Daubaylia n. sp. (Nematoda, Daubayliidae), a parasite of the snail Helix aspersa (Müller) (Mollusca, Pulmonata, Helicidae) from Argentina

Nora B. CAMINO1*, Sandra E. GONZÁLEZ2

1 Investigador CIC. Centro de Estudios Parasitológicos y de Vectores, CEPAVE (CCT La Plata-CONICET-UNLP-CIC) Calle 2 n° 584, 1900 La Plata, Argentina.
2 Profesional de Apoyo CIC. CEPAVE (CCT La Plata-CONICET-UNLP-CIC), La Plata, Argentina

Corresponding author e-mail: nemains@cepave.edu.ar

SUMMARY - Daubaylia n. sp. (Nematoda, Daubayliidae), a parasite of the snail Helix aspersa (Müller) (Mollusca, Pulmonata, Helicidae) from Argentina - Daubaylia bonaerensis n. sp. (Nematoda, Daubayliidae), a parasite of the snail Helix aspersa (Müller) (Mollusca, Pulmonata, Helicidae) from Argentina, is described and illustrated. This new species is characterized in male spicules long, parallel inside the body, but when it projected outward cross. Strong gubernaculum triangular sharp-size. Genital papillae almost not visible at optical microscope, six pairs of preanal papillae, one single papilla on the side just above the anus, one pair of adanal papillae, and one pair of postanal papillae. Female with vulva protruding. Vagina barrel shaped, muscular and strong. Uterus in female mature with nine eggs unsegmented. Tail appendage long, conical, straight and strong.

RIASSUNTO - Daubaylia n. sp. (Nematoda, Daubayliidae) un parassita del gasteropode Helix aspersa (Müller) (Mollusca, Pulmonata, Helicidae) dell’Argentina - In questo lavoro viene descritta Daubaylia bonaerensis n. sp. (Nematoda, Daubayliidae) una nuova specie di parassita del gasteropode Helix aspersa (Müller) (Mollusca, Pulmonata, Helicidae) in Argentina. Il maschio possiede lunghi spiculi disposti parallellamente l’uno all’altro nella posizione di riposo mentre quando sono proiettati all’esterno della loro guaina si incrociano. Il gubernaculum è robusto e di forma triangolare. Le papille genitali non sono ben visibili al microscopio ottico, sono presenti 6 paia di papille preanal, una singola papilla appena sopra l’apertura anale, un paio di papille adanal e un paio di papille postanal. La femmina ha una vulva sporgente. La vagina è robusta, muscolare e ha forma a barile. L’utero nella femmina matura contiene 9 uova non segmentate. L’appendice caudale è robusta, lunga, diritta e di forma conica.

Key words: Daubaylia bonaerensis n. sp., nematode, snail, taxonomy, morphology, Argentina
Parole chiave: Daubaylia bonaerensis n. sp., nematode, gasteropode, taxononimia, morfologia, Argentina

1. INTRODUCTION

Baylis and Daubney (1922) described Cephalobus seistanensis, a nematode parasite of pulmonary cavity of a Persian planorbid snail. Chitwood and Chitwood (1934) proposed the new genus Daubaylia for this nematode and also named a second species D. potomaca. At present eight species have been described, seven from planorbid snails in the world and one species from USA is reared in a leech found in the same pond where the infected planorbid snail occurred. Most species were incompletely described, that is why in this paper we extend the description of the genus Daubaylia, and also we report for the first time for Argentina a new species of nematode, belonging to this genus, parasitizing Helix aspersa (Müller) in the hemaphroditic duct an adults helicids snails, the transmission of this nematode is likely during copulation. As a result of this parasite, the snail become ill, there are no ovipositions, so it production falls sharply. This species of gasteropod is an agricultural and garden pest for what this nematode would be beneficial to control the plague, but it is not good in the breeding establishments of snails as human food.

2. MATERIAL AND METHODS

Adults of the snail Helix aspersa (Müller) (n=50) were from a farm where rearing snails is done for human food, cited in Castelar (S 34° 40’; W 58° 40’), Morón, Buenos Aires, Argentina. They were were collected within a closed room equipped for snail mass rearing during 2006-2007, the sick snails (showed little activity, appearance of dead and with the head and foot evert) were put in plastic containers by hand and then placed in individual vials. The snails were kept at 5°C for 10 min, and then dissected in Petri dishes filled with distilled water under a stereoscope microscope. The nematodes were found in genitals, in the hermaphroditic duct. The nematodes were killed by placing them in distilled water at 60°C for 2 min. They were removed to 50% TAF solution in water for 48 h, then into pure TAF. The nematodes were transferred from the fixative to glycerol for slow evaporation of it and clearing of the parasites. Fixed specimens were used for drawings and measurements with the aid of a lucida camera mounted on a Zeiss compound microscope. All measurements are in μm, the mean and standard deviation, and with ranges in parenthe-
sis. Micrographs obtained with SEM were used to develop a description of the external ultrastructure of the cuticle of the nematodes, which were fixed in a cold solution of 1.5% glutaraldehyde/1.5% formaldehyde in 0.1M acidulate buffer (pH 7.35) overnight, postfixed in cold aqueous solution of 1% osmium peroxide overnight, transferred to 70% ethanol and dehydrated in a graded series of ethanol washes from 10% to 90%, to finish the dehydration in absolute alcohol (100%), and then critical point dried with liquid CO2, mounted on SEM stubs, and coated with gold for 1 hour. Observations of ultrastructure were realized by SEM JEOL JSM-100.

3. DESCRIPTION

Nematoda, Rhabditidea, Daubayliidae Poinar, 1977, *Daubaylia* Chitwood and Chitwood, 1934

*Daubaylia bonaerensis* n. sp.

Description: Long, white and thin nematodes. Smooth cuticle. Six cephalic papillae. Amphids small, pore shaped. Mouth terminal and central. Oesophagus long, muscular, with basal bulb valvated. Male (n = 12): Total length: 4,337 ± 597.19 µm (3,800-4,980); diameter of head at level of cephalic papillae: 39 ± 3.51 µm (35-42); stoma length: 7.8 ± 0.29 µm (7.5-8); stoma width: 7.91 ± 0.12 µm (7.8-8); width of body at level of nerve ring: 55.68 ± 4.04 µm (52-60); maximum body diameter: 116 ± 21.63 µm (98-140); width of body at anus level: 80 ± 2.56 µm (75-89); distance anterior end to nerve ring: 151.32 ± 8.08 µm (144-160); oesophagus length: 285.3 ± 32.3 µm (256-320); distance from anterior end to excretory pore: 388.6 ± 24.02 µm (364-412); spicule length: 224 ± 35.12 µm (190-260); spicule width: 10.17 ± 2.02 µm (8-12); gubernaculum length: 62 ± 8.74 µm (55-72); tail appendage length: 320 ± 46.51 µm (272-365). Spicules long, parallel when they are inside the body, but when projected outward they cross. Strong gubernaculum triangular sharp-size. Genital papillae almost not visible at optical microscope, the number and arrangement of the papillae are as follow: six pairs of preanal papillae, one single papilla on the side just above the anus, one pair of adanal papillae, and one pair of postanal papillae. Tail appendage long, conical, straight and strong. Female (n = 22): Total length: 5,475 ± 141.9 µm (5,320-5,600); diameter of head at level of cephalic papillae: 42.3 ± 2.08 µm (40-44); stoma length: 7.6 ± 0.3 µm (7.5-8);
ma width: 7.8 ± 2.12 µm (7.6-8); width of body at level of nerve ring: 72.3 ± 2.51 µm (72-75); maximum body diameter: 165 ± 25.12 µm (140-190); width of body at level of posterior end: 142 ± 32.12 µm (132-176); width of body at level of vulva: 185 ± 25.7 µm (160-212); distance anterior end to nerve ring: 205 ± 20.82 µm (180-220); oesophagus length: 365 ± 25.16 µm (340-390); distance from anterior end to excretory pore: 410.6 ± 25.7 µm (392-440); vagina

Fig. 2 - Daubaylia bonaerensis n. sp. SEM. A) Posterior end of male showing soft preanal papillae. B) Posterior end of male showing soft postanal papillae. C) Posterior end of male showing the spicules outside. D) Tail of male. E) The papilla in detail. F) Anterior end of female. Bars = A, B, C, D: 20 µm, E: 1 µm, F: 5 µm.

length: 115 ± 15.27 µm (100–130); vagina width: 57.17 ± 1.04 µm (56–58); V*: 44.97 ± 0.25 % (44.17–45.2); length and width of eggs: 71.5 ± 1.32 µm (70–72.5) x 76.3 ± 1.52 µm (75–78); tail appendage length: 517 ± 45.09 µm (470–560). *V: distance from anterior end to vulva/body length x 100. Vulva protruding. Vagina barrel shaped, muscular and strong. Monodelphic, ovary reflexed posteriorly. Uterus in female mature with nine eggs unsegmented. Eggs big, smooth shell, without filament. Tail appendage long, conical, straight and strong.

**Type host:** adults of *Helix aspersa* (Müller) (Mollusca, Pulmonata, Helicidae).

**Type locality:** in a farm where rearing snails is done for human food, Castelar (S 34° 40’; W 58° 40’), Morón, Buenos Aires, Argentina.

**Etymology:** The name refers to the geographic site.

**Type material:** Holotype male, Allotype female and Paratypes are deposited in the Helmintological collection of the Museo de La Plata, Paseo del Bosque s/n, 1900 La Plata, Argentina.

**Site of infection:** The nematodes were found in genitals, in the hermaphroditic duct.

**Prevalence:** 20 %.

**Number of nematodes per snail:** 6-20.

4. **DISCUSSION**

Eight species of the genus *Daubaylia* Chitwood and Chitwood (1934), have been described at present, seven from planorbid snails in the world: *D. dewiti* Schuurmans-Stehkoven (1956) from Netherlands; *D. elegans* Honer & Hansen (1961) from Netherlands; *D. helicophilus* Poinar & Richards (1979) from Taiwan; *D. malayanum* Sullivan & Palmieri (1978) from Malaysia; *D. pearsoni* Anderson & Bartlett (1993) from Australia; *D. potomaca* Chitwood & Chitwood (1934) from USA; and *D. seistanensis* (Baylis & Daubney, 1922) from Iran; and one species from a leech: *D. olsoni* Poinar (1984) from USA. *D. dewiti* has tail of the female short (less than 90 µm), male and female nearly equal in size (less than 2 mm in length), the uterus of mature female usually contained a single undeveloped egg. *D. seistanensis* has six pairs of genital papillae which two pairs are in the base of the tail, the uterus never contains more than one ovum unsegmented.

The male of *Daubaylia bonaerensis* n. sp. is characterized by the spicules long, parallel inside the body, but when it projected outward cross, the gubernaculum is strong and triangular sharp-size, and the genital papillae are not visible at optical microscope, we can only see them by SEM showing the following arrangement: six pairs of preanal papillae, one single papilla on the side just above the anus, one pair of adanal papillae, and one pair of postanal papillae. The female has a protruding vulva, the vagina is muscular, strong and barrel shaped, the uterus in female mature with nine eggs unsegmented. The tail appendage in both sexes is long, conical, straight and strong. All these only characters demonstrate that it is a new species, another one of the genus *Daubaylia*.

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**REFERENCES**


