

**GASTROMERMIS CORDOBENSIS N. SP. (NEMATODA: MERMITHIDAE)
PARASITIZING *SIMULIUM LAHILLEI* PATTERSON & SHANNON
(DIPTERA: SIMULIIDAE) IN ARGENTINA**

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Gastromermis cordobensis n. sp. (Nematoda: Mermithidae) a parasite of larvae of the blackfly *Simulium lahillei* Paterson & Shannon (Diptera: Simuliidae) in Argentina, is described. Diagnostic characters of this species include a mouth ventrally shifted; six cephalic papillae; eight hypodermal chords; small and pear shaped amphids; a long and S-shaped vagina; a single spicule, which is long, has non-uniform walls, and a tip with sculpture; three rows of genital papillae, the middle one with 18 pre-anal and 10 post-anal papillae, the lateral rows have 36 papillae each; oval eggs; and post-parasitic juveniles with long thin tails. Pre-parasitic and parasitic juveniles are included in the description.

Key words: Nematoda – Mermithidae – *Gastromermis cordobensis* – Simuliidae – Taxonomy

Species of the genus *Gastromermis* Micoletzky, 1923, are frequently found as parasites of simuliids, particularly in Europe and America (Poinar, 1975, 1977). A few species namely *G. fidelis* Doucet, 1982, *G. kolleonis* Doucet & Poinar, 1984, and *G. vaginiferous* Camino, 1985, have been reported from Argentina. In this contribution, *Gastromermis cordobensis* n. sp. is described parasitizing larvae of *Simulium lahillei* Paterson & Shannon, from Córdoba, Argentina. Investigations are being continued to evaluate the effectiveness and potential of this parasite as a biological control agent.

MATERIALS AND METHODS

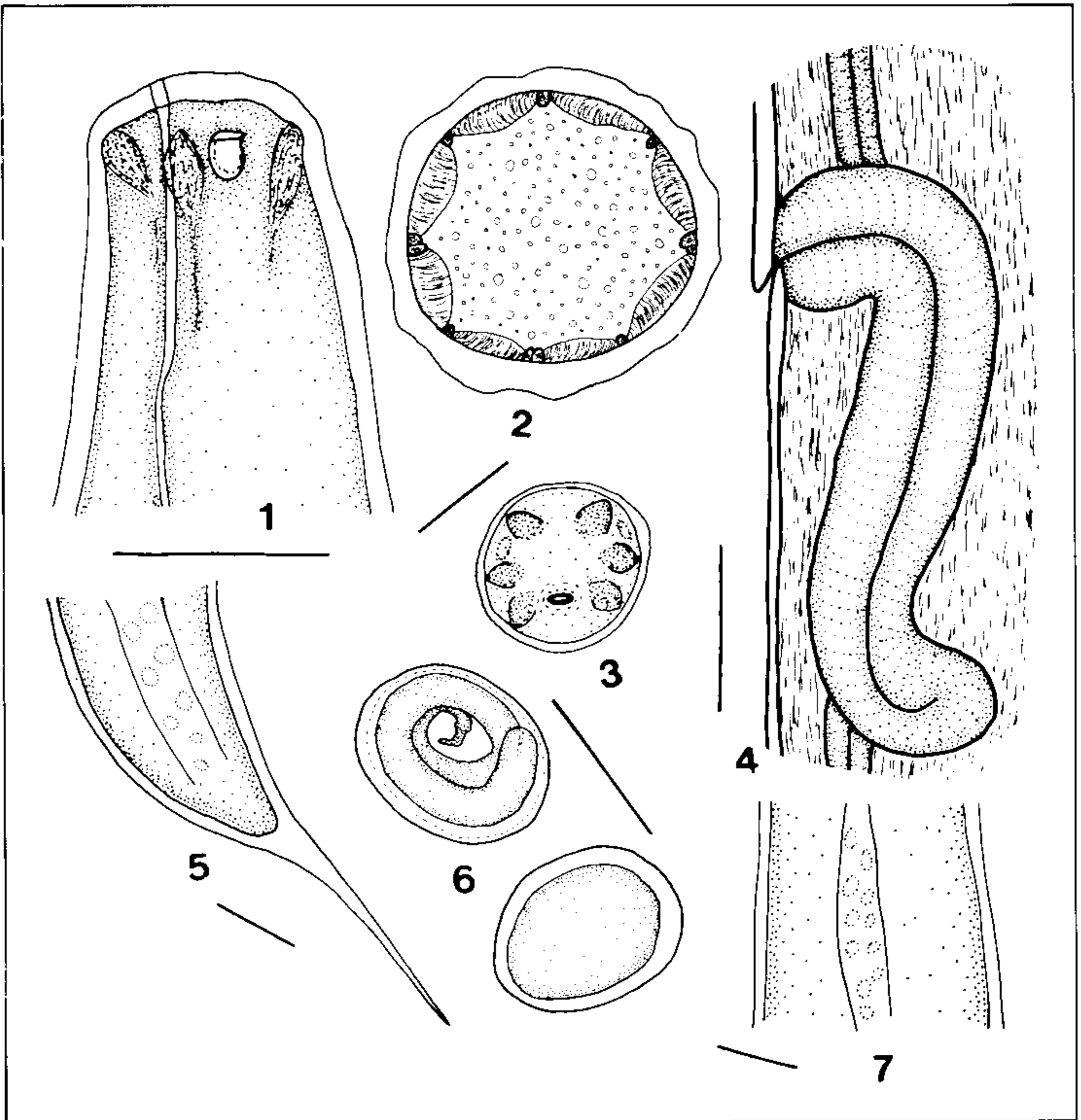
Simulium lahillei larvae were collected by the author from the San Antonio River, in Córdoba, Argentina. They were maintained in a bucket with dechlorinated tap water and an airpump, at 10 °C, until the nematodes emerged. The post-parasitic juveniles were placed in Petri dishes distilled water with a layer sand at the bottom at 10 °C ± 2. Adults and post-parasitic juvenile nematodes were observed alive and then killed in 60 °C distilled water for 3 seconds, fixed in TAF and processed to glycerol by Seinhorst's method for taxonomic

studies (Curran & Hominick, 1980). Histological sections to determine the longitudinal chord arrangement were made by fixing the nematodes in Bouin's fluid, passing them through an alcohol series to paraplast, sectioning at 10 µm and staining with the hematoxylin-eosin technique. An apical view of the head was prepared in glycerine jelly (Hooper, 1970). Morphological studies on the pre-parasitic and parasitic juveniles were made on living material stained with a 1% aqueous solution of New blue R (Poinar, 1975). Drawings and measurements were made from live and fixed specimens with a camera lucida and a micrometer on a Zeiss light microscope.

DESCRIPTION

Gastromermis cordobensis n. sp. (Figs 1-13)
Mermithidae Braun, 1883. *Gastromermis*
Micoletzky, 1923.

Small nematodes. In live specimens the trophosome is a light green color. Cuticle without visible crisscross fibres. Eight hypodermal chords run along the entire body, cells in dorsal chord in one row, lateral chords thin with one row of cells in front of nerve ring and behind it with two rows of small cells; ventral chord has two rows of cells; subdorsal and subventral chords with a small cells in one row. Head homocephalic. Six cephalic papillae

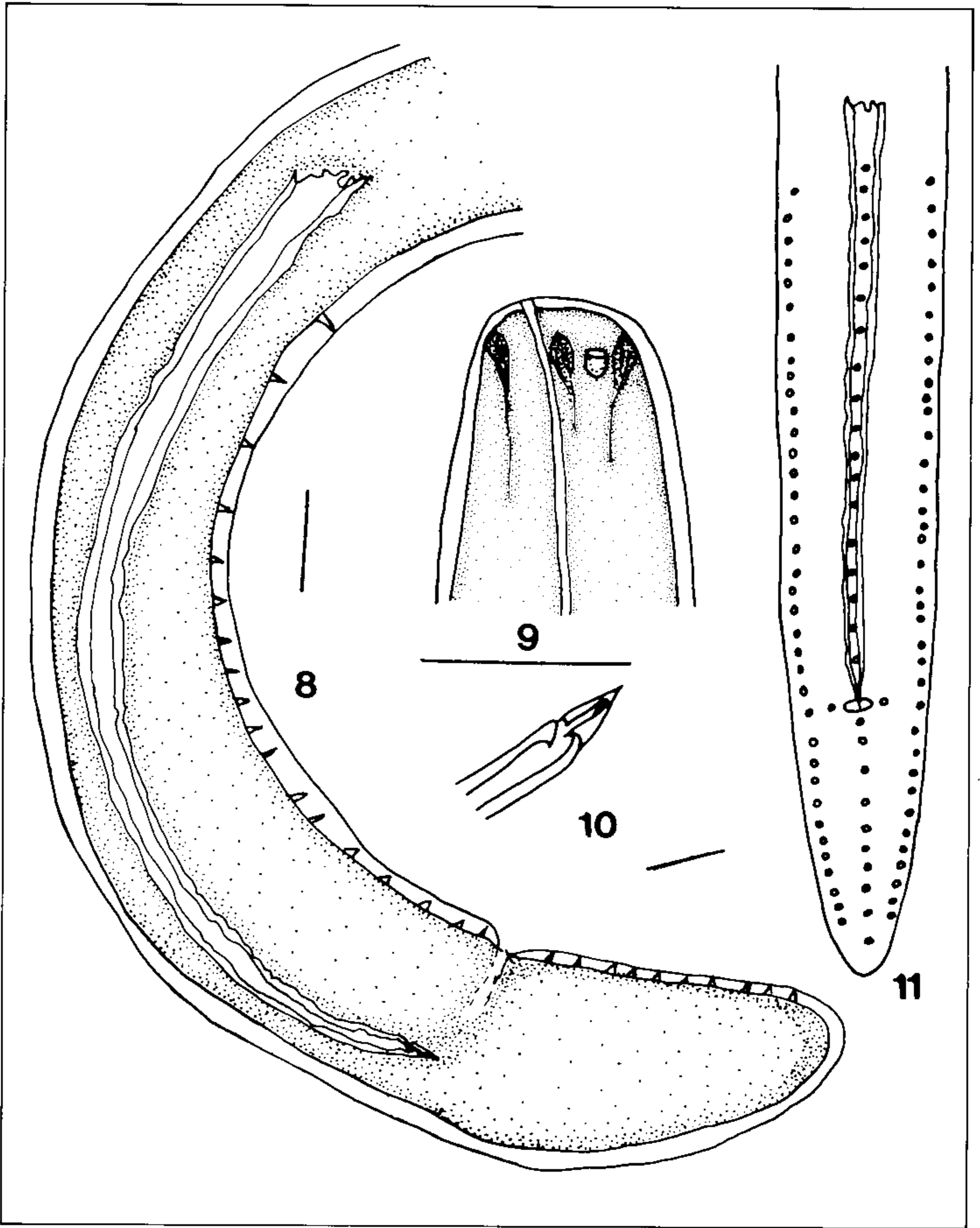


Gastromermis cordobensis n. sp. – Fig. 1: lateral view of female head. Fig. 2: cross section at midbody. Fig. 3: en face view of the female head. Fig. 4: vagina. Fig. 5: lateral view of post-parasitic juvenile tail. Fig. 6: eggs. Fig. 7: lateral longitudinal chord at midbody. (Bars = 50 μ m).

arranged in a ring around the mouth. Amphids small and pear-shaped, situated near the lateral cephalic papillae. Mouth ventrally shifted by one-half the radius of papillary circumference. Vagina cylindrical, long and S-shaped with three loops, the second loop being longer than the first and third one. Spicule single, long with non-uniform walls. The tip of the spicule is sharp-pointed and sculptured. Genital papillae arranged in three rows: the middle row with 18 pre-anal and 10 post-anal papillae, the lateral rows have 36 papillae each. Post-parasitic juveniles with long, pointed, tail appendage.

Measurements are for holotype male and allotype female and for paratypes the range is in parenthesis. All sizes are in micrometers (μ m) except for the adults lengths are in millimeters (mm).

Male: n = 12. Body length: 7 (6-8); width of head at level of cephalic papillae: 43 (41-46); width of body at level of nerve ring: 81 (75-84); greatest width of body: 130 (121-133); width of body at level of anus: 114 (98-120); cuticle thickness at head papillae: 3 (2-4), at nerve ring: 4 (3-5), at base of trophosome: 4 (3-5);



Gastromermis cordobensis n. sp. -- Fig. 8: lateral view of male tail. Fig. 9: lateral view of male head. Fig. 10: spicule's tip. Fig. 11: ventral view of male tail. (Bars = 50 μ m).

oesophagus width: 3 (2-5); oesophagus length: 1880 (1692-2021); distance from head to nerve ring: 300 (280-390); distance from anus to tail: 130 (128-145); length of the spicule: 464 (464-520); width of the spicule in the middle: 11 (10-12); the basal width of the

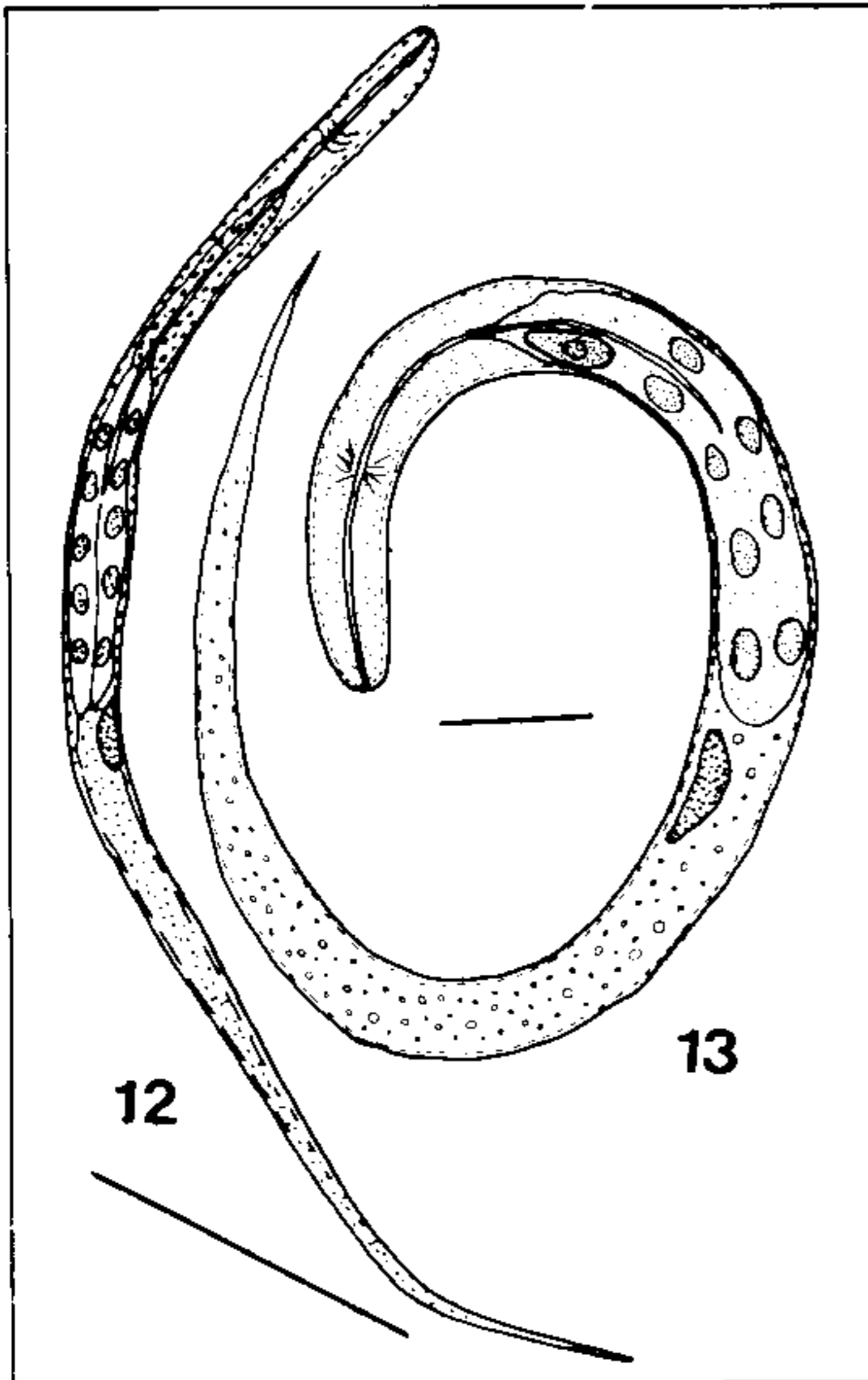
spicule: 19 (17-20); testes: 1410 long (1292-1621); length and width of amphids: 8 x 6, amphid pore: 2 x 5.

Female: n = 10. Body length: 10 (8-11); width of head at level of cephalic papillae:

72 (58-54); width of body at level of nerve ring: 121 (98-122); greatest width of body: 174 (162-180); width of body at level of posterior end of trophosome: 162 (145-174); width of body at level of vulva: 178 (169-188); cuticle thickness at head papillae: 4 (3-5), at nerve ring: 5 (4-6); oesophagus length: 2115 (2091-2185); distance from head to nerve ring: 350 (300-410); V: 48% (47-51); canal vaginal length: 377 (332-406); mean width vagina: 67 (58-72); ovaries length: 940 (822-1081); length and width of amphids: 11 x 9, amphid pore: 3 x 5.

Post-parasitic nuvenil: n = 6; dimensions as in adults. Tail appendage long and thin, mean length 270 (236-304).

Pre-parasitic larva: Fig. 12. n = 10. Body length: 520 (470-587); width of the body at midpoint: 15 (12-19). With a well-developed stylet, 7 long. Oesophagus extends for 1/2 of the body length. Gonad primordium was situated ventrally at the midbody.



Gastromermis cordobensis n. sp. — Fig. 12: pre-parasitic juvenile. Fig. 13: early stage parasitic juvenile. (Bars = 100 μ m).

Parasitic larva: Fig. 13. n = 0. This stage changed during parasitic life. The stylet disappeared. The oesophagus shortened and occupied 1/3 of the length. The pharyngeal glands were atrophied. The stychosome increased greatly in size, and only one large nucleated cell within a granular body (the homocyte) was present. The intestine was wide and full of globules. An anus and rectum were lacking. The gonad primordium was situated at midbody. The tail was long and thin. The longitudinal chords were indistinct, so the arrangement could not be determined.

Eggs: Fig. 11. Oval with smooth shell, unembryonated, laid without any additional covering. 47 x 54 (44-49 x 51-56).

Type host: larvae of *Simulium lahillei* Paterson & Shannon (Diptera: Simuliidae). Ident. by Dr S. Coscarón (Facultad de Ciencias Naturales y Museo, Paseo del Bosque s/n, 1900 La Plata, Argentina).

Type locality: Santo Antonio river, Villa Carlos Paz, Córdoba, Argentina.

Type material: collected by Dra Camino in 1985. Types deposited in the CEPAVE, División Entomonemátodos, Argentina. Series numbered: 1987 M2030-M2058.

REMARKS

Gastromermis cordobensis n. sp. is closest to two species parasitic in simuliids in the USSR, *G. boophthorae* Welch & Rubzov, 1965, and *G. virescens* Rubzov, 1967, and *G. minuta* Rubzov, 1967, parasitic in midges (Chironomidae). They are recognized by having a similar vagina and the spicule has non-uniform walls.

Gastromermis boophthorae differs from the new species in having a very long spicule (700-1000), and the genital papillae in three rows contained 32 to 40 papillae in the medial row which divides near the anus into four rows.

Gastromermis minuta can be distinguished by having a short spicule (250-270) and 6 to 8 post-anal genital papillae.

In England, Curran & Hominick (1981) described *G. metae* a parasite of blackflies. It differs from our new species by having a long vagina (326-469), a much longer spicule (1230-

1870), and the middle row of genital papillae in the male had an arrangement of 23-37 pre-anal and 13-22 post-anal papillae.

Two species of the genus *Gastromermis* described from Argentina, *G. fidelis* Doucet, 1982, parasitizing blackflies and *G. kolleonis* Doucet & Poinar, 1984, from midges, have six hypodermal chords, a character which separates them from *G. cordobensis* n. sp., which has eight chords. The other Argentine species is *G. vaginiferous* Camino, 1985. It is similar to the new species in having eight longitudinal chords the entire length of the body, but it has a short spicule (260-300), long vagina (493-510), and the walls of the spicule are uniform.

Gastromermis cordobensis n. sp. can be recognized by the spicule with a sculpture tip and the medial row of genital papillae arranged in a 18 pre-anal and 10 post-anal pattern.

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