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ULTRASTRUCTURE OF THE EGG OF *MUSCINA STABULANS* AND *SYNTHESIOMYIA NUDISETA* (DIPTERA: MUSCIDAE)

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The eggs of Muscina stabulans *and* Synthesiomyia nudiseta *are morphologically described, based on scanning electron microscope (SEM).*

Key words: Diptera – Muscidae – *Muscina stabulans* – *Synthesiomyia nudiseta* – egg – ultrastructure

Muscina stabulans (Fallén, 1817) and *Synthesiomyia nudiseta* (Wulp, 1883) are synanthropic species of quite medical and veterinary importance because they are vectors of pathogenic microorganisms (Greenberg, 1971). The first species is found worldwide on large scale, and the second one, in tropical regions (Pont, 1972), even though this species has been considered cosmopolitan (Smith, 1973).

Although Hinton (1981) had described the ultrastructure of the egg of several Muscidae, the species *M. stabulans* and *S. nudiseta* were not studied. Liu & Greenberg (1989), described, by use of the SEM, the egg of *M. assimilis* (Fallen, 1823), and considered the egg of *M. stabulans* equal to *M. assimilis.* The present study shows the morphology of the egg-shell of *M. stabulans* and *S. nudiseta,* under SEM.

MATERIALS AND METHODS

The eggs of *M. stabulans* and *S. nudiseta* were obtained from the laboratory colony of the Department of Biology of the Instituto Oswaldo Cruz. The eggs were processed for SEM as referred to by Leite & Lopes (1987).

RESULTS

The egg of *M. stabulans* is pale or white, ship-like, measuring 1023 μm long by 261 μm wide, and flattened at the anterior end and tapered posteriorly (Fig. 1). In the posterior end of the egg, there is one large openning (Figs 2a, b). The exochorion shows longitudinal lines (folds), forming irregular ondulation, on lateral and ventral surfaces. The network of exochorion is formed by irregular polygons, usually hexagon in shape, but without any opening (Figs 2, 3a). Rarely are observed several openings in the exochorion (Fig. 4a). In the dorsal surface there is the median area with a plastron network, hexagonal in shape, which bears many opening (aeropyles) (Figs 3b, 4c, 5b). The boundary area (brim or edge) between the exochorion and the hatching line has one plastron network with openings (Fig. 4d) and one plastron network with pillar-like structures near the hatching line (Figs 4b, 5b). The brim or edge in the median area sometimes contains folds. The micropilar plate has one central pit (micropyle), with a petal-like edge, and surrounded by a small network plastron (Figs 5a, b). The outline above the micropylar plate bears a little preeminent bridge that completely surrounds the micropylar plate, as a collar.

The egg of *S. nudiseta* is pale, cilindrical, measuring 1094 μm long by 248 μm wide (Fig. 7a). It has longitudinal lines (folds) that extend from the anterior to posterior end on the lateral and ventral sides (Figs 7a, b). In the posterior end of the egg there is a large opening. The exochorion shows as hexagon-like network without pits (Fig. 9a). The presence of pits in exochorion is unusually observed. The plastron network in median area bears a hexagonal shape with many openings (aeropyles) (Figs 8b, 9a, b, 10a, b, c). The plastron openings observed on the brim can occur in a small locale of its own median area (Fig. 9b). Near the hatching line, toward the brim and also in

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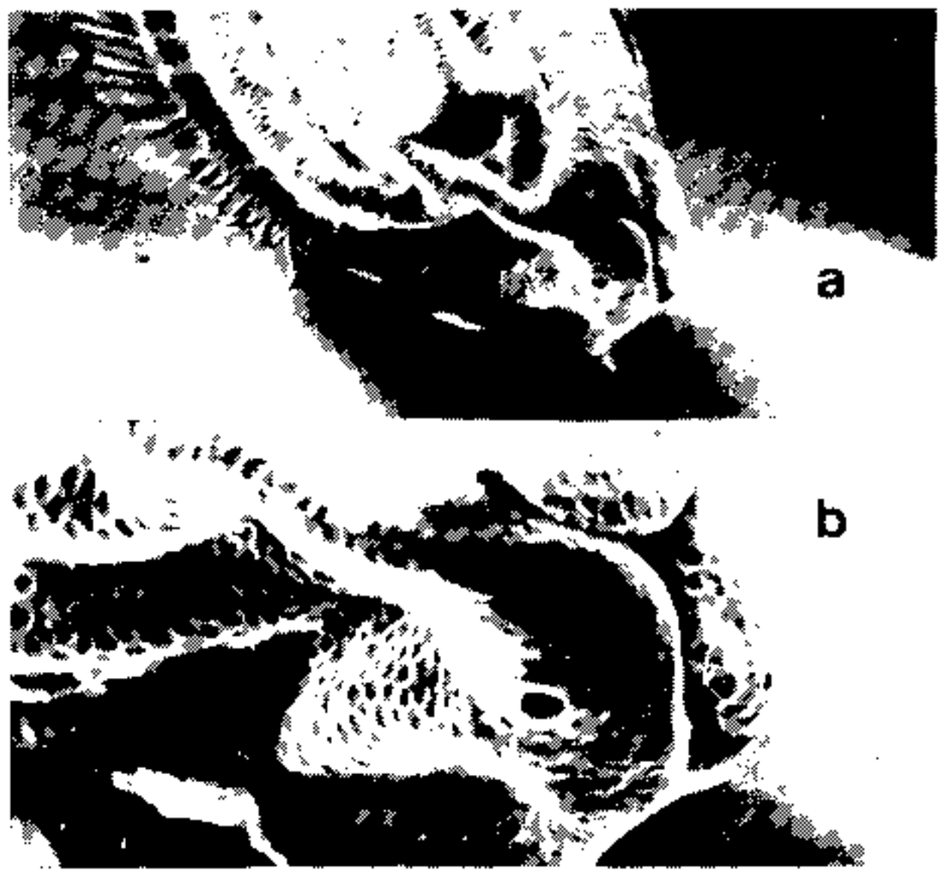
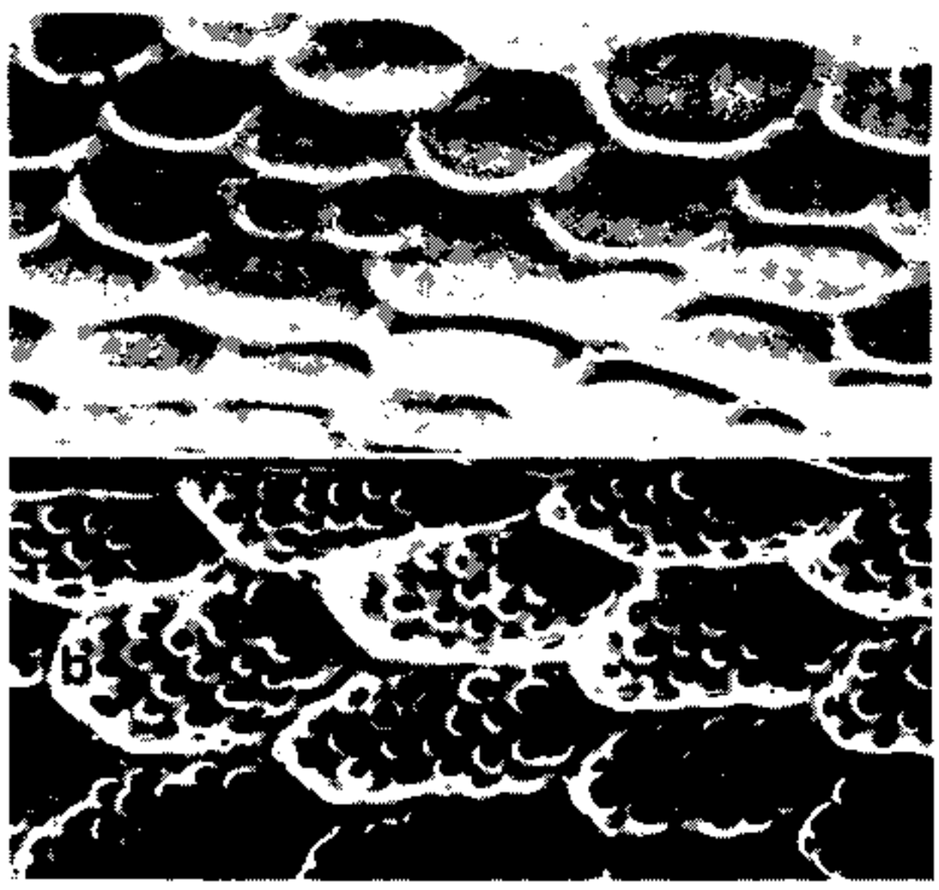
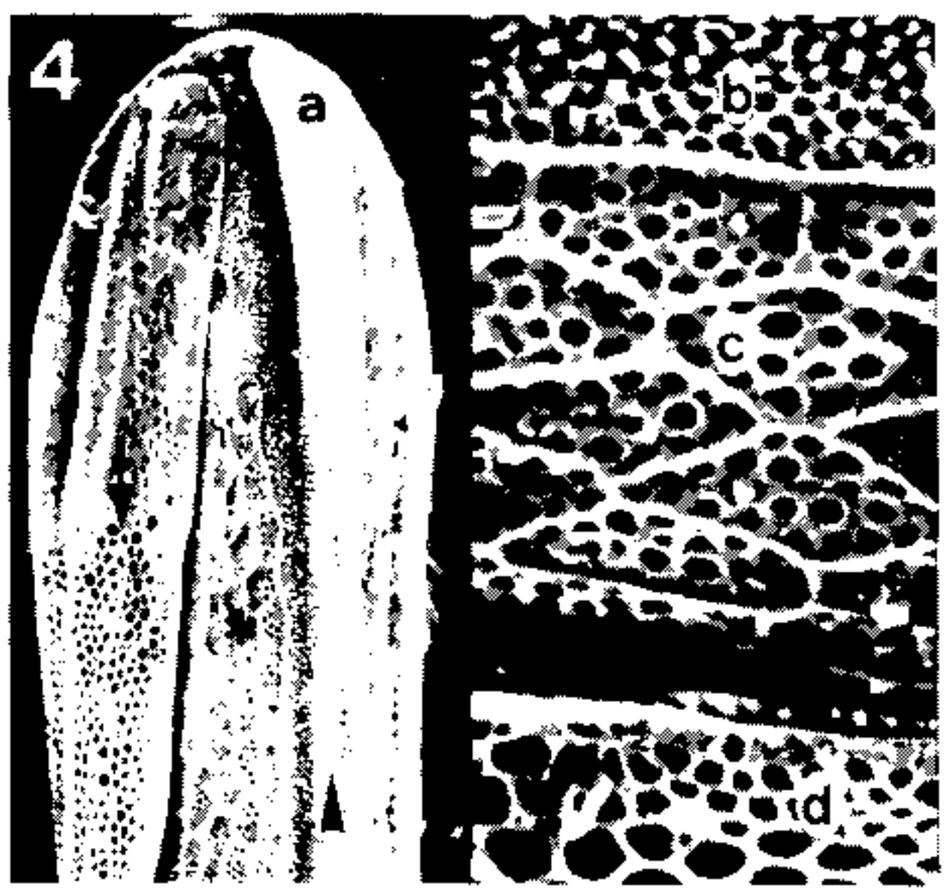
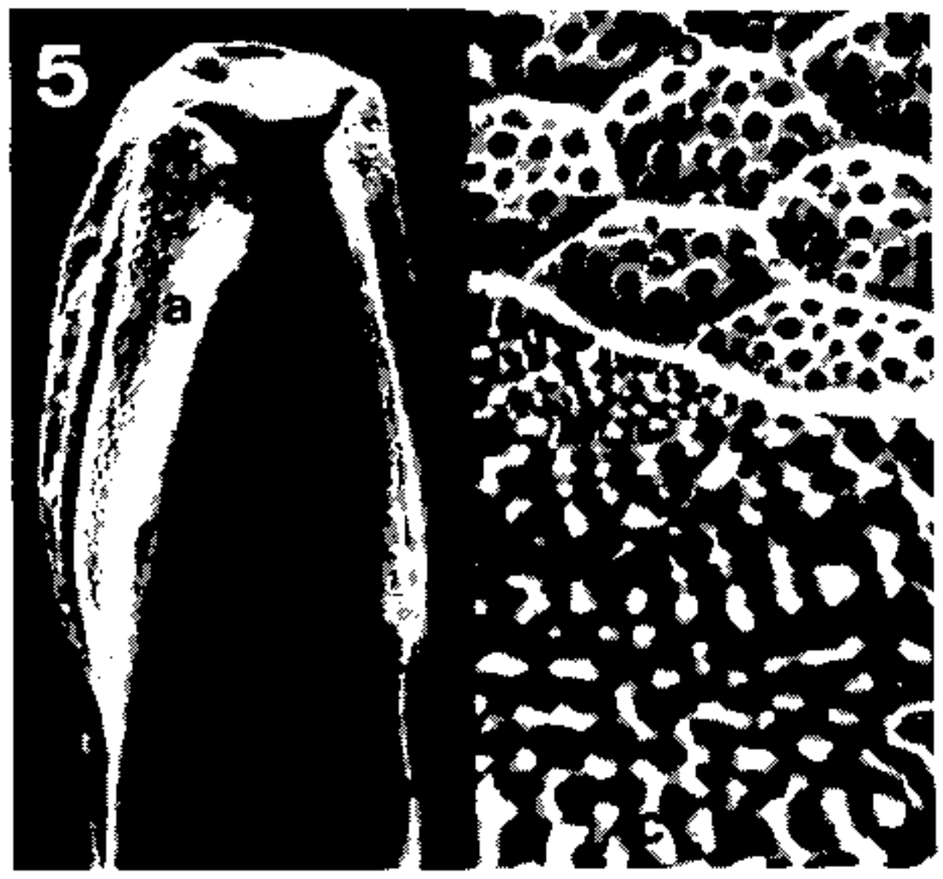
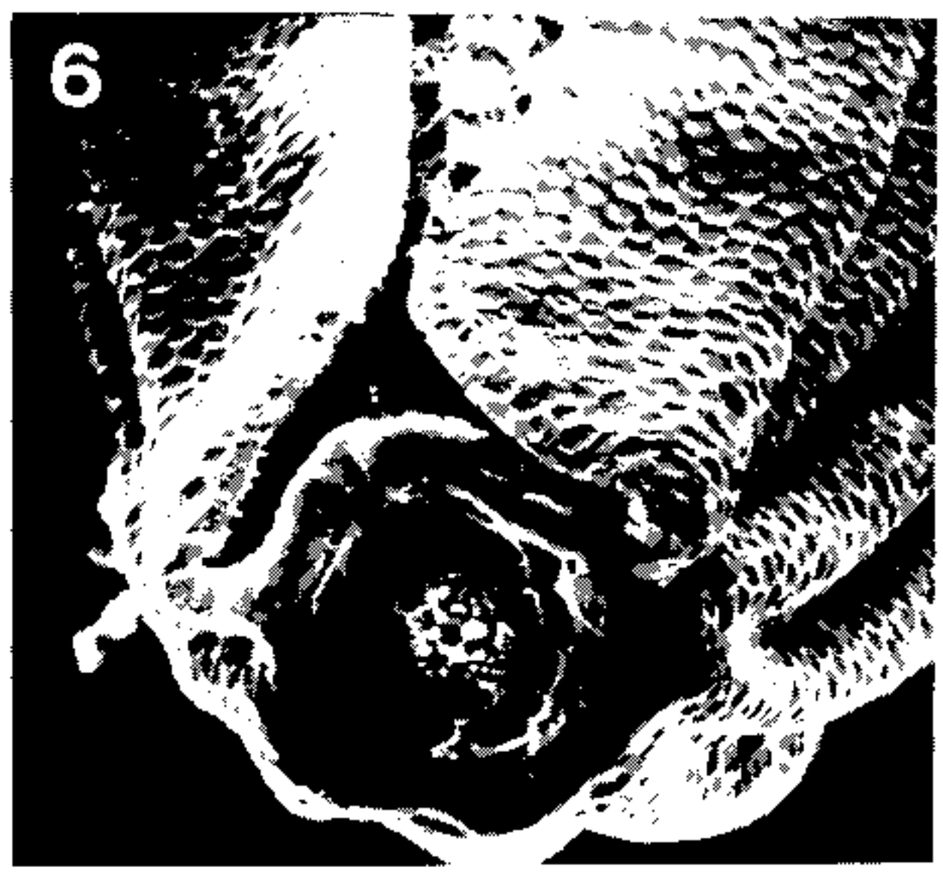




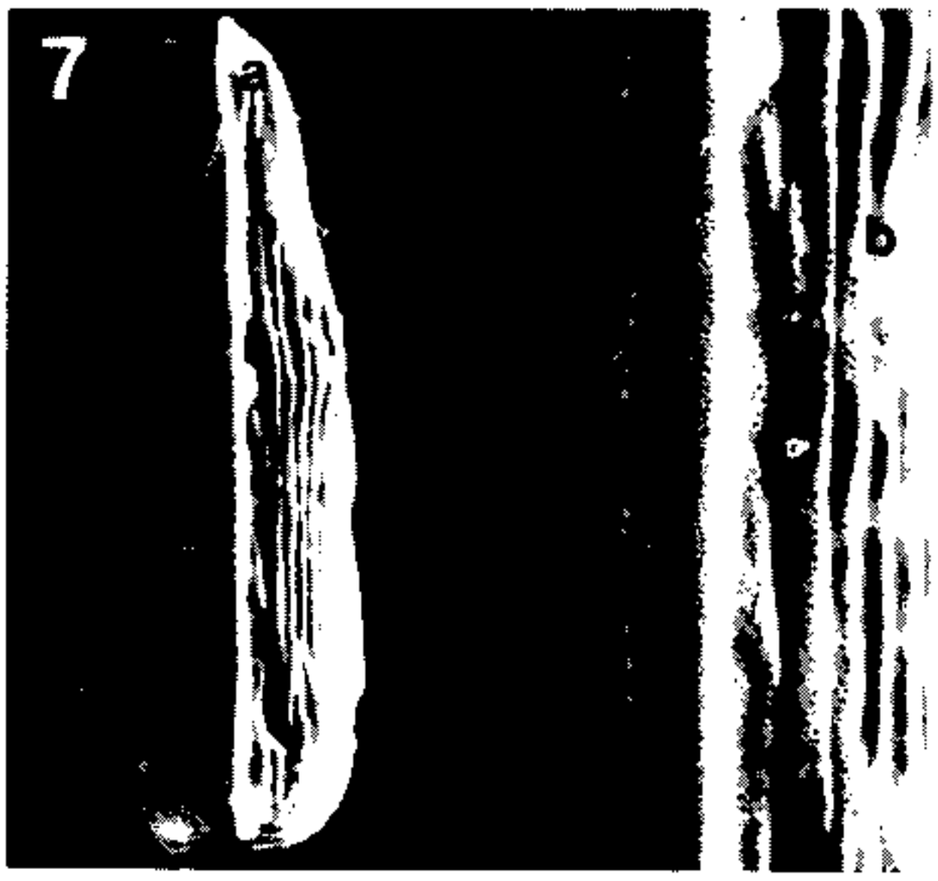


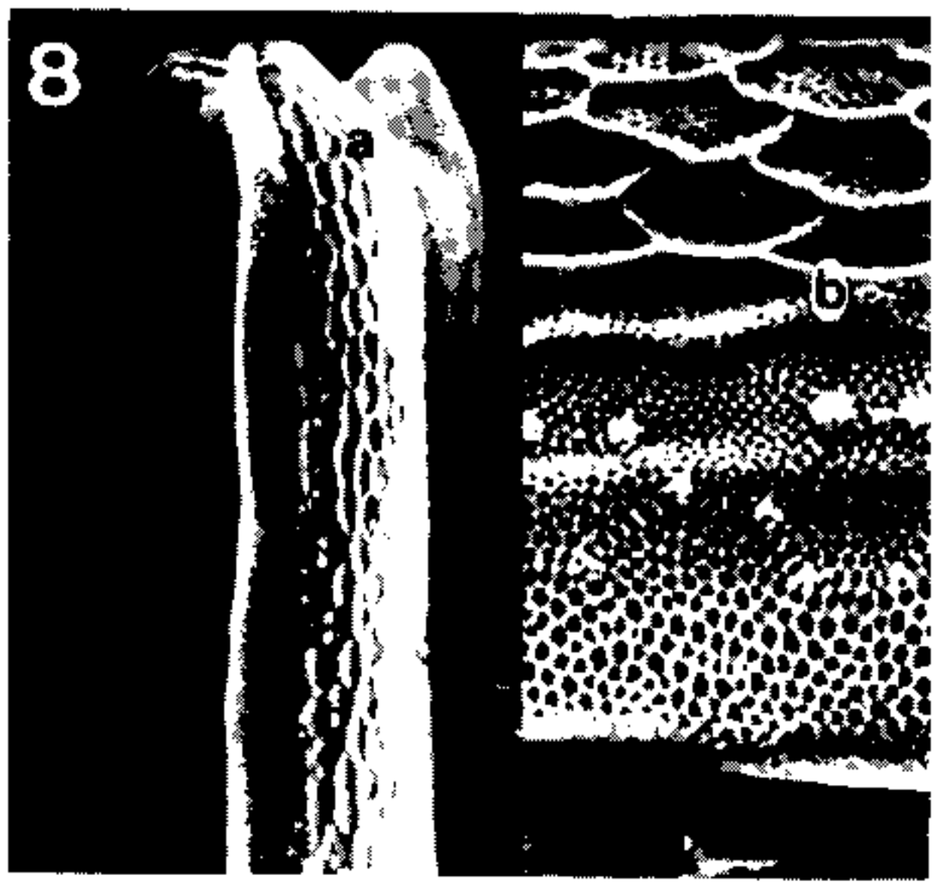


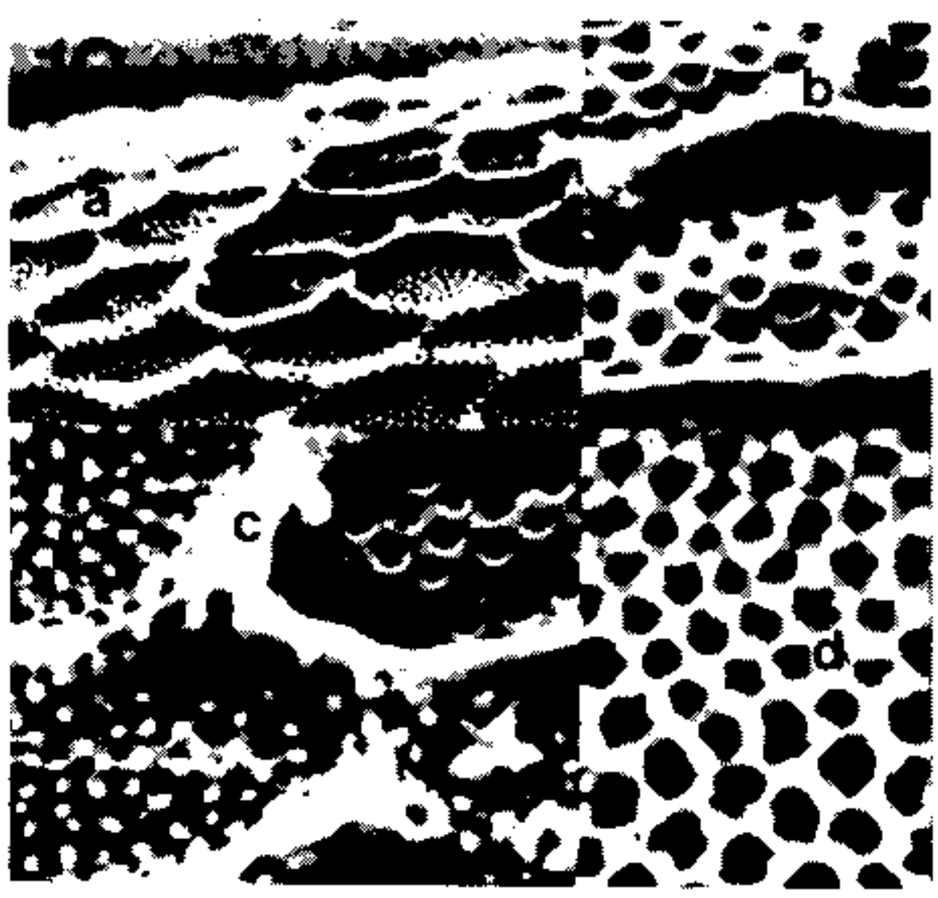


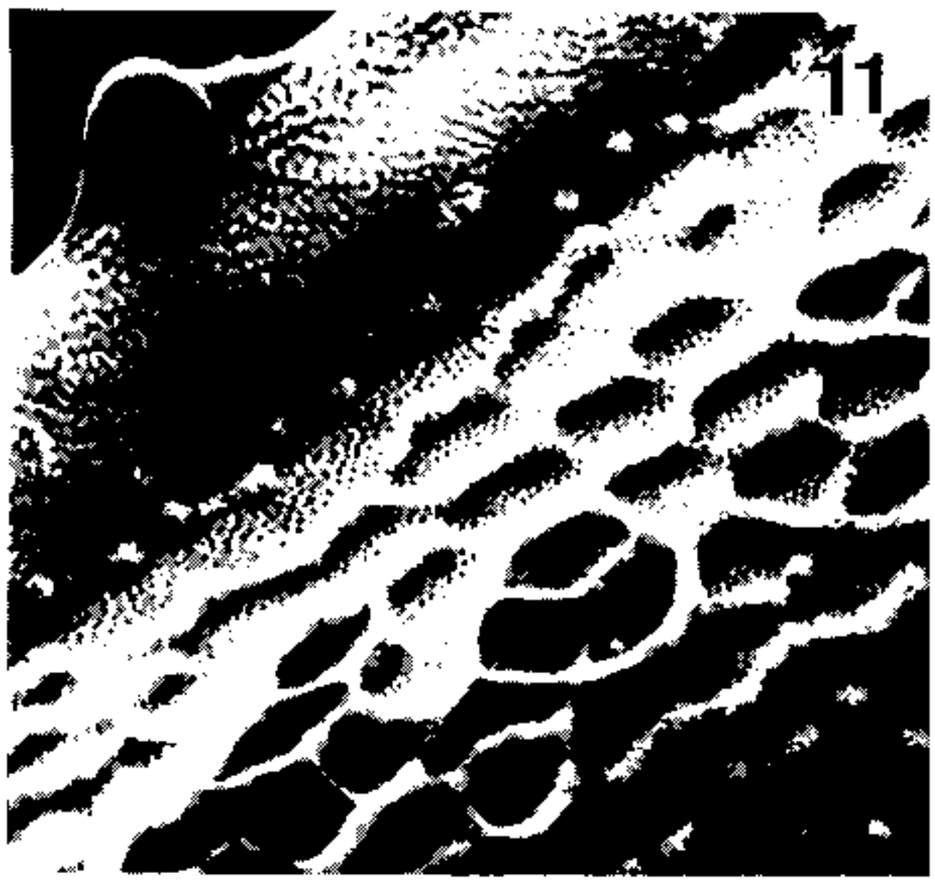
SEM photographs of the egg of *Muscina stabulans*. Fig. 1: complete egg with folds in exochorion. x 107. Fig. 2: posterior end (a). x 200. (b). x 500. Fig. 3: plastron of the exochorion (a). x 2000. Hexagonal network (with aeropyles) of the median area (b). x 1000. Fig. 4: posterior third on dorsal view (a) showing the unusual exochorion with openings (→), median area (*) and brim of edge (>). x 200. Pillar-like network of the brim (b), hexagonal network (with aeropyles) of the median area (c) and brim with openings (d). x 1000. Fig. 5: anterior third (a) on dorsal view. x 206. Median area showing hexagonal network (b). x 1000. Pillar-like network of the brim (c). x 2000. Fig. 6: micropylar plate. x 500.

the median area, have a plastron network with pillar-like structures (Fig. 10d). The brim is frequently unfolded, but the strong process observed is unusual (Fig. 11). The micropilar plate bears a simple central micropyle surrounded by a plaston network (Fig. 12). The bridge above the micropylar plate is keeled, and does not surround the micropylar plate.









SEM photographs of the egg of *Synthesiomyia nudiseta*. Fig. 7: complete egg (a). x 100. The folds of exochorion (b). x 200. Fig. 8: anterior third showing exochorion, brim and median area on lateral view (a). x 136. Median area with hexagonal network (above) and network with openings bellow (b). x 1360. Fig. 9: exochorion and median area (a). x 1000. Hexagonal network aeropyles (b). x 2000. Fig. 10: median area (a). x 500. (b). x 2000. (c) Showing pillar-like network invading the median area. x 2000. Network with opening unusually observed in the median area (d). x 2000. Fig. 11: strong process unusual in brim. x 2000. Fig. 12: micropylar plate. x 566.

DISCUSSION

Based on SEM, the eggs of several Diptera were studied (Hinton, 1981); particularly the respiratory and micropilar systems. Compared with *M. stabulans* and *S. nudiseta,* the median area and micropylar plate are distinct from the Muscidae and Calliphoridae (Hinton, 1981) but

the opening in a limited area of the hexagonal network and the papillar-like structure in the wing of *Fannia coracina* are like the eggs of *M. stabulans* and *S. nudiseta*. The pillar-like structure are similar to those observed in the anterior-lateral apex of the horns of *Musca autummalis* and of outside of the hatching line of the *Orthellia cornicina*.

The eggs of *M. stabulans* and *S. nudiseta* have a similar network in the exochorion and median area, but there are strong differences between them. The opening (aeropyle) in hexagonal network of *M. stabulans* is broader than *S. nudiseta;* however, the later species has more openings in an hexagonal area than the former. In the *M. stabulans,* the margen of micropylar opening bears petal-like shapes and a little preeminent bridge above the micropylar plate, while in the *S. nudiseta* the opening of the micropyle is simple, and the outline above the micropylar plate is keeled. The network of the micropylar plate is limited in *M. stabulans,* but in *S. nudiseta* the network reaches the ventral face of the egg. The differences between both species, can be also observed in the lines (folds) of the exochorion which reach the anterior end of the *S. nudiseta.* The dorsal surface, concavous and flat, observed in *M. stabulans* and *S. nudiseta,* respectively besides the folds running irregularly (*M. stabulans*) and regularly (*S. nudiseta*) are also some of differences identified.

Although Liu & Greenberg (1989) studied the egg of *M. assimilis,* and considered the egg of *M. stabulans* as in *M. assimilis,* they described the longitudinal folds of the exochorion and the petal-like projections in the micropylar opening; such structures are indistinct from those which occur in *M. stabulans* now described. It is possible that the egg of *M. assimilis* shows differences from the *M. stabulans,* but the aforesaid authors did not do a profound study.

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