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SEM structure of *Bourgelatia diducta* (Nematoda, Chabertiidae)

Arun K. Yadav[1] and Veena Tandon[2]

[1]Division of Parasitology, Central Drug Research Institute, Lucknow 226001; [2]Department of Zoology, North-Eastern Hill University, Shillong 793014; India

Abstract. The surface ultrastructure of *Bourgelatia diducta*, a common nematode parasite of domestic pigs in India, was examined with a scanning electron microscope. The anterior end possesses an external corona radiata of 21 elements, 4 cephalic papillae and 2 lateral amphids. The bursa is formed by a longer dorsal and 2 shorter lateral lobes that incorporate a genital cone. The female tail bears a pair of caudal papillae and phasmidial pores near its tip. The vulva appears as a circular, and the anus as a semicircular, opening. The surface ultrastructure of the species studied herein is compared with other members of its family (Chabertiidae), examined previously by SEM.

Introduction

The genus *Bourgelatia* Railliet, Henry et Bauche, 1919 is comprised of only a single species, *B. diducta*, distributed in pigs of south-east Asia and Java (Soulsby 1982). A recent study reveals that it is among commonly occurring (21.6%) nematode infections of domestic pigs in India (Yadav and Tandon 1989). The species has not received much attention by workers in the past as very little information exists in the literature about the biology and/or life cycle of *B. diducta* (Soulsby 1982). In the present study we elucidate the surface ultrastructure of *B. diducta* with the aid of scanning electron microscopy. It is hoped that the information gained would enable us to understand the taxonomy and/or functional biology of the species in a better way.

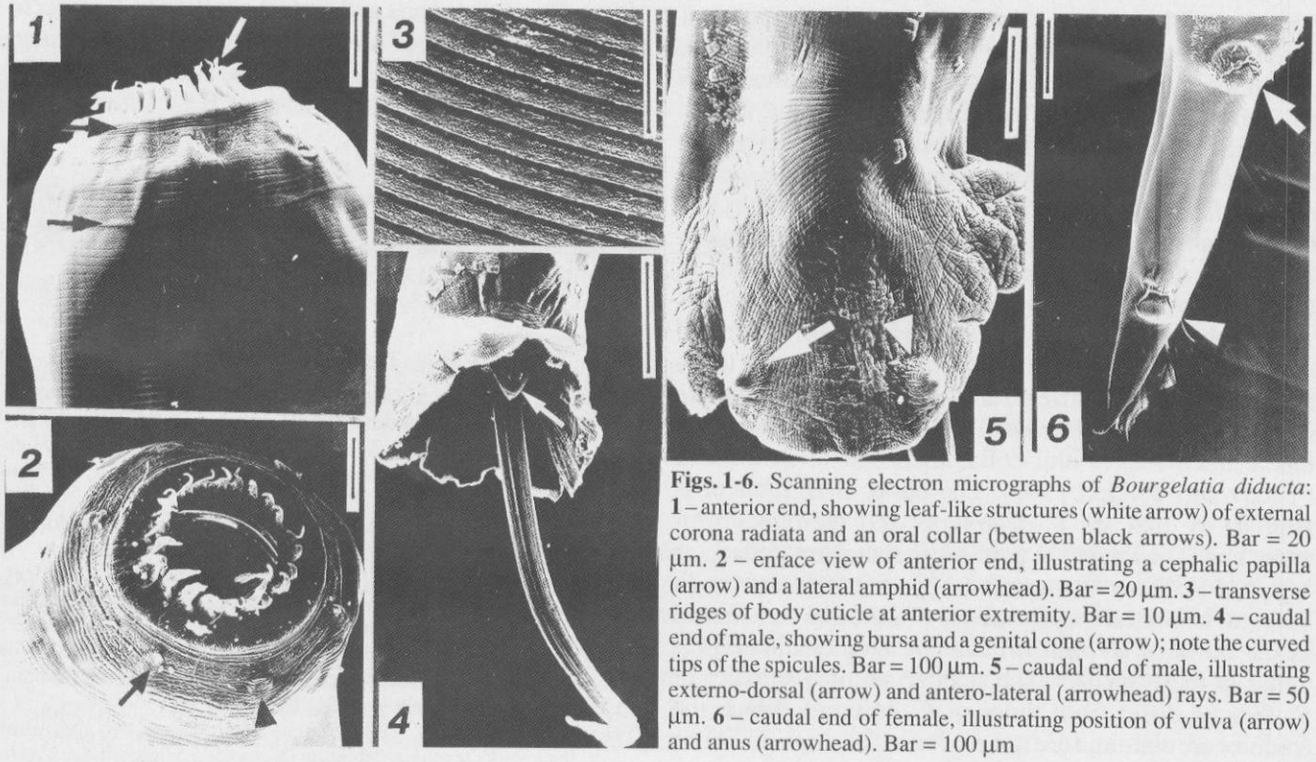
Material and methods

Adult worms of *B. diducta* were collected from the intestines of pigs necropsied at local abattoirs and were fixed for 3 days in 5% buffered formalin. The worms were cut into 5 to 10 mm long pieces and processed for examination as described elsewhere (Tandon and Yadav 1991). The specimens were examined with a Jeol-JSM 35 CF scanning electron microscope. All measurements are given in μm.

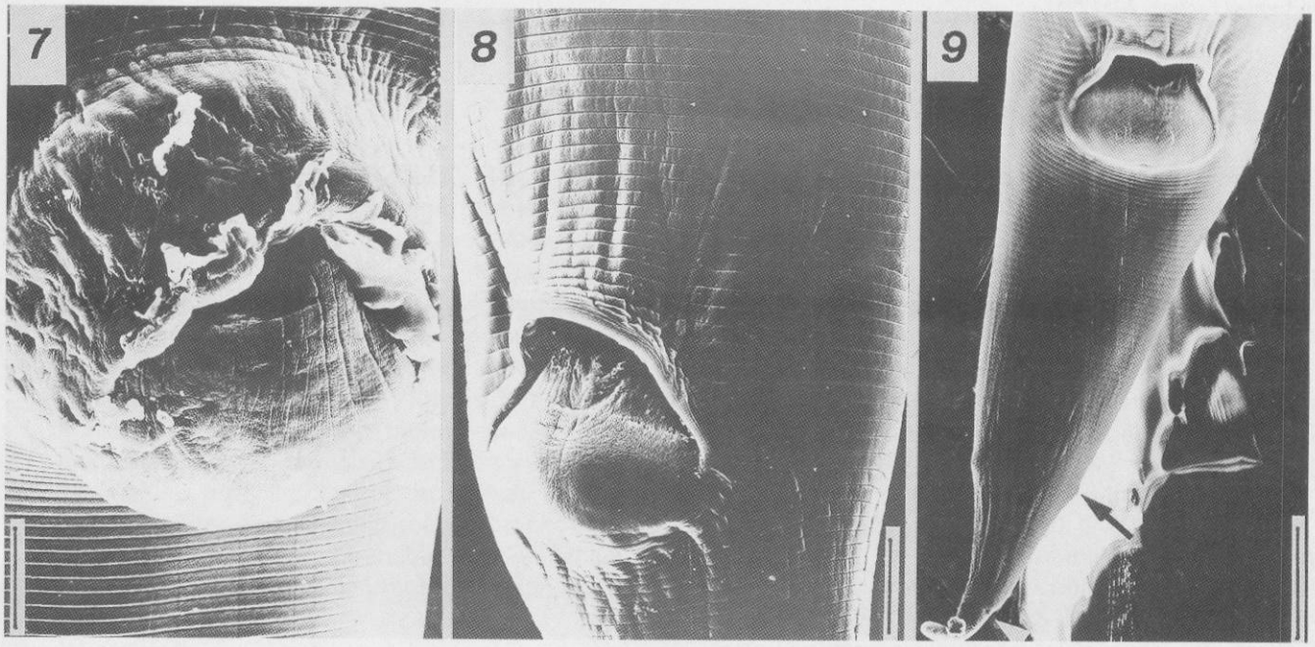
Results

The males of *B. diducta* measure 8.0–10.0 mm in length and 0.41–0.50 mm in maximum width, while the females are 10.0–12.0 mm in length and 0.46–0.55 mm in maximum width. The oral opening (diameter 50) is circular and bears a ring of 21 large (18–20 in length and 5–8 in width) leaf-like structures (Figs. 1 and 2) that forms the external corona radiata. There are 4 stout cephalic papillae (diameter approximately 10) and 2 lateral amphids (diameter approximately 12) at the periphery of the mouth (Fig. 2). The thickening of the cuticle in the cervical area forms an oral collar which measures 40 in length and 142 in width (Fig. 1). The body has regularly placed (approximately at 0.50 distance) transverse striations and the width of an individual groove varies between 3.0–3.5 (Fig. 3).

The bursa of the male consists of a long dorsal and two slightly shorter lateral lobes (Fig. 4); the externo-dorsal and antero-lateral rays appear as conspicuous protrusions on its surface (Fig. 5), while the other bursal rays could not be seen in the micrographs. The slender spicules (450 in length and 25 in width) are curved at their tips and the genital cone (43 in length and 32 in maximum



Figs. 1-6. Scanning electron micrographs of *Bourgelatia diducta*: **1** – anterior end, showing leaf-like structures (white arrow) of external corona radiata and an oral collar (between black arrows). Bar = 20 µm. **2** – enface view of anterior end, illustrating a cephalic papilla (arrow) and a lateral amphid (arrowhead). Bar = 20 µm. **3** – transverse ridges of body cuticle at anterior extremity. Bar = 10 µm. **4** – caudal end of male, showing bursa and a genital cone (arrow); note the curved tips of the spicules. Bar = 100 µm. **5** – caudal end of male, illustrating externo-dorsal (arrow) and antero-lateral (arrowhead) rays. Bar = 50 µm. **6** – caudal end of female, illustrating position of vulva (arrow) and anus (arrowhead). Bar = 100 µm



Figs. 7-9. Scanning electron micrographs of *Bourgelatia diducta*: **7** – vulva, in enlarged view. Bar = 20 µm. **8** – anus, in enlarged view. Bar = 20 µm. **9** – female tail, illustrating a pair of caudal papillae (arrow) and phasmidial pore (arrowhead). Bar = 50 µm

width) is a pointed structure (Fig. 4). The vulva (Figs. 6 and 7) appears as a prominent circular, (diameter 80) and the anus (Figs. 6 and 8) as a semicircular (60 in length and 70 in width), opening. The short, tapering tail bears a pair of minute caudal papillae and phasmidial pores near its tip (Fig. 9).

Discussion

Our present observations on *B. diducta* by scanning electron microscopy are in agreement with the previous light microscopic descriptions of the species by Railliet et al. 1919. Some additional data are provided in the

number and shape of the structures present at the external corona radiata, amphids, cervical and caudal papillae, and in the topography of phasmidial pores, vulva, anus and genital cone. In the other members of the family Chabertiidae, the structures at the external corona radiata are varied in shape and size; small in *Oesophagostomum columbianum* (10 in length and 5 in width) and *O. asperum* (9 in length and 7 in width), hook-like in *Ternidens deminutus*, increased in number (46–48) in *Chabertia ovina*, and absent in *Cyclodontostomum purvisi* (Gibbons 1986, Yadav and Tandon 1992). The cervical papillae and amphids of *B. diducta* resemble those in *T. deminutus* but differ from those in *O. columbianum* (Gibbons 1986, Yadav and Tandon 1992). *O. asperum* has a much longer oral collar than that of *B. diducta* (Yadav and Tandon 1992). The bursa of *B. diducta* is similar to that of *T. deminutus* and *Oesophagostomum* spp.; however, a pair of prebursal papillae, as reported in *Oesophagostomum* spp., is not present in *B. diducta*. In contrast, the presence of a genital cone found in the bursa of *B. diducta*, has not been elucidated for either of these species. The slender, pointed spicules of *B. diducta* differ from those of *C. ovina*, in which the spicules are alate and are not curved at their tips (Gibbons 1986). The vulva, anus and caudal papillae in *B. diducta* are similar to those of *T. deminutus* and *O. columbianum*; however, a pair of phasmidial pores, as observed at the tip of the tail in *B. diducta*, has not been illustrated in these species.

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