

Description of a new species of *Pisphondylia* Möhn, 1960 (Diptera: Cecidomyiidae, Asphondyliini, Schizomyiina) from Brazil

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Abstract. *Pisphondylia rodriguesi*, **sp. nov.** is proposed based on specimens from the Entomological Collection of the Museu Nacional (MNRJ), mounted on microscope slides and identified as *Pisphondylia* sp. (Diptera, Cecidomyiidae). Male, female, pupa and larva of 3rd instar are described. The most relevant morphological characters are illustrated. The new species induces galls on the flower peduncle of *Guapira opposita* (Nyctaginaceae), a native plant to Brazil. The type-locality is Ilha da Marambaia (Mangaratiba, Rio de Janeiro State). The new species is compared with others of the same genus.

Keywords. Gall midge; *Guapira*; Neotropical; Nyctaginaceae; Taxonomy.

INTRODUCTION

Pisphondylia Möhn, 1960 is a Neotropical genus of Cecidomyiidae (Diptera) with only two described species: *P. salvadorensis* Möhn, 1960 and *P. brasiliensis* Maia & Couri, 1992 (Gagné & Jaschhoff, 2025). Both species are gall-inducers on Nyctaginaceae, respectively on *Pisonia* L. and *Guapira* Aubl. genera.

Pisphondylia is recognizable by the following combination of characters: the 3rd instar larva has an elongated terminal segment and lacks the prothoracic spatula; the pupa lacks antennal horns, adults have three or two-segmented palpus, simple tarsal claws, and empodia shorter than the tarsal claws; in males the antennal flagellomeres are not constricted near the middle and the circumfila are laterally sinuous; in females, the ovipositor is elongated, protractile, with a small cercus (Gagné, 1994; Möhn, 1961).

In this paper, a new species of *Pisphondylia* that induces galls on the flower peduncle of *Guapira opposita* (Vell.) Reitz. is described and compared with the other congeneric species, *P. brasiliensis* and *P. salvadorensis*, based on morphological characters of the larva, pupa, male and female.

Guapira opposita is a widespread plant in Brazil, where it occurs in the Amazon Forest, Atlantic Forest, Caatinga, and Cerrado (Rossetto *et al.*, 2025). It hosts ten gall morphotypes, induced by

three genera of Cecidomyiidae, *Bruggmannia* Tavares, 1906, *Pisphondylia* and *Proasphondylia* Felt, 1915 (Maia, 2013; Maia 2024).

MATERIAL AND METHODS

The studied material belongs to the Entomological Collection of the Museu Nacional, Rio de Janeiro (MNRJ)/Universidade Federal do Rio de Janeiro. All specimens are mounted on microscope slides. Each slide has a label that includes information of place and date of collection, collector, host plant species, and galled organ.

Morphologic studies, drawings and photographs of the most important taxonomic characters were made using a Nikon Eclipse E200 optical microscope, with a Nikon Y-IDT drawing tube and a Samsung A13 cell phone camera. All drawings were edited using Corel DRAW® and Sketchbook.

All measurements were performed using a slide with a 0.01 mm scale at each interval with a total of 2 mm. The length of adult's male was measured from the head vertex until the end of the terminalia; for female, from the head vertex until the end of the 8th abdominal segment; for pupa from the upper margin of the antennal sheath to the end of the last abdominal segment, and for larva of 3rd instar from the upper margin of head until the end of the terminal segment.

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We carried out a comparative study among the known species of *Pisphondylia*, based on literature data and, for *Pisphondylia brasiliensis*, we also examined the type-material of the Entomological Collection of MNRJ. We prepared a dichotomous key to segregate the known species. The morphological terminology follows Gagné (2018) for adults and Gagné (1994) for the pupa and larva.

RESULTS

Pisphondylia rodrigueze, Eckhardt & Maia, sp. nov. (Figs. 1-3)

Diagnosis: The new species is the only one with the following set of characters: Adult: palpus three-segmented; male with aedeagus not tapering towards the apex. Pupa: apical seta 0.06 mm long; antennal horn absent; upper facial horns conical; three facial lateral papillae and two setose lower facial papillae on each side; apex of leg sheaths sclerotized. Larva: body 3.8-4.7 mm long; spatula absent; three lateral papillae on each side; last abdominal segment 0.5 mm long, with four setose terminal papillae.

Male: Body 3.40-4.30 mm long (n = 6). **Head (Fig. 1A):** eye facets circular, closely approximated; antennae: scape trapezoidal setose, pedicel squarish setose, flagellomeres cylindrical with bare neck and circumfila laterally sinuous (Fig. 1B); mouth parts: labrum long attenuate, hypopharynx of the same shape of labrum, with long anteriorly directed lateral setulae, labella elongated-convex, with long lateral and three short mesal setae each, palpus: 1st segment cylindrical, shorter than the 2nd segment, 2nd ovoid shorter than the 3rd, 3rd conical, tapering to apex, all segments with setae. **Thorax:** scutum with two dorsocentral rows of setae and two lateral rows; scutellum with setae subdistally; anepimeron with numerous setae; wings 2.50-3.20 mm long (n = 8), tarsal claws bent beyond midlength, empodia shorter than claws (Fig. 1C); abdomen (Fig. 1D): 1st-7th tergites sclerotized, rectangular with posterior row of setae; 8th tergite sclerotized, rectangular, much narrower than the 7th tergite, without setae; anterior pair of trichoid sensilla, on all sternites and not visible on tergites; 2nd-8th sternites rectangular with posterior row of setae; numerous setae at midlength. **Terminalia (Fig. 1E):** gonocoxite semicircular, setose, setae more abundant on the apex, microtrichose; gonostylus squarish with a row of strong setae on the apex, microtrichose; cerci fused basally, wide, tapering towards the apex, setose; hypoproct bilobed setose, parameres rounded, setose; aedeagus glossiform, very wide.

Measurements (n = 6): Body 3.40/3.50/3.90/4.0/4.3/4.40 mm long. Head 0.50 mm in diameter; antenna: scape 0.07/0.10 mm long, pedicel 0.04/0.05 mm long, 1st flagellomere 0.17/0.20 mm long, 2nd 0.17/0.18/0.20 mm long, 3rd 0.17/0.19/0.20 mm long, 4th 0.19/0.20 mm long, 5th-9th flagellomeres 0.20 mm long, 10th 0.17/0.19/0.20 mm

long, 11th 0.17/0.18 mm long, 12th 0.16/0.17/0.18 mm long; palpus: 1st segment 0.04 mm long, 2nd 0.06 mm long, 3rd 0.10 mm long; wing: 2.5/2.6 mm long; gonocoxite: 0.12/0.16 mm long, gonostylus 0.03/0.05 mm long.

Female: Body 3.50-4.70 mm long (n = 6). **Head:** circumfila less sinuous than in male (Fig. 2D), flagellomeres setose, microtrichose with bare neck. **Abdomen (Fig. 2C):** 2nd-8th sternites rectangular, with distal row of setae, scales scattered, 7th segment 1.6 times as long as the 6th. **Ovipositor (Fig. 2E):** 0.60-0.70 mm long (n = 5); very protrusible, elongated, pliable, with elongate ventral setae and sparse dorsal setae, cerci tiny, separated, microtrichose, with setae ventrally, dorsally. Other characters as in male.

Female measurements (n = 6): Body: 3.4/3.50/3.80/4.0/4.50 mm long; **Head:** 0.40/0.50 mm; antenna: scape 0.07/0.08/0.09 mm long, pedicel 0.05/0.06 mm long, 1st + 2nd flagellomeres 0.15/0.16/0.20 mm long, 3th flagellomere 0.14/0.17/0.20 mm long, 4th 0.20 mm long, 5th 0.15/0.20 mm long, 6th 0.15/0.16/0.20 mm long, 7th 0.17/0.18/0.20 mm long, 8th 0.16/0.18/0.20 mm long, 9th 0.12/0.16/0.17 mm long, 10th 0.09/0.1/0.12 mm, 11th 0.06/0.07/0.08 mm long, 12th 0.04/0.05; palpus: 1st segment 0.03/0.04/0.05 mm long, 2nd 0.06/0.07 mm long, 3rd 0.15/0.16 mm long; wing: 3.00/3.10/3.20 mm long; 7th tergite 0.05 mm long; ovipositor: 0.60/0.65/0.70 mm long.

Pupa (Fig. 3A): Body 3.40-4.70 mm long (n = 13). Integument brownish. **Head (Fig. 3B):** antennal horn absent; dorsal plate conical, widest basally, tapering to the apex; apical setae 0.02-0.06 mm long (n = 11), twice as long as the prothoracic spiracle; upper cephalic margin laterally thickened; upper facial horns conical; two lower facial papillae on each side, both with seta, a triplet of lateral papillae (one with setae and two bare) on each side. **Thorax:** prothoracic spiracle cylindrical (Fig. 3C), 0.04-0.06 mm long (n = 7). **Abdomen:** 2nd-8th segments with dorsal spines near anterior margin; 1st-7th tergites with four setose dorsal papillae, 8th tergite with two dorsal papillae; spines on the 2nd segment shorter than the others (Fig. 2D); terminal segment with sexual dimorphism: males with two conical projections far apart (Fig. 2E) and two setose dorsal papillae; females with three conical projections, middle projection shorter than the others, and (Fig. 2F) two setose terminal papillae.

Measurements: Body (n = 13) 3.40/3.60/4.00/4.1/4.2/4.3/4.3/4.3/4.4/4.5/4.5/4.6/4.7 mm long, apical seta (n = 11) 0.02/0.02/0.04/0.04/0.04/0.05/0.05/0.06/0.06/0.06/0.06 mm long; prothoracic spiracle (n = 7) 0.04/0.05/0.05/0.05/0.06/0.06/0.06 mm long.

Larva (Fig. 4A): 3.80-4.70 mm (n = 3). Body elongated, cylindrical, tapered towards posterior end; integument rough. Prothoracic sternal spatula absent, two setose lateral papillae on each side. Terminal segment 0.50 mm long (n = 4), elongate, strongly tapered towards apex,

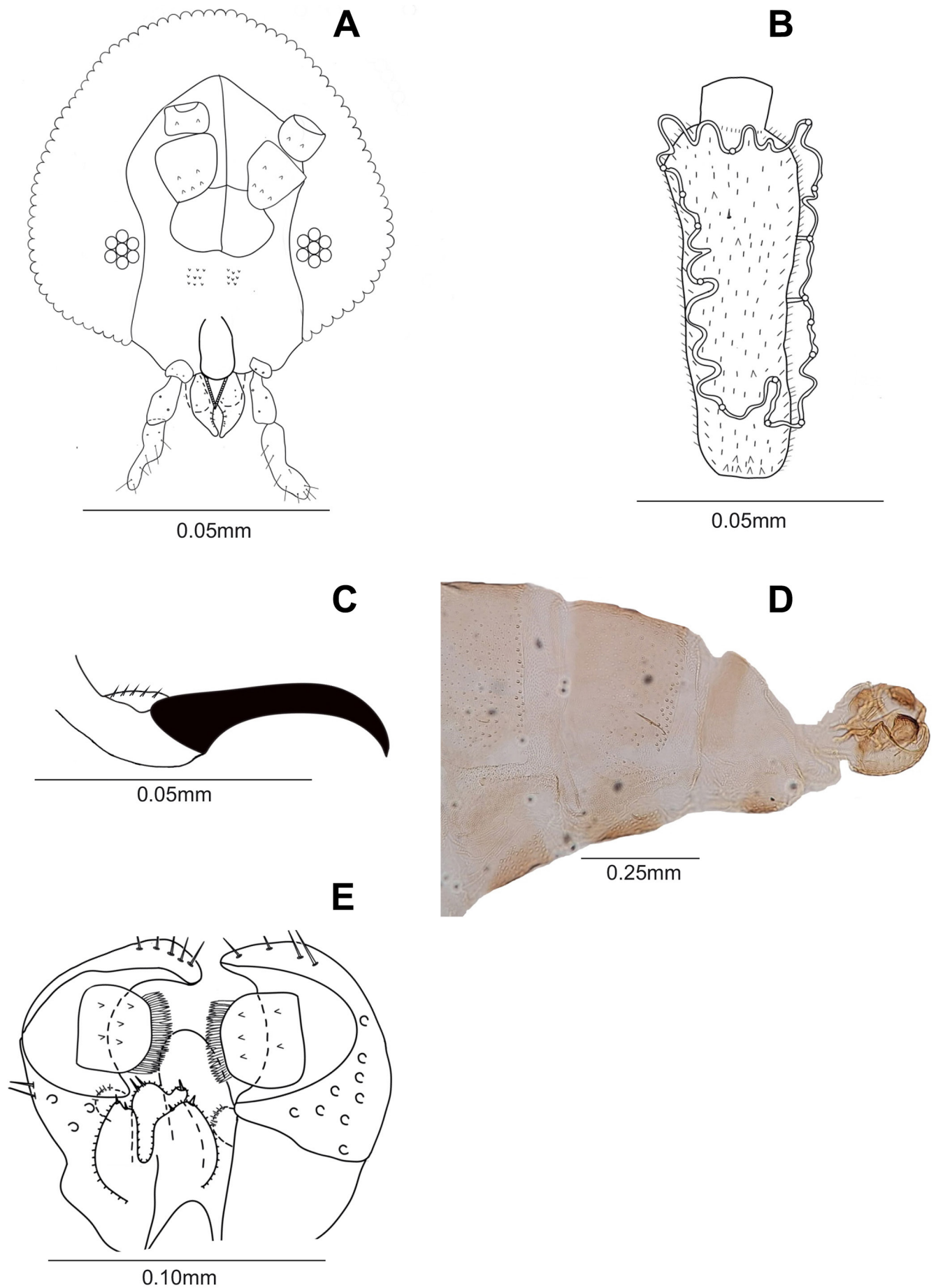


Figure 1. *Pisphondylia rodriguesi*, **sp. nov.**, male: (A) Head, ventral view; (B) 2nd flagellomere, (C) Hindleg, tarsal claws and empodium, lateral view, (D) 2nd abdominal segments, lateral view, (E) Terminalia, dorsal view.

with four setose papillae (two apical and two subapical) (Fig. 4B). Anus ventral, rounded.

Measurements (n = 3): Body 3.80/4.40/4.70 mm long; terminal segment: 0.40/0.45/0.50 mm long.

Gall on flower peduncle, globose, green, red or brown, one-chambered, glabrous on *Guapira opposita* (Fig. 105 of Rodrigues *et al.*, 2014).

Material examined: Holotype male, BRAZIL: Rio de Janeiro State, Mangaratiba, Ilha da Marambaia, Praia do Sítio, 29.VIII.2010, Rodrigues, A. col. MNRJ-ENT1-71375; Paratypes: same data as holotype. 4 pupal exuviae (1 MNRJ-ENT1-71387, 3 MNRJ-ENT1-71391); same place and collector as holotype, 5 males (1 MNRJ-ENT1-71376,

1 MNRJ-ENT1-71377, 1 MNRJ-ENT1-71378, 1 MNRJ-ENT1-71385, MNRJ-ENT1-71386) 19.IX.2011, 5 females (1 MNRJ-ENT1-71382, MNRJ-ENT1-71383, MNRJ-ENT1-71380, MNRJ-ENT1-71384, MNRJ-ENT1-71379, MNRJ-ENT1-71381) 19.VII.2010, 6 larvae of 3rd instar (2 MNRJ-ENT1-71392, 2 MNRJ-ENT1-71394, MNRJ-ENT1-71393) 19.IX.2010; 11 pupae, (2 MNRJ-ENT1-71387, 2 MNRJ-ENT1-71389, 2 MNRJ-ENT1-71388, 2 MNRJ-ENT1-71390, 3 MNRJ-ENT1-71390) 21.XI.2010; same collector, 1 pupal exuvia, Praia da Armação, 21.XI.2010 (MNRJ-ENT1-71395).

Etymology: The word “rodrigues” is named after Dr. Alene Rodrigues, who collected the galls, reared the specimens and mounted on slides all studied material.

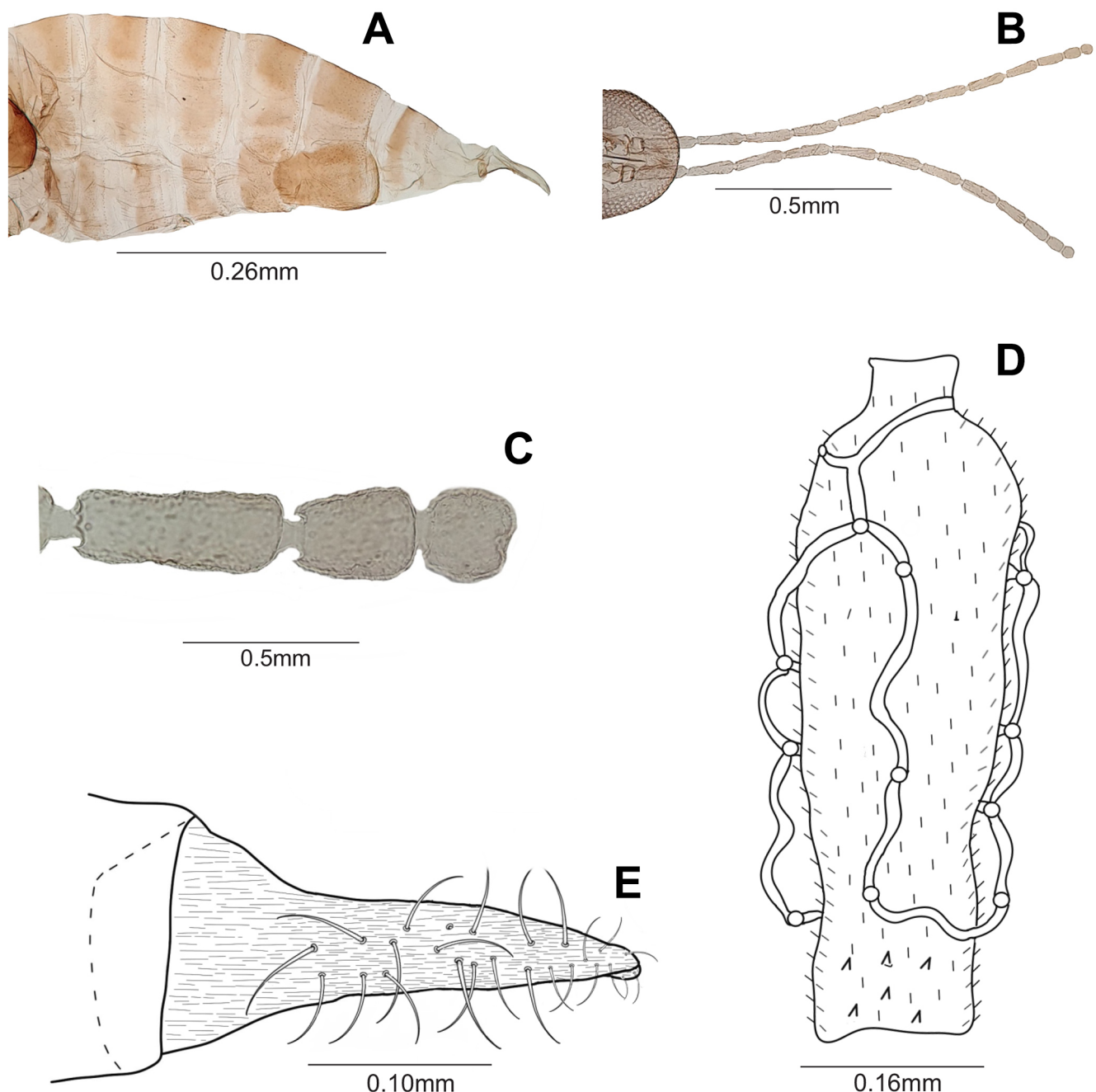


Figure 2. *Pisphondylia rodriguesae*, sp. nov., female: (A) abdomen, lateral view; (B) antennae, general aspect, ventral view (C) last three flagellomeres, ventral view, (D) 3rd flagellomere, (E) Ovipositor, lateral view.

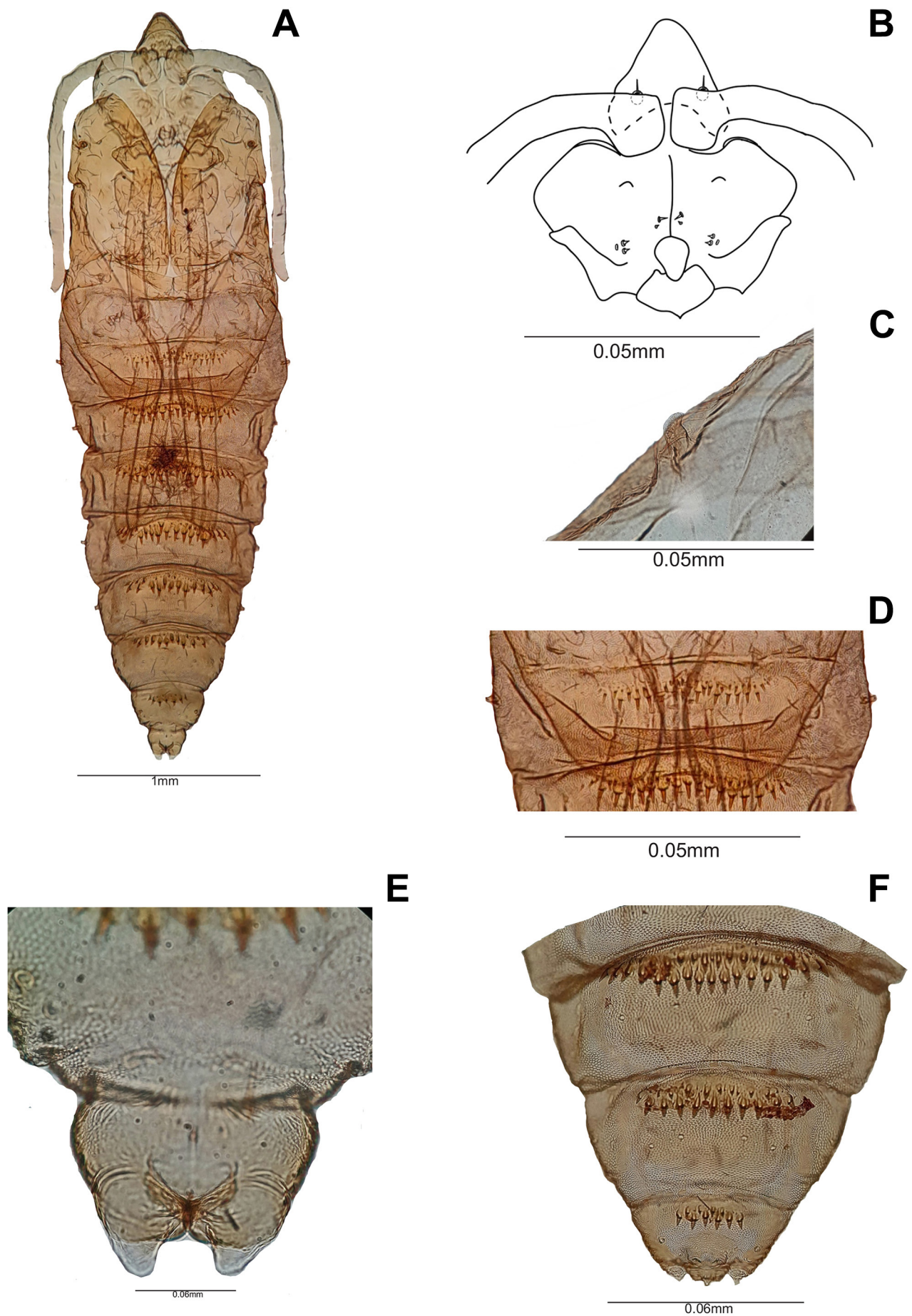


Figure 3. *Pisphondylia rodrigueze*, sp. nov., pupa: (A) body general aspect, dorsal view, (B) Head, dorsal view, (C) Prothoracic spiracle, dorsal view, (D) 2nd-3rd abdominal segments, dorsal view, (E) male last segment, ventral view, (F) female, last segments, dorsal view.

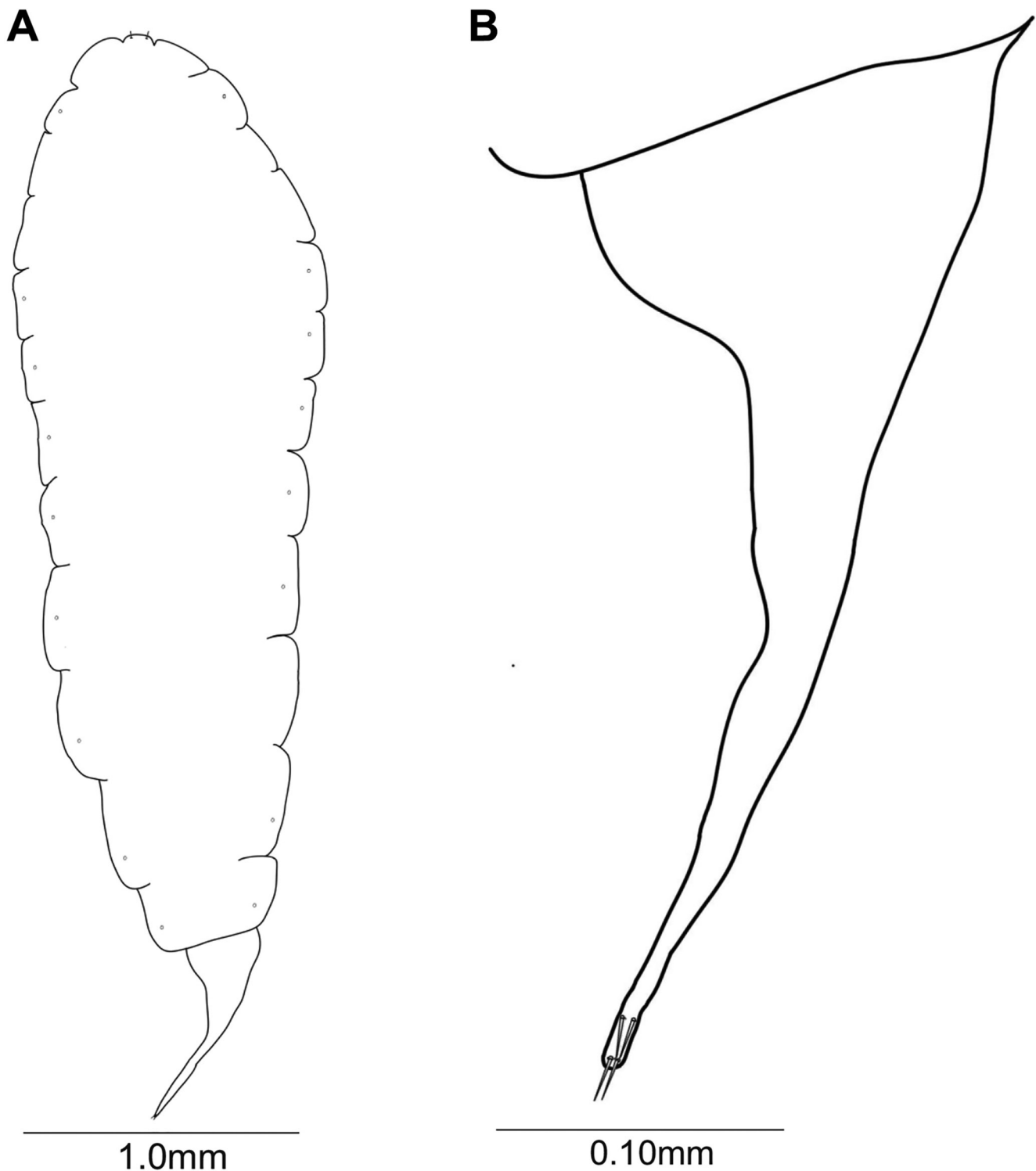


Figure 4. *Pisphondylia rodrigueze*, **sp. nov.**, Larva: (A) body, general aspect, dorsal view, (B) last segment, ventral view.

Remarks: *Pisphondylia rodrigueze*, **sp. nov.** is morphologically more similar to *P. brasiliensis* as both share: male body 2.80-4.30 mm long, and female 3.50-4.50 mm long; prothoracic spiracle between 0.30-0.70 mm long, and presence of conical upper facial horns. Furthermore, both species induce galls on *Guapira opposita*. Unlike them, in *P. salvadorensis*, male is 1.90-2.20 mm long; the prothoracic spiracle is only 0.14 mm long and the upper facial horns are absent. However, *P. rodrigueze* differs from *P. brasiliensis* in the following characters: the pupa of *P. rodrigueze* has two setose lower facial papillae, while in

P. brasiliensis one papilla is setose and the other is bare; the facial horns of the new species are away from each other, while in *P. brasiliensis* they are closely approximated. In addition, *P. rodrigueze* has circular eye facets, cercus fused on base, and aedeagus not tapering towards the apex, while *P. brasiliensis* has eye facets hexagonal, cercus not fused on base, and aedeagus tapering towards the apex.

The description of *Pisphondylia rodrigueze* increases the species richness and representativeness of the genus *Pisphondylia* in Brazil. In addition, it reinforces the genus association exclusively with Nyctaginaceae.

Key to segregate *Pisphondylia* (Diptera, Cecidomyiidae) species

1. Male 2.80–4.30 mm long, female 3.50–4.50 mm; pupa 3.40–4.30 mm long, facial horns present, prothoracic spiracle 0.30–0.70 mm long; 2nd–7th abdominal segments with one row of developed spines and 1 or 2 rows of short spines (Fig. 2C)..... 2
- 1'. Males 1.90–2.20 mm long; pupa 2.50–2.90 mm long, facial horns absent, prothoracic spiracle 0.14 mm long, 2nd–7th abdominal segments with 4 rows of spines *Pisphondylia salvadorensis* Möhn, 1961
2. Adult with eye facets hexagonal, male cerci not fused, aedeagus tapering towards the apex; pupa with dorsal plate rounded at anterior margin, apical setae 0.10 mm long; leg sheaths not sclerotized apically *Pisphondylia brasiliensis* Couri & Maia, 1992
- 2'. Adult with eye facets circular (Fig. 1A), male cerci fused, aedeagus not tapering towards the apex (Fig. 1E); pupa with dorsal plate with conical anterior margin (Fig. 3B), apical setae 0.06 mm long, leg sheaths sclerotized apically *Pisphondylia rodriguesi* Eckhardt & Maia, **sp. nov.**

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