SEM OBSERVATIONS ON SWINE KIDNEY WORM *STEPHANURUS DENTATUS* (NEMATODA : SYNGAMIDAE)

VEENA TANDON* AND ARUN K. YADAV

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

The surface fine topography of *Stephanurus dentatus*, a nematode parasitic in the kidney of pigs, has been studied by means of SEM. The anterior end exhibits a hexagonal mouth opening with 80 to 85 small elements and 4 prominent cephalic papillae. Six teeth, bi-or tri-cuspid type, protrude from the buccal cavity. In males, the bursa is found to be having short and stout rudimentary bursal rays. In females, the vulva and anus lie quite closely ; the former also shows cuticular ornamentations in its vicinity.

Within the last two decades the scanning electron microscopy (SEM) has proved to be an important aid in studying the microtopographic features of various nematode species (Snyder, 1985, Chatterjee *et al.*, 1987 ; Scholz and Ditrich, 1990). However, for *Stephanurus dentatus*, parasitic in the kidney of pigs, no information is available pertaining to its surface fine topography. The present communication is aimed at elucidating the microtopographic features of the adults of *S. dentatus* with the aid of SEM.

MATERIALS AND METHODS

Adult *S. dentatus* were recovered from the kidney of domestic pigs slaughtered at local abattoirs in 0.9% physiological saline. After thorough washing in the saline, 5 to 10 mm long pieces of their cephalic and caudal ends were cut away and fixed in 5% neutral formalin, and processed following standard methods (Snyder, 1985). The specimens were dried using tetramethylsilane (Dey *et al.*, 1989), metal-coated with gold and examined under a Jeol-JSM 35 CF SEM at 15 Kev.

RESULTS

The hexagonal mouth opening is directed straight forwards with a thick cuticular rim (Figs. 1, 3). The latter bears a rudimentary corona radiata containing 80 to 85 small elements (Fig. 2). The cuticle surrounding the oral opening is reflected externally into six raised thickenings, of which the dorsal and ventral are more prominent (Fig. 3). Four prominent seta-like cephalic papillae are present in the circumoral region (Figs. 1, 3,). Emerging from the base of the buccal capsule are visible six tongue-shaped teeth which are bi- or tri-cuspid type and have uniform edges devoid of any ridges (Fig. 3). In males, the bursa is small and thick walled ; the bursal rays are short and stout and always terminate in rounded, relatively wide tips (Fig. 4). Of the various rays, the dorsal is small and bifurcated into two branches each of which in turn is trifurcated at its tip ; the laterals are massive, closely applied to each other, the posterolateral being thicker than the rest two ; the ventral rays are also applied to each other

* Author for correspondence.

and are of the same size. The cloacal aperture appears slit like, situated subventrally between the lateral processes of the bursa. There are present two pairs of cirumcloacal papillae (papillae of right side are not clearly seen in the photomicrographs) each having a rounded, slightly protruding tip. The spicules are swollen distally bearing a minute pore-like opening at their tips (Fig. 4). In females, the posterior extremity is bent ventrally. The tail is conical, bearing a circular opening of the anus quite close to the tip (Fig. 5). The vulva is situated a little in front of the anus, the perineal cuticle exhibiting a pattern of ridges and folds (Figs. 5, 6).

Discussion

In *S. dentatus* the SEM provides the characteristic three dimensional view of the anterior extrimity endowed with the cuticular peripheral thickenings, elements of the corona radiata and cephalic papillae. The hexagonal nature of oral opening having six raised cuticular thickenings has also been observed in *Oxyuris equi* (Barus *et al.*, 1979a) and this character has been implicated to represent six rudimentary lips (Chitwood and Chitwood, 1977). Almost identical and the same number of cephalic papillae have also been recorded in *Murshida hamata*, belonging to the same superfamily i. e. Strongyloidea (Gibbons, 1986). Baylis (1936) earlier had mentioned the presence of about 50 reduced elements in the corona radiata of *S. dentatus*, whereas their number was found to vary between 80 and 85 in the present study. Teeth have been reported to occur in several animal parasitic nematodes such as *Syphacia* spp., *Rictularia jodhpurensis*, etc. (Wiger *et al.*, 1978 ; Mezaros *et al.*, 1978 ; Shingvi and Johnson, 1989). According to Gibbons (1986) the morphology of teeth varies greatly and they have been divided into two categories based on their point of origin—those transformed the labial region, referred to as 'odontia' (e. g. *Physaloptera* spp and *Ancylostoma* sp.) and those originating posteriorly and associated with the oesphagus, referred to as 'onchia' (e.g. in members of the superfamilies Strongyloidea and Trichostrongyloidea, namely, *Strongylus vulgaris* and *Haemonchus contortus*, respectively). *S. dentatus* seems to represent the latter category ; however unlike the *Syphacia* and *Rictularia* spp., no ridges were found to be present surrounding the teeth.

The topography of the bursa, particularly the arrangement of the bursal rays in *S. dentatus* resembles somewhat that in *Trichinella* spp. (Barus *et al.*, 1979b). The perineal cuticular ornamentation in *S. dentatus* appears similar to that in *Oesphagostomum* sp. (Zaman, 1983), The features such as the rudimentary corona radiata and degenerate bursa support the concept advocated by Lichtenfels (1980) that *Stephanurus dentatus* represents a primitive strongylid form.

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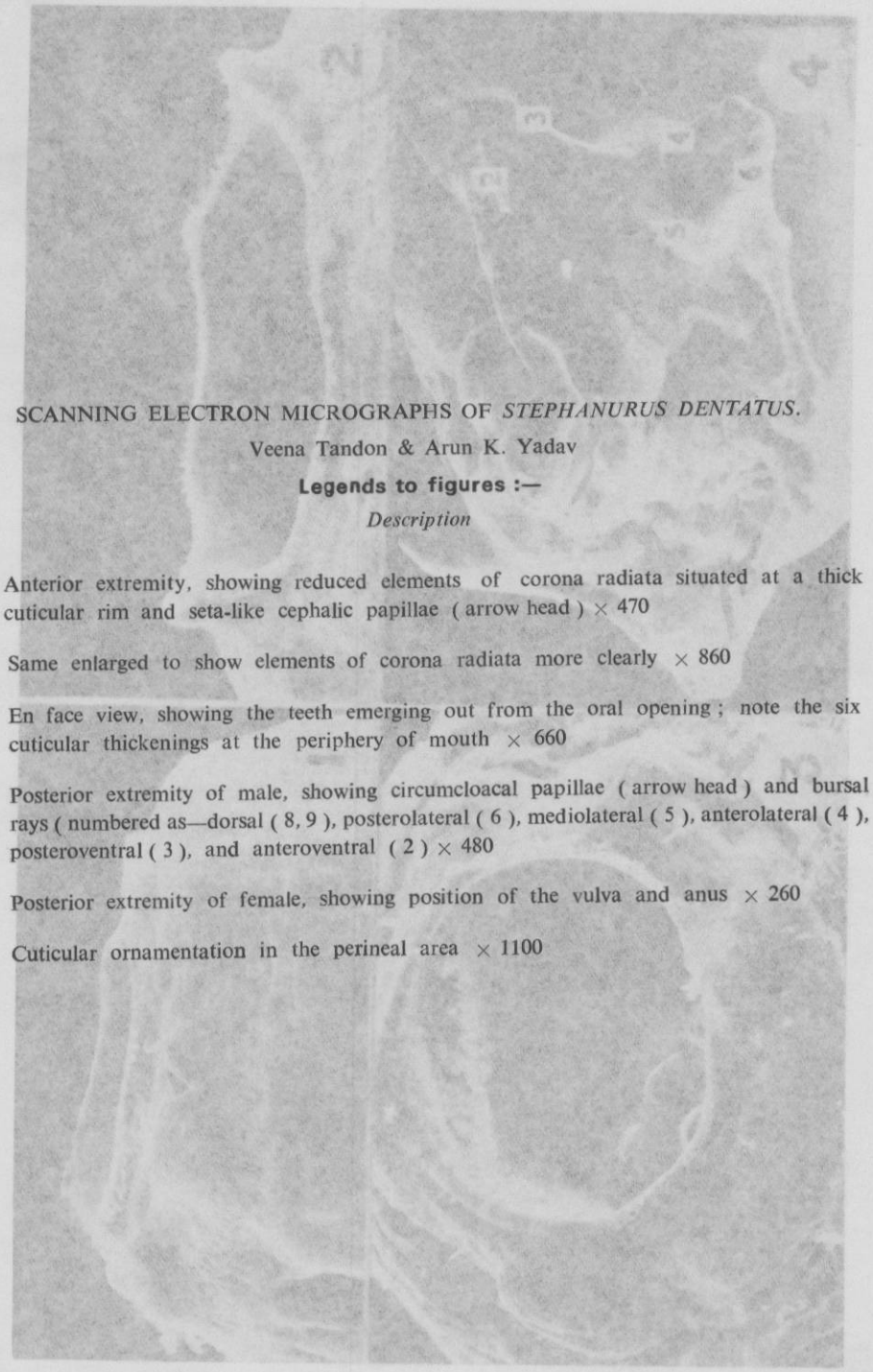

SCANNING ELECTRON MICROGRAPHS OF *STEPHANURUS DENTATUS.*

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Legends to figures :—

Description

1. Anterior extremity, showing reduced elements of corona radiata situated at a thick cuticular rim and seta-like cephalic papillae (arrow head) × 470

2. Same enlarged to show elements of corona radiata more clearly × 860

3. En face view, showing the teeth emerging out from the oral opening ; note the six cuticular thickenings at the periphery of mouth × 660

4. Posterior extremity of male, showing circumcloacal papillae (arrow head) and bursal rays (numbered as—dorsal (8, 9), posterolateral (6), mediolateral (5), anterolateral (4), posteroventral (3), and anteroventral (2) × 480

5. Posterior extremity of female, showing position of the vulva and anus × 260

6. Cuticular ornamentation in the perineal area × 1100

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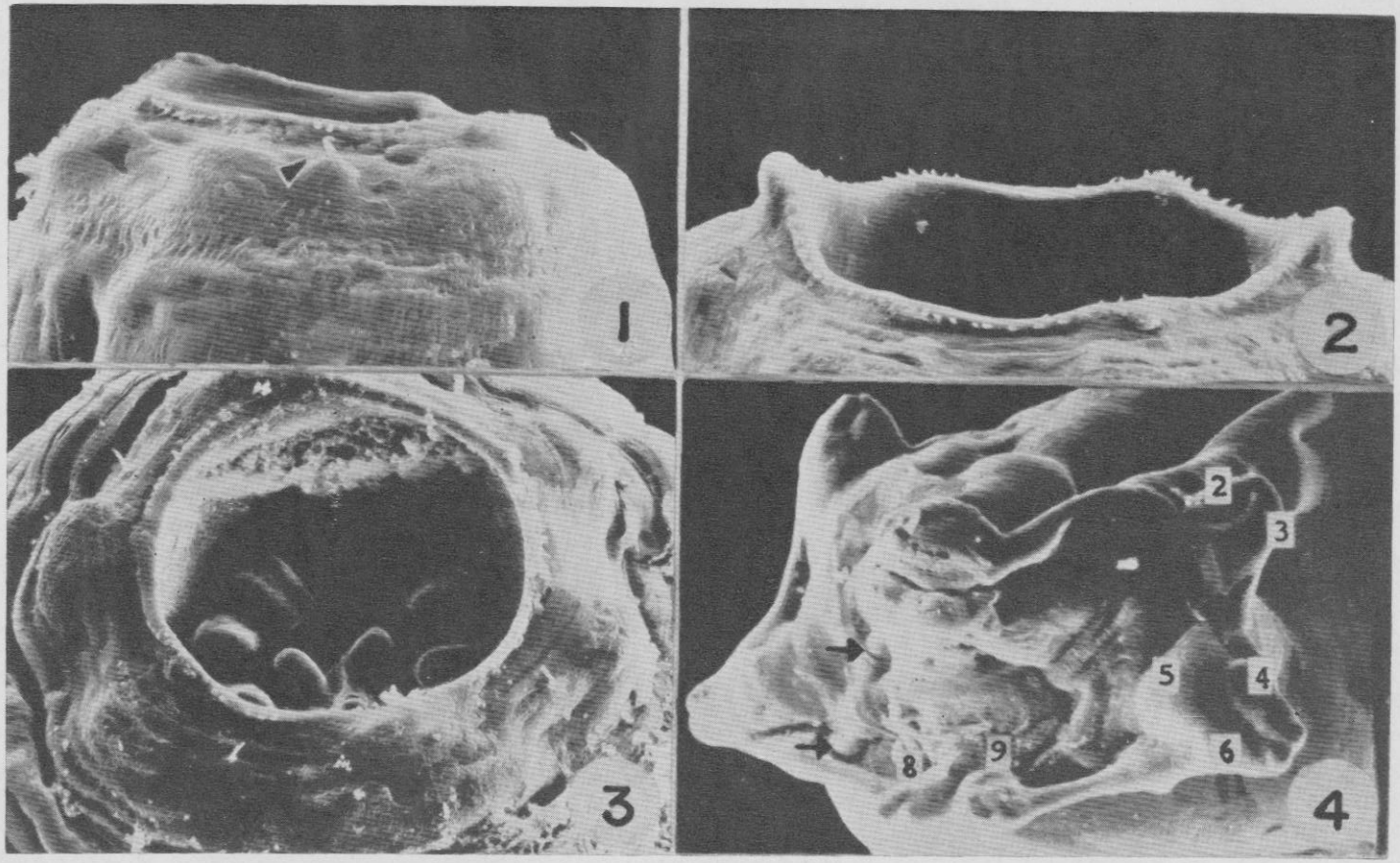

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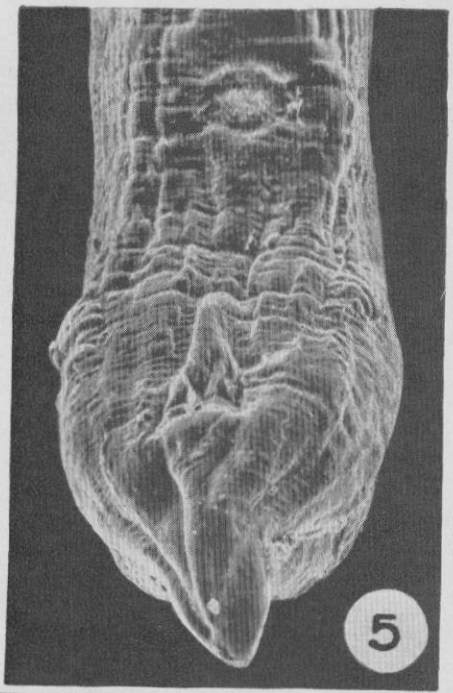

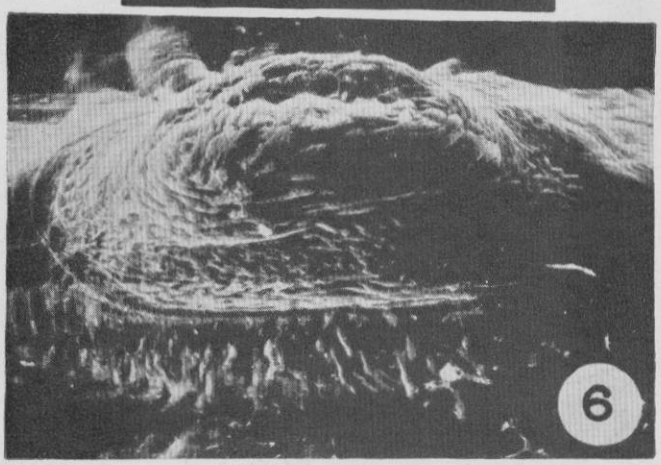

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