

РОССИЙСКАЯ АКАДЕМИЯ НАУК
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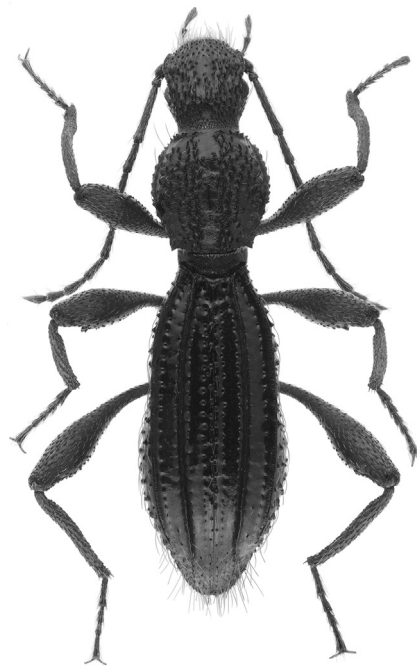


Кавказский Энтомологический Бюллетень

CAUCASIAN ENTOMOLOGICAL BULLETIN

Том 19. Вып. 2

Vol. 19. Iss. 2



Ростов-на-Дону
2023

A new species of the genus *Stepanovia* Kostjukov, 2004 (Hymenoptera: Eulophidae) from Taman Peninsula, Russia

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Abstract. A new species of the genus *Stepanovia* Kostjukov, 2004 (Hymenoptera: Eulophidae: Tetrastichinae), *S. kostjukovi* sp. n., is described from the arid steppe zone of southern coast of the Taman Peninsula (Veselovka village, Krasnodar Region). The new species is close to *S. rosae* Boyadzhiev et Todorov 2013 and *S. fructirosae* Boyadzhiev, Yefremova et Tozlu, 2017, and differs from the both latter species by the funicular segments of antenna shorter, ovipositor sheaths longer (up to twice as long as postcercal), and a combined length of ovipositor sheath and postcercal (almost equal to the length of hind tibia).

Key words: Chalcidoidea, Tetrastichinae, *Stepanovia*, parasitoids, new species, Krasnodar Region.

Новый вид рода *Stepanovia* Kostjukov, 2004 (Hymenoptera: Eulophidae) с Таманского полуострова, Россия

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Резюме. Описан новый вид рода *Stepanovia* Kostjukov, 2004 (Hymenoptera: Eulophidae, Tetrastichinae), *S. kostjukovi* sp. n. из зоны сухих степей южного побережья Таманского полуострова (поселок Веселовка, Краснодарский край). Новый вид близок к *S. rosae* Boyadzhiev et Todorov, 2013 and *S. fructirosae* Boyadzhiev, Yefremova et Tozlu, 2017, от которых отличается более короткими члениками жгутика усика, длинными ножами яйцеклада, которые вдвое длиннее расстояния от пигостилей до вершины последнего тергита, а также суммарной длиной ножен яйцеклада и расстояния от пигостилей до вершины последнего тергита, которая почти равна длине задней голени.

Ключевые слова: Chalcidoidea, Tetrastichinae, *Stepanovia*, паразитоиды, новый вид, Краснодарский край.

Introduction

The eulophid genus *Stepanovia* Kostjukov, 2004 (type species *Aprostocetus aspectabilis* Kostjukov, 1995) was erected for former species of the genus *Aprostocetus* Westwood, 1833, which mainly differs from *Aprostocetus* by malar sulcus below eye with a triangular fovea extending about half length of gena, flagellar segments of antenna thickened, and the middle lobe of mesoscutum with extremely fine superficial reticulation and without median line or sometimes with weakly traceable as a smoother line.

The species of *Stepanovia* attack hosts in the galls of *Diplolepis mayri* (Schlechtendal, 1877), *D. eglanteriae* (Hartig, 1840) and *D. spinosissima* (Giraud, 1859) (Hymenoptera: Cynipidae), as well as Diptera on woody plants [Graham, 1987; Kostjukov, 2004]. Boyadzhiev and Todorov [2013] and Boyadzhiev et al. [2017] reported *Diplolepis rosae* (Linnaeus, 1758) and *D. fructuum* (Rübsaamen, 1895) as a probably hosts of *Stepanovia rosae* Boyadzhiev et Todorov, 2013 and *S. fructirosae* Boyadzhiev, Yefremova et Tozlu, 2017, respectively.

Currently, *Stepanovia* comprises ten species known from the Western Europe, the North Caucasus and Far East of Russia [Graham, 1987; Storozheva et al., 1995; Kostjukov, 2004; Kostjukov et al., 2009; Boyadzhiev and Todorov, 2013; Boyadzhiev et al., 2017; Noyes, 2019].

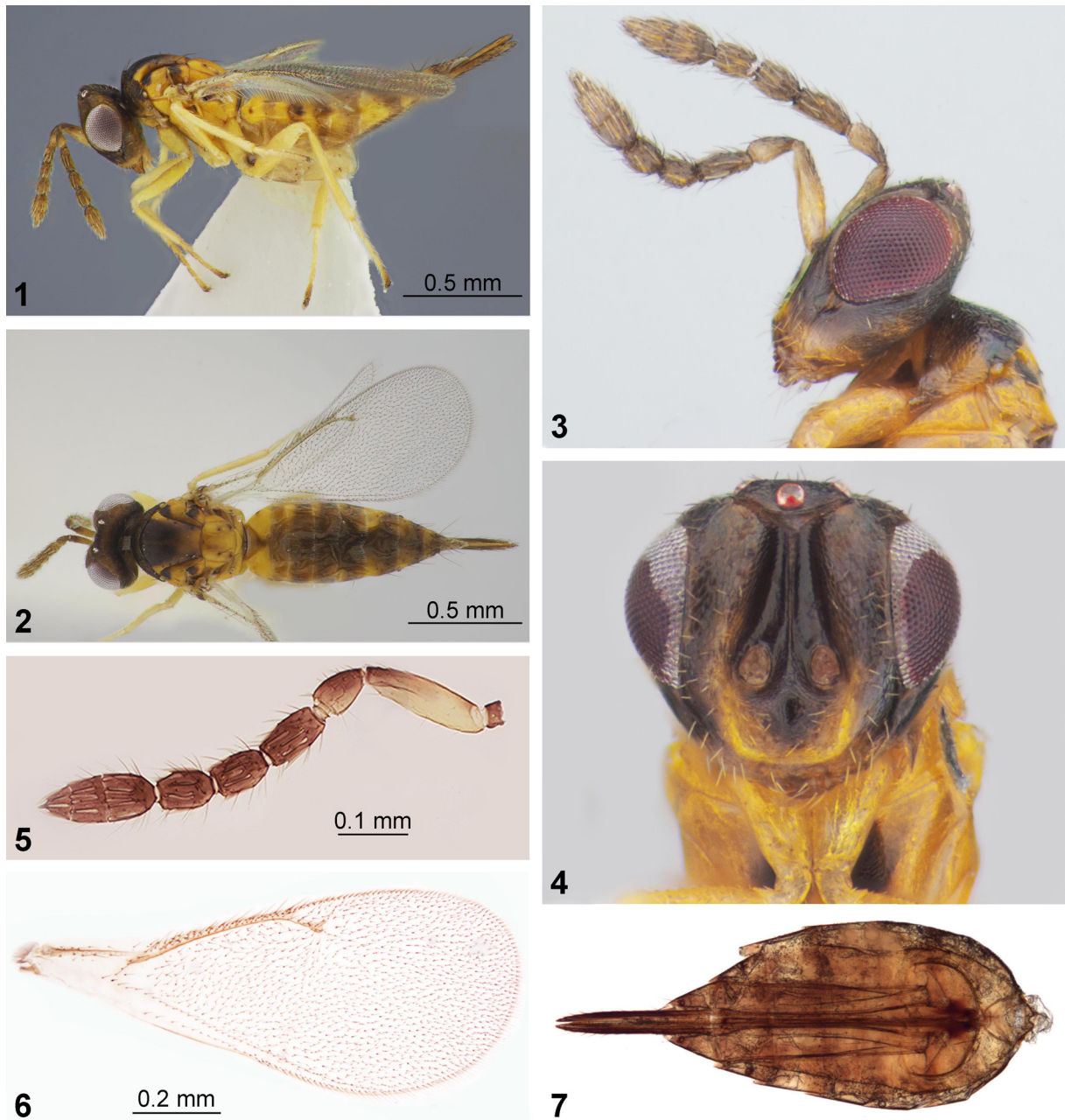
Material and methods

The type material of the new species is deposited in the collection of the Zoological Institute of the Russian Academy of Sciences (ZISP, St Petersburg, Russia).

Morphological terminology follows Graham [1987], Gibson [1997] and Storozheva et al. [1995]. Following abbreviations are used in the text: POL – posterior ocellar line, the shortest distance between the posterior ocelli; OOL – ocello-ocular line, the minimum distance between a posterior ocellus and compound eye margin; F1–F2 – funicular segments; C1–C3 – claval segments; M – marginal vein; ST – the length of the stigmal vein; PM – postmarginal vein. The pedicel is measured in lateral view.

The specimens examined were reared from the galls on *Rosa* sp. collected in dry steppe around Veselovka in Krasnodar Region of Russia, near the Black Sea coast. Parasitoid adults were preserved in 70% ethanol, then placed in 100% ethanol and air dried with HMDS. Specimens were examined using an Olympus SZ 60 microscope.

Photographs of parasitoid adults were taken with a Canon EOS 70D digital camera mounted on an Olympus SZX10 microscope (ZISP). Some parts of specimens were slide-mounted in Canada balsam and photographs of them were taken using a ZEISS SteREO Discovery.V12 modular stereo microscope and an AxioCam MRc5 camera (All-Russian Institute of Plant Protection, St Petersburg, Pushkin, Russia).



Figs 1–7. *Stepanovia kostjukovi* sp. n., female, general view and details of structure. 1–2 – habitus, holotype: 1 – lateral view; 2 – dorsal view; 3–4 – head: 3 – lateral view, 4 – front view; 5 – antenna; 6 – forewing; 7 – gaster. 3–7 – paratypes.

Рис. 1–7. *Stepanovia kostjukovi* sp. n., самка, общий вид и детали строения.

1–2 – габитус, голотип: 1 – вид сбоку; 2 – вид сверху; 3–4 – голова: 3 – вид сбоку, 4 – вид спереди; 5 – антенна; 6 – переднее крыло; 7 – брюшко. 3–7 – паратипы.

Family Eulophidae Westwood, 1829
Subfamily Tetrastichinae Foerster, 1856
Genus *Stepanovia* Kostjukov, 2004

Stepanovia kostjukovi sp. n.
 (Figs 1–12)

Material. Holotype, ♀ (ZISP): Russia, Krasnodar Region, Temryuk District, Veselovka vill., dry steppe, galls on *Rosa* sp. 23–24.07.2020, parasitoid emergence 21–22.08.2020 (O.V. Kosheleva). Paratypes: 17♀, 4♂ (ZISP), 71♀, 3♂ (in ethanol, ZISP), same label as for the holotype, but parasitoids emergence 23–24.08.2020.

Description. Female (Figs 1–7). Body length 1.38–1.9 mm. Head 1.13–1.2 times as broad as mesoscutum, 1.18–2.25 times as broad as long; temples about 0.18–0.23 times length of eyes; POL 1.43–1.57 times OOL, OOL 1.75–2 times OD. Eye 1.78–2 times as long as broad (dorsal view), eyes separated from each other 1.18–1.27 times their height (frontal view). Malar space 0.52–0.58 times height of eye, sulcus with triangular fovea extending 0.33–0.5 times length of gena. Mouth 1.33–1.38 times malar space. Antenna with scape 0.78–0.88 times height of eye, 3.3–3.75 times as long as broad, not reaching median ocellus; pedicellus plus flagellum 1.28–1.46 times breadth of mesoscutum;

pedicellus 1.4–1.8 times as long as broad (lateral view) and 0.75–0.88 times as long as F1; funicle proximally same width as pedicellus, F1–F3 = 1.6–1.8, 1.5–1.55, 1.3–1.4 times as long as broad, respectively; clava 1.33 times broader than F3, 2.3–2.5 times as long as broad, with C1 as long as broad, C2 0.67 length of C1, C3 half length of C2, spine 0.3 length of C3.

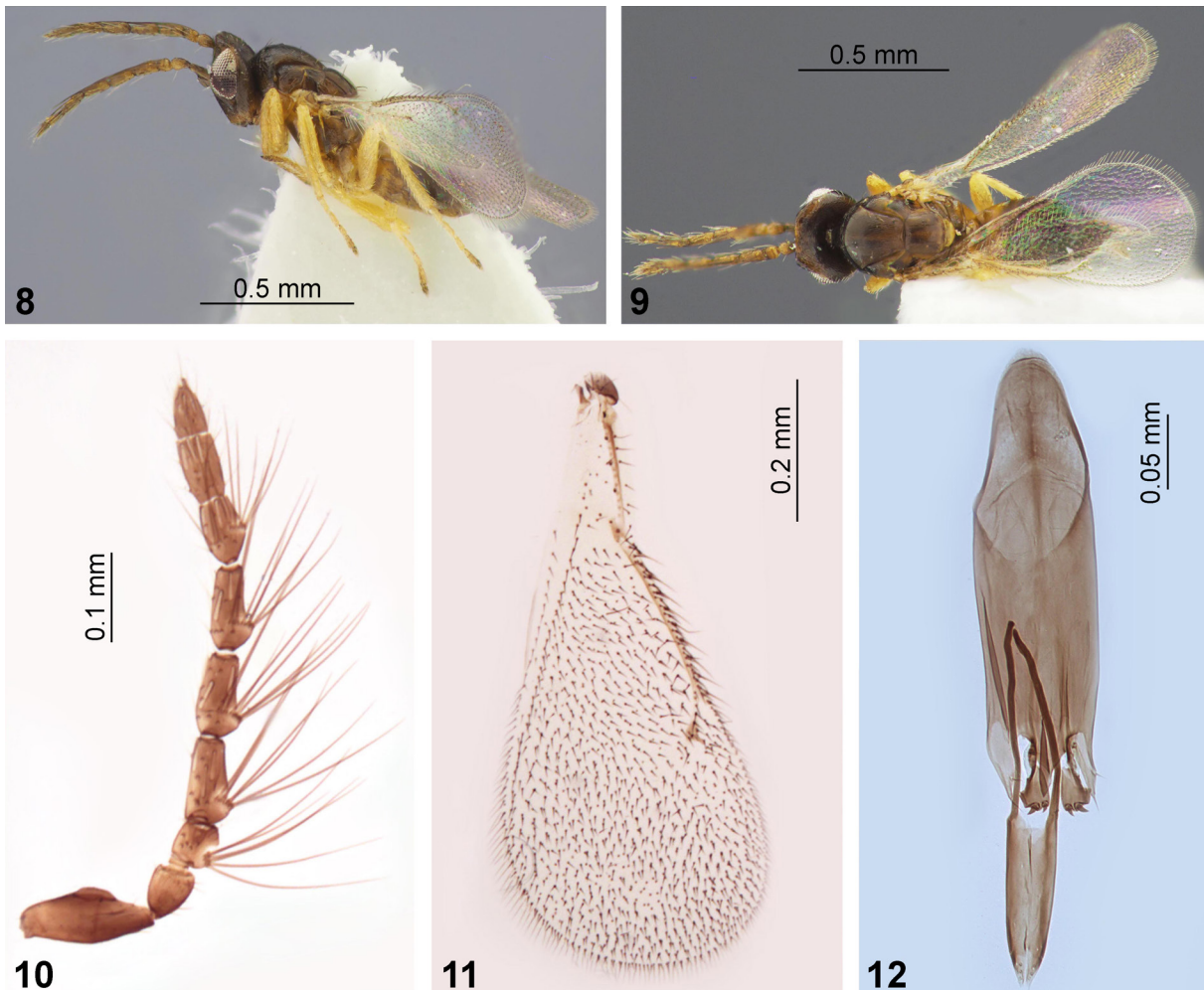
Mesosoma 1.26–1.45 times as long as broad. Pronotum 0.15–0.19 times as long as mesoscutum, with a row of setae near hind margin, they as long as scutellar setae. Mid lobe of mesoscutum 0.81–0.93 times as long as broad, not strongly convex, relatively shiny; median line absent; with 4 adnotaular setae on each side, hindmost about as long as scutellar setae. Scutellum 1.21–1.28 times as broad as long, 0.73–0.77 times as long as mesoscutum, sculptured like mesoscutum but more finely and with shorter areoles; submedian lines equidistant from each other and from sublateral lines, enclosing a space 2.7–3.2 times as long as broad; anterior and posterior setae about subequal in length, slightly greater than distance between submedian lines. Dorsellum 2.3–3 times as broad as long. Propodeum medially 0.80–1 times as long as dorsellum; median carina thin; callus with 2 setae. Legs. Hind coxae 1.77–1.83 times as long as broad; hind femora 4 times as long as broad; spur of mid tibia about as long as basitarsus. Forewing 2.34–2.44 times as long as broad; costal cell slightly shorter than M, SM with 4–5 dorsal setae; M 3.8–4 times

longer than ST; PM with distinct stub, speculum small, hardly extending M, closed below; cilia 0.33 times length of ST. Hindwing obtuse, cilia 0.29–0.36 times breadth of wing.

Metasoma. Gaster elongated, apically pointed, 2.2–2.3 times as long as mesosoma, 1.64–1.89 times as long as head plus mesosoma, 3.5–3.9 times as long as broad; last tergite 1.3–1.5 times as long as broad; ovipositor sheaths plus postcercalae 0.78–0.85 times length of hind tibia, ovipositor sheaths 1.2–2 times length of postcercalae; longest setae of each cercus 1.63–1.88 times length of next longest seta, slightly sinuate.

Colour. Body yellow or brownish, without metallic tinge. Head brownish with yellowish U-shaped pattern. Antenna with scape yellow, dorsal margin light brown; flagellum light brown to yellow. Mesosoma generally yellow, except pronotum and whole or anterior part of mesoscutum brown. Gaster yellow or brownish, with yellow to light brown transverse stripes, ovipositor sheaths dark brown. Legs pale yellow, with apices of tarsi darker. Wings hyaline with venation whitish.

Male (Figs 8–12). Body length 1.15–1.2 mm. Head 1.15–1.2 times as broad as mesoscutum, 2.24–2.39 times as broad as long; temples 0.08–0.15 times length of eyes; POL 2–2.2 times OOL, OOL 1.25–1.66 times OD. Eyes (dorsal view) 1.75–1.88 times as long as broad, separated by 1.35–1.47 times their height. Malar space 0.59–0.67 height of eye, sulcus with triangular fovea



Figs 8–12. *Stepanovia kostjukovi* sp. n., male, paratypes, general view and details of structure.

8–9 – habitus: 8 – lateral view, 9 – dorsal view; 10 – antenna; 11 – forewing; 12 – genitalia.

Рис. 8–12. *Stepanovia kostjukovi* sp. n., самец, паратипы, общий вид и детали строения.

8–9 – габитус (паратип): 8 – вид сбоку, 9 – вид сверху; 10 – антенна; 11 – переднее крыло; 12 – гениталии.

Table 1. Distinctive features of females of *Stepanovia kostjukovi* sp. n., *S. rosae* and *S. fructirosae*.
Таблица 1. Отличительные признаки самок *Stepanovia kostjukovi* sp. n., *S. rosae* и *S. fructirosae*.

Morphological character Морфологический признак	<i>S. rosae</i>	<i>S. fructirosae</i>	<i>S. kostjukovi</i> sp. n.
POL / OOL ratio Отношение постоцеллярной линии к окулооцеллярной	1.31–1.43	1.31–1.44	1.43–1.57
Pedicle length / breadth ratio (lateral view) Отношение длины и ширины поворотного членика (вид сбоку)	1.81–1.84	1.8–2	1.4–1.8
Pedicle plus flagellum / breadth of mesoscutum ratio / Отношение поворотного членика и флагеллума, вместе взятых, к ширине среднеспинки	1.18–1.29	1.08–1.17	1.28–1.46
F1 length / breadth ratio Отношение длины F1 к его ширине	2.13–2.36	2–2.22	1.6–1.8
F2 length / breadth ratio Отношение длины F2 к его ширине	1.56–1.69	1.72–2.22	1.5–1.55
F3 length / breadth ratio Отношение длины F3 к его ширине	1.3–1.53	1.8–2	1.3–1.4
Clava length / breadth ratio Отношение длины булавы к ее ширине	2.14–2.4	2.43–3.11	2.3–2.5
Gaster length / breadth ratio Отношение длины брюшка к его ширине	2.8–4	2.43–2.73	3.5–3.9
Last tergite of gaster length / breadth ratio Отношение длины последнего тергита брюшка к его ширине	1.15–1.21	0.98–1.15	1.3–1.5
Ovipositor sheaths plus postcercal / length of hind tibia ratio / Отношение суммарной длины ножен яйцеклада и расстояния от пигостилей до вершины последнего тергита брюшка к длине задней голени	0.66–0.69	0.49–0.54	0.78–0.85
Ovipositor sheaths / length of postcercal ratio / Отношение длины ножен яйцеклада к расстоянию от пигостилей до вершины последнего тергита брюшка	1–1.14	0.51–0.69	1.2–2
Colour Окраска	Head and mesosoma black, gaster brownish / Голова и мезосома черные, брюшко коричневатое	Body black or brownish / Тело черное или коричневатое	Body yellow or brownish / Тело желтое или коричневатое

extending 0.3–0.4 length of gena. Mouth 1.1–1.36 times malar space. Antenna with scape 0.91–0.93 times height of eye, 2.33–2.6 times as long as broad, with ventral plaque 0.31–0.38 times length of scape; pedicle plus flagellum 1.95–2.03 times breadth of mesoscutum; pedicle 1.2–1.25 times as long as broad and 1.2–1.25 times as long as F1; F1 1.2–1.38 times, F2 to F4 2 times as long as broad; clava as broad as F4, as long as F3 + F4, 4.2–4.5 times as long as broad, C1 as long as C2, 1.6 and 2 times as long as broad, respectively, terminal spine 0.24 times length of C3, apical setae 3 times as long as terminal spine.

Mesosoma 1.38–1.59 times as long as broad. Pronotum 0.16–0.2 times as long as mesoscutum. Midlobe of mesoscutum 0.84–0.93 times as long as broad. Dorsellum 2.2–2.5 times as broad as long. Propodeum medially 1.2–1.25 times as long as dorsellum. Scutellum 1.21–1.33 times as broad as long, 0.63–0.71 times as long as mesoscutum. Forewing 2.16–2.22 times as long as broad; SM with 3–4 dorsal setae; M 3.57–3.84 times length of ST; cilia 0.57 times length of ST.

Metasoma. Gaster 0.97–1.12 times as long as mesosoma, 0.75–0.8 times as long as head plus mesosoma, twice as long as broad. Genitalia, see Fig. 12.

Colour. Body brownish, without metallic tinge. Antenna with scape brown; flagellum light brown to yellow. Mesosoma generally brown, except dorsellum pale yellow. Gaster brownish, basally yellowish. Legs pale yellow or hind coxae slightly darkened.

Differential diagnosis. The main morphological differences between *S. kostjukovi* sp. n., *S. rosae* and *S. fructirosae* are given in the Table 1.

Distribution. Russia (Krasnodar Region, Taman Peninsula).

Hosts. Unknown. Associated with gall wasps (Hymenoptera, Cynipidae) on *Rosa* sp.

Etymology. This species is named in honour of Viktor V. Kostjukov (Moscow, Russia), a Russian entomologist and expert on the eulophid wasps of the subfamily Tetrastichinae.

Acknowledgements

I am grateful to Dr Igor Ya. Grichanov (All-Russian Institute of Plant Protection, St Petersburg, Pushkin, Russia) who kindly revised an early draft of this manuscript, anonymous reviewer and Dr Sergey A. Belokobylskij (ZISP) provided helpful suggestions improved the text.

The work was funded by All-Russian Institute of Plant Protection, Project No. FGEU-2022-0002.

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Received / Поступила: 4.08.2023

Accepted / Принята: 19.09.2023

Published online / Опубликована онлайн: 3.10.2023