

MEMORABILIA ZOOL.	48	207-217	1994
-------------------	----	---------	------

Alexandr G. RADCHENKO

**New Palaearctic species of the genus *Myrmica* LATR.
 (Hymenoptera, Formicidae)**

Abstract. Four new species are described: *Myrmica pisarskii* (Mongolia and Southern Siberia; similar to *M. kasczenkoi* RUZS.), *M. zojae* (SE Altai; similar to *M. lobicornis* NYL.), *M. transsibirica* (Siberia from Altai to Pacific Ocean; similar to *M. bicolor* KUPIAN. and *M. kasczenkoi*), and *M. tschekanovskii* (Eastern Siberia; similar to *M. arnoldii* DLUSSKY). *M. pisarskii*, *M. zojae* and *M. transsibirica* belong to the *lobicornis* group, and *M. tschekanovskii* to the *arnoldii* group (the subgenus *Dodecamyrmica* sensu K. ARNOLDI 1968).

In a preceding paper (RADCHENKO, in press) a survey of the genus *Myrmica* LATR. has been given and 9 groups of Palaearctic species have been established: *rubra*, *rugosa*, *scabrinodis*, *lobicornis*, *schencki*, *luteola*, *arnoldii*, *carinata*, and *ritae*; all socially parasitic species have been provisionally placed in a separate, tenth group. So far, nearly 70 Palaearctic *Myrmica* good species are known. Four of these, from different regions of Siberia and the Far East, are described below.

Measurements and indices used:

- HL (Head length) – the length of the head in full-face view, measured in a straight line from the anterior point of the median clypeal margin to mid-point of the occipital margin;
- HW (Head width) – the maximum width of the head in full-face view, measured behind the eyes (excluding the eyes!);
- SL (Scape length) – the maximum straight-line length of the antennal scape;
- FW (Frons width) – the maximum distance between frontal carinae;
- FLW (Frontal lobe width) – the maximum width of frontal lobes;
- AL (Alitrunk length) – the diagonal length of the alitrunk in lateral view from the posterior base of the metapleural lobes to the antero-dorsal border of the promesonotum (in females and males) or to the anterior border of the neck shield (in workers);
- CI (Cephalic index) = HL:HW;
- SI (Scape index) = HL:SL;
- FI (Frontal index) = FLW:FW;
- FLI (Frontal lobe index) = HW:FLW;

The material examined belongs to the following institutions:

- ZM – Zoological Museum of Moscow University, Moscow;
- IZ – Institute of Zoology, Ukrainian Academy of Sciences, Kiev;
- MiIZ – Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw.

Myrmica pisarskii sp. n.

M. saposhnikovi RUZS.: PISARSKI 1969a: 228, PISARSKI 1969b: 296, DLUSSKY, PISARSKI 1970: 85, nec RUZSKY 1905.

Holotype, worker: AL 1.50; HL 1.02; HW 0.90; SL 0.77; FW 0.34; FLW 0.45 mm (Figs 1–4).

Paratypes, workers: AL 1.36–1.57; HL 0.85–1.06; HW 0.76–0.97; SL 0.69–0.84; FW 0.32–0.36; FLW 0.42–0.50 mm.

Head somewhat elongate (CI 1.10–1.16), with convex sides, feebly rounded occipital corners and straight occipital border. Median portion of clypeus slightly prominent anteriorly. Frontal carinae moderately curved, frons relatively narrow (FI 1.28–1.40; FLI 2.48–2.75). Antennal scapes relatively short (SI 1.24–1.35), abruptly curved basally, possessing small transversal lobe or teeth. Antennal sockets surrounded by arched rugae. Frons coarsely longitudinally rugulose, lateral parts of dorsum of head with wavy rugae and loop-like sculpture.

Alitrunk in side view low, with faint mesopropodeal impression, which is frequently lacking. Propodeal spines thin, acute at apex, slightly extended at base, feebly curved downwards and out backwards. Petiolar node low, massive, its anterior face slightly concave and meeting with dorsal face under feebly rounded angle; dorsal area indistinct, fluently merged with posterior face. Postpetiole higher than petiole. Alitrunk and pedicel coarsely rugulose.

Body with dense long standing hairs. Alitrunk, pedicel and antennal scapes reddish-brown, head and gaster dark brown.

Paratypes, females: AL 1.76–1.92; HL 1.06–1.16; HW 0.98–1.08; SL 0.83–0.87 mm (Figs 5–8).

Head somewhat elongate (CI 1.08–1.10), with slightly convex sides and rounded occipital corners; anterior clypeal border straight. Frontal carinae more feebly curved than in workers, frons broader (FI 1.23–1.25; FLI 2.46–2.48); antennal sockets surrounded by arched rugae. Shape of antennal scapes as in workers, SI 1.29–1.33. Frons and vertex coarsely longitudinally rugulose, lateral parts of dorsum of head and occiput with wavy rugae.

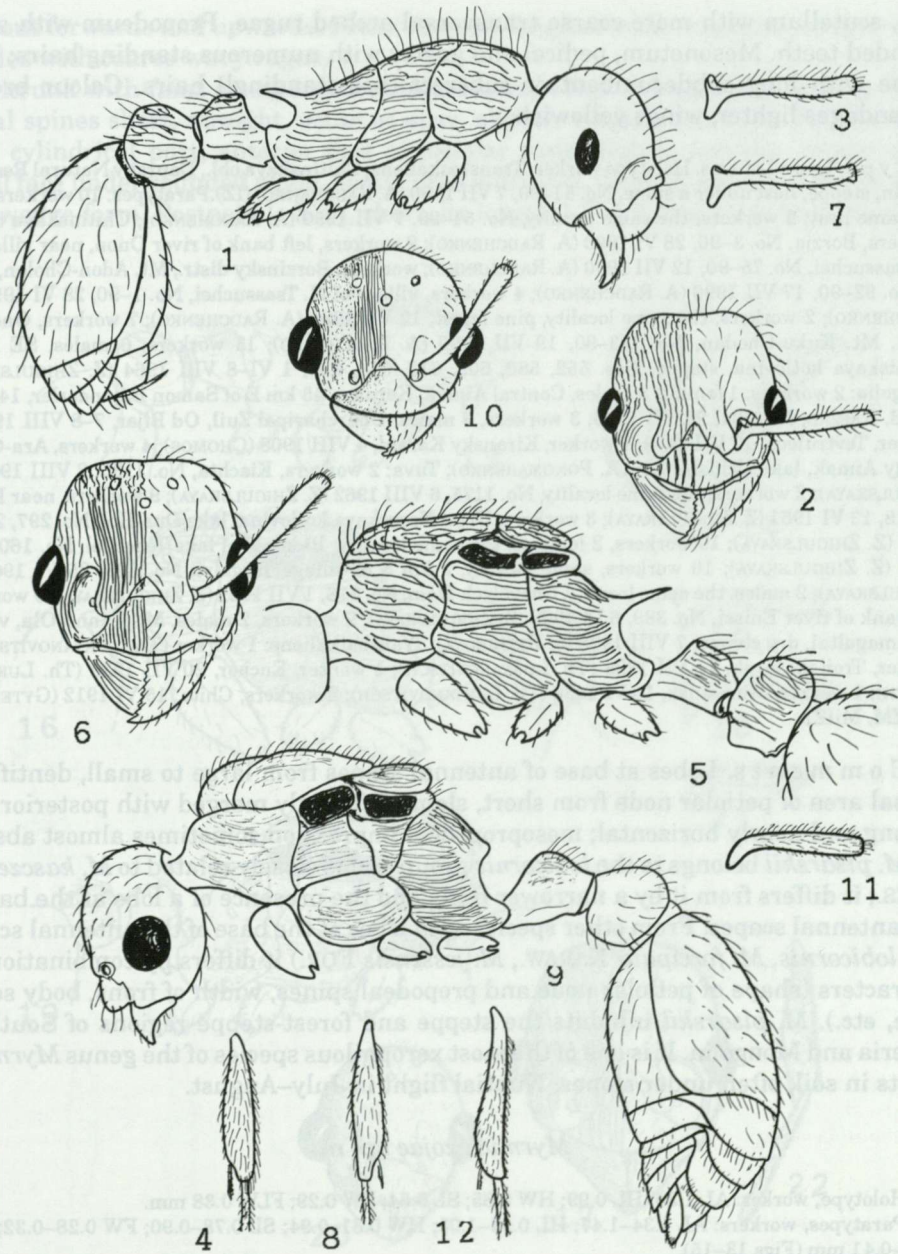
Propodeal spines straight, acute, feebly extended at base. Anterior face of petiolar node slightly concave, dorsal area distinct, slightly sloping; postpetiole higher than petiole.

Sides of alitrunk, scutum and scutellum coarsely longitudinally rugulose. Body with numerous standing hairs. Colour reddish-brown, appendages lighter.

Paratypes, males: AL 1.54–1.85; HL 0.81–0.94; HW 0.70–0.90; SL 0.64–0.69 mm (Figs 9–12).

Head somewhat elongate (CI 1.05–1.08) with convex occipital border and widely rounded occipital corners. Antennal scapes long (SI 1.22–1.36), abruptly curved basally with distinct small angles. Frons finely longitudinally rugulose, other parts of dorsum of head densely punctate. Head with numerous standing hairs; antennal scapes with short hairs, their length no more than half the maximum thickness of scapes.

Mesopleurae finely densely rugulose, sides of propodeum with more coarse rugosity; prothorax densely punctate. Scutum finely longitudinally rugulose and punc-



Figs 1-12. *Myrmica pisarskii* sp. n.: 1-4 - worker (holotype), 5-8 - female (paratype), 9-12 - male (paratype); 1, 9 - body in profile, 5 - alitrunk and pedicel in profile, 2, 6, 10 - head from above, 3, 7, 11 - antennal scapes, 4, 8, 12 - hind tibiae.

tate, scutellum with more coarse transversal arched rugae. Propodeum with short rounded teeth. Mesonotum, pedicel and gaster with numerous standing hairs; hind tibiae with long subdecumbent or suberect (not standing!) hairs. Colour brown, appendages lighter, wings yellowish.

Type localities. Holotype worker: Transbaikaliens, Chitinskaya obl., Daursky Natural Reserve, Irelgin, steppe, nest under a stone, No. 51–90, 7 VII 1990 (A. RADCHENKO) (IZ). Paratypes: 10 workers from the same nest; 2 workers, the same locality, No. 51–90, 7 VII 1990 (A. RADCHENKO); Chitinskaya obl.: 5 workers, Borzia, No. 3–90, 28 VI 1990 (A. RADCHENKO); 9 workers, left bank of river Onon, near village of N. Tsassuchei, No. 75–90, 12 VII 1990 (A. RADCHENKO); workers, Borzinsky distr., Mt. Adon-Cholon, 1000 m, No. 92–90, 17 VII 1990 (A. RADCHENKO); 4 workers, village of N. Tsassuchei, No. 1–90, 28 VI 1990 (A. RADCHENKO); 2 workers, the same locality, pine forest, 12 VII 1990 (A. RADCHENKO); 7 workers, Ononsky distr., Mt. Kuku-Chodan, No. 113–90, 19 VII 1990 (A. RADCHENKO); 15 workers, 6 males, SE Altai, Kuraiskaya kotlovina, steppe, Nos. 552, 580, 609, 612, 614, 638, 1 VI–8 VIII 1964 (Z. ZHIGULSKAYA); Mongolia: 2 workers, 1 female, 4 males, Central Aimak, Kerulen, 45 km E of Samon Bajanderler, 1400 m, exped. KASZAB, No. 304, 26 VII 1965; 3 workers, 3 males, Uburcharipai Zuil, Od Bijar, 7–8 VIII 1985; 1 worker, Tivrulech, 17 VII 1979; 1 worker, Kiransky Karaul, 4 VIII 1908 (CHOMOS); 4 workers, Ara-Changajsky Aimak, lake Uchish-Noor (A. PONOMARENKO); Tuva: 2 workers, Kiachta, No. 1135, 2 VIII 1962 (Z. ZHIGULSKAYA); 2 workers, the same locality, No. 1175, 6 VIII 1962 (Z. ZHIGULSKAYA); 9 workers, near Kysyl, No. 18, 13 VI 1961 (Z. ZHIGULSKAYA); 3 workers, Ubsu-Noorskaya kotlovina, lake Dus-Hol, No. 297, 25 VII 1962 (Z. ZHIGULSKAYA); 10 workers, 2 females, the same locality, 10 km N of lake Ters-Hol, No. 160, 7 VI 1962 (Z. ZHIGULSKAYA); 10 workers, same locality, 3 km S of village Torgalyk No. 220, 25 VI 1962 (Z. ZHIGULSKAYA); 2 males, the same locality, Shevelych-Hem, No. 316, 1 VII 1962 (Z. ZHIGULSKAYA); 9 workers, left bank of river Enisei, No. 389, 6 IX 1962 (Z. ZHIGULSKAYA); 2 workers, 2 males, Mt. Tannu-Ola, village of Samagaltai, dry steppe, 7 VIII 1978 (J. REZNIKOVA); Transbaikaliens: 1 worker (Th. LUKYANOVITSCH); 1 worker, Troitskosavsk, 11 VII 1928 (Th. LUKYANOVITSCH); 1 worker, Enchor, 20 VII 1928 (Th. LUKYANOVITSCH); 1 worker, Minusinsk, 10 VI 1936 (Th. LUKYANOVITSCH); 2 workers, Chita, 15 VI 1912 (GYTELMAN) (IZ, ZM, MiIZ).

Comments. Lobes at base of antennal scapes from large to small, dentiform; dorsal area of petiolar node from short, sloping, fluently merged with posterior face to long and nearly horizontal; mesopropodeal impression sometimes almost absent.

M. pisarskii belongs to the *lobicornis* group and is closely related to *M. kasczenkoi* RUZS.; it differs from it by a narrower frons and the presence of a lobe at the base of the antennal scapes. From other species with lobes at the base of the antennal scapes (*M. lobicornis*, *M. forcipata* KARAW., *M. jessensis* FOR.) it differs by combinations of characters (shape of petiolar node and propodeal spines, width of frons, body sculpture, etc.). *M. pisarskii* inhabits the steppe and forest-steppe regions of Southern Siberia and Mongolia. It is one of the most xerophilous species of the genus *Myrmica*. Nests in soil, often under stones. Nuptial flight in July–August.

Myrmica zojae sp. n.

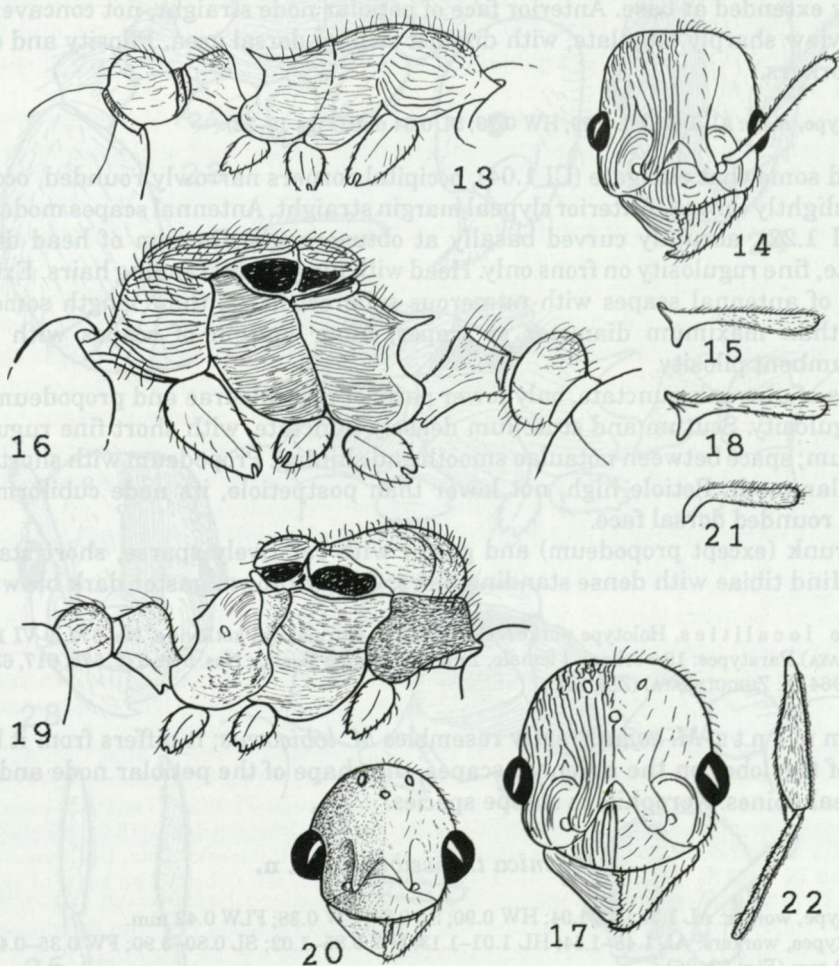
Holotype, worker: AL 1.34; HL 0.99; HW 0.85; SL 0.84; FW 0.29; FLW 0.38 mm.

Paratypes, workers: AL 1.34–1.47; HL 0.94–1.05; HW 0.81–0.94; SL 0.78–0.90; FW 0.28–0.32; FLW 0.36–0.41 mm (Figs 13–15).

Head elongate (CI 1.12–1.18), with slightly convex sides, narrowly rounded occipital corners and straight occipital border. Anterior clypeal margin straight or very feebly convex. Frontal carinae strongly curved, frons narrow (FI 1.27–1.35, FLI 2.83–3.10), antennal sockets surrounded by arched rugae. Antennal scapes moderately long (SI 1.17–1.24), abruptly curved basally, forming right angle, with large lobes,

stick out forwards and upwards. Frons coarsely longitudinally rugulose, occiput and temples with coarse wavy rugae.

Alitrunk with faint mesopropodeal impression, which is frequently lacking. Propodeal spines short, straight, acute at apex, slightly extended at base. Petiole with short cylindrical part, anterior face of petiolar node slightly concave, meets with dorsal face under rounded angle, dorsal area indistinct, sloping, petiolar node in side view wedge-form. Postpetiole high, short, its length 1.7–1.8 times less than height.



Figs 13–22. *Myrmica zojae* sp.n.: 13–15 – worker (holotype), 16–18 – female (paratype), 19–22 – male (paratype); 13, 16, 19 – alitrunk and pedicel in profile, 14, 17, 20 – head from above, 15, 18, 21 – antennal scapes, 22 – hind tibiae.

Alitrunk and pedicel strongly longitudinally rugulose. Body with numerous standing hairs; antennal scapes and tibiae with numerous, rather coarse suberect hairs. Alitrunk, pedicel and appendages reddish-brown, head and gaster darker.

Paratype, female: AL 1.82; HL 1.13; HW 1.2; SL 0.88 mm (Figs 16–18).

Shape of head, frontal carinae, frontal lobes and scapes as in workers.

Sides of alitrunk longitudinally rugulose, rugae more coarse on propleurae and propodeum; scutum and scutellum longitudinally rugulose. Propodeal spines short, strongly extended at base. Anterior face of petiolar node straight, not concave; node in side view sharply angulate, with distinct sloping dorsal area. Pilosity and colour as in workers.

Paratype, male: AL 1.65; HL 0.79; HW 0.76; SL 0.64 mm (Figs 19–22).

Head somewhat elongate (CI 1.04), occipital corners narrowly rounded, occipital border slightly convex. Anterior clypeal margin straight. Antennal scapes moderately long (SI 1.22), abruptly curved basally at obtuse angle. Dorsum of head densely punctate, fine rugulosity on frons only. Head with numerous standing hairs. External margin of antennal scapes with numerous suberect hairs, their length somewhat longer than maximum diameter of scapes; inner margin of scapes with dense subdecumbent pilosity.

Sides of alitrunk punctate, only lower parts of mesopleurae and propodeum with fine rugulosity. Scutum and scutellum densely punctate, with short fine rugulosity on scutum; space between notaulae smooth and shining. Propodeum with short acute triangular teeth. Petiole high, not lower than postpetiole, its node cubiform with convex, rounded dorsal face.

Alitrunk (except propodeum) and gaster with relatively sparse, short standing hairs. Hind tibiae with dense standing hairs. Colour brown, gaster dark brown.

Type localities. Holotype worker: the SE Altai, Kuraiskaya kotlovina, No. 572, 9 VI 1964 (Z. ZHIGULSKAYA). Paratypes: 19 workers, 1 female, 1 male, the same locality, Nos. 546, 572, 575, 617, 638, 657, VI–VII 1964 (Z. ZHIGULSKAYA) (ZM, IZ).

Comments. *M. zojae* greatly resembles *M. lobicornis*; it differs from it by the shape of the lobes on the antennal scapes, the shape of the petiolar node and short propodeal spines. Xerophilous steppe species.

Myrmica transsibirica sp. n.

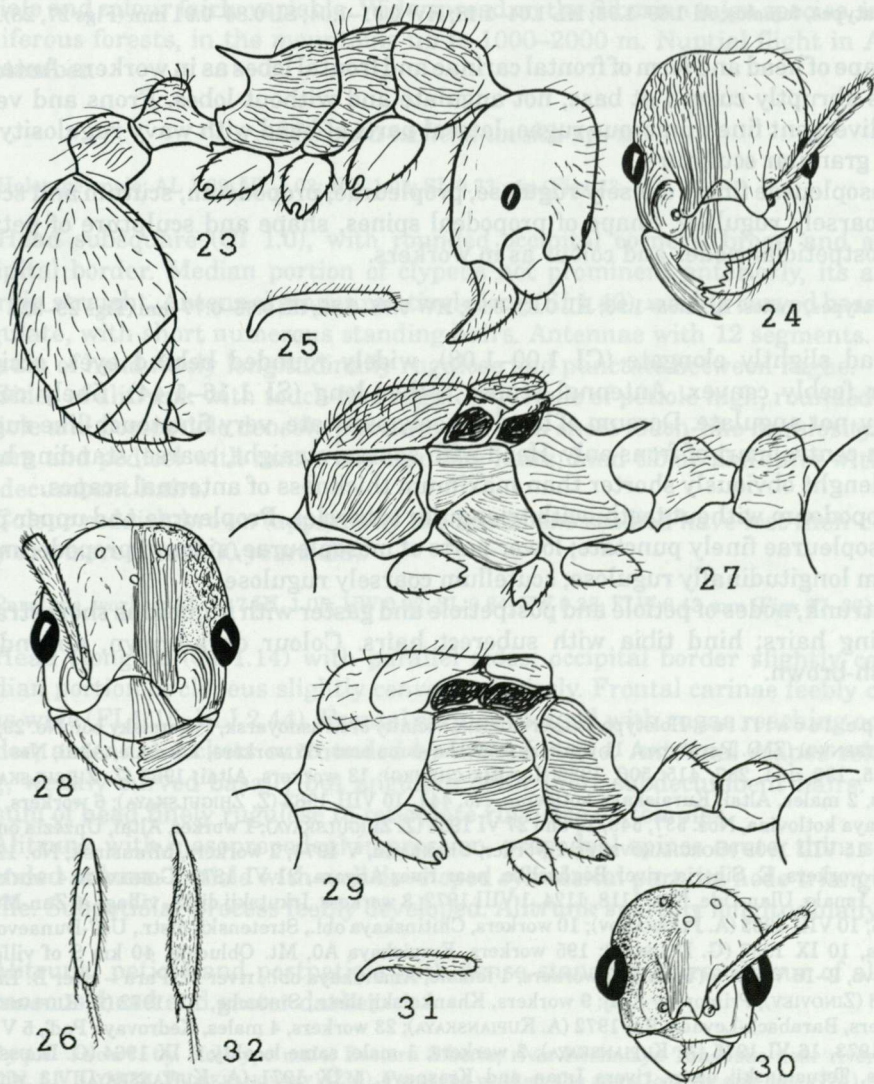
Holotype, worker: AL 1.53; HL 1.04; HW 0.90; SL 0.84; FW 0.38; FLW 0.42 mm.

Paratypes, workers: AL 1.48–1.54; HL 1.01–1.13; HW 0.85–1.02; SL 0.80–0.90; FW 0.35–0.45; FLW 0.38–0.50 mm (Figs 23–26).

Head slightly elongate (CI 1.10–1.18), with nearly parallel sides, rounded occipital corners and straight occipital border. Clypeus with straight or feebly convex anterior margin. Frontal carinae feebly curved, frons broad (FI 1.07–1.15, FLI 2.28–2.59). Antennal scapes relatively short (SI 1.21–1.36), abruptly curved basally, not possessing lobes, sometimes with a faint angle only. Antennal sockets surrounded by arched

rugae. Dorsum of head mostly densely longitudinally rugulose, lateral parts of head with wavy rugae.

Alitrunk with distinct mesopropodeal impression. Propodeal spines moderately long, straight or slightly curved downwards, acute, extended at base. Petiole with cylindrical part, anterior face of petiolar node concave, dorsum of node in side view not angulate, widely rounded or with indistinct area. Sides of alitrunk with numerous



Figs 23–32. *Myrmica transsibirica* sp. n.: 23–26 – worker (holotype), 27–28 – female (paratype), 29–32 – male (paratype); 23 – body in profile, 27, 29 – alitrunk and pedicel in profile, 24, 28, 30 – head from above, 25, 31 – antennal scapes, 26, 32 – hind tibiae.

straight or somewhat wavy rugae. Petiolar node with short wavy rugae and puncture; postpetiolar node with more coarse straight rugulosity.

Body with numerous standing hairs; hairs on antennal scapes rather long, their length equal or slightly longer than maximum thickness of scapes; hind tibia with suberect hairs. Colour fuscous, sides of alitrunk, petiolar and postpetiolar nodes and appendages ochraceous-brown.

Paratypes, females: AL 1.69–1.93; HL 1.04–1.18; HW 0.91–1.04; SL 0.84–0.91 mm (Figs 27, 28).

Shape of head and form of frontal carinae and frontal lobes as in workers. Antennal scapes abruptly curved at base, not angulate and without lobes. Frons and vertex with divergent fine numerous rugae, lateral parts of head with wavy rugulosity and dense granular sculpture.

Mesopleurae finely densely rugulose, propleurae, propodeum, scutum and scutellum coarsely rugulose. Shape of propodeal spines, shape and sculpture of petiolar and postpetiolar nodes and colour as in workers.

Paratypes, males: AL 1.65–1.93; HL 0.83–0.97; HW 0.78–0.85; SL 0.66–0.77 mm (Figs 29–32).

Head slightly elongate (CI 1.00–1.08), widely rounded behind eyes, occipital border feebly convex. Antennal scapes rather long (SI 1.16–1.44), finely curved basally, not angulate. Dorsum of head densely punctate, very fine touch-like rugulosity on central part of frons only. Head with sparse, straight, coarse, standing hairs, their length obviously shorter than maximum thickness of antennal scapes.

Propodeum without teeth, with triangular tubercles. Propleurae and upper parts of mesopleurae finely punctate; lower parts of mesopleurae, sides of propodeum and scutum longitudinally rugulose; scutellum coarsely rugulose.

Alitrunk, nodes of petiole and postpetiole and gaster with numerous short straight standing hairs; hind tibia with suberect hairs. Colour dark-brown, appendages reddish-brown.

Type localities. Holotype worker: Russia, vicinity of Krasnoyarsk, Pogorelsky bor, No. 29, 1964 (V. DMITRENKO) (ZM). Paratypes: 11 workers from the same nest; 65 workers, 1 female, Altai, Nos. 4, 14, 119, 125, 130, 131, 237, 415, 506, 1988 (L. OMELCHENKO); 13 workers, Altai, 1968 (Z. ZHIGULSKAYA); 2 females, 2 males, Altai, Kuraiskaya kotlovina, No. 441, 10 VIII 1963 (Z. ZHIGULSKAYA); 6 workers, Altai, Chuiskaya kotlovina, Nos. 537, 549, 18 and 27 VI 1964 (Z. ZHIGULSKAYA); 1 worker, Altai, Unzezia on river Katun', 15 VIII 1909 (GORCHAKOVSKY); 1 worker, Chakassia, V 1974; 2 workers, Minusinsk, No. 1286, V 1974; 6 workers, E. Siberia, river Bogdashka, near river Angara, 21 VI 1873 (GORTUNG); 4 workers, 1 female, 1 male, Ulan-Ude, Nos. 1118, 1124, 1 VIII 1972; 3 workers, Irkutskij distr., village of Zun-Murino, No. 295, 10 VIII 1965 (A. PLESHANOV); 10 workers, Chitinskaya obl., Stretenskij distr., Ust'-Dunaevo, Pad' Kulinda, 10 IX 1957 (G. DLUSSKY); 195 workers, Evreiskaya AO, Mt. Obluchje, 40 km S of village of Pashkovo, 2–16 VI 1978 (TOMS); 20 workers, 1 female, Amurskaya obl., river M. Para – river B. Ergel, 5 IX 1958 (ZINOVIEV); Primorsky Kraj: 9 workers, Khankaiskij distr., Sintuche, 1 V 1972 (A. KUPIANSKAYA); 9 workers, Barabach-Levada, 9 V 1972 (A. KUPIANSKAYA); 23 workers, 4 males, Kedrovaya Pad', 5 V 1971, 18 IX 1973, 16 VI 1975 (A. KUPIANSKAYA); 2 workers, 1 male, same locality, 6 IX 1964 (G. DLUSSKY); 8 workers, Tetuchinskij distr., rivers Iman and Krasnaya, 4 IX 1971 (A. KUPIANSKAYA); 13 workers, Dalnegorskij distr., Tetuche-Pristan', lake Vas'kovka, 26 VI 1972 (A. KUPIANSKAYA); 7 workers, Pejshula, Zmeinaya Gorka, 21 VII 1969 (A. KUPIANSKAYA); 11 workers, Sudzuche, bukhta Kut, 5 VIII 1946 (SHAROV); Suvorovo, 24 VI 1972 (ZHERYCHIN); 4 workers, vicinity of Vladivostok, 5 V 1989 (L. RYBALOV); 1 female, lake Hanka, 2 IX 1986 (A. KOTENKO); 4 workers, Sakhalin, vicinity of Juzhno-Sakhalinsk, 25 VII 1975 (A. KUPIANSKAYA); 2 workers, Sakhalin, village of Matrosova, 9 VIII 1986 (S. BASARUKIN); Kunashir: 3

workers, Alechino, 23 VIII 1875 (TIKHOMIROVA); 3 workers, Tretiakovo, 21 VIII 1975 (TIKHOMIROVA); 11 females, 2 males, lake Goriachee, volcano Golovina, 9 VIII 1970 (TIKHOMIROVA) (ZM, IZ).

C o m m e n t s. *M. transsibirica* belongs to the *lobicornis* group and differs from other species with a not angulate base of the antennal scapes (*M. kasczenkoi*, *M. bicolor* KUPIAN., *M. angulinodis* RUZS.) by broad frons, the head and alitrunk sculpture and the shape of the petiolar node. Changeable species; body size, shape of petiole and colour fairly variable. Wide-spread on the Siberian tajga species, inhabits coniferous forests, in the mountains up to 1000–2000 m. Nuptial flight in August–September.

Myrmica tschekanovskii sp. n.

Holotype, male: AL 1.89; HL 1.03; HW 1.03; SL 0.73 mm (Figs 33–36).

Head subsquare (CI 1.0), with rounded occipital corners, broad and straight occipital border. Median portion of clypeus not prominent anteriorly, its anterior margin straight. Antennal scapes relatively long (SI 1.40), weakly curved basally, not angulate, with short numerous standing hairs. Antennae with 12 segments. Entire dorsum of head finely longitudinally rugulose and punctate between rugae.

Sides of alitrunk with touch-like rugulosity. Node of petiole high, rounded above. Petiole and postpetiole densely punctate and with short touch-like rugulosity. Mesonotum and pedicel with numerous standing hairs; hind tibiae and tarsi with short subdecumbent hairs.

Colour reddish-brown (apparently the specimens studied have lost their colour – they are more than 100 years old).

Paratype, worker: AL 1.47 HL 1.05; HW 0.92; SL 0.84; FW 0.38; FLW 0.43 mm (Figs 37–39).

Head elongate (CI 1.14) with parallel sides; occipital border slightly concave. Median portion of clypeus slightly convex anteriorly. Frontal carinae feebly curved, frons wide (FI 1.15, FLI 2.44). Frontal carinae merged with rugae reaching occipital border; antennal sockets surrounded by arched rugae. Antennal scapes relatively long, weakly curved basally but angulate, with short subdecumbent hairs. Entire dorsum of head finely rugulose to reticulate-rugulose on temples.

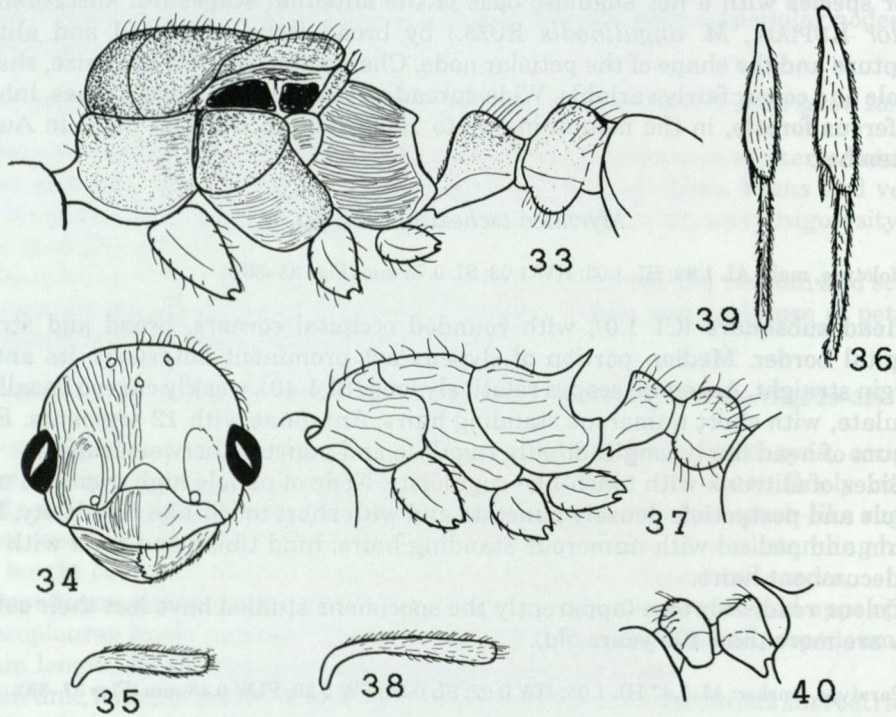
Alitrunk with mesopropodeal impression, propodeal spines acute, thin, slightly extended at base. Petiole with well developed cylindrical part, its node triangular in profile. Subpetiolar process feebly developed. Alitrunk sparsely longitudinally rugulose.

Alitrunk, petiole and postpetiole with dense standing hairs. Colour of alitrunk ochraceous, head and gaster darker.

Type locality. Holotype male: Eastern Siberia, river Nizhniaya Tunguska near river Enisei, 64°40'N, 5 VIII 1873 (TSHEKANOVSKY) (ZM). Paratype worker: the same locality and date (ZM).

C o m m e n t s. *M. tschekanovskii* belongs to the *arnoldii* group (the subgenus *Dodecamyrmica* sensu K. ARNOLDI 1968). The male differs from *M. arnoldii* DLUSSKY by long antennal scapes (SI 1.40; SI of *M. arnoldii* 2.55–2.62). The worker differs by

the length of the scapes (SI 1.25; SI of *M. arnoldii* 1.42–1.50) and by their shape (the scapes of *M. arnoldii* are not angulate at the base) and feebly developed the subpetiolar process (see Figs 37, 40).



Figs 33–39. *Myrmica tschekanovskii* sp. n.: 33–36 – male (holotype), 37–39 – worker (paratype); 33, 37 – alitrunk and pedicel in profile, 34 – head from above, 35, 38 – antennal scapes, 36, 39 – hind tibiae; Fig. 40 – *M. arnoldii* DLUSSKY: worker pedicel in profile.

REFERENCES

- ARNOLDI K. V. 1968. Vazhnye dopolneniya k mirmekofayne (*Hymenoptera, Formicidae*) SSSR i opisaniye novykh form. Zool. Zh., Moskva, 47: 1800–1822.
- DLUSSKY G. M., PISARSKI B. 1970. *Formicidae* aus der Mongolei. Mitt. Zool. Mus. Berlin, 46: 85–90.
- PISARSKI B. 1969a. Fourmis (*Hymenoptera: Formicidae*) de la Mongolie. Fragm. faun., Warszawa, 15: 221–236.
- PISARSKI B. 1969b. *Myrmicidae* und *Formicidae*. In: Ergebnisse der zoologischen Forschungen von Dr. Z. KASZAB in der Mongolei (*Hymenoptera*). Faun. Abh., Dresden, 2: 295–316.
- RADCHENKO A. G. Obzor palearkticheskikh murav'ev roda *Myrmica* (*Hymenoptera, Formicidae*). Zool. Zh., Moskva (in press).

RUZSKY M. D. 1905. Murav'e Rossii. Kazan', 800 pp.

Institute of Zoology, Ukr. Ac. Sci.
B. Khmel'nitsky St 15, Kiev-30
252601 Ukraine

STRESZCZENIE

Nowe palearktyczne gatunki z rodzaju *Myrmica* LATR. (Hymenoptera, Formicidae)

Opisane są 4 nowe gatunki z rodzaju *Myrmica* LATR.: *M. pisarskii* (Mongolia i Południowa Syberia), *M. zojae* (południowo-wschodnia część Altaju), *M. transsibirica* (Syberia od Altaju po wybrzeże Pacyfiku) i *M. tschekanovskii* (Wschodnia Syberia). Trzy pierwsze gatunki należą do grupy *M. lobicornis* NYL., czwarty – do grupy *M. arnoldii* DLUSSKY (podrodzaj *Dodecamyrmica* sensu K. ARNOLDI, 1968).

Zhanna REZNIKOVA, Boris KYABKO

Experimental study of the ants' communication system, with the application of the Information Theory approach

Abstract. In the laboratory experiments devised on the basis of the Information Theory, ants (*Formica polyctena* FÖRST., *F. sanguinea* LATR., *Camponotus caryonis* RUGG.) had to transmit a definite amount of information to each other in order to obtain food. The ants were able to memorize and pass up to 6 bits of information, and the time of communication was proportional to the amount of information. The results evidenced the existence of a developed "language behaviour" in species with a high level of social organization and have showed them as being able to use "text" regularities for information coding. A special series of experiments demonstrated the ants' ability to count and to transmit numbers.

INTRODUCTION

Due to their social mode of life, ants can occupy the key position in most ecosystems and they really have no equal rivals within the complex of predators. The success of ecologically dominant ant species must be due, at least in part, to their complex spatial-temporal organization. A lot of paper have been published on the spatial pattern and different ways of territory utilization (DLUSSKY 1965, 1967, ROSENGREN 1971, 1977, HÖLDOBLER, WILSON 1977, 1978, 1990, ZAKHAROV 1991, and others). The works of PISARSKI (1972, 1973, 1982) made a valuable contribution to the development of our knowledge in the field of ants' complex territorial behaviour. He formulated a classification of ant societies in the light of the Evolution Theory (PISARSKI 1978).

Obviously, ecologically dominant ant species are especially dependent on recruitment systems to control their environment (HÖLDOBLER 1983). The ants' communication system is one of the most controversial issues in ethology. These insects are known to use different communicative ways for recruitment: chemical trails, sound signals, kinopsis (reaction to the excited scout behaviour), tandems etc. (WILSON