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A new species of *Euthycera* (Diptera: Sciomyzidae) from Kashmir

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Front cover: Male holotype of *Euthycera axei* sp. nov., lateral view, Kashmir, Gulmarg, 17.VIII–5.IX.1978 [RBINS]. © Jonas Mortelmans.

A new species of *Euthycera* (Diptera: Sciomyzidae) from Kashmir

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Abstract

Euthycera axei **sp. nov.** is described based on one male and one female. The new species differs from the congeners in the following characters: the male sternite 6 bearing two projections, the absence of a spot on the face; the trapezoid-shaped male sternite 5 with two anterior medial lobes; the hypandrium with a clear subapical process and its axe-like apical end; and the distiphallus with a hook-like tip. The new species is described from the high-altitude region of Gulmarg in Kashmir. High-resolution pictures of male and female habitus are provided, together with details of the male terminalia to facilitate identification of the new species.

Keywords: Palaearctic, snail-killing flies, taxonomy

Introduction

The world fauna of the genus *Euthycera* Latreille, 1829 is represented by 22 species and is mainly distributed throughout the Palaearctic (21 species) and Nearctic Regions (2 species). Identification of *Euthycera* remains challenging, as diagnostic characters are often variable and poorly described. Furthermore, sexual dimorphism is extreme, with females being generally larger and paler than males (e.g., ROZKOŠNÝ & KNUTSON, 2006). Reference material remains essential for identification.

For this reason, publicly accessible entomological collections are of immense value for the taxonomist, as they serve as the ultimate reference resource whilst the taxonomist is identifying specimens. Furthermore, collections often hold large numbers of unidentified material from both recent and historic campaigns, enabling the taxonomist to jump back in time. One example of such an entomologic collection is the Royal Belgian Institute of Natural Sciences (RBINS, Brussels), which holds approximately 38 million specimens (BRECKO *et al.*, 2018). It is estimated that shelf time, being the time between deposition of material and description of species, is generally 21 years (FONTAINE *et al.*, 2012). The new species of *Euthycera* here described is another example of such enormous shelf time, more than 42 years in this case.

Material & methods

From the Royal Belgian Institute of Natural Sciences, the author borrowed two unidentified specimens of *Euthycera*.

Morphological analyses and diagnoses of the specimens were performed with a Euromex NZ1903b stereomicroscope with 60x magnification. Diagnoses of the male genitalia, general measurements, and photographs of the specimens were made by the author by use of a Leica M205 stereomicroscope with a maximum of 160x magnification, at the LifeWatch Marine Observatory (Flanders Marine Institute, Ostend, Belgium). To prepare the male terminalia for examination, the authors employed a technique commonly used to study dipteran terminalia: (1) completely removing the abdomen, (2) soaking it for 10 minutes in warm KOH, (3) soaking it for 20 minutes in tap water, (4) soaking it for 10 minutes in EtOH-HCl (acidified ethanol), and finally (5) soaking it for 20 minutes in tap water. After examination, the macerated abdomen is placed in a plastic microvial containing a few drops of glycerin, and the microvial is pinned beneath the rest of the specimen.

With prior approval from the RBINS collections manager, Wouter Dekonick, we dissected one male specimen to enable examination of the terminalia. The abdomen was examined by placement in a spot plate with the depression filled with tap water. For photography, the abdomen was immobilized by placing it in a spot plate with the depression filled with glycerin.

Terminology used in this paper follows that of CUMMING & WOOD (2009).

The map is created with the open-source software R (RSTUDIOTEAM, 2019). All details on the distribution and phenology of *Euthycera* **sp. nov.** are available via ScioMapper (MORTELMANS, 2020), an online tool for visualising the distribution, phenology, bibliography, and taxonomy of snail-killing flies, with reference to the data source.

Results

Euthycera is a typical member of the tribe Tetanocerini in the subfamily Sciomyzinae. *Euthycera* can be recognized by the following combination of characters: cell Cup without triangular extension [compare to *Salticella* Robineau-Desvoidy, 1830]; pro-episternum without distinct seta above the base of forecoxa [as in all Tetanocerini]; vein A_1+CuA_2 reaching the posterior margin of wing; a reticulate pattern on the wings; anepisternum and anepimeron bare; prosternum bare; hind tibiae with one apical seta; subalar setae absent; scutellum with two pairs of setae; base of the orbital seta often, but not always, marked with a shiny, velvety black spot; lunula very wide and mostly shiny; two strong ocellar setae; interior margin of posterior coxa without setulae; postpedicel without apical tuft of hairs; two pairs of postalar setae. The male genitalia with surstyli simply pointed and rather short; the epandrium is not fused below the cerci (ROZKOŠNÝ & KNUTSON, 2006; KNUTSON & VALA, 2011; LI *et al.*, 2019). The key to the genera of Palaearctic Sciomyzidae (KNUTSON & VALA, 2011) is considered very good for use in determining genera of Sciomyzidae from the Palaearctic Region, and the generic concepts of *Euthycera* are unambiguous. A confusion with *Dichetophora* Rondani, 1868 might be possible; we therefore refer to LI *et al.* (2019), who documented the generic concepts of both genera.

Order Diptera Linnée, 1758
Superfamily Sciomyzoidea Fallén, 1820
Family Sciomyzidae Macquart, 1846
Subfamily Sciomyzinae Fallén, 1820
Tribus Tetanocerini Newman, 1834
Genus *Euthycera* Latreille, 1829

***Euthycera axei* sp. nov.**

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(Figs 1–11)

HOLOTYPE: ♂ Kashmir, Gulmarg, 2600–2800 m, 17.VIII–5.IX.1978, IG 4211 [RBINS].

PARATYPES: 1♀ Kashmir, Gulmarg, 2600–2800 m, 17.VIII–5.IX.1978, IG 34211 [RBINS].

DIAGNOSIS. *Euthycera axei* sp. nov. is closely related to *E. hrabei* Rozkošný, 1969, *E. korneyevi* Rozkošný & Knutson, 2006, *E. merzi* Rozkošný & Knutson, 2006, *E. alpina* (Mayer, 1953) and *E. stictica* (Fabricius, 1805) because male sternite 6 bears two projections. In all other species of *Euthycera*, male sternite 6 either lacks projections or has only one projection (Fig. 1). Other diagnostic characters of the new species are as follows: absence of a spot on the face; trapezoid-shaped male sternite 5 with two anterior medial lobes; the hypandrium with a clear subapical process and with an axe-like apical end; and the distiphallus with a hook-like tip.



Fig. 1. Ventral view on male postabdomen, and detailed section of sternites 5 and 6.

DESCRIPTION. MALE: Head: Ground color yellow. Eyes rounded, almost as high as wide, uniform brown. Cheek almost half the eye height. Frons entirely shiny except for pubescent frontal vittae and pubescent orbital strip. Lunule prominent, broad and shining, pale brown. Face, parafacialia, and cheeks completely with silvery white pubescence, which only reaching the level above the antennal sockets along the eye margin. Postocciput mainly shining, only dorsally and ventrally with white, silvery pubescence. Two pairs of fronto-orbital setae; indistinct black droplet-like spots present at bases of these setae, not reaching eye margin; spot somewhat more rounded around bases of anterior orbital setae, very indistinct at base of posterior orbital setae. Midfrontal strip straplike, broad, dusted dull greyish, brownish only along sides; color of midfrontal strip extending onto occipital area. Two large, black, divergent postocellar setae. Antennae relatively slender, postpedicel as long as pedicel, tapered toward apex, yellow with slightly darkened margins. Antennal arista yellow with short whitish pubescence approximately 1.5 times as long as arista itself. Pedicel yellow, with many black setulae. Face in profile nearly straight, somewhat concave only in basal third. Facial spot faintly present, very indistinct, rounded. Palpi yellow, with black setae. Proboscis yellowish brown, with mixture of yellow and black setae. One pair of inner and one pair of outer vertical setae.

Thorax: Scutum uniformly light yellowish brown, with four longitudinal dark brown stripes not reaching posterior edge of scutum; all stripes clearly separate from each other. Median stripes on scutum as wide as the light area between them. Lateral stripes somewhat wider than median stripes. Chaetotaxy: one pair of humerals, 1 pair of presuturals, 2 pairs of notopleurals, 1 pair of supraalars, 2 pair of postalars, 2 pairs of postalars, and 2 pairs of dorsocentral setae. Halteres completely yellow. Broad brownish stripe on upper pleura occupying slightly more than half of anepisternum; pleura otherwise mainly with white, dusted silvery. Anepisternum and anepimeron bare. Katepisternum bearing several black setae uniformly arranged over katepisternum surface. Scutellum with a broad, brown, posteriorly directed triangular spot in the middle; this brown spot surpassing anterior edge of scutellum and occupying the posterior

part of the scutum; apical part of scutellum slightly darker. Hind margin of scutellum with one pair of basal setae and one pair of apical setae; their bases situated outside of the brownish spot.

Wing: Brownish reticulate, with spots large and circular, rather similar in size, extending onto the alula. Veins yellowish basally, brownish apically. Four large pale spots in the costal margin between end of vein R_1 and vein R_{2+3} . Small setae on costa blackish.



Fig. 2. Male holotype, lateral view.

Legs: Coxae and trochanter heavily dusted with white silvery pubescence. Femora shiny. Tibiae with white silvery pubescence, being not as intense as on pleura. Legs uniformly pale yellow, only last 2–3 segments of tarsi somewhat darker. Pulvilli white. Claws whitish yellow basally, blackish apically. Ventral sides of tarsi with strong, brown, comb-like setulae. Other setae and setulae on legs dark black. One strong black seta on anterior side of midfemur. Hind femur with three apical, anterodorsal setae and two rows of antero- and posteroventral setae, the row of posteroventral setae extended almost over the entire length of femur, the row of anteroventral setae present only apically. Preapical bristles on all tibiae well developed.

Abdomen: Tergites yellowish brown with diffuse greyish median patches. Black setae evenly distributed over tergites. Sternites yellowish brown with grey pubescence.

Male terminalia: Epandrium not fused below cerci, surstyli symmetrical. Hypandrium and distiphallus conspicuously asymmetrical (Figs 9–11). Sternite 5 almost trapezoid, posterior margin slightly incised; bearing two large and prominent anterior medial projections, visible in lateral view. Sternite 6 slender, with two asymmetrical projections widely separated by a large incision; the left projection appearing as a small knob, the right projection appearing as a



Fig. 3. Male holotype, lateral view, detail on pleura and head.

Fig. 4. Male holotype, frontal view, detail on face and frons.

Fig. 5. Male holotype, dorsolateral view, detail on frons, thorax and antennae.

Fig. 6. Male holotype, dorsal view.

Fig. 7. Male holotype, detail of wing.

Fig. 8. Female paratype, lateral view.

shallow bar. Each posterior branch of the hypandrium with a large subapical projection with an axe-like apical end emerging beyond epandrium in lateral view, margin of epandrium with two large setose projections. Surstyli elongated, in lateral view with a notch at one-third the length from base. Left side of distiphallus with a hook-like apical end. Ejaculatory apodeme large and curved, the apical end somewhat thickened. Phallopodeme straight.



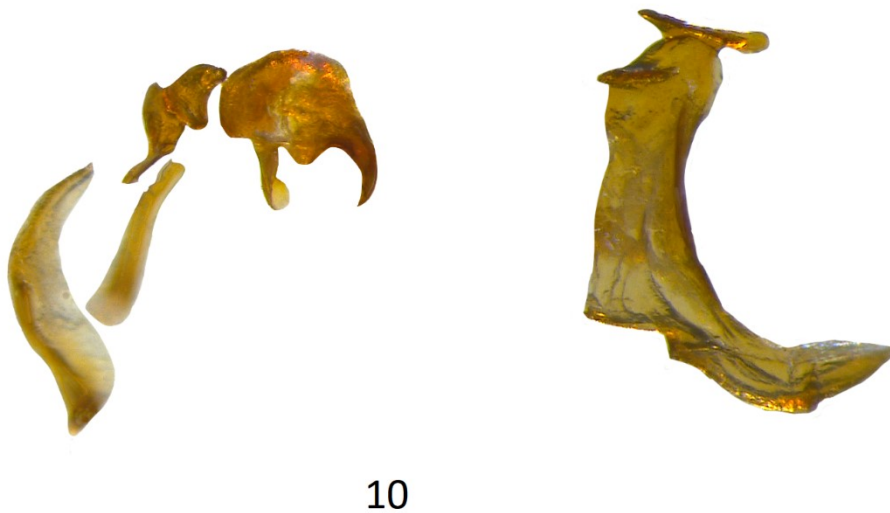
Fig. 9. Lateral left view on postabdomen with distiphallus, hypandrium and gonostyli clearly visible.

FEMALE: Very similar to male (Fig. 8), but darker in color, especially the wings, fronto-orbital spots, and facial spot; foreleg also darker: the tarsi completely dark, and tip of tibiae with dark apex. Mid- and hindlegs similar to those of the male. Female terminalia not examined.

ETYMOLOGY. The species is named for the axe-shaped apical end of the hypandrium.

DISTRIBUTION. Known only from the high-altitude region of Gulmarg, Kashmir.

ECOLOGY. Unknown.



10

11

Fig. 10. Distiphallus, left lateral view.

Fig. 11. Hypandrium, left side.

Discussion

Euthycera is a large genus with variable species, so we do not attempt to revise the genus here. Through reference to various publications, it is possible to identify all species of *Euthycera* in the Palearctic Region although examination of the male terminalia remains essential. Despite the genus being in urgent need of revision, the new species is described nonetheless as its characters are unique and its description does not generate additional taxonomic problems.

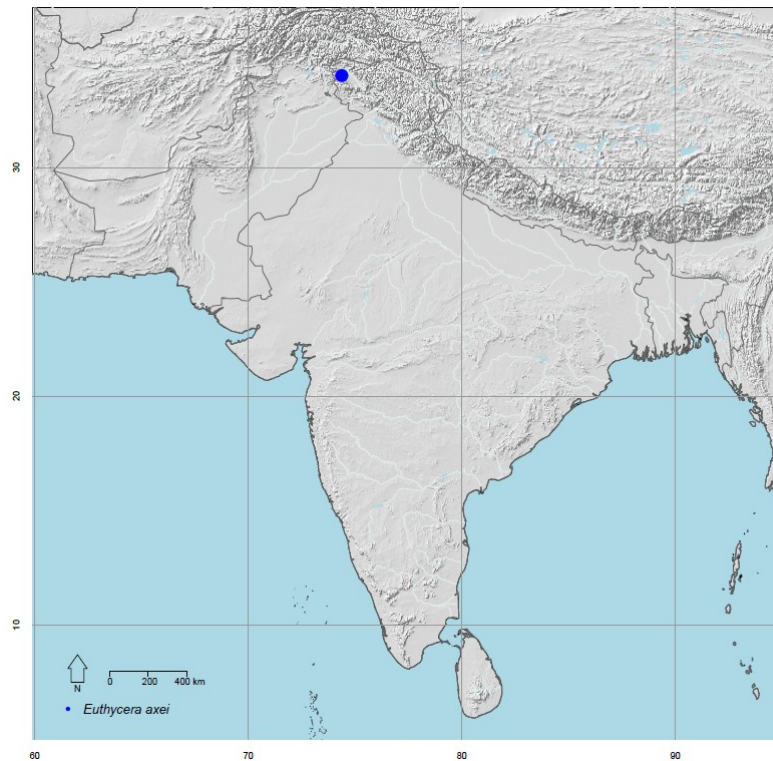


Fig. 12. Distribution of *Euthycera axei* sp. nov. showing essentially India and Pakistan, illustrating the occurrence of this species in high-altitude Kashmir.

Euthycera axei sp. nov. is known only from high-altitude Kashmir, at an astonishing 2600–2800m (Fig. 12). This altitudinal distribution is similar to that of close congeners like *E. korneyevi* and *E. merzi*, both of which are restricted to high-altitude areas in central Asia [Kyrgyzstan, all known material collected between 1500m and 2600m]. The fauna of central Asian snail-killing flies remains poorly known despite several publications (e.g. ELBERG, 1978; ROZKOŠNÝ & KNUTSON, 2006; MERZ & ROZKOŠNÝ, 1995; KURINA & KNUTSON, 2019). It is expected that more undescribed species might be found from the region.

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