Male and Female Genitalia of *Toxorhynchites amboinensis*  
(Diptera: Culicidae)

Wallace A. Steffan, Arthur H. Kodani and Neal L. Evenhuis  
Department of Entomology  
Bishop Museum  
P. O. Box 19000-A  
Honolulu, Hawaii  96819

**ABSTRACT.** Male and female genital components of *Toxorhynchites (Toxorhynchites) amboinensis* are illustrated. An additional series of illustrations provide interpretive composites of the male and female genitalia.

The following illustrations are intended as an aid to users of a series of biosystematic studies of *Toxorhynchites*. Descriptions and illustrations of genitalia usually are based on slide-mounted preparations and are difficult to interpret on a two-dimensional basis.

This study was initially planned to provide us with a better understanding of the genitalia of *Toxorhynchites*, which, superficially, are remarkably uniform throughout their nearly world-wide distribution. A series of acetate overlays were prepared and provided a two-dimensional interpretation of views of the genitalia as various components of the slide-mounted preparations were brought into focus. Since this technique was very successful for our purposes, the following illustrations were prepared as an interpretive aid.

Live males and females of *Toxorhynchites (Toxorhynchites) amboinensis* (Doleschall) were obtained from the Pacific Biomedical Research Center, University of Hawaii. The origin of this colony is detailed in Steffan et al. (1980).

The genitalia were dissected in physiological saline, cleared in a 10% potassium hydroxide (KOH) solution, washed in water and transferred to glycerol. The genitalia were studied during all phases of preparation, and initial drawings were made from the glycerol preparations. Specimens then were mounted in Euparal, following the techniques described in Belkin (1962), for final detailed examination. Illustrations of the various genital components were transferred to acetate overlays. When a satisfactory sequence of drawings was achieved, the final series of composites were drawn.

Interpretation of internal anatomical features follows Jones and Wheeler (1965). Terminology essentially follows Harbach and Knight (1980); however, we are following McAlpine (1981:10) and Mackerras (1970:4) in the use of terms relating to orientation and relationship of parts of structure; i.e., basal
medial lobe rather than basal mesal lobe. We have added the abbreviations AG and TM, respectively, for the terms Accessory Gland and Transverse Muscles on the female genitalia which were not included in Harbach and Knight (1980).

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LITERATURE CITED


Fig. 1. Dorsal (prerotational sense) view of *Toxorhynchites (Toxorhynchites)*
amboinensis (Doleschall) male genitalic components. a. gonocoxites, gonostylus and sternum IX; b. aedeagus; c. paraprocts; d. basal pieces and parameres; e. tergum IX.

**Abbreviations**

BML - basal medial lobe
BP - basal piece
Ce - cercus
DAB - dorsal aedeagal bridge
Gc - gonocoxite
GC - gonostylar claw
Gs - gonostylus
Par - paramere
Ppr - paraproct
VAB - ventral aedeagal bridge
IX-S - sternum IX
Fig. 2. Dorsal (prerotational sense) view of male genitalia of *Te.* (Tox.) *amboinensis* showing buildup of genitalic components. a. gonocoxites and gonostylus; b. addition of parameres and basal pieces; c. addition of aedeagus; d. addition of paraprocts and cercus; e. addition of tergum IX.
Fig. 2
Fig. 3. Male genitalic components of *Tx. (Tox.) amboinensis*.  

a. gonocoxite and gonostylus, medial view;  
b. aedeagus, lateral view;  
c. paraproct and cercus, lateral view, with detail showing cercal setae;  
d. paramere and basal piece, medial view;  
e. sternum IX and tergum IX, lateral view.

Abbreviations

BML - basal medial lobe  
BP - basal piece  
Ce - cercus  
Cse - cercal seta(e)  
Gc - gonocoxite  
GC - gonostylar claw  
Gs - gonostylus  
Par - paramere  
Ppr - paraproct  
IX-S - sternum IX  
IX-Te - tergum IX
Fig. 4. Lateral view of male genitalia of *Tx. (Tox.) amboinensis* showing breakdown of genitalic components (all structures paired; left gonocoxite - prerotational sense - removed for clarity). a. male genitalia, *in situ*; b. sternum VIII and tergum VIII removed; c. sternum IX and tergum IX removed; d. paraprocts and cercus removed; e. aedeagus removed; f. parameres and basal pieces removed.

**Abbreviations**

VIII-S - sternum VIII
VIII-Te - tergum VIII
Fig. 4

VIII-S

VIII-Te
Fig. 5. Female genitalic components of *Tx. (Tox.) amboinensis*, ventral view.

a. cerci, proctiger and tergum IX, *in situ*; b. postgenital lobe;

c. upper and lower vaginal lips and insula, *in situ*.

Abbreviations

Ce    - cercus
I     - insula
LVL   - lower vaginal lip
PGL   - postgenital lobe
Pr    - proctiger
UVL   - upper vaginal lip
IX-Te - tergum IX
Fig. 5

(a) IX-Te
(b) PGL
(c) UVL, I, LVL
Fig. 6. Female genitalia of *Tx. (Tox.) amboinensis* showing buildup of genital components. a. cerci, protiger and tergum IX, ventral view; b. addition of postgenital lobe, ventral view; c. addition of upper and lower vaginal lips and insula, ventral view; d. female genitalia *in situ*, dorsal view.

Abbreviations

Ce - cercus
Go - gonotreme
I - insula
LVL - lower vaginal lip
PGL - postgenital lobe
Pr - protiger
UVL - upper vaginal lobe
IX-Te - tergum IX
Fig. 7. Lateral view of female genitalic components of *Tx. (Tox.) amboinensis*.  
a. cercus, proctiger and tergum IX; b. postgenital lobe; c. upper and lower vaginal lips, insula and gonotreme.

Abbreviations

Ce - cercus  
Go - gonotreme  
I - insula  
LVC - lower vaginal lip  
PGL - postgenital lobe  
Pr - proctiger  
UVL - upper vaginal lip  
IX-Te - tergum IX
Fig. 7

IX-Te
Pr
Ce

PGL

I
Go
UVL
LVL
Fig. 8. Lateral view of female genitalia of *Tx. (Tox.) amboinensis* showing buildup of genitalic components. a. cercus, proctiger and tergum IX; b. addition of postgenital lobe; c. addition of upper and lower vaginal lips and insula.
Fig. 8

a

b

c
Fig. 9. Dorsal view of morphology of female genitalia of *Tx. (Tox.*) amboinensis*, with detail of junction of spermathecal and accessory gland ducts and detail of spermathecal capsule.

**Abbreviations**

AG - accessory gland  
AGD - accessory gland duct  
AGDB - accessory gland base  
I - insula  
LVL - lower vaginal lip  
SCa - spermathecal capsule  
SCaP - spermathecal capsule pore  
SDU - spermathecal duct  
TM - transverse muscles  
UVL - upper vaginal lip  
VA - vagina  
IX-Te - tergum IX
Fig. 9

AGD

IX-Te

AG

SDu

AGDB

SCa

SCaP

Va

LVL

TM

0.05 mm

0.05 mm

0 0.1 0.2 0.3 mm