



## GALL MIDGES (DIPTERA, CECIDOMYIIDAE) ASSOCIATED WITH *HETEROPTERIS NITIDA* DC. (MALPIGHIACEAE) <sup>1</sup>

(With 20 figures)

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**ABSTRACT:** Four species of gall midges (Diptera, Cecidomyiidae) were obtained from flower buds of *Heteropteris nitida* DC. (Malpighiaceae). *Clinodiplosis floricola* sp.nov. (larva, pupa, male and female) is described based on material collected at the restinga of Barra de Maricá, Maricá, Rio de Janeiro.

**Key words:** Diptera. Cecidomyiidae. *Clinodiplosis floricola* sp.nov. Gall. Malpighiaceae.

**RESUMO:** Mosquitos de galhas (Diptera, Cecidomyiidae) associados com *Heteropteris nitida* DC. (Malpighiaceae). Quatro espécies de mosquitos de galha (Diptera, Cecidomyiidae) foram obtidas de botões florais de *Heteropteris nitida* DC. (Malpighiaceae). *Clinodiplosis floricola* sp.nov. (larva, pupa, macho e fêmea) é descrita com base em material coletado na restinga da Barra de Maricá, Maricá, Rio de Janeiro.

**Palavras-chave:** Diptera. Cecidomyiidae. *Clinodiplosis floricola* sp.nov. Galha. Malpighiaceae.

### INTRODUCTION

*Heteropteris nitida* DC. (Malpighiaceae) occurs from Bahia to Paraná and is very abundant at the restinga of Barra de Maricá, where it is easily found along the road of Zacharias Beach (MAIA, 2001). The closed flowers of this plant are frequently destroyed by larvae of *Clinodiplosis* sp. (Diptera, Cecidomyiidae), which leave the plant and pupate in the soil. In this paper, this species of *Clinodiplosis* is described.

Phytophagous larvae of other species of Cecidomyiidae were found at the same time in the closed flowers. These species are recorded herein.

### MATERIAL AND METHODS

Part of the examined specimens was previously obtained by MAIA (2001). Additional material was obtained by rearing. For this, samples of closed flowers were collected at the restinga of Barra de Maricá (Maricá, RJ) in April, 2005 and carried to the laboratory of Diptera, where they were kept in plastic pots containing a layer of soil on the bottom (as the larva pupates in the soil) and covered by a fine screening. The pots were checked daily. Adults and pupal exuviae were preserved in 70% ethanol.

Later, they were mounted on microscope slides following the methodology of GAGNÉ (1994).

The Cecidomyiidae genera were identified based on the keys of GAGNÉ (1994).

All material was deposited in the Diptera collection of Museu Nacional, Rio de Janeiro (MNRJ).

### RESULTS

Four species of gall midges (Diptera, Cecidomyiidae) were obtained from the closed flowers of *Heteropteris nitida*, namely: *Clinodiplosis floricola* sp.nov., *Youngomyia* sp., *Lestodiplosis* sp., and a not determined Cecidomyiidi.

*Clinodiplosis floricola* sp.nov. is described and illustrated as larva, pupal exuviae, male, and female (Figs.1-20). *Youngomyia* sp. and *Lestodiplosis* sp. (probably both new species) are recorded for the first time on this host plant.

*Clinodiplosis* Kieffer, 1895 is a cosmopolitan genus with 93 known species. Most are fungivorous, but many Neotropical species are phytophagous (GAGNÉ, 2004). Twelve species have been recorded from Brazil on Asteraceae (n=3), Lamiaceae (n=1), Melastomataceae (n=1), Moraceae (n=1), Myrtaceae (n=1), Orchidaceae (n=1), Rubiaceae (n=2) and

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Verbenaceae (n=2) (GAGNÉ, 2004). This is the first record on Malpighiaceae.

*Youngomyia* Felt, 1908 is a genus known from six species. It has been recorded from Neotropical, Nearctic and Oriental regions and includes gall forming species and inquilines. Only one species, *Youngomyia pouteriae* Maia, 2001 has been recorded from Brazil (GAGNÉ, 2004).

*Lestodiplosis* Kieffer, 1894 is a cosmopolitan genus with 168 described species. It comprises only predaceous species. Seven species have been recorded from the Neotropical region and a single one is known from Brazil (GAGNÉ, 2004).

*Clinodiplosis floricola* sp.nov.  
(Figs. 1-20)

Larva – Body length: 1.90-2.23mm (n=6). Spatula (Fig.1) 2-toothed; length: 0.09-0.12mm (n=6). Sternal papillae asetose, two groups of three lateral papillae on each side of spatula (two pairs setose). Terminal segment (Fig.2): three pairs of corniform papillae and one pair of setose papillae (setal length: 0.03-0.04; n=6).

Pupa – Length: 1.70-1.92mm (n=3). Head (Fig.3): antenal horn short with 0.015mm of length (n=1); apical seta long (length: 0.07; n=2) (Fig.4); two pairs of lower facial papillae (one asetose and the other setose, setal length: 0.01mm, n=2) (Fig.5); three pairs of lateral facial papillae, one pair setose and two without seta (Fig.6). Prothoracic spiracle (Fig.7) elongate with 0.25-0.30mm of length (n=5) and thin. Foreleg sheath reaching the distal margin of abdominal segment 5, midleg sheath reaching basal 1/9 abdominal segment 6 and hindleg sheath reaching the basal 1/3 of abdominal segment 6. Abdominal segments 2-8 with conspicuous spines at basal 1/3, restricted to mesal region; distal spines gradually crescent (Fig.8).

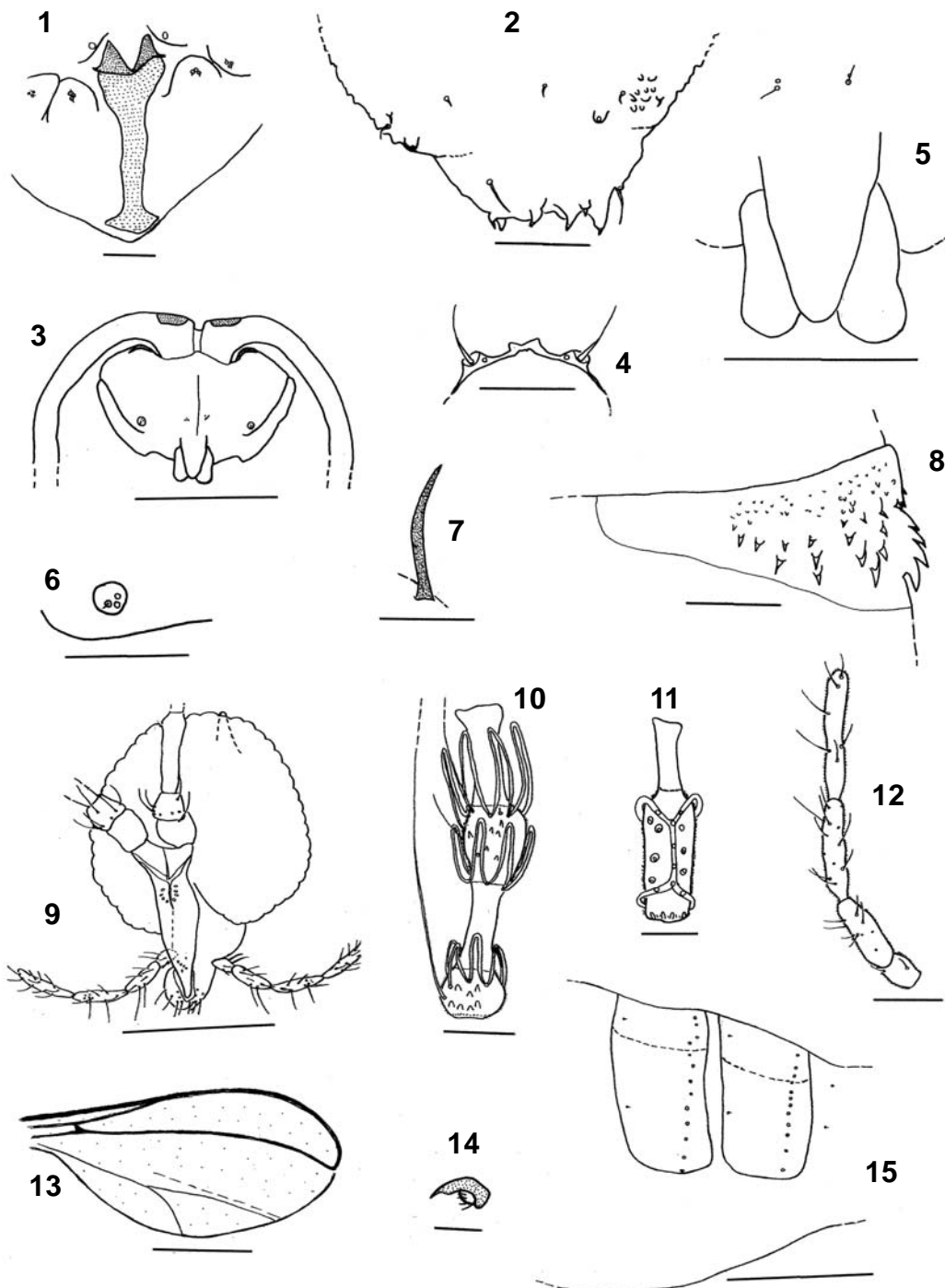
Adult – Head (Fig.9): occipital process present. Eye facets hexagonal, all closely approximated. Antenna: male flagellomeres binodal and tricircumfilar, circumfilar loops regular in length, flagellomere necks subequal to distal node length (Fig.10); female flagellomeres cylindrical with neck well developed, measuring 0.36 times the total length of the flagellomere, female circumfilar as two connected horizontal rings (Fig.11). Flagellomere necks bare in both sexes. Flagellomere 12 with apical process, setulose in both sexes. Frontoclypeus with 8 setae (n=8). Labrum triangular, long-attenuate, with 3 pairs of ventral sensory setae. Hypopharynx as long

as labrum, with anteriorly directed lateral setulae. Labella elongate-convex, each with several long lateral setae and two pairs of short mesal sensory setae. Palpus with four crescent cylindrical segments, all with setae (Fig.12).

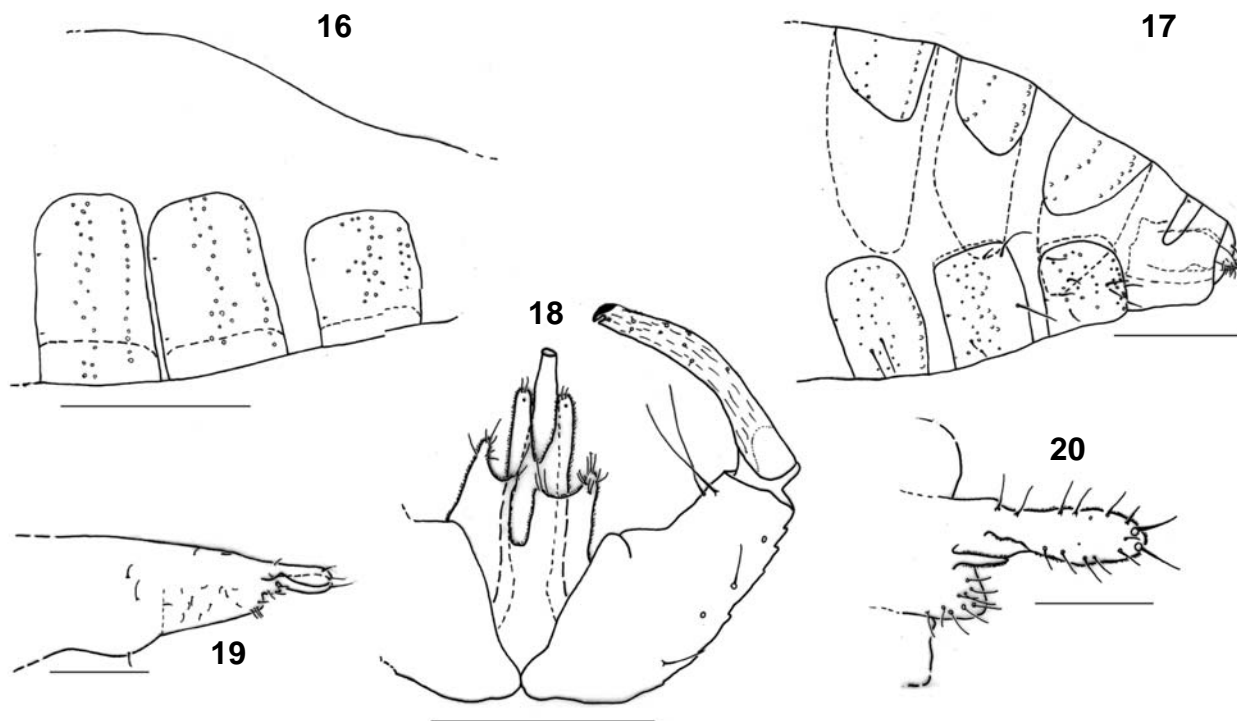
Thorax. Wings: length: 1.14-1.67mm (n=6) in male (n=6), 1.6mm in female (n=1); venation (Fig.13):  $R_1$  as long as  $2/5$  of wing length,  $R_5$  present and evanescent,  $R_5$  curved, joining C beyond wing apex,  $M_3$  evanescent; CuA forked. Anepisternum bare. Anepimeron with 4-6 setae (n=6). Tarsal claws simple, bent before midlength and irregular in width, abruptly attenuate subapically; empodium short, reaching bent in claws (Fig.14).

Abdomen. ♂ (Figs.15-16): tergites 1-7 rectangular with a distal row of setae and a basal pair of trichoid sensilla, tergite 8 not sclerotized with only a pair of trichoid sensilla. Sternites 2-7 rectangular with a caudal row of setae, irregular mesal rows of setae and a pair of trichoid sensilla; sternite 8 sclerotized, rectangular, conspicuously shorter than sternite 7, with scattered setae near distal margin and at mesal region and a pair of trichoid sensilla. Female (Fig.17): tergites 1-7 rectangular with rounded lateral margin, a caudal row of setae, some lateral setae near mesal region and a pair of trichoid sensilla; tergite 8 shorter than the precedent, elongate, with a pair of trichoid sensilla and no setae. Sternites 2-7 rectangular, sternite 8 quadrate, with a caudal row of setae, scattered setae at mesal region, lateral setae present and a basal pair of trichoid sensilla. Male terminalia (Fig.18): gonocoxite with mesal lobe; gonostylus about  $4/5$  of gonocoxite length, thin, regular in width, striate except near basis, basis setulose; cercus setose and secondarily lobed; hypoproct narrow, conspicuously longer than cercus, deeply bilobed, and setose; aedeagus elongate conspicuously longer than hypoproct and rounded at apex. Ovipositor (Fig.19) protrusible, female cerci (Fig.20) elongate-ovoid and setose, with a pair of apical seta stronger than others, female hypoproct narrow, elongate and setose.

Material examined – Holotype, ♂. BRAZIL, RIO DE JANEIRO: Maricá (Barra de Maricá), 05/VI/1998, V.Maia leg., MNRJ. Paratypes, same locality, date and collector, 2♀; same locality and collector, 28/I/1998, 6 larvae; same locality, 20/IX/2000, Maia & Azevedo leg., 2♂, 1♀, 1 pupal exuviae (slide with more one species); same locality, 30/III/2004, V.Maia leg., 10 larvae; same locality, 11/V/2004, V.Maia leg., 1♂, 1♀; same locality, 11/III/2005, V.Maia leg., 3♂; same locality, 16/IV/2005, Guedes & Maia leg., 4♂, 1♀ and 2 pupal exuviae, MNRJ.



*Clinodiplosis floricola* sp.nov. - fig.1- larva, prothoracic spatula, sternal and lateral papillae, ventral view; fig.2- larva, segments terminal, dorsal view; fig.3- pupa, head, frontal view; fig.4- pupa, apical seta, dorsal view; fig.5- pupa, lower facial papillae, frontal view; fig.6- pupa, lateral facial papillae, frontal view; fig.7- pupa, prothoracic spiracle; fig.8- pupa, abdominal segment 2, lateral view; fig.9- adult, female head, frontal view; fig.10- adult, male flagellomere 5; fig.11- ♀, flagellomere 3; fig.12- ♀, palpus; fig.13- ♀, wing; fig.14- ♀, hindleg, tarsal claw; fig.15- ♂, abdominal segments 6 to 8, tergites, lateral view. Scale bars: 1, 14=0.02mm; 2, 4, 5=0.10mm; 3=0.30mm; 6, 8, 10, 12=0.05mm; 7, 9, 15=0.20mm; 11=0.03mm; 13=0.50mm; 14=0.02mm.



*Clinodiplosis floricola* sp.nov., adults - fig.16- ♂, abdominal segments 6 to 8, sternites, lateral view; fig.17- ♀, abdominal segments 5 to end; fig.18- male terminalia, dorsal view; fig.19- ovipositor, lateral view; fig.20- female cerci and hypoproct, ventral view. Scale bars: 16-17=0.2mm; 18-19=0.1mm; 20=0.05mm.

**Etymology** – The name *floricola* refers to the part of the plant where the larva lives.

**Remarks** – This species is distinctive by the apical process of flagellomere 12 with setulae; tarsal claw simple, bent before midlength and abruptly attenuate subapically; male cerci secondarily lobed and male tergite 8 not sclerotized.

**Other material** – *Youngomyia* sp.: BRAZIL, RIO DE JANEIRO: Maricá (Barra de Maricá), 05/VI/1998, V.Maia leg., 2♂; 16/IV/2005, Guedes & Maia leg., 8♂, MNRJ.

*Lestodiplosis* sp.: BRAZIL, RIO DE JANEIRO: Maricá (Barra de Maricá), 05/VI/1998, V.Maia leg., 3♀; 16/IV/2005, Guedes & Maia leg., 1♀, MNRJ.

Not determined Cecidomyiidi: BRAZIL, RIO DE JANEIRO: Maricá (Barra de Maricá), 16/IV/2005, Guedes & Maia leg., 1♂, MNRJ.

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