 5.VIII.1995; all leg. D.K.

REMARKS: This species, originally described in *Diplomaragna* [Shear, 1990] and, later, transferred to *Altajosoma* [Mikhajlova, 2000], is currently known only from the Irkutsk Area, the terra typica. The length of the anterior gonopod telopodites varies, i.e. these are shorter in the above males as compared to those from the type series from the Khamar-Daban Mts.

Ancestreuma feynmani (Shear, 1990)

Diplomaragna feynmani Shear, 1990: 17, figs.

Diplomaragna feynmani — Mikhajlova, 1993: 22.

Ancestreuma feynmani — Mikhajlova, 2000: 155.

Material: 3 ♂♂, 6 ♀♀, 2 juv. (ZMUM), Krasnoyarsk Prov., Predivinsk, pitfall traps, 29.VI–15.VIII.1995. — 1 ♂ (ZMUM), 1 ♂ (IBSV), same locality, pitfall traps, 29.VI–19.VIII.1995; all leg. L.R. — 1 ♂, 1 ♀ (IBSV), 1 ♂, 2 ♀♀, 3 juv. (ZMN), Republic Tuva, Pit-Khem Distr., ca. 5 km NW of Sesserlig, Uvuksky Mt. Range, 1,000–1,100 m a.s.l., mixed forest, litter, 24–25.VII.1989; leg. D.L.

REMARKS: Originally described in *Diplomaragna* [Shear, 1990], this species has since been transferred to *Ancestreuma* [Mikhajlova, 2000]. Hitherto known from Tuva, its terra typica, and the Krasnoyarsk Province.

Ancestreuma longibrachiatum (Shear, 1990)

Diplomaragna longibrachiata Shear, 1990: 14, figs.

Diplomaragna longibrachiata — Mikhajlova, 1993: 25.

Ancestreuma longibrachiatum — Mikhajlova, 2000: 155.

Material: 1 ♂ (IBSV), 1 ♂ (ZMN), Republic Tuva, West Sayan, Kurtushibinsky Mt. Range, ca. 10 km NW of Shivilig, 1,100–1,200 m a.s.l., mixed forest, litter, 6.VII.1990; leg. D.L.

REMARKS: Originally described in *Diplomaragna* [Shear, 1990], this species has since been transferred to *Ancestreuma* [Mikhajlova, 2000]. Hitherto known from Mongolia and the Krasnoyarsk Province of Siberia. The record in Evenkia by Mikhajlova [1993] actually refers to *A. ryvkini*.

Ancestreuma raniferum Mikhajlova, 2000

Ancestreuma raniferum Mikhajlova, 2000: 156, figs.

REMARKS: The species is only known from the original description from the Republic of Tuva, Siberia.

Ancestreuma ryvkini (Shear, 1990)

Diplomaragna ryvkini Shear, 1990: 14, figs.

Diplomaragna ryvkini — Mikhajlova, 1993: 25.

Ancestreuma ryvkini — Mikhajlova, 2000: 156.

Material: 1 ♂ (IBSV), SE Tuva, middle flow of Karghy River, 50°31'N 97°03'E, 1,400 m a.s.l., 28–30.VI.1996; leg. Y.M. — 4 ♂♂, 3 ♀♀, 5 juv. (ZMUM), Irkutsk Area, Lake Baikal, environs of Maritui, *Betula* forest with fern undergrowth, litter + moss, 10.VII.1988; leg. A.T. — 8 ♂♂, 16 ♀♀ (CAS), same locality, Lake

Baikal, Bolshie Koty, 480 m a.s.l., 51°54.9'N 105°4.3'E, 5.VIII.1995; leg. D.K. — 4 ♂♂, 2 ♀♀ (ZMUM), Krasnoyarsk Prov., Yeniseysk Distr., environs of Ust-Pit, 30.VII–6.IX.1994. — 1 ♂, 3 juv. (ZMUM), same locality, 1995. — 14 ♂♂, 14 ♀♀, 10 juv. (ZMUM), same locality, pitfall traps, 10.VII–26.VIII.1995; all leg. L.R.

REMARKS: Originally described in *Diplomaragna* [Shear, 1990], this species has since been transferred to *Ancestreuma* [Mikhajlova, 2000]. This is a widespread species known from Mongolia as well as Evenkia, Tuva, Buryatia and the Irkutsk Area, Siberia.

Ancestreuma subulatum Mikhajlova, 2000

Ancestreuma subulatum Mikhajlova, 2000: 157, figs.

REMARKS: Originally described from the Irkutsk Area, Siberia, this species seems to be confined to its terra typica.

Asiatyla communicantis (Golovatch, 1977)

Ancestreuma communicantis Golovatch, 1977: 738, figs; Mongolia.

Diplomaragna communicantis — Shear, 1990: 17, figs; Mongolia.

Asiatyla communicantis — Mikhajlova, 2000: 159; Mongolia.

Material: 2 ♂♂, 15 ♀♀ (CAS), Irkutsk Area, Lake Baikal, Bolshie Koty, 480 m a.s.l., 51°54.9'N 105°4.3'E, 5.VIII.1995; leg. D.K.

REMARKS: This species, originally described in *Ancestreuma* from Mongolia [Golovatch, 1977], has since been transferred to *Diplomaragna* [Shear, 1990] and, very recently, to *Asiatyla* [Mikhajlova, 2000]. The above is the first record of the species in the fauna of Russia.

Asiatyla sajanica (Gulička, 1972)

Altajosoma sajanicum Gulička, 1972: 37, fig.

Altajosoma sajanicum — Lokšina & Golovatch, 1979: 382.

Ancestreuma boreale — Golovatch, 1979: 336, figs; Lokšina & Golovatch, 1979: 382.

Diplomaragna borealis — Shear, 1990: 17, fig; Mikhajlova, 1993: 18.

Diplomaragna sajanica — Shear, 1990: 38; Mikhajlova, 1993: 25.

Asiatyla sajanica — Mikhajlova, 2000: 159.

Material: 4 juv. (ZMUM), Krasnoyarsk Prov., Turukhansk Distr., Mirnoe, 13–23.VI.1988. — 6 ♂♂, 4 ♀♀, 2 juv. (ZMUM), same locality, 8–18.VII.1988. — 1 ♂, 2 ♀♀ (ZMUM), same locality, pitfall traps, 10–20.VIII.1988. — 1 ♀, 1 juv. (ZMUM), same locality, 8–18.VI.1989. — 1 ♂, 11 juv. (ZMUM), same locality, 9–19.VI.1989. — 2 juv. (ZMUM), same locality, 10–20.VI.1989. — 1 ♀ (ZMUM), same locality, 1–11.VII.1989. — 6 ♂♂ (ZMUM), same locality, 2–12.VII.1989. — 3 ♂♂, 1 ♀ (ZMUM), 2 ♂♂, 3 ♀♀ (IBSV), same locality, 5–15.VIII.1989. — 1 ♀, 2 juv. (ZMUM), same locality, 6.VIII.1989. — 1 ♀ (ZMUM), same locality, 11.VIII.1989. — 1 juv. (ZMUM), same locality, 18–28.VI.1990. — 1 juv. (ZMUM), same locality, 20–30.VI.1990. — 4 juv. (ZMUM), same locality, 25.VI.1990. — 1 ♂, 3 juv. (ZMUM), same locality, 6–16.VII.1990. — 6 ♂♂, 13 ♀♀, 26 juv. (ZMUM), same locality, 6–17.VII.1990. — 1 ♂, 4 ♀♀, 5 juv. (ZMUM), same locality, 6–20.VII.1990. — 3 juv. (ZMUM), same locality, 11.VII.1990. — 1 ♀ (ZMUM), same locality, 13.VII.1990. — 5 ♂♂, 9 ♀♀, 2 juv. (ZMUM), same locality, 1–11.VIII.1990. — 1 ♂, 2 ♀♀ (ZMUM), same locality, 2–12.VIII.1990. — 1 ♀ (ZMUM), same locality, 8.VIII.1990. — 4 juv. (ZMUM), same locality, 12–22.VI.1991. — 1 ♂ (IBSV), 1 ♂, 1 ♀, 4 juv. (ZMUM), same locality, VII.1991. — 8 ♂♂, 7 ♀♀, 2 juv. (ZMUM), same locality, 5–15.VII.1991; all leg. L.R. — 2 ♂♂, 1 juv. (ZMUM), same locality, Arghidzhek Station, 10.VIII.1994; leg. I.L. — 2 ♂♂, 2 ♀♀, 1 juv. (ZMN), Republic Tuva, Tandinsk Distr., East Tannu-Ola Mt. Range, opposite Lake Chaghytal, ca. 2,000 m a.s.l., moss litter in *Larix dahurica* forest, 27.VI.1989; leg. D.L. — 2 ♂♂,

2♀♀, 5 juv. (IBSV), SE Tuva, middle flow of Karghy River, 50°31'N 97°03'E, 1,400 m a.s.l., 28–30.VI.1996. — 9 ♂♂, 16 ♀♀ (IBSV), same locality, Sanghelen Mt. Range, 50°28'96"N 95°24'37"E, 2,030 m a.s.l., mountainous bush tundra, 16–18.VII.1996; all leg. Y.M.

REMARKS: This species, originally described in *Altajosoma* from Tuva [Gulička, 1972] and, later, transferred to *Diplomaragna* [Shear, 1990], is a senior subjective synonym of *Ancestreuma boreale*, a form described from the middle flow region of Yenisey River, Krasnoyarsk Province. Both the synonymy and the reassignment to *Asiatyla* have been established by Mikhajlova [2000].

Asiatyla similata Mikhajlova, 2000

Asiatyla similata Mikhajlova, 2000: 158, figs

REMARKS: Known from the Irkutsk Area only, its terra typica. Close to *A. sajanica* (see just below).

Orientylla dahurica (Gerstfeldt, 1859), **comb.n.**

Craspedosoma dahuricum Gerstfeldt, 1859: 272.

Diplomaragna mikhajlovae Shear, 1990: 20, figs; **syn n.**; Russian Far East

Diplomaragna mikhajlovae — Mikhajlova, 1993: 25; Russian Far East.

Orientylla mikhajlovae — Mikhajlova, 2000: 171, figs; Russian Far East.

REMARKS: Due to the courtesy of Dr. V. A. Krivokhatsky, the Keeper of Arachnida and Myriapoda at the Zoological Institute of the Russian Academy of Sciences in St. Petersburg, we have recently been privileged to re-examine two samples in a jar labeled "Original specimens of Gerstfeldt's "Platoden, Crustacean, Myriapoden etc. Sibiriens"" and "Myriapoda Specimena origin. oed Gerstfeldt Platoden etc.". However, the labels inside the tubes had faded so that they were almost or fully impossible to decipher.

One of the tubes contained a well-preserved male of what could readily be identified as *Orientylla mikhajlovae*, a species first described in *Diplomaragna*, from the southern Russian Far East [Shear, 1990], and very recently transferred to *Orientylla* [Mikhajlova, 2000]. The externally curved, unciform distal ends of the lateral sheath process of the posterior gonopods represent the sole difference of this specimen from the types, but this variation is obviously infraspecific.

This male is provided with an almost completely faded label reading "Platy...cimi (Lucas)", which does not correspond to any of the species named or identified by Gerstfeldt [1859].

Gerstfeldt proposed two new species names in the order Chordeumatida, i.e. *Julus armatus* (later transferred to *Craspedosoma* by Haase [1880]), from Irkutsk, Siberia and *Craspedosoma dahuricum*, from near the mouth of Shilka River, Chita Area, i.e. just at the border between the Chita Area, Siberia proper and the Amurskaya Area, Russian Far East. Both were described too poorly to suggest more than their actual assignment to the family Diplomaragnidae [Mikhajlova, 1993].

Based on geographical evidence alone, it seems thus fairly safe to surmise that the above male actually represents a syntype (herewith designated as lectotype) of *Craspedosoma dahuricum*, because *Orientylla mikhajlovae* does occur both in the Amurskaya Area (i.e. quite close to the Chita Area) and Maritime Province, Russian Far East, whereas Irkutsk/Cisbaikalia seems too far away in the west to seriously consider the sample as a syntype of *Julus armatus*. This formally results in the following: *Craspedosoma dahuricum* Gerstfeldt, 1859 = *Orientylla dahurica* (Gerstfeldt, 1859), **comb.n.** = *Orientylla mikhajlovae* (Shear, 1990), **syn.n.**

The second tube contained a female and fragments of a juvenile of what is currently accepted as *Pacifiulus amurensis* (Gerstfeldt, 1859), hence fully confirming the earlier synonymization made as based on circumstantial evidence alone [Mikhajlova, 1998a]. Although the label enclosed was impossible to read, the traces of ink being too faint, this material seems likewise type. The female is herewith designated as lectotype, thus apparently deriving from between what is currently known as Khabarovsk and Komsomolsk-on-Amur, Russian Far East [Mikhajlova, 1993, 1998b].

Shearia calycina Mikhajlova, 2000

Shearia calycina Mikhajlova, 2000: 167, figs

REMARKS: The species is only known from the original description from the southern Altai, Siberia.

Shearia densecava (Gulička, 1972)

Altajosoma densecavum Gulička, 1972: 37, fig.

Altajosoma densecavum — Lokšina & Golovatch, 1979: 382

Diplomaragna densecava — Shear, 1990: 38; Mikhajlova, 1993: 22.

Shearia densecava — Mikhajlova, 2000: 166, figs

REMARKS: This species, originally described in *Altajosoma* from several places in the southeastern Altai within Russia [Gulička, 1972], has since been transferred, first to *Diplomaragna* [Shear, 1990], very recently to *Shearia* [Mikhajlova, 2000].

Shearia khakassica Mikhajlova, 2000

Shearia khakassica Mikhajlova, 2000: 163, figs

REMARKS: Originally described and currently known only from the Republic of Khakassia, Siberia.

Shearia oiskaya Mikhajlova, 2000

Shearia oiskaya Mikhajlova, 2000: 165, figs.

REMARKS: This species has hitherto been described only from the Krasnoyarsk Province, Siberia, its locus typicus lying in Yermakovo Distr., Oisky Mt. Range.

Shearia rybalovi Mikhajlova, 2000

Shearia rybalovi Mikhajlova, 2000: 164, figs.

Material: 3 ♂♂, 4 ♀♀ (ZMUM), Krasnoyarsk Prov, Sayano-Shushensky Nature Reserve, mouth of Ottug-Sug River, 7–18.VII.1990. — 6 ♂♂, 5 ♀♀ (ZMUM), same locality, 8–19.VII.1990. — 1 ♂, 1 ♀, 1 juv. (ZMUM), same locality, 19–26.VII.1990. — 5 ♂♂, 9 ♀♀, 3 juv. (ZMUM), same locality, 26.VII–5.VIII.1990. — 1 ♂, 7 ♀♀, 1 juv. (ZMUM), same locality, 28.VII–7.VIII.1990. — 5 ♂♂, 31 ♀♀, 22 juv. (ZMUM), same locality, 7–17.VIII.1991. — 3 ♂♂, 1 ♀, 2 juv. (ZMUM), same locality, pitfall traps, 8–18.VIII.1991. — 1 ♂ (ZMUM), same locality, 5–15.VIII.1991. — 7 ♂♂, 8 ♀♀, 1 juv. (ZMUM), same locality, 6–16.VIII.1991. — 1 ♂, 1 ♀ (ZMUM), same locality, 2–12.VIII.1992. — 5 ♂♂, 3 ♀♀, 2 juv. (ZMUM), same locality, 31.VII–10.VIII.1992. — 4 ♂♂, 5 ♀♀, 8 juv. (ZMUM), same locality, 17–27.VII.1993; all leg. L.R.

REMARKS: The species is only known from the original description from the West Sayan Mts, Krasnoyarsk Province [Mikhajlova, 2000].

Shearia shushenskaya Mikhajlova, 2000

Shearia shushenskaya Mikhajlova, 2000: 168, figs.

Material: 2 ♂♂ (ZMUM), Krasnoyarsk Prov., Sayano-Shushensky Nature Reserve, mouth of Ottug-Sug River, 7–17.VII.1991. — 3 ♂♂ (ZMUM), same locality, 5–15.VIII.1991. — 1 ♂ (ZMUM), same locality, 31.VII–10.VIII.1992; all leg. L.R.

REMARKS: The species has been described from the West Sayan Mts in Krasnoyarsk Province, Siberia.

Shearia teletskaya Mikhajlova, 2000

Shearia teletskaya Mikhajlova, 2000: 167, figs.

REMARKS: The species is only known from the original description from the Altai, Siberia, the environs of Lake Teletskoe being the locus typicus.

Altajella pallida Gulička, 1972
Figs 12–29.

Altajella pallida Gulička, 1972: 43, figs.

Material: 1 ♂ (ZMUM), Altai Mts, Lake Teletskoe, Altaisky Nature Reserve, Chiri, upper reaches of Chiri River, *Picea obovata* + *Pinus sibirica* taiga forest, 1,350 m a.s.l., 28–29.VII & 2.VIII.1997; leg. S.G. & A.T.

REDESCRIPTION: Male. Length 7 mm, width 0.7 mm. Colouration in alcohol pale yellowish with a marble anterior part, maybe so because freshly moulted. Antennae light brown, legs pale, ocelli black.

Body with 28 segments, subcylindrical, juloid, smooth. Head densely setose, vertigial suture well visible. Genae strongly convex, pilose. Labrum usual, with three median teeth at fore margin, without prominent spines. Eye patches oval-triangular, rather small, composed of 12–13 ocelli. 13 ocelli on right side, 12 on left one. Antennae long and slender, clavate, antennomere 3 longest (Fig. 12). Gnathochilarium without promontum, with several strong distal setae on outer sides of stipes. Remaining parts of stipes beset with short to medium-sized setae, shorter ones more basally. Lamellae linguales likewise with short setae basally and longer ones distally. Collum semi-circular, with 3+3 macrochaetae, not covering the head from above. Paraterga/bulges on metazonites absent (Figs 13 & 14). Transverse suture between pro- and metazona well-developed. Metazonal 3+3 macrochaetae short, always pointed, on each side usually forming an extended transverse triangle (Fig. 13); macrochaetae on a few posteriormost metazona forming a transverse row. Axial dorsal suture well-developed.

Legs short and slender. Legs 1 and 2 a little reduced, normal, coxa as usual pierced with vas deferens, tarsal setae on ventral side brush-like, stout. ♂ legs 3–7 slightly but increasingly enlarged, coxa 7 particularly incrassate dorso-ventrally. Tarsal papillae (Fig. 17) present from ♂ leg 3 until legs of somite 20, onward absent. From ♂ leg 10 on, ventral patch immediately proximally of claw lacking tarsal papillae. Claws of ♂ legs 1 and 2 each with a very delicate ventral and dorsal midway spinicle (Figs 15 & 16); onward both spinicles increasingly reduced, ventral one being absent already from leg 4 on (Figs 17 & 18), dorsal spinicle retained until legs of somite 11 where barely traceable. ♂ legs 10 and 11 with coxal glands, coxa 10 (Fig. 19) somewhat enlarged, with a curved distomedian process (cx), sternite (st10) with a long, lateral, unciform outgrowth on each side and a caudomedian protuberance. Sternite (st11) of ♂ leg-pair 11 (Fig. 20) with a distinct caudomedian protuberance. Somite 27 legless. Each anal valve with three setae at caudal margin. Subanal scale with 1+1 setae.

Anterior gonopods (Figs 21–26) placed on a membranous sternite (p) devoid of tracheal apodemes as well as of structures both medially and laterally; coxites tripartite, indepen-

dent, not contiguous medially, suberect. External piece of coxite bifid (b1 and b2) (Figs 21 & 22). Branch b2 (= “solenomerite”) distally micropilose, with variously shaped outgrowths; prostatic groove terminating on a caudo-parabasal outgrowth (s) (Fig. 24). Branch b1 smooth, slender, simple, a little higher than b2. Inner piece of coxite (ch) narrowed distally, broadly lobe-shaped parabasally (Fig. 21 & 25). At base, both these pieces of coxite embracing a glandular globule (?coxal glands) (g) (Figs 22 & 26). Third piece represented by a paramedian pair of flagella (f) originating in basal part of coxites, each forming a U-shaped loop, lying inside prostatic groove along “solenomerite” and finally ending in a free coiled spiral; tip of each flagellum slightly concave and with a subterminal incision. Posterior gonopods strongly reduced (Figs 27–29), placed on a narrow plate-like sternite supplied with evident tracheal apodemes, coxites contiguous medially, each coxite with two conical processes (c), telopodite strongly reduced, 3-segmented, pubescent.

Female unknown.

REMARKS: This genus and species has been described based on a single male holotype taken from near Kiga (= Kyga) River, Lake Teletskoe, Altai [Gulička, 1972]. So the above material can be considered as strictly topotypic, because both localities are only a few air-km away from one another. Regrettably, the holotype, now in St. Petersburg, was returned incomplete, with the gonopods missing, thus preventing any attempt at a revision [Mikhajlova, 1993].

Gulička [1972], when proposing his *Altajella*, stated that a new family could be established for this genus alone, but he never formalized the issue. As the original description and illustrations given by Gulička were too incomplete, often even misleading, until now this form remained among nomina dubia [cf. Mikhajlova, 1993]. It is only due to the fresh topotypic sample that the species could finally be revised, and the allocation and affinities of *Altajella* somewhat clarified. The necessity to create a new family to accommodate *Altajella* is reconfirmed, too, and the issue is formalized.

Below is a new diagnosis of this genus, followed by a discussion and a diagnosis of a new family proposed for accommodation of this and further two genera.

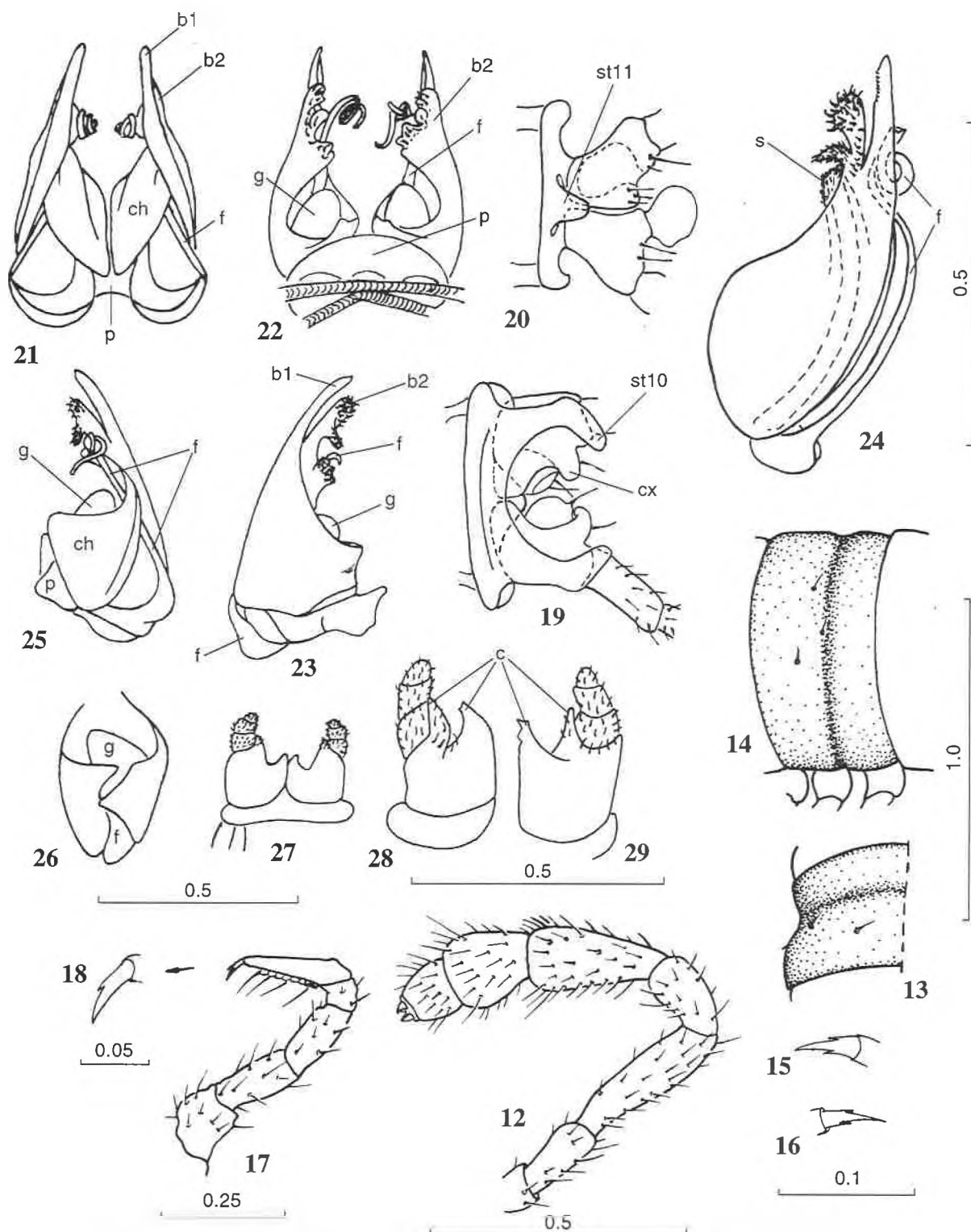
Altajella Gulička, 1972

Altajella Gulička, 1972: 42.

DIAGNOSIS: Body with 28 segments, juloid (subcylindrical). Gnathochilarium without promontum. Collum usual. Metazonites with neither paraterga nor lateral bulges, each with usual 3+3 macrochaetae. Teguments smooth.

Legs short, in ♂ with tarsal papillae coming to naught toward caudal body end. ♂ leg-pairs 3–7 slightly but increasingly enlarged, ♂ legs 10 and 11 virtually normal, with coxal glands, coxa 10 with a distomedial process. One additional spinicle on claw either both middorsally and midventrally (legs 1–3) or only middorsally (from leg 4 until about mid-body). Sternite of ♂ leg-pair 10 with a long unciform outgrowth laterally on each side and a protuberance caudomedially. Sternite of ♂ leg-pair 11 with a protuberance caudomedially.

Anterior gonopods placed on a membranous sternite devoid of tracheal apodemes as well as structures medially and laterally; coxites independent, elongate, tripartite, each divided into an external and an internal (= “solenomerite”) piece, these both embracing a glandular globule at base, and a pair of paramedian flagella beginning near base of coxite, mostly attached to “solenomerite” and ending in a free coil. Posterior gonopods rather strongly reduced, lying on a narrow



Figs 12–29. *Altajella pallida* Gulička, 1972, ♂ topotype: 12 — antenna; 13 — somite 15 (left half, dorsal view); 14 — same (lateral view); 15 — claw of leg-pair 1; 16 — claw of leg-pair 2; 17 — leg-pair 15 (tarsal setation largely omitted); 18 — claw of leg-pair 15; 19 — basal part of leg-pair 10 (front view); 20 — basal part of leg-pair 11 (caudal view); 21 — anterior gonopods (front view); 22 — same (caudal view); 23 — same (lateral view); 24 — same (anterolateral view, flagellum displaced); 25 — same (mesal view); 26 — basal part of anterior gonopods (ventral view); 27 — posterior gonopods (front view); 28 — left posterior gonopod (front view); 29 — right posterior gonopod (front view); b1, b2 — branches of external piece of coxite (b2 = “solenomerite”); c — coxal processes of posterior gonopods; ch — inner piece of coxite; cx — coxal process of leg-pair 10; f — flagellum; g — glandular globule (?coxal glands); p — membranous sternite; s — caudo-parabasal outgrowth of “solenomerite” terminating the seminal groove; st10 — caudal outgrowth on sternite of leg-pair 10; st11 — caudal outgrowth on sternite of leg-pair 11. Scale bars in mm.

plate-like sternite with readily recognizable tracheal apodemes; coxites small, contiguous medially, each with two more or less conical outgrowths; telopodites short, few-segmented.

Type species: *Altajella pallida* Gulička, 1972.

Teleckophoron montanum Gulička, 1972

Figs 30–40.

Teleckophoron montanum Gulička, 1972: 41, figs.

Material: 1 ♂ (IBSV), Krasnoyarsk Prov., Yermakovo Distr., Sayano-Shushenskii Nature Reserve, Ottug-Sug River, 8–19.VII.1990. — 1 juv. (ZMUM), same locality, 7–17.VII.1991. — 1 ♂, 3 ♀♀ (ZMUM), same locality, 2–12.VII.1992. — 1 ♂, 1 ♀, 1 juv. (IBSV), same locality, 17–27.VII.1993. — 1 ♀ (ZMUM), Lake Ekspeditsionnoe, montane tundra, 28.VIII.1991. — 1 ♂, 3 ♀♀ (ZMUM), same locality, pitfall trapping, 14–19.VII.1992. — 1 ♀ (ZMUM), same locality, 18.VII.1992; all leg. LR.

REDESCRIPTION: Male. Length 13–14 mm, width 0.9–1.2 mm. Colouration in alcohol brown, with oval marble spots laterally on pro- and metazona (Figs 31 & 32). Frons and vertex dark brown, antennae and legs brown, ocelli black.

Body with 28 segments, subcylindrical, juloid, smooth. Head setose, vertigial suture hardly visible. Labrum usual, with three median teeth at fore margin, devoid of spines. Genae strongly convex. Eye patches triangular, each composed of 22–23 ocelli. Antennae (Fig. 30) long and slender, clavate, antennomere 3 longest. Gnathochilarium without promontum, with several strong setae on outer sides of distal parts of stipes. Remaining parts of stipes beset with setae, latter shorter and more numerous basally than distad. Each lamella lingualis with several medium-sized setae, a long seta only distally. Collum not covering the head from above, oval, with 3+3 macrochaetae. Paraterga/bulges on metazonites absent. Transverse suture between pro- and metazona rather well-developed, 3+3 macrochaetae on metazonites relatively short, pointed, usually forming an extended transverse triangle on each side of body (Figs 31 & 32). Axial dorsal suture well-developed. Each anal valve with three setae at caudal margin. Subanal scale with 1+1 setae.

Legs slender but not very long, claws long, slightly curved, at least from pair 3 on with two minute, poorly traceable accessory claws dorsally at base (Fig. 33). Legs 1 and 2 typically reduced, normal, coxa 2 as usual pierced with vas deferens, latter's orifice opening apically on a small knob; claws 1 and 2 each not only with two minute accessory claws dorsally but often with a spinicle (= filament) ventrally at base (this spinicle absent only from a ♂ from Lake Ekspeditsionnoe). ♂ legs 3–7 slightly but increasingly enlarged, without any further modifications. Tarsal papillae present from ♂ leg 3 until legs of somite 24, onward missing, especially strongly developed on pairs 3–7, missing just proximally of claw from ♂ leg 10 on. Somite 27 legless. ♂ legs 10 and 11 with coxal glands; pair 10 with sternite (st10) supplied with a median outgrowth curved caudally (Fig. 34); coxa 11 with a strong,

distomesal, unciform protuberance (u) and a caudal, lobe-shaped, papillate outgrowth (bl), sternite 11 (st11) with a similar but larger median outgrowth caudally (Fig. 35).

Anterior gonopods (Figs 36–39) positioned on a narrow, plate-like, strongly sclerotized sternite devoid of median structures (except for 1+1 minute paramedian setae) but with clearly traceable tracheal apodemes; coxites independent, not contiguous medially, tripartite, curved distocaudally. External branch of coxite (e) slenderer, representing a relatively simple "solenomerite", prostatic groove terminating at a curved apex. Inner branch (i) higher than both other branches, divided distally into an outer lobe (b) and an inner flagelliform process (p). Third branch (t) lying in between, lamelliform, of irregular shape. Posterior gonopods (Fig. 40) placed on a nearly normal, plate-like sternite with clearly expressed tracheal apodemes; coxites curved distocaudally, setose terminally, each with a front groove (g) and a parabasal styletiform process (o); telopodite totally reduced.

Female. Length 14 mm, width 1.3 mm. Body with 28 segments. Ocelli 21. Tarsal papillae absent. Leg-pair 2 normal, not reduced, coxa with a small distocaudal knob. Prefemur 3 with a small but distinct distolateral outgrowth. Other nonsexual characters as in male. Vulvae not dissected for examination.

REMARKS: Like the previous species, *T. montanum* has hitherto been known only from the environs of Lake Teletskoe, Altai Mts [Gulička, 1972]. So the above record extends the distribution of this species and genus to the West Sayan Mts as well. Although Gulička's original description and accompanying illustrations of this species are quite poor, while the holotype (now in St. Petersburg) has been returned without gonopods, thus discouraging any revisionary attempt, there is no doubt that the new samples are conspecific with *T. montanum*, a form heretofore considered among nomina dubia [cf. Mikhajlova, 1993].

Gulička [1972], when proposing *Teleckophoron*, stated that a new family could be established for this genus alone. However, he refrained from formalizing the issue. So the opportunity is taken here to both adequately diagnose *Teleckophoron* and to formally advance a new family to incorporate this and further two genera.

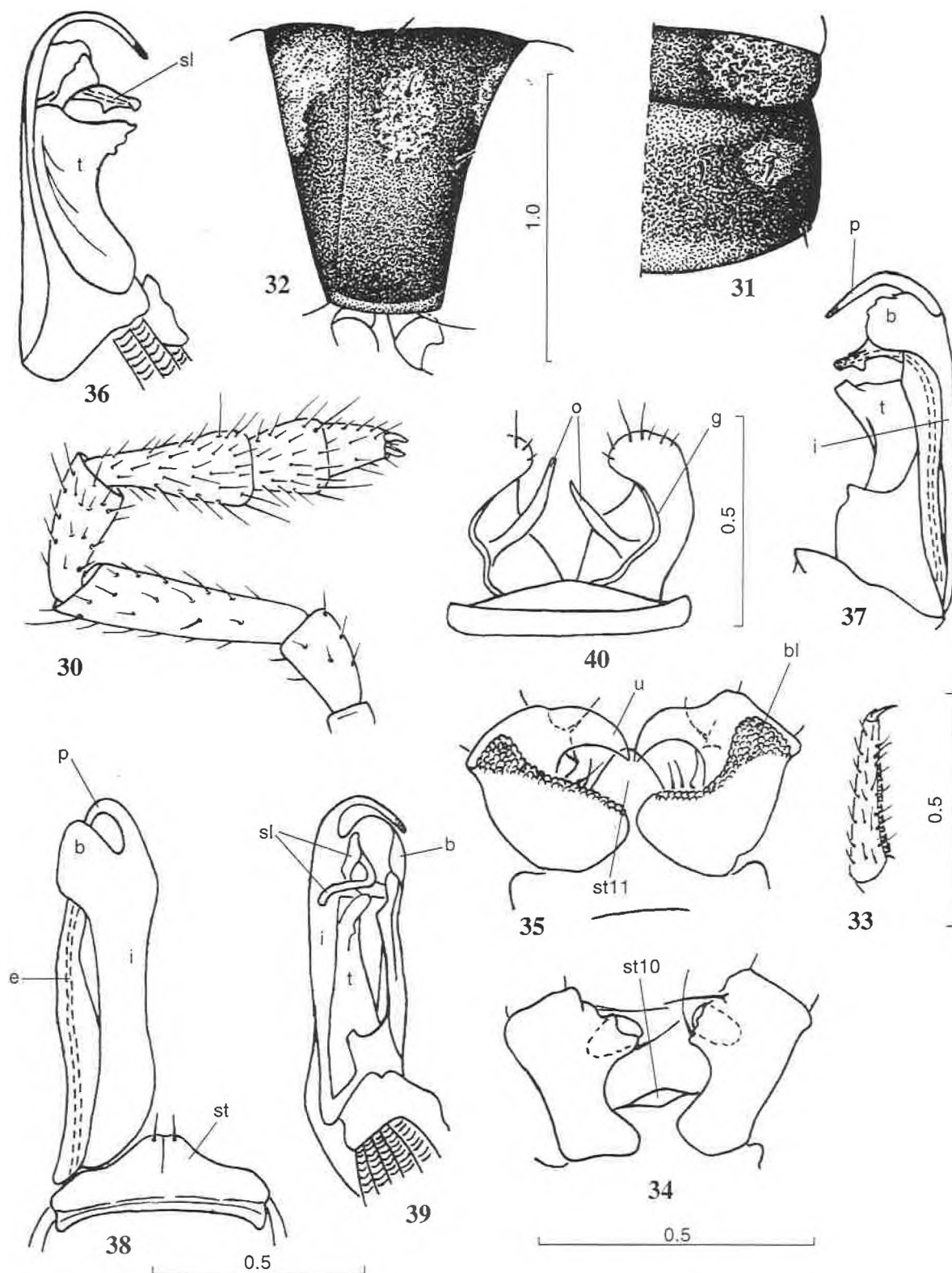
Teleckophoron Gulička, 1972

Teleckophoron Gulička, 1972: 41.

DIAGNOSIS: Body with 28 segments, juloid (subcylindrical). Gnathochilarium without promontum. Collum usual. Metazonites without paraterga/bulges, each with usual 3+3 macrochaetae. Teguments smooth.

Legs not particularly long, in ♂ with tarsal papillae, ♂ leg-pairs 3–7 slightly but increasingly incrassate, ♂ legs 10 and 11 virtually normal, with coxal glands, each of their sterna with a caudal protuberance caudomedially, coxa 11 with a distomedian process. Each claw usually with two minute accessory claws dorsally at base.

Рис. 12–29. *Altajella pallida* Gulička, 1972, топотип ♂: 12 — антенна; 13 — 15-й сомит (левая половина, вид сверху); 14 — то же (вид сбоку); 15 — коготок 1-й пары ног; 16 — коготок 2-й пары ног; 17 — 15-я пара ног (тarsальное опушение в основном не изображено); 18 — коготок 15-й пары ног; 19 — базальная часть 10-й пары ног (вид спереди); 20 — базальная часть 11-й пары ног (вид сзади); 21 — передние гоноподии (вид спереди); 22 — то же (вид сзади); 23 — то же (вид сбоку); 24 — то же (вид сбоку и немного спереди, жгутики отогнуты); 25 — то же (вид изнутри); 26 — базальная часть передних гоноподий (вид снизу); 27 — задние гоноподии (вид спереди); 28 — левый задний гоноподий (вид спереди); 29 — правый задний гоноподий (вид спереди); b1, b2 — ветви наружной части коксита (b2 = соленомерит); c — коксальные выросты задних гоноподий; ch — внутренняя часть коксита; cx — коксальный отросток 10-й пары ног; f — жгутик; g — овальные железистые образования (коксальные железы?); p — перепончатый стернит; s — задний парабазальный вырост соленомерита с семенной бороздкой; st10 — вырост стернита 10-й пары ног; st11 — вырост стернита 11-й пары ног. Масштаб в мм.



Figs 30–40. *Teleckophoron montanum* Gulička, 1972, ♂ from West Sayan: 30 — antenna; 31 — somite 15 (dorsal view); 32 — same (right half, lateral view); 33 — tarsus 15; 34 — basal part of leg-pair 11; 35 — basal part of leg-pair 11; 36 — anterior gonopods (mesal view); 37 — same (lateral view); 38 — same (front view); 39 — same (caudal view); 40 — posterior gonopods (front view); b — lobe of inner piece; bl — lobe of coxite 11; e — external piece (= "solenomerite") of anterior gonopod coxite; g — groove on posterior gonopod coxite; i — inner piece of anterior gonopod coxite; o — parabasal process of posterior gonopod coxite; p — process of inner piece; sl — distal part of "solenomerite"; st — sternite of anterior gonopods; st10 — sternite of leg-pair 10; st11 — sternite of leg-pair 11; t — third piece of anterior gonopod coxite; u — coxal process of leg-pair 11. Scale bars in mm.

Anterior gonopods placed on a narrow, plate-like, sclerotized sternite with clearly traceable tracheal apodemes; coxites independent, not contiguous medially, tripartite, curved disto-caudally, flagella absent. External branch of coxite slenderer, representing a relatively simple "solenomerite", prostatic groove terminating at apex. Inner branch higher than both other branches, subdivided distally. Third branch lying in between, lamelliform, of irregular shape. Posterior gonopods placed on a nearly normal, plate-like sternite with tracheal apodemes, coxites relatively simple, telopodite totally reduced.

Type species: *Teleckophoron montanum* Gulička, 1972.

REMARKS: In contrast to Gulička [1972], who tended to treat both monobasic *Altajella* and *Teleckophoron* as warranting separation into a new family each, these two South Siberian genera plus the Tian-Shan *Elongeuma* Golovatch, 1982 appear to show such a degree of similarity as to be assigned to a single familial category, Altajellidae fam.n. Originally, *Elongeuma*, still monobasic but actually containing at least further two Tian-Shan species to be described, was treated in the basically European Haaseidae [cf. Golovatch, 1982] but it has since been considered as without clear familial placement [Spelda & Golovatch, in preparation]. Also, Golovatch [1982] miscounted the segments in *Elongeuma*, which are actually 28, not 30.

Indeed, the new family can be diagnosed by a unique combination of characters such as the juloid body with 28 segments (apparently related to the small size), the absence of a promentum, the presence of tarsal papillae and accessory claws on certain ♂ legs, and of coxal glands on both scarcely modified ♂ legs 10 and 11, the complex, tripartite though fully independent anterior gonopods supporting no median sternal structures but supplied by a solenomerite-like structure (= a branch supporting a prostatic groove) and, in *Altajella* and *Elongeuma*, a paramedian pair of long flagella sheathed by some other elements of the coxite, and the strongly reduced, barely functional posterior gonopods. The anterior gonopods are placed either on a membranous sternite devoid of tracheal apodemes (apomorphy, *Altajella*) or on a sclerotized plate-like sternum supplied with tracheal apodemes (plesiomorphy, *Teleckophoron* and *Elongeuma*). Posterior gonopods simple, placed on a plate-like, virtually unmodified sternum, nearly to totally contiguous medially, with coxal processes, reduced, telopodites few-segmented or absent. In addition, the claws of *Altajella* with their midway spinicle(s) seem unique in the entire order [cf. Attems, 1959]. The posterior gonopods of *Teleckophoron* and *Elongeuma* are nearly identical, a character currently treated of paramount importance for revealing high-level affinities within the entire order Chordeumatida [Shear, 2000].

In general, such a combination of characters seems to be particularly close to that of the Euro-Caucasian family Mastigophorophyllidae but the latter is distinct in the reduced ♀ leg-pair 2 as well as the presence of a promentum, paraterga and long paramedian flagella on both gonopod pairs. However, one must not exaggerate the importance of flagella on this or that gonopod pair in Chordeumatida, as this character appears to vary considerably even within Altajellidae (branch

p being far from too flagelliform in *Teleckophoron*) and is only of generic rank at least within the family Metopidiotrichidae, suborder Heterochordeumatidea [Shear & Tanabe, 1994; Shear, 2000]. Similarly, a very strongly to totally reduced ♀ leg-pair 2 is likewise characteristic not only of the Mastigophorophyllidae but also of certain species of Kashmireumatidae [Shear, in preparation]. On the other hand, considering the absence of both a promentum and paraterga in Altajellidae, the entire combination of the above traits plus the coherent distribution seem sufficiently strong to maintain this family as probably especially similar to but still independent from the Mastigophorophyllidae.

In the recent family-level reclassification of the order Chordeumatida [Shear, 2000], the Altajellidae fam.n. is to be assigned to the suborder Craspedosomatidea, being disjunct in the juloid body devoid of paraterga combined with the missing promentum, the non-reduced ♂ leg-pair 10 and ♀ leg-pair 2, the presence of ♂ tarsal papillae, the rather complex though fully independent anterior gonopods often supplied with a paramedian pair of long flagella, and the reduced, barely functional posterior gonopods. Formally, the following diagnosis can be advanced.

Altajellidae fam.n.

DIAGNOSIS: Body with 28 segments, juloid (= subcylindrical), neither being common among Chordeumatida. Antennae slender (versus clavate in Trachygonidae and Trichopetalidae). Gnathochilarium without promentum (with a promentum in all other families of Craspedosomatidea). Collum not covering the head from above (versus covering in Rhiscosomidae and Striariidae). Metazonites devoid of paraterga or bulges (versus more or less well-developed paraterga or bulges in most members of Chordeumatida). Teguments smooth as in the bulk of Chordeumatida (coarsely tuberculate in Rhiscosomidae and some Cleidogonidae, striate in Striariidae).

Legs not very long, ♂ coxae 2, 3 and 7 virtually unmodified (versus coxa 2 with a strong distomedian process in Caseyidae, and coxa 7 with a similar process in Attemsiidae and Urochordeumatidae), penes absent (present only in Urochordeumatidae). ♀ leg-pair 2 virtually normal, tarsal papillae present from ♂ leg-pair 3 at least until midbody legs; ♂ pairs 3–7 increasingly enlarged. ♂ legs 10 and 11 virtually normal in size, with coxal glands, their sternites and coxae often slightly modified, never reduced. At least some claws with minute accessory spinicle(s) or claw(s).

Anterior gonopods placed either on a plate-like sternum with tracheal apodemes laterally or on a membranous sternite devoid of tracheal apodemes laterally, never with considerable structures medially so that coxites, however complex, remaining fully independent, more or less elongate, each more or less tripartite, often one branch represented by a long paramedian flagellum and always another branch being a solenomerite-like structure supporting a prostatic groove, then both these branches being in tight contact at least over most of their extent and sheathed by remaining parts of coxite. Posterior gonopods rather strongly reduced, barely function-

Рис. 30–40. *Teleckophoron montanum* Gulička, 1972, ♂ с Западного Саяна: 30 — антенна; 31 — 15-й сомит (правая половина, вид сверху); 32 — то же (вид сбоку); 33 — лапка 15-й пары ног; 34 — базальная часть 10-й пары ног; 35 — базальная часть 11-й пары ног; 36 — передние гоноподии (вид изнутри); 37 — то же (вид сбоку); 38 — то же (вид спереди); 39 — то же (вид сзади); 40 — задние гоноподии (вид спереди); b — лопасть внутренней части; bl — лопасть коксита 11-й пары ног; e — наружная часть (= "соломерит") коксита передних гоноподий; g — бороздка на коксите задних гоноподий; i — внутренняя часть коксита передних гоноподий; o — отросток на коксите задних гоноподий; p — отросток внутренней части; sl — дистальная часть "соломерита"; st — стернит передних гоноподий; st10 — стернит 10-й пары ног; st11 — стернит 11-й пары ног; t — третья часть коксита передних гоноподий; u — коксальный отросток 11-й пары ног. Масштаб в мм.

al, lying on a narrow plate-like sternite supplied with tracheal apodemes; coxites small, each with 1–2 median processes; telopodites short, few-segmented to totally missing.

Type genus: *Altajella* Gulička, 1972.

Other genera included: *Teleckophoron* Gulička, 1972 and *Elongeuma* Golovatch, 1982.

Schizoturanus clavatipes (Stuxberg, 1876)

Polydesmus clavatipes Stuxberg, 1876a: 34, figs.

Polydesmus clavatipes — Stuxberg, 1876b: 316.

Schizoturanus clavatipes — Lohmander, 1933: 27; Hoffman, 1975: 82, figs; Lokšina & Golovatch, 1979: 384; Mikhajlova, 1993: 32, fig.

Material: 2 ♂♂, 1 ♀ (IBSV), 3 ♂♂, 1 ♀ (ZMN), Novosibirsk Area, Iskitim Distr., Malinovka, mesophytous meadow, 15.VIII.1987. — 5 ♂♂, 1 ♀ (ZMN), 30–35 km S of Novosibirsk, Koltsovo, mesophytous meadow, 27.VIII.1994 all leg. D.L. — 1 ♀, 2 juv. (ZMUM), Krasnoyarsk Prov., Yeniseysk Distr., environs of Ust-Pit, pitfall traps, 30.VII–6.IX.1994. — 1 ♀ (ZMUM), same locality, 2–10.VII.1995. — 3 ♀♀, 3 juv. (ZMUM), same locality, 10.VII–26.VIII.1995. — 2 juv. (ZMUM), same Province, Predivinsk, 28.VI.1995; all leg. L.R. — 1 ♀ (ZMUM), same Province, environs of Krasnoyarsk, "Stolby" Nature Reserve, 25.VIII.1994. — 2 ♂♂ (IBSV), same Province, Turukhansk Distr., Central Siberian Nature Reserve, Canyon Yuzhnyi, 30.X.1994; all leg. I.U. — 10 ♂♂, 3 ♀♀ (ZMUM), Kemerovo Area, Kuznetsky Alatau Nature Reserve, delta of Malaya Bezymianka River ca. 19 air-km SSW of Belogorsk, *Abies sibirica* + *Pinus sibirica* taiga, 500 m a.s.l., 27–31.08.1993, leg. S.G. & V.G. — 1 ♀, 8 juv. (ZMUM), same locality, ca. 16 air-km SW of Belogorsk, Kiya River, Bezymianka River delta, riverine taiga, 14–17.07.1994. — 1 ♂, 1 ♀, 26 juv. (ZMUM), same Area, Novokuznetsk District, ca. 10 air-km S of Kuzedeyevo, *Tilia* insular forest (= Lipovyi ostrov), 450–550 m a.s.l., 20–24.07.1994, all leg. S.G. & A.R. — 1 ♀, 8 juv. (ZMUM), Altai Mts, Lake Teletskoe, near delta of Chulyshman River, *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 650 m a.s.l., 13–24.07.1997, leg. S.G. — 4 ♂♂, 4 ♀♀, 26 juv. (ZMUM), same locality, near Artybash, *Picea obovata* + *Abies sibirica* + *Pinus sibirica* taiga forest, 500–800 m a.s.l., 13–24.07.1997, leg. S.G. & A.T.

REMARKS: This species, originally described from between Mariinsk, Kemerovo Area and Achinsk, Krasnoyarsk Province [Stuxberg, 1876a], has since been reported from the Novosibirsk Area as well [Mikhajlova, 1993]. The above material shows that *S. clavatipes* is quite widespread in West and Southwest Siberia, including the Altai Mts, Gornaya Shoriya, and Kuznetsky Alatau Mts.

Schizoturanus salairicus (Gulička, 1963)

Turanodesmus salairicus Gulička, 1963: 522, figs.

Schizoturanus salairicus — Lokšina & Golovatch, 1979: 384; Mikhajlova, 1993: 31.

Material: 20 ♂♂, 4 ♀♀, 26 juv. (ZMUM), Kemerovo Area, Kuznetsky Alatau Nature Reserve, Mt. Bolshaya Tserkovnaya, 26 air-km SSW of Belogorsk, 1,300–1,450 m a.s.l., upper timberline, 26.08.1993, leg. S.G. & V.G. — 1 ♀, 7 juv. (ZMUM), same locality, ca. 16 air-km SW of Belogorsk, Kiya River, Bezymianka River delta, riverine taiga, 14–17.07.1994, leg. S.G. & A.R. — 2 ♂♂ (ZMUM), same locality, delta of Bezymianka River, ca. 16 air-km SW of Belogorsk, *Abies sibirica* + *Pinus sibirica* taiga with *Betula*, *Salix* etc. along the stream, 420 m a.s.l., 01–05.09.1993. — 11 ♂♂, 10 juv. (ZMUM), same locality, delta of Malaya Bezymianka River, ca. 19 air-km SSW of Belogorsk, *Abies sibirica* + *Pinus sibirica* taiga, 500 m a.s.l., 27–31.08.1993, all leg. S.G. & V.G. — 25 juv. (ZMUM), same Area, Novokuznetsk District, ca. 10 air-km S of Kuzedeyevo, *Tilia* insular forest (= Lipovyi ostrov), 450–550 m a.s.l., 20–24.07.1994, leg. S.G. & A.R.

REMARKS: The species is only known from the Kemerovo Area, Siberia, its terra typica [Gulička, 1963], being quite

common in the Salair, Gornaya Shoriya, and Kuznetsky Alatau Mts.

Schizoturanus tabescens (Stuxberg, 1876)

Polydesmus tabescens Stuxberg, 1876a: 27, figs.

Polydesmus tabescens — Stuxberg, 1876b: 316.

Schizoturanus tabescens — Mikhajlova, 1993: 32, fig.

Material: 2 ♀♀ (ZMUM), Krasnoyarsk Prov., Turukhansk Distr., Mirnoe, 13–23.VI.1988 — 6 ♀♀, 6 juv. (ZMUM), same locality, 23.VI.1990. — 3 ♀♀, 3 juv. (ZMUM), same locality, 25.VI.1990. — 7 ♀♀ (ZMUM), same locality, 6–17.VII.1990. — 3 ♀♀, 2 juv. (ZMUM), same locality, 7.VII.1990. — 3 ♀♀, 1 juv. (ZMUM), same locality, 11.VII.1990. — 3 ♀♀, 2 juv. (ZMUM), same locality, environs of Bakhta, 13.VII.1995. — 5 juv. (ZMUM), same locality, Yeniseysk Distr., environs of Ust-Pit, 1995. — 1 ♀ (ZMUM), same Province, Predivinsk, 28.VI.1996; all leg. L.R.

REMARKS: Only known from several places in the Krasnoyarsk Province [cp. Mikhajlova, 1993]. As among the rather numerous samples only a single male has hitherto been encountered, perhaps this is evidence of parthenogenesis.

Uniramidesmus perplexus Mikhajlova, 1984

Uniramidesmus perplexus Mikhajlova, 1984: 456, figs.

Uniramidesmus perplexus — Mikhajlova, 1993: 33.

Material: 1 ♂ (IBSV), Irkutsk Area, Lake Baikal, environs of Bolshie Koty, *Pinus* + *Betula* forest, litter, 21.VI.1988. — 1 ♂ (ZMUM), same locality, environs of Maritui, *Betula* + *Alnus* forest, litter, moss, 9.VII.1988; all leg. A.T.

REMARKS: This species is only known from the Irkutsk Area, its terra typica [Mikhajlova, 1984].

A provisional list of Siberian Diplopoda

ORDER POLYZONIIDA

Family Polytoniidae

Genus *Angarozonium* Shelley, 1998

1. *Angarozonium amurense* (Gerstfeldt, 1859)

ORDER JULIDA

Family Julidae

Genus *Cylindroiulus* Verhoeff, 1894

2. *Cylindroiulus latestriatus* (Curtis, 1845)

Genus *Julus* Linnaeus, 1758

3. *Julus ghilarovi* Gulička, 1963

3a. *J. ghilarovi ghilarovi* Gulička, 1963

3b. *J. ghilarovi brachydactylus* Gulička, 1972

Genus *Megaphyllum* Verhoeff, 1894

4. *Megaphyllum* aff. *sjaelandicum* (Meinert, 1868)

Genus *Pacifiulus* Mikhajlova, 1982

5. *Pacifiulus amurensis* (Gerstfeldt, 1859)

Genus *Sibiriulus* Gulička, 1972

6. *Sibiriulus altaicus* Gulička, 1972

7. *S. dentiger* Gulička, 1963

8. *S. multiricus* sp.n.

Family Nemasomatidae

Genus *Orinisobates* Lohmander, 1933

9. *Orinisobates microthylax* Enghoff, 1985

10. *O. sibiricus* (Gulička, 1963)

Julida nomina dubia

11. *Julus profugus* Stuxberg, 1876

12. *J. terrestris* Linnaeus, 1758

ORDER CHORDEUMATIDA

Family Altajellidae

Genus *Altajella* Gulička, 197213. *Altajella pallida* Gulička, 1972Genus *Teleckophoron* Gulička, 197214. *Teleckophoron montanum* Gulička, 1972

Family Anthroleucosomatidae

Genus *Ghilarovia* Gulička, 197215. *Ghilarovia kygae* Gulička, 197216. *G. novosibirica* Shear, 1988

Family Diplomaragnidae

Genus *Altajosoma* Gulička, 197217. *Altajosoma bakurovi* (Shear, 1990)18. *A. coxale* (Shear, 1990)19. *A. deplanatum* (Stuxberg, 1876)20. *A. golovatchi* (Shear, 1990)21. *A. katunicum* Mikhailjova, 200022. *A. kemerovo* (Shear, 1990)23. *A. shilenkovi* (Shear, 1990)Genus *Ancestreuma* Golovatch, 197724. *Ancestreuma feynmani* (Shear, 1990)25. *A. longibrachiatum* (Shear, 1990)26. *A. ramiferum* Mikhailjova, 200027. *A. ryvkini* (Shear, 1990)28. *A. subulatum* Mikhailjova, 2000Genus *Asiatyla* Mikhailjova, 200029. *Asiatyla communicantis* (Golovatch, 1977)30. *A. sajanica* (Gulička, 1972)31. *A. similata* Mikhailjova, 2000Genus *Orientyla* Mikhailjova, 200032. *Orientyla dahurica* (Gerstfeldt, 1859)Genus *Shearia* Mikhailjova, 200033. *Shearia calycina* Mikhailjova, 200034. *S. densecava* (Gulička, 1972)35. *S. khakassica* Mikhailjova, 200036. *S. oiskaya* Mikhailjova, 200037. *S. rybalovi* Mikhailjova, 200038. *S. shushenskaya* Mikhailjova, 200039. *S. teletskaya* Mikhailjova, 2000

Chordeumatida nomina dubia

40. *Craspedosoma armatum* (Gerstfeldt, 1859)41. *C. cylindricum* Stuxberg, 1876

ORDER POLYDESMIDA

Family Polydesmidae

Genus *Schizoturanius* Verhoeff, 193142. *Schizoturanius clavipes* (Stuxberg, 1876)43. *S. salairicus* (Gulička, 1963)44. *S. tabescens* (Stuxberg, 1876)Genus *Uniramidesmus* Golovatch, 197945. *Uniramidesmus perplexus* Mikhailjova, 1984

Conclusions

The millipede fauna of Siberia, an extremely vast region ranging from Transuralia in the west to the Chita and Irkutsk areas in the east, all known to be dominated by a very severe, sharply continental climate, permafrost and taiga or tundra vegetation on bogs, appears to be

unexpectedly relatively rich and diverse. This fauna is quite comparable to, though definitely somewhat poorer than, that of the Russian Far East: ca. 45 species or subspecies, 17 genera, 7 families and 4 orders versus 63 species, 26 genera, 15 families and 5 orders [Mikhailjova, 1998, 2000]. The bulk of millipede diversity is actually confined to the montane formations lying in the south of Siberia, where also endemism is particularly profound: Altai, Sayan, Khamar-Daban etc. In these mountains millipedes, first of all members of the order Chordeumatida, commonly reach the (sub)alpine belt.

Further to the north, especially over the vast plains of western, central and eastern Siberia, the fauna is particularly strongly impoverished and, though containing a few relatively widespread boreal/taiga forms like *Polyzonium amurense* or *Altajosoma golovatchi*, it seems to enjoy very few to no endemic species. Furthermore, not only the tundra belt in the Extreme North but also several regions in West Siberia like the Omsk, Tomsk and Tyumen areas which support taiga and/or small-leaved forest-steppe woodlands appear to be almost to totally devoid of Diplopoda. Several large rivers such as the Ob, Yenisey and some others seem to have served as the main pathways for northward dispersal of Diplopoda in Siberia. This is so because all major Siberian rivers run from south to north while their beds are about the only places in northern Siberia which are both rich in arboreal riverine vegetation and devoid of permafrost. In any event, permafrost seems to represent an environmental factor totally suppressing any diplopod fauna.

The Yenisey Valley, or Stegmann's line, appears to serve as a marked biogeographical barrier for certain millipedes as well [cf. Stegmann, 1938], the distribution of *Angarozonium* being a nice example of such a western range limit.

Endemism in Siberian Diplopoda is largely low-level, with four genera (*Sibirulius*, *Ghilarovia*, *Altajella*, and *Teleckophoron*) and a single subendemic family (Altajellidae), largely in the order Chordeumatida, more or less restricted to the Altai Mountains with the adjacent Gornaya Shoriya, Salair, Kuznetsky Alatau Mts and, partly, West Sayan Mts. The fauna of these mountainous lands, though dominated by purely Siberian/local forms, still harbours several elements of the European faunal nucleus (e.g., *Julus*, *Megaphyllum*) [cp. Kime & Golovatch, 2000]. Some others are shared with Central Asia (*Orinisobates sibiricus*, *Schizoturanius*, Altajellidae) or the ancient Mediterranean (Anthroleucosomatidae) [cf. Golovatch, 1984]. Regrettably, the faunas of the Rudnyi Altai, Tarbagatai and Saur mountains in the adjacent parts of East Kazakhstan are too poorly known to be properly compared in this context. In contrast, east of the Altai Mountains, endemism appears to decrease to finally become species-level only. Very few genera (*Angarozonium*, *Pacifiulius*, *Uniramidesmus*) and almost no species are shared by the diplopod faunas of Siberia and the Russian Far East; yet both regions are dominated by members of the family Diplomaragnidae. This family seems to have originated in Mongolia and/or adjacent parts of East Siberia whence several waves of eastward

and westward dispersal waves have obviously taken place [Shear, 1990; Mikhailova, 2000]. The influence of the Siberian faunal nucleus in the west is currently delimited by the Siberian *Altajosoma golovatchi* encountered in the Urals and Cisuralia, and the neoendemic *Schizoturanus dmitriewi* (Timotheew, 1897) in the forest-steppe belt of the Russian Plain, Eastern Europe [Golovatch, 1992].

On the other hand, the Siberian fauna is still relatively poorly known. Not only do several species require a revision but also about any reasonable millipede collection from Siberia appears to yield new taxa. So both further collecting efforts over this vast territory and much more identification work are necessary to finally assess the fauna and distributions of Siberian Diplopoda.

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