

Description and karyotype of a new species of *Stepanovia* Kostjukov, 2004 (Hymenoptera: Eulophidae)

Описание и кариотип нового вида рода *Stepanovia* Kostjukov, 2004 (Hymenoptera: Eulophidae)

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KEY WORDS: Hymenoptera, Eulophidae, *Stepanovia*, new species, karyotype.

КЛЮЧЕВЫЕ СЛОВА: Hymenoptera, Eulophidae, *Stepanovia*, новый вид, кариотип.

ABSTRACT. A new species of parasitic wasps of the family Eulophidae, *Stepanovia kubanica* Kostjukov, **sp.n.** reared from *Diplolepis* galls in the Krasnodar Territory (Russia) is described. This species is morphologically close to *S. eurytomae* (Nees).

РЕЗЮМЕ. Описан новый вид наездников-эвлофид *Stepanovia kubanica* Kostjukov, **sp.n.**, выведенный из галлов *Diplolepis* spp. в Краснодарском крае. Вид морфологически близок к *S. eurytomae* (Nees).

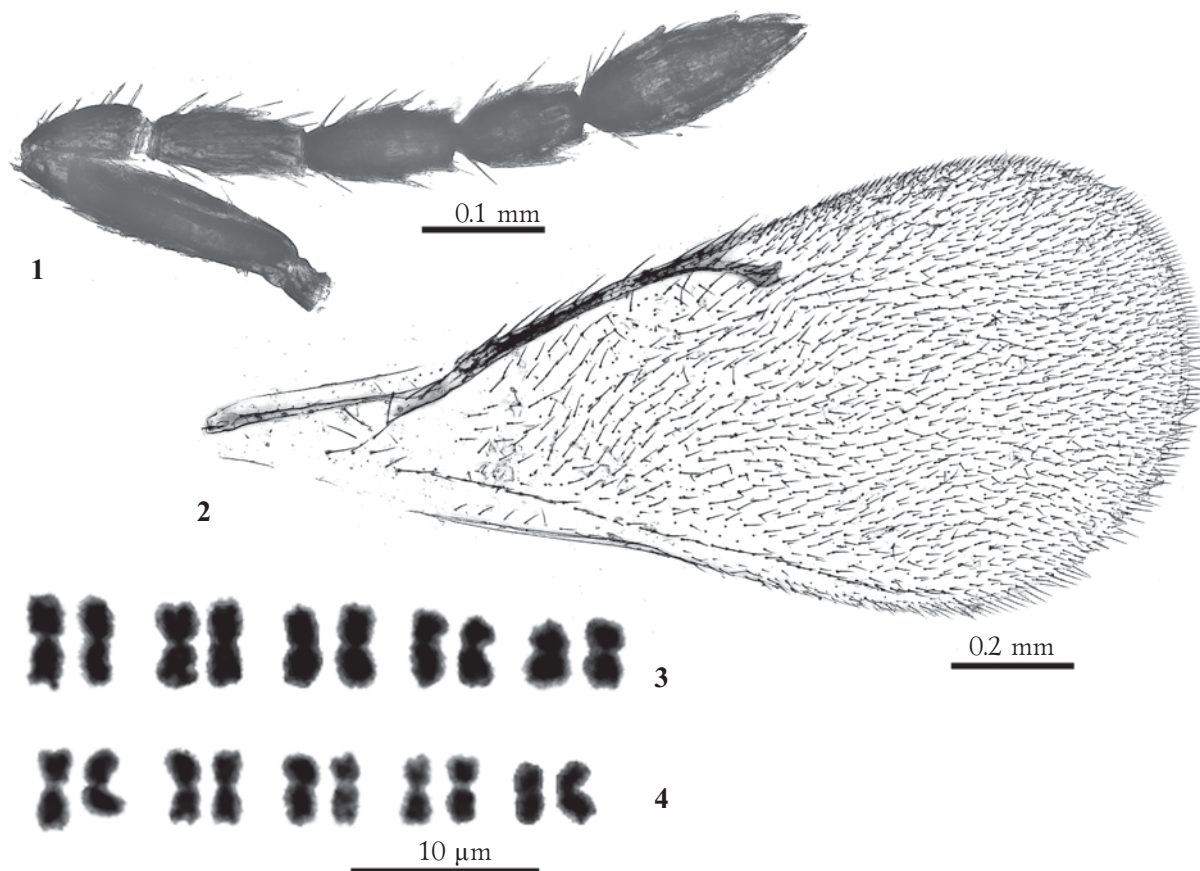
The genus *Stepanovia* Kostjukov, 2004 was erected a few years ago for a species group of the genus *Aprostocetus* Westwood, 1833 that differs from all other genera of *Aprostocetus* s.l. in the specific structure of the head and its appendages as well as in the host range [Kostjukov, 2004]. A new species that belongs to this genus was recently reared from insect galls. The description of external morphology and karyotype of this species is given below. Chromosome preparations were obtained from ovaries of adults using standard technique for studying chromosomes in adult females of parasitic wasps [Gokhman & Quicke, 1995]. Cell divisions were studied and photographed using the optic microscope Zeiss Axioskop 40 FL fitted with the digital camera AxioCam MRc. To obtain karyograms, the resulting images were processed with the image analysis program AxioVision version 3.1 and Adobe Photoshop version 8.0. Chromosomes were classified according to the works by Levan et al. [1964] and Imai et al. [1977].

Following abbreviations are used in the text: C₁–C₃ — claval segments 1–3, F₁–F₄ — funicular segments 1–4, OD — major diameter of lateral ocellus, OOL — oculo-ocellar length (shortest distance between lateral ocellus and eye margin), POL — postero-ocellar length (shortest distance between lateral ocelli), M — marginal vein, SM — submarginal vein, ST — stigmal vein; 2n — diploid chromosome number, NF — arm number.

Stepanovia kubanica Kostjukov, **sp.n.**

MATERIAL. Holotype: ♀, Krasnodar, All-Russian Research Institute for Biological Plant Protection, 16.V 2006 (Kostjukov). Paratypes: 11 ♀♀ and 3 ♂♂, same location and collector as in holotype, 14–20.V.2006. The holotype and most paratypes are deposited in the Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia; three female paratypes are deposited in the Zoological Museum, Moscow State University, Moscow, Russia.

DESCRIPTION. Female. Head 2.25–2.35 x as broad as long, 1.1–1.2 x as broad as mesoscutum, POL 1.05–1.15 OOL, OOL 1.8–2.0 OD. Eyes 1.25–1.35 x as long as broad, distance between them slightly exceeds their length. Malar space 0.5 eye length, sulcus with triangular fovea, 0.3–0.35 length of gena. Mouth 1.2–1.25 malar space. Face near malar sulcus with several large punctures. Length of setae on vertex nearly equals OD. Antenna (Fig. 1) with scape more or less distinctly reaching median ocellus, 0.8–0.9 eye length. Pedicel 2.05–2.4 x as long as broad, slightly shorter than or as long as F₁, funicle slightly stouter than pedicel, its segments decrease in length, F₁ 2.1–2.6 x, F₂ 1.7–1.9 x, F₃ 1.25–1.6 x as long as broad. Clava somewhat broader than F₃, 2.7–2.9 x as long as broad, about as long as F₂ + F₃, with C₁ as long as broad, C₂ hardly shorter than C₁, C₃ shorter than C₂, spine about 0.25 length of C₃; apical setae slightly shorter than spine, sensilla not quite numerous, irregularly uniseriate or partly biseriate on proximal segments of funicle, moderately long, decumbent. Thorax 1.4–1.5 x as long as broad, propodeal slope about 50°. Pronotum short, crescentic, with row of setae near hind margin, setae nearly as long as scutellar ones. Mid lobe of mesoscutum 1.05–1.15 x as broad as long, median line absent or hardly traceable, with 3–5 adnotaular setae, hindmost as long as scutellar setae, with extremely fine superficial reticulation (its areoles 3–4 x as long as broad). Scutellum 1.1–1.2 x as long as broad, 0.65–0.75 as long as mesoscutum, submedian lines approximately equidistant from each other and lateral lines, slightly diverging caudad, enclosing space 2.7–3.1 x as long as broad, setae subequal, their length slightly exceeds distance between submedian lines, anterior pair of setae slightly before or in the middle of scutellum, sculpture of scutellum is like that of mesoscutum, but more fine and with shorter areoles. Dorsellum 2.0–2.2 x as broad as



Figs 1–4. Morphology and karyotype of females of the genus *Stepanovia*: 1 — *S. kubanica*, sp.n.; 4 — *S. eurytomae*; 1 — antenna; 2 — forewing; 3–4 — karyogram.

Рис. 1–4. Морфология и кариотип самок рода *Stepanovia*: 1 — *S. kubanica*, sp.n.; 4 — *S. eurytomae*; 1 — антенна; 2 — переднее крыло; 3–4 — кариограмма.

long, its hind edge curved. Propodeum medially about as long as dorsellum, with fine and very slightly raised reticulation, median carina shining and sharp, callus with 2–3 setae. Forewing (Fig. 2) 2.2–2.3 x as long as broad, reaching tip of ovipositor sheaths or hardly extending beyond them; coastal cell shorter than M, 9–12 x as long as broad, with row of setae on its lower surface sparse, often broken medially, SM with 3–5 dorsal setae, M 3.8–4.1 x longer than ST, its front edge with 10–17 setae, ST at about 50e, proximally thin, but with distinct stigma; PM with distinct stub; speculum of moderate size, hardly extending M; cilia 0.15–0.3 length of ST. Hindwing obtuse, cilia 0.2–0.4 wing breadth. Legs of medium length, hind coxae about twice as long as broad, oblique, with hind edge curved, hind femora about 4 x as long as broad, spur of mid tibia about 0.7 length of basitarsus, 4th tarsomere shorter than basitarsus. Gaster 2.1–2.5 x as long as broad, distinctly longer than head plus thorax, as broad as thorax, last tergite 1.3–1.4 x as long as broad; ovipositor sheaths plus postcercalae 0.4–0.6 length of hind tibia, sheaths 0.5–0.6 length of postcercalae; longest setae of each cercus about 1.7 length of next longest setae, slightly sinuate.

Body black, sometimes with extremely weak bluish tinge, with following parts yellow or yellowish: mouth edge, genae (entirely or in their lower part), face and frons (entirely or laterally), vertex, anterior angle and posterior part of mid lobe

of mesoscutum. Antennal scape and pedicel black, sometimes testaceous basally, flagellum black. Legs yellow, coxae black basally, fore tarsi and most segments of mid and hind tarsi blackish. Tegulae yellow or yellowish, darker apically. Wings hyaline, venation brownish.

Body length 2.1–2.4 mm.

Male. Differs from female as follows. Head 1.25–1.3 x as broad as mesoscutum. POL 1.1 OOL. Antenna with scape 2.7–3.0 x as long as broad, its ventral plaque 0.3–0.4 length of scape, situated only in its upper half. Length of pedicel plus flagellum 1.7 x breadth of mesoscutum; pedicel twice as long as broad, slightly longer than F_1 ; funicle slightly stouter proximally than pedicel, filiform or slightly tapering distad; F_1 hardly longer than half F_2 , 1.2 x as long as broad, remaining segments subequal in length, 2.2–2.3 x as long as broad. Clava 5.1 x as long as broad, longer than $F_3 + F_4$. Submedian lines of scutellum come rather close together. Gaster elliptic, as long as thorax but narrower than that.

Body black, coxae black, legs otherwise yellow, femora more or less infuscate proximally.

Body length 1.0–1.1 mm.

DISTRIBUTION. Russia (Krasnodar Territory).

BIOLOGY. All studied specimens were reared from galls of gallwasps of the genus *Diplolepis* Geoffroy, 1762 on *Rosa* spp.

KARYOTYPE. Mitotic chromosome set of *Stepanovia kubanica*, **sp.n.** was studied (Fig. 3). $2n = 10$ and $NF = 20$ were found in this species. All chromosomes are metacentric and gradually decrease in length. A closely related species, *Stepanovia eurytomae* (Nees, 1834) that was collected together with the aforementioned one, also has a similar karyotype (Fig. 4).

DIFFERENTIAL DIAGNOSIS. *Stepanovia kubanica*, **sp.n.** is closely related to *S. eurytomae*, from which it differs in certain morphological features (Table).

NOTES. Species of *Stepanovia* that attack hosts in galls of *Diplolepis* spp. include not only *Stepanovia kubanica*, **sp.n.** and *S. eurytomae*, but also *S. aurantiaca* (Ratzeburg, 1852) and *S. avetjanae* (Kostjukov, 1978) [Kostjukov, 1978; Graham, 1987]. Since diploid karyotypes of Eulophidae (including Tetrastichinae) that contain five pairs of large biarmed chromosomes and a pair of small subtelo-/acrocentrics ($2n = 12$) represent the plesiomorphic condition, all chromosome sets with $2n = 10$ that were also found e.g. in some species of *Aprostocetus* s.str. and *Melittobia* are obviously apomorphic [Gokhman, 2005].

Table 1. Distinction features of females of *Stepanovia kubanica*, **sp.n.** and *S. eurytomae* (Nees)
Таблица 1. Отличительные признаки самок *Stepanovia kubanica*, **sp.n.** и *S. eurytomae* (Nees)

<i>Stepanovia kubanica</i> , sp.n.	<i>S. eurytomae</i> (Nees)
POL:OOL — 1.05–1.15.	POL:OOL — about 1.5.
OOL:OD — 1.75–2.1.	OOL:OD — 1.5.
Scape reaching median ocellus.	Scape not reaching median ocellus.
Vertex yellow or yellowish.	Vertex black.
Tegulae yellow or yellowish.	Tegulae testaceous, brown or black.
Gaster entirely black.	Gaster dorsally reddish at the base (sometimes up to the middle of its length), ventrally more or less yellowish.
Venation brownish or blackish.	Venation yellow or yellowish.

ACKNOWLEDGEMENT. The present study was partially supported by the grant No. 07–04–00326 from the Russian Foundation for Basic Research.

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