

# Quitinized structures of the spermatheca of five Muscidae species (Insecta, Diptera)

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**ABSTRACT.** The morphology of the quitinized structures related to the spermatheca of five Muscidae species is described and illustrated: *Atherigona orientalis* Schiner, 1868; *Stomoxys calcitrans* (Linnaeus, 1758); *Muscina stabulans* (Fallén, 1817); *Ophyra solitaria* Albuquerque, 1958 and *Hydrotaea nicholsoni* Curran, 1939.

**KEY WORDS.** Descriptions, illustrations, morphology.

**RESUMO.** A morfologia das estruturas quitinizadas relacionadas com a espermateca de cinco espécies de Muscidae é descrita e ilustrada: *Atherigona orientalis* Schiner, 1868; *Stomoxys calcitrans* (Linnaeus, 1758); *Muscina stabulans* (Fallén, 1817); *Ophyra solitaria* Albuquerque, 1958 e *Hydrotaea nicholsoni* Curran, 1939.

**PALAVRAS CHAVE.** Descrições, ilustrações, morfologia.

COURI (1987) contributed to the knowledge of the quitinized structures of the spermathecae of Muscidae species, describing the morphology of 15 species: *Biopyrellia bipuncta* (Wiedemann, 1830); *Musca domestica* Linnaeus, 1758; *Philornis univittatus* Dodge, 1968; *Charadrella malacophaga* Lopes, 1938; *Cyrtonneurina polystigma* (Wulp, 1896); *Neomuscina neosimilis* Snyder, 1949; *Brontaea debilis* (Williston, 1896); *Graphomyia mexicana* Giglio-Tos, 1893; *Mydaea plaumani* Snyder, 1941; *Scutellomusca marginata* (Albuquerque, 1954); *Dolichophaonia gallicola* (Albuquerque, 1958); *Phaonia nigriventris* (Albuquerque, 1954); *Linnophora saeva* (Wiedemann, 1830); *Coenosia camorinensis* Albuquerque, 1956 and *Neodexiopsis paulistensis* Albuquerque, 1956.

Before this contribution, very little was known on these structures on Muscidae family, where, at the most, the papers brought the illustration of the capsule. However, the taxonomic value of these structures in other Diptera families, has been demonstrated in several contributions (e.g. ARTIGAS 1971, ARTIGAS *et al.* 1988, ARTIGAS & PAPAVERO 1990, ARTIGAS *et al.* 1991 in Asilidae, NAGATOMI & LIU 1995, and ARTIGAS 1990 in Mydidae, Panthophthalmidae and Xylophagidae *s. lat.*; PAPE 1992 in some dipteran families focusing the phylogeny of Tachinidae).

The analysis of the spermatheca and allied structures of the 15 Muscidae species, representing most of the sub-families (COURI 1987) clarified some characters. In other to have a better representation of the family, five other species were dissected: *Atherigona orientalis* Schiner, 1868; *Stomoxys calcitrans* (Linnaeus, 1758); *Muscina stabulans* (Fallén, 1817); *Ophyra solitaria* Albuquerque, 1958 and *Hydrotaea nicholsoni* Curran, 1939.

This paper also has the purpose to contribute to further

phylogenetic analysis, through the use of the characters related to the spermatheca.

## MATERIAL AND METHODS

The methodology of dissection and the terminology were the same described in COURI (1987), as well as the diagnostic characters used in the descriptions.

## DESCRIPTIONS

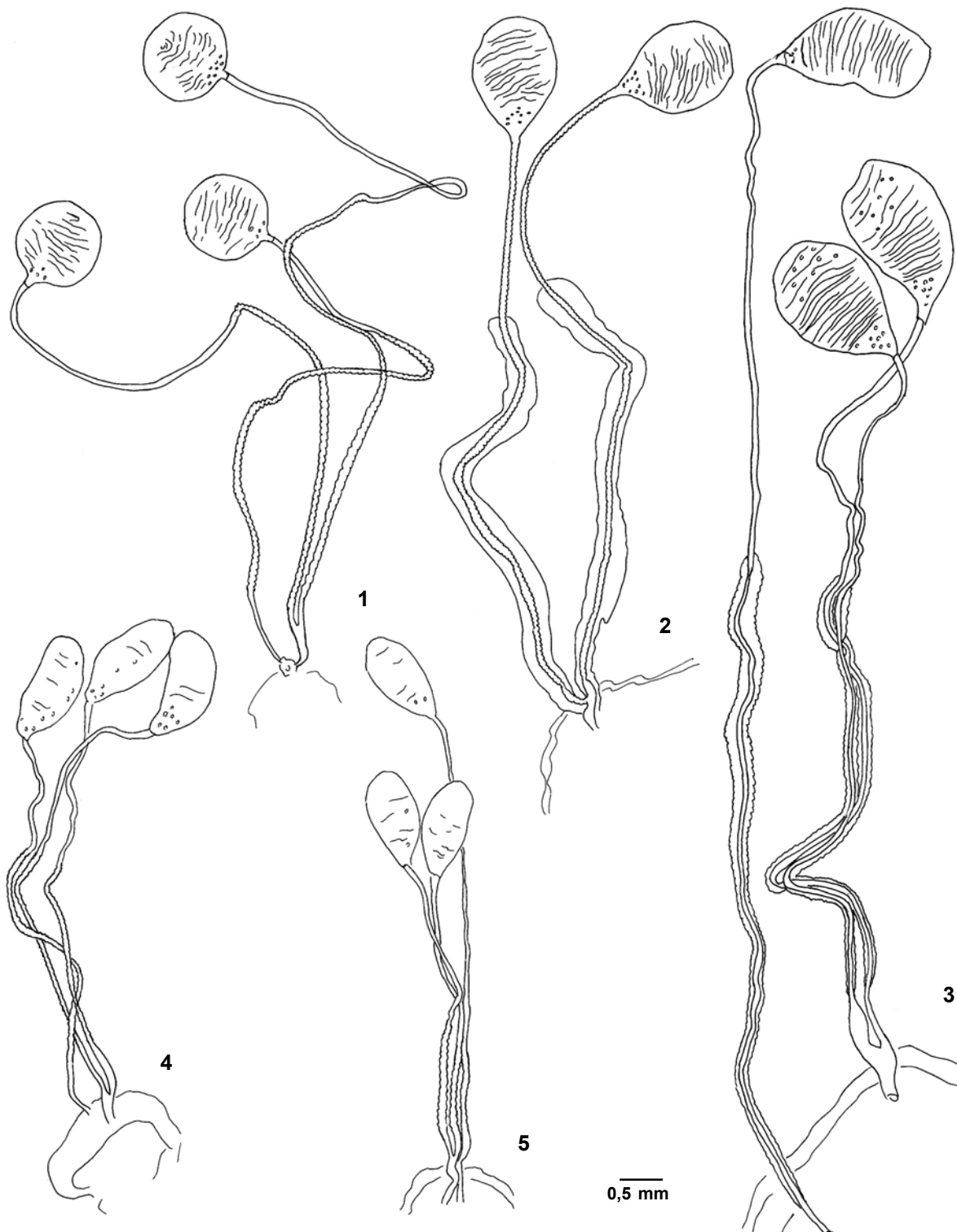
*Atherigona orientalis*. (Fig. 1), spermathecae: three in number, round, equal sized, surface little corrugate, many pores near base and few pores at apex. Spermathecal ducts: medium sized, one shorter than the two others.

*Stomoxys calcitrans*. (Fig. 2), spermatheca: two in number, pear-shaped, equal sized, surface little corrugate, many pores near base. Spermathecal ducts: short, both similar in length.

*Muscina stabulans* (Fig. 3), spermatheca: three in number, pear-shaped, equal sized, surface very corrugate, many pores near base and near apex. Spermathecal ducts: long, one of them longer than the others.

*Ophyra solitaria* (Fig. 4), spermatheca: three in number, elongate, equal sized, surface very little corrugate, almost smooth; few pores near base and others scattered. Spermathecal ducts: short, one of them longer than the others.

*Hydrotaea nicholsoni* (Fig. 5), spermatheca: three in number, elongate, equal sized, surface very little corrugate, almost smooth; few pores closer to base. Spermathecal ducts: short, one of them longer than the others.



Figs 1-5. Quitinized structures of spermatheca: (1) *Atherigona orientalis*; (2) *Stomoxys calcitrans*; (3) *Muscina stabulans*; (4) *Ophyra solitaria*; (5) *Hydrotaea nicholsoni*.

Table I. Diagnostic characters/states of the spermatheca and spermathecal ducts in Muscidae species (some data from COURI 1987).

Species	Spermatheca				Spermathecal ducts	
	Shape	Surface	Pores	Position of pores	Length	Relative length
Atherigoninae						
<i>Atherigona orientalis</i>	round	little corrugate	present	base	medium	one shorter
Muscinae						
Stomoxyini						
<i>Stomoxys calcitrans</i>	pear-shaped	little corrugate	present	base	short	similar
Muscini						
<i>Biopyrellia bipuncta</i>	elongate	very corrugate	present	base and apex	medium	similar
<i>Musca domestica</i>	2 elongate, 1 round	little corrugate	present	base	medium	similar
Azelinae						
<i>Hydrotaea nicholsoni</i>	elongate	almost smooth	present	base	short	one longer
<i>Ophyra solitaria</i>	elongate	almost smooth	present	base	short	one longer
Dichaetomyiinae						
<i>Cyrtoneurina polystigma</i>	elongate	very corrugate	present	base	long	similar
<i>Neomuscina neosimilis</i>	elongate	very corrugate	present	base	long	similar
<i>Charadrella mallacophaga</i>	pear-shaped	very corrugate	present	base	long	similar
Reinwardtinae						
<i>Philornis univittatus</i>	round	very corrugate	present	scattered	long	one longer
<i>Muscina stabulans</i>	pear-shaped	very corrugate	present	scattered	long	one longer
Phaoninae						
<i>Dolichophaonia brasiliensis</i>	pear-shaped	very corrugate	absent	ÑÑ	very long	one longer
<i>Phaonia nigriventris</i>	pear-shaped	very corrugate	present	base	very long	similar
Mydaeinae						
<i>Graphomyia mexicana</i>	pear-shaped	very corrugate	present	base	long	one longer
<i>Mydaea plaumani</i>	pear-shaped	very corrugate	present	base	long	similar
<i>Brontaea debilis</i>	elongate	very corrugate	present	apex	medium	similar
<i>Scutellomusca marginata</i>	elongate	very corrugate	present	base	medium	one longer
Coenosiinae						
Limnophorini						
<i>Limnophora saeva</i>	round	almost smooth	present	scattered	very long	similar
Coenosiini						
<i>Coenosia camorinensis</i>	pear-shaped	almost smooth	present	base	very long	similar
<i>Neodexiopsis paulistensis</i>	round	almost smooth	present	base	very long	similar

## DISCUSSION

Adding the data in COURI (1987) with the ones herein presented, some patterns at sub-family level could be traced (see also Tab. I).

Atherigoninae (*A. orientalis*): spermatheca round with pores at base, spermathecal ducts medium.

Muscinae (*S. calcitrans*, *B. bipuncta*, *M. domestica*): pores more concentrate at base of capsules; all spermathecal ducts similar in length.

Azelinae (*O. solitaria*, *H. nicholsoni*): spermatheca pear-

shaped, with surface almost smooth; pores at base, spermathecal ducts short, with one longer than the others.

Dichaetomyiinae (*C. malacophaga*, *C. polystigma*, *N. neosimilis*): surface of the spermatheca very corrugate, pores at base, spermathecal ducts long, similar in length.

Reinwardtinae (*M. stabulans*, *P. univittatus*): surface of the spermatheca very corrugate, pores scattered, spermathecal ducts long, with one longer than the others.

Phaoninae (*D. gallicola*, *P. nigriventris*): surface of the spermatheca very corrugate, spermathecal ducts very long.

Mydaeinae (*M. plaumani*, *G. mexicana*, *S. marginata*, *B.*

*debilis*): surface of the spermatheca very corrugate, pores at base.

Coenosinae (*L. saeva*, *C. camorinensis*, *N. paulistensis*): surface of the spermatheca almost smooth, spermathecal ducts very long, similar in length.

Future studies on the phylogeny of the muscids, should test these characters.

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