

FINE TOPOGRAPHY OF TEGUMENTAL SURFACE OF *OLVERIA INDICA*,  
A RUMEN PARASITE OF CATTLE

VEENA TANDON

Department of Zoology, North-Eastern Hill University, Shillong 793 014, India

(Accepted June 16, 1986)

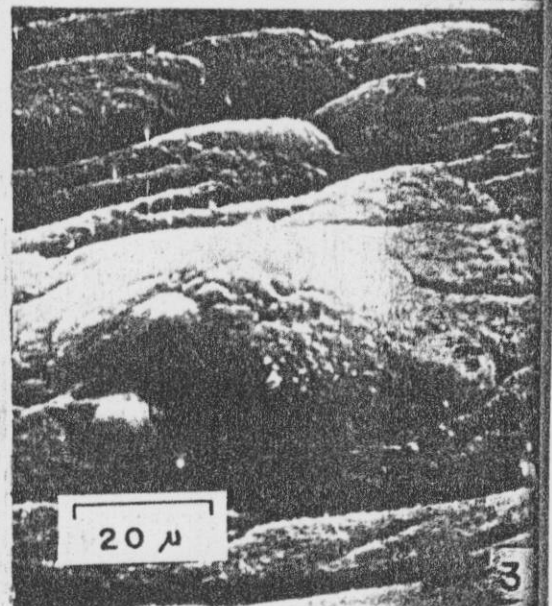
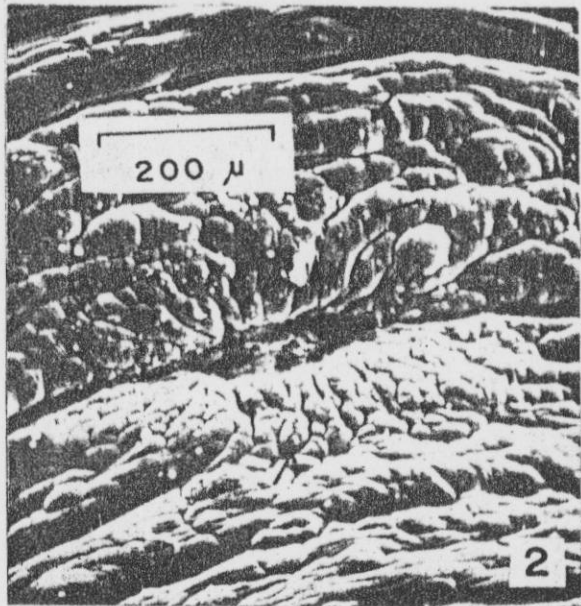
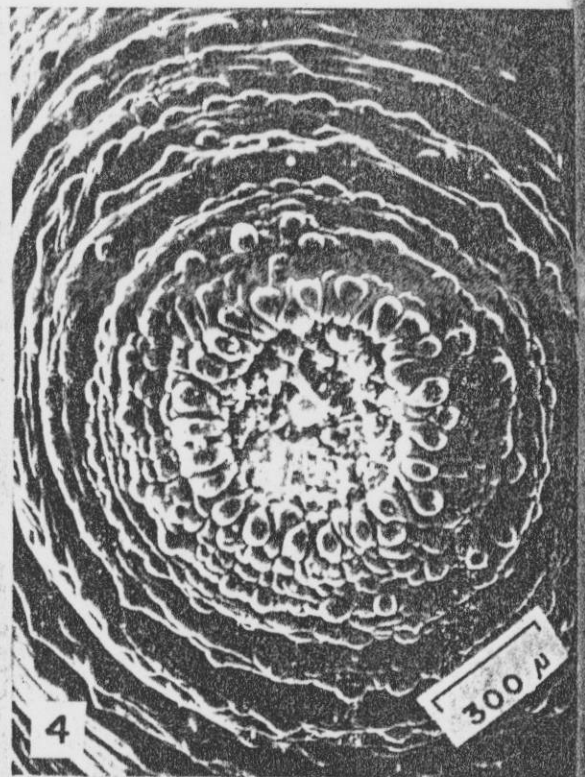
Stereoscan studies of paramphistome flukes, a taxonomically complex group of Digenea, have revealed that surface features and their distribution pattern are species specific (Eduardo, 1980 a, b, c, 1982-1984; Tandon and Maitra, 1981, 1983). The present communication illustrates the fine surface morphology of *Olveria indica* Thapar Sinha, (1945), a cladorchine paramphistome.

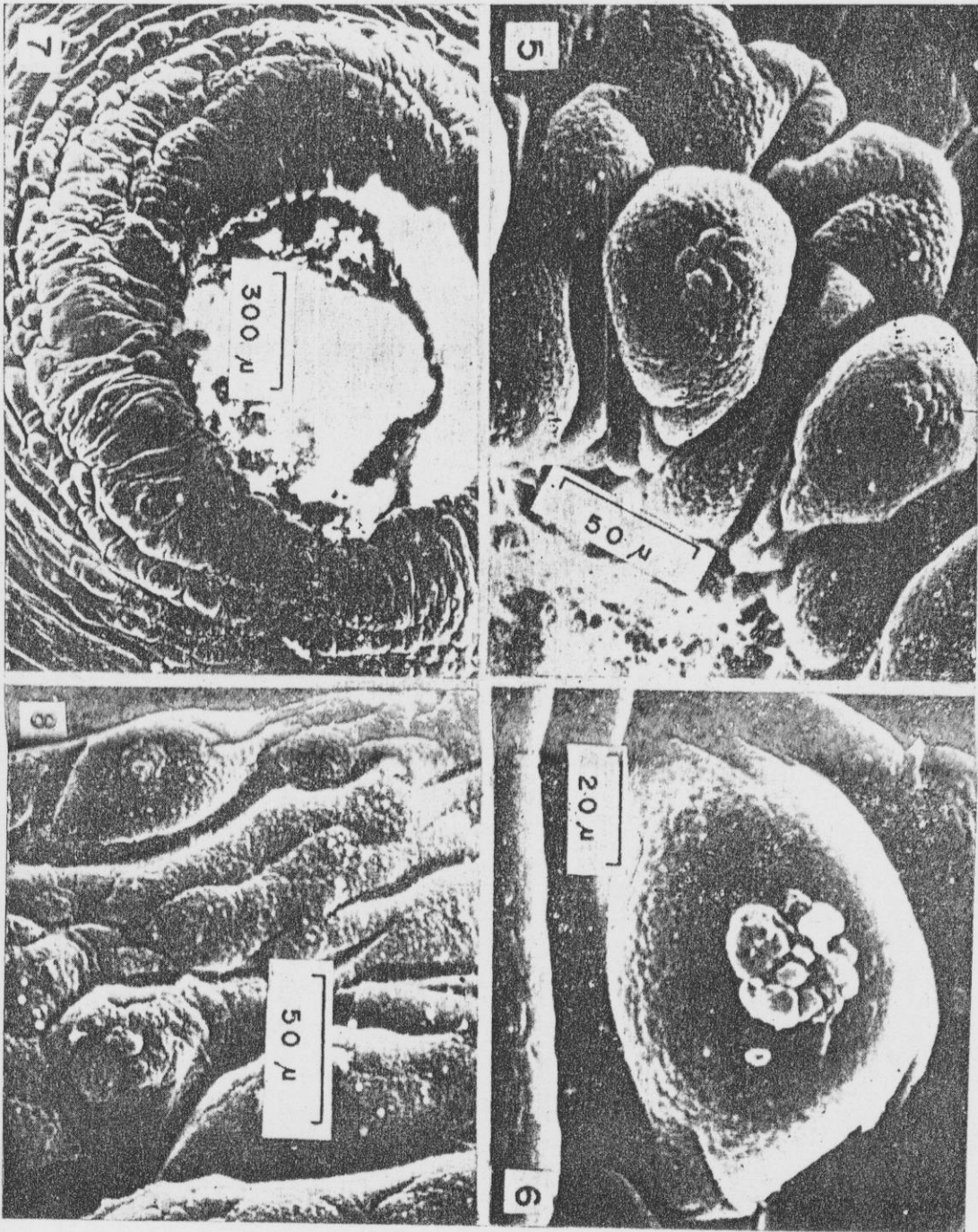
*O. indica* occurs rarely in the Assam cattle which are almost invariably found heavily infected with other paramphistome species. Of the four specimens recovered from the rumen of a freshly slaughtered cow, the stained whole mount preparations of two revealed the features characteristic of *O. indica*, viz., pouched pharynx, J-shaped oesophagus comprizing a long muscular and a short glandular part, posteriorly uncurved caeca and a distinct pars muscosa. The remaining worms were fixed in 10% buffered cold formalin for scanning electron microscopy. The critical-point-dried and metal-coated specimens were observed under a Philips PSEM 500 at electron acceleration voltages of 10-20 kv.

Both the dorsal and ventral surfaces show transverse foldings which acquire a somewhat concentric pattern at the two extremities (Fig. 1); this pattern probably reflects the state of contraction of the worm and its subtegumental musculature. The general tegument has a non-tuberculated nature like that of many orthococline paramphistomes (Eduardo, 1980 a-c; Tandon and Maitra, unpublished), but scattered irregularly over it are present nodular aciliate protuberances. However, the region in the immediate vicinity of the genital pore (Fig. 2) presents a corrugated tegument with nodular smooth elevations (Fig. 3) distributed here and there and not showing any distinct pattern of papillary arrangement. Some species like *Gastrodiscoides hominis* and *Calicophoron papillosum* have a specific architecture of tegument surrounding the genital pore (see Tandon and Maitra, *loc. cit.*).

The oral rim (Fig. 4) is distinctly wreath-like, consisting of a ring of petaloid elevations arranged so as to form a rosette (Fig. 5). A higher resolution reveals their tegument also to be finely wrinkled. Apically situated on these petaloid elevations is a clustre of 6-10 smooth papillate structures (Fig. 6). A regular pattern of concentrically arranged tegumental ridges that are separated by deep craters and studded with domed smooth elevations is decipherable in anterior region of the body; the sensory structures are more concentrated in this region than the remaining body surface.

At the acetabular rim, the tegument is radially corrugated (Fig. 7). Knob-like aciliate and non-pitted protrusions also abound in this region, and their surface contour is also finely wrinkled like those in other parts of the body (Fig. 8).





As observed in members of the sub families Paramphistominae, Orthocoeliinae, Gastrothylacinae and Gastrodiscinae, *O. indica* (representing subfamily Cladorchiinae) also exhibits a non-spinous tegument. Absence of spines thus seems to be an ubiquitous feature of tegument in paramphistomes.

This study was supported by a grant (no. 13640) from the University Grants Commission, India.

## REFERENCES

- EDUARDO, S. L. 1980a. *Bilatorchis papillogenitalis* n.g., n.sp. (Paramphistomidae: Orthocoeliinae), a parasite of the red lechwe (*Kobus lechwe* Gray, 1850) from Zambia. *Syst. Parasit.* **1**, 141-149.
- EDUARDO, S. L. 1980b. *Orthocoelium indonesiense*, a new species of amphistome from ruminants in Indonesia. *Syst. Parasit.* **1**, 203-210.
- EDUARDO, S. L. 1980c. A new genus, *Leiperocotyle*, for *Cotylophoron okapi* Leiper, 1935 and *C. congolense* Baer, 1936 and redescription of *C. okapi*. *Syst. Parasit.* **1**, 255-263.
- EDUARDO, S. L. 1982. The taxonomy of the family Paramphistomidae Fischeoeder, 1901 with special reference to the morphology of species occurring in ruminants. II. Revision of the genus *Paramphistomum* Fischeoeder, 1901. *Syst. Parasit.* **4**(5), 189-238.
- EDUARDO, S. L. 1983. The taxonomy of the family Paramphistomidae Fischeoeder, 1901 with special reference to the morphology of species occurring in ruminants. III. Revision of the genus *Catoprophoron* Näsmark, 1937. *Syst. Parasit.* **5**(1), 25-79.
- EDUARDO, S. L. 1984. The taxonomy of the family Paramphistomidae Fischeoeder, 1901 with special reference to the morphology of species occurring in ruminants. IV. Revision of the genus *Gigantocotyle* Näsmark, 1937 and elevation of the subgenus *Explanatum* Fukui, 1929 to full generic status. *Syst. Parasit.* **6**(1), 3-32.
- TANDON, V. AND MATRA, S. C. 1981. Stereoscan observations on the surface topography of *Gastrothylax crumenifer* (Creplin, 1847) Poirier, 1883 and *Paramphistomum epiclitum* Fischeoeder, 1904 (Trematoda: Digenca). *J. Helminth.* **55**, 231-37.
- TANDON, V. AND MATRA, S. C. 1983. Surface morphology of *Gastrodiscoides hominis* (Lewis and McConnell, 1876) Leiper, 1913 (Trematoda: Digenca) as revealed by scanning electron microscopy. *J. Helminth.* **57**, 339-342.
- THAPAR, AND SINHA, B. B. 1945. On the morphology of a new genus of amphistomes from the rumen of cattle in the United Provinces. *Indian J. vet. Sci. anim. husb.*, **15**(3), 219-221.

Figs. 1-8. *Olveria indica* Thapar and Sinha, (1945)—Scanning electron microscopy.

1. Whole worm (in ventral view).
2. Tegumental corrugations in the region surrounding the genital pore, and studded with nodular elevations (arrows).
3. A closer view of the latter.
4. Tegumental architecture of the circum-oral region.
5. A magnified view of the oral rim.
6. A single circum-oral petaloid elevation at higher resolution. Note the fine wrinkles of its surface and the clustre of smooth papillae at the apex.
7. A portion of the acetabular rim exhibiting the radially corrugated tegument.
8. A portion of the latter magnified to reveal its contour and also the aciliate protrusions.