# First records of the tribe Holcobraconini and the genus *Zombrus* Marshall, 1897 (Hymenoptera: Braconidae: Doryctinae) in Europe

# Первые указания трибы Holcobraconini и рода *Zombrus* Marshall, 1897 (Hymenoptera: Braconidae: Doryctinae) для Европы

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The doryctine tribe Holcobraconini and its genus *Zombrus* Marshall, 1897 are recorded for the first time for Europe. *Zombrus bicolor* (Enderlein, 1912), which was previously known only from the East Palaearctic, is recorded for Kazakhstan (Almaty Province) and European part of Russia (Astrakhan' Province) for the first time. A discussion about the content and distribution of the Holcobraconini genera and the Palaearctic species of the genus *Zombrus*, and a key to the Palaearctic species of *Zombrus* are provided. The redescriptions of the tribe Holcobraconini, the genus *Zombrus* and species *Z. bicolor* are given.

Впервые для фауны Европы указывается триба Holcobraconini и род *Zombrus* Marshall, 1897. Известный ранее из Восточной Палеарктики *Zombrus bicolor* (Enderlein, 1912) впервые обнаружен в Казахстане (Алма-Атинская область) и в Европейской части России (Астраханской области). Обсуждаются состав и распространение родов трибы Holcobraconini и палеарктических видов рода *Zombrus*. Приводится ключ палеарктических видов рода *Zombrus*. Дается переописание трибы Holcobraconini, рода *Zombrus* и вида *Z. bicolor*.

**Key words:** ectoparasitoids of beetle larva, taxonomy, redescriptions, first records, Europe, Kazakhstan, Hymenoptera, Braconidae, Doryctinae, Holcobraconini, *Zombrus*

**Ключевые слова:** эктопаразитоиды личинок жуков, таксономия, переописания, первые указания, Европа, Казахстан, Hymenoptera, Braconidae, Doryctinae, Holcobraconini, *Zombrus*

## INTRODUCTION

Tribe Holcobraconini is a monophyletic group (Zaldívar-Riverón et al., 2008) and one of the morphologically more distinct supergeneric taxa of the braconid wasps of subfamily Doryctinae. This tribe is currently divided into three subtribes (Belokobylskij, 1992): Holcobraconina (with genera *Holcobracon* Cameron, 1905 and *Nervellius* Roman, 1924), Odontobraconina (with genera *Odontobracon* Cameron, 1887, *Zombrus* Marshall, 1897 and *Liodoryctes* Szépligeti, 1906), and Ivondroviina (with *Ivondrovia* Shenefelt et Marsh, 1976). The members of Holcobraconini are widely distributed in the tropical and subtropical regions of the world penetrating to the southern parts of the Palaearctic and Nearctic Regions (Shenefelt & Marsh, 1976).

The only holcobraconine genus recorded in the south and eastern parts of the Palaearctic Region is *Zombrus*, with the following four species: *Z. anisopus* Marshall, 1897, *Z. bicolor* (Enderlein, 1912), *Z. flavipennis* (Brullé, 1848), and *Z. sikkimensis* Enderlein,

1920. The data on the distribution of these species is mainly fragmental. *Zombrus anisopus* has been recorded from Egypt, Saudi Arabia and also Morocco (**first record**: 1 female, "Morocco mer., Aoulouz env., 17.V.1997, leg. P. Prudek"; BZLA); *Z. flavipennis* from Iran and Pakistan; and *S. sikkimensis* from Afghanistan and India (Sikkim). Only *Z. bicolor* is common in the Far East Region of Asia, being recorded from Mongolia, East China, the southern part of the Russian Far East, Korean Peninsula, Japan (Yu et al., 2005), and recently from Kyrgyzstan (Belokobylskij & Maeto, 2009).

In this study, *Z. bicolor*, as well as the tribe Holcobraconini, are recorded for the first time for the European part of Russia (Astrakhan' Province) and, consequently, for Europe. The redescriptions of the above tribe, *Zombrus* and *Z. bicolor*, as well as a key to the Palaearctic species of *Zombrus* are given below.

The terminology of the morphological features and sculpture, measurements and wing venation nomenclature follow Belokobylskij and Maeto (2009). The examined material is deposited in the Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia; ZIN) and in the collection of Martin Schwartz, Biologiezentrum (Linz, Austria; BZLA).

## TAXONOMIC PART

Order **HYMENOPTERA**

Family **BRACONIDAE**

Subfamily **DORYCTINAE**

Tribe **HOLCOBRACONINI**

Holcobraconini Cameron, 1905a: 90; Shenefelt & Marsh, 1976: 1363 (as synonym of Odontobraconini); Belokobylskij, 1992: 912 (as valid name); Yu et al, 2005.

Acanthobraconini Fahringer, 1928: 7; Shenefelt & Marsh, 1976: 1363 (as junior synonym of Odontobraconini); Belokobylskij, 1992: 912 (as junior synonym of Holcobraconini); Yu et al, 2005.

Odontobraconinae Granger, 1949: 91.

Odontobraconini: Tobias, 1968: 26; Shenefelt & Marsh, 1976: 1363; Fischer, 1981: 46; Marsh, 1988: 442; Belokobylskij, 1992: 912 (as junior synonym of Holcobraconini); Yu et al, 2005.

***Diagnosis of the tribe.*** Eyes glabrous. Occipital carina often distinct and complete dorsally, widely reduced below and not joined with hypostomal carina, rarely completely absent. Postgenal bridge very narrow. Maxillary palps 6-segmented, labial palps 4-segmented; third segment of labial palpus usually distinctly shortened (Fig. 13). Mesosoma not depressed. Pronotum (lateral view) dorsally with distinct and wide convex lobe (Fig. 7). Notauli deep and usually complete (Fig. 8), sometimes entirely reduced. Sternaulus present (Fig. 9). Prepectal carina always distinct. Postpectal carina absent. Propodeum usually entirely with quite large areolae (Fig. 8); propodeal bridge absent. Fore wing with two radiomedial veins, recurrent vein antefurcal, parallel vein arising behind middle of apical margin of brachial cell, brachial cell closed (Fig. 12). In hind wing submedial cell large, nervellus present, recurrent vein long, strongly curved towards apex of wing (Fig. 12). Hind coxa without basoventral corner and tubercle, dorsally with one or two distinct process or teeth (Fig. 14), but sometimes without them. First metasomal tergite short, with short acrosternite, with distinct dorsope. Second to sixth tergites with separated laterotergites; second tergite with wide and lenticular median area separated by furrows and suture (Figs 15, 16). Basal ring of male genitalia not closed; parameres narrow; digitus volsellaris long and thick. Head of larva with developed epistoma and hypostoma.

***Composition.*** This tribe includes six genera: *Holcobracon*, *Ivondrovia*, *Liodoryctes*, *Nervellius*, *Odontobracon*, *Zombrus*.

### *Zombrus* Marshall, 1897

*Zombrus* Marshall, 1897: 10 (type species *Zombrus anisopus* Marshall, 1897, by following

designation of Viereck, 1914); Shenefelt & Marsh, 1976: 1366; Fischer, 1980: 552; 1983: 312; Belokobylskij, 1998: 71; Yu et al., 2005.

*Acanthobracon* Szépligeti, 1902: 47 (type species: *A. fuscipennis* Szépligeti, 1902); Shenefelt & Marsh, 1976: 1366.

*Neotrimorus* Dalla Torre, 1898: 100 (replacement name for *Trimorus* Kriechbaumer, 1894) (type species: *Trimorus nigripennis* Kriechbaumer, 1894); Shenefelt & Marsh, 1976: 1366.

*Trichiobracon* Cameron, 1905b: 104 (type species: *T. pilosus* Cameron, 1905); Shenefelt & Marsh, 1976: 1367.

*Trichodoryctes* Szépligeti 1906: 599 (type species: *Acanthobracon striolatus* Szépligeti, 1902); Shenefelt & Marsh, 1976: 1367.

*Trimorus* Kriechbaumer 1894: 60 (junior homonym of *Trimorus* Foerster, 1856) (type species: *T. nigripennis* Kriechbaumer, 1894); Shenefelt & Marsh, 1976: 1367.

***Remarks.*** *Zombrus* is one of the largest genus of the tribe Holcobraconini consisting of about 45 species, and a single representative of this tribe in the Palaearctic fauna. The species of this genus are widely distributed in the tropical and subtropical localities of the Old World, mainly in the Afrotropical and Oriental Regions, and only four of its species penetrate to the southern and eastern parts of the Palaearctic Region. This genus is recorded here for the fauna of Europe for the first time.

***Characteristics of the genus.*** Head transverse (Fig. 5). Ocelli arranged in triangle with base larger than its sides. Clypeus often with flange along its lower margin. Hypoclypeal depression rather large and rounded. Face with two distinct submedian oval depressions above clypeal suture (Fig. 6). Occipital carina usually distinct dorsally, widely reduced below and not joined with hypostomal carina. Antennae rather slender, setiform, long. First flagellar segment usually longer than second segment (Fig. 3). Last antennal segment with short apical spine (Fig. 4).

Mesosoma not depressed dorso-ventrally (Fig. 9). Pronotum with complete pronotal carina (dorsal view). Mesonotum rather highly and roundly elevated above pronotum, usually smooth. Notauli more or less deep and often complete (Fig. 8). Metanotum dorsally with small and rounded dorsal tooth. Sternaulus deep and often sculptured (Fig. 9). Propodeum with rather distinct lateral tubercles, without areas delineated by carinae; usually entirely areolate by large areolae (Fig. 8).

Wings (Fig. 12). Radial cell of fore wing more or less shortened. Radial vein arising before middle of pterostigma. Second radiomedial cell usually short. Discoidal cell anteriorly petiolate. Nervulus postfurcal. In hind wing, first abscissa of mediocubital vein not shorter than second abscissa. Medial cell long and rather narrow.

Legs. Fore tibia with several thick spines arranged in almost one row on inner side (Fig. 10), with row of dense and coarse spines on inner apical margin. Hind coxa dorsally with long and curved anterior process and short subpointed posterior tooth (Fig. 14). Hind femur usually thick. Basitarsus of hind tarsus short, about half as long as second to fifth segments combined.

Metasoma (Figs 15–17). First tergite wide. Second tergite with wide and lenticular median area separated anteriorly by oblique basolateral furrows, with usually distinct or shallow lateral subparallel stripes. Suture between second and third tergites deep, medially curved and with distinct pointed sublateral bends. Third tergite without depression. Ovipositor usually short, not longer than metasoma (Figs 1, 2); its sheaths with rather long dense black setae.

***Biology.*** Parasiotids of Cerambycidae.

***General distribution.*** Palaearctic, Oriental and Afrotropical Regions.

**Key to the Palaearctic species of *Zombrus***

1. Occipital carina entirely absent. Pterostigma mainly yellow, faintly infuscate basally. Fore wings yellow. Lower part of face, first and second metasomal tergites laterally pale yellow. Body length 18.5 mm – Iran, Pakistan . . . . . ***Z. flavipennis***
– Occipital carina dorsally and at least partly laterally present. Pterostigma black or dark

brown, sometimes pale on basal third. Fore wings dark brown to almost black, partly with yellowish spots. Body without pale yellow colouration . . . . . 2

2. Body covered by long and dense setae. Setae on hind tibiae not shorter than maximum width of tibia (Fig. 11). Frons medially with short process (Fig. 6). Middle tarsus not or slightly shorter than tibia. All veins of wings black (Fig. 12). Legs and all palps black or dark reddish brown. Face sparsely punctate or reticulate-punctate (Fig. 6). Body length 4.3–13.5 mm – Russia (South-East of the European part, South of the Far East), Kazakhstan, Kyrgyzstan, Mongolia, China, Korean Peninsula, Japan . . . . . ***Z. bicolor***
– Body covered by short and sparse setae. Setae on hind tibiae distinctly shorter than maximum width of tibia. Frons medially with long process. Middle tarsus distinctly shorter than tibia. Veins in the base of wings yellowish, blackish in other part. Legs and all palps light reddish brown. Face coarsely areolate or coarsely punctate with rugosity . . . . . .3
3. Transverse diameter of eye 1.3 times length of temple. Face coarsely areolate-rugulose. First flagellar segment 1.1 times longer than second segment. Radial cell of hind wing with unsclerotised transverse vein. Hind femur 2.3–2.6 times longer than its maximum width. Pterostigma with pale brown basal spot. Body length 9.8–15.5 mm – Morocco, Egypt, Saudi Arabia . . . . . ***Z. anisopus***
– Transverse diameter of eye 1.6 times length of temple. Face coarsely punctate with rugosity only near eyes. First flagellar segment 1.3 times longer than second segment. Radial cell of hind wing without transverse vein. Hind femur 2.7 times longer than its maximum width. Pterostigma without pale brown basal spot. Body length 10.2 mm – Afghanistan, India (Sikkim) . . . ***Z. sikkimensis***

## ***Zombrus bicolor*** (Enderlein, 1912) (Figs 1–17)

*Neotrimorus bicolor* Enderlein, 1912: 29.
*Zombrus bicolor*: Shenefelt & Marsh, 1976: 1367; Fischer, 1980: 556; Belokobylskij, 1998: 71; Belokobylskij & Maeto, 2009: 755.
*Odontobracon sjoestedti* Fahringer, 1929: 83.
*Zombrus sjoestedti:* Shenefelt & Marsh, 1976: 1371; Belokobylskij, 1994: 22 (as synonym of *Z. bicolor*).

***Examined material***: **Russia (European part):** 1 female (ZIN), Astrakhan' Prov., env. Astrakhan' City, about 1 km S of Il'inka, meadow in the Volga River flood-land, 30 June 2010 (K. Samartsev leg). **Kazakhstan**: 1 male (ZIN), "Vernensk.[iy] u.[ezd] (= Alma-Ata Province) 1907, Shingarev [coll.]". **Kyrgyzstan**: 2 females (BZLA, ZIN), Kyrgyzskiy Ridge, Tshon-Azyk, June 2000 (V. Gurko leg.).

***Description.*** Female. Body length 6.0–13.5 mm; fore wing length 4.8–9.7 mm.

Head width (dorsal view) 1.5–1.7 times its median length. Transverse diameter of eye 1.2–1.3 times longer than temple. Ocelli arranged in triangle with base 1.0–1.1 times its sides. POL 0.7–0.8 times Od, 0.3–0.4 times OOL. Frons concave, with not high median keel. Eye glabrous, 1.15–1.20 times as high as broad. Malar space 0.65–0.85 times height of eye, and 1.1–1.3 times basal width of mandible. Face width 1.2–1.4 times height of eye and 1.1–1.2 times height of face and clypeus combined. Clypeus without lower flange. Malar suture very shallow or indistinct. Hypoclypeal depression round, its width 0.7–0.8 times distance from edge of depression to eye. Occipital carina below obliterated on long distance.

Antennae rather thick, setiform, 46–52-segmented. Scape 1.5–1.7 times longer than its maximum width. First flagellar segment 3.0–3.5 times longer than its apical width, 1.2–1.3 times longer than second segment. Penultimate segment 1.7–2.0 times longer than wide, 0.7–1.0 times as long as apical segment; the latter with distinct apical spines.

Mesosoma. Length 2.0–2.2 times its height. Pronotum distinctly convex dorsally and with deep median longitudinal depression. Mesoscutum (lateral view) highly and roundly elevated above pronotum. Notauli deep, sparsely crenulate. Prescutellar depression deep, rather long, with one-three distinct carinae, smooth between carinae, 0.4 times as long as scutellum. Sternaulus deep, rather narrow, crenulate, running along anterior 0.8–0.9 of lower part of mesopleuron. Metapleural lobe short, wide,

subpointed apically. Propodeum with thick and short lateral tubercles.

Wings. Fore wing 2.8–3.3 times longer than its maximum width. Metacarp 1.2–1.4 times longer than pterostigma. Second radial abscissa 1.7–2.0 times longer than first abscissa, formed with it very obtuse angle or sometimes situated in almost single line, 0.3–0.4 times as long as the straight or weakly curved third abscissa, 1.2–1.4 times longer than first radiomedial vein and formed with it almost right angle. Second radiomedial cell small, 1.4–1.5 times longer than its maximum width, 0.5–0.6 times as long as brachial cell. Recurrent vein 2.2–2.8 times longer than second abscissa of medial vein. Distance from nervulus to basal vein 0.5–1.0 times nervulus length. Brachial cell wide, 2.3–2.6 times longer than wide. Hind wing 4.2–4.5 times longer than its maximum width, with four hamuli. First costal abscissa 1.4–1.7 times longer than second abscissa. First abscissa of mediocubital vein 1.6–1.8 times longer than second abscissa.

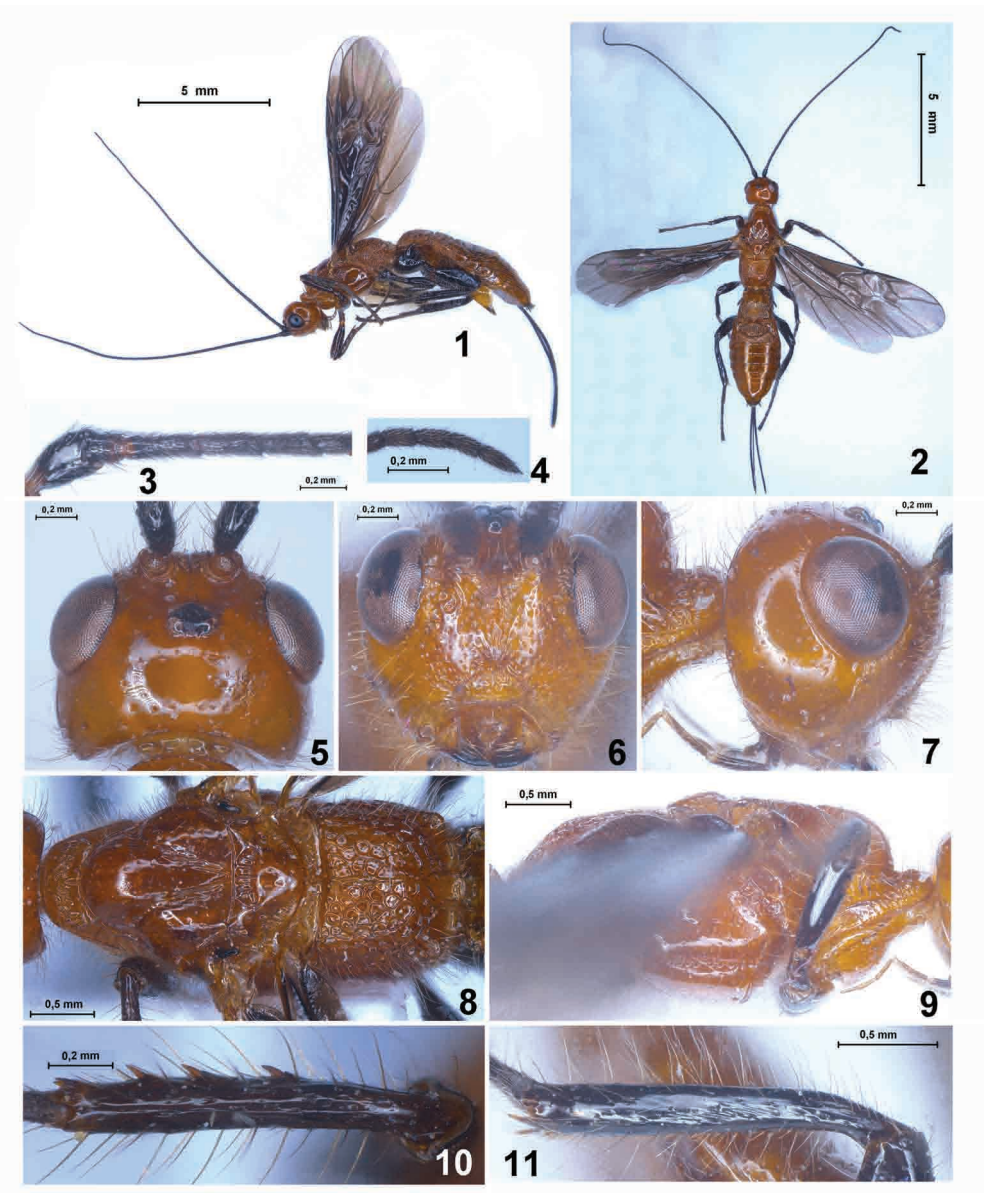
Legs. Hind femur 2.5–2.8 times longer than its maximum width. Hind tarsus about 0.9 times as long as hind tibia. Hind basitarsus half as long as second-fifth segments combined. Second segment of hind tarsus about 0.7 times as long as basitarsus, 1.3–1.4 times longer than fifth segment (without pretarsus).

Metasoma. First tergite with small spiracular tubercles in basal 0.3, with wide, distinct and curvedly-oblique apico-lateral depression, strongly widened basally, then weakly and almost linearly widened from dorsope level to apex. Length of first tergite 0.8–1.0 times its maximum width; maximum width 1.2–1.4 times its width at level of dorsope. Second tergite with deep antero-lateral oblique depressions and with two sublateral and almost longitudinal depressions, with large, convex, and oval median area; median length of tergite 0.45–0.50 times its basal width, 1.0–1.2 times median length of third tergite. Suture between second and third tergites deep, with distinct lateral bends. Ovipositor sheath 0.6–0.7 times as long as metasoma, 0.9–1.2 times as long as mesosoma, 0.5–0.6 times as long as fore wing.

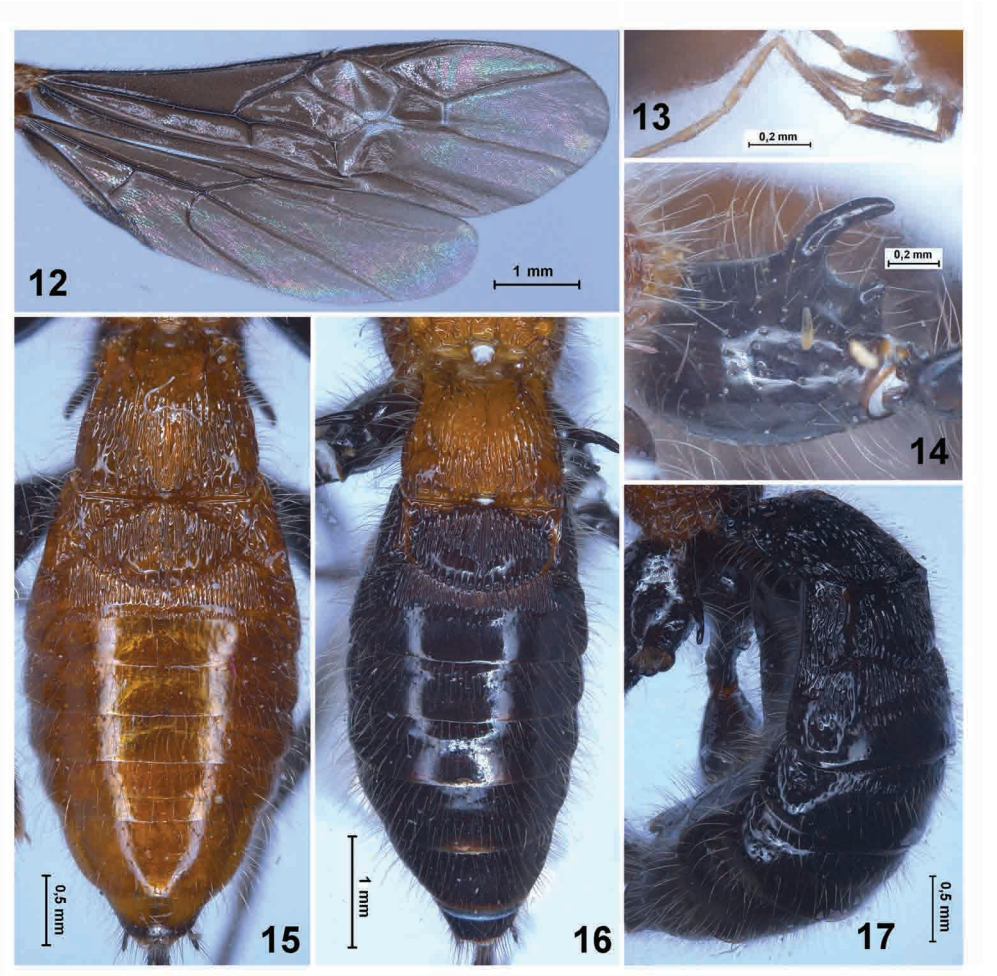
Sculpture and pubescence. Head smooth, face more or less distinctly and usually sparsely punctate or reticulate-punctate. Pronotum dorsally coarsely reticulate-rugose. Mesonotum and mesopleuron smooth, mesoscutum medio-posteriorly striate or at least with two striae, its median lobe sparsely and deeply punctate. Propodeum coarsely and largely areolate, smooth inside areolae, without delineated areas, usually with dorsal basal carina. Hind coxae dorsally rugose-punctate. First tergite (except its rugulose-reticulate mediobasal area), second tergite in basal area and third in basal half distinctly striate, second tergite laterally rugose-areolate. Sometimes third tergite basally and submedially narrow smooth, rarely entirely smooth. Rarely fourth tergite basally shortly striate. Remaining tergites always smooth. Body almost entirely with rather dense, long and erect setae. Hind tibia with long, rather dense and erect setae, length of setae on its dorsal surface 1.0–1.5 times maximum width of hind tibia.

Colour. Head and mesosoma light reddish brown, head sometimes yellowish brown; rarely propodeum and metapleuron dark reddish brown. Metasoma dark reddish brown to black, sometimes first and second tergites light reddish brown basally and along depressions, often metasoma entirely light reddish brown (Figs 15–17). Antennae entirely black. Palps dark reddish brown to black. Legs dark reddish brown to black, often fore coxae light reddish brown, but dark ventrally. Anterior (long) process of hind coxa sometimes more or less pale in apical 0.3–0.5. Fore wing strongly darkened, paler distally. Pterostigma black.

Male. Body length 4.3–11.8 mm; fore wing length 2.9–7.7 mm. Length of temple 0.9–1.0 times transverse diameter of eye. Antennae 36–55-segmented. Metasoma slender. First metasomal tergite 1.0–1.1 times as long as apical width. Length of sec-




**Figs 1–11.** *Zombrus bicolor*. **1**, habitus, lateral view; **2**, habitus, dorsal view; **3**, basal segments of antenna; **4**, apical segments of antenna; **5**, head, dorsal view; **6**, head, front view; **7**, head, lateral view; **8**, mesosoma, dorsal view; **9**, mesosoma, lateral view; **10**, fore tibia, dorsal view; **11**, hind tibia, lateral view.




**Figs 12–17.** *Zombrus bicolor*. **12**, fore and hind wings; **13**, palpi; **14**, hind coxa, lateral view; **15, 16**, metasoma, dorsal view; **17**, metasoma, dorsal-lateral view.

ond tergite 0.50–0.55 times its basal width. Second suture with less distinct lateral bends, in small specimens bends almost absent. Third tergite in basal 0.5–0.8, fourth in basal 0.3–0.5, usually fifth in basal 0.2–0.5, and often sixth basally striate. Sometimes propodeum and metapleuron reddish brown or dark reddish brown and fore coxa black; rarely (in serial material) metasoma reddish brown, with dark reddish brown narrow basal and apical parts. Otherwise similar to female.

***Biology***. Ectoparasitoids of *Allotraeus sphaerioninus* Bates, 1877, *Chlorophorus annularis* (Fabricius, 1787), *Ch. japonicus* (Chevrolat, 1863), *Dere thoracica* White, 1855, *Hesperophanes campestris* (Falderman, 1835), *Xylotrechus namanganensis* Heydel, 1885, and *X. pyrrhoderus* Bates, 1873 (Cerambycidae) (Yu et al., 2005; Belokobylskij & Maeto, 2009).

***Distribution***. Russia [South-East of the European part (**first record**), South of the Far East], Kazakhstan (**first record**), Kyrgyzstan, Mongolia, China, Korean Peninsula, Japan.

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## REFERENCES

**Belokobylskij S.A.** 1992. On the classification and phylogeny of the braconide wasps of subfamilies Doryctinae and Exothecinae (Hymenoptera, Braconidae). Part I. On the classification, 1. *Entomologicheskoye Obozreniye*, **71**(4): 900–928.

**Belokobylskij S.A.** 1994. A review of braconide wasps of subfamilies Doryctinae and Exothecinae (Hymenoptera, Braconidae) of the Far East, East Siberia and neighbouring territories. *Trudy Zapovednika "Daursky"*, Kiev, **3**: 5–77.

**Belokobylskij S.A.** 1998. Subfam. Doryctinae. *In*: **Lehr P.A.** (ed.). Key to Insects of the Russian Far East. Neuropteroidea, Mecoptera, Hymenoptera. Vladivostok: Dal'nauka, **4**(3): 50–109. (In Russian).

**Belokobylskij S.A. & Maeto K.** 2009. Doryctinae (Hymenoptera, Braconidae) of Japan. (Fauna mundi. Vol. 1). Warszawa: Warshawska Drukarnia Naukowa. 806 p.

**Cameron P.** 1905a. On the phytophagous and parasitic Hymenoptera collected by Mr. E. Ernest Green in Ceylon. *Spolia zeylanica*, **3**: 67–97.

**Cameron P.** 1905b. A third contribution to the knowledge of the Hymenoptera of Sarawak. *Journal of the Straits Branch of the Royal Asiatic Society*, **44**: 93–168.

**Dalla Torre C. G.** 1898. Nomenclatorisches über Braconiden–Gattungen. *Wiener Entomologische Zeitung*, **17**: 99–100.

**Enderlein G.** 1912. Zur Kenntnis der Spathiinen und einiger verwandter Gruppen. *Archiv für Naturgeschichte* (A), **78**(2): 1–37.

**Fahringer J.** 1928. Braconidae p.p. Aethiopische Region. *Opuscula Braconologica*, **1**(1–3): 1–224.

**Fahringer J.** 1929. Beiträge zur Kenntnis der Braconiden-Fauna Chinas. *Entomologisk Tidskrift*, **50**: 82–88.

**Fischer M.** 1980. Taxonomische Untersuchungen uber Doryctinae aus der *Odontobracon*-Verwandtschaft (Hymenoptera, Braconidae). *Annales Naturhistorische Museum Wien*, **83**: 547–572.

**Fischer M.** 1981. Versuch einer systematischen Gliederung der Doryctinae, insbesondere der Doryctini, und Redescriptionen nach Material aus dem Naturwissenschaftlichen Museum in Budapest (Hymenoptera, Braconidae). *Polskie Pismo Entomologiczne*, **51**: 41–99.

**Fischer M.** 1983. Illustrierte Redescription von Arten aus den Gattungen *Zombrus* Marshall, *Nervellius* Roman und *Liodoryctes* Szépligeti (Hymenoptera, Braconidae, Doryctinae). *Polskie Pismo Entomologiczne*, **53**: 311–336.

**Granger C.** 1949. Braconides de Madagascar. *Memoires de l'Institut Scientifique de Madagascar, Seria A, Biologie Animale*, **2:** 1–428.

**Kriechbaumer J.** 1894. Hymenoptera Ichneumonidea a medico nautico Dr. Joh. Brouns in itinere ad oras Africae occidentalis lecta. *Berliner Entomologische Zeitschrift*, **39**: 43–68.

**Marsh P.** 1988. Revision of the tribe Odontobraconini in the Western Hemisphere (Hymenoptera: Braconidae: Doryctinae). *Systematic Entomology*, **13**: 443–464.

**Marshall T.A.** 1897. Les Braconides (supplement). *In*: **Andre E.** (Ed.). Species des Hyménoptères d'Europe et d'Algerie, Paris, **5bis**. 334 p.

**Shenefelt R.D. & Marsh P.M.** 1976. Hymenopterorum Catalogus. Pars 13. Braconidae 9. Doryctinae. 's-Gravenhage: Dr W. Junk: 1263–1424.

**Szépligeti G.V.** 1902. Tropische Cenocoelioniden und Braconiden aus der Sammlung des Ungarischen National-Museum. *Természetrajzi Füsetek*, **25**: 39–84.

**Szépligeti G.V.** 1906. Braconiden aus der Sammlung des ungarischen national Museums. *Annales Historico-Naturales Musei Nationalis Hungarici*, **4**: 547–618.

**Tobias V.I.** 1968. The questions of the classification and phylogeny of the fam. Braconidae (Hymenoptera). *Doklad na 20-h Ezhegodnyh Chteniiah Pamyati N.A. Kholodkovskogo [Lecture at the 20th Annual Meeting in Memory of N. A. Kholodkovsky]*: 3–43.

**Viereck H.I.** 1914. Type species of the genera of *Ichneumon* flies. *Bulletin of the United States National Museum*, **83**: 1–186.

**Yu D.S., van Achterberg C. & Horstmann K.** 2005. *World Ichneumonoidea 2004. Taxonomy, Biology, Morphology and Distribution*. CD/DVD. Taxapad, Vancouver, Canada. www.taxapad.com.

**Zaldívar-Riverón A., Belokobylskij S.A., León-Regagnon V., Briceño R. & Quicke D.L.J.** 2008. Molecular phylogeny and historical biogeography of the cosmopolitan parasitic wasp subfamily Doryctinae (Hymenoptera: Braconidae). *Invertebrate Systematic*, **22**: 345–363.

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