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ABSTRACT: Additional data on the synlophe and morphological measurements are provided for the heligmonellids *Stilestrongylus aculeata* (Travassos, 1918) and *Stilestrongylus eta* (Travassos, 1937), collected from *Akodon montensis* Thomas, 1913, of the Atlantic Forest, Rio de Janeiro, Brazil. The synlophe of *S. aculeata* is characterized by 19 cuticular middle body ridges in males and 24 cuticular middle body ridges in females, whereas *S. eta* presents 17 middle body ridges in males and 20 middle body ridges in females.

The genus *Stilestrongylus* Freitas, Lent, and Almeida, 1937, belongs to the superfamily Heligmosomoidea in the suborder Trichostrongylina (Durette-Desset, 1971). The primary characteristics used to identify *Stilestrongylus* are: (1) an asymmetrical caudal bursa; (2) a hypertrophied genital cone; and (3) the number, degree of inclination, and orientation of the synlophe axis in relation to the sagittal axis (Durette-Desset and Digiani, 2007).

Currently, there are 26 species in this genus, and the synlophes have not been described in 3 of these species, *Stilestrongylus eta* (Travassos, 1937), *Stilestrongylus aculeata* (Travassos, 1918), and *Stilestrongylus riberoi* (Travassos, 1937). Recently, Notarnicola et al. (2010) redescribed *Stilestrongylus stilesi* and added synlophe characteristics. Here, we provide new morphological measurements and additional data on the synlophe of *S. aculeata* and *S. eta* based on specimens collected in *Akodon montensis* Thomas, 1913, from the Atlantic Forest, Rio de Janeiro, Brazil.

Specimens of *A. montensis* were trapped using a Tomahawk® trap (model 201, Tomahawk Live Trap, Hazelhurst, Wisconsin; 16 × 5 × 5 inches [40.6 × 12.7 × 12.7 cm]) and Sherman® trap (model XLK, H.B. Sherman Traps, Tallahassee, Florida; 3 × 3.75 × 12 inches [7.6 × 9.5 × 30.5 cm]) during 2004 and 2005 in the municipality of Teresópolis (22°24′36″S, 42°58′48″W) in the Atlantic Coastal Forest, State of Rio de Janeiro, Brazil. Collection licenses for rodents were obtained from the Brazilian Environmental Institute (IBAMA, CGFAU 009/2002 and IBAMA No. 012/2004). The rodents were killed in a CO_2 chamber and subsequently necropsied. The nematodes were then collected from the small intestine of 87 *A. montensis* specimens. The worms were washed briefly in a 0.85% NaCl solution, fixed in hot A.F.A. (2% acetic acid, 3% formaldehyde, and 95% ethanol), and clarified in lactophenol. Drawings were made with the aid of a camera lucida attached to a Zeiss standard microscope. Morphological measurements are displayed in Table I. The synlophe was studied in 1 male and 1 female from each species following Durette-Desset (1985), and the terminology related to the caudal bursa follows Durette-Desset and Chabaud (1981). The number of dorsal and ventral ridges was counted with respect to the axis (axes) of orientation. Paratypes

TABLE I. Morphological measurements of *Stilestrongylus aculeata* (Travassos, 1918) Durette-Desset, 1971, and *Stilestrongylus eta* (Travassos, 1937) Durette-Desset, 1971, recovered from *Akodon montensis* in Serra dos Órgãos, Teresópolis, State of Rio de Janeiro, Brazil. All measurements are in micrometers, except length of the body for paratypes species, followed by mean and range in parentheses.

	Stilestrongylus aculeata		*Stilestrongylus eta*	
Characteristics	Male ($n = 10$)	Female ($n = 10$)	Male ($n = 10$)	Female ($n = 10$)
Body length	2.75 (1.04–3.21)	3.47 (1.9–4.87)	1.54 (1.28–1.87)	1.85 (1.08–2.69)
Width	70 (60–90)	80 (50–120)	50 (50–60)	60 (50–70)
Cephalic vesicle length × width	53 (46–63) × 36 (22–68)	59 (55–70) × 33 (22–48)	43 (33–56) × 22 (13–32)	43 (35–55) × 24 (19–32)
Esophagus	308 (250–345)	344 (282–403)	244 (183–300)	259 (216–298)
Nerve ring	110 (95–136)	117 (83–151)	80 (53–98)	90 (83–116)
Excretory pore	238 (186–378)	217 (152–240)	144 (91–175)	192 (163–263)
Spicules	370 (350–420)	–	340 (300–380)	–
Genital cone length × width	81 (63–100) × 43 (28–60)	–	36 (30–41) × 26 (20–40)	–
Gubernaculum length × width	23 (15–27) × 11 (8–13)	–	15 (10–20) × 9 (6–11)	–
Vagina vera	–	17 (13–20)	–	21 (16–25)
Vestible	–	78 (60–100)	–	48 (28–58)
Sphincter length × width	–	33 (23–50) × 34 (25–53)	–	23 (16–30) × 24 (16–40)
Infundibulum	–	127 (103–180)	–	63 (47–98)
Uterus	–	535 (447–580)	–	410 (330–530)
Vulva–tail	–	79 (66–106)	–	57 (42–67)
Anus–tail	–	35 (25–51)	–	24 (13–27)
Eggs		56 (50–61) × 34 (30–37)	–	60 (45–66) × 30 (22–32)

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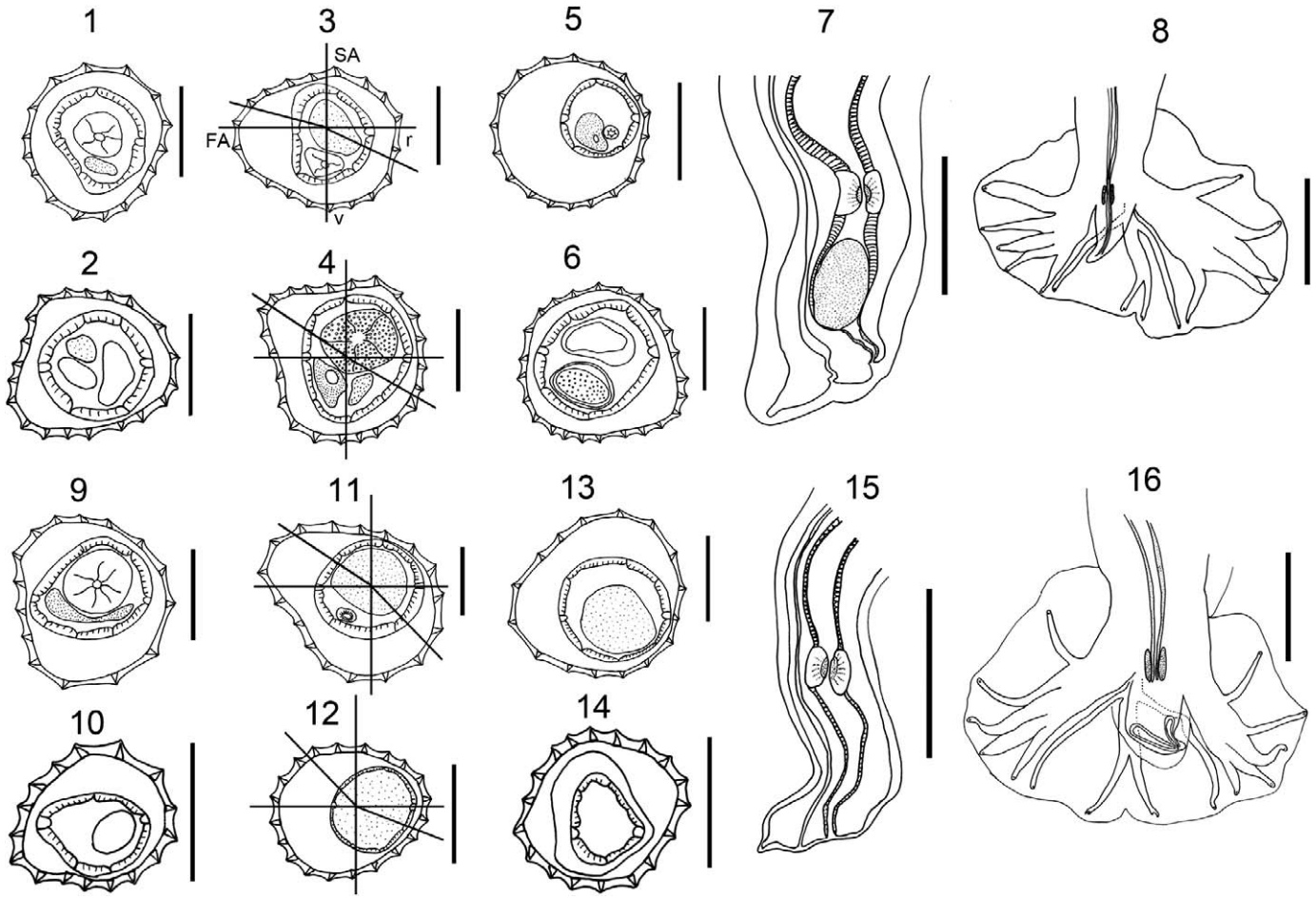

FIGURES 1–16. *Stilestrongylus aculeata*. (**1**) Transverse section at the anterior extremity, male. (**2**) Transverse section at the anterior extremity, female. (**3**) Transverse section at the middle body, male. (**4**) Transverse section at the middle body, female. (**5**) Transverse section just anterior to caudal bursa, male. (**6**) Transverse section just anterior to the vulva, female. (**7**) Right lateral view of the tail, female. (**8**) Ventral view, male. Scale bars: Figs. 1–6 = 50 μm; Figs. 7, 8 = 100 μm. *Stilestrongylus eta*. (**9**) Transverse section at the anterior extremity, male. (**10**) Transverse section at the anterior extremity, female. (**11**) Transverse section at the middle body, male. (**12**) Transverse section at the middle body, female. (**13**) Transverse section just anterior to the caudal bursa, male. (**14**) Transverse section just anterior to the vulva, female. (**15**) Right lateral view of the tail, female. (**16**) Ventral view, male. Scale bars: Figs. 8–13, 16 = 50 μm; Fig. 14 = 100 μm. For Figures 3, 4, 11, and 12, axes of orientation are represented. Abbreviations: r: right side; v: ventral side; FA: frontal axis passing through the lateral fields; SA: sagittal axis.

of *S. aculeata* (syn: *Helligmosomum aculeatum* Travassos, 1918; *Longistriata aculeata* [Travassos, 1918] Travassos & Darriba, 1929) (CHIOC 9875 a-b) and *S. eta* (syn: *Longistriata eta* [Travassos, 1937]) (CHIOC 14319) were obtained from the Helminthological Collection of the Instituto Oswaldo Cruz (CHIOC) to confirm the morphological identification. The host nomenclature follows Musser and Carleton (2005).

In *Stilestrongylus aculeata*, both sexes present a cuticle bearing longitudinal, uninterrupted ridges appearing posteriorly to the cephalic vesicle and ending just anterior to the caudal bursa in males but reaching the posterior extremity in females. There are 16 (7/9) ridges in males and 20 (9/11) ridges in females located at the esophageal-intestinal junction (Figs. 1, 2). There are 19 (9/10) ridges located at the middle body in males and 23 (12/11) ridges located at the middle body in females (Figs. 3, 4). Finally, males present 19 (11/8) ridges at the posterior end, whereas females present 24 (9/15) ridges at the posterior end (Figs. 5, 6). At the middle body, the ridges are slightly unequal in size, with smaller ridges on the ventral right and the dorsal left quadrants. Ridges at the middle body are positioned in a double-axis orientation: In males, the right axis is at a 65° inclination to the sagittal axis, and the left axis is at a 75° inclination, whereas in females, the right axis is at a 60° inclination to the sagittal axis, and left axis is at a 55° inclination. Female tail has narrow extremity (Fig. 7). The caudal bursa is asymmetric, and the right lobe is more developed than the left one. Ray 2 is robust, whereas rays 4 and 5 present similar sizes and are located together and are separated at the distal end. Ray 6 on the right lobe is shorter and thicker than on the left lobe and emerges at the middle part of ray 5, from which it diverges into a "V" shape. Ray 8 arises subsymmetrically at the base of the dorsal part of the trunk, but the left ray arises in a more proximal location than the right one. The dorsal rays are divided at the third part into 2 branches, and each branch is divided into 2 subequal sub-branches: The external rays 9 are slightly longer than the internal rays (Fig. 8).

In *Stilestrongylus eta*, the cuticles of males and females have longitudinal, uninterrupted ridges emerging posteriorly to the cephalic vesicle and ending just anteriorly to the caudal bursa in males and the posterior extremity in females. There are 15 (8/7) ridges in males and 16 (7/9) ridges in females located at the esophageal-intestinal junction (Figs. 9, 10). There are 17 (9/8) ridges in males and 20 (10/10) ridges in females located at the middle body (Figs. 11, 12). Finally, males present 16 (8/8) ridges at the posterior end, whereas females have 18 (7/11) ridges (Figs. 13, 14). Ridges at the middle body are positioned in a double-axis orientation: In males, the right axis is at a 45° inclination to the sagittal axis, and the left axis is at a 55° inclination, whereas in females, the right axis is at a 68°

inclination to the sagittal axis, and the left axis is at a 43° inclination. At the middle body, the ridges are of equal size. Female tail has narrow extremity (Fig. 15). The caudal bursa is slightly asymmetric, with the right lobe more developed than the left one. Ray 2 on the right lobe is larger than on the left one. Rays 3 and 4 emerge from the same trunk. Rays 4, 5, and 6 arise from the distal third of the common trunk. Ray 6 on the left lobe is longer and thinner than on the right one. Ray 8 is thin and emerges from the base of dorsal trunk. The dorsal ray is divided at the middle of the trunk into 2 branches, and each branch is divided into 2 subequal subbranches consisting of rays 9 and 10 (Fig. 16).

The nematode *S. aculeata* was first described as *Helligmosomum aculeatum* in a wild rat (Travassos, 1918). Similarly, *S. eta* was first described as *Longistriata eta* in *Akodon* sp. (Travassos, 1937). Only later were both placed in the genus *Stilestrongylus* by Durette-Desset (1971). It was reported that *S. aculeata* and *S. eta* have low host specificity and are able to infect the following sigmodontine rodents: *Oligoryzomys eliurus* (Wagner, 1845) (syn. *Oryzomys eliurus*), *Oligoryzomys nigripes* Olfers, 1818, *Akodon cursor* Winge, 1887, and *A. montensis* (Gomes et al., 2003; Simões et al., 2011).

Simões et al. (2011) reported that the *Stilestrongylus* genus was the dominant species in the helminth community of sigmodontines, corroborating the coevolutionary hypothesis proposed by Durette-Desset (1985). In addition, *Stilestrongylus* species have been found in hosts with sympatric distributions that may be closely related and/or have similar ecological roles (Simões et al., 2011).

The number of the ridges and the axis of orientation of the synlophe are known in 23 species in the genus *Stilestrongylus* and represent morphological and taxonomic criteria for generic classification. These characters are now described in 2 additional species (*S. aculeata* and *S. eta*). Moreover, the number of males and females studied in the original species descriptions are not mentioned, and some measurements were not included. The present study contributes to the complete description of these species. Durette-Desset and Digiani (2010) added to the morphological description of the female reproductive system of *S. eta* based on CHIOC material. The synlophe, however, could not be described once the specimens were mounted in permanent slides.

The genus *Stilestrongylus* has more than 24 subequal cuticular ridges at the middle body, a hypertrophied genital cone, and an asymmetric caudal bursa (Durette-Desset, 1971). However, *S. eta*, *S. aculeata*, and *Stilestrongylus scapteromys* Digiani, Sutton & Durette-Desset, 2003, present fewer than 24 ridges at the middle body. This finding emphasizes that a differentiation based only on the number of ridges in the synlophe is inadequate for distinguishing between *Hassalstrongylus* (cuticular ridges ranging 19–24) and *Stilestrongylus*, because this characteristic can be the same in both genera (Digiani et al., 2007). We propose that the characteristics for the genus *Stilestrongylus* include species with more than 17 cuticular ridges at the middle body instead of 24 as proposed by Durette-Desset (1971). Similarly, it has been proposed that the *Guerrerostrongylus* species include members with more than 35 ridges at the midbody (Simões et al., 2012) rather than 40 (Sutton and Durette-Desset, 1991). Additionally, these species present an asymmetrical caudal bursa and a developed genital cone—features that are in accordance with the genus description. Thus, the characteristics of the caudal bursa and genital cone are essential for the identification of this genus.

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