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New Species of the Genus *Belomicrus* (Hymenoptera, Sphecidae) of the Asian Fauna. 1. Species of the Groups *italicus* and *radoszkowskyi**

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Abstract. Five new species of digger wasps of the genus *Belomicrus* A. Costa are described from Kazakhstan, Uzbekistan, Turkmenistan, and Mongolia. *Belomicrus nasutus* sp. n. from the group of *italicus* s. str. differs from the related species in the flat triangular prominence in the middle of its clypeal medial lobe. *B. shatalkini* sp. n. from the group of *affinis* is characterized by white spots on its abdominal terga and ♀ postnotum. The other 3 species belong to the group of *radoszkowskyi* and differ from congenera in the following features: *B. kozlovi* sp. n. differs in deep and almost square emargination between the metanotal squamae; *B. nartshukae* Sp. n. differs in the posteriorly jointed metanotal squamae with a small apical emargination and broad pygidial plate; *B. subfasciatus* sp. n. differs in the posteriorly jointed metanotal squamae with a small apical emargination, an angulate apical band on the clypeal medial lobe, and densely pubescent head, thorax, and propodeum.

Key words: Hymenoptera; Sphecidae; *Belomicrus*; systematics.

This paper is a result of continued investigations of the Palearctic fauna of wasps of the genus *Belomicrus* A. Costa, 1871 and includes the description of five new species placed in groups of *italicus* A. Costa, 1871 and *radoszkowskyi* (Dalla Torre, 1897), brief characteristics of which, as conditional designations used in descriptions of species, we offered earlier (Kazenas and Antropov, 1994)[1]. Material for this work was new findings of specimens of the genus in the collections of the Zoological Institute of the Russian Academy of Sciences, St. Petersburg (ZIS) and of the Zoological Institute of Moscow State University (ZMM).

Belomicrus nasutus Antropov, sp. n.
(Fig. 1, *1-6*)

Material. Holotype ♀: Uzbekistan, "Bukhara Prov., 25 km SW of Kagan, Dzheyran Nursery, 20.V.1991 (Matveyev)" (ZMM).

Description. ♀. Head in anterior view (Fig. 1, *1*) round, slightly transverse; *IOD* = 53:37; medial lobe of clypeus (Fig. 1, *2-3*) in anterior view with distinct lateral corners and slender medial process, in middle with medial crest forming sharp triangular carina (in lateral view); frons almost flat, with barely developed medial groove, slightly convex in upper part; genae in dorsal view behind eyes

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[1]Kazenas, V. L., and A. V. Antropov. 1994. New digging wasps of the genus *Belomicrus* (Hymenoptera, Sphecidae) of the Asiatic Palearctic. 1. Species of groups of *italicus* and *radoszkowskyi*. [In Russ.]. Zool. Zh. 73 (1): 68-77.

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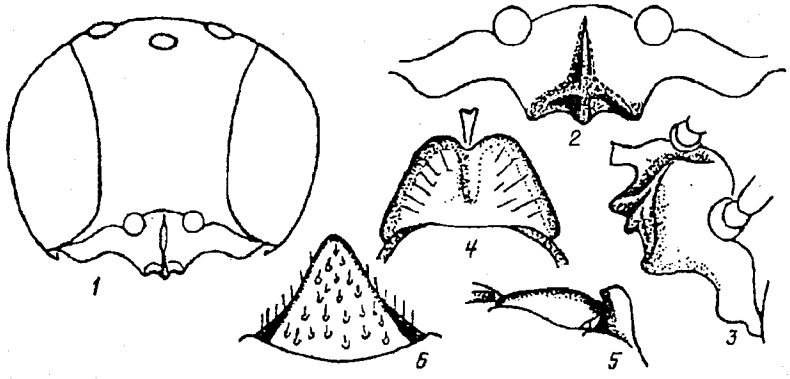

Fig. 1. *Belomicrus nasutus* sp. n. ♀: *1*) head in anterior view, *2*) clypeus in anterior view; *3*) same in lateral view, *4*) postscutellum and spine of propodeum in dorsal view, *5*) same in lateral view, *6*) pygidium.

evenly convex and without tubercles: *OOD:OD:POD* = 7:8:26; posterior margins of eyes almost at same level with middle of lateral ocelli; mandibles ventrally slightly convex, but without distinct lobes; carina of pronotum evenly convex and without crest; scutellum evenly weakly convex; postscutellum (Fig. 1, *4*) with medial crest, with fused transverse lateral ridges, transparent scales, and small (less than diameter of lateral ocellus) apical emargination; spine of propodeum (Fig. 1, *5*) in lateral view narrowly trapezoid, at apex slightly swollen and divided by medial groove dorsoposteriorly; pterostigma moderately sclerotized on perimeter, not broader than half width of marginal cell; pygidium (Fig., 1, *6*) moderately broad (65°).

Sculpturation of body in form of very uneven punctation mainly on shagreened background (shiny on frons and scutellum). Intervals between punctations on mesopleura 0.1-2 diameter of punctation, on frons and vertex 0.5-3, on mesonotum 0.5-6, on pygidium 1-3, and on scutellum 1-6 times diameter of same. Coarsest punctation on pygidium and scutellum, finest punctation on lower part of frons. Abdominal tergites with micropunctation at bases of setae. Metapleura with longitudinal ridges and sides with oblique and dense crests.

Pubescence very fine and sparse, silvery, developed mainly on clypeus and lower part of frons along inner ocular orbits.

Color mainly black. Scape, base of mandibles, ridge of pronotum (except medial groove), and humeral tubercles, all tibia outwardly and forefemora outwardly near apex whitish yellow. Flagellum of antennae ventrally, tibia inwardly, tarsi entirely, tegulae and squamae, and also apicomedial stripe of postscutellum yellow-ferrugineous. Anterior margin of clypeus, mandibles mainly, flagellum dorsally, semitransparent apical marginal stripes of abdominal tergites I-V, and pygidium entirely ferrugineous (to brownish ferrugineous).

Length of body 3.6 mm, length of forewing 2.5 mm.

♂. Not known.

Differential diagnosis. In shape of squamae of postscutellum this species should be placed in the *italicus* species group (s. str.), but it differs from other species of this complex, *B. italicus* and *B. glaber* Kazenas, 1993, in white 1st-2nd antennal segments and ridge of pronotum; flat, triangular

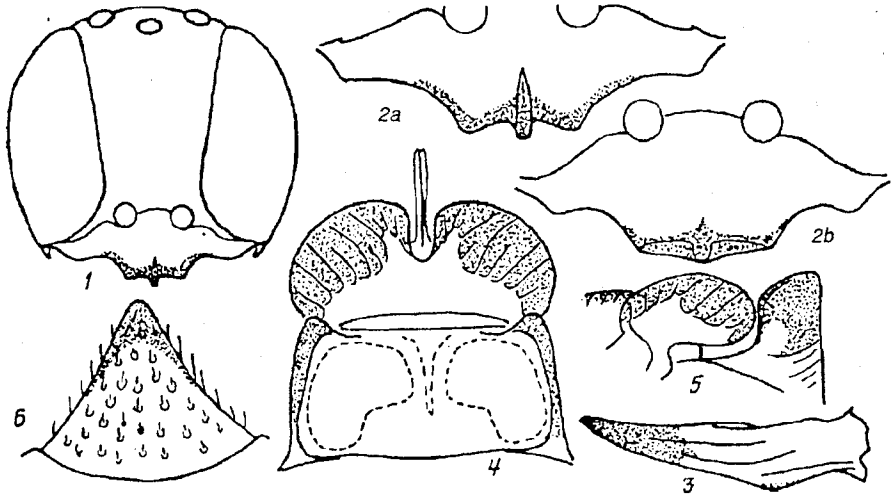

Fig. 2. *Belomicrus shatalkini* sp. n.: *1*) head in anterior view, *2*) clypeus, *3*) mandible in ventral view, *4*) scutellum and spine of propodeum in dorsal view, *5*) same in lateral view, *6*) pygidium (*1*, *2a*, *3-6* - ♀; *2b* - ♂).

process in middle of medial lobe of clypeus; and acute middle process of its apical marginal stripe; shagreened in surface of mesonotum and mesopleura; and lesser size of body. The new species differs from *B. italicus* also in sparser punctation of mesonotum and scutellum, pale medial ridge of postscutellum and apices of foretibia, and from *B. glaber* it differs mainly in dark postscutellum, absence of distinct pale bands of abdominal tergites, and broader pygidium. In shape of medial lobe of clypeus it is similar to *B. tridentifier* Kazenas, 1993, from which it differs in structure of postscutellum and presence of spine of propodeum, as well as in color of antennae, propodeum, and abdominal tergites.

Belomicrus shatalkini Antropov, sp. n.
(Fig. 1, *1-6*)

Material. Holotype ♀: "Turkmenia, Badkhyz, Yeroyulanduz, 27-28.V.1991 (A. Shatalkin)" (ZMM). Paratypes: Turkmenia: 3 ♀s, "Badkhyz Yeroyulanduz, 17.V.1990 (A. Leley)"; 10 ♂s, "Badkhyz, Kyzyl-Dzhar," 30.V-1.VI.1991, 7-9.VI.1991 (A. Shatalkin); 2 ♂s, "Ashkhabad, hills, 20.V.1932 (Ushinskiy)" (ZMM and ZIS).

Description. ♀. Head in anterior view (Fig. 2, *1*) round; *IOD* = 45:28; medial lobe of clypeus (Fig. 2, *2a*) distinctly convex, with broad transparent apical stripe, clear lateral angles, and slender medial process; frons very weakly convex, with barely developed medial groove in upper part; genae in dorsal view behind eyes evenly convex and without tubercles; *OOD:OD:POD* = 5:8:20; posterior margins of eyes at level of posterior margins of lateral ocelli; mandibles (Fig. 2, *3*) with weak ventral swelling in basal half; ridge of pronotum evenly convex and without ridge; scutellum with strong medial depression in distinct, transparent, outwardly bent stripe on sides and posteriorly; squamae of postscutellum (Fig. 2, *4*) round, transparent, transversely ridged, strongly depressed in middle, divided with oval apical depression reaching posterior margin of postscutellum; spine of propodeum (Fig. 2, *5*) strongly swollen with narrow groove in upper part, trapezoidal in lateral view; pterostigma pale, evenly

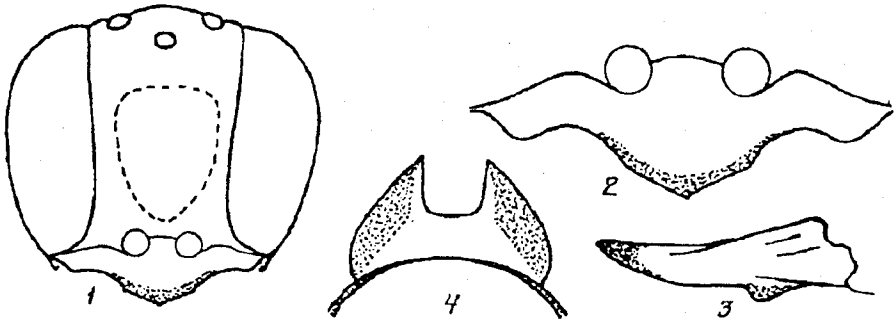

Fig. 3. *Belomicrus kozlovi* sp. n.: *1*) head in anterior view, *2*) clypeus, *3*) mandible in ventral view, *4*) postscutellum in dorsal view.

sclerotized, at least half as narrow as marginal cell; pygidium (Fig. 2, *6*) moderately wide (60°).

Sculpturation of body mainly in form of even (on mesonotum with smooth parts near adlateral grooves) dense punctation on background of shiny intervals between punctations. Intervals on frons, genae, mesopleura, and abdominal tergites I-II 0.5-1; on vertex and pygidium 1-1.5 and on mesonotum 1-2 as diameter of punctation. Scutellum with very sparse and scattered punctations (intervals 4-7 times diameter of punctation). Coarsest punctations on pygidium, and smallest punctations present on lower part of frons. Sides of propodeum shiny, without oblique ridges.

Pubescence fine, silvery, best developed in lower parts of frons and genae, on clypeus and remaining surface barely distinct.

Color mainly black. Narrow stripe behind transparent marginal stripe of clypeus, entire 1st-2nd segments, flagellum ventrally, spot at base of mandibles, ridge of pronotum (except medial groove) and humeral tubercles, bases of tegulae and wing squamae, pair of somewhat developed spots on scutellum, postscutellum and inner squamal parts, lateral preapical stripes of scutellum and postscutellum, forefemora and midfemora except upper side, femora on apices, all tibia and 1st-4th segments of tarsi and somewhat developed broad preapical medial spots of tergites I-II of abdomen whitish cream; apical stripe of pygidial area ferrugineous (to red-ferrugineous); apical segments of tarsi yellow-brown; flagellum in dorsal view and forefemora and midfemora in dorsal view brown.

Length of body 3.6 mm, length of forewing 2.5 mm.

♂. Generally similar to ♀ (including characters associated with sex); *IOD* = 43:27; medial lobe of clypeus (Fig. 2, *2b*) with acute lateral angles and small medial triangular process; *OOD:OD:POD* = 6:7:19; mandibles with more developed ventral tubercles; segments of antennae not modified, 3rd-12th segments shorter than wide, *A3:AW* = 8:4; scutellum usually entirely black, midtibia and hindtibia mesally with brown spots, 2nd-5th segments of midtarsi and hindtarsi yellow-brown, pale spots of abdominal tergites I-II considerably smaller.

Length of body 3.3 mm. length of forewing 2.2 mm.

Differential diagnosis. In shape of postscutellum the species belongs to the subgroup *affinis*

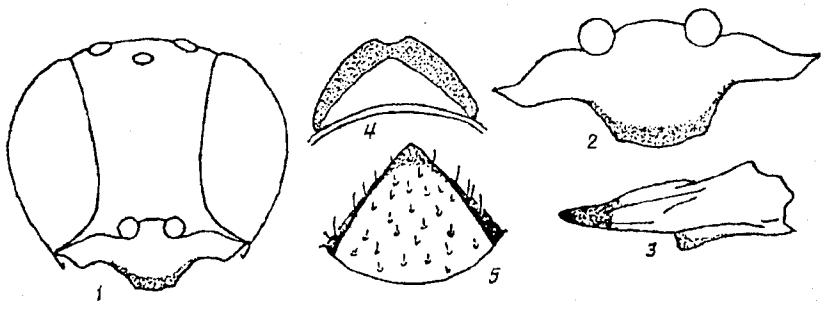

Fig. 4. *Belomicrus nartshukae* sp. n., ♀: *1*) head in anterior view, *2*) clypeus, *3*) mandible in ventral view, *4*) postscutellum in dorsal view, *5*) pygidium.

Gussakovskij, 1952 of the group *italicus*. It differs from *B. affinis* and *B. meridionalis* Kazenas et Antropov, 1994 in weaker ventral processes of mandibles and pale spots on scutellum (♀) and abdomen (♂ and ♀). It also differs from *B. affinis* in sparser punctation of head and mesonotum on shiny background, weak pubescence of mesonotum and especially of mesopleura and broader scales of postscutellum, and from *B. meridionalis* in more convex medial lobe of clypeus, absence of tubercles in upper part of genae posteriorly of eyes, pale colored 2nd antennal segment, ridge of pronotum, wing squamae and postscutellum, smaller and even punctation of mesonotum, finer punctation of mesopleura without longitudinal rugules and also in narrower pygidium.

Belomicrus kozlovi Antropov, sp. n.
(Fig. 3, *1-4*)

Material. Holotype ♂, "Mongolia, 25 km NNW of Khuvsgel, 2.VIII.1971 (M. Kozlov)" (ZMM).

Description. ♂. Head anteriorly (Fig. 3, *1*) round, somewhat transverse; *IOD* = 37:31; medial lobe of clypeus (Fig. 3, *2*) moderately convex, with narrow, transparent, angulate apical stripe; frons in lower part flat, in upper part convex on sides from distinct medial groove; genae in upper part behind eyes weakly developed and without tubercles; between inner orbits and anterior margin of lateral ocelli deep lanceolate pits developed: *OOD:OD:POD* = 4:7:16; posterior margins of eyes distinctly behind margins of lateral ocelli; mandibles (Fig. 3, *3*) in ventral view with clear, round lobe in basal half; segments of flagellum not modified; *A*13:*AW* = 7:4; ridge of mesonotum convex, without ridge; scutellum evenly convex; scales of postscutellum (Fig. 3, *4*) colorless and with acute medial ridge; pterostigma evenly moderately sclerotized, 0.40 marginal cell; tergite VII truncate and somewhat depressed posteriorly.

Sculpturation mainly even with shiny intervals, on vertex and mesopleura 0.5-1, on frons 1-3, on abdominal tergite 2-3, and on mesonotum 2-4 times diameter of punctations. Coarsest punctations on mesonotum and frons, finest punctations on vertex, mesopleura, and especially on abdominal tergite I. Scutellum with very sparse and unevenly scattered punctations. Punctation of major part of abdomen in form of micropunctations at base of setae. Sides of propodeum moderately shiny and without oblique ridges.

Pubescence decumbent and silver-colored. Densest and slightly flattened setae approximately as long as diameter of medial ocellus developed on sides of clypeus, on genae, and on lower part of frons

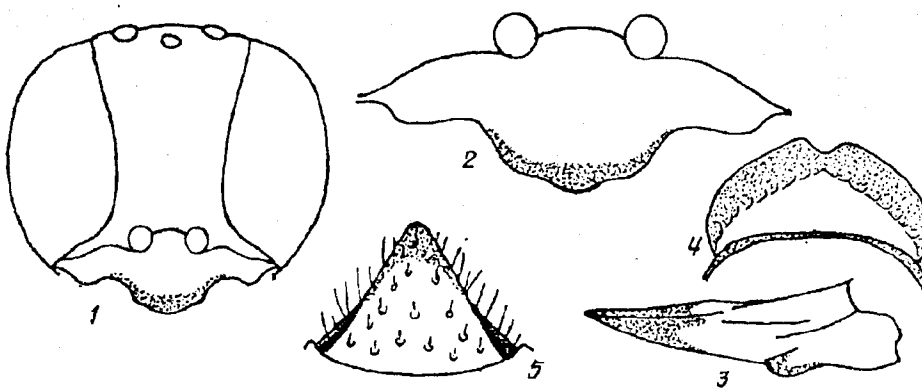

Fig. 5. *Belomicrus subfasciatus* sp. n., ♀: *1*) head in anterior view, *2*) clypeus, *3*) mandible in ventral view, *4*) postscutellum in dorsal view, *5*) pygidium.

(directed downwardly), sparser setae in upper part of frons and on vertex (directed toward medial ocellus), and also on mesonotum (directed centrally center) and mesopleura (directed ventroposteriorly). On remaining parts of body pubescence only barely developed or (on abdomen) relatively sparser and shorter.

Color of body contrasty. Medial lobe of clypeus, 1st-2nd segments of antennae, mandibles (except dark apices), ridge of pronotum and humeral tubercles mainly, forelegs entirely (including coxae), apices of coxae, trochanters, tibia, and midtarsi and hindtarsi entirely, midfemora mainly, hindfemora on apex, squamae of forewings, apical stripes on sides of scutellum and postscutellum, postscutellum in middle and inner margins of its squamae, posterior margins of scutellum and preapical bands of tergites I-IV, and also interrupted diffused bands of abdominal sternites II-V whitish cream. 3rd-12th antennal segments in ventral view, anterior margins of pale bands of ridge of pronotum and abdominal tergites I-VI, scutellum mainly and midfemora anteriorly yellow. Veins of forewings and abdominal segment VII entirely yellow-ferrugineous. Remaining parts of body from dark-brown (base of abdominal tergite I) to black.

Length of body 3.3 mm, length of forewing 2.2 mm.

♀. Not known.

Differential diagnosis. In structure of squamae of postscutellum this species should be placed in *radoszkowskyi* species group and differs from *B. shestakovi* Kazenas et Antropov, 1994 and *B. nartshukae* sp. n. in deep emargination between squamae reaching posterior margin of postscutellum. The species is most similar to *B. radoszkowskyi*, but it differs from it in almost square shape and large size of emargination between squamae of postscutellum, narrower apical stripe of medial lobe of clypeus without acute, lateral angles, dark apices of antennae, pale forelegs (including coxae) and midlegs (from apex to coxae) and spots on abdominal sternites.

Belomicrus nartshukae Antropov, sp. n.
(Fig. 4, *1-5*)

Material. Holotype ♀, Kazakhstan, "E Karatau, 15.V.1978 (Narchuk)" (ZMM).

Description. ♀. Head in anterior view (Fig. 4, *1*) somewhat transverse; *IOD* = 41:32; medial lobe of clypeus (Fig. 4, *2*) convex, far extending, with obtuse lateral corners and strongly obtusely angled medially; frons in ventral view slightly depressed, in upper half convex on sides of medial groove; genae in dorsal view, behind eyes weakly convex and without tubercles; *OOD:OD:POD* = 6:7:16; posterior margins of eyes almost at level of posterior margins of lateral ocelli; mandibles (Fig. 4, *3*) in ventral view with distinct lobe in basal half; ridge of pronotum evenly convex and without crest; scutellum semiround, weakly evenly convex, with narrow stripe posteriorly and on sides; squamae of postscutellum (Fig. 4, *4*) transparent, narrow, slightly bent upwardly; posteriorly completely fused and with broad, but shallow, rounded apical emargination not reaching posterior margin of postscutellum; propodeum without dorsal spine; pterostigma weakly and mainly along perimeter sclerotized, almost 1/3 as wide as marginal cell; pygidium (Fig. 4, *5*) broad (70°).

Sculpturation of body in form of even punctation with shiny intervals, which on frons, vertex, and mesopleura 0.5-1, on mesonotum 3-5, and on scutellum and pygidium 3-6 times diameter of punctation. Coarsest punctations on pygidium, finest punctations on lower part of frons and in upper part of mesopleura. Abdominal tergites with fine, dense, and even smaller punctation. Sides of propodeum densely and finely oblique-rugulose.

Pubescence decumbent, silver-colored, shorter than diameter of medial ocellus, densest on sides of clypeus and in lower part of mesopleura. On frons, vertex, and mesonotum rather sparse, not masking sculpturation of cuticle.

Color contrasty, dark parts of body chiefly black. Preapical spot of medial lobe of clypeus behind transparent stripe; entire 1st and 2nd-12th antennal segments in ventral view; mandibles in basal half; ridge of pronotum and humeral tubercles; bases of tegulae, wing squamae, and veins of wings; lateral preapical stripes of scutellum and postscutellum; postscutellum in middle; all tarsi and foretibia entirely; midtibia and hindtibia mainly; forefemora and midfemora broadly in ventral view; broad uninterrupted apical bands of abdominal tergites I-V, including downward curved laterotergites; and pygidium entirely whitish yellow. Scutellum yellow. 2nd-12th antennal segments dorsally; forefemora dorsally; anterior border of pale apical bands of tergites; medial spots of abdominal sternites II-III and IV entirely bright yellow (to yellow-brown).

Length of body 3.4 mm, length of forewing 2.2 mm.

♂. Not known.

Differential diagnosis. In structure of squamae of postscutellum this species should be placed in the *radoszkowskyi* group of species. It differs from *B. radoszkowskyi* and *B. kozlovi* sp. n. in the posteriorly fused squamae of postscutellum with small apical emargination not reaching posterior margin of postscutellum. It differs from *B. shestakovi* and *B. subfasciatus* sp. n., which are similar in this character, in broader pygidium. As well, it differs from the first species also in absence of pale spots on mesonotum, mesopleura, and propodeum; denser punctation of mesonotum; shorter squamae of postscutellum; dark colored coxae, trochanters (mainly), and femora; and also in color of abdomen. It differs from the second species mainly in dark clypeus (except spot on medial lobe), more strongly, but not angulately extended apical stripe; weaker and short pubescence of body (especially of genae, mesopleura, and propodeum); and in mainly black-and-white color of abdominal tergites (ferrugineous stripes very weak).

Belomicrus subfasciatus Antropov, sp. n.

Material. Holotype ♀, Turkmenia, "Farab, 12-28.V.1929 (A. Shestakov)" (determined by V.

Gussakovskiy as *B. fasciatus* Rad.) (ZIS). Paratype ♀, same locality, 21.V.1929 (A. Shestakov) (ZMM).

Description. ♀. Head in anterior view (Fig. 5, *1*) round and weakly transverse; *IOD* = 45:28; medial lobe of clypeus (Fig. 5, *2*) medium convex, with transparent stripe, broad, triangularly extended anteriorly, and limited by distinct corners on sides; frons in lower part somewhat concave and in upper part convex on sides of medial groove; genae in upper part beyond eyes evenly convex and without tubercles; *OOD:OD:POD* = 6:8:18; posterior margins of eye slightly behind posteriors of lateral ocelli; mandibles (Fig. 5, *3*) in ventral view with developed lobe in basal half; ridge of pronotum evenly convex and without crest; scutellum evenly convex, with outwardly bent transparent stripe on sides and posteriorly; squamae of postscutellum (Fig. 5, *4*) completely transparent, weakly transversely ridged, completely fused, posteriorly with small (less than diameter of anterior ocellus) emargination not reaching posterior margin of postscutellum; propodeum without spine, with slender medial ridge; pterostigma weakly sclerotized, not less than half as narrow as marginal cell; pygidium (Fig. 5, *5*) moderately wide (65°).

Head, thorax, and sternum of abdomen mainly black. Clypeus entirely, 1st-2nd antennal segments, ridge of pronotum (except medial groove), and humeral tubercles; bases of tegulae and wing squamae; apices of coxae, foretrochanters and midtrochanters ventrally, and hindtrochanters at base and apically; forefemora and midfemora (except upper side); hindfemora on apex; all tibia and tarsi; lateral preapical stripes of scutellum and postscutellum; entire postscutellum; broad continuous apical bands on abdominal tergites I-V and their downward curved laterosternites; and also pygidial area entirely whitish cream. Flagellum (on upper side somewhat darker, wing squamae and veins, most of scutellum, foretrochanters, and midtrochanters on upper side; hindtrochanters almost entirely; and forefemora and midfemora dorsally yellow-ferrugineous. Apical stripe of clypeus, scutellum at base, preapical 1/3 of femora and bases of abdominal tergites I-V ferrugineous.

Length of body 3.7 mm, length of forewing 2.4 mm.

♂. Not known.

Differential diagnosis. In structure of squamae of postscutellum this species should be placed in the *radoszkowskyi* group of species. It differs from *B. radoszkowskyi* and *B. kozlovi* sp. n. in posteriorly fused squamae of postscutellum with shallow apical emargination not reaching posterior margin of postscutellum. It differs from *B. shestakovi* and *B. nartshukae* sp. n., which are similar in this character, in angulate-convex medial lobe of entirely pale clypeus and denser, decumbent pubescence of front, genae, mesonotum, mesopleura, and upper part of propodeum. It differs from the first species also in absence of pale spots on mesonotum, mesopleura, and propodeum; denser punctation of head and mesonotum; broad, pale apical bands of abdominal tergites; and broader pygidium. It differs also from second species in exclusively ferrugineous-white color of abdominal tergites (black stripes are absent) and in narrower pygidium.