

Four new species of *Aphanolaimus* de Man, 1880 (Nematoda : Araeolaimida) from South America

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Summary – Four new species of *Aphanolaimus* de Man, 1880 are described from South America. *A. aymarae* n. sp., characterized by body length 1.4-1.8 mm, amphidial fovea forming a complete circle with faint elevation, lateral field originating at the 27th to 45th annulus, 600-700 annuli, spinneret broadly conoid, terminal part not protruding and V-shaped vagina, *A. boliviensis* n. sp., characterized by body length 1-1.3 mm, amphidial fovea forming a complete spiral, lateral field originating at the 13th to 18th annulus, 420-520 annuli, spinneret conoid with terminal part slightly narrower, posterior part of stoma sclerotized, straight vagina, spicules 32-33 μm and 7-8 pre-anal supplements and *A. quechuae* n. sp., characterized by body length 1.2-1.3 mm, amphidial fovea forming a circle without prominent central elevation, lateral field originating at the 6th to 10th annulus, 525-610 annuli, spinneret bluntly conoid, vagina straight, spicules 40-46 μm and 7-8 pre-anal supplements, were found in the Andean region of Bolivia. *A. brasiliensis* n. sp. was collected from soil around the roots of cacao in Brazil and is characterized by body length 0.6 mm, amphidial fovea forming a single complete spiral with central elevation, lateral field originating at the 13th to 15th annulus, lateral field also indented in the middle of each annulus, 235-269 annuli, cuticle with longitudinal striations and long needle-like spinneret.

Résumé – *Quatre nouvelles espèces d'Aphanolaimus de Man, 1880 (Nematoda : Araeolaimida) provenant d'Amérique du Sud.* – Quatre nouvelles espèces d'*Aphanolaimus* de Man, 1880, provenant d'Amérique du Sud sont décrites. *A. aymarae* n. sp. est caractérisé par la longueur du corps (1,4-1,8 mm), les amphides circulaires pourvues d'une élévation centrale faible, le champ latéral débutant au niveau des anneaux 27-45, le nombre d'anneaux (600-700), la partie postérieure de la queue conoïde et le vagin en forme de V; *A. boliviensis* n. sp. est caractérisé par la longueur du corps (1-1,3 mm), les amphides spirales, le champ latéral débutant au niveau des anneaux 13-18, le nombre total d'anneaux (420-520), la partie postérieure de la queue conoïde-rétrécie, la partie postérieure du stoma sclérotisée, la forme linéaire du vagin, la longueur des spicules (32-33 μm) et le nombre des suppléments (7-8); *A. quechuae* n. sp. est caractérisé par la longueur du corps (1,2-1,3 mm), les amphides circulaires sans élévation, le champ latéral débutant au niveau des anneaux 6-10, le nombre total d'anneaux (525-610), la partie postérieure de la queue conoïde, la forme linéaire du vagin, la longueur des spicules (40-46 μm) et le nombre des suppléments (7-8). Ces trois espèces ont été récoltées en Bolivie. Un échantillon de sol racinaire de cacaoyer provenant du Brésil contenait *A. brasiliensis* n. sp. caractérisé par la longueur du corps (0,6 mm), les amphides unispirales pourvues d'une élévation centrale, le champ latéral débutant au niveau des anneaux 13-15 et indented au milieu de chaque anneau, le nombre total d'anneaux (235-269), la présence des lignes longitudinales et la partie postérieure de la queue se terminant en forme d'aiguille.

Key-words : *Aphanolaimus*, South America, nematodes.

During July and August 1979, members of the Instituut voor Dierkunde, Universiteit Gent, Belgium, collected benthos samples from lakes and ponds in various ecological zones of the Andean region in Bolivia. The locations of the sampling sites and their physical and chemical characteristics are described in Mertens *et al.* (1982). In these samples, three new *Aphanolaimus* species were found. They are described in the present paper together with another new *Aphanolaimus* species collected around the roots of cacao (*Theobroma cacao* L.) in Brazil.

The samples from Bolivia were fixed with hot 4% formaldehyde. The nematodes were extracted from the soil by the centrifugation-flotation method, processed to pure glycerin by a modified Seinhorst method and mounted between cover slips on aluminium slides (De

Grisse, 1969). The nematodes were first extracted from the sample from Brazil by a modified decantation/cotton wool filter technique, and killed, fixed and processed to pure glycerin according to the method described by Seinhorst (1966).

Aphanolaimus aymarae * n. sp. (Fig. 1)

MEASUREMENTS

Holotype female: L = 1.40 mm; a = 26.9; b = 5.6; c = 8.4; c' = 6.1; V = 48.4; G₁ = 28.7; G₂ = 24.6; mid-body diam. = 52 μm .

* After the Aymara tribe, original inhabitants of Bolivia.

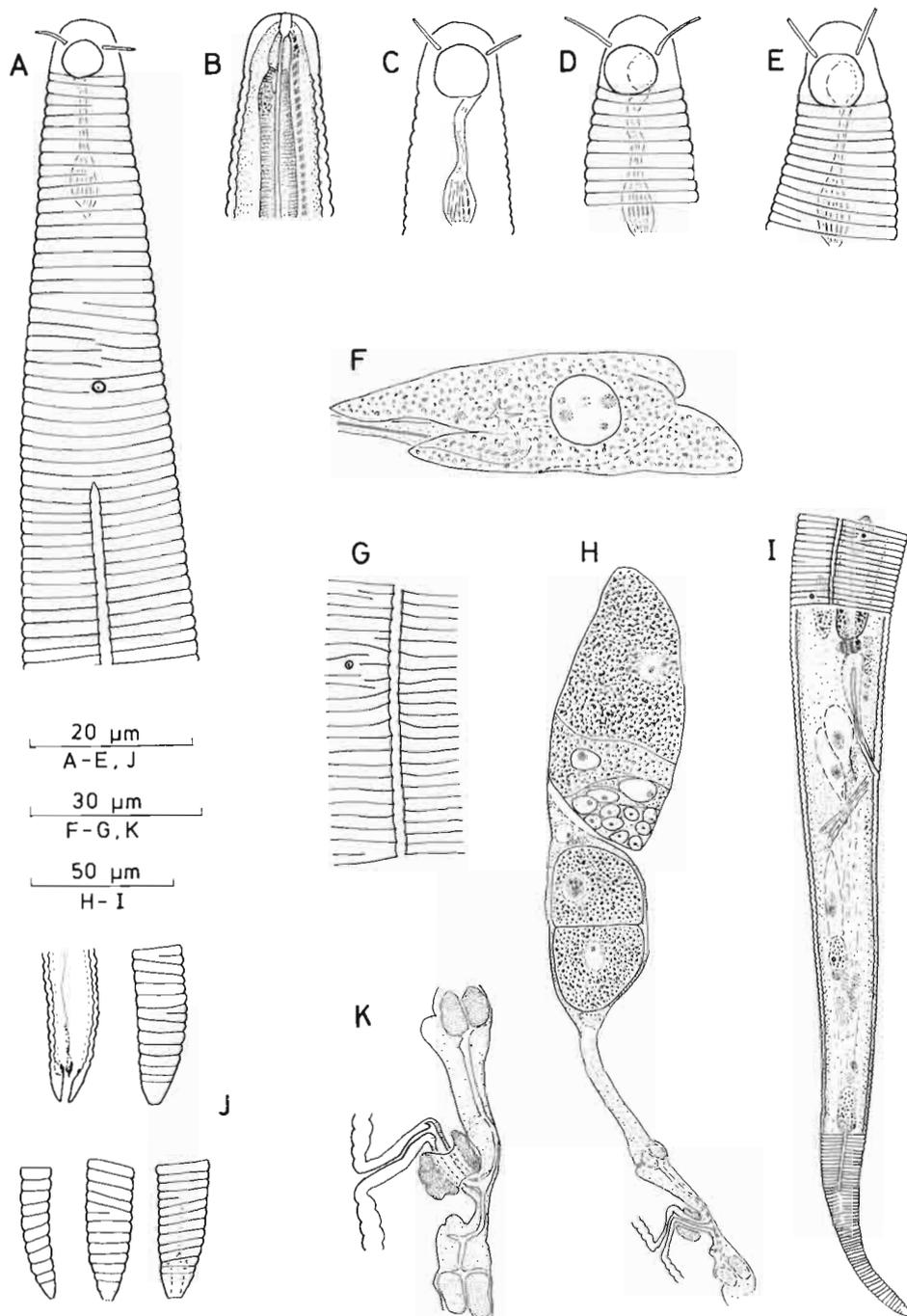


Fig. 1. *Aphanolaimus aymarae* n. sp. – A : Anterior body region, surface view (holotype); B : Head end, median view (holotype); C : Head end showing amphid; D, E : Head ends in surface view; F : Ventral gland; G : lateral field and annulation at mid-body; H : Anterior branch of reproductive system; I : Tail region; J : Tail ends; K : Vagina and ovejector.

Females (n = 5) : L = 1.49-1.76 (1.64 mm); a = 23.2-27.9 (26); b = 5.8-6 (5.9); c = 7.4-8.8 (8.4); c' = 5.4-6.7 (6); V = 48.7-51.5 (49.7); G₁ = 13.8-26.9 (18.6); G₂ = 15.6-26.8 (20.8); mid-body diam. = 57-75 (64) μm .

DESCRIPTION

Female : Body coiled after fixation, tapering towards both extremities. Head diameter somewhat less than 1/5 of maximum body diameter and 1/4 of body diameter at level of the pharyngo-intestinal junction. Cuticle 3-4 μm thick with 600 to 700 distinct annuli along the body. Annuli wider in the middle of the body than near the extremities : in a straight portion of the body near the middle they average 2 μm . No longitudinal striations present. Lateral field 1.5-2.5 μm wide, marked off by two crenated lines, originating at the 27th to 45th annulus, at 57-76 (65) μm , i.e. 5.5-6.9 times the head diameter, from the anterior end of the body and extending throughout the body till 71-81 % of the tail length. The lateral lines are indented opposite the transverse striae of the cuticle. Twenty-six to 37 prominent body pores present, irregularly distributed along the dorsal and ventral side of each lateral field. A minute projection can often be observed inside the pores. The pores are connected with granular, oval epidermal gland cells whose nucleus is situated either at its anterior or posterior edge. The first body pore occurs at the 21th to 39th annulus, the second body pore at the 52th to 65th annule. Head 9.5-12 μm wide at base and 8-11 μm high, provided with four well developed cephalic setae, 6-7 μm long. Amphidial fovea large, 5-7 μm wide, i.e. 50-65 % of the corresponding head diameter, pseudospiral forming a complete circle with faint central elevation. Anterior margin of amphids opposite base of cephalic setae. Fovea 6.1 (5-6.5) μm in diameter, leading inward at its dorsal side to the amphidial canal which widens to the fusus at 9-10 μm behind the posterior edge of the fovea. Fusus starting opposite the 6th to 7th annulus and extending over four to six annuli. Stoma 2-3 μm long, small, inverse funnel-shaped. Pharynx a narrow, weakly muscularized cylinder, 252-298 (274) μm . Pharyngo-3970 m altitude. (Collected on 9.7.1979 by D. De Waele.)
 Ventral gland with asymmetrical, H-shaped cell body, 45-72 (59.5) μm long, situated in the region of the pharyngo-intestinal junction. Nerve ring situated half-way along the pharynx. Female reproductive system amphidelphic with common ovejector connected to both uteri through sphincter muscles. Uteri long with eggs in various stages of development, including fully grown juveniles, hence the species is ovoviviparous. Females studied with two to nine intra-uterine eggs, 59-74 (65) μm long and 28.5-34 (31.5) μm wide. No trace of sperm in the female genital tract indicating a parthenogenetic reproduction. Vulva equatorial. Vagina V-shaped with the point of the V forwardly directed, 25-31

(28) μm long, extending inward over 1/3 to 1/2 of the corresponding body diameter. Tail 167-205 (191) μm long. Three caudal glands present, the anterior one or two extending over the rectum. Spinneret broadly conoid, terminal part not offset nor protruding.

Male : not found.

TYPE HABITAT AND LOCALITY

Mud mixed with roots from the aquaduct running from the glacier lake of the Cerro Maria Lloco to Huallatani, Huayna Potosi, Bolivia, 4800 m altitude. Collected on 22.7.1979 by D. De Waele.

OTHER HABITATS AND LOCALITIES

Benthic mud sample from a roadside brooklet between La Paz and the Lagunas Tuni, Altiplano, Bolivia, 3970 m altitude. (Collected on 9.7.1979 by D. De Waele.)

Benthic mud sample from a brooklet in the Hichu Kkota drainage bassin of Lake Khara Kkota, Lagunas Kkota, Bolivia, 4320 m altitude. (Collected on 11.7.1979 by D. De Waele.)

Benthic mud samples from the littoral zone and the centre of a small lake between Khara Kkota and Khotia, Lagunas Kkota, Bolivia, 4450 m altitude. (Collected on 7.8.1979 by D. De Waele.)

TYPE SPECIMENS

Holotype female and five paratype females deposited at the Nematode Collection of the Instituut voor Dierkunde, Universiteit Gent, Belgium (slides 3621-3625).

DIAGNOSIS AND RELATIONSHIPS

A. aymarae n. sp. can be separated from all species in the genus by the combination of the following characters : body length 1.4 to 1.8 mm; cephalic setae shorter than head diameter at base; amphidial fovea pseudospiral forming a complete circle with faint central elevation; lateral field originating at the 27th to 45th annule; lateral lines not indented in the middle of each annulus; 600 to 700 annuli; cuticle without longitudinal striations; first body pore at the 21th to 39th annulus; spinneret broadly conoid, terminal part not protruding; stoma not sclerotized and V-shaped vagina.

A. aymarae n. sp. belongs to the group of large (more than 0.8 mm) *Aphanolaimus* species with circular to pseudospiral amphidial fovea, more than 500 annuli and posterior part of the stoma not sclerotized. *A. aymarae* n. sp. resembles *A. aquaticus* von Daday, 1884, *A. spiriferus* Cobb, 1914, *A. viviparus* Plotnikov, 1899 and *A. quechuae* n. sp.. From the former three species it differs in the shape of the spinneret (broadly conoid, terminal part not offset in *A. aymarae* n. sp. vs short and stout, terminal part offset in *A. aquaticus*, *A. spiriferus* and *A. viviparus*). From *A. aquaticus*, *A. viviparus* and *A. quechuae* n. sp. it differs in body length (1.4-1.8 mm in *A. aymarae* n. sp. vs usually less than 1.4 mm in *A. aquaticus*, *A. viviparus* and *A. quechuae* n. sp.). It further differs from

A. aquaticus and *A. quechuae* n. sp. in the shape of the vagina (V-shaped in *A. aymarae* n. sp. vs straight in *A. aquaticus* and *A. quechuae* n. sp.); from *A. aquaticus* in the length of the cephalic setae (shorter than head diameter at base in *A. aymarae* n. sp. vs longer than head diameter at base in *A. aquaticus*) and from *A. quechuae* n. sp. in the origin of the lateral field (at the 27th to 45th annulus in *A. aymarae* n. sp. vs at the 10th annulus in *A. quechuae* n. sp.).

***Aphanolaimus boliviensis* n. sp.**

(Fig. 2)

MEASUREMENTS

Holotype female: L = 1.09 mm; a = 26.5; b = 4.9; c = 7.3; c' = 7.4; V = 49.4; G₁ = 13.2; G₂ = 13.2; mid-body diam. = 41 µm.

Females (paratypes, n = 2): L = 1.17-1.31 mm; a = 30.4-32.5; b = 5.3-6.3; c = 7.5-7.7; c' = 7.2-8.3; V = 49.7-50.6; G₁ = 13.6-14.4; G₂ = 11.1-12.4; mid-body diam. = 36-43 µm.

Males (paratypes, n = 2): L = 0.97-1.10 mm; a = 44.1-52.3; b = 4.8-5.5; c = 6.7-6.9; c' = 6.9; T = 43.1-49.5; pre-anal supplements 7-8; spicule = 31-35 µm (axially); gubernaculum = 9-10 µm; mid-body diam. = 21-22 µm.

DESCRIPTION

Female: Body after fixation coiled in two specimens, more straight in one, tapering towards both extremities. Head diameter about 3/10 of maximum body diameter and 2/5 to 1/2 of body diameter at level of the pharyngo-intestinal junction. Cuticle 2.5-3 µm thick, with 420 to 520 annuli along the body. In a straight portion of the body near the middle, the annuli average 2.5 µm. Annuli without longitudinal striations. Lateral field 1.5 µm wide, marked off by two crenated lines, originating at the 13th to 18th annulus, at 46-54 µm, i.e. 3.8 to 4.5 times the head diameter, from the anterior end of the body and extending throughout the body till 63-70 % of the tail length. Lateral lines indented opposite the transverse striae of the cuticle. Twenty-two to 28 prominent body pores present, irregularly distributed along the dorsal and ventral side of each lateral field. Pores connected with granular, oval epidermal gland cells with their nucleus either at the anterior or posterior edge. First body pore occurring at the 11th to 16th annulus, second body pore at the 29th to 36th annulus. Inside each pore a small sensillum can be observed. Head 11.5-12.5 µm wide at base and 10.5-11.5 µm high, provided with four well developed cephalic setae, 9-9.5 µm long, i.e. somewhat shorter than the basal head width. Amphidial fovea large, 7.5-8 µm wide, i.e. 60-75 % of the corresponding head diameter, forming a complete spiral. Anterior margin of amphids opposite base of cephalic setae. Fovea leading inward at its dorsal side to the amphidial canal which widens to a large fusus situated at

level of the second to third annulus and extending over four annuli. Stoma 4.5-5.5 µm long, consisting of a small, inverse funnel-shaped anterior part and a sclerotized 2-3 µm long posterior part. Pharynx 208-223 µm long, forming a narrow, weakly muscularized cylinder. Pharyngo-intestinal junction cylindrical with conical tip. Intestine forming an uniform tube. Rectum 40-48 µm, i.e. 1.9 to 2.3 anal body diameters long. Ventral gland large with strongly asymmetrically H-shaped cell body (79-80 µm) situated in the region of the posterior pharynx and anterior intestine. Nerve ring situated halfway along the pharynx. Female reproductive system amphidelphic, consisting of a common ovejector with two pairs of subdorsal glands and separated by sphincters from both uteri. Each uterus consists of a wide, short chamber, followed by a double spermatheca filled with sperm at the junction of oviduct and uterus. Oviduct wide with two nuclei closely together and without visible lumen, connected ventrally to the reflexed ovary. Position of both genital branches in relation to intestine variable: one female has both branches at the left side of the intestine; one both branches on the right side while one has the anterior branch on the left side and the posterior one on the right side. Vulva equatorial. Vagina straight, 20-22 µm long, extending inward at right angle over 1/2 of the corresponding body diameter. Intra-uterine eggs present in two specimens. Tail 148-179 µm long. Three caudal glands present, the anterior one or two extending over the rectum. Spinneret conoid with terminal part slightly narrower.

Male: Resembling females in most respects. Head 10.5-12 µm wide at base and 11.5 µm high. Cephalic setae 7-8 µm. Head diameter about 1/2 of maximum body width. Cuticle with 500-520 annuli along the body. In a straight portion of the body near the middle they average 2 µm. Lateral field originating at the 13th to 17th annulus, at 43-53 µm, i.e. 3.5-5 times the head diameter, from the anterior end of the body. Twenty-one to 23 body pores present. The first body pore occurs at the 11th to 17th annulus, the second one at the 29th to 31st annulus. Male reproductive system with single, posterior reflexed testis and anterior gland. Spicules proximally with a capitulum, distally ending bluntly. Gubernaculum with triangular cuneus and plate-like corpus. Seven or eight pre-anal tuboid supplements present, 11-14 µm long. The penultimate supplement is surrounded by a prominent cuticular elevation. Tail region provided with five pairs of well developed setae: a pair of lateroventral ones opposite the spicules; two pairs of lateroventral ones on the tail; one pair of laterodorsal ones shortly anterior or posterior to the end of the lateral field and one pair of lateral ones at 30-50 % of the tail region posterior to the lateral field. In one specimen the lateral one was missing on one side. The lateroventral caudal setae 7.5-9 µm long; the laterodorsal ones 4.5-6 µm and the lateral ones 2.5-3.5 µm.

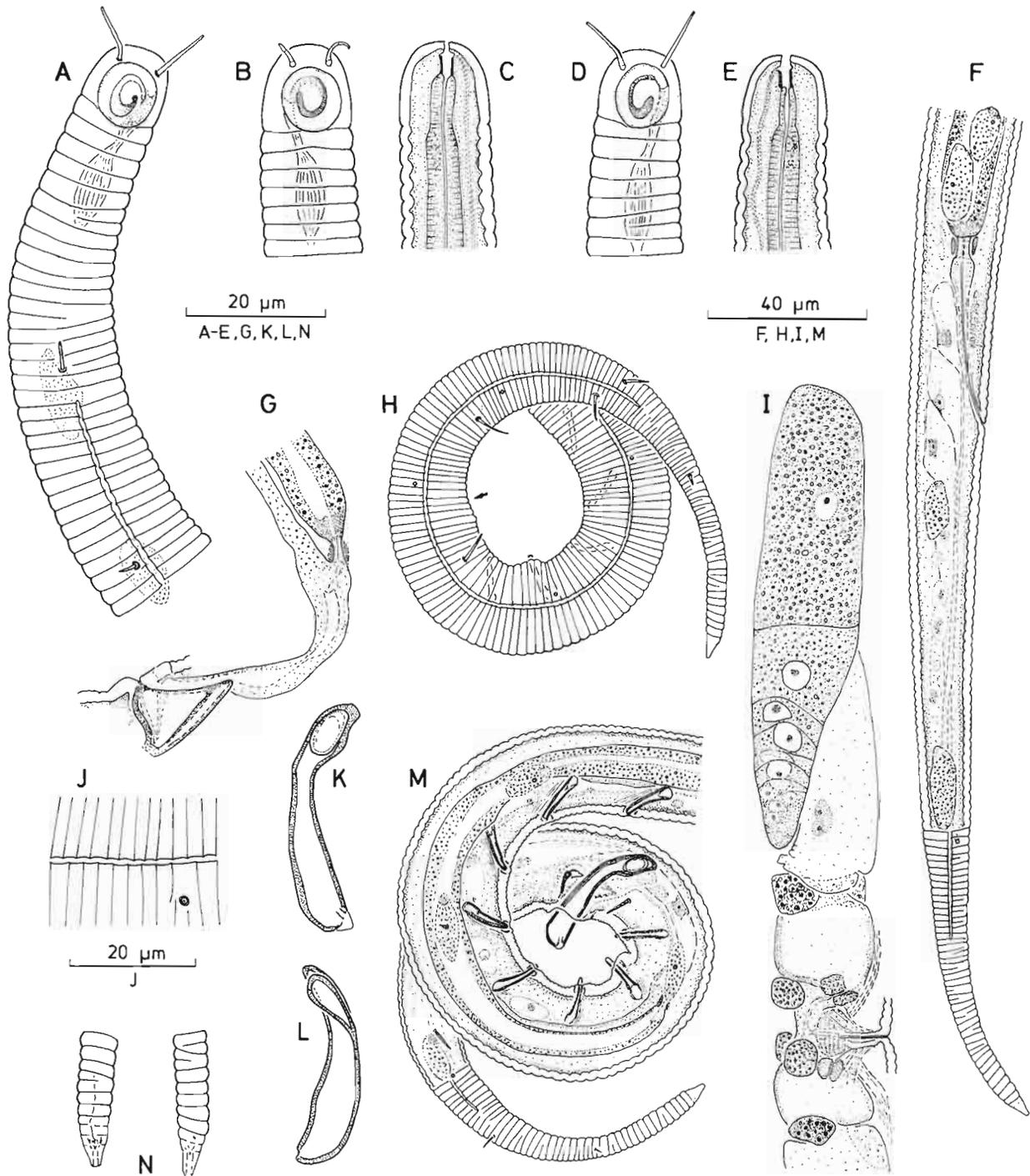


Fig. 2. *Aphanolaimus boliviensis* n. sp. – A : Anterior body region of male, surface view; B, D : Head ends of males in surface view, C, E, : Head ends of males in median view; F : Tail region of female; G : Cloaca and gubernaculum; H : Posterior body region of male in surface view (arrow indicates cloacal opening); I : Anterior branch of reproductive system of female; J : Lateral field and annulation of female at mid-body; K, L : Spicules; M : Posterior body region of male; N : Tail ends.

TYPE HABITAT AND LOCALITY

Wet mosses in the Hichu Kkota drainage bassin of Lake Khara Khota, Lagunas Kkota, Bolivia, 3992 m altitude. (Collected on 11.7.1979 by D. De Waele.)

TYPE SPECIMENS

Holotype female, two paratype females and two paratype males deposited at the Nematode Collection of the Instituut voor Dierkunde, Universiteit Gent, Belgium (slides 3626-3627).

DIAGNOSIS AND RELATIONSHIPS

A. boliviensis n. sp. can be separated from all species in the genus by the combination of the following characters: body length 1.0 to 1.3 mm; cephalic setae shorter than head width at base; amphidial fovea forming a complete spiral; lateral field originating at the 13th to 18th annulus; lateral field not indented in the middle of each annulus; 420 to 520 annuli; cuticle without longitudinal striations; first body pore at the 11th to 17th annulus; spinneret conoid with terminal part slightly narrower; posterior part of stoma sclerotized in females and males; vagina straight in females; spicules 32-33 μm : seven to eight pre-anal supplements in males.

A. boliviensis n. sp. resembles *A. microlaimus* De Coninck, 1935 (only males known) in body length, length of cephalic setae, sclerotized stoma, spiral shape of amphidial fovea, origin of lateral field, lateral field not indented in the middle of each annulus, cuticle without longitudinal striations and the position of the first body pore. Males of *A. boliviensis* n. sp. differs from males of *A. microlaimus* in the number of annuli (500-520 in *A. boliviensis* n. sp. vs 346-372 in *A. microlaimus*), tail length (146-158 μm in *A. boliviensis* n. sp. vs 135-146 μm in *A. microlaimus*), number of setae on tail (five pairs of setae in *A. boliviensis* n. sp. vs four pairs of setae in *A. microlaimus*), shape of spinneret (conoid with terminal part slightly narrower in *A. boliviensis* n. sp. vs terminal part offset in *A. microlaimus*) and spicule length (31-35 μm in *A. boliviensis* n. sp. vs 29-30 μm in *A. microlaimus*).

***Aphanolaimus brasiliensis* n. sp.**

(Fig. 3 A-E)

MEASUREMENTS

Holotype female: L = 0.62 mm; a = 32.4; b = 4.9; c = 6.8; c' = 7.1; V = 49.7; G₁ = 20; G₂ = 13.2; mid-body diam. = 21 μm .

Two paratype females: L = 0.57-0.60 mm; a = 35.6-39.9; b = 4.8-5.2; c = 5.8; c' = 7.9-8.9; V = 48.6-50; G₁ = 12-17.2; G₂ = 10-18.1; mid-body diam. = 15-16 μm .

DESCRIPTION

Female: Body C-shaped after fixation, tapering towards

both extremities. Head diameter about 1/3 of maximum body diameter and 2/5 to 1/2 of body diameter at level of the pharyngo-intestinal junction. Cuticle about 2.5 μm thick, with 263-269 coarse annuli along the dorsal and 235-251 annuli along the ventral half of the body. Annuli wider in the middle of the body than near the extremities: in a straight portion of the body near the middle they average 2.8-3 μm . Annuli provided with about 40 longitudinal striations at mid-body. Lateral field 1-1.5 μm wide, marked off by two crenated lines, originating at the 13th to 15th annulus, at 30-34 μm or 4.3-4.5 times the head diameter, from the anterior end of the body and extending throughout the body till 56-57 % of the tail length. Lateral lines indented opposite the transverse striae of the cuticle and in the middle of each annulus. Fourteen to seventeen prominent body pores present, irregularly distributed along the dorsal and ventral side of each lateral field. A minute projection often visible inside the pores. Pores connected with granular, oval epidermal gland cells, 10-14 μm long and 4-6 μm wide. First body pore occurring at the 4th to 6th annulus, second body pore at the 16th to 18th annulus. Head 6.5-7 μm wide at base and 6.5-7 μm high, provided with four well developed cephalic setae, 7.5-8 μm long, i.e. somewhat longer than the basal head diameter. Amphidial fovea large, 4-5 μm wide, i.e. 60-70 % of the corresponding head diameter, forming a single complete spiral with central elevation. Anterior margin of amphids opposite base of cephalic setae. Fovea leading inward at its dorsal side to a canal which widens to a large fusus at 14-15 μm from the anterior end of the body, i.e. about twice the basal head diameter. Fusus starting opposite the 5th to 6th annulus and extending over three annuli. Stoma 1.5 μm long, small, inverse funnel-shaped. Pharynx 114-125 μm long, forming a narrow, weakly muscularized cylinder. Pharyngo-intestinal junction cylindrical with conical tip. Intestine forming a uniform tube. Rectum 20-23 μm , i.e. 1.3-1.9 anal body diameters long. Ventral gland with a comparatively small (15 μm) oval cell body situated in the region of the pharyngo-intestinal junction. Nerve ring situated halfway along the pharynx. Female reproductive system agreeing in every aspect with that described for *A. louisae* (Coomans & De Waele, 1979) and for *A. seshadrii* (Raski & Coomans, 1990) except for empty spermathecae. Position, of both genital branches in relation to intestine variable: one female has both branches at the right side of the intestine; one has the anterior branch at the left side and the posterior branch at the right side while one has the anterior branch at the right side and the posterior branch at the left side. Vulva equatorial. Vagina 7-9 μm long, extending inward over 1/3 to 1/2 of the corresponding body diameter. No intra-uterine eggs present. Tail 91-103 μm long. Three caudal glands present, the anterior one extending dorsally over the rectum. Spinneret long, needle-like.

Male: not found.

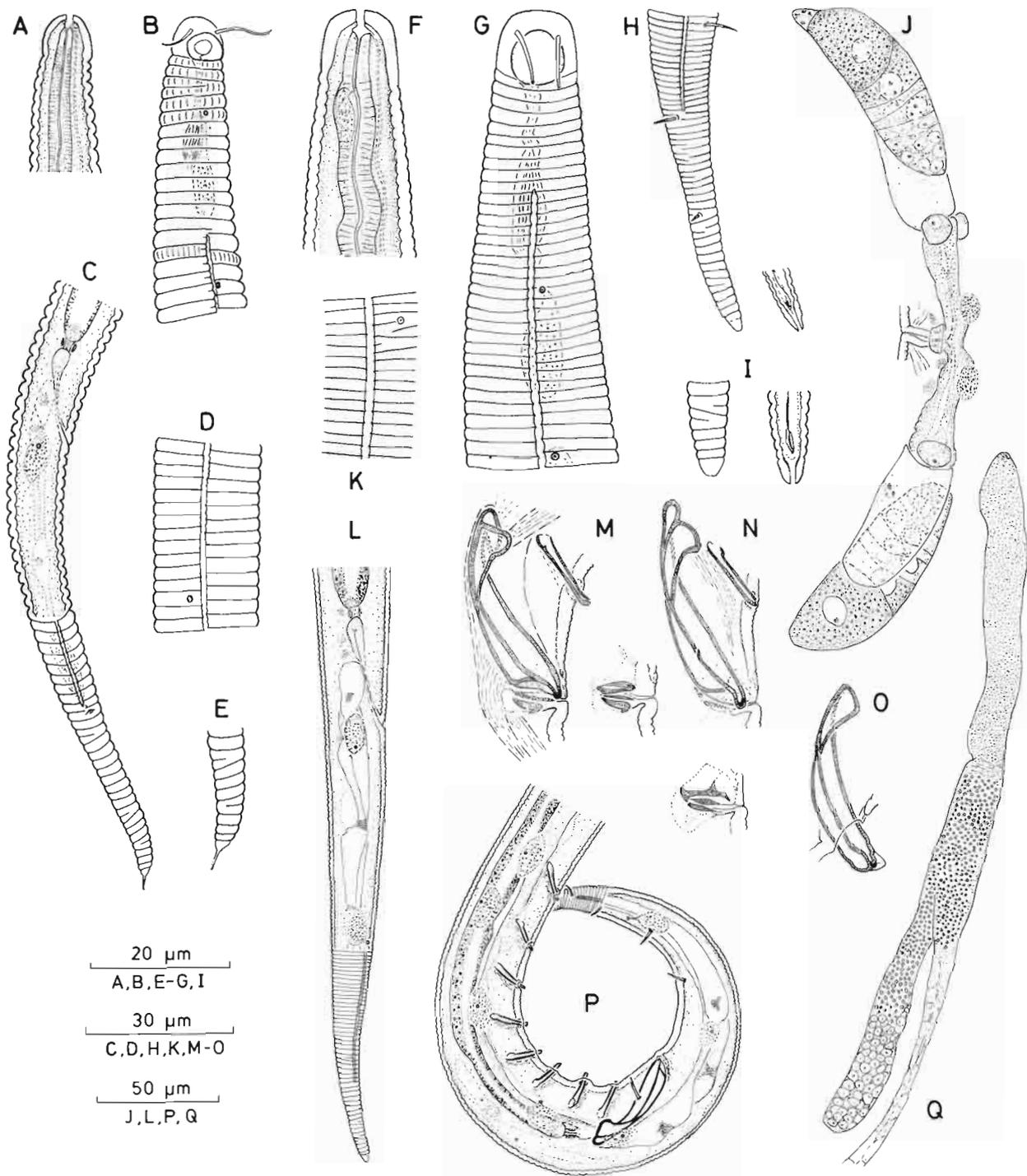


Fig. 3. *Aphanolaimus brasiliensis* n. sp. – A : Head end, median view; B : Anterior end, surface view; C : Tail region; D : Body annulation at mid-body; E : Tail end. All drawings from holotype. – *Aphanolaimus quechuae* n. sp. – F : Head end of female, median view; G : Anterior end of female in surface view; H : Tail end of male; I : Tail end of female; J : Reproductive system of female; K : Lateral field and annulation of female at mid-body; L : Tail region of female; M, N : Spicules and corresponding gubernacula; O : Protruded spicule; P : Posterior body region of male; Q : Reproductive system of male. All drawings of female from holotype.

TYPE HABITAT AND LOCALITY

Soil around the roots of cacao (*Theobroma cacao* L.), Brazil. (Collected by R. D. Sharma.)

TYPE SPECIMENS

Holotype female and two paratype females deposited at the Nematode Collection of the Instituut voor Dierkunde, Universiteit Gent, Belgium (slide 3628).

DIAGNOSIS AND RELATIONSHIPS

A. brasiliensis n. sp. can be separated from all species in the genus by the combination of the following characters: body length 0.6 mm; cephalic setae longer than head width at base; amphidial fovea forming a single complete spiral with central elevation; lateral field originating at the 13th to 15th annulus; lateral field also indented in the middle of each annulus; 235 to 251 (ventral) or 263 to 269 (dorsal) annuli; cuticle with longitudinal striations; first body pore at the 4th to 6th annulus; spinneret long, needle-like; stoma not sclerotized.

A. brasiliensis n. sp., *A. seshadrii* Raski & Coomans, 1990 and *A. louisae* Coomans & De Waele, 1979 are the only *Aphanolaimus* species with a cuticle with longitudinal striae. *A. brasiliensis* n. sp. also resembles *A. seshadrii* and *A. louisae* in the unispiral shape of the amphidial fovea, lateral field also indented in the middle of each annulus, needle-like spinneret and straight vagina. *A. brasiliensis* n. sp. differs from *A. seshadrii* and *A. louisae* in the origin of the lateral field (at the 13th to 15th annulus in *A. brasiliensis* n. sp. vs. at the 3rd to 7th annulus in *A. seshadrii* and 5th to 7th annulus in *A. louisae*). *A. brasiliensis* n. sp. further differs from *A. seshadrii* in tail length (91-103 μm in *A. brasiliensis* n. sp. vs 76-82 μm in *A. seshadrii*) and from *A. louisae* in body length (0.6 mm in *A. brasiliensis* n. sp. vs 0.8-1.1 mm in *A. louisae*), length of cephalic setae (7.5-8 μm *A. brasiliensis* n. sp. vs 10-11 μm in *A. louisae*) and number of annuli (235-269 in *A. brasiliensis* n. sp. vs 308-369 in *A. louisae*).

***Aphanolaimus quechuae* * n. sp.**

(Fig. 3 F-Q)

MEASUREMENTS

Holotype female: L = 1.31 mm: a = 25.7; b = 5.4; c = 7.3; c' = 6.9; V = 48.7; G₁ = 48.7; G₂ = 11; mid-body diam. = 51 μm .

Males (paratypes, n = 3): L = 1.16-1.24 (1.20) mm; a = 27.7-30.2 (28.9); b = 5.5-5.7 (5.6); c = 7.5-7.9 (7.7); c' = 4.3-4.8 (4.6); T = 56.2-61 (58.4); pre-anal supplements 7-8; spicule (axially) = 42-46 (44) μm ; gubernaculum = 7-8 μm ; mid-body diam. = 41-42 (42) μm .

* After the Quechua tribe, original inhabitants of Bolivia.

DESCRIPTION

Female (holotype): Body coiled after fixation, tapering towards both extremities. Head diameter somewhat less than 1/4 of maximum body diameter and 3/10 of body diameter at the pharyngo-intestinal junction. Cuticle 2.5 μm thick, with more than 525 small but distinct annuli along the body. In a straight portion of the body near the middle annules averaging 2.2 μm . No longitudinal striations. Lateral field originating at the 10th annulus, i.e. 2.3 times the head diameter, from the anterior end of the body, extending throughout the body till 4/5 of the tail length. Lateral field marked off by two crenated lines, 1.5 μm wide, indented opposite the transverse striae of the cuticle. Twenty-four and 22 prominent body pores present, irregularly distributed along the dorsal and the ventral side of the lateral fields. Inside each pore a minute projection can often be observed. Each body pore is connected with a granular, oval epidermal gland cell. The first body pore occurs at the 20th annulus, the second body pore occurs at the 35th annulus. Head 11 μm wide at base 11 μm high, provided with four well developed cephalic setae, 8 μm long. Amphidial fovea large, 7.5 μm wide, i.e. about 70 % of the corresponding head diameter, forming a circle without prominent central elevation. Anterior margin of amphids opposite base of cephalic setae. Fusus at 20 μm from the anterior end of the body; it starts opposite the 7th annulus and extends over 10 annuli. Stoma 3 μm long, small, inverse funnel-shaped. Pharynx 243 μm long, forming a narrow weakly muscularized cylinder. Pharyngo-intestinal junction cylindrical with conical tip. Intestine forming an uniform tube. Rectum 54 μm long, i.e. 2.1 anal body widths. Ventral gland large, with H-shaped cell body (57 μm) situated in the region of the pharyngo-intestinal junction. Nerve ring situated halfway along the pharynx. Female reproductive system with wide oviducts, empty spermathecae and poorly differentiated sphincters. Vulva equatorial. Vagina straight, 20 μm long, extending inward over 2/5 of the corresponding body diameter. Tail 180 μm long. Three well developed caudal glands present. Spinneret bluntly conoid.

Male: Resembling female in most respects. Head diameter 3/10 of maximum body diameter and 1/3 of the body diameter at the pharyngo-intestinal junction. Cuticle 2.5 μm thick, with 550-610 small but distinct annuli along the body. In a straight portion of the body near the middle they average 2-2.5 μm . Lateral field originating at the 6th to 9th annule, at 19.5-21.5 μm , i.e. 1.6-1.7 times the head diameter, from the anterior end of the body and extending throughout the body till 70-75 % of the tail length. Twenty-two to 31 body pores present. The first body pore occurs at the 20th to 24th annulus, the second one at the 31th to 34th annulus. Head 12-12.5 μm wide at base and 10.5-11 μm high. Cephalic setae 8-9 μm long. Amphidial fovea with low central

elevation. Fusus at 17.5-18.5 μm from the anterior end of the body, starting opposite the 5th to 6th annulus and extending over eight annuli. Pharynx 208-220 μm long. Ventral gland with H-shaped 51-62 (56.7) μm long cell body. male reproductive system with single, posterior reflexed testis. Spicules wide with well developed proximal capitulum, while distally they end bluntly with heavily sclerotized lateral knob and weakly sclerotized medial tip. Gubernaculum variable in shape, cuneus in lateral view appearing as a tripartite structure. Seven ($n = 1$) or eight ($n = 2$), pre-anal tuboid supplements present; their length varies from 12 to 20 μm . The one but last supplement is surrounded by a prominent cuticular elevation. Tail region provided with six pairs of well developed setae: a pair of lateroventral ones opposite the spicules; three pairs of lateroventral ones; one pair of laterodorsal ones shortly anterior or posterior to the end of the lateral field and one pair of lateral ones about halfway between the end of the lateral field and the tail tip. In one specimen one additional lateroventral caudal seta was present on one side opposite the spicules while in another specimen the laterodorsal caudal seta was absent on one side and the lateral one was missing on the other side. The lateroventral caudal setae 7-10 μm long; the laterodorsal ones 5-7 μm and the lateral ones 3-3.5 μm .

TYPE HABITAT AND LOCALITY

Benthic mud sample from a brooklet in the Hichu Kkota drainage bassin of Lake Khara Kkota, Lagunas Kkota, Bolivia, 4320 m altitude. (Collected on 11.7.1979 by D. De Waele.)

TYPE SPECIMENS

Holotype female and three paratype males deposited at the Nematode Collection of the Instituut voor Dierkunde, Universiteit Gent, Belgium (slides 3629-3630).

DIAGNOSIS AND RELATIONSHIPS

A. quechuae n. sp. can be separated from all species in the genus by the combination of the following characters: body length 1.2 to 1.3 μm ; cephalic setae shorter than head diameter at base; amphidial fovea forming a circle without prominent central elevation; lateral field originating at the 6th to 10th annulus; 525 to 610 annuli; cuticle without longitudinal striations; first body pore at the 20th to 24th annulus; spinneret bluntly conoid; sto-

ma not sclerotized in the females and males; vagina straight in the females; spicules 40-46 μm ; seven to eight pre-anal supplements in the males.

A. quechuae n. sp. is closely related with *A. aymarae* n. sp., *A. aquaticus* and *A. spiriferus*. From *A. aymarae* n. sp. it can be distinguished as mentioned in the section on the relationships of *A. aymarae* n. sp.. From *A. aquaticus* and *A. spiriferus* it differs in the dimensions of the head (head more than 10 μm wide at base and high in *A. quechuae* n. sp. vs less than 10 μm wide at base high in *A. aquaticus* and *A. spiriferus*), origin of the lateral field (at the 6th to 10th annulus in *A. quechuae* n. sp. vs from the 30th annulus onwards in *A. aquaticus* and *A. spiriferus*), average width of the annuli near the middle of the body (2-2.5 μm in *A. quechuae* n. sp. vs 1.5-2 μm in *A. aquaticus* and *A. spiriferus*) and shape of the spinneret (bluntly conoid in *A. quechuae* n. sp. vs short and stout, terminal part offset in *A. aquaticus* and *A. spiriferus*). *A. quechuae* n. sp. further differs from *A. spiriferus* in vagina shape (straight in *A. quechuae* n. sp. vs V-shaped in *A. spiriferus*) in the females and spicule length (42-46 μm in *A. quechuae* n. sp. vs 37-42 μm in *A. spiriferus*) in the males.

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