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Artículo Científico

Stegana penicillata (Kertész, 1901) (Diptera, Drosophilidae) collected at the Panguana Biological Field Station in the Huánuco Region of Peru

Ocurrencia de *Stegana penicillata* (Kertész, 1901) (Diptera, Drosophilidae) en la Estación Biológica Experimental de Panguana, Región de Huánuco, Perú

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ABSTRACT. Among 210 undetermined Neotropical Drosophilidae collected by Michael von Tschirnhaus, at the Panguana Biological Field Station in the Huánuco Region of Peru, a male of *Stegana penicillata* (Kertész 1901) was identified, analyzed and photomicrographed. This is the second record of a male of *S. penicillata* in Peru and the first record of this species in the Huánuco Region.

KEYWORDS: Amazonian Peru, habitus; male terminalia; new record; photomicrographs.

RESUMEN. Se reporta la ocurrencia y se presenta el análisis morfológico y fotográfico de un macho de *Stegana penicillata* (Kertész 1901) identificado entre 210 individuos pertenecientes a la familia Drosophilidae colectados por Michael von Tschirnhaus en la Estación Biológica Panguana de la Región Huánuco en Perú. Este hallazgo es el segundo registro de un macho de *S. penicillata* en Perú y el primer registro de esta especie en la región de Huánuco.

PALABRAS CLAVES: Amazonía Peruana, habitus; terminalia masculina; nuevo registro; fotomicrografías.

INTRODUCTION

In late 1981, Michael von Tschirnhaus collected a variety of samples from the Panguana Biological Field Station, a private and protected area in the Huánuco Region, Peru. This area is located in a primary lowland rainforest of Amazonian Peru and more details can be found in Kovařík et al. (2015). The collection included 210 undetermined Neotropical Drosophilidae, from which one Peruvian male specimen of *Stegana penicillata* (Kertész 1901), originally described in the monotypic genus *Pyrgometopa,* was identified. The identification of this rare species was made possible, in large part, due to the fine high-resolution optical photomicrographs and SEM micrographs of *Stegana penicillata* included in a recently published paper (Pirani and Grimaldi 2019).

Interestingly, only four other *Stegana penicillata* have been reported in Peru, a female holotype from Callanga, and three nontype specimens (one male and two females) from the Cusco Region. Thus,

the specimen described herein from Panguana represents the second male *S. penicillata* from Peru and the first record of this rare and striking species in the Huánuco Region.

Notably, the type locality of *S. penicillata* originally cited by Kertész (1901) was simply Peru (Callanga). It is believed that this location corresponds to a small community in the Challabamba municipality of the Paucartambo Province in the Cusco Region, and is probably close to the Callanga River that is situated in the middle of the Parque Nacional del Manú.

In the present study, 18 habitus and close-up photomicrographs of the male Peruvian *Stegana penicillata* are provided. Our work aimed to complement the images published for both sexes by Pirani and Grimaldi (2019: 448-449). In fact, we have included 14 terminalia photomicrographs of the same fly to supplement the drawings in the aforementioned report (p. 451).

MATERIAL AND METHODS

Label data attached to the specimen was cited in full with slashes and double slashes indicating line changes and label changes, respectively. Our own notes and interpretations are enclosed in brackets. Unless otherwise indicated, all photomicrographs in the same plate were taken and enlarged to the same magnification.

1 ♂, ZMUZ (#262) dissected, labelled: "Peru: Panguana [Panguana Biological Field Station and Private Protected Area] / 9º36'53"S 74º55'57" W / 2.ix-20.x.1981 / Tschirnhaus leg. // X256 [Pe0256] [collector code] / Rio [Río] Llulapichis [misspelled, should read Llullapichis], an eastern tributary of Río Pachitea / Prov. [Province, currently Region] Huánuco, roof of [a grey-green] tent [in primary forest, aspirated] // ♂ // 262 [our own code] // *Stegana* / *penicillata* (Kertész) / Bächli & Vilela det." Refer to Vilela and Bächli (2000) and Bächli et al. (2004) for terminalia preparations and terminology, and to Vilela and Bächli (2019) for photomicrograph procedures.

RESULTS AND DISCUSSION

Stegana Meigen, 1830

Stegana penicillata (Kertész 1901) (Figs. 1-32)

Pyrgometopa penicillata Kertész, 1901: 420; Hendel, 1901: 233 (distribution); Wheeler 1981:(affiliation); Bächli 1984: 36 (type material); Brake and Bächli 2008: 291 (affiliation); *Stegana penicillata* (Kertész 1901): Pirani and Grimaldi 2019: 447-454 (proposed new combination, redescription, figures, distribution).

Diagnosis. Refer to Pirani and Grimaldi 2019: 447.

Supplementary description to Pirani and Grimaldi (2019).

The general color of this specimen is brownish, which is in contrast to being described as black by Kertész (1901) or blackish-brown by Pirani and Grimaldi (2019). The color variation (brownish) is most likely due to the long-term storage in ethanol. Otherwise, the description by Pirani and Grimaldi (2019) fully applies, despite missing several setae and having some that are damaged. The resting insertion sockets clearly allow identification. Frons in the lower third medially, slightly protruding (Fig. 13). Male terminalia sclerite terminology adopted in the present paper, but differing from those used by Pirani and Grimaldi (in parentheses) include aedeagal apodeme (phallapodeme), aedeagus (postgonites), decasternum (subepandrial sclerite), dorsal arch (pregonite), outer paraphysis (no name), distal segment of posterior ejaculatory duct or endophallus (basiphallus+distiphallus+epiphallus), ventral rod of aedeagal apodeme (phallic guide).

Terminalia ♂ (Figs. 19-32). Epandrium (Figs. 19-22) microtrichose, except for the narrow anterior and ventral stripes, mostly setose on the anteroventral surface, in addition to two parallel rows of setae, one adjacent to the distal margin, mostly bearing larger setae, and one medially, bearing smaller setae; devoid of a ventral lobe. Cercus (Fig. 20) positioned lower, narrow, densely setose, devoid of microtrichia, anteriorly articulated to the lower posterior margin of the epandrium; ventral lobe absent. Surstylus (Fig. 20) somewhat rectangular, medially folded slightly over itself, deeply concave, double-walled, dorsoposterior margin concave, pointed inwards medially, somewhat embracing the cercus tip, mediodistally bearing a single, peg-shaped prensiseta, adjacent and preceded by a tuft of ca. 10 ventral, tiny setulae and ca. 30 mediodorsal, long, distally waved, sharply pointed setae on the inner ventral surface, not microtrichose, not fused to epandrium. Decasternum (Figs. 21, 22) sclerotized, H-shaped, anterodorsally deeply concave. Dorsal arch (Figs. 27-32) strongly sclerotized, mediodistally square-shaped, serrate. Hypandrium (Fig. 31) tongue-shaped in ventral view, arms strongly divergent, anterior margin strongly convex, posterior margin concave; posterior hypandrial

process absent; gonopod not recognizable, most probably fused to the posterior hypandrial margin. Aedeagus (Figs. 17, 18, 27-32) weakly sclerotized, dorsoventrally flatten, distally banner petal-shaped in the dorsal and ventral views, slightly shorter than the aedeagal apodeme, fused to each other; medioproximal margin sinuate, ventral margin medially extended backwards as a short, narrow, emarginated strip (Figs. 28, 29, 32), laying between the ventral rod and distal opening of the posterior ejaculatory duct (gonopore). Inner paraphysis unrecognizable, either fused to the dorsal arch or aedeagus. Outer paraphysis (Figs. 28-32) relatively small, isosceles triangle-shaped, widely separated, perpendicular to the aedeagus and separate from it by an interval greater than usual, articulated to the posterior hypandrial margin by membranous tissue, bearing 3 tiny setulae near the inner margin, arranged in a curved row. Aedeagal apodeme (Fig. 28) laterally flatten, anteriorly expanded laterally,

Figures 1–6. *Stegana penicillata* (Kertész 1901), male from Panguana, Peru, habitus, five views and one close-up of the head: 1, left lateral, 2, left oblique dorsal, 3, idem but even more oblique, 4, head and thorax, dorsal, 5, thorax and abdomen, dorsal, 6, close-up of the head, dorsal. Images in Figures. 1-5 and Fig. 6 were acquired at different magnifications. Scale bars = 1 mm, and 0.2 mm, respectively.

slightly sinuate in the lateral view; ventral rod strongly sclerotized, dorsoventrally flatten, shorter than the ribbon-like projection of the aedeagus ventral margin, bow-shaped in the lateral view, laterally expanded distally, articulated to the posterior hypandrium margin medially. Ejaculatory apodeme (Figs. 23-26) large, slightly shorter than the aedeagal apodeme, heavily sclerotized; handle slightly sinuate, rod-shaped, oblique to and arising from the anterodorsal edge of the basal plate, the latter shorter than aedeagus, distally emarginate, dorsoventrally shallowly concave, bearing two groups of five apparently membranous foramina near the anterior edge (Fig. 26), lateral margin with a hook medially (Figs. 24, 26).

Distribution (according to Pirani and Grimaldi 2019). Brazil (States of Acre, Amazonas and São Paulo), French Guyana and Peru (Cusco and Huánuco Regions [New record]).

Biology. Morge (1956) reported observing larvae of

Figures 7–12. *Stegana penicillata* (Kertész 1901), male from Panguana, Peru, six close-ups of the head: 7, left oblique anterior, 8, left oblique dorsal, 9, dorsal, 10, frontal, 11, ventral, 12, left oblique posterior. Images in Figures. 7-11 and Fig. 12 were acquired at different magnifications. Scale bars = 0.5 mm and 0.2 mm, respectively.

Stegana coleoptrata below the bark of fallen birch trees and Pirani and Grimaldi (2019: 453) stated "A few breeding records have reported them [*Stegana* spp.] emerging from trunks and branches of fallen, decaying trees", and suggested there must be some association with the flowerheads of *Vernonia* sp. (Asteraceae) since pollen grains of this plant were attached to the spines on the first tarsomere of the hind leg of one male Peruvian specimen.

Comments. This fly, collected in Amazonian Peru, became the third male and twelfth specimen of *Stegana penicillata* on record.

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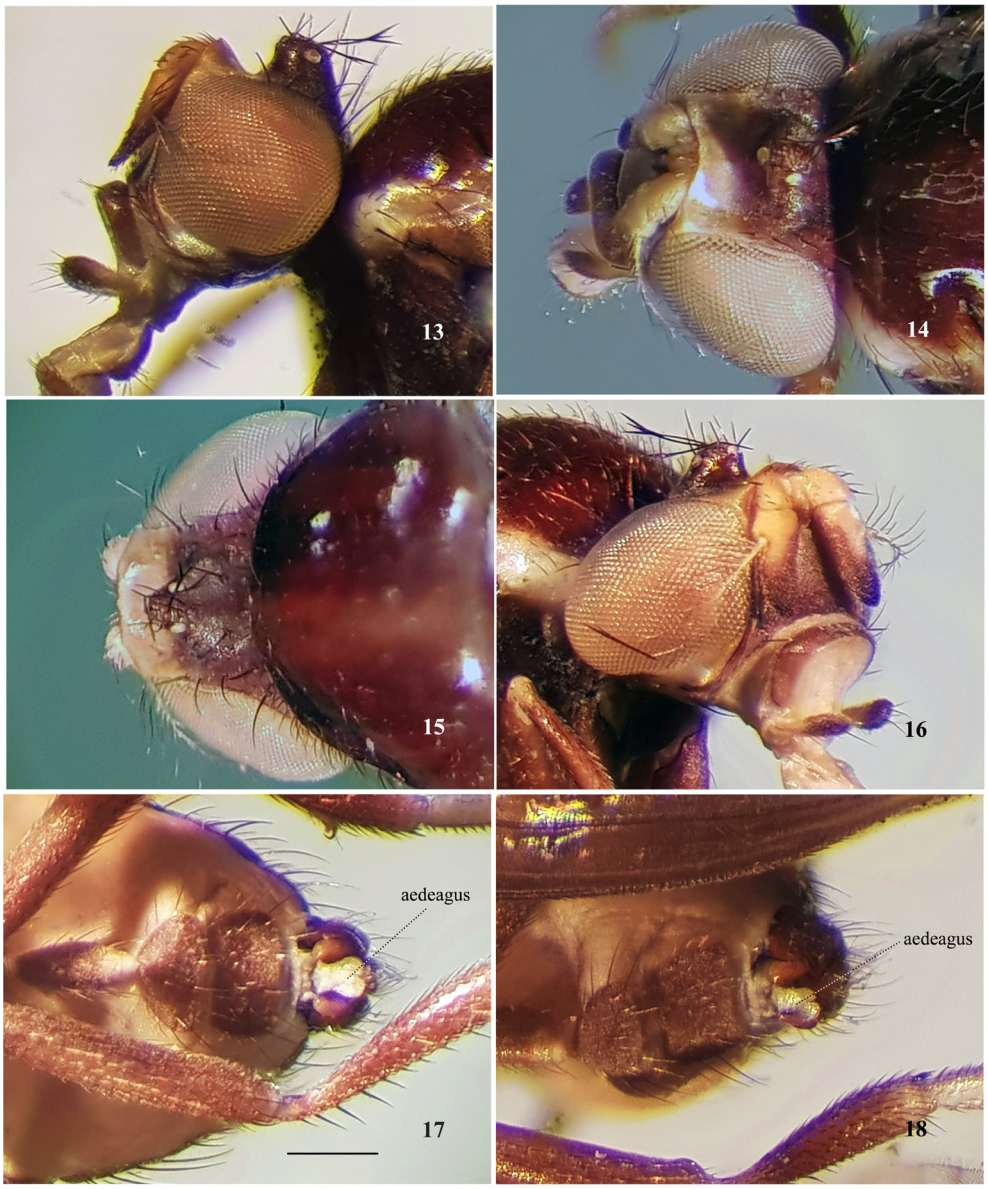
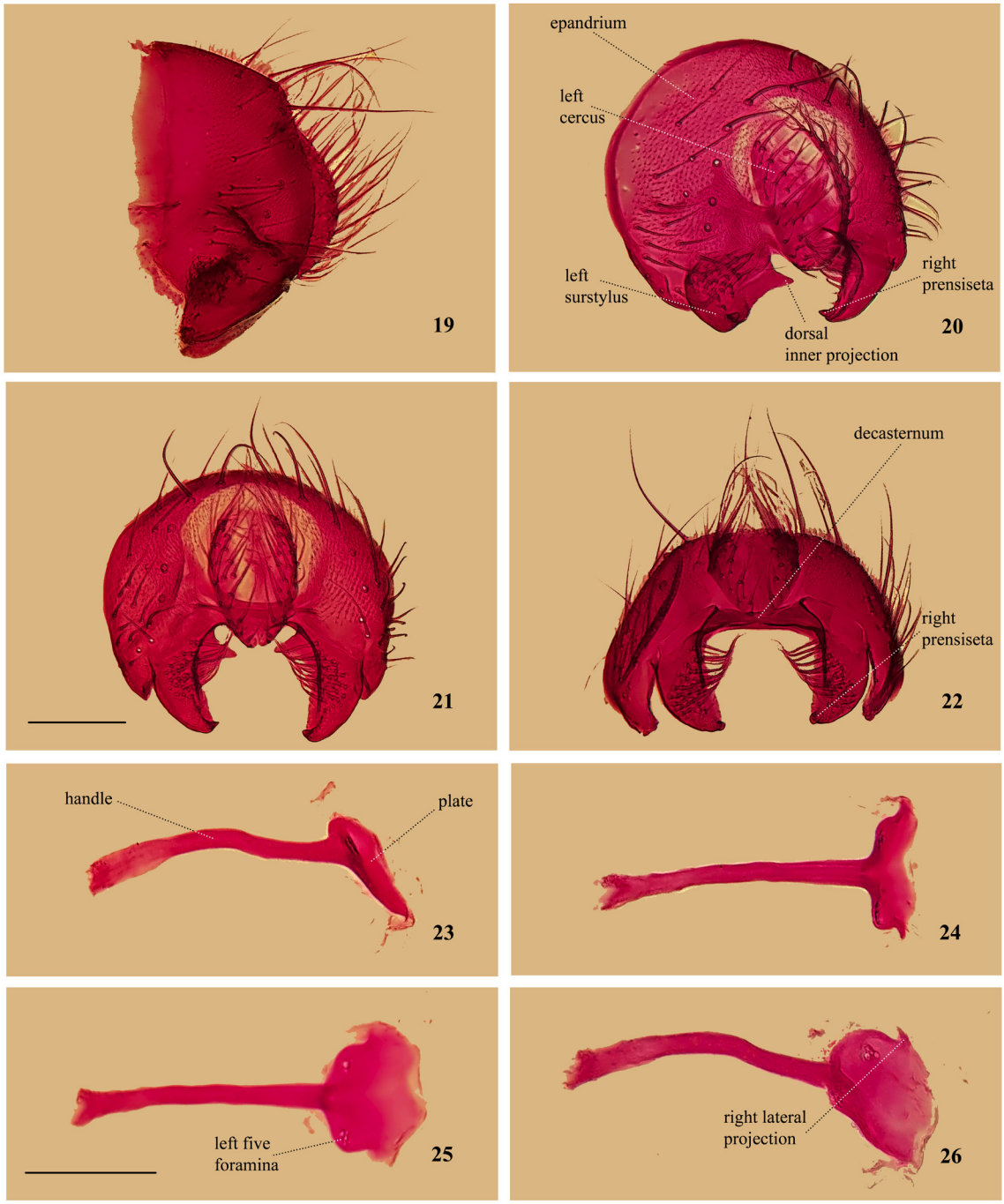
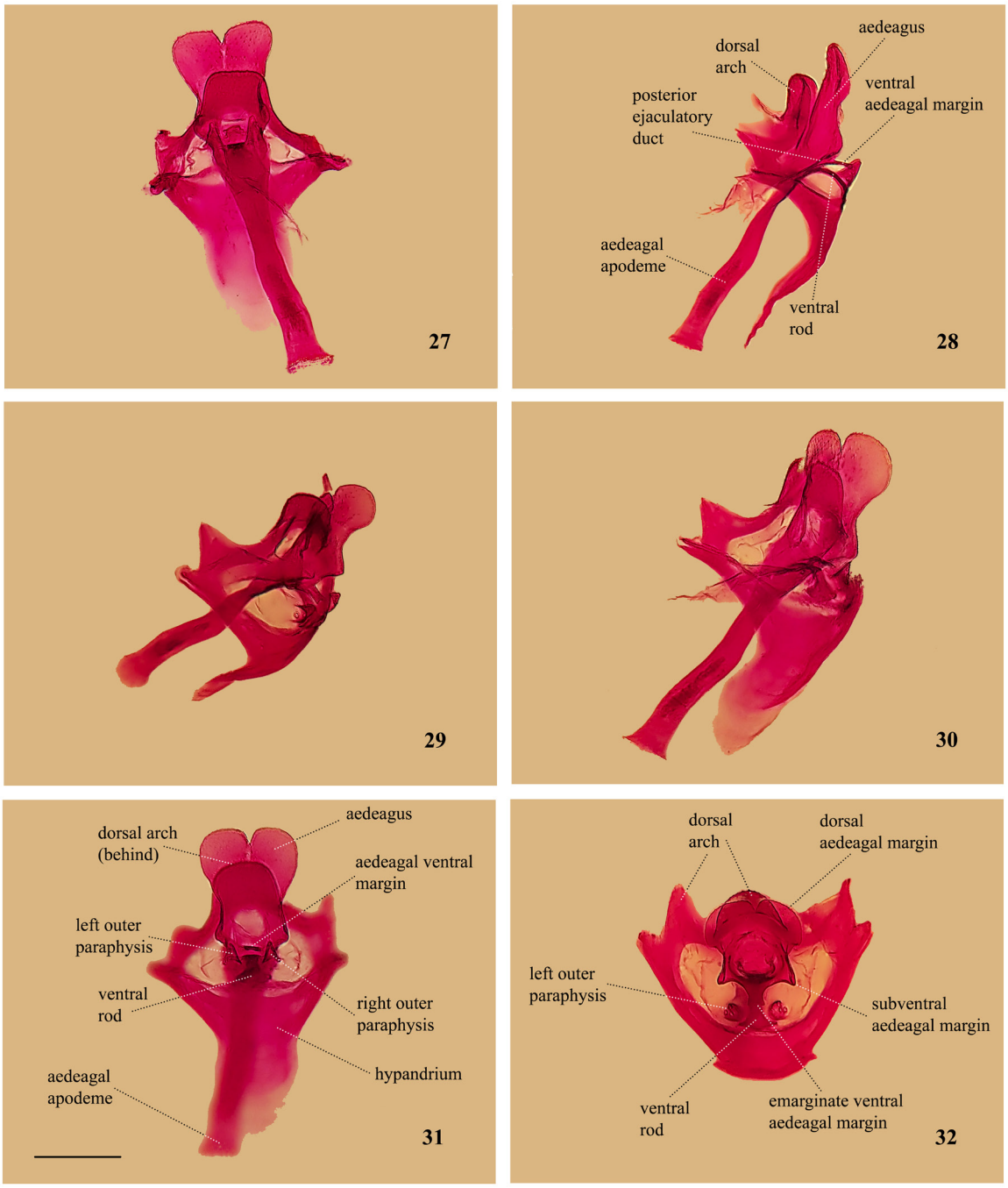


Figures 13–18. *Stegana penicillata* (Kertész 1901), male from Panguana, Peru, four close-ups of the head (13-16) and two terminalia (17,18): 13, left lateral, 14, anterodorsal, 15, posterodorsal, 16, right laterofrontal, 17, ventral, 18, left oblique ventral. Note: the whitish aedeagus strongly contrasts with the dark brown epandrium and surstyli. Scale bar = 0.2 mm



Figures 19–26. *Stegana penicillata* (Kertész 1901), male from Panguana, Peru, 19-22, four views of the external male terminalia (epandrium, cerci and surstyli), 23-26, ejaculatory apodeme, idem: 19, left lateral to 22, ventral posterior and 23, left lateral to 26, oblique dorsal. Images in Figures. 19-22 and Figures. 23-26 were acquired at different magnifications. Scale bars = 0.1 mm.



Figures 27-32. Stegana penicillata (Kertész 1901), male from Panguana, Peru, internal male terminalia (hypandrium, aedeagus, aedeagal apodeme and outer paraphyses), six views: 27, dorsal to 32, posterior. Scale bar = 0.1 mm.

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