

**COMPARATIVE ANATOMY OF THE FEMALE GENITALIA OF
GENERIC-LEVEL TAXA IN TRIBE AEDINI (DIPTERA: CULICIDAE).
PART XVI. GENUS *PHAGOMYIA* THEOBALD**

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Abstract. A comparative, morphological analysis of the female genitalia of species included in genus *Phagomyia* Theobald was conducted. The female genitalia of the genus are characterized and a comparison with other taxa is provided. The type species of the genus, *Ph. gubernatoris* (Giles), is illustrated. Treatment of the genital morphology of the genus includes a composite description, detailed description of the type species, list of the species examined, list of published illustrations and/or descriptions of included species with their literature citations, and a discussion. The discussion section contains a list of the most distinctive female genital features of *Phagomyia*, a comparison of these with other aedine genera, and other pertinent information.

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INTRODUCTION

This is the sixteenth in a series of papers by the author that describe the female genitalia of the generic-level taxa included in tribe Aedini of family Culicidae. Part I of the series (Reinert 2000a) included a brief historical background of published papers dealing with the subject and provided an introduction to the series, part II (Reinert 2000b) dealt with genus *Psorophora* Robineau-Desvoidy, part III (Reinert 2000c) with genus *Udaya* Thurman, part IV (Reinert 2000d) with genus *Zeugomyia* Leicester, part V (Reinert 2000e) with genus *Aedes* Meigen, part VI (Reinert 2001a) with genus *Ayurakitia* Thurman, part VII (Reinert 2001b) with genus *Opifex* Hutton, part VIII (Reinert 2001c) with genus *Verrallina* Theobald, part IX (Reinert 2001d) with genus *Eretmapodites* Theobald, part X (Reinert 2002a) with genus *Heizmannia* Ludlow, part XI (Reinert 2002b) with genus *Haemagogus* Williston, part XII (Reinert 2002c) with genus *Armigeres* Theobald, part XIII (Reinert 2002d) with genus *Ochlerotatus* Lynch Arribalzaga, part XIV (Reinert 2002e) provided a key to genera recognized at that time, and part XV (Reinert 2008) with genus *Georgecraigius* Reinert, Harbach and Kitching. Reinert et al. (2004, 2006 and 2008) conducted phylogenetic analyses of tribe Aedini and revised the classification of generic-level taxa. This paper covers the female genitalia of genus *Phagomyia* Theobald, which was resurrected from synonymy with *Finlaya* Theobald by Reinert et al. (2006).

A comparative, morphological analysis of the female genitalia of *Phagomyia* species was conducted, a characterization is given, and a discussion including a comparison with other aedine taxa is provided. The format used includes a composite description, a detailed description and illustration of the type species, *Ph. gubernatoris* (Giles), a list of the species examined, a list of published illustrations and/or descriptions of species with their literature citations, and a discussion including the most distinctive features and other items of note.

MATERIALS AND METHODS

Female genitalia of genus *Phagomyia* are considered here to include all structures caudad of abdominal segment VII. Segment VIII is included since its tergum and sternum are often modified in development and shape, and possess specialized setae.

Terminology used in the descriptions and illustration follows Reinert (2000a, 2008a) and the abbreviations used are found in the "List of Abbreviations Used in the Text and/or Figure" that precedes the figure. The morphological description is based on slide-mounted genitalia that were dissected from dead, dried females. Measurements and descriptions of female genital structures are based on specimens that were cleared, dissected, arranged in a dorsoventrally flattened position, and mounted in Canada balsam under glass cover slips on microscope slides. Ranges are based on the species (listed under "species examined" section) and specimens that I have examined, therefore some variation may occur in species not seen. A phase contrast microscope was used because this was usually necessary to determine some structures, e.g., spermathecal eminence on the roof of the vagina. Measurements of structures (e.g., length and width of terga VIII and IX, sternum VIII, cercus, etc.) include only the pigmented and sclerotized areas and were visible at 400X magnification. Measurements were made using an ocular micrometer having a linear scale of 100 divisions that had been calibrated using a stage micrometer. The scale used in the illustration is in millimeters.

The method of preparation of specimens followed Reinert (2000a). During dissection of the genitalia extra care was taken when separating the insula and lower vaginal lip from sternum VIII as the insula often breaks off and remains attached to the apical intersegmental membrane of the sternum. To avoid this, the intersegmental membrane of sternum VIII was separated from the apical margin of the sternum and mounted with the insula and lower vaginal lip.

FEMALE GENITALIA OF GENUS *PHAGOMYIA* THEOBALD

Genus description. Segments VII and VIII. Laterally compressed; intersegmental membrane between VII-Te and VIII-Te short to intermediate in length. **Tergum VIII.** Width greater than length; covered with minute spicules; moderately pigmented; base gently concave; apex broadly rounded, with several slightly curved, short setae; setae on distal 0.39-0.69; basolateral seta very short; numerous broad scales densely covering distal 0.63-0.85; VIII-Te index 0.46-0.60; VIII-Te/IX-Te index 1.13-2.38; length 0.23-0.36 mm; width 0.46-0.68 mm. **Sternum VIII.** Width greater than length; covered with minute spicules; moderately pigmented; base nearly straight to very gently concave; apex gently sloping from apicolateral corners to midline, with several nearly straight setae, moderately long laterally and becoming shorter mesally; numerous narrowly lanceolate, short setae on distal area; short to moderately long setae on distal 0.78-0.88; setae 1-5-S in more or less angular line extending from basomesal area to apicolateral area, seta 1-S inserted some distance caudally from basal margin; basolateral seta absent (rarely present in *Ph. feegradei* (Barraud)); few to several broad scales usually present on proximal lateral areas; VIII-S index 0.70-0.85; length 0.37-0.48 mm; width 0.47-0.69 mm. **Tergum IX.** Moderately long to relatively long; basal area somewhat expanded laterally into sharp, narrowly pointed area; covered with minute spicules; moderately pigmented; comprised of 2 moderately wide lateral plates connected mesally by moderately pigmented, sclerotized, postbasal band; with 3-8 short setae distally on each lobe, 6-14 total setae; IX-Te width/length ratio 0.69-1.27; length 0.14-0.20 mm; width 0.12-0.23 mm. **Insula.** Liplike; covered with minute spicules; 2-5 short to moderately long setae laterally on each side, 4-8 total setae. **Lower vaginal lip.** Covered with minute spicules; lightly to moderately pigmented; narrow; hinge moderately wide; without lower vaginal sclerite; ventral tuft present. **Upper vaginal lip.** Covered with minute to short spicules; moderately to heavily pigmented; narrow; lateral part bowed outward, caudal margin more or less flat; upper vaginal sclerite moderately pigmented, very small. **Spermathecal eminence.** Membranous; ill-defined, somewhat ovoid in outline. **Postgenital lobe.** Covered with short spicules; long; relatively narrow; apex relatively narrow, usually rounded, occasionally flat; basal mesal apodeme elongate, narrow; setae on distal 0.44-0.65 of ventral surface; numerous short setae on distal 0.44-0.65 of ventral surface; PGL ventral index 3.04-4.59; PGL ventral width/Ce dorsal width ratio 0.44-0.62. **Proctiger.** Membranous; with scattered minute spicules. **Cercus.** Covered with minute and short spicules; moderately long; moderately wide; distal part sharply oblique; base with relatively deep emargination; without scales; setae on distal 0.54-0.69 of dorsal surface; lateral and mesal margins more or less straight; cercus index 2.13-2.70; Ce/dorsal PGL index 1.91-2.48; length 0.22-0.31 mm; width 0.09-0.14 mm. **Spermathecal capsules.** One large and 2 slightly smaller ones; heavily pigmented; spherical; with few small, spermathecal capsule pores near orifice. **Accessory gland duct.** Basal darkly pigmented area short.

Type species description (*Ph. gubernatoris*, Figure 1). *Tergum VIII*. Setae on distal 0.39-0.58; numerous scales densely covering distal 0.73-0.81; VIII-Te index 0.53-0.55; VIII-Te/IX-Te index 1.81-2.05; length 0.33-0.34 mm; width 0.60-0.64 mm. ***Sternum VIII*.** Setae on distal 0.82-0.85; 3-6 (usually 3 or 4) scales on each side of distal 0.71-0.80; VIII-S index 0.70-0.76; length 0.44-0.46 mm; width 0.60-0.64 mm. ***Tergum IX*.** With 4-6 setae distally on each lobe, 10-12 total setae; IX-Te index 0.80-0.94; IX-Te width/length ratio 1.06-1.25; length 0.16-0.18 mm; width 0.18-0.21 mm. ***Postgenital lobe*.** Apex normally flat; setae on distal 0.45-0.56 of ventral surface; PGL ventral index 3.04-4.00; PGL ventral width/Ce dorsal width ratio 0.52-0.60. ***Cercus*.** Index 2.40-2.70; Ce/dorsal PGL index 2.26-2.48; length 0.27-0.31 mm; width 0.11-0.12 mm.

Species examined. *Phagomyia assamensis* (Theobald), *Ph. cacharana* (Barraud), *Ph. deccana* (Barraud), *Ph. feegradei*, *Ph. gubernatoris*, *Ph. inquinata* (Edwards), *Ph. khazani* (Edwards), *Ph. lophoventralis* (Theobald), *Ph. melanoptera* (Giles), *Ph. plumifera* (King and Hoogstraal), and *Ph. prominens* (Barraud).

Discussion. The following combination of features is most distinctive for the female genitalia of species belonging to genus *Phagomyia*. Postgenital lobe is long and relatively narrow with numerous short setae on the distal 0.44-0.65 of the ventral surface. Cercus is moderately long, moderately wide with the distal part sharply oblique, and scales are absent. Tergum VIII has the width greater than the length, most of the surface is densely covered with broad scales, and the apical margin is broadly rounded. Sternum VIII has the width greater than the length, scales are absent or few in number, the apical margin is gently sloping from the apicolateral corners to the midline, and numerous short, narrowly lanceolate setae are on the distal area.

Female genitalia of *Phagomyia* bear some similarity to those of "*Ochlerotatus (Protomacleaya)*" and *Kenknighthia* in the development of the postgenital lobe, cercus and sternum VIII. "*Ochlerotatus (Protomacleaya)*" species are easily distinguished from *Phagomyia* by the development of tergum IX and the insula with numerous moderately long setae in lateral patches. *Kenknighthia* species are easily distinguished from those of *Phagomyia* by the development of tergum IX and by the presence of short, narrowly lanceolate setae on the apical margin of the cercus.

Phagomyia includes species previously placed in the Gubernatoris Assemblage of *Ochlerotatus (Finlaya)* (*sensu* Reinert (2002d)).

Published illustrations (1) and/or descriptions (2) of female genitalia. *Phagomyia assamensis*: Reinert et al. 2006 (2); *Ph. gubernatoris*: Reinert 2002d (1, 2), Reinert et al. 2006 (2), 2008 (2); *Ph. lophoventralis*: Reinert et al. 2006 (2), 2008 (2); and *Ph. prominens*: Reinert et al. 2006 (2).

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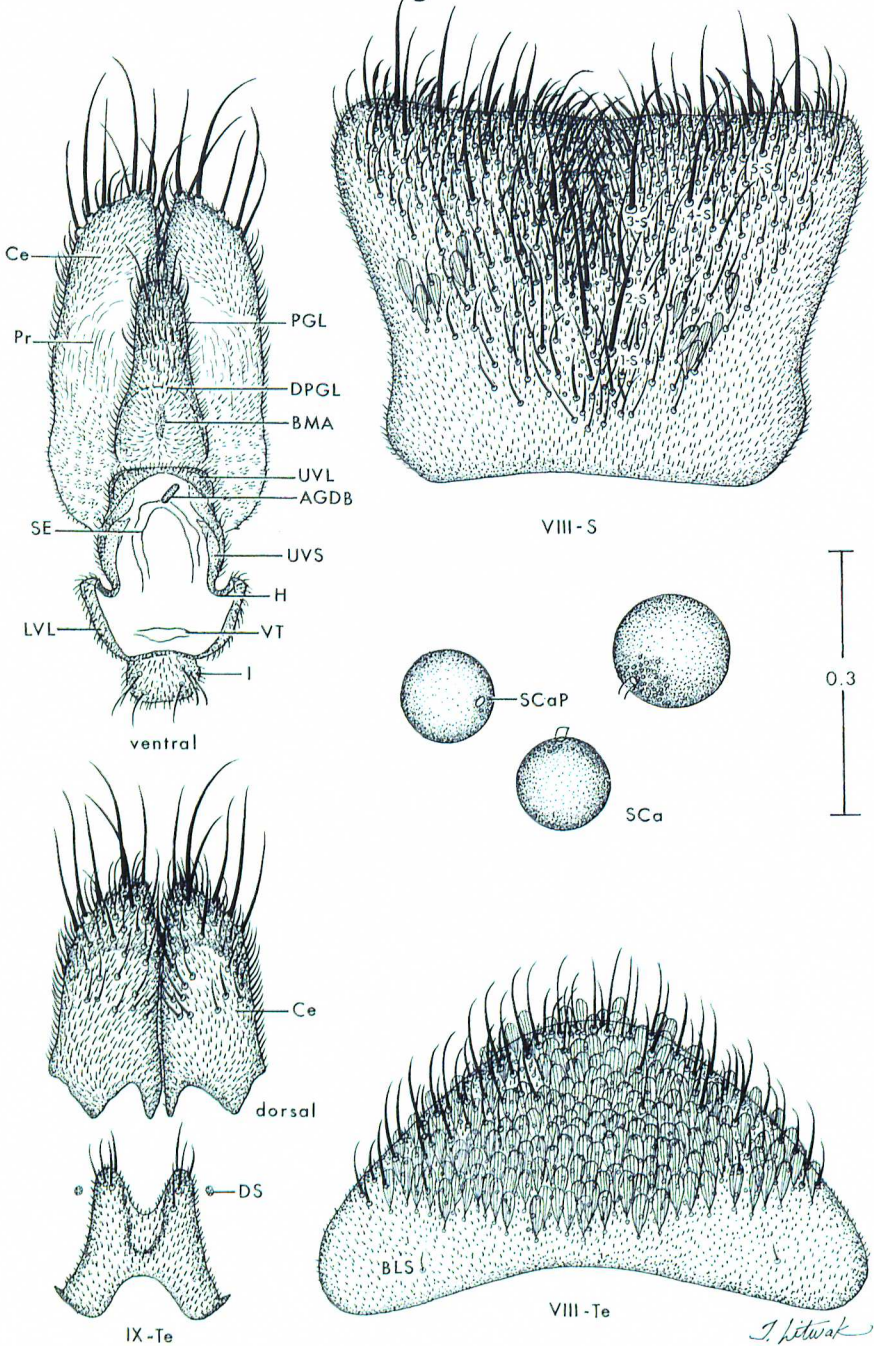
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FIGURE 1. FEMALE GENITALIA OF *PHAGOMYIA GUBERNATORIS***LIST OF ABBREVIATIONS USED IN THE TEXT AND/OR FIGURE**

AGDB	= accessory gland duct base
BLS	= basolateral seta
BMA	= basal mesal apodeme
Ce	= cercus
DPGL	= line of attachment of Pr to dorsal surface of PGL
DS	= dorsal sphere
H	= hinge
I	= insula
IX-Te	= tergum IX
LVL	= lower vaginal lip
mm	= millimeter
PGL	= postgenital lobe
Pr	= proctiger
SCa	= spermathecal capsule
SCaP	= spermathecal capsule pore
SE	= spermathecal eminence
UVL	= upper vaginal lip
UVS	= upper vaginal sclerite
VIII-S	= sternum VIII
VIII-Te	= tergum VIII
VT	= ventral tuft
1-5-S	= Seta 1-5-S

Fig. 1



Phagomyia gubernatoris

J. Netwak

SYSTEMATIC INDEX

Valid generic and specific taxa are italicized, other taxa are in Roman type. Boldface page numbers are those which began the primary treatment of the taxon.

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