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A Revision of Digger Wasps of the Genus *Oxybelomorpha* (Hymenoptera, Crabronidae, Oxybelini): 4. The *O. rhodesiana* and *O. rubicunda* Species-groups[1]

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Abstract—Two South African species-groups of digger wasps of the genus *Oxybelomorpha* Brauns, 1897 are revised: (1) *O. rhodesiana* group consisting of three species, including the new *O. wojciechi*; (2) previously unknown monotypic *O. rubicunda* group. The lectotypes of *Belomicrus rhodesianus* Arnold, 1927 and *B. turneri* Arnold, 1927 are designated.

The fourth part of a revision of digger wasps of the genus *Oxybelomorpha* Brauns, 1897 deals with South-African species with the falcate, narrowly triangular metanotal scales tapered at the apices and frequently translucent on the outer sides.

It should be clarified that a falcate shape of the metanotal scales is one of the most typical variants in the tribe Oxybelini, occurring in genera with modified (*Belomicrinus*, *Belomicrus*, *Wojus*) and unmodified metasomal tergites (*Oxybelus*). Therefore, *O. rhodesiana* and *O. rubicunda* species-groups are incorporated here only formally.

Undoubtedly, the conception that the metanotal scales play a certain role in the life of oxybelines is well founded. These functions are most likely associated with a specificity of the nest-making in dry soil. If this assumption is correct, then a similar shape of the metanotal scales in the oxybelines assigned to different groups or even genera may be a result of the convergences of functionally similar organs. In particular, though the structure of the metanotal scales in species of the *O. rhodesiana* group is outwardly similar to that in species of the Palaearctic *O. patei* group, such "nonfunctional" characters as the convex pronotal carina with weakly developed transverse ridges (or without them), medially depressed mesoscutum and scutellum and, especially, more or less widened dorsal carina of the metapleura and, to a lesser extent, ventrally depressed coxae of the male relate these species to species of another South-African group, *O. braunsii* (revised in the preceding part of the paper). Therefore, I think that the significance of the shape of the metanotal scales as a taxonomical character, when it is considered separately from others ("nonfunctional") characteristics, cannot be overestimated, at least, in order to draw phylogenetical conclusions.

Oxybelomorpha rhodesiana Species-group

Description. Pronotal carina convex, with lateral angles or without them, bearing transverse ridges, as maximum, only on humeral calli; mesoscutum and scutellum depressed medially; scutellum with developed posterolateral lobes; metanotal scales falcate, distance between them more than twice exceeding their length; prexocal tooth weak, rounded; metapleura with fine lamellar dorsal carina; fore coxa of male with ventral depression; fore femur of female without outer carina; apex of hind femur only weakly modified, or not modified; 1st segment of hind tarsus usually without preapical pit on inner side; upper propodeal spine narrowed at apex, without apical emargination; metasomal tergite I with small dorsal pit or without it.

I include in this group three South African species: *O. rhodesiana* (Arnold, 1927) from the Republic of South Africa, Zimbabwe, and Lesotho; *O. turneri* (Arnold, 1927) from Cape Province of South Africa, and *O. wojciechi* sp. n. from Namibia (Fig. 1) (described below).

Oxybelomorpha rhodesiana (Arnold, 1927)

Belomicrus (*Oxybelomorpha*) *rhodesianus* Arnold, 1927 : 65. ♀, ♂, Zimbabwe [SAM]. Lectotype designated here.—Arnold, 1930 : 14.

Belomicrus rhodesianus: de Beaumont, 1950 : 423;—Bohart and Menke, 1976 : 364;—Dollfuss, 1989 : 7.

[1] For abbreviations of the depositories of the types and some morphological terms, see Antropov (2005).

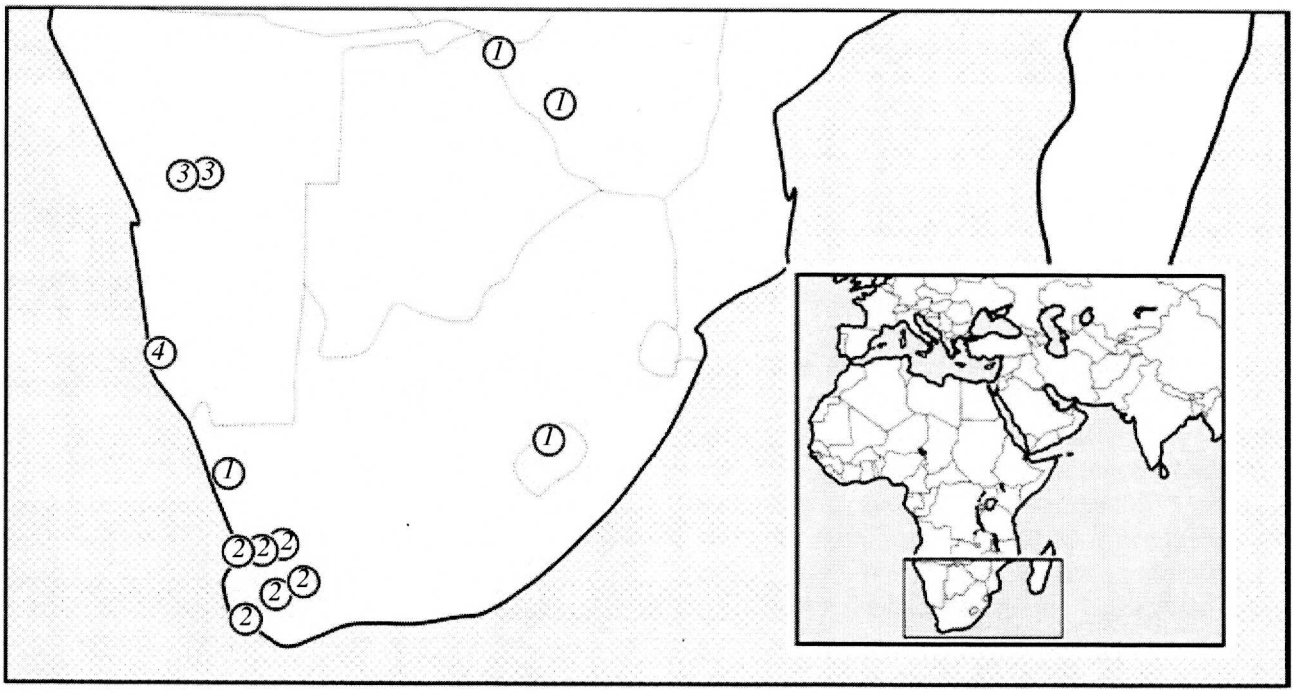

Fig. 1. Distribution of species of the *Oxybelomorpha rhodesiana* and *O. rubicunda* groups: (*1*) *O. rhodesiana*, (*2*) *O. turneri*, (*3*) *O. wojciechi*, (*4*) *O. rubicunda*.

Material. Lectotype, ♀, specimen (*a*) with following labels: "Sawmills, S. Rhodesia, 1.IV.1923 (Rhodesia Museum)," "TYPE ♂, ♀, *Belomicrus rhodesianus* G. Arnold," "SOUTH AFRICAN MUSEUM ex NATIONAL MUSEUM BULAWAYO, 1981," "SAM-HYM-AO13327 a/b." [SAM]. Paralectotypes, 16 ♂, 1 ♂, specimen (*b*) on same pin as lectotype; 2 ♂ (on one pin), "Sawmills, S. Rhodesia, 1.IV.1923 (G. Arnold)," "COTYPE ♂," "SAM-HYM-AO13327 c/d;" 2 ♂ (on one pin), "Sawmills, S. Rhodesia, 1.IV.1923 (G. Arnold)," "PARATYPE ♂," "SAM-HYM AO 13327 e/f;" 2 ♂ (on one pin), "Sawmills, S. Rhodesia, 1.IV.1923 (G. Arnold)," "PARATYPE ♂, *Belomicrus rhodesianus* G. Arnold," "SAM-HYM-AO13327 g/h;" 2 ♂ (on one pin), "Sawmills, S. Rhodesia, 1.IV.1923 (G. Arnold, "PARATYPE ♂, *Belomicrus rhodesianus* G. Arnold," "SAM-HYM-A013327 i/j;" 2 ♂ (on one pin), "Sawmills, S. Rhodesia, 1.4.1923 (G. Arnold)," "PARATYPE ♂, *Belomicrus rhodesianus* G. Arnold," "SAM-HYM-AO13327 k/1;" 2 ♂ (on one pin), "Sawmills, S. Rhodesia, 1.IV.1923 (G. Arnold)," "PARATYPE ♂, *Belomicrus rhodesianus* G. Arnold," "SAM-HYM-AO13314" [SAM]; 2 ♂ (on one pin), "Sawmills, S. Rhod., 1.IV.1923 (Rhodesian Museum—Brit. Mus., 1947–77)" [BMNH]; 1 ♂, "Sawmills, S. Rhodesia, 1.IV.1923 (G. Arnold)," "PARATYPE ♂" [NHMW] [this specimen was designated by Dollfuss (1989) as paratype]. Other material: 1 ♂, "MAMATHES, Basutoland, 14.I.1943 (C. Jacot Guillarmod);" 1 ♀, "MAMATHES, Basutoland, 14.I.1945 (C. Jacot Guillarmod);" 1 ♂, 29.XII.1946 (C. Jacot Guillarmod);" 1 ♀, "MAMATHES, Basutoland, 16.II.1947 (C. Jacot-Guillarmod);" 1 ♂, "MAMATHES, Basutoland, 25.XII.1947 (C. Jacot Guillarmod);" 1 ♂, "MAMATHES, Basutoland, 22.II.1948 (C. Jacot Guillarmod);" 1 ♂, "MAMATHES, Basutoland, 15.XII.1957 (C. Jacot Guillarmod)" [AMC]; 1 ♂, "Sawmills, S. Rhod., 1st April, 1923 (Roy Stevenson);" 1 ♂, "Sawmills, S. Rhod., 1st April, 1923 (Roy Stevenson—Brit. Mus., 1925–294);" 1 ♀, "W. Matetsi, S. Rhodesia, Apr., 1934 (R.H.R. Stevenson—Brit. Mus., 1935–80);" 1 ♀, 1 ♂, "W. Matetsi, S. Rhodesia, Apr., 1934 (R.H.R. Stevenson, 1934–128);" 1 ♂, "MAMATHES, Basutoland, 25.XII.1947 (C. Jacot Guillarmod) (O.W. Richards Coll.—Brit. Mus., 1967–510)" [BMNH]; 1 ♂, "Mamathe's Basutoland, 27 Feb., 1956 (L. Bevis)" [DNSM]; 1 ♂, "Sawmills, S. Rhodesia, 1.IV.1923 (G. Arnold)," [SAM-HYM-AO13314] [SAM]; 1 ♀, "W. Matetsi, S. Rhodesia, Apr., 1934 (R.H.R. Stevenson)" [USNM].

Description. Female. Head in front view rounded, slightly wider than long (Fig. 2, *1a*); *IOD* = 38 : 29; lower part of frons weakly depressed, with 2 smooth vertical stripes behind appressed scapes; upper part of

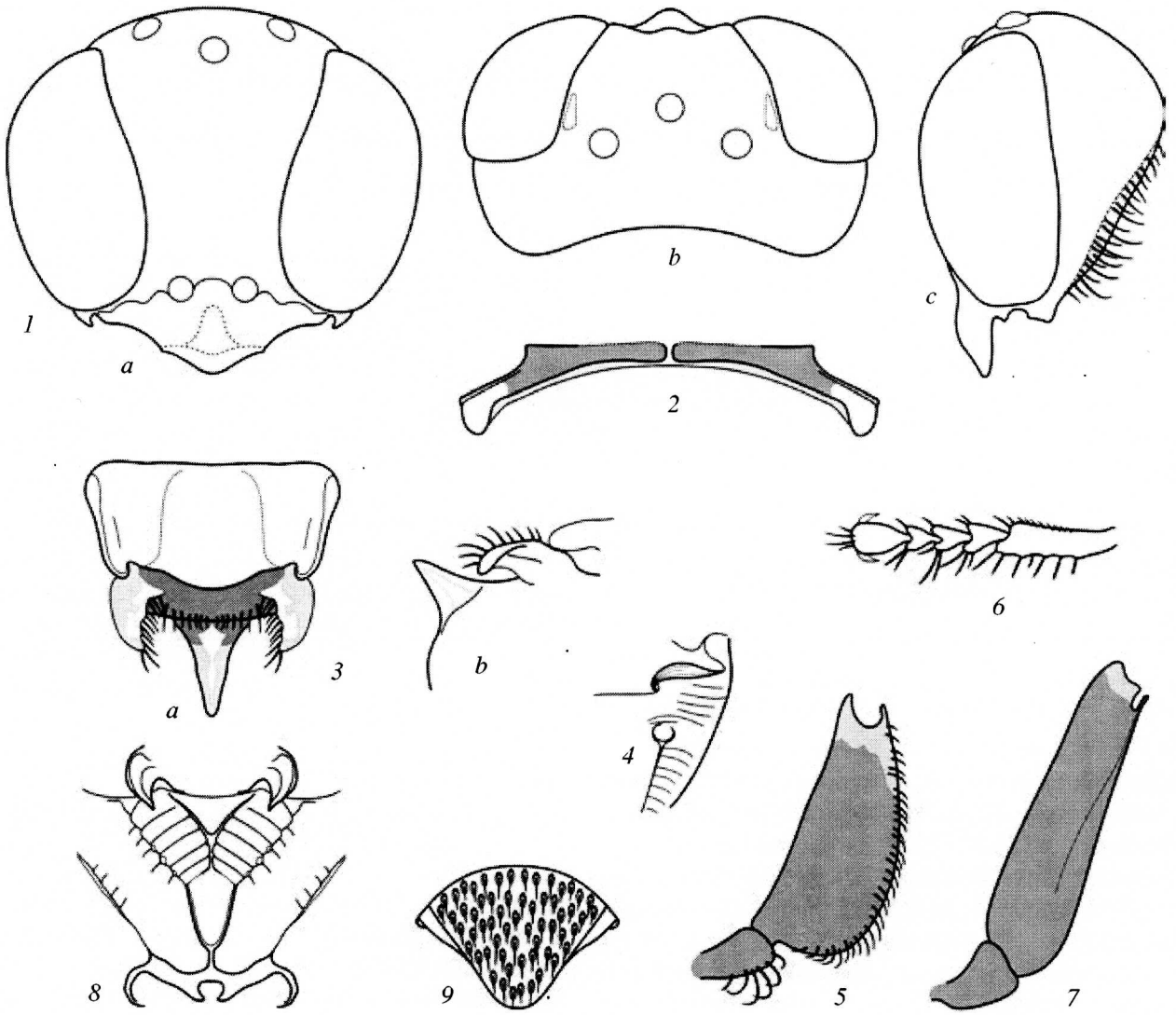

Fig. 2. *Oxybelomorpha rhodesiana*, female: (*1*) head [(*a*) front, (*b*) dorsal, (*c*) lateral view]; (*2*) pronotal carina, dorsal view; (*3*) scutellum, metanotum, and propodeal spine [(*a*) dorsal, (*b*) lateral view]; (*4*) upper part of metapleuron; (*5*) fore trochanter and femur, view from inner side; (*6*) fore tarsus, view from outer side; (*7*) hind femur, view from outer side; (*8*) propodeum, posterior view; (*9*) metasomal tergite VI, dorsal view.

frons weakly convex, with median groove reaching median ocellus; vertex distinctly convex; parietal areas oval, flat, without distinct borders, with smooth convex oval carina in anterior part (Fig. 2, *lb*); *OOD* : *OD* : *POD* = 7 : 6 : 17; temple uniformly convex (Fig. 2, *1c*); median lobe of clypeus convex at base, flattened in anterior part, without bounding carinae at sides, with obtusely rounded lateral angles, distance between angles about 1.2 times that from angle to antennal socket; flagellar segments mainly as long as wide, 6–9th wider than long. Pronotal carina with median depression and tapered lateral angles (Fig. 2, *2*); humeral calli with fine vertical carina reaching lateral angles of pronotal carina; mesoscutum convex in anterior part, with wide median depression reaching its posterior margin, also depressed at posterior corners; admedian lines fine, approximate; parapsidial grooves and adlateral lines invisible because of background of dense punctation; scutellum widely depressed medially, weakly oval-projecting in posterior part, with strong posterolateral lobes (Fig. 2, *3d*); metanotum flat in middle, with small median tubercle; metanotal scales falcate, with apices curved downwards; distances between apices of scales twice length of scales, exceeding distances between their bases; mesopleura uniformly convex; prexocal tooth weak, rounded; metapleura with short lamellar dorsal carinae; 1st segment of fore tarsus weakly asymmetrical at apex

(Fig. 2, *6*); fore femur with angular ventral margin, but without ridge or carina (Fig. 2, *5*); apex of hind femur unmodified (Fig. 2, *7a*); 1st segment of hind tarsus without preapical pit. Propodeum with fine lateral carinae extending from its apex; dorsal area bounded by fine costae (Fig. 2, *8*); dorsal spine medially depressed in anterior part, widened at base, narrowed toward apex, sharp or narrowly truncate, without apical emargination (Fig. 2, *3a*, *3b*). Metasomal tergite I without pronounced dorsal pit; tergites II–III and, to a lesser degree, tergites IV–V with transverse basal depressions; posterior areas weakly separated from discs of tergites.

Sculpture of body consisting of uniform, coarse, dense punctation with mainly shining intervals between punctures; intervals on head and mesosoma not exceeding diameter of punctures. Largest punctures situated on mesoscutum and scutellum; smaller ones, on mesopleura, vertex, in upper part of frons, and on temple; smallest ones, in lower part of frons. Punctures in lower part of temple, at posterior margin of mesoscutum, and, especially, on scutellum merging in strigae. Metapleura finely rugose. Propodeum matte, mainly dense alveolate (most finely on lateral parts), sparsely transversely ridged under dorsal spine, with radial ridges along lateral carinae on upper side. Punctation of discs of metasomal tergites also uniform; punctures becoming smaller in direction from tergite I to tergite IV, and intervals between punctures becoming longer, from $d = 1–2\varnothing$ to $d = 3–4\varnothing$ (on tergite V, punctures becoming again slightly larger and denser); posterior areas not distinctly separated from discs by rows of smaller and dense punctures ($d \leq \varnothing$); pygidial area with largest, strongly elongate punctures nearly merging into coarse longitudinal striae (Fig. 2, *9*). Metasomal sternites with minute punctures at bases of hairs, only sides of sternite VI with punctures as large as those in lower part of frons.

Pubescence of body silvery, mainly sparse, dense (concealing sculpture of cuticle) only at sides of lower part of frons and on lateral lobes of clypeus. Hairs mainly recumbent; raised on vertex, mesoscutum, scutellum, and metanotum, their length there not exceeding diameter of lateral ocellus. Setae of psammophore in upper part of temple denser, their length not exceeding width of flagellum; sparser in lower part of temple and on mandible, their length there 1.3–1.5 times width of mandibular base (Fig. 2, *1c*); length of setae on fore trochanter not exceeding width of trochanter; length of uniform setae along outer margin of fore femur not exceeding width of 1st tarsal segment (Fig. 2, *5*); digging comb on 1st segment of fore tarsus consisting of 5 or 6 fine raised setae, length of which less than width of segment (Fig. 2, *6*).

Body mainly black; edging of median lobe of clypeus translucent, rufous; scape mainly yellowish white, with fuscous spot on inner side at base; flagellar segments rufous on lower side; mandible yellow at base, rufous in middle, reddish fuscous at apex. Humeral calli yellow; metanotal scales yellowish white along inner margins, translucent and pale on outer sides; all tarsi yellowish white (becoming slightly darker toward apices); all tibiae mainly yellowish white, with oval fuscous spots on inner sides; fore and middle femora mainly, hind one, entirely dark brown; fore femur with yellow apical spot occupying 1/3 of lower side of femur; middle femur yellow only at apex; tegula translucent, rufous; basal wing sclerites with large fuscous spot in middle, yellow on outer sides; veins of wings fuscous. Metasoma mainly black, only translucent posterior areas of segments rufescent.

Body length 4.0–4.2 mm.

Male mainly similar to female in sculpture, pubescence, and coloration of body, differing only in characters associated with sex. $IOD = 34 : 24$ (Fig. 3, *1a*); parietal areas absent (Fig. 3, *1b*); $OOD : OD : POD = 6 : 6 : 15$; flagellar segments slightly wider than long or as long as wide (Fig. 3, *2*), pygidial area trapezoidal, straightly truncate at apex. Psammophore on temple (Fig. 3, *1c*), fore trochanter, and fore femur (Fig. 3, *4*) absent; length of setae on mandible not exceeding width of flagellum; digging comb on fore tarsus absent (Fig. 2, *5*).

Body length 3.2–3.8 mm.

Differential diagnosis. *O. rhodesiana* differs from other members of the group in the rufous apical edging of the clypeus and lower side of the flagellum, yellow outer sides of the basal wing sclerites and outer sides of the tibiae yellowish white along the entire length. In addition, *O. rhodesiana* differs from *O. turneri* in the developed lateral angles of the pronotal carina, mainly yellowish white scape and apex of the fore femur on the lower side, yellow humeral calli, yellowish white propodeal spine, larger and denser (especially, on the mesopleura) punctation of the mesosoma, and wider and very densely punctate (without intervals between punctures) pygidium of the female; *O. rhodesiana* differs from *O. wojciechi* sp. n. in the entirely black metasoma in both sexes, not modified apex of the hind

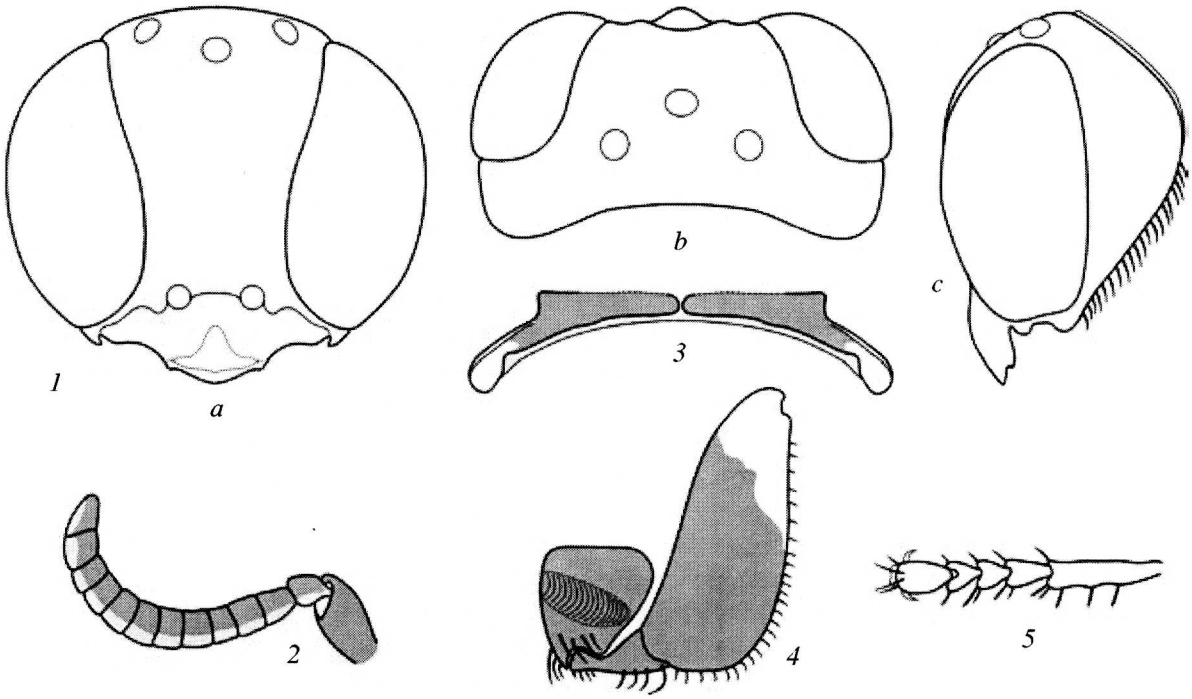

Fig. 3. *Oxybelomorpha rhodesiana*, male: (*1*) head [(*a*) front, (*b*) dorsal, (*c*) lateral view]; (*2*) antenna, front view; (*3*) pronotal carina, dorsal view; (*4*) fore coxa, trochanter, and femur ventral view from inner side; (*5*) fore tarsus, view from outer side.

femur, and absence of preapical pit on 1st segment of the hind tarsus and dorsal pit on the metasomal tergite I.

Notes. *Belomicrus* (*Oxybelomorpha*) *rhodesianus* was described from a series collected by Arnold; this series consists of 1 female and 16 males deposited, according to the description, at the Transvaal Museum and Rhodesian Museum (SAM, at present). Only specimens from the collection of SAM were mentioned as the types, without indication of their exact number. Nearly all specimens of the series in the SAM collection are mounted by pairs (pinned on cardboard rectangles). Among these, one pair (no. AO 13327 a/b) includes both sexes and is provided with a red label with the inscription "TYPE." The other specimens are provided with green type labels, and the pair of males no. AO 13327 c/d is designated as the cotype, and the others, as paratypes. One pair of males from the type series was probably transferred later to the collection of BMNH, and one male, in the collection of NHMW. At same time, the collection of TM does not contain Arnold's specimens indicated in the description.

Oxybelomorpha turneri (Arnold, 1927)

Belomicrus (*Oxybelomorpha*) Turneri Arnold, 1927 : 66. ♀, ♂: South Africa, Cape Province [BMNH]. The lectotype is designated here.—Arnold, 1930 : 14.

Belomicrus turneri: Bohart and Menke, 1976 : 364.

Material. Lectotype: ♀, "Ceres, Cape Province. Nov., 1920," "S. Africa. R.E. Turner. Brit. Mus., 1920–497.," "TYPE. ♀, *Belomicrus* Turneri G. Arnold," "British Museum," "B.M. TYPE HYM. 21.1.144 a" [BMNH]. Paralectotype: ♂, "Ceres, Cape Province. Nov., 1920.," "S. Africa. R.E. Turner. Brit. Mus., 1920–497.," "TYPE. ♂, *Belomicrus* Turneri G. Arnold," "British Museum.," "B.M. TYPE HYM. 21.1.144 b" [BMNH]. Other material: 1 ♀, "South Africa, Rapenburg, Cape Flats, 1–14.X.1920 (R.E. Turner—Brit. Mus., 1920–424);" 1 ♀, "South Africa, Ceres, Cape Province, 1500 ft., 27.X–1.XI.1920 (R.E. Turner—Brit. Mus., 1920–447);" 7 ♀, "South Africa, Ceres, Cape Province, Nov., 1920 (R.E. Turner—Brit. Mus., 1920–497);" 1 ♀, "South Africa, Ceres, Cape Province, Nov., 1920 (R.E. Turner—Brit. Mus., 1920–497. 252);" 7 ♀ Mus., 1924–503);" 1 ♂, "South Africa, Ceres, Cape Province, 1–12.XI.1924 (R.E. Turner—Brit. Mus., 1924–503. 251)" [BMNH]; 1 ♂, "CAPE PROVINCE. Clanwilliam District, 5 km W Clanwilliam, road to Graafwater, 5–6.X.1988 (D.W. Gess);" 2 ♀, "89/90/100. CAPE PROVINCE. Zeekoevlei, c. 20 km W of Clanwilliam on road to

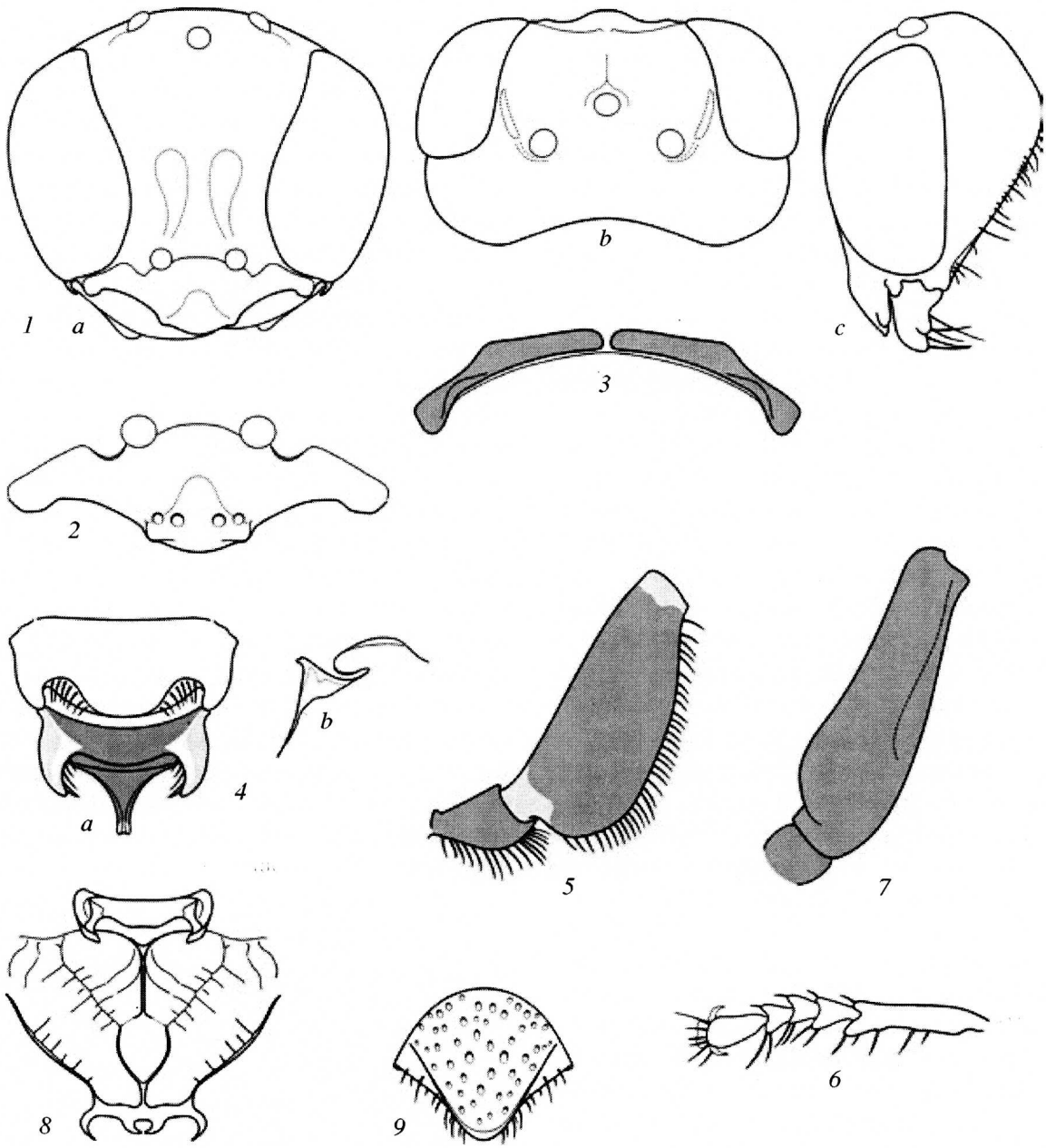

Fig. 4. *Oxybelomorpha turneri*, female: (*1*) head [(*a*) front, (*b*) dorsal, (*c*) lateral view]; (*2*) clypeus, front view; (*3*) pronotal carina, dorsal view; (*4*) scutellum, metanotum, and propodeal spine [(*a*) dorsal, (*b*) lateral view]; (*5*) fore trochanter and femur, view from inner side; (*6*) fore tarsus, view from outer side; (*7*) hind femur, view from outer side; (*8*) propodeum, posterior view; (*9*) metasomal tergite VI, dorsal view.

Graafwater, 17.X.1989 (F.W. and S.K. Gess);" 1 ♀, "90/91/72. CAPE PROVINCE. 11 km W of Clanwilliam on road to Graafwater, 2–8.X.1990 (F.W. and S.K. Gess). On white fls of *Coelanthum grandiflorum* E. Mey ex Fengl. (Aizoaceae);" 3 ♀, 2 ♂, "CAPE PROVINCE. 11 km W of Clanwilliam on road to Graafwater, 2–8.X.1990 (F.W. and S.K. Gess)" [AMC]; 1 ♀, "SOUTH AFRICA. Cape Prov. Lake Brandvleidam, at dam, 7 mi S. Worcester, 23 Oct, 1970 (H.V. Daly)" [CAS].

Description. Female. Head in front view rounded, slightly wider than long (Fig. 4, *1d*); *IOD* = 42 : 28; lower part of frons flat, with two wide shining vertical areas behind appressed scapes; upper part of frons weakly convex at sides of fine median groove reaching

median ocellus; vertex uniformly convex; *OOD* : *OD* : *POD* = 8 : 6 : 18; parietal areas narrowly oval, depressed, smooth, weakly bounded (Fig. 4, *1b*); temple uniformly convex (Fig. 4, *1c*); median lobe of clypeus convex at base, with flattened vertical median area bounded by smoothened carinae, oval-projecting in anterior part, bounded by obtused lateral angles separated by distance subequal to that from angle to antennal socket (Fig. 4, *2*); flagellar segments, except for 1st, 2nd, and ultimate ones, wider than long. Pronotal carina roundly convex, with fine posterior edging, without pronounced lateral angles and transverse ridges (Fig. 4, *3*); humeral calli convex, without vertical carinae; mesoscutum uniformly convex, with median depression reaching 2/3 of its length; admedian lines approximate, indistinct against background of fine dense punctation; parapsidial grooves and adlateral lines in the form of short furrows frequently concealed by punctation; scutellum wider than long, weakly depressed medially, widely oval-projecting backwards, with posterolateral lobe tapered at apex on inner side (Fig. 4, *4a*); metanotum flat in middle, with narrow falcate scales slightly curved downwards; distance between apices of scales nearly twice length of scales; mesopleura uniformly convex; prexocal tooth weak, rounded; metapleura with narrow, but distinct lamellar dorsal carina; fore femur longitudinal depressed on anterior side, with smoothened longitudinal ridge on outer side (Fig. 4, *5*); apex of hind femur unmodified (Fig. 4, *7*); 1st segment of hind tarsus without preapical pit. Propodeum with entire lateral carinae extending from its apex and with dorsal area bounded by fine, but distinct costae (Fig. 4, *5*); dorsal spine medially depressed in anterior part, narrowed toward apex, without distinct apical emargination (Fig. 4, *1a*, *1b*). Metasomal tergite I without dorsal pit, only with weak median depression; tergites II and III with weak basal depressions; posterior areas of tergites slightly separated from moderately convex basal parts.

Sculpture uniformly punctate, mainly with shining intervals between punctures. Lower part of frons with very fine punctures ($d \leq \varnothing$); upper part of frons with distinctly larger punctures, $d = \varnothing$ in middle, with smooth areas along inner orbits of eyes; vertex with slightly smaller and sparser punctures (d = 2–3$\varnothing$); temple with similar punctures ($d = \varnothing$), elongate and forming vertical grooves in lower part. Pronotal carina at sides and humeral calli with punctures smaller than those on vertex, (d = 1–2$\varnothing$); mesoscutum with punctures similar to those on frons (d = 1–2 $\varnothing$) and slightly smaller at margins, with short longitudinal wrinkles in posterior part; punctures in middle of scutellum similar to those on mesoscutum, finer and sparse (d = 2–4$\varnothing$) at its margins; metanotum with smoothened minute punctures at bases of hairs in middle and with smooth scales; punctures on mesopleura similar to those on mesoscutum, uniform in anterior part (d = 1–2$\varnothing$), scattered on rest of surfaces (d = 2–5$\varnothing$); metapleura regularly finely longitudinally wrinkled. Propodeum matte on upper and posterior sides, densely alveolate, with fine radial ridges on dorsal area and with coarser irregular ridges at sides of area; sides of propodeum shining, irregularly ridged along lateral carinae, nearly smooth on other surface. Metasomal tergites uniformly punctate, shining; tergites I and II punctate as mesoscutum (d = 1.5–2$\varnothing$); punctures on tergites III–V gradually becoming smaller and sparser (from d = 2–3$\varnothing$ on tergite III to d = 4–5$\varnothing$ on tergite V); posterior areas mainly smooth, but separated from discs of tergites only by bends without rows of fine punctures; pygidial area with large, but rather sparse punctures (d = 1–3$\varnothing$) and distinct shining areas between them (Fig. 4, *9*); metasomal sternites with sparse minute punctures at bases of hairs, only sternite VI with denser minute punctation at sides.

Pubescence of body short, sparse, dense to conceal sculpture of cuticle only on lateral lobes of clypeus and in lower part of frons along inner orbits of eyes; hairs on vertex, in middle of mesoscutum, scutellum, and metanotum raised, shorter than diameter of anterior ocellus; pubescence mainly silvery, but with strong bronze tint on vertex, mesoscutum, and metasomal tergites V and VI; metasomal tergites I–IV with lateral spots of denser recumbent silvery hairs. Setae of psammophore on temple fine, their length in upper part not exceeding width of flagellum, in lower part, slightly less width of mandibular base (Fig. 4, *1c*); length of setae on mandible equal to, or slightly exceeding width of mandibular base; length of setae on fore trochanter less than width of trochanter; length of setae on fore femur distinctly less than width of 1st segment of fore tarsus; digging comb on 1st segment of fore tarsus consisting of 3 or 4 outer setae, length of which not exceeding width of segment (Fig. 4, *6*).

Body mainly black. Median lobe of clypeus without translucent rufous edging; scape and flagellum dark

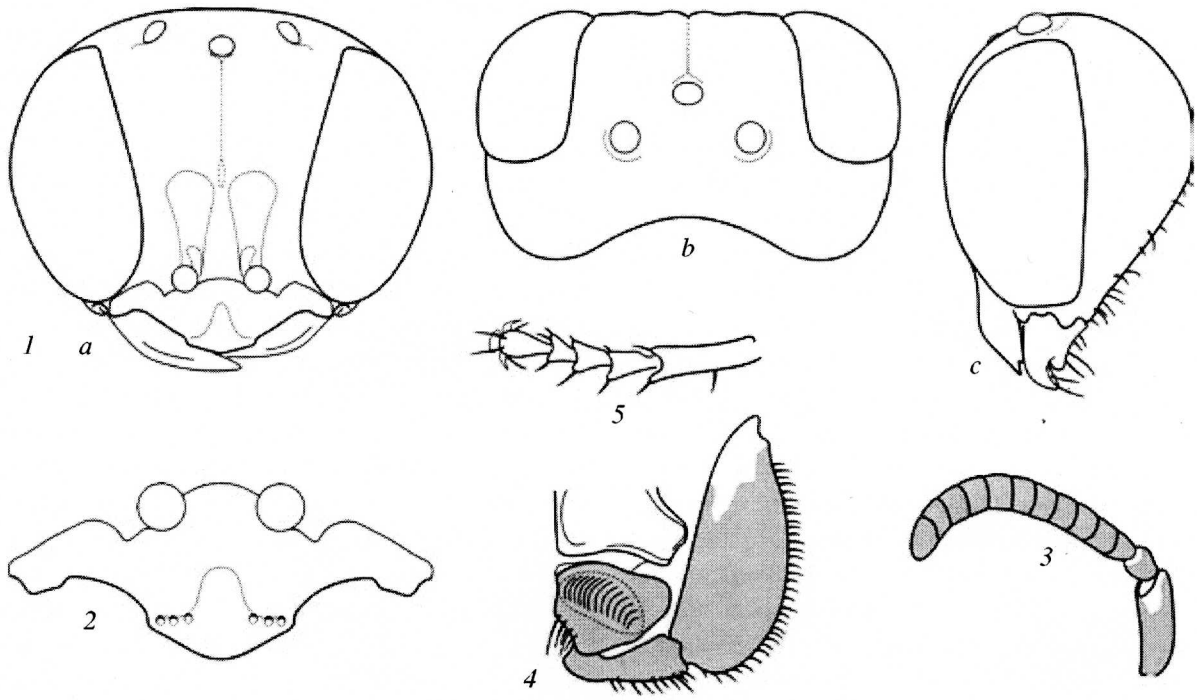

Fig. 5. *Oxybelomorpha turneri*, male: (*1*) head [(*a*) front, (*b*) dorsal, (*c*) lateral view]; (*2*) clypeus, front view; (*3*) antenna, front view; (*4*) fore coxa, trochanter, and femur, ventral view from inner side; (*5*) fore tarsus, view from outer side.

brown to black; mandible mainly yellow, reddish fuscous at apex. Pronotal carina and humeral calli black; metanotal scales yellowish white on inner margins, translucent and pale on outer sides; tarsi pale fuscous, with 1st segment of fore tarsus yellowish at base; fore and middle tibiae yellowish white on outer sides, fuscous on inner sides; hind tibia yellowish white only in basal half on outer side, fuscous in other parts; femora black on outer sides, fuscous on inner sides; fore and middle femora occasionally with small yellow spots at apices; tegula translucent, fuscous; basal wing sclerites entirely fuscous. Propodeal spine discolored only at apex, brownish. Pygidial area reddish fuscous at apex.

Body length 5.1 mm.

Male mainly similar to female, except in characters associated with sex. *IOD* = 37 : 17 (Fig. 5, *1a*); parietal areas absent (Fig. 5, 1b); *OOD* : *OD* : *POD* = 7 : 6 : 15; median lobe of clypeus bounded by obtused lateral angles, distance between which subequal to that from angle to antennal socket (Fig. 5, *2*); flagellar segments mainly wider than long (Fig. 5, *3*); punctation in upper part of frons and on vertex and mesosoma finer, that on mesopleura finer and distinctly sparser (*d* = 3–6∅); setae of psammophores of temple (Fig. 5, *1c*), trochanters, and fore femur (Fig. 5, *4*) inconspicuous; digging comb on fore tarsus absent (Fig. 5, *5*); pubescence of metasomal sternites sparse, recumbent, except for rows of preapical fimbria; hind tibia almost entirely yellowish white on outer side, fuscous on inner side.

Body length 4.0 mm.

Differential diagnosis. *O. turneri* differs from other species of the *O. rhodesiana* group in the absence of lateral angles of the pronotal carina, sparser punctation of the pygidial area in the female (with distinct smooth intervals between punctures), and darkest coloration of the body (entirely black scapes, humeral calli, and femora, and also fuscous basal wing sclerites and propodeal spine). In addition, *O. turneri* differs from *O. rhodesiana* in the distinctly finer and sparser punctation of the head, mesosoma, and metasomal tergites and in the entirely black median lobe of the clypeus; it also differs from *O. wojciechi* in the entirely black metasoma in both sexes, unmodified apex of the hind femur, and absence of preapical pit on the inner side of 1st segment of the hind tarsus and dorsal pit on metasomal tergite I.

Notes. In the description of *B.* (*Oxybelomorpha*) *turneri*, 16 females and 1 male are mentioned, collected by R. Turner from Ceres in November (year not indicated). The collection of BMNH contains 17 fe-

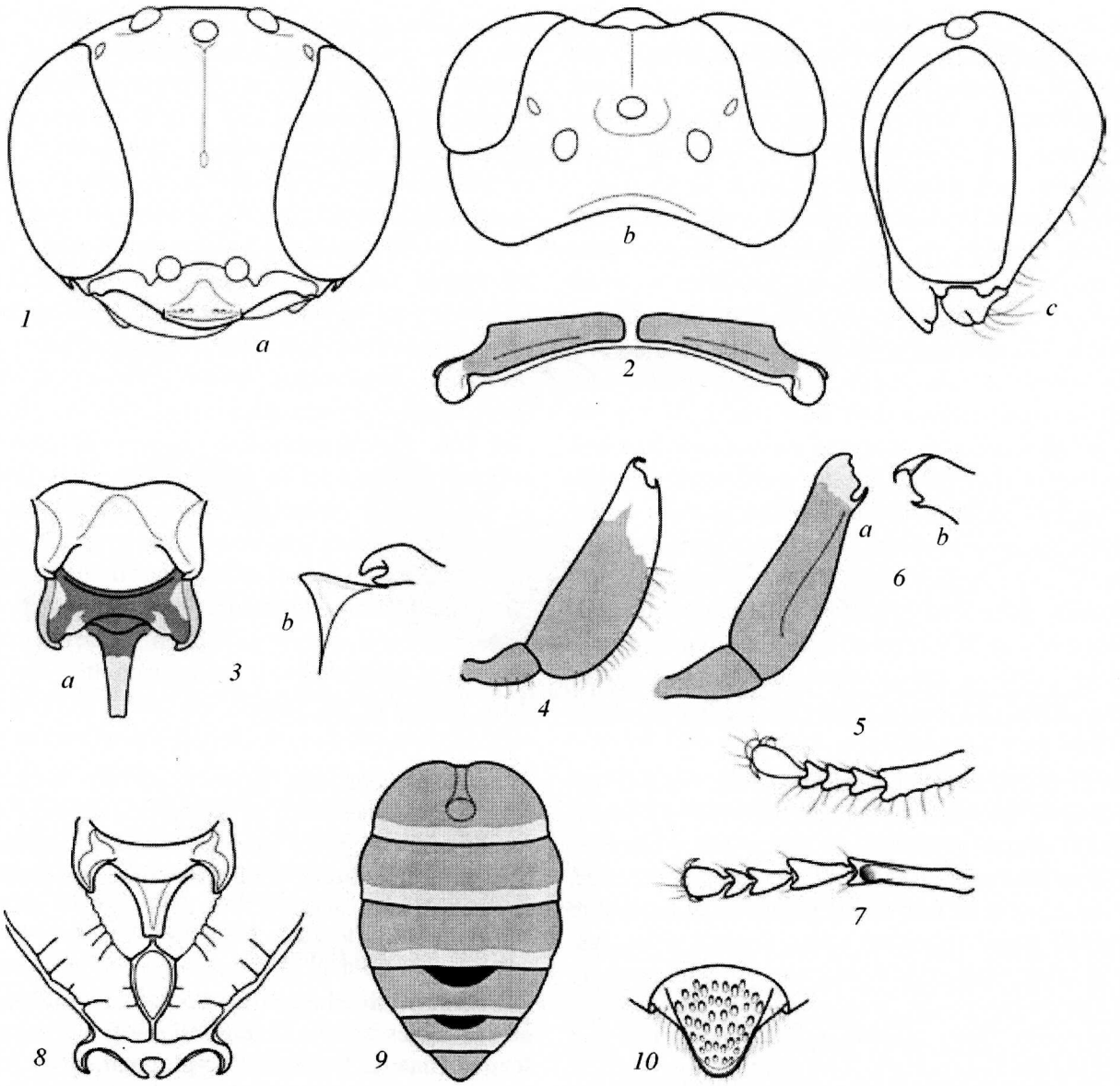

Fig. 6. *Oxybelomorpha wojciechi*, female: (*1*) head [(*a*) front, (*b*) dorsal, (*c*) lateral view]; (*2*) pronotal carina, dorsal view; (*3*) scutellum, metanotum, and propodeal spine [(*a*) dorsal, (*b*) lateral view]; (*4*) fore trochanter and femur, view from inner side; (*5*) fore tarsus, view from outer side; (*6*) hind femur [(*a*) view from outer side; (*b*) apex, view from inner side]; (*7*) hind tarsus, posterior view from inner side; (*8*) propodeum, posterior view; (*9*) metasoma, dorsal view; (*10*) metasomal tergite VI, dorsal view.

males and 5 males from this locality, dated 1920 and 1924, that formally corresponds to Arnold's description. Among all the specimens, only two ones (nos. 1920–497) are provided with identical red type labels inscribed by the author, and seven more females (with similar nos.) have no such labels. Obviously, Arnold examined the most part of Turner's collections, but designated only two specimens as typical.

Oxybelomorpha wojciechi Antropov, sp. n.

Material. Holotype: ♀, "NAMIBIA: Karibib District: 15 km W Karibib, 28 February, 1990 (W.J. Pulawski cllr.)" [CAS]. Paratypes: 2 ♂, "NAMIBIA: Karibib District: 15 km W Karibib, 28 February, 1990 (W.J. Pulawski cllr.)" [CAS]; 1 ♀, "NAMIBIA: Karibib: 43 Km E Karibib, 20.2.1990 (leg. Max. Schwarz)" [MS].

Description. Female. Head in front view rounded, slightly wider than long (Fig. 6, *la*); *IOD* = 34 : 22; lower part of frons moderately depressed, with 2 fine smooth vertical stripes behind appressed scapes; upper part of frons weakly convex, with fine, but deep median groove reaching anterior ocellus; vertex uniformly moderately convex; *OOD* : *OD* : *POD* = 7 : 5 : 15; parietal areas oval, convex, smooth, without dis-

tinct borders (Fig. 6, *1b*); temple distinctly widened at level of upper 1/3 of eye (Fig. 6, *1c*); median lobe of clypeus convex at base, with smooth triangular flattened median area bounded at sides by rounded bends, with apical edging separated at sides by rows of punctures, and with obtused lateral angles separated by distance twice exceeding that from angle to antennal socket; flagellar segments unmodified, wider than long, except for 1st, 2nd, 9th, and 10th ones; ultimate segment rounded at apex, its length more than 1.5 times its maximum width. Pronotal carina rounded, with fine median depression, narrow posterior edging, and obtused rectangular lateral angles, without transverse ridges (Fig. 6, *2*); humeral calli with vertical carina; mesoscutum uniformly convex, with deep median depression reaching its posterior margin; admedian lines concealed by dense punctation in lower part of median depression; parapsidial grooves absent; adlateral lines in the form of small areas of several approximate punctures; scutellum wider than long, with median depression, flatly depressed in posterior part, with developed posterolateral lobes (Fig. 6, *3a*); metanotum with flat depression in middle, bounded at posterior margin by sharp ridge; metanotal scales falcate, translucent on outer sides, with yellow stripe along inner margins and with strongly deflexed tapered apices, distance between which twice more length of scale; mesopleura uniformly convex; prexocal tooth weak, rounded; metapleura with narrow upper lobe; 1st segment of fore tarsus slightly asymmetrical at apex; fore femur with shallow longitudinal depression on outer side, rounded at margins, without pronounced carina (Fig. 6, *4*); hind femur weakly, but distinctly narrowed before apex, widened at apex, with pronounced longitudinal ridge on upper side (Fig. 6, *6a*, *6b*); 1st segment of hind tarsus in both sexes with preapical pit on inner side (Fig. 6, *7*). Propodeum with lateral carinae extending from its apex and slightly widened at upper corners, dorsal area bounded by fine costae, and narrow dorsal spine medially depressed in anterior part and without apical emargination (Fig. 6, *8*). Metasomal tergite I with small, but distinct rounded pit (Fig. 6, *9*); tergites II–IV and, to lesser extent, tergite V with strong transverse basal depressions.

Body uniformly densely punctate, with shining intervals between punctures. Lower part of frons with very fine and dense punctures at sides ($d \leq \varnothing$); upper part of frons with larger punctures, $d = \varnothing$ along median groove, $d = 2\varnothing$ near inner orbits of eyes on upper side; vertex with smaller punctures, $d = 1–2\varnothing$ in middle and $d = 2–3\varnothing$ at sides; temple with punctures elongate vertically, becoming smaller in lower part and merging there in vertical grooves, $d = \varnothing$; median lobe of clypeus with smooth triangular area in middle, its each side with 2 or 3 large punctures separating apical edging. Pronotal carina with distinct punctures similar to those on vertex, $d = \varnothing$; mesoscutum with larger punctures ($d = \varnothing$ on most part, $d = 1–3\varnothing$ in middle), bearing short longitudinal wrinkles in posterior part; punctures on scutellum dense in middle ($d = \varnothing$), scattered at sides ($d = 2–3\varnothing$); metanotum smooth, impunctate in middle; mesopleura with punctation similar to that on mesoscutum, $d = \varnothing$ on most part, $d = 1.5–2\varnothing$ in middle; metapleura densely rugose. Upper side of propodeum mainly densely alveolate, matte, with irregular radial ridges along lateral carinae; sides of propodeum alveolate in anterior parts, irregularly plicate along lateral carinae. Metasomal tergites distinctly punctate; punctures on tergites I and II similar to those on vertex, becoming distinctly smaller toward metasomal apex ($d = 1–3\varnothing$ on tergite I, $d = 1–2\varnothing$ on tergite II, $d = 2–3\varnothing$ on tergite III, and $d = 3–6\varnothing$ on tergites IV and V); tergite VI with largest, longitudinally elongate punctures ($d < \varnothing$) (Fig. 6, *10*); posterior areas of tergites separated from discs only by bends without transverse rows of punctures; at base, metasomal sternites strigate, at apex, finely alveolate, shining, with minute punctures at base of preapical cilia and at sides of sternite VI.

Pubescence silvery, short, mainly recumbent, raised only on vertex, mesoscutum, scutellum, and metanotum; length of hairs on vertex less than diameter of anterior ocellus; densest recumbent hairs situated on lateral lobes of clypeus and in lower part of frons, concealing sculpture of surface there; slightly sparser hairs arranged in upper part of frons, they directed upwards and outwards. Setae of psammophore on temple weak in upper part, their length not exceeding width of flagellum; stronger in lower part, their length not exceeding width of mandibular base (Fig. 6, *1c*); length of setae at lower margin of mandible 1.2–1.5 times width of mandibular base; fore trochanter with setae curved forwards, their length not exceeding width of trochanter; fore femur with outer row of setae, length of which subequal to width of 1st segment of fore tarsus (Fig. 6, *4*); digging comb on 1st segment of fore tarsus consisting of 4 raised setae, length of which not exceeding maximum width of segment (Fig. 6, *5*).

Head and mesosoma mainly black, metasoma reddish rufous. Scape yellow in apical half on lower side, fuscous on rest of surface; mandible yellowish white in basal half, then rufous, reddish fuscous at apex. Pronotal carina black; humeral calli yellowish white; metanotal scales translucent and rufescent on outer sides, with yellow stripe along margins; tegula translucent, rufous; basal wing sclerites with fuscous spot in middle, rufous at margins; veins of wings fuscous; fore tarsus yellowish rufous; middle and hind tarsi rufous, with 4th and 5th segments darkest; fore and middle tibiae yellowish white on outer sides; fore tibia rufous on inner side; middle tibia with fuscous spot; hind tibia fuscous in apical 2/3, yellow at base; femora mainly fuscous or dark brown; fore femur yellow in apical 1/3 on lower side; middle femur yellow at apex; hind one rufous at apex. Propodeal spine black at base, translucent on outer side, with fine yellow median stripe. Two basal and one apical metasomal tergites entirely reddish rufous, tergite III also entirely reddish rufous or with small median fuscous spot at base, tergites IV and V with distinct median transverse fuscous spots (Fig. 6, *9*); metasomal sternites mainly rufescent fuscous; posterior areas of segments translucent, pale rufous.

Body length 3.4 mm.

Male mainly similar to female in punctation and pubescence of body, differing in characters associated with sex. *IOD* = 30 : 19 (Fig. 7, *1a*); parietal areas less strongly convex (Fig. 7, *1b*); *OOD* : *OD* : *POD* = 5 : 4 : 13; flagellar segments, except for 1st and apical ones, wider than long (Fig. 7, *2*); pronotal carina with roundly obtused lateral angles, without transverse ridges (Fig. 7, *3*); psammophore at ventral margin of mandible formed by setae, length of which less than width of mandibular base; temple (Fig. 7, *1c*), fore trochanter, and outer side of fore femur without psammophore (Fig. 7, *4*); digging comb of fore tarsus absent (Fig. 7, *5*); metasoma entirely black, or three basal tergites with rufous lateral spots becoming smaller toward metasomal apex.

Body length 3.4 mm.

Differential diagnosis. *O. wojciechi* sp. n. differs from other species of the *O. rhodesiana* group in the metanotal scales with the inner margins connected by a distinct ridge, distinctly widened apex of the hind femur, presence of a preapical pit on the inner side of 1st segment of the hind tarsus and rounded dorsal pit on metasomal tergite I, and also in the mainly reddish rufous metasoma of the female and occasionally developed red lateral spots on metasomal tergites I–III of the male. In addition, *O. wojciechi* sp. n. differs from *O. rhodesiana* in the obtused lateral angles of the pronotal carina, and from *O. turneri*, in their presence and in the denser punctation of the pygidial area of the female.

Notes. It is noteworthy that in the morphological characters differing *O. wojciechi* sp. n. from the other members of the *O. rhodesiana* group, this species is most similar to representatives of the *O. braunsii* species-group; it is a "intermediate link" between these groups. Obviously, both specie-groups is closely related, which is substantiated by a similar structure of the metapleura and fore coxa of the male.

Etymology. The species is named for Dr. Wojcieh J. Pulawski (California Academy of Sciences, San Francisco, USA) one of leading modern taxonomists of Sphecidae.

Oxybelomorpha rubicunda Species-group

Description. Lower part of frons with deep longitudinal depression; median lobe of clypeus without lateral angles; pronotal carina without lateral angles; pronotal carina convex; humeral calli without transverse ridges; mesoscutum depressed medially; scutellum with posterolateral lobes; metanotum without median carina and with elongate scales tapered at apices; prexocal tooth of mesopleura ill-defined; metapleura convex in upper part, without dorsal carina; 1st segment of fore tarsus strongly asymmetrical; fore femur without outer carina; hind femur unmodified; 1st segment of hind tarsus in both sexes without preapical pit; dorsal propodeal spine slender, tapered at apex; metasomal tergite I without dorsal pit and median groove.

I place in this group the only Namibian species (Fig. 1), *O. rubicunda* sp. n.

Oxybelomorpha rubicunda Antropov, sp. n.

Material. Holotype: ♀, "Dreimasterpunt, DIAMOND AREA, 1 27°34′S 15°28′E, 15–25.XI.1993 (E. Marais). Pres. pitf. traps. Rocky substrate" [NM].

Description. Female. Head in front view roundly triangular, distinctly narrowed in lower part (Fig. 8, *1a*); *IOD* = 37 : 24; lower part of frons with very deep

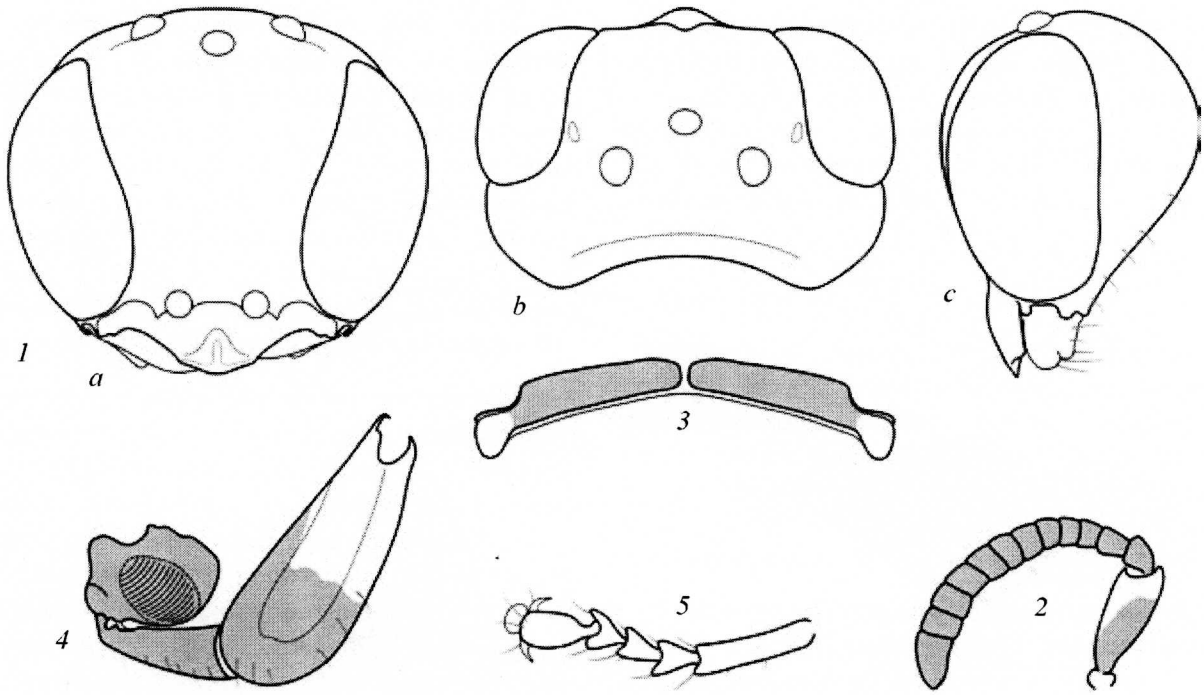

Fig. 7. *Oxybelomorpha wojciechi*, male: (*1*) head [(*a*) front, (*b*) dorsal, (*c*) lateral view]; (*2*) antenna, front view; (*3*) pronotal carina, dorsal view; (*4*) fore coxa, trochanter, and femur, ventral view from inner side; (*5*) fore tarsus, view from outer side.

longitudinal depression behind appressed scapes; upper part of frons weakly convex, with fine median groove reaching median ocellus; vertex weakly convex; parietal areas absent, only outlined by fine oblique grooves (Fig. 8, *1b*); *OOD* : *OD* : *POD* = 6 : 6 : 16; temple uniformly convex (Fig. 8, *7c*); median lobe of clypeus convex, with rounded anterior margin, without pronounced lateral angles (Fig. 8, *2*); flagellar segments, except for 1st and ultimate ones, wider than long. Pronotal carina with fine median depression and fine translucent posterior edging, Pronotal carina without lateral angles; pronotal carina and humeral calli uniformly convex, without transverse ridges (Fig. 8, *3*); mesoscutum uniformly convex, with deep median depression reaching its middle; admedian lines concealed by dense punctation of median depression; parapsidial grooves in the form of singular rows of punctures, reaching middle of length of mesoscutum; adlateral lines absent; scutellum rectangular, with median depression consisting of singular lines of punctures, with obtused posterior margin and with posterolateral lobes tapered on inner side at apex (Fig. 8, *4a*); metanotum flatly convex in middle, with elongate falcate scales convex along inner margins and slightly incurved at apices, distance between apices of scales equal to length of scales; mesopleura convex; prexocal tooth in the form of weak, rounded ridge; metapleura mainly flat, strongly convex in upper parts, without trace of metapleural carina; 1st and 2nd segments of fore tarsus asymmetrical; outer apical prominence of 1st segment subequal to 2nd segment, that of 2nd segment distinctly shorter (Fig. 8, *6*); fore femur depressed on anterior side, rounded on outer side, without longitudinal ridge (Fig. 8, *5*); apex of hind femur unmodified (Fig. 8, *7*). Propodeum with entire fine lateral carinae extending from its apex; dorsal area bounded at apex by inconspicuous carinae (Fig. 8, *8*); dorsal spine fine, medially depressed in anterior part, sharp at apex, without emargination (Fig. 8, *4a*, *b*). Metasomal tergite I without dorsal pit and median depression (Fig. 8, *9*); tergites II and III deeply, and tergites IV and V less deeply transversely depressed at bases.

Sculpture of body mainly formed by large and rather sparse punctation with shining intervals between punctures. Lower part of frons with very fine, uniform, dense punctures, without smooth areas ($d = \varnothing$ in middle, $d = 1–2\varnothing$ at sides); upper part of frons with distinctly larger punctures ($d = 1–3\varnothing$); vertex with similar large punctures ($d = 1–3\varnothing$); punctures on temple fine, similar to those in lower part of frons, dense, uniform, not elongate vertically ($d = \varnothing$); median lobe of clypeus with smooth triangular area in

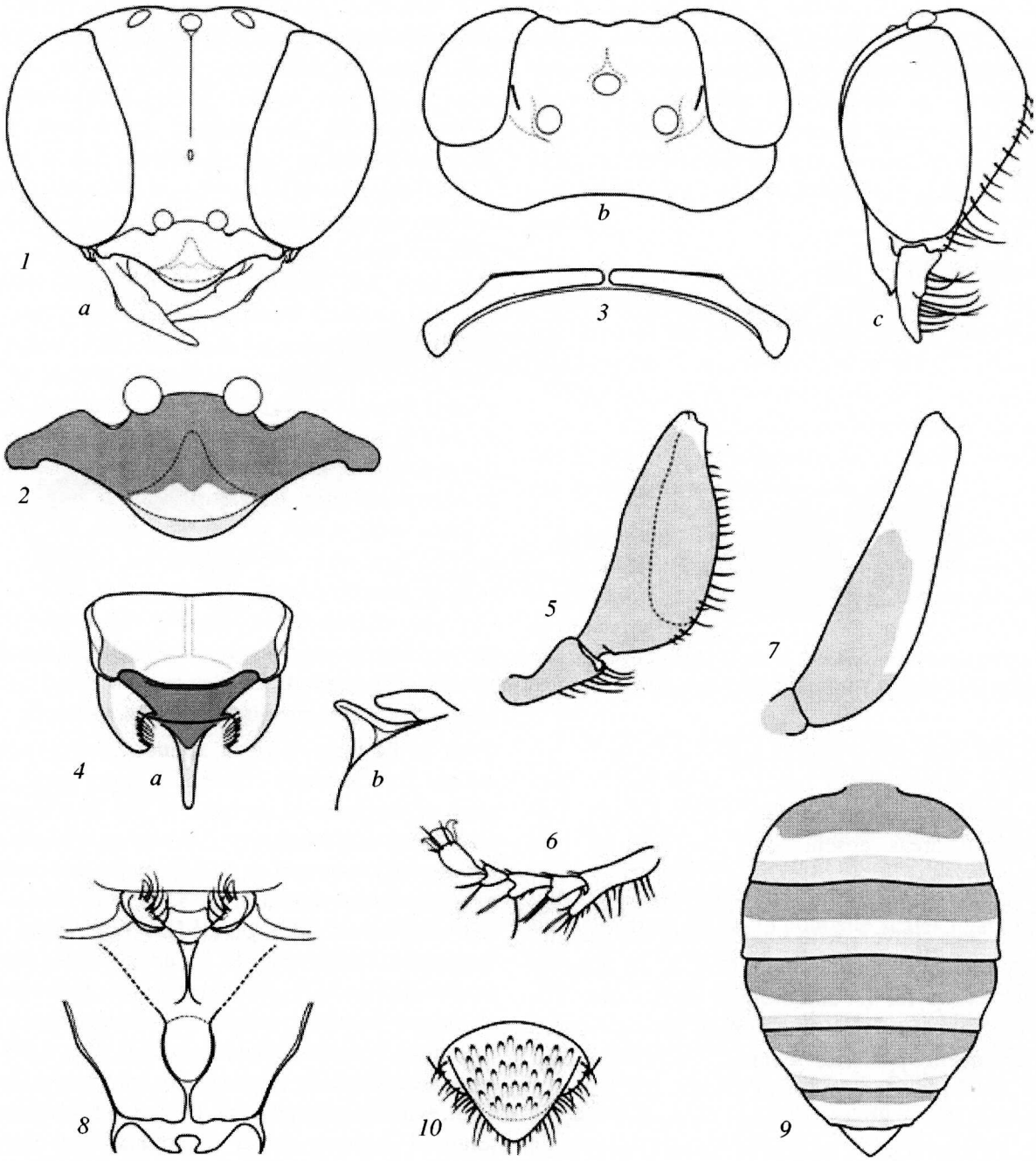

Fig. 8. *Oxybelomorpha rubicunda*, female: (*1*) head [(*a*) front, (*b*) dorsal, (*c*) lateral view]; (*2*) clypeus, front view; (*3*) pronotal carina, dorsal view; (*4*) scutellum, metanotum, and propodeal spine [(*a*) dorsal, (*b*) lateral view]; (*5*) fore trochanter and femur, view from inner side; (*6*) fore tarsus, view from outer side; (*7*) hind femur, view from outer side; (*8*) propodeum, posterior view; (*9*) metasoma, dorsal view; (*10*) metasomal tergite VI, dorsal view.

anterior part, without sculpture. Pronotal carina with punctures similar to those in lower part of frons ($d = \varnothing$); mesoscutum with distinctly larger, scattered punctures and large smooth areas ($d = 1–4\varnothing$), bearing very short longitudinal wrinkles in posterior part; scutellum nearly impunctate, with no more than 3–4 large punctures on lateral parts; metanotum smooth in middle, with scales bearing 1–2 large punctures at bases; mesopleura with smaller and distinctly denser, uniform punctures ($d = 1–2\varnothing$ in upper parts, $d = 1–3\varnothing$ in lower parts); metapleura finely and uniformly longitudinally wrinkled, smooth on upper-anterior sides. Propodeum very densely, finely alveolate on upper and posterior sides, matte, without distinct costae;

sides of propodeum finely rugulose in anterior part, finely alveolate in posterior part, semi-matte. Metasomal tergites shining, with punctures at base similar to those on mesopleura, gradually becoming smaller toward metasomal apex (d = 1–5∅); posterior areas not separated from discs by rows of punctures, finely and densely punctate only on tergite I ($d \leq$ ∅); pygidial area with largest punctures elongate longitudinally ($d <$ ∅) (Fig. 8, *10*); metasomal sternites with sparse minute punctures at bases of hairs, with distinct punctures ($d <$ ∅) only at sides of apex of sternite VI.

Pubescence of body fine, silvery, mainly scattered; only clypeus (except for smooth area of median lobe), lower part of frons, sutures of mesopleura, and upper side along lateral carinae of propodeum with dense recumbent pubescence concealing sculpture of cuticle. Hairs raised on vertex, mesoscutum, scutellum, and metanotum, recumbent or (on metasomal apex) semi-recumbent on rest of surface; length of hairs on vertex and metanotum 1.5 times diameter of lateral ocellus, length of other hairs not exceeding diameter of lateral ocellus. Hairs along median groove of upper part of frons directed toward inner orbits of eyes. Length of setae of psammophore on temple, along lower margin of mandible, and near apex of fore trochanter not less than 1.2 times width of mandibular base (Fig. 8, *1c*); fore femur on outer side with row of raised setae, length of which equal to width of flagellum (Fig. 8, *5*); digging comb on 1st segment of fore tarsus consisting of 5 or 6 raised outer setae, length of which 1.2–1.5 times width of segment (Fig. 8, *6*).

Head and mesosoma mainly black, metasoma reddish rufous. Median lobe of clypeus with yellow transverse stripe behind translucent rufous apical edging; antennae entirely yellowish rufous; mandible mainly yellowish rufous, with reddish fuscous apices. Pronotal carina and humeral calli yellow; posterolateral lobes of scutellum with yellowish rufous spots; metanotum black in middle; scales translucent on outer sides, with convex yellowish white parts; all tarsi and tibiae yellowish white; all femora yellowish white on outer sides, rufous at bases and on inner sides; trochanters rufous; tegula translucent, yellowish; basal wing sclerites yellow, without dark spots; veins of wings discolored, whitish. Propodeal spine translucent, with small whitish spot at base. Metasoma mainly rufous, tergites I–V with whitish preapical bands, pygidial area entirely whitish.

Body length 4 mm.

Male unknown.

Differential diagnosis. *O. rubicunda* sp. n. is the only species of the genus, which possesses the entirely rufous metasoma with developed pale preapical bands on the tergites. It also differs from other species of the genus with falcate metanotal scales in the deeply depressed lower part of the frons and strongly asymmetric 1st segment of the fore tarsus.

Etymology. The species name originates from the Latin word "rubicundus" (bright red), which emphasizes the coloration of its metasoma.

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