



A scanning electron-microscope examination of the scolex of *Houttuynia struthionis*

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ABSTRACT

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A scanning electron-microscope examination of the scolex of *Houttuynia struthionis*, a cestode of ostriches, was undertaken in order to study its surface structure. The scolex differs from those of other subfamilies in the family Davaineidae in that it does not have scale-like spines covering the base of the rostellum. Instead, the base is covered with small hooks resembling the larger rostellar hooks in shape.

Keywords: Cestode, *Houttuynia struthionis*, ostrich, scanning electron microscope, scolex

INTRODUCTION

Houttuynia struthionis is a cestode belonging to the family Davaineidae and is a parasite occurring in the intestines of ostriches in Africa. It is not uncommon to recover up to 4 000 scolices of this worm from 4-month-old birds at necropsy (A.F. van Amelsfoort, unpublished data 1991). The scolex has a retractile rostellum bearing two rows of large hammer-shaped hooks, and is equipped with four unarmed suckers (Khalil, Jones & Bray 1994; Schmidt 1987). The proglottides are wider than they are long, craspedote, and the genital pores are unilateral. In the gravid proglottid, the uterus becomes fragmented into egg capsules containing several eggs (Bâ, Sene & Marchand 1995; Khalil *et al.* 1994; Schmidt 1987). Only one scanning electron-microscope study has thus far been undertaken to compare the surface ultrastructures of the family Davaineidae (Bâ *et al.* 1995). This study was done on four genera within this fam-

ily. Scale-like spines were reported on the rostellar "collar" of all the genera previously studied, and this led to the present study of the scolex of *H. struthionis* (Bâ *et al.* 1995; Blitz & Smyth 1973; Gijon-Botella, Del Castillo-Remiro & Lopez-Roman 1989).

MATERIALS AND METHODS

H. struthionis were collected from the intestines of ostriches and preserved in a 4% phosphate-buffered formalin solution. The worms were rinsed in distilled water and kept in 70% alcohol for approximately 5 d. The samples were then dehydrated in stages in 80%, 90% and 100% ethanol, and critical-point dried. Individual, mounted scolices were sputter-coated with gold and viewed with a scanning electron microscope (Hitachi, S-2550 Scanning Electron Microscope).

RESULTS

The generically significant characters of the family Davaineidae are the shape of the rostellum, the continuity of the rostellar hooks, a distinct number of rows and the shape of the larger hooks (Khalil *et al.* 1994). The scolex of *H. struthionis* is 800–1100 µm wide and 450–600 µm long, depending on the age

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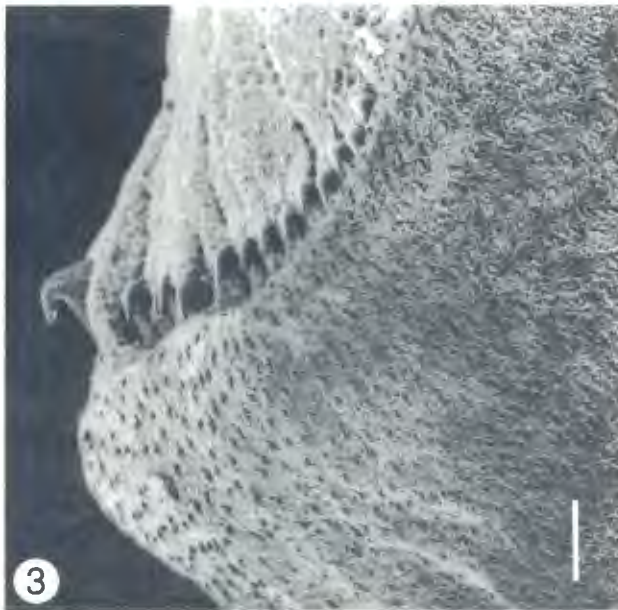
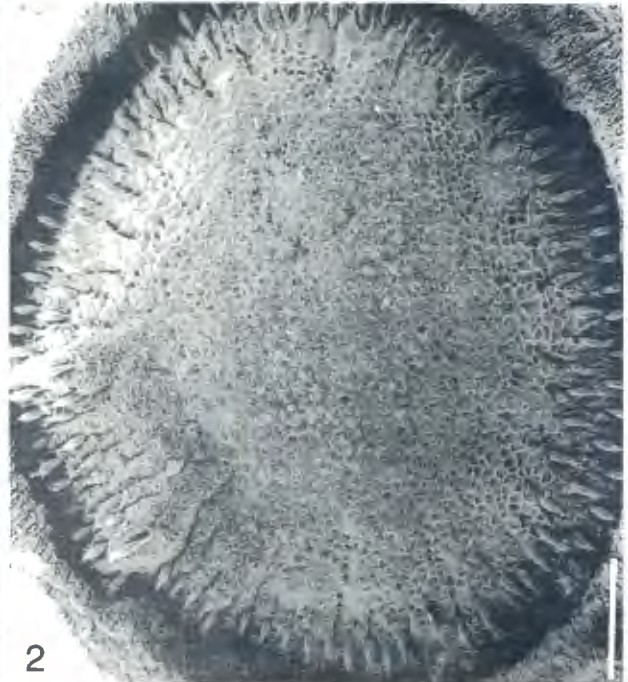


FIG. 1 Apical view of the scolex with the rostellar "collar" extended
Bar = 300 μ m

FIG. 2 The rostellum consists of a ring of 180–200 hooks arranged in a double row
Bar = 50 μ m

FIG. 3 A large hook in the rostellum displaying its typical hammer-claw
Bar = 25 μ m

FIG. 4 The smaller hooks on the base of the rostellum resemble the shape of the larger hooks
Bar = 10 μ m

of the cestode (Fig. 1). This implies that immature scolices will have a smaller diameter and length than adult ones. The rostellum which has a diameter of 350–500 μ m, consists of a ring with 180–200 hammer-shaped hooks, 45–50 μ m long, arranged in a double row (Fig. 2). The apex, and therefore the

visible portion of these larger hooks, is 20–25 μ m long (Fig. 3). Posterior to the rostellum is a lip bearing small hooks, that encircles the larger hooks (Fig. 3). These smaller hooks form a "collar" and are 4–5 μ m long. The apex of these hooks has the same basic shape as that of the larger hooks (Fig. 4). The apex

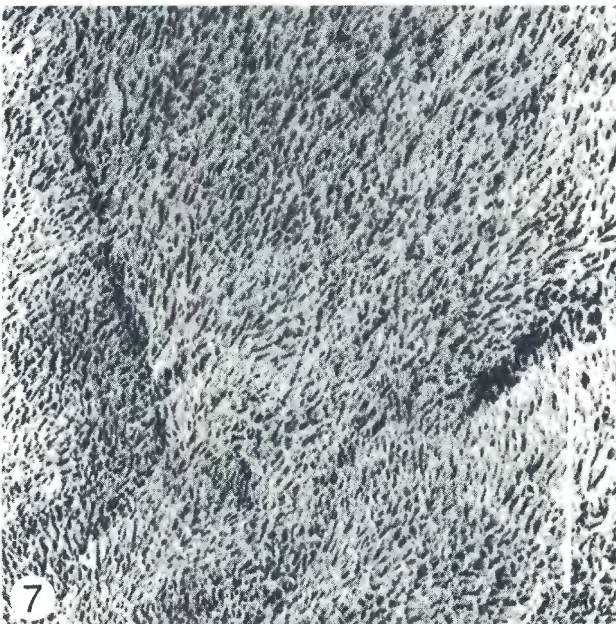
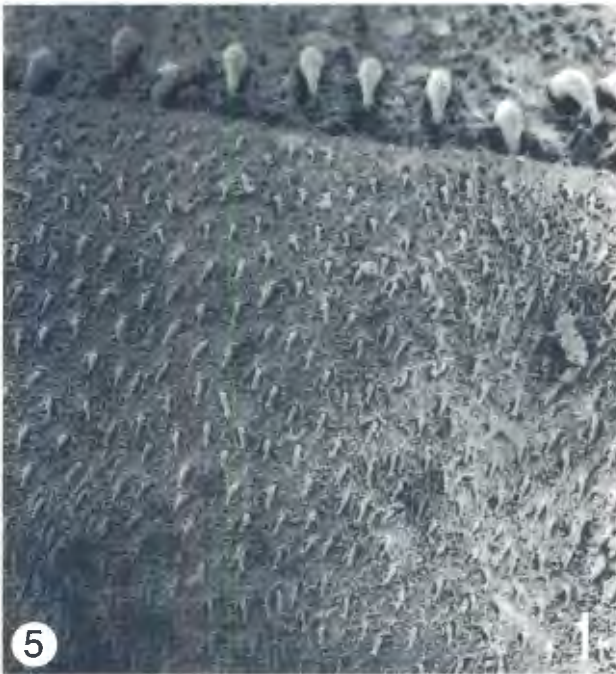


FIG. 5 The smaller spines have no specific arrangement within the "collar"
Bar = 5 μm

FIG. 7 Fine microtriches cover the sucker surface
Bar = 6 μm

FIG. 6 The unarmed suckers are circular in shape
Bar = 75 μm

FIG. 8 The rest of the rostellum is covered by larger microtriches
Bar = 20 μm

is not embedded, and the visible part of these hooks is approximately 2 μm long (Fig. 5). The scolex bears four unarmed circular-shaped suckers with a diameter of 260–360 μm (Fig. 6). The scolex is covered with large microtriches, whereas the suckers are covered with microtriches with a fine texture (Fig. 7 and 8).

DISCUSSION

Some members of the Davaineidae family show scale-like spines on the rostellar base when examined by scanning electron microscopy (Bâ *et al.* 1995). The scolex of *H. struthionis* differs from those of other members of the subfamilies in this family, in that its

base is covered with hooks that resemble the larger hooks in the rostellum (Fig. 5). The shape of these accessory spines on the "collar" seems to be of specific significance to *H. struthionis* and does not change the status of the genus *Houttuynia* within the family Davaineidae (Movessian 1989).

REFERENCES

- BÂ, C.T., SENE, T.H. & MARCHAND, B. 1995. Scanning electron examination of scale-like spines on the rostellum of five Davaineidae (Cestoda, Cyclophyllidae). *Parasite*, 2:63–67.
- BLITZ, N.M. & SMYTH, J.D. 1973. Tegumental ultrastructure of *Raillietina cesticellus* during larval adult transformation with emphasis on the rostellum. *International Journal for Parasitology*, 3:561–570.
- GIJON-BOTELLA, H., DEL CASTILLO-REMIRO, J.A. & LOPEZ-ROMAN, R. 1989. Estudio al M.E.B. de *Raillietina (Raillietina) micracantha* Fühmann, 1908 parasito de *Columba livia domestica* en las Islas Canarias. *Revista Iberica de Parasitologia*, 49:37–40.
- KHALIL, L.F., JONES, A. & BRAY, R.A. (Editors) 1994. *Keys to the cestode parasites of vertebrates*. Wallingford: CAB International University Press.
- MOVESSIAN, S.O. 1989. New zoological system of cestodes of the suborder Davaineata Skrjabin, 1940. *Helminthologia*, 26:117–127.
- SCHMIDT, G.D. 1987. *Handbook of tapeworm identification*. Boca Raton: CBC Press.