

UDK 595.796

TAXONOMIC REVISION OF THE *STRIATIVENTRE* SPECIES GROUP OF THE GENUS *TETRAMORIUM* (HYMENOPTERA, FORMICIDAE)

A. G. Radchenko¹, A. Scupola²

¹*Schmalhausen Institute of Zoology, the NAS of Ukraine,
vul. B. Khmel'nitskogo, 15, Kiev, 01030 Ukraine*

E-mail: rad@izan.kiev.ua

²*Museo di Storia Naturale, Lungadige Porta Vittoria, 9, 37129 Verona, Italy*

E-mail: scupolant@outlook.it

Taxonomic Revision of the *Striativentre* Species Group of the Genus *Tetramorium* (Hymenoptera, Formicidae). Radchenko, A. G., Scupola, A. — The *Tetramorium striativentre* species group is revised. Workers and queens of the species of this group are characterized by the unique for all other Palaearctic *Tetramorium* species feature: the first gastral tergite, or at least its anterior half, is very densely and distinctly longitudinally striato-punctated. We place six species to this group, including two new ones: *T. striativentre* Mayr, *T. schneideri* Emery, *T. kabulistanicum* Pisarski, *T. saudicum* Sharaf, *T. sabatinellii* sp. n. from Jordan, and *T. pisarskii* sp. n. from Afghanistan. Additions to the diagnosis of *T. striativentre* and *T. schneideri* and the first descriptions of males of these two species are provided, and a key to species of this group is compiled.

Key words: ants, taxonomy, *Tetramorium*, *striativentre* species group, *Tetramorium sabatinellii* sp. n., *T. pisarskii* sp. n., Palaearctic.

Таксономическая ревизия группы видов *striativentre* рода *Tetramorium* (Hymenoptera, Formicidae). Радченко А. Г., Скупола А. — Ревизована группа видов *Tetramorium striativentre*. Рабочие и самки видов этой группы характеризуются уникальным среди всех прочих палеарктических видов *Tetramorium* признаком: первый тергит брюшка или, по меньшей мере, его передняя половина с густой и отчетливой продольной струйчато-пунктированной скульптурой. Мы отнесли шесть видов к этой группе, включая два новых: *T. striativentre* Mayr, *T. schneideri* Emery, *T. kabulistanicum* Pisarski, *T. saudicum* Sharaf, *T. sabatinellii* sp. n. из Иордании и *T. pisarskii* sp. n. из Афганистана. Приведены дополнительные данные к диагнозам *T. striativentre* и *T. schneideri*, впервые описаны самцы двух последних видов и составлена таблица для определения видов из этой группы.

Ключевые слова: муравьи, таксономия, *Tetramorium*, *striativentre* species group, *Tetramorium sabatinellii* sp. n., *T. pisarskii* sp. n., Палеарктика.

Introduction

Tetramorium Mayr, 1855 is one of the most speciose ant genera that includes more than 450 described species (Bolton, 2014) distributed worldwide except for Antarctic and Arctic territories. Majority of them (> 200) are found in the Afrotropical Region and about 60 in the Palaearctic. The latest taxonomic revisions of this genus were carried out for all zoogeographic regions, except for the Palaearctic (Bolton, 1976, 1977, 1979, 1980).

The first taxonomic review of the Palaearctic *Tetramorium* was provided by Emery (1909). Afterwards some reviews of this genus from various parts of the West Palaearctic were made by Santschi (1927), Stitz (1939) and Kratochvíl (1944). More recently, some data on the Palaearctic *Tetramorium* were published in the regional monographs or special taxonomic papers, including descriptions of a number of new species from Morocco (Cagniant, 1997), Iberian Peninsula (López, 1991 a, b; López et al., 1992), South Europe (Bernard, 1967), Balkans (Agosti, Collingwood, 1987 a, b), Switzerland (Kutter, 1977), North Europe (Collingwood, 1979), Italy (Mei, 1995; Sanetra et al., 1999), Germany (Schulz, 1996; Seifert, 1996), Poland (Radchenko et al., 1998; Czechowski et al., 2002, 2012), Central and North Europe (Seifert, 2007), European part of the former Soviet Union and Caucasus (Arnoldi, 1968; Radchenko, Arakelyan, 1990; Arakelyan, 1994), former Soviet Union (Radchenko, 1992 a, b), Kyrgyzstan (Tarbinsky, 1976), Kazakhstan (Bursakov, 1984), Turkmenistan (Dlussky, Zabelin, 1985; Dlussky et al., 1990), Afghanistan (Pisarski, 1967, 1969), Turkey (Poldi, 1979), Saudi

Arabia (Collingwood, 1985; Collingwood, Agosti, 1996; Sharaf et al., 2012, 2013), China (Wang et al., 1988; Xu, Zheng, 1994; Zhou, Jiang, 1998), Japan (Imai et al., 2003). Nevertheless, modern taxonomic revision were provided only for some Palaearctic species groups of *Tetramorium* (Csősz et al., 2007, 2014; Csősz, Schulz, 2010), and, in general, this genus in Palaearctic needs cardinal revision.

It is significant to notice that *Tetramorium* is objectively and subjectively very complicated taxonomically genus, because workers of many species are very variable (particularly in body sculpture and colour), workers of different species resemble one another and are often hardly distinguishable, and both queens and males are necessary for the correct identification and interpretation of the majority of species. At that, most of the species and infraspecific forms were described based solely on workers and in museum collections sexual forms are present only for a few samples. At last, besides ca. 450 described good species, about 250 valid infraspecific names are known in this genus. Furthermore, it was recently shown that even within one of the commonest and widespread Palaearctic species, commonly identified as *T. caespitum* (Linnaeus, 1758), there are several morphologically and molecularly different cryptic species (Schlick-Steiner et al., 2006; Steiner et al., 2010; Csősz et al., 2014).

Despite workers of tropical *Tetramorium* species sometimes are quite diverse morphologically, Palaearctic members of this genus in general have more uniform body structure, but often they well differ by the character of sculpture.

Members of the *striativentre* species group are characterized by a unique feature for all at least Palaearctic *Tetramorium*: the first gastral tergite, or at least its anterior half, of workers and queens is very densely and distinctly longitudinally striato-punctated. In contrast, the first gastral tergite of all other species is smooth and appearing shiny, at most with superficial microreticulation, or finely and sparsely punctated.

Until now, three species were attributed to this species group: *T. striativentre* Mayr, 1877, *T. schneideri* Emery, 1898, and *T. kabulistanicum* Pisarski, 1967 (Radchenko, 1992 a, b). One more species, indisputably belonging to this group, has been described recently from Saudi Arabia (Sharaf et al., 2013), although it was originally placed to the *caespitum* species group. At last, one more new species of this group was collected in Jordan, and somewhat surprisingly we found the second new species within the paratype series of *T. kabulistanicum*. Below we describe two new species, *T. sabatinellii* sp. n. and *T. pisarskii* sp. n., provide some additions to the diagnosis of *T. striativentre* and *T. schneideri*, describe for the first time males of the two latter species, and compile a key to species of this group.

Material and methods

This revision is based on the examination of existing material deposited in various museum collections, and a new material collected in Jordan by Italian entomologists Guido Sabatinelli, Mauro Daccordi and Marco Uliana. Altogether, more than 200 specimens were examined. Measurements of specimens (accurate to 0.01 mm) were taken for each caste using the Olympus SZX12 stereomicroscope and these were used to calculate various indices. Original photos were made using the Leica MZ16 stereomicroscope, connected to the camera IC 3D. The examined material is deposited in the following collections:

MSNG — Museo Civico di Storia Naturale “Giacomo Doria” di Genova, Italy;

MSNVR — Museo Civico di Storia Naturale di Verona, Italy;

MSNM — Museo Civico di Storia Naturale di Milano, Italy;

MIZ — Museum and Institute of Zoology of Polish Academy of Sciences, Warsaw, Poland;

SIZK — Schmalhausen Institute of Zoology of National Academy of Sciences of Ukraine, Kiev, Ukraine;

ZMMU — Zoological Museum of Lomonosov Moscow State University, Moscow, Russia;

ASPC — personal collection of one author (A. S.).

Morphometrics:

ESD — the distance between the tips of propodeal spine in dorsal view;

ESL — the maximum length of propodeal spine in profile, measured along the spine from its tip to the deepest point of the propodeal constriction at the base of the spine;

FLW — the maximum distance between the outer borders of the frontal lobes;

FW — the minimum width of frons between the frontal carinae;

GnL — the length of gena, measured in profile from the lower eye margin to the nearest point of the anterior head margin.

HL — the maximum length of head in dorsal view, measured in a straight line from the most anterior point of clypeus to the mid-point of occipital margin;

HTL — the maximum length of hind tibia;

HW — the maximum width of head in dorsal view behind (above) the eyes;

MH — the height of mesosoma (seen in profile) from upper level of mesonotum perpendicularly to the level of lower margin of mesopleuron (queens and males);

ML — the diagonal length of mesosoma (seen in profile) from anterior end of the neck shield to the posterior margin of propodeal lobes (workers), and from the most anterodorsal point of mesosoma to posterior margin of propodeal lobes (queens and males);

OL — the maximum diameter of eye;

PH — the maximum height of petiole in profile, measured from the uppermost point of the petiolar node perpendicularly to the imaginary line between the tip of subpetiolar process and posteroventral points of petiole;

PL — the maximum length of petiole in dorsal view, measured from the posterodorsal margin of petiole to the articulation with propodeum; the petiole should be positioned so that measured points lay on the same plane;

PndL — the length of petiolar node in dorsal view, measured between posterior and anterior ridges, surrounded petiolar node.

PNW — the maximum width of pronotum in dorsal view (workers);

PPH — the maximum height of postpetiole in profile from the uppermost to the lowermost point, measured perpendicularly to the tergo-sternal suture;

PPL — the maximum length of postpetiole in dorsal view between its visible anterior and posterior margins;

PPW — the maximum width of postpetiole in dorsal view;

PW — the maximum width of petiole in dorsal view;

SCL — the length of scutum + scutellum in dorsal view (queens and males);

SCW — the maximum width of scutum in dorsal view (queens and males);

SL — the maximum straight-line length of scape from its apex to the articulation with condylar bulb.

The number of longitudinal rugae (rug-frons) between frontal carinae level with the eyes in workers and queens is also counted.

Indices:

CI — HL/HW, ESLI — ESL/HW, FI — FW/HW, FLI — FLW/FW, MI — ML/MH, OI₁ — OL/HW,

OI₂ — OL/GnL, PI₁ — PL/PH, PI₂ — PW/HW, PndI — PW/PndL, PPI₁ — PPL/PPW, PPI₂ — PPW/HW, SCI — SCL/SCW, SI₁ — SL/HL, SI₂ — SL/HW.

***Tetramorium sabatinellii* sp. n.**

Material examined. Holotype, worker, Jordan, 31°34' N, 36°01' E, road number 15 Amman-Aqaba, 50 km to the south of Amman, 3.6 km to the north of Al Zumayla, in the semi-deserts ground 800 m west of the road 15 on a little hill at 686 m a. s. l., 29.04.2009, leg. Guido Sabatinelli, Mauro Daccordi and Marco Uliana (MSNG). Paratypes, 44 workers, 1 ♀ and 1 ♂ from the nest of holotype (MSNG, MSNVR, MSNVE, MSNM, SIZK, ASPC).

Etymology. The species is dedicated to our colleague, Guido Sabatinelli, who worked in Jordan and collected this species.

Workers (fig. 1, *a-d*). Head somewhat longer than wide, with subparallel, almost straight sides, widely rounded occipital corners and very feebly concave occipital margin. Eyes situated about midlength of sides of head, gena distinctly longer than maximal diameter of eye. Scape quite strongly curved at base, without any additional structures on bent, not reaching occipital margin. Frontal carinae distinctly curved and frontal lobes extended. Frons with quite coarse longitudinal rugosity, number of rugae between frontal carinae level with the eyes < 15. Mandibles with 5 teeth, coarsely longitudinally rugose. Surface of head between rugae densely punctated, mandibles smooth and shiny. Occipital margin with a few quite long suberect hairs, temples and genae without hairs.

Mesosoma with shallow metanotal groove, propodeum with relatively long teeth widened at base, but not with thin spines. Whole mesosoma with quite coarse longitudinal, somewhat sinuous rugae. Petiole longer than high, its node transversal; postpetiole distinctly higher and wider than length. Petiolar node with sinuous longitudinal rugae, postpetiolar dorsum with almost straight longitudinal rugae. Mesosomal dorsum and waist with not abundant, quite long erect hairs. Whole first gastral tergite densely longitudinally striato-punctated.

Head, mesosoma and waist reddish-brown, gaster blackish-brown.

Measurements of workers (in mm; n = 20), ordered as: holotype (min-max) [mean ± SD]: HL 0.85 (0.76–0.89) [0.83 ± 0.033], HW 0.81 (0.74–0.86) [0.80 ± 0.032], FW 0.33 (0.31–0.37) [0.34 ± 0.016], FLW 0.37 (0.35–0.41) [0.38 ± 0.016], OL 0.21 (0.18–0.23) [0.20 ± 0.014], GnL 0.19 (0.17–0.22) [0.18 ± 0.013], SL 0.67 (0.62–0.73) [0.67 ± 0.025], ML

1.09 (1.03–1.17) [1.10 ± 0.031], PNW 0.53 (0.50–0.58) [0.54 ± 0.021], PL 0.36 (0.32–0.39) [0.36 ± 0.015], PW 0.26 (0.25–0.29) [0.27 ± 0.016], PH 0.29 (0.27–0.31) [0.29 ± 0.012], PndL 0.20 (0.18–0.22) [0.20 ± 0.012], PPL 0.20 (0.20–0.24) [0.22 ± 0.013], PPW 0.30 (0.29–0.34) [0.32 ± 0.014], PPH 0.30 (0.27–0.33) [0.32 ± 0.014], ESL 0.14 (0.12–0.17) [0.14 ± 0.013], ESD 0.22 (0.20–0.25) [0.23 ± 0.015], HTL 0.61 (0.54–0.66) [0.60 ± 0.027], rug-frons 12 (11–14) [13 ± 0.970].

Indices: CI 1.04 (1.01–1.08) [1.04 ± 0.016], SI₁ 0.79 (0.77–0.83) [0.80 ± 0.015], SI₂ 0.82 (0.80–0.85) [0.84 ± 0.015], FI 0.41(0.41–0.45) [0.43 ± 0.010], FLI 1.13 (1.08–1.15) [1.12 ± 0.023], OI₁ 0.26 (0.23–0.27) [0.25 ± 0.010], OI₂ 1.12 (1.05–1.13) [1.10 ± 0.029], PI₁ 1.25 (1.19–1.28) [1.25 ± 0.025], PI₂ 0.32(0.33–0.36) [0.34 ± 0.012], PndI 1.33 (1.26–1.44) [1.35 ± 0.055], PPI₁ 0.67 (0.67–0.71) [0.70 ± 0.013], PPI₂ 0.36 (0.36–0.41) [0.39 ± 0.016], ESLI 0.18(0.16–0.19) [0.17 ± 0.011].

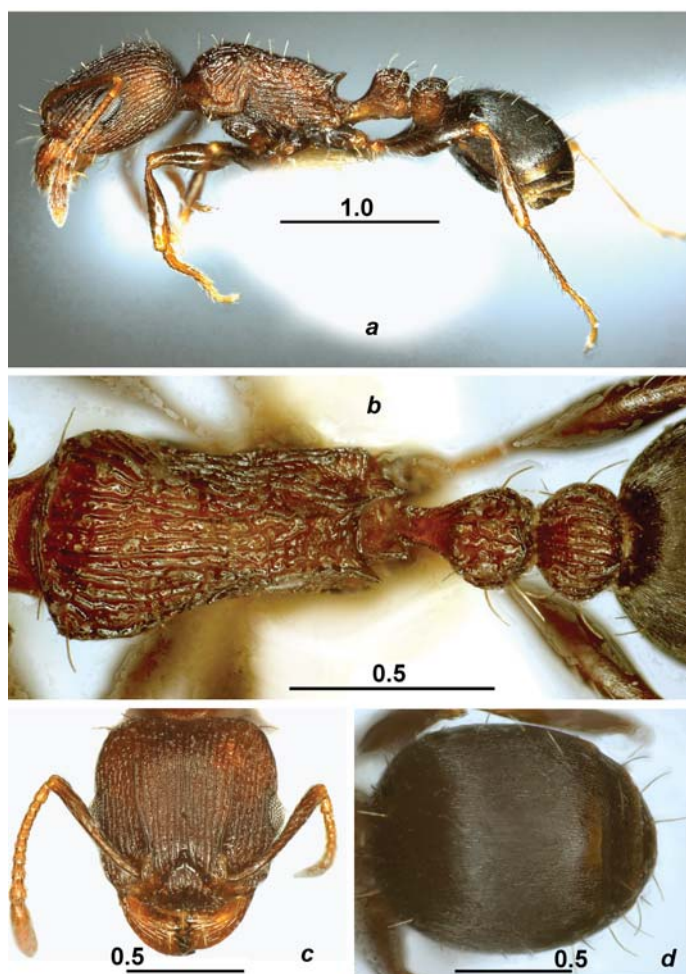


Fig. 1. Details of structure of *Tetramorium sabinellii* sp. n., worker, holotype: *a* — body in profile; *b* — mesosoma and waist, dorsal view; *c* — head, dorsal view; *d* — gaster, dorsal view. Scale bars here and further are given in millimeters.

Рис. 1. Детали строения *Tetramorium sabinellii* sp. n., рабочий, голотип: *a* — тело в профиль; *b* — грудь и стебелек, вид сверху; *c* — голова, вид сверху; *d* — брюшко, вид сверху. Масштаб здесь и далее указан в миллиметрах.

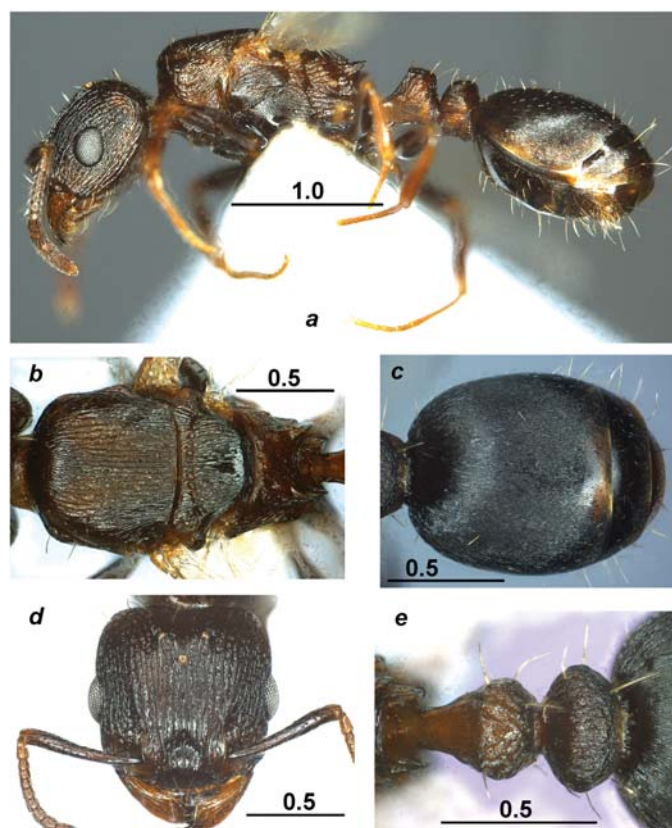


Fig. 2. Details of structure of *Tetramorium sabinellii* sp. n., queen, paratype: *a* — body in profile; *b* — mesosoma, dorsal view; *c* — gaster, dorsal view; *d* — head, dorsal view; *e* — waist, dorsal view.

Рис. 2. Детали строения *Tetramorium sabinellii* sp. n., самка, паратип: *a* — тело в профиль; *b* — грудь, вид сверху; *c* — брюшко, вид сверху; *d* — голова, вид сверху; *e* — стебелек, вид сверху.

Queen (fig. 2, *a-e*). Shape, sculpture and pilosity of head as in workers, except for presence of ocelli and relatively shorter scape.

Mesosoma long and low, scutum and scutellum flattened, do not raised on pronotal level, scutum somewhat narrowed anteriorly, so that antero-lateral angles of pronotum visible from above. Scutum and scutellum with quite coarse longitudinal rugae, sides of mesosoma (except for that of propodeum) with finer rugulae. Shape of propodeal spines as in workers. Shape of waist similar to that of workers, but petiolar node relatively much shorter than in workers, so that it seems more transversal (seen from above). Sculpture of gaster and pilosity of body as in workers. Colour generally darker than in workers, head and gaster blackish-brown, mesosoma and waist somewhat lighter, legs brownish-red.

Measurements of queen (in mm): HL 0.95, HW 0.92, FW 0.41, FLW 0.45, OL 0.25, GnL 0.20, SL 0.69, PL 0.47, PW 0.31, PH 0.40, PndL 0.17, PPL 0.23, PPW 0.39, PPH 0.41, ESL 0.15, ESD 0.32, HTL 0.65, ML 1.54, MH 0.77, SCL 1.10, SCW 0.83, rug-frons 13.

Indices: CI 1.02, SI₁ 0.73, SI₂ 0.75, FI 0.44, FLI 1.09, OI₁ 0.27, OI₂ 1.27, PI₁ 1.19, PI₂ 0.33, PndI 1.87, PPI₁ 0.60, PPI₂ 0.42, ESLI 0.17, MI 2.00, SCI 1.33.

Male (fig. 3, *a-e*; 4, *a-d*). Head somewhat wider than length, broadly rounded above eyes, occipital margin convex. Anterior clypeal margin slightly prominent medially. Eyes big, situated distinctly below midlength of sides of head, so that genae very short. Scape length about half of head width. Mandibles with five sharp teeth. Sculpture of head dorsum quite coarse: frons and clypeus with longitudinal and longitudinally-concentric rugosity, surface between and behind lateral ocelli with transversal rugae, remaining part of head

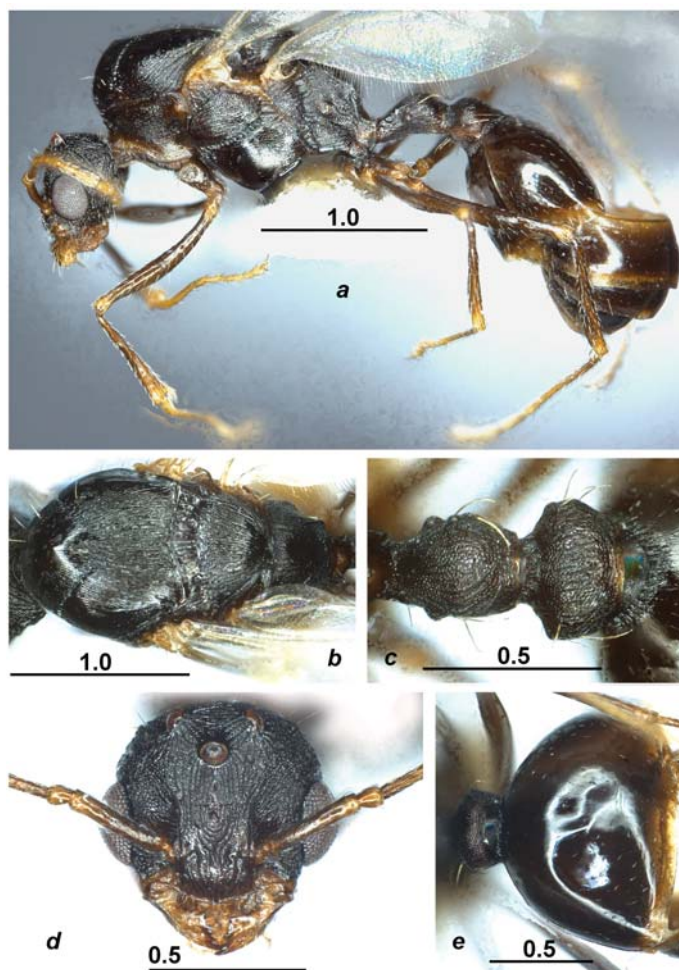


Fig. 3. Details of structure of *Tetramorium sabinellii* sp. n., male, paratype: *a* — body in profile; *b* — mesosoma, dorsal view; *c* — waist, dorsal view; *d* — head, dorsal view; *e* — first gastral tergite, dorsal view.

Рис. 3. Детали строения *Tetramorium sabinellii* sp. n., самец, паратип: *a* — тело в профиль; *b* — грудь, вид сверху; *c* — стебелек, вид сверху; *d* — голова, вид сверху; *e* — первый тергит брюшка, вид сверху.

dorsum coarsely and densely punctated. Occipital margin and temples with not abundant long erect hairs.

Mesosoma long and low, scutum and scutellum very feebly convex, notauli well developed only on anterior part of scutum. Petiole long and low, with almost straight anterior face and widely rounded node dorsum. Petiole not widened, its node subcircle (seen from above), postpetiole > 1.4 times wider than petiole. Central part of scutum and scutellum with not coarse, but dense longitudinal rugulosity, surface between rugulae densely punctated. Pronotum and mesopleura, as well as whole propodeum, mostly densely punctated. Petiolar node and postpetiole densely and coarsely punctated, dorsum of petiolar node also with longitudinally-concentric rugae, dorsum of postpetiole also with longitudinal rugae.

Stipites of genitalia strongly curved inward apically (seen dorsally or ventrally), their apices strongly excavated (seen from behind).

Mesosoma and waist with not abundant long erect hairs. Surface of gastral tergites completely smooth and shiny. Body colour black, mandibles and appendages brownish.

Measurements of male (in mm): HL 0.64, HW 0.66, OL 0.29, GnL 0.04, SL 0.37, PL 0.46, PW 0.28, PH 0.28, PPL 0.24, PPW 0.40, PPH 0.42, HTL 0.85, ML 1.73, MH 1.07, SCL 1.31, SCW 0.92.

Indices: CI 0.97, SI₁ 0.53, SI₂ 0.52, OI₁ 0.43, OI₂ 6.50, PI₁ 1.68, PI₂ 0.43, PPI₁ 0.61, PPI₂ 0.60, MI 1.62, SCI 1.42.

Taxonomic notes. Workers and queens of *T. sabatinellii* well differ from those of *T. kabulistanicum* and *T. pisarskii* by the completely longitudinally striato-punctated first gastral tergite, while such sculpture is present only on the basal half of tergite in two latter species. *T. sabatinellii* differs from *T. striativentre* by the distinctly curved frontal carinae and extended frontal lobes (mean FLI 1.12 in workers *T. sabatinellii* vs. 1.01 in *T. striativentre*), by the coarser rugosity on the head dorsum (in workers number of rugae between frontal carinae level with the eyes <15, mean 13 vs. > 15, mean 18, respectively), and by the another sculpture on the waist dorsum (see Key below, and compare fig. 1, *b*, *c* and 6, *b*, *c*). It differs from *T. schneideri* by the transversal petiolar node, which is subcircle in the latter species (seen from above), and by the coarser rugosity on the head dorsum. Among all know species of this group, workers of *T. sabatinellii* the most resemble *T. saudicum*, differing from the latter mostly morphometrically: they have longer scape, wider petiolar node and postpetiole, longer genae, etc. (see also Key).

E c o l o g y. The nest of this species was found in the semi-desert area with sparse vegetation in soil under stone at an altitude 686 m a. s. l.

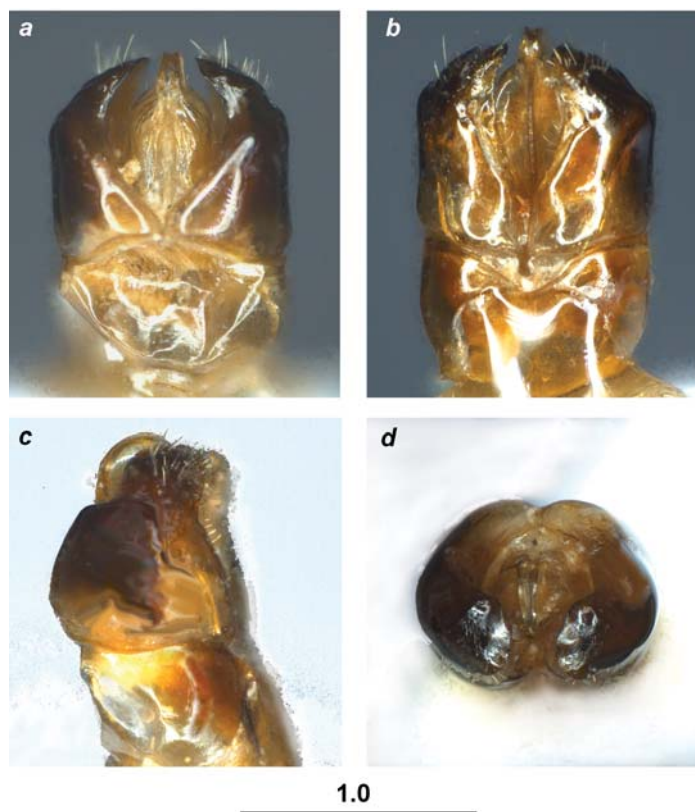


Fig. 4. Genitalia of *Tetramorium sabatinellii* sp. n., male, paratype: *a* — dorsal view; *b* — ventral view; *c* — lateral view; *d* — caudal view.

Рис. 4. Гениталии *Tetramorium sabatinellii* sp. n., самец, паратип: *a* — вид сверху; *b* — вид снизу; *c* — вид сбоку; *d* — вид сзади.

***Tetramorium pisarskii* sp. n.**

= *Tetramorium striativentre kabulistanicum* Pisarski, 1967: 403, part., only workers from Hassan Guilan, nec. material from Cheikhabad.

Material examined. Holotype, worker, "Afghanistan, Hassan Guilan entre Guerechk et Dilaram, A 314, 7.9.1957, leg. K. Lindberg", "*T. kabulistanica* sp. n. det. B. Pisarski", "Inst. Zool. PAN Warszawa 43/61" (MIZ). Paratype, worker with the same label (MIZ) (see also Taxonomic notes, below).

Etymology. The species is dedicated to the memory of outstanding Polish myrmecologist Prof. Bohdan Pisarski.

Workers (fig. 5, *a-d*). Head very little longer than wide, with somewhat convex sides, widely rounded occipital corners and very feebly concave or almost straight occipital margin. Eyes situated about midlength of sides of head, length of gena subequal to maximal diameter of eye. Scape quite strongly curved at base, without any additional structures on bent, reaching occipital margin. Frontal carinae distinctly curved and frontal lobes extended. Frons with relatively fine longitudinal rugosity, number of rugae between frontal

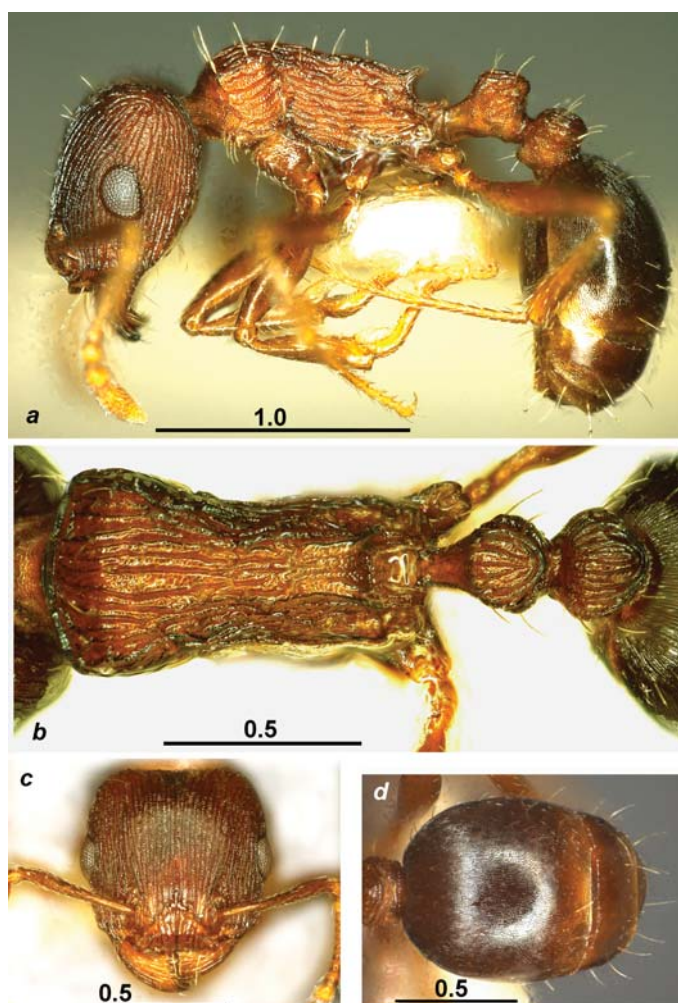


Fig. 5. Details of structure of *Tetramorium pisarskii* sp. n., worker, holotype: *a* — body in profile; *b* — mesosoma and waist, dorsal view; *c* — head, dorsal view; *d* — gaster, dorsal view.

Рис. 5. Детали строения *Tetramorium pisarskii* sp. n., рабочий, holotype: *a* — тело в профиль; *b* — грудь и стебелек, вид сверху; *c* — голова, вид сверху; *d* — брюшко, вид сверху.

carinae level with the eyes ca. 20. Mandibles with 5 teeth, coarsely longitudinally rugose. Surface of head between rugae densely punctated, same on mandibles smooth and shiny. Occipital margin with a few quite long suberect hairs, temples and genae without hairs.

Mesosoma with very shallow metanotal groove, propodeum with relatively long teeth widened at base, but not with thin spines. Whole mesosoma with quite coarse longitudinal, almost straight rugae. Petiole longer than high, its node transversal; postpetiole distinctly higher than long and distinctly wider than length. Petiolar node dorsum and postpetiolar dorsum with regular longitudinally-concentric rugae. Mesosomal dorsum and waist with not abundant, quite long erect hairs. Only basal half of first gastral tergite densely longitudinally striato-punctated, remainder part of tergite smooth and shiny or with fine superficial microreticulation. Head, mesosoma and waist brownish-red, appendages somewhat lighter, gaster blackish-brown.

Measurements of workers (in mm; n = 2), ordered as: holotype-paratype: HL 0.83–0.85, HW 0.81–0.83, FW 0.34–0.33, FLW 0.37–0.36, OL 0.21–0.20, GnL 0.21–0.21, SL 0.67–0.65, ML 1.06–1.07, PNW 0.54–0.52, PL 0.33–0.35, PW 0.25–0.25, PH 0.26–0.29, PndL 0.21–0.20, PPL 0.21–0.20, PPW 0.29–0.29, PPH 0.28–0.30, ESL 0.22–0.09, ESD 0.21–0.21, HTL 0.63–0.62, rug-frons 20–14.

Indices: CI 1.02–1.02, SI₁ 0.81–0.76, SI₂ 0.83–0.78, FI 0.42–0.40, FLI 1.09–1.09, OI₁ 0.26–0.24, OI₂ 1.00–0.95, PI₁ 1.27–1.21, PI₂ 0.31–0.30, PndI 1.19–1.25, PPI₁ 0.72–0.69, PPI₂ 0.36–0.35, ESLI 0.27–0.11.

Queens, males and ecology unknown.

Taxonomic notes. *T. pisarskii* the most resembles *T. kabulistanicum*, sharing with the latter the character of sculpture on the first gastral tergite. Moreover, holotype and paratype specimens of *T. pisarskii* were originally included by Pisarski (1967) to the paratype series of *T. kabulistanicum*. Nevertheless, Pisarski (loc. cit., p. 405) noted that “Workers from Hassan Guilan have somewhat coarser, but more regular sculpture than those from Cheikhabad” (out translation from French). *T. pisarskii* distinctly differs from *T. kabulistanicum* by the sculpture of mesosoma and waist: the mesosomal dorsum is with more regular, almost straight longitudinal rugae, the waist dorsum is with regular longitudinally-concentric rugae vs. the mesosomal and waist dorsum are with sinuous longitudinal rugae in the latter species. Additionally, longitudinal rugosity on the head dorsum in *T. pisarskii* is less coarse, number of rugae between frontal carinae level with the eyes ≥ 20 (≤ 15 in *T. kabulistanicum*).

***Tetramorium striativentre* Mayr, 1877**

Tetramorium caespitum var. *striativentre* Mayr, 1877: 16, worker, ♀ (part., worker from Samarkand and ♀), Uzbekistan (redescribed in German: Mayr, 1880: 35) (see also Taxonomic notes, below). *Tetramorium caespitum* subsp. *striativentre*: Ruzsky, 1905 a: 538. *Tetramorium striativentre*: Dalla Torre, 1893: 135; Ruzsky, 1905 a: 766; 1905 b: 518; Emery, 1909: 706; Ruzsky, 1923: 4; Collingwood, 1961 a: 54; 1961 b: 289; Pisarski, 1967: 403; Dlussky, Zabelin, 1985: 232; Dlussky et al., 1990: 208; Radchenko, 1992 a: 45; 1992 b: 52; Collingwood, Heatwole, 2000: 10; Paknia et al., 2010: 35.

Material examined. Lectotype, worker (designated here), “Samarkand” (original label of A. Fedchenko is in Russian — “Самаркандъ”), “7” (ZMMU). Non-type material. Ca. 100 workers, 7 ♀, 2 ♂ from Uzbekistan, Turkmenistan, Kyrgyzstan, Tajikistan, Afghanistan and Iran.

Measurements of workers (in mm; n = 30), ordered as: lectotype (min-max) [mean \pm SD] (see also fig. 6, a–d): HL 0.77 (0.77–0.91) [0.86 \pm 0.041], HW 0.76 (0.73–0.85) [0.81 \pm 0.037], FW 0.28 (0.28–0.35) [0.32 \pm 0.007], FLW 0.29 (0.29–0.35) [0.32 \pm 0.014], OL 0.17 (0.15–0.21) [0.18 \pm 0.013], GnL 0.18 (0.18–0.25) [0.23 \pm 0.015], SL 0.62 (0.55–0.64) [0.60 \pm 0.025], ML 0.98 (0.92–1.15) [1.07 \pm 0.072], PNW 0.56 (0.48–0.59) [0.54 \pm 0.032], PL 0.34 (0.31–0.36) [0.33 \pm 0.016], PW 0.22 (0.22–0.32) [0.29 \pm 0.026], PH 0.27 (0.25–0.32) [0.29 \pm 0.020], PndL 0.18 (0.18–0.24) [0.21 \pm 0.019], PPL 0.22 (0.19–0.27) [0.22 \pm 0.013],

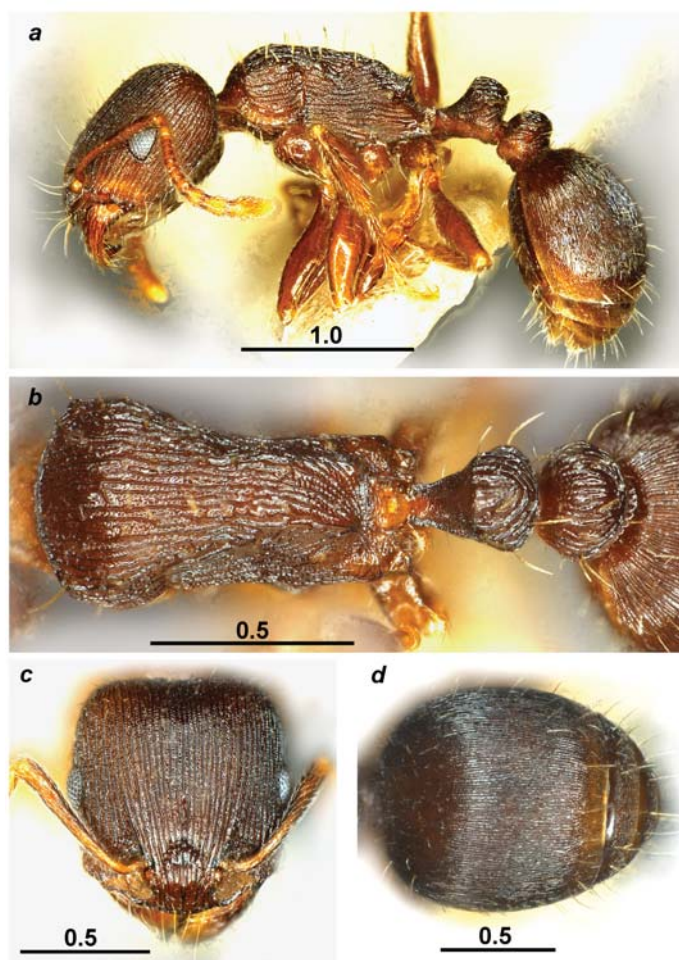


Fig. 6. Details of structure of *Tetramorium striativentre*, worker; *a* – body in profile; *b* – mesosoma and waist, dorsal view; *c* – head, dorsal view; *d* – gaster, dorsal view.

Рис. 6. Детали строения *Tetramorium striativentre*, рабочий: *a* – тело в профиль; *b* – грудь и стебелек, вид сверху; *c* – голова, вид сверху; *d* – брюшко, вид сверху.

PPW 0.27 (0.27–0.35) [0.31 ± 0.020], PPH 0.25 (0.23–0.32) [0.28 ± 0.016], ESL 0.14 (0.04–0.14) [0.08 ± 0.028], ESD 0.12 (0.12–0.25) [0.21 ± 0.027], HTL 0.56 (0.55–0.64) [0.61 ± 0.015], rug-frons 21 (16–21) [18 ± 0.252].

Indices: CI 1.01 (1.01–1.11) [1.07 ± 0.026], SI₁ 0.81 (0.67–0.81) [0.70 ± 0.029], SI₂ 0.82 (0.71–0.82) [0.75 ± 0.027], FI 0.37(0.37–0.42) [0.40 ± 0.014], FLI 1.04 (1.00–1.06) [1.01 ± 0.016], OI₁ 0.22 (0.20–0.26) [0.23 ± 0.011], OI₂ 0.94 (0.68–0.94) [0.81 ± 0.055], PI₁ 1.26 (1.03–1.27) [1.16 ± 0.060], PI₂ 0.29 (0.29–0.39) [0.36 ± 0.020], PndI 1.22 (1.21–1.48) [1.34 ± 0.063], PPI₁ 0.81 (0.60–0.90) [0.72 ± 0.038], PPI₂ 0.36 (0.35–0.42) [0.38 ± 0.019], ESLI 0.18 (0.05–0.18) [0.10 ± 0.034].

Measurements of queens (in mm; n = 7), ordered as: min-max [mean \pm SD] (see also fig. 7, *a-c*): HL 1.05–1.14 [1.10 ± 0.033], HW 1.05–1.14 [1.09 ± 0.032], FW 0.40–0.48 [0.44 ± 0.032], FLW 0.39–0.47 [0.42 ± 0.033], OL 0.29–0.33 [0.30 ± 0.012], GnL 0.22–0.26 [0.24 ± 0.014], SL 0.72–0.78 [0.74 ± 0.022], PL 0.46–0.51 [0.48 ± 0.016], PW 0.43–0.51 [0.46 ± 0.023], PH 0.43–0.48 [0.46 ± 0.023], PndL 0.23–0.27 [0.25 ± 0.018], PPL 0.26–0.32 [0.29 ± 0.021], PPW 0.49–0.56 [0.53 ± 0.024], PPH 0.43–0.49 [0.46 ± 0.027], ESL 0.05–0.13 [0.08 ± 0.027], ESD 0.39–0.43 [0.42 ± 0.016], HTL 0.73–0.81 [0.77 ± 0.026], rug-frons 18–

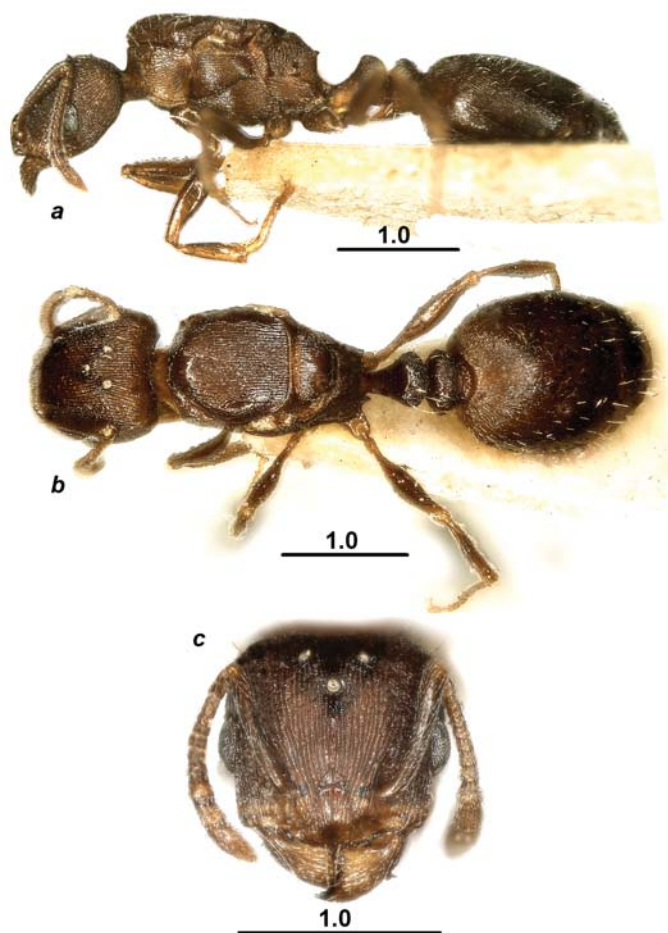


Fig. 7. Details of structure of *Tetramorium striativentre*, queen: *a* — body in profile; *b* — body, dorsal view; *c* — head, dorsal view.

Рис. 7. Детали строения *Tetramorium striativentre*, самка; *a* — тело в профиль; *b* — тело, вид сверху; *c* — голова, вид сверху.

23 [21 ± 1.902], ML 1.73–1.93 [1.80 ± 0.081], MH 0.90–0.98 [0.93 ± 0.030], SCL 1.24–1.36 [1.29 ± 0.040], SCW 0.96–1.04 [0.98 ± 0.027].

Indices: CI 0.97–1.04 [1.01 ± 0.023], SI₁ 0.66–0.68 [0.67 ± 0.009], SI₂ 0.64–0.68 [0.67 ± 0.020], FI 0.36–0.46 [0.41 ± 0.030], FLI 0.91–0.97 [0.96 ± 0.025], OI₁ 0.26–0.28 [0.27 ± 0.008], OI₂ 1.21–1.33 [1.26 ± 0.045], PI₁ 0.95–1.12 [1.04 ± 0.062], PI₂ 0.38–0.48 [0.42 ± 0.032], PndI 1.67–1.90 [1.78 ± 0.094], PPI₁ 0.50–0.61 [0.54 ± 0.042], PPI₂ 0.46–0.53 [0.49 ± 0.021], ESLI 0.05–0.12 [0.08 ± 0.025], MI 1.90–2.03 [1.95 ± 0.043] SCI 1.28–1.35 [1.31 ± 0.028].

First description of males (fig. 8, *a–c*; 9, *a–c*).

Material examined. 2 ♂, Uzbekistan, Aman-Kurgan, 25.05.1942, leg. K. Arnoldi (ZMMU).

Head somewhat wider than length, broadly rounded above eyes, occipital margin convex. Anterior clypeal margin gradually convex, not prominent. Eyes big, situated distinctly below midlength of sides of head, so that genae quite short. Scape length about half of head width. Mandibles with five sharp teeth. Sculpture on head dorsum not very coarse

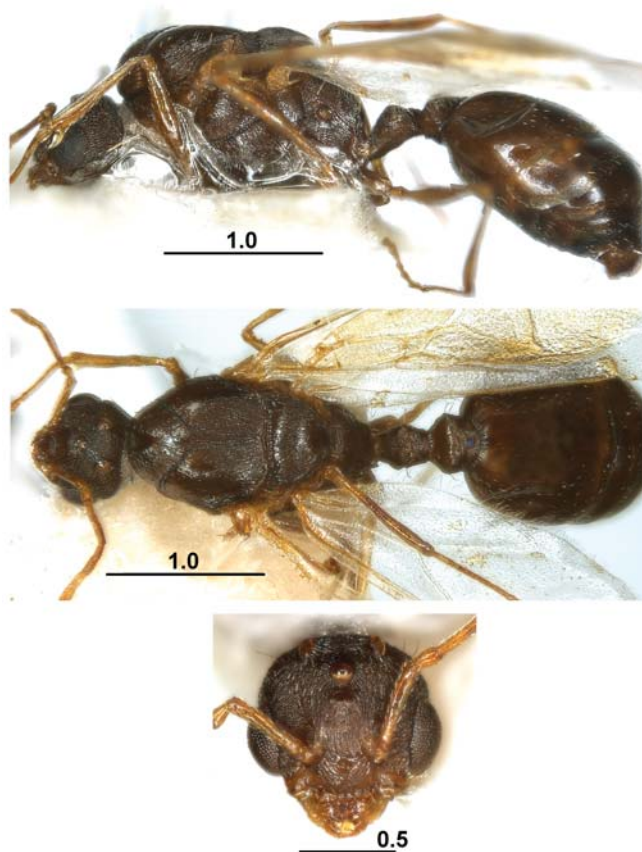


Fig. 8. Details of structure of *Tetramorium striativentre*, male: *a* — body in profile; *b* — body, dorsal view; *c* — head, dorsal view.

Рис. 8. Детали строения *Tetramorium striativentre*, самец: *a* — тело в профиль; *b* — тело, вид сверху; *c* — голова, вид сверху.

(distinctly less coarse than in *T. sabinellii*): frons with longitudinal and longitudinally-concentric rugosity, clypeus with semi-concentric rugosity, surface between and behind lateral ocelli with not coarse transversal rugae, remaining part of head dorsum quite coarsely and densely punctated. Occipital margin and temples with not abundant long erect hairs.

Mesosoma long and low, scutum and scutellum convex, notauli well developed. Petiole not very long and quite low, with almost straight anterior face and rounded node dorsum. Petiole widened, its node wider than length (seen from above), postpetiole < 1.4 times wider than petiole. Scutum and scutellum with dense longitudinal rugulosity, surface between rugulae densely but not coarsely punctated, while lateral parts of dorsum of scutum smooth and shiny. Mesopleura and propodeum densely, but not coarsely longitudinally rugulose, pronotum mostly smooth. Petiolar node and postpetiole densely and coarsely punctated, dorsum of petiolar node also with longitudinally-concentric rugae.

Stipites of genitalia gradually curved inward apically (seen dorsally or ventrally), their apices slightly excavated (seen from behind).

Mesosoma and waist with not abundant long erect hairs. Surface of gastral tergites completely smooth and shiny. Body colour blackish-brown, mandibles and appendages brownish-red.

Measurements of males (in mm; $n = 2$), ordered as: min-max: HL 0.70–0.72, HW 0.73–0.73, OL 0.31–0.33, GnL 0.08–0.08, SL 0.36–0.38, PL 0.36–0.36, PW 0.31–0.33, PH 0.29–0.30, PPL 0.26–0.26, PPW 0.43–0.44, PPH 0.36–0.39, HTL 0.95–0.96, ML 1.91–1.98,

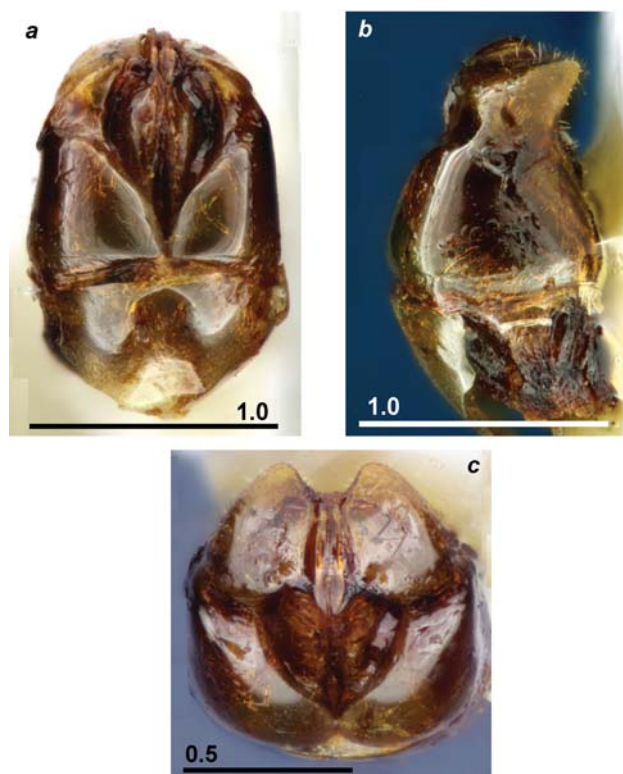


Fig. 9. Genitalia of *Tetramorium striativentre*, male: *a* — dorsal view; *b* — lateral view; *c* — caudal view (photo V. Radchenko).

Рис. 9. Гениталии *Tetramorium striativentre*, самец: *a* — вид сверху; *b* — вид сбоку; *c* — вид сзади (фото В. Г. Радченко).

MH 1.18–1.24, SCL 1.40–1.40, SCW 0.95–0.98.

Indices: CI 0.96–0.98, SI₁ 0.51–0.54, SI₂ 0.50–0.52, OI₁ 0.43–0.45, OI₂ 4.00–4.17, PI₁ 1.22–1.27, PI₂ 0.43–0.45, PPI₁ 0.59–0.61, PPI₂ 0.59–0.61, MI 1.55–1.67, SCI 1.44–1.48.

Taxonomic notes. *T. striativentre* was described by Mayr (1877, in Russian; redescribed in German by him in 1880) based on 2 workers and 1 queen, collected by the expedition of A. P. Fedchenko. The main diagnostic feature of this species is the sculpture of the first gastral tergite that is completely densely longitudinally striato-punctated. As the type localities Mayr (1877: 17) recorded: “7th of March 1869 in Samarkand, 9th of May in Ulus, beginning of May 1871 in Kisil-Kumy” (now Uzbekistan). Unfortunately, it is not obvious from the original description, where from workers and queen are originated. Moreover, Mayr (loc. cit., p. 16) noted, that the propodeum of one worker specimen is with “two short, barely visible denticles, while the second worker has spines, length of which is distinctly longer than their width at the base” (our translation from Russian).

Ruzsky (1905 a: 766) investigated the syntypes worker and queen of *T. striativentre* preserved at that time in the collection of ZMMU, and confirmed heterospecificity of this species and *T. schneideri*. Unfortunately, he also did not provide any label data for these specimens, but noted that worker specimen has original Mayr’s label. Nowadays we found in the collection of ZMMU only one worker from the Mayr’s type series with the original labels from the collection of Fedchenko: “Самаркандъ”, “7”. We designated this worker as the lectotype of *T. striativentre*, despite it seems somewhat “atypical” by some features compare to all other examined specimens of this species from its whole range (about 100 workers). Particularly, it has much longer propodeal spines and relatively longer scape

what is similar to those of *T. schneideri*. Nevertheless, by the most important diagnostic feature, such as the shape of the frontal carinae and lobes, the character of sculpture of the head and waist, and the shape of the petiolar node it certainly belongs to *T. striativentre* (see below).

Dlussky et al. (1990) pointed out that type specimens (Sic!: perhaps it is misprinting, as it should be only one worker) of *T. striativentre* from Kisil-Kumy, preserved in the collection of ZMMU, belong to *T. schneideri*. Unfortunately, we could not find corresponding material in that collection (investigated in 2012). Most probably, it is a specimen with longer spines, mentioned by Mayr (see above).

Preceding authors (e. g. Ruzsky, 1905 a, b; Dlussky et al., 1990) had used for the separation of *T. striativentre* and *T. schneideri* first of all the character of sculpture on the head dorsum and the length of the propodeal teeth. These features are normally useful, but occasionally they may be quite variable and sometimes single specimen of both species may be hardly distinguishable. Thus, despite the sculpture on the head dorsum in *T. striativentre* is generally coarser than in *T. schneideri*, the number of longitudinal rugae level with the eyes in the first species is 16–21 (mean 18) and 17–33 (mean 23) in the latter one; at the same time, the length of propodeal spines are rather variable in both species, despite they are generally shorter in *T. striativentre* (mean ESLI 0.10 with the range 0.05–0.18 vs. mean 0.19 with the range 0.15–0.25 in *T. schneideri*).

Radchenko (1992 a) added as an important feature for the separation of these species the shape of the petiolar node: transversal in *T. striativentre* (PndI > 1.20) and subcircle in *T. schneideri* (PndI < 1.15).

In the course of the current revision we paid an attention to one more very distinct feature never used before for the separation of *T. striativentre* and all other species with the completely striato-punctated first gastral tergite (e. g. *T. schneideri*, *T. saudicum* and *T. sabatinellii*): the frontal carinae in *T. striativentre* are not curved, gradually converging anteriorly so that the frontal lobes are not extended (FLI 1.00–1.06, mean 1.01), but in three other species the frontal carinae are curved above the antennal insertions and the frontal lobes are distinctly extended (FLI ≥ 1.08, means 1.12 ... 1.17) (compare fig. 6, c and 1, c; 10, c).

Finally, *T. striativentre* well differs from three above mentioned species by the more regular, longitudinally-concentric rugae on the dorsum of the petiolar node and postpetiole (compare fig. 6, b and 1, b; 10, b).

Distribution. Central Asia, Afghanistan, Iran, NW China. André (1883) has recorded this species from Palestine (Nazareth), and Wheeler and Mann (1916) — from Syria and Jordan. We did not see the corresponding material, but based on the known distribution of *T. striativentre* we may suspect that records from Palestine, Syria and Jordan might concern *T. sabatinellii*.

Ecology. It inhabits mostly mountain regions where prefers steppe-like and semi-desert biotopes with sparse vegetations. Nests are built in a soil, often under stones. Zoo-necrophagic species, collecting both living small invertebrates and their remnants, but quite actively collects also plant seeds. Nuptial flights occur in the end of May or in June (depending from region) (for more details see Dlussky, 1981, Dlussky et al., 1990).

***Tetramorium schneideri* Emery, 1898**

Tetramorium schneideri Emery, 1898: 145, worker, Uzbekistan; Ruzsky, 1902: 2; 1905 a: 517.

Tetramorium striativentre subsp. *schneideri*: Ruzsky, 1905 a: 767; 1905 b: 518; Emery, 1909: 706; Karawajew, 1911: 55; Emery, 1924: 278; Pisarski, 1967: 403; Tarbinsky, 1976: 115, workers, ♀. Revived status as species: Dlussky, Zabelin, 1985: 232; Dlussky et al., 1990: 207; Radchenko, 1992 a: 45; 1992 b: 52; Paknia et al., 2010: 35. *Tetramorium striativentre* Mayr, 1877: 16 (part., only worker from Kisil-Kumy).

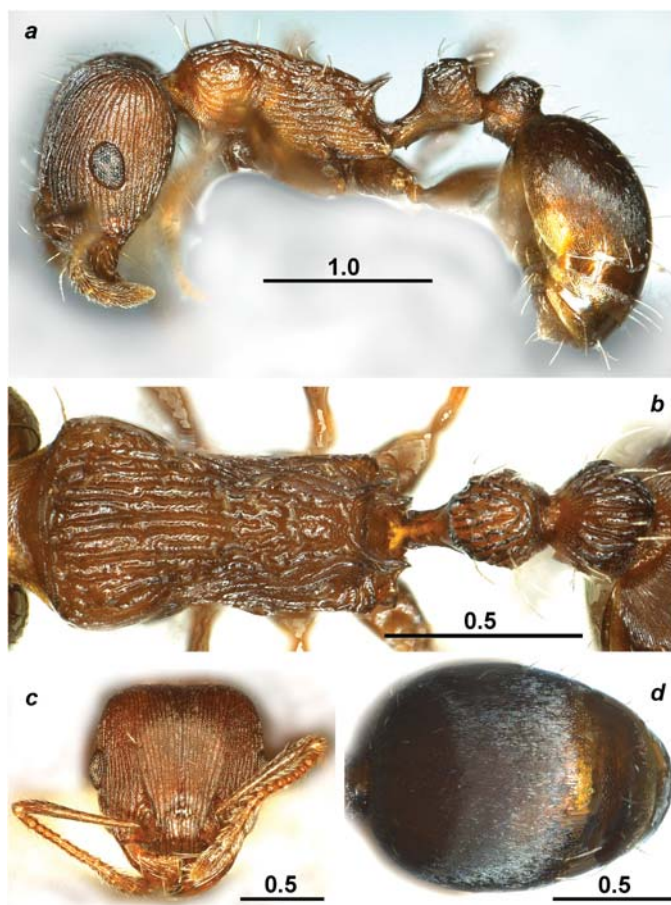


Fig. 10. Details of structure of *Tetramorium schneideri*, worker: *a* — body in profile; *b* — mesosoma and waist, dorsal view; *c* — head, dorsal view; *d* — gaster, dorsal view.

Рис. 10. Детали строения *Tetramorium schneideri*, рабочий: *a* — тело в профиль; *b* — грудь и стебелек, вид сверху; *c* — голова, вид сверху; *d* — брюшко, вид сверху.

Material examined. About 100 workers, 1 ♀, 1 ♂ from Uzbekistan, Turkmenistan, Kyrgyzstan, Tajikistan, Kazakhstan, Afghanistan and Iran.

Measurements of workers (in mm; $n = 30$), ordered as: min-max [mean \pm SD] (see also fig. 10, *a-d*): HL 0.66–0.90 [0.83 \pm 0.055], HW 0.65–0.90 [0.81 \pm 0.065], FW 0.26–0.34 [0.31 \pm 0.022], FLW 0.30–0.39 [0.36 \pm 0.025], OL 0.14–0.23 [0.20 \pm 0.018], GnL 0.13–0.24 [0.19 \pm 0.028], SL 0.52–0.72 [0.65 \pm 0.056], ML 0.86–1.16 [1.05 \pm 0.075], PNW 0.40–0.57 [0.52 \pm 0.040], PL 0.32–0.46 [0.38 \pm 0.041], PW 0.19–0.27 [0.24 \pm 0.023], PH 0.22–0.32 [0.28 \pm 0.023], PndL 0.18–0.27 [0.23 \pm 0.020], PPL 0.20–0.26 [0.23 \pm 0.017], PPW 0.23–0.32 [0.28 \pm 0.023], PPH 0.23–0.31 [0.29 \pm 0.015], ESL 0.11–0.19 [0.15 \pm 0.018], ESD 0.17–0.26 [0.22 \pm 0.022], HTL 0.49–0.70 [0.64 \pm 0.020], rug-frons 17–33 [23 \pm 4.484].

Indices: CI 0.99–1.09 [1.02 \pm 0.028], SI₁ 0.71–0.83 [0.78 \pm 0.035], SI₂ 0.71–0.85 [0.80 \pm 0.035], FI 0.36–0.43 [0.38 \pm 0.017], FLI 1.09–1.23 [1.17 \pm 0.037], OI₁ 0.22–0.27 [0.24 \pm 0.005], OI₂ 0.91–1.23 [1.03 \pm 0.085], PI₁ 1.19–1.56 [1.36 \pm 0.090], PI₂ 0.25–0.31 [0.29 \pm 0.013], PndI 0.89–1.11 [1.02 \pm 0.065], PPI₁ 0.75–0.90 [0.81 \pm 0.039], PPI₂ 0.31–0.39 [0.35 \pm 0.021], ESLI 0.15–0.25 [0.19 \pm 0.026].

Measurements of queen (in mm) (see also fig. 11, *a-e*): HL 0.91, HW 0.96, FW 0.37, FLW 0.43, OL 0.25, GnL 0.19, SL 0.75, PL 0.53, PW 0.35, PH 0.49, PndL 0.25, PPL 0.25,

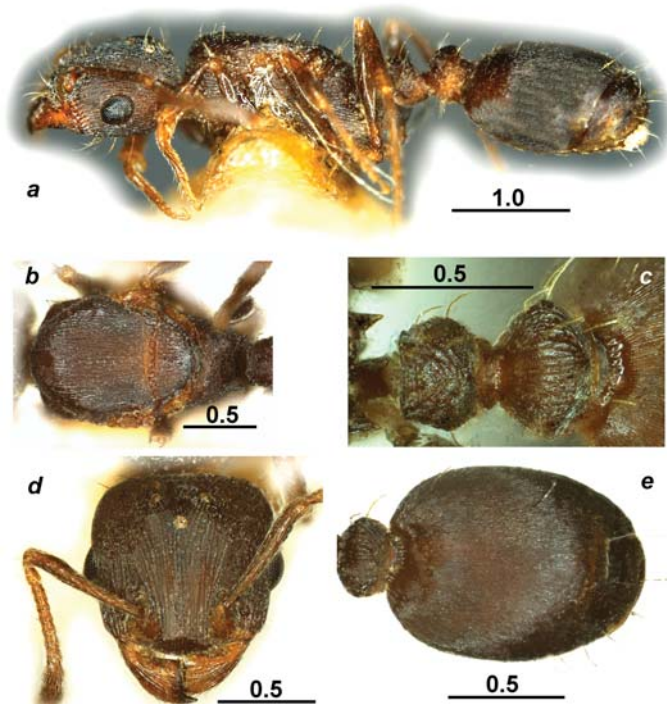


Fig. 11. Details of structure of *Tetramorium schneideri*, queen: *a* — body in profile; *b* — mesosoma, dorsal view; *c* — waist, dorsal view; *d* — head, dorsal view; *e* — gaster, dorsal view.

Рис. 11. Детали строения *Tetramorium schneideri*, самка: *a* — тело в профиль; *b* — грудь, вид сверху; *c* — стебелек, вид сверху; *d* — голова, вид сверху; *e* — брюшко, вид сверху.

PPW 0.43, PPH 0.37, ESL 0.11, ESD 0.35, HTL 0.72, ML 1.49, MH 0.74, SCL 1.03, SCW 0.85, rug-frons 27.

Indices: CI 0.95, SI₁ 0.82, SI₂ 0.78, FI 0.39, FLI 1.15, OI₁ 0.26, OI₂ 1.32, PI₁ 1.37, PI₂ 0.37, PndI 1.39, PPI₁ 0.59, PPI₂ 0.45, ESLI 0.11, MI 2.46, SCI 1.22.

First description of male (fig. 12, *a–e*; 13, *a–d*).

Material examined. 1 ♂, Uzbekistan, Kuldzhuktau, 9.05.1961 (ZMMU).

Head somewhat wider than length, broadly rounded above eyes, occipital margin convex. Anterior clypeal margin slightly prominent medially. Eyes big, situated distinctly below midlength of sides of head, so that genae very short. Scape length about half of head width. Mandibles with five sharp teeth, apical one much longer than others. Sculpture of head dorsum quite coarse: frons and clypeus with longitudinal rugosity, surface between and behind lateral ocelli with transversal rugae, remaining part of head dorsum coarsely and densely punctated. Occipital margin and temples with not abundant, relatively short erect to suberect hairs.

Mesosoma very long and low, scutum and scutellum very feebly convex, forming with propodeum more or less regular arch, notauli well developed. Petiole very long and low, twice longer than height, with almost straight anterior face and very widely rounded node dorsum. Petiole quite narrow, its node subcircle (seen from above), postpetiole > 1.6 times wider than petiole. Scutum and scutellum finely and densely longitudinal ruguloso-striated, surface between rugulae finely, but densely punctated, lateral parts of dorsum of scutum smooth and shiny. Sides of mesosoma finely, but densely longitudinally striato-punctated. Petiolar node laterally with short longitudinal rugulae, its dorsum finely punctated,

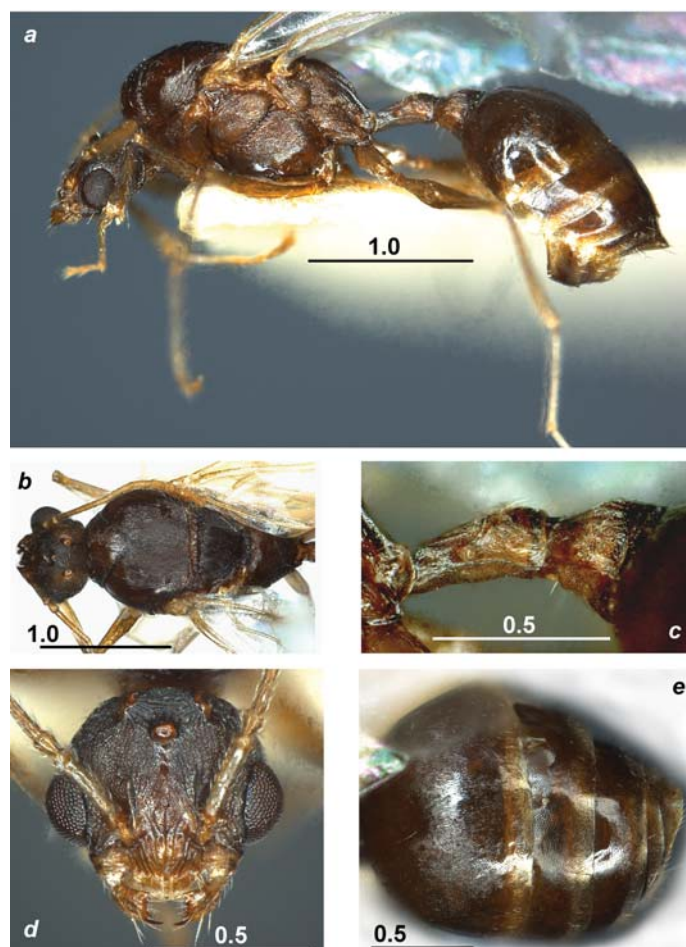


Fig. 12. Details of structure of *Tetramorium schneideri*, male: *a* — body in profile; *b* — mesosoma, dorsal view; *c* — waist, lateral view; *d* — head, dorsal view; *e* — gaster, dorsal view.

Рис. 12. Детали строения *Tetramorium schneideri*, самец; *a* — тело в профиль; *b* — грудь, вид сверху; *c* — стелек, вид сбоку; *d* — голова, вид сверху; *e* — брюшко, вид сверху.

postpetole dorsally quite coarsely longitudinally rugose.

Stipites of genitalia very smoothly curved inward apically (seen dorsally or ventrally), their apices convex, not excavated (seen from behind).

Mesosoma and waist with sparse and quite short erect hairs. In contrast to known males of other species from *striativentre*-group, surface of first gastral tergite finely, but densely longitudinally striato-punctated (this sculpture is similar to that in workers and queens, but is much finer), remainder tergites with fine, but very obvious superficial microreticulation. Body colour dark reddish-brown, clypeus, mandibles and appendages brownish-yellow.

Measurements of male (in mm): HL 0.61, HW 0.63, OL 0.26, GnL 0.04, SL 0.31, PL 0.443, PW 0.22, PH 0.22, PPL 0.24, PPW 0.36, PPH 0.32, HTL 0.83, ML 1.69, MH 0.94, SCL 1.20, SCW 0.94.

Indices: CI 0.96, SI₁ 0.51, SI₂ 0.49, OI₁ 0.42, OI₂ 6.00, PI₁ 2.00, PI₂ 0.35, PPI₁ 0.67, PPI₂ 0.58, MI 1.81, SCI 1.28.

Taxonomic notes. Emery (1898) described *T. schneideri* based on the single worker from Bukhara (Uzbekistan), collected by Prof. Oskar Schneider. As this species by the many diagnostic features (especially by the sculpture of the first gastral tergite) is similar to *T. striativentre*, later on Emery had some objections to the taxonomic status of this

species and requested Ruzsky to compare *T. schneideri* with the type specimens of *T. striativentre*. As a result, Ruzsky (1905 a: 766–767; 1905 b) confirmed heterospecificity of these taxa and proposed to consider *T. schneideri* as a subspecies of *T. striativentre*. The status of *T. schneideri* as a species was revived by Dlussky and Zabelin (1985).

Karawajew (1912) described *T. striativentre* subsp. *schneideri* var. *longispina* from Turkmenistan (Repetek). Despite this name is unavailable (quadrinomen), we examined 2 “syntype” workers of this form with the labels: “Transkaspien, Repetek. Nr. 1741 W. Karawajew”, “*Tetramorium striativentre* Em. *schneideri* Em. v. *longispina* Kar. Typus”, “Syntypus *Tetramorium striativentre schneideri* v. *longispina* Kar.” (SIZK). Here we may only confirm the opinion of Dlussky et al. (1990) that these specimens are *T. schneideri* with the very long propodeal spines.

For the differences of *T. schneideri* and *T. striativentre* see Taxonomic notes to the latter species, above. *T. schneideri* well differs from two other species with the completely sculptured first gastral tergite (*T. saudicum* and *T. sabatinellii*) first of all by the subcircle petiolar node (it is distinctly transversal in the latter species), and by the finer longitudinal rugosity on the head dorsum (number of rugae between the frontal carinae level with the eyes > 15, mean 23, same in the latter species < 15, means 12 ... 13).

Distribution. Central Asia, southern Kazakhstan, Afghanistan, Iran.

Ecology. In contrast to the previous species, distributed mainly on plains and foothills, it prefers desert and semi-desert biotopes and is one of the commonest ant species in many places. Nests build in a soil, sometimes under stones. Consumes mainly plant seeds,

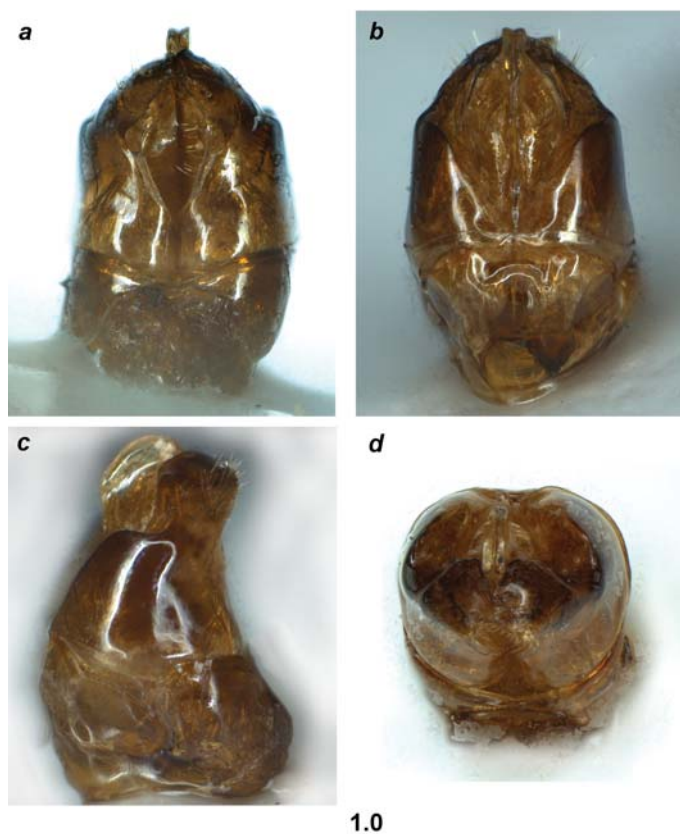


Fig. 13. Genitalia of *Tetramorium schneideri*, male: *a* — dorsal view; *b* — ventral view; *c* — lateral view; *d* — caudal view.

Рис. 13. Гениталии *Tetramorium schneideri*, самец: *a* — вид сверху; *b* — вид снизу; *c* — вид сбоку; *d* — вид сзади.

but also collects living and dead small invertebrates. Nuptial flight is in May — early June (for more details see Zakharov, 1976; Dlussky, 1981; Dlussky et al., 1990).

***Tetramorium kabulistanicum* Pisarski, 1967**

Tetramorium striativentre subsp. *kabulistanicum* Pisarski, 1967: 403, workers, ♀, ♂, Afghanistan (part., only material form Cheikhabad; see Taxonomic note, below); 1969: 319. *Tetramorium kabulistanicum*: Radchenko, 1992 a: 44, 1992 b: 53.

Material examined. Paratypes, 4 workers, 1 ♀, 1 ♂, “Afghanistan, Cheikhabad, sud de Kaboul, route de Ghazni, A 473, 2050 m, 13.5.1958, leg. K. Lindberg” (MIZ). Non-type material. 10 workers from Afghanistan and Turkmenistan.

Measurements of workers (in mm; n = 10), ordered as: min-max [mean ± SD] (see also fig. 14, a–d): HL 0.77–0.85 [0.82 ± 0.036], HW 0.77–0.83 [0.79 ± 0.020], FW 0.32–0.34 [0.33 ± 0.007], FLW 0.34–0.36 [0.35 ± 0.007], OL 0.18–0.20 [0.19 ± 0.005], GnL 0.19–0.24 [0.21 ± 0.014], SL 0.58–0.66 [0.62 ± 0.027], ML 0.99–1.12 [1.06 ± 0.046], PNW 0.51–0.56

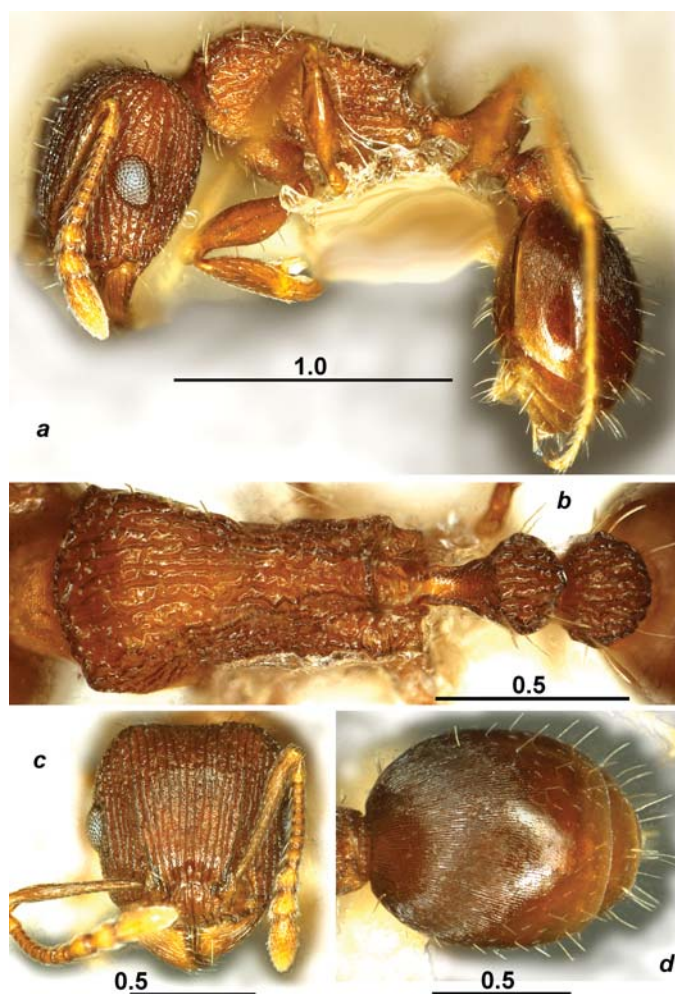


Fig. 14. Details of structure of *Tetramorium kabulistanicum*, worker, paratype: a — body in profile; b — mesosoma and waist, dorsal view; c — head, dorsal view; d — gaster, dorsal view.

Рис. 14. Детали строения *Tetramorium kabulistanicum*, рабочий, паратип: a — тело в профиль; b — грудь и стелек, вид сверху; c — голова, вид сверху; d — брюшко, вид сверху.

[0.53 ± 0.018], PL 0.34–0.36 [0.35 ± 0.009], PW 0.24–0.29 [0.26 ± 0.017], PH 0.25–0.33 [0.29 ± 0.026], PndL 0.20–0.24 [0.22 ± 0.013], PPL 0.20–0.23 [0.21 ± 0.011], PPW 0.26–0.35 [0.31 ± 0.030], PPH 0.253–0.33 [0.29 ± 0.028], ESL 0.11–0.14 [0.13 ± 0.027], ESD 0.20–0.25 [0.23 ± 0.015], HTL 0.58–0.63 [0.60 ± 0.017], rug-frons 11–15 [13 ± 1.414]. Indices: CI 0.99–1.08 [1.03 ± 0.031], SI₁ 0.73–0.78 [0.75 ± 0.018], SI₂ 0.74–0.81 [0.78 ± 0.023], FI 0.40–0.43 [0.42 ± 0.010], FLI 1.03–1.09 [1.07 ± 0.020], OI₁ 0.22–0.26 [0.24 ± 0.011], OI₂ 0.79–1.00 [0.91 ± 0.061], PI₁ 1.09–1.36 [1.33 ± 0.084], PI₂ 0.31–0.36 [0.33 ± 0.018], PndI 1.09–1.26 [1.19 ± 0.050], PPI₁ 0.64–0.77 [0.69 ± 0.046], PPI₂ 0.33–0.43 [0.40 ± 0.034], ESLI 0.14–0.18 [0.16 ± 0.014].

Measurements of queen (in mm) (fig. 15, *a–e*): HL 0.87, HW 0.90, FW 0.40, FLW 0.42, OL 0.285, GnL 0.19, SL 0.66, PL 0.45, PW 0.35, PH 0.41, PndL 0.17, PPL 0.31, PPW 0.47, PPH 0.04, ESL 0.15, ESD 0.39, HTL 0.66, ML 1.49, MH 0.76, SCL 1.03, SCW 0.81, rug-frons 17.

Indices: CI 0.96, SI₁ 0.76, SI₂ 0.73, FI 0.43, FLI 1.08, OI₁ 0.30, OI₂ 1.47, PI₁ 1.11, PI₂ 0.39, PndI 2.13, PPI₁ 0.65, PPI₂ 0.52, ESLI 0.17, MI 1.96, SCI 1.27.

Measurements of male (in mm) (figs 16, *a–e*): HL 0.65, HW 0.65, OL 0.29, GnL 0.06, SL 0.31, PL 0.45, PW 0.34, PH 0.30, PPL 0.31, PPW 0.44, PPH 0.35, HTL 0.88, ML 1.63, MH 0.91, SCL 1.24, SCW 0.90.

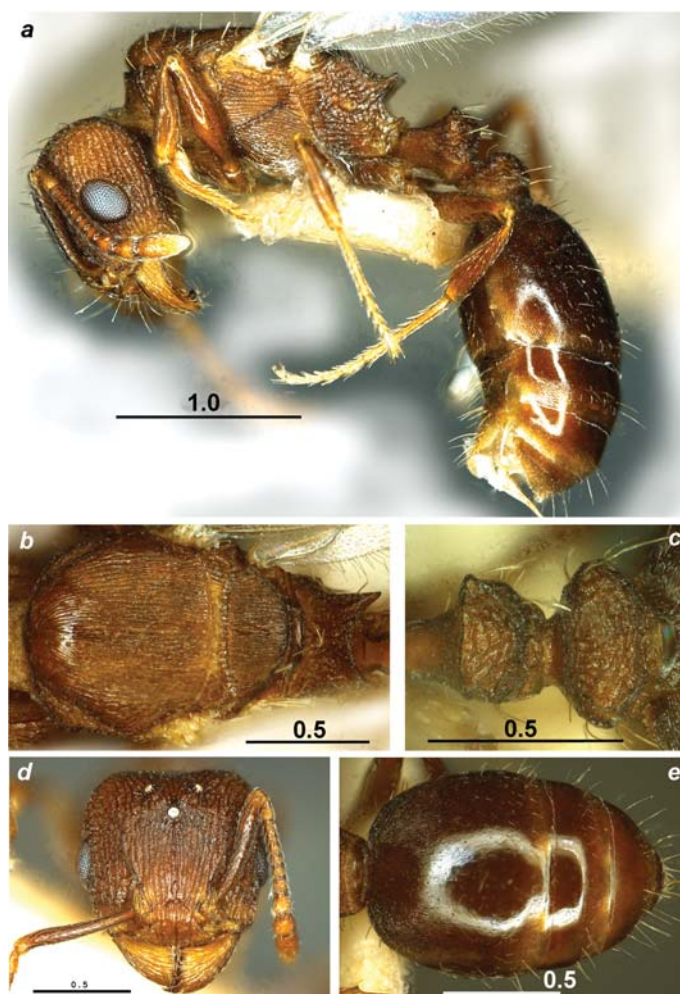


Fig. 15. Details of structure of *Tetramorium kabulisticum*, queen, paratype: *a* — body in profile; *b* — mesosoma, dorsal view; *c* — waist, dorsal view; *d* — head, dorsal view; *e* — gaster, dorsal view.

Рис. 15. Детали строения *Tetramorium kabulisticum*, самка, паратип: *a* — тело в профиль; *b* — грудь, вид сверху; *c* — стелек, вид сверху; *d* — голова, вид сверху; *e* — брюшко, вид сверху.

Indices: CI 1.00, SI₁ 0.47, SI₂ 0.47, OI₁ 0.440, OI₂ 5.20, PI₁ 1.48, PI₂ 0.53, PPI₁ 0.70, PPI₂ 0.68, MI 1.78, SCI 1.38.

Taxonomic notes. Pisarski (1967) described *T. striativentre* subsp. *kabulistanicum* based on the two nest samples from two different localities: 30 workers (including holotype), six gynes and one male from Cheikhabad (coll. No A 473), and three workers from Hassan Guilan (coll. No A 314). The specimens from the second locality belong to *T. pisarskii* sp. n., described above, and are excluded from the type series of *T. kabulistanicum* (see Taxonomic notes to the latter species).

T. kabulistanicum well differs from *T. striativentre* first of all by the sculpture of the first gastral tergite: only its basal half is densely longitudinally striato-punctated, the remaining part of tergite is smooth and shiny or at most with fine superficial microreticulation, while in the latter species whole surface of the first gastral tergite is densely longitudinally striato-punctated.

By the character of sculpture of the first gastral tergite *T. kabulistanicum* resembles *T. pisarskii*, but differs from it by the sculpture of mesosoma and waist, as well as by the sculpture on the head dorsum (see also Taxonomic notes to *T. pisarskii*, above).

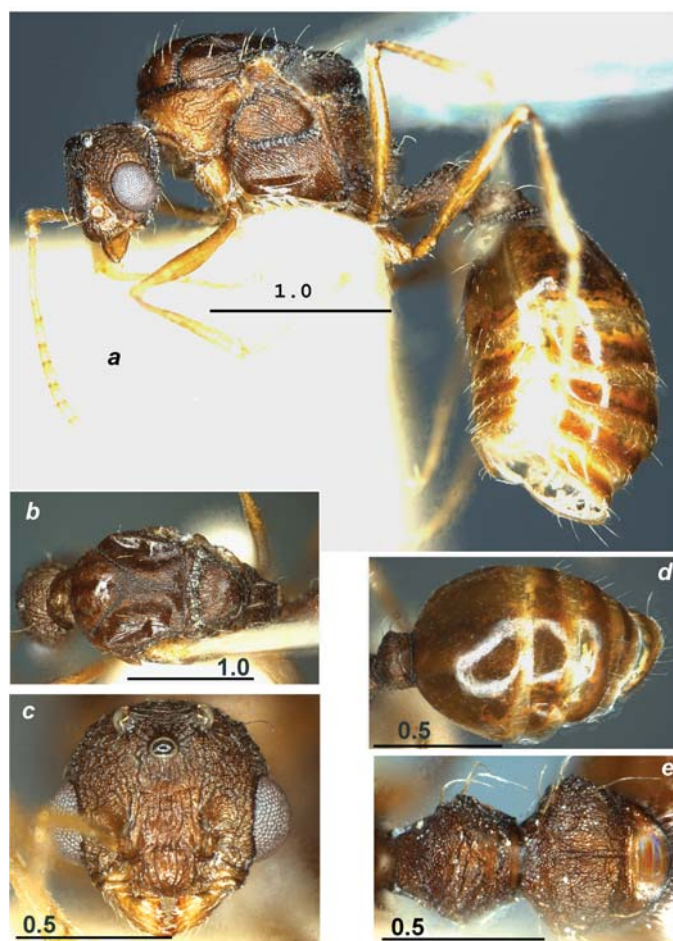


Fig. 16. Details of structure of *Tetramorium kabulistanicum*, male, paratype: *a* — body in profile; *b* — mesosoma, dorsal view; *c* — head, dorsal view; *d* — gaster, dorsal view; *e* — waist, dorsal view.

Рис. 16. Детали строения *Tetramorium kabulistanicum*, самец, паратип: *a* — тело в профиль; *b* — грудь, вид сверху; *c* — голова, вид сверху; *d* — брюшко, вид сверху; *e* — стелек, вид сверху.

Distribution. Afghanistan and Turkmenistan.
Ecology unknown.

***Tetramorium saudicum* Sharaf, 2013**

Tetramorium saudicum Sharaf, 2013: 574, workers, Saudi Arabia (in Sharaf et al., 2013).

Material examined. Paratypes, 3 workers, "Saudi Arabia, Rawdhat Khorim, 25-22-986 N, 47-16-712 E, 559 m, 24.II.2012, HP (A) No. 0067" (nest of holotype) (SIZK).

Measurements of workers (in mm; n = 3), ordered as: min-max: HL 0.80–0.81, HW 0.78–0.78, FW 0.32–0.33, FLW 0.36–0.37, OL 0.20–0.21, GnL 0.19–0.21, SL 0.61–0.62, ML 0.96–0.99, PNW 0.52–0.52, PL 0.33–0.33, PW 0.24–0.25, PH 0.26–0.28, PndL 0.20–0.21, PPL 0.21–0.22, PPW 0.28–0.30, PPH 0.21–0.23, ESL 0.10–0.13, ESD 0.21–0.22, HTL 0.55–0.56.

Indices: CI 1.03–1.04, SI₁ 0.74–0.77, SI₂ 0.77–0.79, FI 0.41–0.42, FLI 1.12–1.13, OI₁ 0.25–0.27, OI₂ 1.00–1.06, PI₁ 1.20–1.24, PI₂ 0.31–0.32, PndI 1.16–1.22, PPI₁ 0.76–0.80, PPI₂ 0.35–0.38, ESLI 0.13–0.17.

For some more measurements see Sharaf et al. (2013).

Taxonomic notes. *T. saudicum* the most resembles *T. sabatinellii* and differs from it by some morphometrics features (see Note to the latter species and Key).

A key to species of *Tetramorium striativentre* species group (workers and queens¹)

1. Whole surface of first gastral tergite densely longitudinally striato-punctated (fig. 1, d; 2, c; 6, d; 7, b; 10, d; 11, e). 2
- Only basal half of first gastral tergite densely longitudinally striato-punctated, remainder part of tergite smooth and shiny or at most with fine superficial microreticulation (fig. 5, d; 14, d; 15, e). 5
- 2(1). Frontal carinae not curved, gradually converging anteriorly, so that frontal lobes not extended laterally (FLI in workers 1.00–1.06, mean 1.01, in queens < 1.00, mean 0.96); longitudinal rugosity on head dorsum relatively fine, number of rugae between frontal carinae level with the eyes > 15 (mean in workers 18, in queens — 21) (fig. 6, c; 7, c). Petiolar node transversal (mean PndI in workers 1.34, in queens — 1.78); both petiolar node dorsum and postpetiolar dorsum with regular longitudinally-concentric rugae (fig. 6, b; 7, b). Propodeum with short denticles (mean ESLI in workers 0.10, in queens — 0.08) (fig. 6, a; 7, a). *T. striativentre* Mayr
- Frontal carinae curved above antennal insertions, frontal lobes distinctly extended (FLI ≥ 1.08, means in workers 1.12 ... 1.17, in queens 1.09 ... 1.15); longitudinal rugosity on head dorsum various (fig. 1, c; 2, d; 10, c; 11, d). Petiolar node of various shape, petiolar node dorsum with sinuous longitudinal rugae, postpetiolar dorsum with longitudinal rugae (fig. 1, b; 2, e; 10, b; 11, c). Propodeum with longer teeth or even thin spines (means ESLI in workers 0.15 ... 0.19, in queens 0.11 ... 0.17) (fig. 1, a; 2, a; 10, a; 11, a)'. 3
- 3(2). Petiolar node subcircle (mean PndI in workers 1.02, in queens — 1.40) (fig. 10, b; 11, c). Longitudinal rugosity on head dorsum relatively fine, number of rugae between frontal carinae level with the eyes > 15 (mean 23) (fig. 10, c; 11, d). *T. schneideri* Emery
- Petiolar node transversal (means PndI in workers 1.20 ... 1.35, in queen 1.40) (fig. 1, b; 2, e). Longitudinal rugosity on head dorsum coarser, number of rugae between frontal carinae level with the eyes < 15 (means 12 ... 13) (fig. 1, c; 2, d). 4
- 4(3). Scape somewhat shorter, mean SI1 0.75, SI2 0.78. Petiolar node somewhat narrower, mean PndI 1.20; postpetiole somewhat narrower, mean PPI1 0.77, mean PPI2 0.36. Gena only somewhat longer than maximal diameter of eye, mean OI2 1.04. *T. saudicum* Sharaf
- Scape somewhat longer, mean SI1 0.80, SI2 0.84. Petiolar node somewhat wider, mean PndI 1.35; postpetiole somewhat wider, mean PPI1 0.70, mean PPI2 0.39. Gena distinctly longer than maximal diameter of eye, mean OI2 1.10 *T. sabatinellii* sp. n.

¹Queens of *T. pisarskii* and *T. saudicum* are unknown.

- 5(1). Mesosomal dorsum and waist dorsum with sinuous longitudinal rugae (fig. 14, b; 15, c). Longitudinal rugosity on head dorsum coarser, number of rugae between frontal carinae level with the eyes ≤ 15 (fig. 14, c; 15, d). *T. kabulistanicum* Pisarski
 – Mesosomal dorsum with more regular, almost straight longitudinal rugae, waist dorsum with regular longitudinally-concentric rugae (fig. 5, b). Longitudinal rugosity on head dorsum less coarse, number of rugae between frontal carinae level with the eyes ≥ 20 (fig. 5, c) *T. pisarskii* sp. n.

A key to species of *Tetramorium striativentre* species group (males²)

1. Surface of first gastral tergite finely, but densely longitudinally striato-punctated (fig. 12, e). Petiole very long and low, PI1 2.00 (fig. 12, c) *T. schneideri* Emery
 – Surface of first gastral tergite smooth and shiny (fig. 3, e; 8, b; 16, d). Petiole shorter and higher, PI1 < 1.70 (fig. 3, a; 8, a; 16, a)..... 2
 2(1). Genae very short, OI2 6.50; petiole longer and lower, PI1 1.68 (fig. 3, a, d). *T. sabatinellii* sp. n.
 – Genae longer, OI2 < 5.50 ; petiole shorter and higher, PI1 < 1.50 (fig. 8, b, c; 16, a, c). 3
 3(2). Petiole narrower and higher, PI1 < 1.30 , PI2 ≤ 0.45 ; genae longer, OI2 < 4.20 (fig. 3, a–c). *T. striativentre* Mayr
 – Petiole wider and lower, PI1 > 1.45 , PI2 > 0.50 ; genae shorter, OI2 > 5.00 (fig. 16, a, c, e) *T. kabulistanicum* Pisarski

We are sincerely grateful to curators of the museum collection for the providing material for investigation: Elena Fedosseva (ZMMU), Fabrizio Rigato (MSNM), Mostafa Rezek Sharaf (Er-Riyadh), Mauro Daccordi (Verona) and Marco Uliana (MSNVE), and to Vladimir Radchenko (Kyiv), who made photos of the male genitalia of *T. striativentre*. Finally, particular thanks to Guido Sabatinelli (Amman) for his courtesy and assistance in the field researches in Jordan.

References

- Agosti, D., Collingwood, C. A. A provisional list of the Balkan ants (Hym., Formicidae) and a key to the worker caste. I. Synonymic list // Mitteilungen der Schweizerischen Entomologischen Gesellschaft. — 1987 a. — **60**, H. 1–2. — S. 51–62.
 Agosti, D., Collingwood, C. A. A provisional list of the Balkan ants (Hym., Formicidae) and a key of the worker caste. II. Key of the worker caste, including the European species without the Iberian // Mitteilungen der Schweizerischen Entomologischen Gesellschaft. — 1987 b. — **60**, H. 3–4. — S. 261–293.
 André, E. Les fourmis. Species des Hyménoptères d'Europe et d'Algérie. Tome Deuxième. — Beaune : Edmond André, 1883. — P. 281–404.
 Arakelyan, G. R. Fauna of Republic Armenia. Hymenopterous Insects. Ants (Formicidae). — Erevan : Gitjutjun, 1994. — 153 p. — Russian : Аракелян Г. Р. Фауна республики Армения. Насекомые перепончатокрылые. Муравьи (Formicidae).
 Arnoldi, K. V. Important additions to the myrmecofauna (Hymenoptera, Formicidae) of the USSR and descriptions of new forms // Zoologicheskyy zhurnal. — 1968. — **47**, is. 12. — P. 1800–1822. — Russian : Арнольди К. В. Важные дополнения к мирмекофауне (Hymenoptera, Formicidae) СССР и описание новых форм.
 Bernard, F. Faune de l'Europe et du Bassin Méditerranéen. 3. Les fourmis (Hymenoptera, Formicidae) d'Europe occidentale et septentrionale, 3. — Paris : Masson, 1967 (1968). — 411 p.
 Bolton, B. The ant tribe Tetramoriini (Hymenoptera: Formicidae). Constituent genera, review of smaller genera and revision of Triglyphotrix Forel // Bulletin of the British Museum (Natural History) (Entomology). — 1976. — **34**. — P. 281–379.
 Bolton, B. The ant tribe Tetramoriini (Hymenoptera: Formicidae). The genus Tetramorium Mayr in the Oriental and Indo-Australian regions, and in Australia // Bulletin of the British Museum (Natural History) (Entomology). — 1977. — **36**. — P. 67–151.
 Bolton, B. The ant tribe Tetramoriini (Hymenoptera: Formicidae). The genus Tetramorium Mayr in the Malagasy region and in the New World // Bulletin of the British Museum (Natural History) (Entomology). — 1979. — **38**. — P. 129–181.
 Bolton, B. The ant tribe Tetramoriini (Hymenoptera: Formicidae). The genus Tetramorium Mayr in the Ethiopian zoogeographical region // Bulletin of the British Museum (Natural History) (Entomology). — 1980. — **40**. — P. 193–384.
 Bolton, B. 2014. An online catalogue of the ants of the world. Available from <http://antcat.org>. (accessed 27.02.2015).

² Males of *T. pisarskii* and *T. saudicum* are unknown.

- Bursakov, S. S. Two new species of the genus *Tetramorium* (Hymenoptera: Formicidae) from south-eastern Kazakhstan // *Zoologicheskyy zhurnal*. — 1984. — 58, is. 3. — P. 399–405. — Russian : Бурсаков С. С. Два новых вида рода *Tetramorium* (Hymenoptera: Formicidae) из юго-восточного Казахстана.
- Cagniant, H. Le genre *Tetramorium* au Maroc (Hymenoptera: Formicidae): clé et catalogue des espèces // *Annales de la Société Entomologique de France*. N. S. — 1997. — 33. — P. 89–100.
- Collingwood, C. A. The 3rd Danish expedition to Central Asia. Zoological Results 27. Formicidae from Afghanistan // *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening*. — 1961 a (1960). — 123. — P. 51–79.
- Collingwood, C. A. Ergebnisse der Deutschen Afghanistan-Expedition 1956 der Landessammlungen für Naturkunde Karlsruhe // *Beiträge zur Naturkundlichen Forschung in Südwestdeutschland*. — 1961 b. — 19. — S. 89–290.
- Collingwood, C. A. The Formicidae (Hymenoptera) of Fennoscandia and Denmark // *Fauna entomologica Scandinavica*. — 1979. — 8. — 174 p.
- Collingwood, C. A. Hymenoptera: Fam. Formicidae of Saudi Arabia // *Fauna of Saudi Arabia*. — 1985. — 7. — P. 230–302.
- Collingwood, C. A., Agosti, D. Formicidae of Saudi Arabia (Part 2) // *Fauna of Saudi Arabia*. — 1996. — 15. — P. 300–385.
- Collingwood, C. A., Heatwole, H. Ants from Northwestern China (Hymenoptera, Formicidae) // *Psyche*. — 2000. — 103, 1–2. — P. 1–24.
- Csösz, S., Radchenko, A., Schulz, A. Taxonomic revision of the Palaearctic *Tetramorium cheketti* species-complex (Hymenoptera: Formicidae) // *Zootaxa*. — 2007. — 1405. — P. 1–38.
- Csösz, S., Schulz, A. A taxonomic review of the Palaearctic *Tetramorium ferox* species-complex // *Zootaxa*. — 2010. — 2401. — P. 1–29.
- Csösz, S., Wagner, H. C., Bozsó, M. *et al.* *Tetramorium indocile* Santschi 1927 stat. rev. is proposed scientific name for *Tetramorium* sp. C sensu Sclick-Steiner *et al.* (2006) basal on combined molecular and morphological evidence (Hymenoptera: Formicidae) // *Zoologischer Anzeiger*. — 2014. — 253. — S. 469–481.
- Czechowski, W., Radchenko, A., Czechowska, W. The ants (Hymenoptera, Formicidae) of Poland. — Warsaw : MIZ, 2002. — 200 p.
- Czechowski, W., Radchenko, A., Czechowska, W., Vepsäläinen, K. The ants of Poland with reference to the myrmecofauna of Europe // *Fauna Poloniae*. N. S. — Warszawa : Natura Optima Dux Foundation, 2012. — Vol. 4. — 496 p.
- Dalla Torre, C. G. *Catalogus Hymenopterorum, hucusque descriptorum systematicus et synonymicus*. Vol. 7: Formicidae (Heterogyna). — Leipzig, 1893. — 289 p.
- Dlussky, G. M. The ants of deserts. — Moscow : Nauka, 1981. — 203 p. — Russian : Длусский Г. М. Муравьи пустынь.
- Dlussky, G. M., Soyunov, O. S., Zabelin, S. I. The ants of Turkmenistan. — Ashkhabad : Ylym, 1990. — 273 p. — Russian : Длусский Г. М., Союнов О. С., Забелин С. И. Муравьи Туркменистана.
- Dlussky, G. M., Zabelin, S. I. Ant fauna of the basin of riv. Sunbar (south-western Kopetdagh) // *Rastitel'nost i zhivotnyi mir zapadnogo Kopetdaga*. — Ashkhabad : Ylym, 1985. — P. 208–246. — Russian : Длусский Г. М., Забелин С. И. Фауна муравьев бассейна р. Сумбар (юго-западный Копетдаг).
- Emery, C. *Beiträge zur Kenntniss der paläarktischen Ameisen* // *Öfversigt at Finska Vetenskaps-Societetens Förhandlingar*. — 1898. — 20. — S. 124–151.
- Emery, C. *Beiträge zur Monographie der Formiciden des paläarktischen Faunengebietes*. 9 // *Deutsche Entomologische Zeitschrift*. — 1909. — S. 695–712.
- Emery, C. Hymenoptera, Fam. Formicidae, subfam. Myrmicinae // *Genera Insectorum* / Ed. P. Wytsman. — Bruxelles, 1924 (1922). — Fasc. 174 C. — P. 207–397.
- Imai, H. T., Kihara, A., Kondoht, M. *et al.* Ants of Japan. — Tokyo : Gakken, 2003. — 224 p.
- Karawajew, W. Ameisen aus Transkaspien und Turkestan // *Trudy Russkago Entomologicheskago Obshchestva*. — 1911 (1910). — 39. — P. 1–72.
- Karawajew, W. Ameisen aus dem paläarktischen Faunengebiet // *Russkoe Entomologicheskoe Obozrenie*. — 1912. — 12. — P. 581–586.
- Kratochvíl, J. Mravenci mohelnské rezervace. Rozbor taxonomický, faunisticko-oekologický, sociologický a zoogeografický // *Archiv Svazu na ochranu přírody a domoviny na Moravě*. — 1944. — 6. — S. 9–102.
- Kutter, H. *Insecta Helvetica* Fauna. 6. Hymenoptera, Formicidae. — Zürich, 1977. — 298 S.
- López, F. Estudio morfológico y taxonómico de los grupos de especies ibéricas del género *Tetramorium* Mayr, 1855 // *Boletín de la Asociación Española de Entomología*. — 1991 a. — 15. — P. 29–52.
- López, F. Variabilidad morfológica y problemas taxonómicos en *Tetramorium caespitum* (Linné, 1758) y *Tetramorium semilaeve* André, 1881 // *Boletín de la Asociación Española de Entomología*. — 1991 b. — 15. — P. 65–78.
- López, F., Zorrilla, J. M., Acosta, F. J., Serrano, J. M. Comparative morphological study of *Tetramorium caespitum* (Linné, 1758) and *Tetramorium semilaeve* André, 1881 // *Miscellanea Zoológica* (Barcelona). — 1992 (1991). — 15. — P. 169–178.
- Mayr, G. Formicidae. Travels in Turkestan Fedchenko A. P. Vol. 2, Part. 5, N 7 // *Izvestia Imperatorskogo Obshchestva Lyubitelei Estestvoznania, Antropologii i Etnografi pri Imperatorskom Moskovskom Uni-*

- versitete. — 1877. — 26. — P. 1–20. — Russian : Майр Г. Formicidae. В: Федченко А. П. Путешествия в Туркестан.
- Mayr, G. Die Ameisen Turkestan's gesammelt von A. Fedtschenko // Tijdschrift voor Entomologie. — 1880. — 23. — S. 17–40.
- Mei, M. Arthropoda di Lampedusa, Linosa e Pantelleria (Canale di Sicilia, Mar Mediterraneo). Hymenoptera Formicidae (con diagnosi di due nuove specie) // Naturalista Siciliano. — 1995. — Suppl. 19. — P. 753–772.
- Paknia, O., Radchenko, A., Pfeiffer, M. New records of ants (Hymenoptera: Formicidae) from Iran // Asian Myrmecology. — 2010. — 3. — P. 29–39.
- Pisarski, B. Fourmis (Hymenoptera, Formicidae) d'Afganistan recoltés par Dr. Lindberg // Annales Zoologici. — 1967. — 24, 6. — P. 375–425.
- Pisarski, B. Beiträge zur Kenntnis der Fauna Afghanistans // Časopis Moravského Musea. — 1969. — Suppl. 54. — S. 305–325.
- Poldi, B. Un nuovo Tetramorium dell'Anatolia // Entomologica Basiliensia. — 1979. — 4. — P. 499–503.
- Radchenko, A. G., Arakelyan, G. R. Ants of the group Tetramorium ferox Ruzsky from Crimea and Caucasus // Biologicheskii Zhurnal Armenii. — 1990. — 43. — P. 371–378. — Russian : Радченко А. Г., Аракелян Г. Р. Муравьи группы Tetramorium ferox Ruzsky из Крыма и Кавказа.
- Radchenko, A. G. Ants of the genus Tetramorium of the fauna of USSR. Communication 1 // Zoologicheskii zhurnal. — 1992 a. — 71, is. 8. — P. 39–49. — Russian : Радченко А. Г. Муравьи рода Tetramorium фауны СССР. Сообщ. 1.
- Radchenko, A. G. Ants of the genus Tetramorium of the fauna of USSR. Communication 2 // Zoologicheskii zhurnal. — 1992 b. — 71, is. 8. — P. 50–58. — Russian : Радченко А. Г. Муравьи рода Tetramorium фауны СССР. Сообщ. 2.
- Radchenko, A., Czechowski, W., Czechowska, W. The genus Tetramorium Mayr (Hymenoptera, Formicidae) in Poland — a survey of species and a key for their identification // Annales Zoologici. — 1998. — 48. — P. 107–118.
- Ruzsky, M. The ants of the vicinity of the Aral Sea // Izvestiya Turkestanskogo otdeleniya Imperatorskogo Ruskogo Geograficheskogo Obshchestva. — 1902. — 3, is. 1. — P. 1–24. — Russian : Рузский М. Д. Муравьи окрестностей Аральского моря.
- Ruzsky, M. The ants of Russia (Formicariae Imperii Rossici). Systematics, geography and data on the biology of Russian ants. Part I // Trudy Obshchestva Estestvoispytatelej pri Imperatorskom Kazanskom Universitete. — 1905 a. — 38, N 4–6. — P. 1–800. — Russian : Рузский М. Д. Муравьи России (Formicariae Imperii Rossici). Систематика, география и данные по биологии русских муравьев. Ч. 1.
- Ruzsky, M. Über Tetramorium striativentre Mayr und Tetr. schneideri Em. // Zoologischer Anzeiger. — 1905 b. — 29. — S. 517–518.
- Ruzsky, M. Ants of the Isl. Cheleken' // Izvestiya Tomskogo Gosudarstvennogo Universiteta. — 1923. — 72. — P. 1–6. — Russian : Рузский М. Д. Муравьи острова Челекена.
- Sanetra, M., Güsten, R., Schulz, A. On the taxonomy and distribution of Italian Tetramorium species and their social parasites (Hymenoptera Formicidae) // Memorie della Società Entomologica Italiana. — 1999. — 77. — P. 317–357.
- Santschi, F. A propos du Tetramorium caespitum L. // Folia Myrmecologica et Termitologica. — 1927. — 1. — P. 52–58.
- Schlick-Steiner, B. C., Steiner, F. M., Moder, K. et al. A multidisciplinary approach reveals cryptic diversity in western Palearctic Tetramorium ants (Hymenoptera: Formicidae) // Molecular Phylogeny and Evolution. — 2006. — 40. — P. 259–273.
- Schulz, A. Tetramorium rhenanum nova species vom "Mittleren Rheintal", Deutschland // Linzer Biologische Beiträge. — 1996. — 28. — S. 391–412.
- Seifert, B. Ameisen: beobachten, bestimmen. — Augsburg : Naturbuch Verlag, 1996. — 352 S.
- Seifert, B. Die Ameisen Mittel- und Nordeuropas. — Tauer : Lutra-Verlags- und Vertriebsgesellschaft, 2007. — 368 S.
- Sharaf, M. R., Aldawood, A. S., Taylor, B. A new ant species of the genus Tetramorium Mayr, 1855 (Hymenoptera: Formicidae) from Saudi Arabia, with a revised Key to the Arabian Species // PLoS ONE. — 2012. — 7 (2). — P. 1–9.
- Sharaf, M. R., Abdel-Dayem, M. S., Al Dhafer, H. M., Aldawood, A. S. The ants (Hymenoptera: Formicidae) of Rawdhat Khorim Nature Preserve, Saudi Arabia, with description of a new species of the genus Tetramorium Mayr. — Zootaxa. — 2013. — 3709, N 6. — P. 565 — 580.
- Steiner, F. M., Seifert, B., Moder, K., Schlick-Steiner, B. C. A multisource solution for a complex problem in biodiversity research: Description of the cryptic ant species Tetramorium alpestre sp. n. (Hymenoptera: Formicidae) // Zoologischer Anzeiger. — 2010. — 249. — S. 223–254.
- Stitz, H. Die Tierwelt Deutschlands und der angrenzenden Meeresteile nach ihren Merkmalen und nach ihrer Lebensweise. 37 Theil. Hautflüger oder Hymenoptera. 1. Ameisen oder Formicidae. — Jena : G. Fischer, 1939. — 428 S.
- Tarbinsky, Yu. S. The ants of Kirghizia. — Frunze : Ilim, 1976. — 217 p. — Russian : Тарбинский Ю. С. Муравьи Киргизии.

- Wang, M., Xiao, G., Wu, J. Taxonomic studies on the genus *Tetramorium* Mayr in China // *Forest Research*. — 1988. — **1**. — P. 264–274.
- Wheeler, W. M., Mann, W. M. The ants of the Phillips expedition to Palestine during 1914 // *Bulletin of the Museum of Comparative Zoology at Harvard College*. — 1916. — **60**. — P. 167–174.
- Xu, Z., Zheng, Z. New species and new record species of the genus *Tetramorium* Mayr from southwestern China // *Entomotaxonomia*. — 1994. — **16**. — P. 285–290.
- Zakharov, A. A. Ecology and colony structure on desert ant *Tetramorium schneideri* (Hymenoptera, Formicidae) // *Zoologichesky zhurnal*. — 1976. — **55**, is. 2. — P. 250–254. — Russian: Захаров А. А. Экология и структура семьи у пустынного муравья *Tetramorium schneideri* (Hymenoptera, Formicidae).
- Zhou, S., Jiang, G. Taxonomic study of the ant genus *Tetramorium* Mayr from Guangxi // *Guangxi Sciences*. — 1998. — **5**, N 1. — P. 74–75.

Received 19 February 2015

Accepted 24 March 2015