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Oswaldocruzia venezuelensis sp. n. (Nematoda: Trichostrongylina, Molineoidea), a parasite of *Bufo marinus* from Venezuela

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Abstract. A new species of *Oswaldocruzia* Travassos, 1917, a parasite of *Bufo marinus* L. from Venezuela, is described. Like most Neotropical *Oswaldocruzia*, *Oswaldocruzia venezuelensis* sp. n. is characterized by spicules with three principal branches: blade, shoe and fork, and by a division of the fork within the distal third of the spicule length. *O. vaucheri* Ben Slimane et Durette-Desset, 1993 is the most closely related species due to its caudal bursa of type II and its cervical alae of the same shape but it differs in the following characters: the position of the papillae of rays 4 situated nearer the papillae of rays 3 rather than rays 5, a higher percentage of the ridges in the oesophageal region, the cervical alae three times longer and sharp and the spicular fork divided less deeply.

Numerous species of *Oswaldocruzia* Travassos, 1917, has been described from South America: Brazil (4), Brazil and Ecuador (2), Chile (1), Ecuador (9), Ecuador and Guiana (1), Guiana (1), Paraguay (1) and Peru (1). Most of them possess the same characteristics, i.e. the spicules are divided into 3 branches, blade, shoe and fork, and the latter is divided within the distal third of the spicule length. There is no crest opposite each lateral cord. Species are closely related to each other and are distinguished mainly by the pattern of the synlophe in the oesophageal region and by the relative arrangement of rays 6, 8 and 9. The material collected by one of us (R. G.) has allowed us to describe a new species from Venezuela belonging to this group.

MATERIALS AND METHODS

Nematodes were collected from the small intestine of one *Bufo marinus* L., from Venezuela. They were fixed immediately in 70 % ethanol (boiled), stored in 70 % ethanol and deposited in the Helminthological Collections of the Muséum national d'Histoire naturelle of Paris (MNHN), in the Colección de Parasitología, Museo de Biología, Universidad Central de Venezuela (CP-MBUCV) and in the Institute of Parasitology, České Budějovice (IPCAS).

The study of the synlophe is based on the method of Durette-Desset (1985); the nomenclature of the synlophe in the oesophageal region follows that of Ben Slimane et al. (1993). Cervical alae are defined as one or more latero-ventral ridges more developed than the other ridges.

The nomenclature of the caudal bursa follows Durette-Desset and Chabaud (1981), concerning the relative arrangement of rays 6, 8 and 9 follows that of Durette-Desset et al. (1992). The spicules were studied after dissection and the nomenclature is that of Ben Slimane et al. (1993).

All measurements are in μm unless otherwise stated. The first number corresponds to the holotype or the allotype, the numbers in parentheses to the extremes of the paratypes.

RESULTS

Oswaldocruzia venezuelensis sp. n. Fig. 1

Description: Nematodes not coiled. Cephalic vesicle without anterior swelling. Excretory pore situated near end of oesophagus. Triangular-shaped deirids, posterior to excretory pore. Well-developed excretory glands. Musculo-glandular oesophagus separation clearly visible at nerve ring level (Fig. 1A). Cervical alae present but very short, not reaching level of oesophagus end. Cuticular ridges without chitinous support. No crest opposite lateral cords (Fig. 1B–E).

Synlophe (studied in transversal section in 1 male paratype): Cuticle bears uninterrupted longitudinal ridges. In male, 69 % of ridges appear in oesophageal region within 76 % of dorsal ridges and 62 % of ventral ridges. In female, 78 % of ridges appear in oesophagal region within same dorsal and ventral ratio. Ridges disappear just anterior to caudal bursa in male and at phasmid level in female.

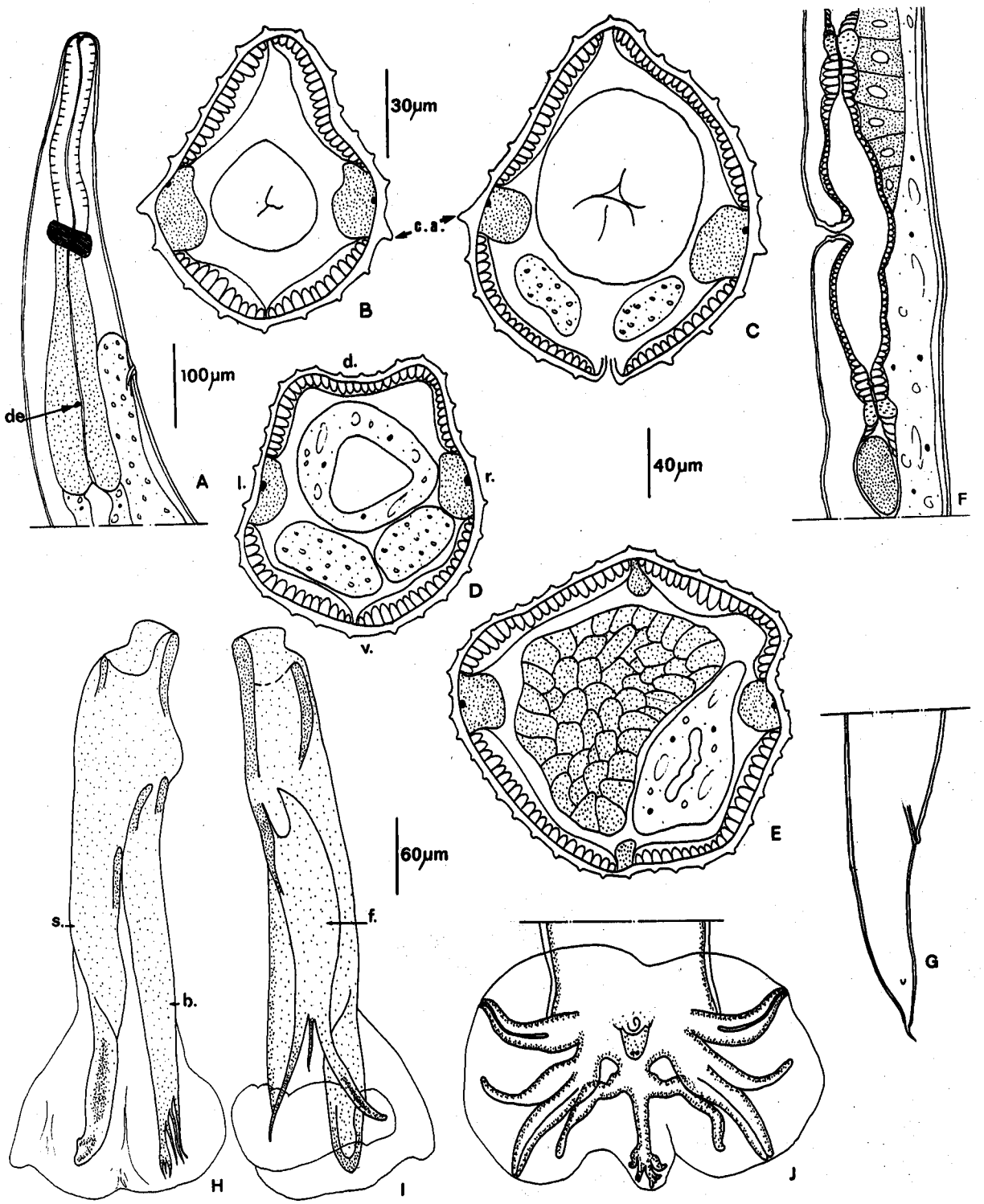

Fig. 1. *Oswaldocruzia venezuelensis* sp. n. from *Bufo marinus*. **A** – male, anterior part, right lateral view; **B–E** male, synlophe in transversal section (**B** – between nerve ring and excretory pore level; **C** – at excretory pore level; **D** – at oesophago-intestinal junction; **E** – at mid-body level); **F** – female, ovejector, left lateral view; **G** – female, tail, right lateral view; **H,I** – right spicule (**H** – externo-dorsal view; **I** – ventral view); **J** – male, caudal bursa, ventral view. All sections are oriented as D. Scale bars: 100 µm (A, F, G), 30 µm (B , C , H , I), 40 µm (D , E) and 60 µm (J).

Abbreviations: d = dorsal, v = ventral, r = right, l = left, s = shoe, b = blade, f = fork.

Cervical alae appear at about 100 µm (male) and 120 µm (female) behind cephalic vesicle and are 280 µm (male) and 380 µm long (female). Each ala is composed of one triangular and rounded crest orientated towards ventral side. (Fig. 1B, C).

In male, 23 ridges (13 dorsal, 8 ventral, 2 alae) at excretory pore level (Fig. 1C), 29 ridges (16 dorsal, 13 ventral) at oesophago-intestinal junction (fig. 1D) and 42 ridges (21 dorsal, 21 ventral) at mid-body (Fig. 1E). In female, 39 ridges (21 dorsal, 18 ventral) at oesophago-intestinal junction and 50 ridges (27 dorsal, 23 ventral) at mid-body. All crests orientated perpendicularly to body surface, spaced regularly and with same size.

Male: 8,800 (5,800–7,200) mm long and 200 (130–190) wide at mid-body. Cephalic vesicle 160 (100–125) long and 50 (50–50) wide. Nerve ring, excretory pore and deirids 280 (180–250), 540 (330–460) and 540 (360–470) from apex, respectively. Oesophagus 630 (440–540) long.

Caudal bursa with 2–3 pattern which tends towards 2–1–2, i.e. extremities of rays 4 curved towards rays 3 but papillae of rays 4 situated at about same distance between papillae of rays 3 and 5 (Fig. 1H). Rays 8 arising on root of dorsal ray and overlapped by rays 6 in their median third (type II). Rays 9 arising distally on trunk of dorsal ray before division of the latter into two branches to right and three to left. Gubernaculum absent. Genital cone 30 (30–35) high and 25 (25–30) wide at its base, bearing a large papilla zero on anterior lip and 2 minute papillae on posterior lip.

Spicules 215 (200–215) long, divided proximally into three main branches: shoe, blade, distally divided into six small branches of inequal length and fork, distally divided at 23 % of whole length of spicule (Fig. 1F, G).

Female: 13,000 (8,150–13,200) mm long and 150 (140–170) wide at mid-body. Cephalic vesicule 120 (90–120) long and 50 (40–50) wide. Nerve ring, excretory pore and deirids 250 (200–230), 550 (380–450) and 570 (400–470) from apex, respectively. Oesophagus 590 (480–570) long. Didelphic. Vulva at 4, 800 (2,600–4, 500) mm from caudal extremity. *Vagina vera*: 40 (40–40) long dividing vestibule 280 (260–340) long into two equivalent parts. Sphincters both 40 (35–40) and infundibula both 25 (25–25) long, respectively. Tail 200 (180–240) long and 70 (70–100) wide at anus level with caudal spine 15 (15–15) long.

Type host: *Bufo marinus* L., 1758 (Bufonidae).

Site: small intestine.

Type locality: Venezuela, Santa Rita, Carretera Las Mercades-Cabruta, Estado, Guarico, 20/09/91.

Type material: holotype – male, allotype – female MNHN (Coll. No. 441 KKa); 3 male and 4 female paratypes – MNHN (Coll. No. 441 KKb), 2 male and 2 female paratypes – CP-MBUCV (Coll. No. 4588) 1 male and 1 female paratypes – IPCAS (Coll. N-687).

DISCUSSION

The parasites of *Bufo* belong to the Neotropical *Oswaldocruzia* characterized by the presence of cervical alae and a caudal bursa of type II. Amongst these species, only 4 possess, as our specimens, cervical alae in which each is composed of just one latero-ventral crest: *O. mazzai* Travassos, 1935, a parasite of Bufonidae from Brazil and Ecuador; *O. dlouhyi* Ben Slimane et Durette-Desset, 1995, a parasite of Bufonidae from Brazil; *O. peruensis* Ben Slimane, Verhaag et Durette-Desset, 1995, a parasite of Iguanidae from Peru and *O. vaucheri* Ben Slimane et Durette-Desset, 1993, a parasite of Leptodactylidae from Ecuador (Travassos 1935, Ben Slimane and Durette Desset 1993, 1995, Ben Slimane et al. 1995). *O. mazzai* is differentiated by minute cervical alae, only visible in the transversal section of the body and numerous crests with chitinous reinforcement at mid-body. *O. dlouhyi* is distinguished by a cephalic vesicle composed of two parts with rays 4 almost reaching the edge of the caudal bursa.Both *O. peruensis* and *O. vaucheri* are differentiated by the position of the papillae of rays 4, situated nearer those of rays 3 than rays 5. In addition, in *O. peruensis,* the shape of the alae is different and the ridges are undulated and not pointed. In *O. vaucheri,* which is the closely related species, the alae are sharp-shaped in transversal section, are about three times longer and arise 25 µm behind the cephalic vesicle compared with 100 µm in our specimens. At last, the spicular fork is divided at 20 % of the spicule length compared with 23 % in our specimens. We consider the specimens from *Bufo* as belonging to a new species *Oswaldocruzia venezuelensis* sp. n. named after the country where the parasites were found.

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