FOLIA PARASITOLOGICA (PRAHA) 28: 51—53, 1981.

# ON THE ULTRASTRUCTURE OF THOMINX CONTORTA (NEMATODA: CAPILLARIIDAE)

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*Dedicated to Academician B. Ryšavý on the occasion of his 60th birthday*

**Abstract.** The ultrastructure of outer morphological characters of *Thominx contorta* from *Larus ridibundus* has been studied for the first time by scanning electron microscopy. The following characters are described and documented: cephalic plate with a group of papillae, vulval region, and marked characteristic structure of pseudobursa and spicule sheath. The shape and situation of spines on the spicule sheath and a pair of double sessile paracloacal papillae are considered to be important characters which have not yet been recorded in this species.

The SEM studies of nematodes, particularly of the family Capillariidae Neveu-Lemaire, 1936, have recently supplied new information on the ultrastructure of the surface of their bodies and organs (Wright 1974, 1978, Ishii et al. 1974, Tenora et al. 1980, 1981, Baruš et al. 1981). The species *T. contorta* (Creplin, 1839) of the genus *Thominx* Dujardin, 1845, and especially its synonymy, has often been discussed. The aim of this paper was to study its morphology and ultrastructure in order to amend the specific diagnosis of this taxon.

## MATERIAL AND METHOD

The nematodes were recovered from a naturally infected definitive host, *Larus ridibundus* L. from the Ob River region (U.S.S.R.). The material was collected during All-union helminthological expeditions of the USSR Academy of Sciences in the years 1974—1975.

All specimens were localized under the cuticle of oesophagus in the hosts. Of this collection, 185 females and 62 males were determined by optical microscope and 10 males and 10 females were then used for the SEM studies. The morphology and measurements of our specimens fully conform to the data given for this species in the monograph by Baruš et al. (1978). Consequently, only the description and evaluation of the ultrastructure by SEM is dealt with below. The material was processed using the method published in the paper by Baruš et al. (1980) and then examined and photographed in a Jeol JSM-35C scanning electron microscope.

## RESULTS

The head part (cephalic plate) is hemispherical and 0.007—0.010 mm wide in both males and females. It is distinctly separated from the remaining part of body by a transverse incision. The surface of the cephalic plate is covered by a smooth cuticle, whereas the cuticle on the reamining part of body bears irregular transverse striations (Plate I, Fig. 1). The mouth in form of a transverse slit is 0.002 mm long and is situated in the middle part of the cephalic plate. Although we did not manage to clean completely the mouth opening, moderate lip-like elevations with slightly elevated bases were visible

on its sides (Plate I, Fig. 2). A total of 12 cephalic papillae (sessile or embedded) were observed around the mouth opening, six of them in the inner circle and six in outer circle (Plate I, Figs. 1, 2).

The transverse and irregular striations of the cuticle are distinct on the whole body with the exception of vulva region (Plate I, Fig. 3). The vulva is a transverse, crescent-shaped slit, measuring 0.001—0.020 mm in width. Its upper lip is moderately protruding, the lower lip is wide and rounded, with a rugose surface and irregular longitudinal striations. Two lateral bacillary bands run along the whole body length in both males and females (Plate I, Fig. 3). They are indistinct and only the distribution of pores underlying hypodermal gland cells indicates their situation. The pores of these gland cells are rounded and slightly elevated above the body line.

The male pseudobursa is very simple. It consists of two low lateral processes with two indistinct tops at the level of the upper and lower margin of cloaca opening (Plate I, Fig. 4). The surface of pseudobursa is covered with a close, irregularly and indistinctly undulated cuticle (Plate II, Fig. 1). A characteristic feature is the presence of one pair of paracloacal double papillae (Plate II, Fig. 2) situated on the top of the anterior low process of pseudobursa. The upper margin of cloaca opening runs into a narrow, rounded lip. The maximum width of cloacal opening is 0.012—0.015 mm.

The evaginated spicule sheath is tubular (Plate II, Fig. 3) and of even width (0.009 to 0.011 mm). It is the so-called "armed" type of spicule sheath, covered with long spines on its whole surface. The spines are markedly longer than wide (Plate II, Fig. 1) and their tips are rounded. They measure 0.003—0.004 mm in length and 0.0004 to 0.0005 mm in width and are arranged more or less regularly in 14—16 longitudinal rows (on one side of the spicule sheath). The spines on the distal end of the spicule sheath (around its opening) are arranged in an irregular rosette (Plate II, Fig. 4).

## DISCUSSION

The ultrastructure of the head end in *T. contorta* (Creplin, 1839) is identical in some characters with that in *T. aerophilus* (Creplin, 1839) which was studied earlier by SEM (Tenora et al. 1980). These characters are the smooth cuticle, general shape of cephalic plate, shape and situation of mouth opening and the presence of cephalic papillae. The last character has not been studied in detail in the Capillariidae.

The bacillary bands are of a primitive structure. In this respect our results complement the data on this character in *T. contorta* published by Baruš (1974).

The pseudobursa in *T. contorta* is evidently simple, which confirms the earlier data. However, of importance is the finding of a pair of double sessile paracloacal papillae. Other features observed by us contribute to the knowledge of the ultrastructure of pseudobursa, situation of cloaca, form of upper lip of cloaca and surface of pseudobursa cuticle.

The spicule sheath is of a typical tubular shape, which is characteristic for the species of the genus *Thominx*. Characteristic for *T. contorta* is the shape of spines (markedly longer than wide) and their topography. *T. contorta* differs from *T. aerophilus* studied earlier by Tenora et al. (1980) in the shape and situation of spines. In *T. aerophilus*, they are finger-shaped, conical and sparsely distributed on the spicule sheath, whereas in *T. contorta*, they are markedly elongated, approximately by one half longer than in *T. aerophilus*, and densely distributed.

According to Baruš et al. (1978), *T. contorta* was described from the typical host, *Larus canus* L. and it has also been reported from some other bird species in the Middle Europe. A comparison of our material of *T. contorta* from *Larus ridibundus* L. (studied

by optical microscope and SEM) with the specimens recovered by Linstow from *Podiceps cristatus* (Pallas, 1764) and studied by Baruš (1974) confirms the synonymy of *T. pachyderma* Linstow, 1877 with *T. contorta* (Creplin, 1839).

## УЛЬТРАСТРУКТУРА НЕМАТОДЫ *THOMINX CONTORTA* (NEMATODA: CAPILLARIIDAE)

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**Резюме.** С помощью сканирующей электронной микроскопии впервые изучена ультраструктура внешних морфологических признаков вида *Thominx contorta* от *Larus ridibundus*. Описаны и документированы следующие признаки: головная часть с группой сосочков, область вульвы, характерная структура псевдобурсы и спикулярного влагалища. Важными признаками считаются форма и расположение шипов спикулярного влагалища и пара двойных (сидячих), до сих пор не известных параклоакальных сосочков.

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Received 15 February 1980.

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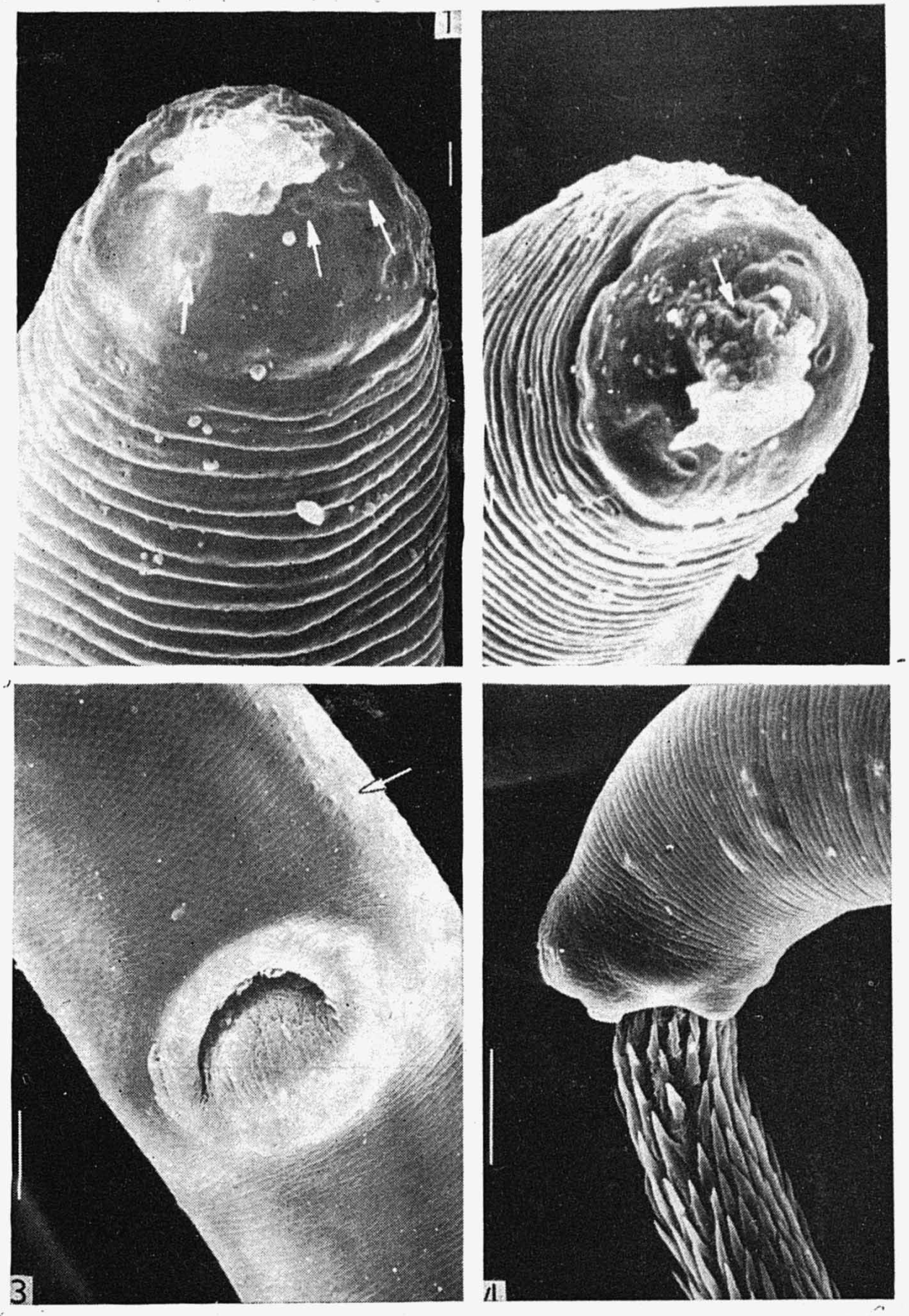
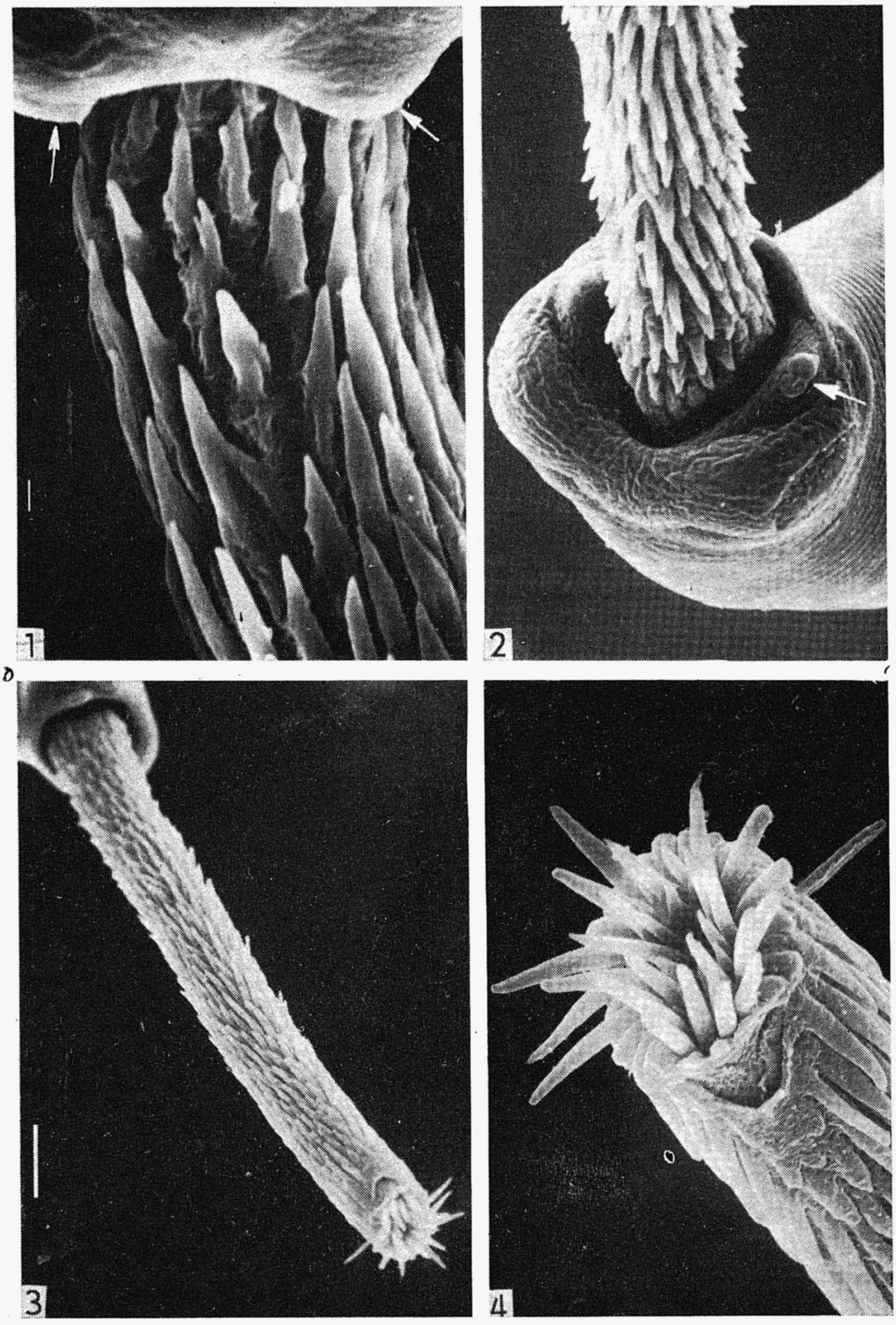



Figs. 1—4. Scanning electron micrographs of *Thominx contorta* (Creplin, 1839). **Fig. 1.** Head end of female body (lateral view); note 3 papillae in inner circle (arrow) — (× 7,800; white scale = 0.001 mm). **Fig. 2.** Cephalic plate of female (apical view); note situation of mouth opening (arrow) — (× 7,200; white scale = 0.001 mm). **Fig. 3.** Vulva region (ventral view); note bacillary band (arrow) — (× 1,500. white scale = 0.010 mm). **Fig. 4.** Posterior end of male body with evaginated spicule sheath (lateral view) — (× 2,000; white scale = 0.010 mm).




**Figs. 1—4.** Scanning electron micrographs of *Thominx contorta* (Creplin, 1839). **Fig. 1.** Margin of pseudobursa with evaginated spicule sheath and detail of spines (lateral view); note two processes of pseudobursa (arrow) — (× 5,400; white scale = 0.001 mm). **Fig. 2.** Pseudobursa (ventral view); note a double paracloacal papilla (arrow) — (× 2,700; white scale = 0.001 mm). **Fig. 3.** Evaginated part of spicule sheath (general view) — (× 1,200; white scale = 0.010 mm). **Fig. 4.** Distal end of spicule sheath (detail) (opening of tube with spines) — (× 4,000; white scale = 0.001 mm).