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Palaeartic species of the *Spathius exarator* species group (Hymenoptera: Braconidae: Doryctinae) with entirely sculptured mesopleuron

SERGEY A. BELOKOBYSKIY^{1,2} & KONSTANTIN G. SAMARTSEV¹

¹Zoological Institute, Russian Academy of Sciences, St Petersburg 199034, Russia. E-mail: doryctes@gmail.com

²Museum and Institute of Zoology PAN, Wilcza 64, 00-679 Warsaw, Poland

Abstract

The Palaeartic species of the *S. exarator* species group of the genus *Spathius* Nees with entirely sculptured mesopleuron are discussed. Four new species, *Spathius austriacus* sp. nov., *S. intercontinentalis* sp. nov., *S. pseudodentatus* sp. nov., and *S. sculptipleurum* sp. nov., are described and illustrated. *Spathius curvicaudis* Ratzeburg, 1944 treated here as junior synonym of *S. erythrocephalus* Wesmael, 1838 (syn. nov.) The key for determination of the Palaeartic species of this group with constantly or temporary sculptured mesopleuron is provided.

Key words: Hymenoptera, Braconidae, *Spathius*, ectoparasitoids, new species, key, Palaeartic region

Introduction

Spathius Nees, 1818 is the largest, polymorphic and perhaps polyphyletic genus of the subfamily Doryctinae (Belokobylskij, 2003) included approximately 400 described species mostly from the Oriental and Palaeartic regions (Nixon, 1943; Belokobylskij, 2003; Chen & Shi, 2004; Belokobylskij & Maeto, 2009). Species of this genus were arranged into almost 40 species groups, but their diagnostic characters are not always help unambiguously include species in some appropriate groups (Belokobylskij, 2003; Marsh & Strazanac, 2009). This problem became especially apprehensible after descriptions of numerous new *Spathius* taxa from the Oriental and South-East Palaeartic regions.

Spathius species are vastly known in all temperate and tropical territories of the world, but in the Neotropical region the members of this genus penetrate only in its north part (Costa Rica and Mexico: Marsh, 2002; Belokobylskij & Zaldívar-Riverón, 2014). Molecular phylogenetic study of Doryctinae (Zaldivar-Riverón *et al.*, 2008) clarified that former tribe Spathiini (*sensu* Belokobylskij, 1992) is polyphyletic and members of this tribe (including *Spathius* and *Notiospathius*, among other genera) were distinctly separated on the Old World and New World phylogenetic clades.

Most of the *Spathius* species are idiobiont ectoparasitoids of the xylophagous larvae of several Coleoptera families, particularly Anobiidae, Bostrichidae, Buprestidae, Cerambycidae and Curculionidae (mainly Scolytinae). Members of *Spathius* have also been reared from the concealed-living larvae of Lepidoptera (Pyalidae, Sesiidae, Tineidae and Tortricidae) and Hymenoptera (Xiphidriidae) (Shenefelt & Marsh, 1976; Belokobylskij, 1992, 2003; Yu *et al.*, 2012).

In this paper, we review the Palaeartic *Spathius exarator* species group having entirely or almost entirely sculptured (striate, rugose-striate or reticulate-rugose) mesopleura of mesosoma. Interestingly, the most part of Nearctic species of *Spathius* belonging to at least two species groups have entirely sculptured mesopleura in different level of spreading (Marsh & Strazanac, 2009). In the Palaeartic fauna, *S. dentatus* Telenga, 1941, *S. fukushimus* Belokobylskij et Maeto, 2009, *S. lehri* Belokobylskij, 1998 and *S. paramoenus* Belokobylskij et Maeto, 2009 from the *S. exarator* species group characterize such peculiar condition of the mesopleura. It is necessary to mention that some specimens of *S. exarator* (Linnaeus, 1758), *S. rubidus* (Rossi, 1794) and *S. erythrocephalus* Wesmael, 1838 (*S. curvicaudis* Ratzeburg, 1844, **syn. nov.**) also have sculpturing on almost all surfaces of mesopleura, but these species are mainly characterized by this sclerite being predominantly smooth.

9. Palpi entirely or almost entirely dark reddish brown. Trochanters and trochantelli white or whitish yellow, distinctly contrasted with coxae and femora. Fore wing strongly darkened. Second radial abscissa usually distinctly shorter than first radiomedial vein. Ovipositor upcurved. Body length 2.0–4.0 mm—Western Europe *S. erythrocephalus* Wesmael (= *S. curvivcaudis* Ratzeburg) (some specimens)
- Palpi entirely or almost entirely light reddish brown or yellowish brown (Figs 21, 57). Trochanters and trochantelli yellow or brownish yellow, not or weakly contrasted with coxae and femora (Figs 17, 52, 64). Fore wing faintly darkened (Figs 27, 62). Second radial abscissa usually not or weakly shorter than first radiomedial vein (Figs 28, 62). Ovipositor almost straight. . 10
10. Vertex entirely strongly transverse striate. Mesoscutum with distinct rugae near notauli and laterally. Subapical segments of antenna pale, distinctly paler than previous segments. Hind coxa whitish yellow. Dorsal surface of hind tibia with long setae. Body length 3.4–4.3 mm.—Japan (Amami, Ryukyu) *S. paramoenus* Belokobylskij et Maeto
- Vertex weakly and often incomplete transverse striate (Figs 20, 55). Mesoscutum without or only with short rugae near notauli and laterally (Figs 23, 59). Subapical segments of antenna dark, not paler than previous segments (Figs 18, 53). Hind coxa light reddish brown or reddish brown (Fig. 61) . Dorsal surface of hind tibia with short setae (Figs 25, 64) 11
11. Antennae 25–28-segmented. Pronotal keel posterior branch medially fused with posterior margin of pronotum on rather wide distance (Fig. 59). Second segment of hind tarsus 1.15–1.35 times longer than fifth segment (without pretarsus). Basal (median) carina of propodeum rather long, usually 1.1–1.8 times longer than anterior fork of propodeal areola (Fig. 59). Areola wide and rather short, usually 1.2–1.8 times longer than wide (Fig. 59). Third and following tergites smooth (Figs 67, 68). Body length 2.0–3.6 mm.—Russia (European part, South Urals), Austria, France, Spain *S. sculptipleurum* sp. nov.
- Antennae 32–36-segmented. Pronotal keel posterior branch medially not fused with posterior margin of pronotum and weakly or very weakly separated from it (Fig. 23). Second segment of hind tarsus 1.7–1.8 times longer than fifth segment (without pretarsus). Basal (median) carina of propodeum rather short, 0.7–1.0 times as long as anterior fork of propodeal areola (Figs 23, 29). Areola narrow and rather long, 1.8–2.6 times longer than wide (Figs 23, 29). Third tergite weakly and finely reticulate-coriaceous or reticulate-punctate in basal 0.5–0.7, smooth apically; sometimes fourth and rarely fifth tergites basally very weakly areolate-coriaceous or punctate-coriaceous (Figs 30, 32). Body length 3.2–5.2 mm.—Russia (Siberia, Far East), Italy *S. intercontinentalis* sp. nov.

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