

## LUEHEIA INSCRIPTA (WESTRUMB, 1821) (ACANTHOCEPHALA: PLAGIORHYNCHIDAE) IN ANURANS (LEPTODACTYLIDAE: BUFONIDAE) FROM MEXICO

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### Summary:

Juveniles of *Lueheia inscripta* (Westrumb, 1821) Travassos, 1919 (Acanthocephala: Plagiorhynchidae), an acanthocephalan with six lemnisci, are reported and described from mesenteries of frogs *Leptodactylus fragilis* Brochi, 1877 and a toad *Bufo marinus* (Linnaeus, 1758) from Morelos state, Mexico. These are new host records extending the known geographical distribution of this species from Brazil and Puerto Rico to Mexico.

**KEY WORDS:** *Lueheia inscripta*, Acanthocephala, anurans, Mexico

**Résumé :** LUEHEIA INSCRIPTA (WESTRUMB, 1821) (ACANTHOCEPHALA: PLAGIORHYNCHIDAE) CHEZ DES ANOURES (LEPTODACTYLIDAE: BUFONIDAE) FROM MEXICO

Des préadultes de *Lueheia inscripta* (Westrumb, 1821) Travassos, 1919 (Acanthocephala : Plagiorhynchidae), un acanthocéphale présentant six lemnisci, sont rapportés et décrits au niveau du mésentère de la grenouille *Leptodactylus fragilis* Brochi, 1877 et du crapaud *Bufo marinus* (Linnaeus, 1758) de l'état de Morelos au Mexique. L'enregistrement de ces nouveaux hôtes étend la distribution géographique connue de cette espèce du Brésil et de Porto Rico au Mexique.

**MOTS CLÉS :** *Lueheia inscripta*, Acanthocephale, anoures, Mexique.

Adults of Plagiorhynchid acanthocephalan *Lueheia inscripta* (Westrumb, 1821) parasitize birds of the family Turdidae and have been reported from Brazil (Travassos, 1926) and Puerto Rico (Whittaker *et al.*, 1970). The saurian *Anolis cristatellus* has been reported as paratenic host for the species in Puerto Rico (Acholonu, 1976). During an ongoing study of the helminth parasites of amphibians of Morelos state, Mexico, juveniles of this species were collected from frogs and a toad, the opportunity was taken to provide additional morphological data and to extend the known geographic distribution of this species.

## MATERIALS AND METHODS

Examination of 20 *Leptodactylus fragilis* caught at Emiliano Zapata (18°50'24"N, 99°10'59"W) Morelos, Mexico, on August 2008 yielded 20 encysted juveniles (10 ♂, 10 ♀) specimens identified as *L. inscripta*. Eighteen frogs were parasitized, two of them with two juveniles each, all others with single parasite. Examination of a single toad *Bufo marinus* from Tescalitejalpa, Morelos (not positioned), on June 2008, yielded two more juvenile females. All acanthocephalans were found encysted on host's mesentery. After removal from their cysts, acanthocephalans were placed in distilled water to force osmotic evagination of the proboscis, fixed, stained in Mayer's paracarmine, dehydrated in ascending concentrations of ethanol, cleared in terpineol and whole mounted in Canada balsam. Measurements are in micrometres unless otherwise states; width refers to the maximum width. Trunk length excludes the proboscis and bursa (if everted). The proboscis and hooks were measured only in lateral view, and the length of the male reproductive system is the distance from the anterior margin of the anterior testis to the posterior end of the trunk (exclusive of the bursa if everted). Illustrations were made with the aid of a camera lucida. Voucher specimens are deposited in the Colección Nacional de Helmintos, Instituto de Biología, Universidad Nacional Autónoma de México (CNHE) catalog number CNHE 6415.

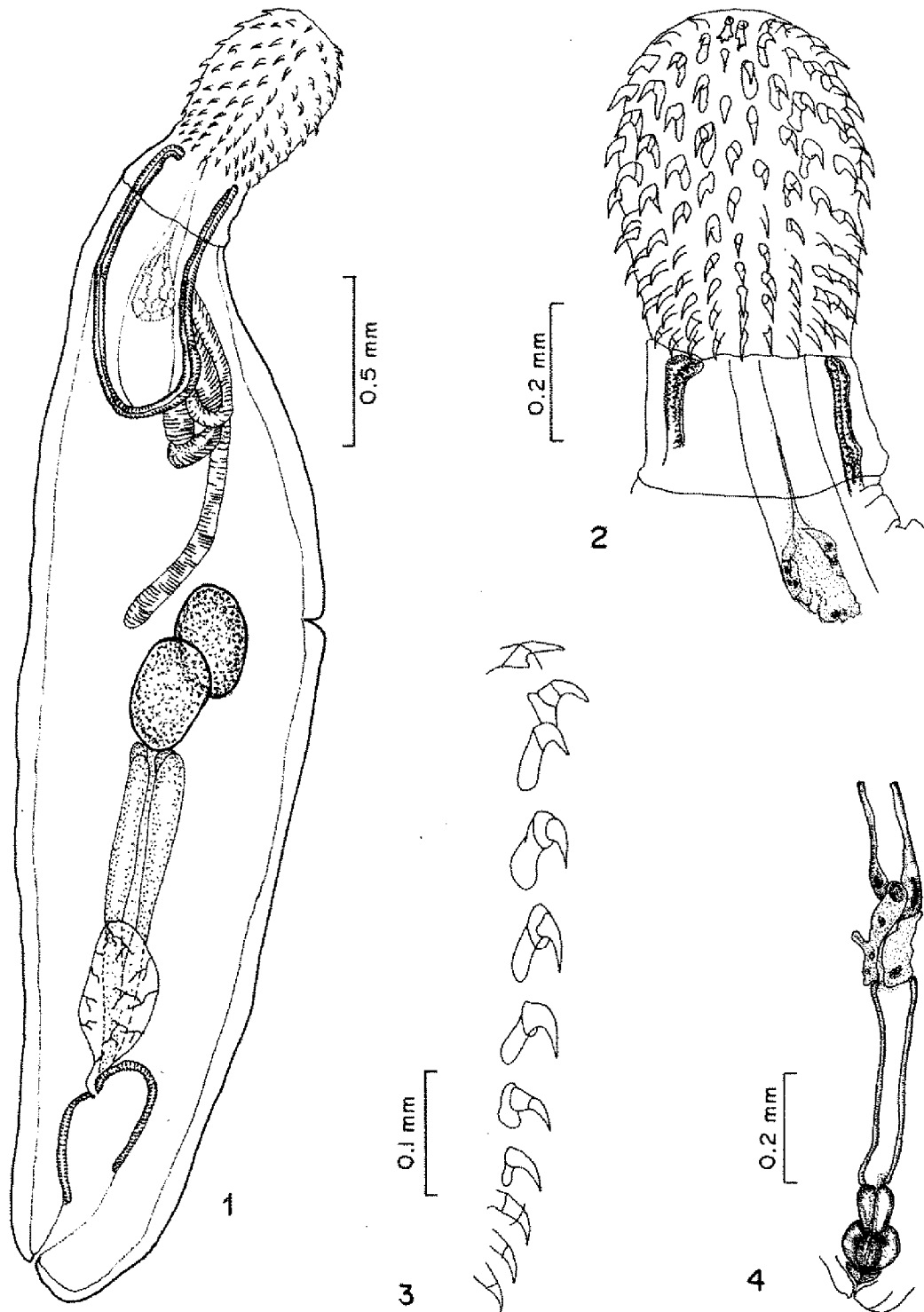
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Figs 1-4. – *Luebeia inscripta* (Westrumb, 1821) juvenile: 1. Male. 2. Proboscis. 3. Single hook row in a male. 4. Reproductive system of a female.

Reference	<i>Luebeia inscripta</i> Travassos, 1926		<i>Luebeia adluebeia</i> Werby, 1938		Present work	
	♂	♀	♂	♀	♂ (n = 4)	♀ (n = 4)
Trunk L × W (mm)	8 × 1.2	9-15 × 1.9-2.2	3.5-9.2 × 0.8-1.7	11.3-15 × 1.8-2.5	2.376-3.633 (3.167) × 0.623-0.841 (0.759)	4.049-4.653 (4.390) × 0.792-0.940 (0.890)
Proboscis L × W	520-600 × 410-430		385-490 × 280-385	399-602 × 315-525	420-560 (500) × 330-380 (350)	540-610 (580) × 370-410 (390)
Proboscis armature (longitudinal rows × hooks per row)	28-30 × 9-10		28 × 9-10	28 × 9-10	27-30 × 10-11	28-30 × 10-11
Hooks (blade) length L × W	49-56		17-42	20-62	30-55*	35-65*
Neck L × W			126-210 long	164-280 long	190-270 (210) × 270-330 (300)	257-297 (279) × 336-386 (356)
Receptacle L × W (mm)	1.6 × 0.34		0.749-1.19 length	1.141-1.54 length	0.732-1.108 (0.905) × 0.297-0.346 (0.335)	1.108-1.237 (1.172) × 0.326-0.396 (0.356)
Lemmings L × W (mm)			0.84-1.82 length	1.96-2.59 length	0.891-1.336 (1.138) × 0.039-0.079 (0.062)	1.267-1.825 (1.600) × 0.042-0.049 (0.046)
Total length of genitalia (mm)		1.9			1.613-2.455 (2.093)	0.800-1.100 (0.958)
Anterior testis L × W (mm)	1.0 × 0.4-0.5		0.231-1.274 × 0.12-0.177		0.270-0.366 (0.322) × 0.075-0.200 (0.153)	
Posterior testis L × W (mm)			0.28-1.267 × 0.154-0.776		0.237-0.375 (0.317) × 0.062-0.265 (0.174)	
Cement glands L × W (mm)	1.9 × 0.87		0.7-3.43 length		0.740-1.087 (0.869) × 0.025-0.060 (0.043)	
Saeftingen's pouch L × W			20-40 × 10-30		28-43 (38) × 17-21 (19)	
Bursa L × W			735 × 455 (inverted)		396-750 (586) × 227-300 (263) (everted)	
Eggs L × W		63-78 × 28		36-41 × 12-15		
Hosts		<i>Platycheila flavipes</i> ; <i>Turdus</i> spp.	<i>Turdus migratorius</i>	<i>Leptodactylus labialis</i>		
Locality		Brazil	USA	Mexico		

\* Length of hooks in single row (from anterior to posterior) (mean in parentheses), males 20-40 (30), 25-45 (36.6), 30-45 (40), 42-55 (49), 50-60 (55), 45-55 (51.6), 40-42 (40.6), 40-42 (41.3), 40-45 (43.3), 40-46 (43.6); females 35-40 (37.5), 40-45 (42.5), 45-52 (48.5), 52-60 (56), 47-65 (56), 45-57 (51), 40-45 (42.5), 40-40 (40), 40-42 (41), 38-45 (41.5), 40-42 (41).

Table I. – A comparison of specimens studied in this paper with published measurements of *Luebeia inscripta* Travassos, 1919 and *Luebeia adluebeia* Werby, 1938. Range, minimum-maximum followed by mean between parentheses are given for the specimens studied in present work.

## RESULTS

### *LUEBEIA INSCRIPTA* (WESTRUMB, 1821)

Hosts, localities and data of collection: *Leptodactylus fragilis* Brochi, 1977 caught at Emiliano Zapata, Morelos, Mexico (18°50'24"N, 99°10'59"W), August 2008; *Bufo marinus* (Linnaeus, 1758) from Tescalitejalpa, Morelos, Mexico (not positioned), June 2008.

Location in hosts: mesentery.

Voucher specimens deposited at the Colección Nacional de Helminthos (CNHE), Universidad Nacional Autónoma de México, Instituto de Biología, México D. F. catalog number CNHE 6415.

Infection: 18 of 20 *L. fragilis* (prevalence 90 %) were parasitised by one to two encysted juveniles (mean intensity  $1.1 \pm 0.3$ ). A total of 20 acanthocephalans were collected: 10 males and 10 females. Two more encysted juveniles, both females, were collected from a single *B. marinus*.

Description (Figs 1-4) based on 22 juvenile specimens (10 males, and 22 females). Palaeacanthocephala, Plagiorhynchidae, Porrorchinae, with characteristics of *Luebeia*. Body small-sized, fusiform, wider at first third or near middle, and gradually tapering toward blunt extremities. Dorsal trunk wall almost straight, ventral trunk wall convex (Fig. 1) in both sexes. Sexual dimorphism present, with trunk, proboscis, proboscis receptacle and lemnisci larger in females than in males. Proboscis ovoid, subglobular (Fig. 2). Proboscis hooks in straight longitudinal rows, without dorsoventral differentiation. Proboscis hooks in 27 to 30 longitudinal rows of 10 to 11 hooks per row. Blades similar in length, increasing slightly to hooks 5-6, larger hooks medial, more evenly curved. Posterior hooks spiniform (Fig. 3). Anterior and middle hooks rooted, with roots simple, posteriorly directed, well developed. Roots of anterior hooks slightly longer than blades, those of medial hooks about as long as blades; roots of posterior hooks, nos. 7-8, reduced to a small knob; posteriormost hooks unrooted. Neck robust, well developed. Proboscis receptacle inserted at base of proboscis, double walled, brain near its middle. Lemnisci six, long, slender. Gonopores terminal in both sexes.

Males (based on four juveniles). Trunk 2.376-3.633 mm (3.167)  $\times$  0.623-0.841 mm (0.759). Proboscis 42-56 (50)  $\times$  33-38 (35) armed with 27-30 longitudinal rows of 10-11 hooks each. Length of hooks in one row from anterior 20-40 (30), 25-45 (36.6), 30-45 (40), 42-55 (49), 50-60 (55), 45-55 (51.6), 40-42 (40.6), 40-42 (41.3), 40-45 (43.3), 40-46 (43.6). Neck 190-270 (210)  $\times$  270-330 (300). Proboscis receptacle 0.732-1.108 mm (0.905)  $\times$  0.297-0.346 mm (0.335). Lemnisci 0.891-1.336 mm (1.138)  $\times$  39-79 (62). Reproductive system (Fig. 1) extending in posterior 2/3 of body length, 1.613-2.455

mm (2.093). Testes somewhat pre-equatorial, ovoid, contiguous, often overlapped, about equal in size. Anterior testis 270-366 (322)  $\times$  75-200 (153); posterior testis 237-375 (317)  $\times$  62-265 (174). Cement glands 4, tubular, 0.740-1.087 mm (0.869)  $\times$  25-60 (43). Saefftingen's pouch 28-43 (38)  $\times$  17-21 (19). Bursa 396-750 (586)  $\times$  227-300 (263).

Females (based on four juveniles). Trunk 4.049-4.653 mm (4.390)  $\times$  0.792-0.940 mm (0.890). Proboscis 54-61 (58)  $\times$  37-41 (39) armed with 28-30 longitudinal rows of 10-11 hooks each. Length of hooks in one row from anterior 35-40 (37.5), 40-45 (42.5), 45-52 (48.5), 52-60 (56), 47-65 (56), 45-57 (51), 40-45 (42.5), 40-40 (40), 40-42 (41), 38-45 (41.5), 40-42 (41). Neck 257-297 (279)  $\times$  336-386 (356). Proboscis receptacle 1.108-1.237 mm (1.172)  $\times$  0.326-0.396 mm (0.356). Lemnisci 1.267-1.825 mm (1.600)  $\times$  42-49 (46). Total length of reproductive system 0.800-1.100 mm (0.958) (Fig. 4).

## DISCUSSION

The anatomy of the juvenile specimens collected from the anurans is generally similar to that of the adults described from birds, i.e. all characteristics of our *L. inscripta* match those recorded in available literature; morphometric and meristic traits of juvenile specimens are provided and compared with those of the adults in Table I.

Van Cleave (1942) proposed the genus *Furcata* Werby, 1938 as a junior synonym of *Luebeia* Travassos, 1919 and noted *F. adluebeia* Werby, 1938 as a probably direct synonym of *L. inscripta*. Later Van Cleave and Williams (1951) restudied the specimens of *F. adluebeia* and concluded that they represent a valid species, so that should be recorded as *Luebeia adluebeia* (Werby, 1938). This species is very similar to *L. inscripta* but differs from it in having a somewhat smaller proboscis, hooks and eggs. Measures from the original description of *L. adluebeia* (Werby, 1938) were included for comparison in Table I. By its meristic traits juvenile specimens from Mexico are more similar to *L. inscripta* than to *L. adluebeia*.

American robins *Turdus migratorius*, are common in the localities of collection of the frogs *L. fragilis*, and the toad *B. marinus* such that the presence of juveniles *L. inscripta* can be related to the insectivorous feeding of these amphibian hosts. These are new host records for *L. inscripta*, which is recorded by the first time from Mexico.

## ACKNOWLEDGEMENTS

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