

**A NEW SPECIES OF *PROCAMALLANUS*
(*DENTICAMALLANUS*) (NEMATODA: CAMALLANIDAE)
IN *THORACOCHARAX STELLATUS* (PISCES:
GASTEROPELECIDAE) FROM ARGENTINA**

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ABSTRACT: A new species, *Procamallanus* (*Denticamallanus*) *ana* n. sp., from *Thoracocharax stellatus* (Kner, 1858) intestine is described and illustrated. It represents the first reported species of Argentina and the second one of South America. It differs from its congener mainly because the presence of saw-like spiral thickenings of buccal capsule and outstanding basal ring in both sexes; females with 5-7 saw-like spiral thickenings in the inner surface of posterior half of capsule without tooth-like structure; males with two pairs of postanal papillae and one saw-like spiral thickening in the inner surface of capsule although with two single and conical teeth at its posterior half.

KEY WORDS: *Procamallanus* (*Denticamallanus*), Nematodes parasites, freshwater fishes, Argentina.

Gasteropelecids members are widespread from Panama to the southern ending of South America. These fishes are able to perform short flights over water surface, usually as an escape strategy from aquatic predators. As far as know, they are the unique flying fishes caused by a propulsive force due to their greatly enlarged pectoral muscles (Monasterio de Gonzo, 2003).

Gasteropelecidae family encompasses three genus (*Carnegiella* Eigenmann, 1909, *Gasteropelecus* Eigenmann, 1909 and *Thoracocharax* Fowler, 1907) and nine species. *Thoracocharax* genus occurs in Argentina with only one species, *T. stellatus* (Kner 1858) (Monasterio de Gonzo, 2003; López et al., 2003).

Procamallanus Baylis, 1923 (Nematoda: Camallanidae) include several species described from freshwater and marine fishes. Many current authors consider those specimens with spiral ridges in the buccal capsule as distinctive genus: *Spirocamallanus* Olsen, 1952 (Moravec et al., 2000).

From freshwater fishes in the Neotropical Realm three *Procamallanus* subgenus were recorded: *Procamallanus* Baylis, 1923, *Spirocamallanus* Olsen, 1952 y *Denticamallanus* Moravec & Thatcher, 1997. The subgenus *Procamallanus* (*Denticamallanus*) comprise only one valid species, *Procamallanus* (*Denticamallanus*) *dentatus* Moravec & Thatcher, 1997 parasitic of *Bryconops alburnoides* (Cypriniformes) recorded in Brazil (Moravec, 1998).

The aim of this paper was to describe the first species of the subgenus *Procamallanus* (*Denticamallanus*) in *Thoracocharax stellatus* from Argentina and the second species from South America.

MATERIAL AND METHODS

In November 2006, 29 specimens of *Thoracocharax stellatus* (sex not specified; Lst = 3.5-5 cm) from Río Teuquito, (24°12'0.5" S; 62°54'13" W), Salta, Argentina were collected and examined for helminths. Fishes were 10% formalin

fixed before preservation in 70% ethanol. Body cavity was opened by a mid-ventral incision and the digestive tract was removed. Nematodes were cleared in lactophenol and examined under light microscope. Drawings were made with the aid of LEICA microscope. Quantitative descriptors of parasite populations were estimated based on definitions of Bush et al. (1997). Measurements are given in millimeters unless otherwise stated. For SEM (scanning electronic microscopy) examination specimens were dehydrated throughout an ethanol series, acetone and ether, coated with gold and examined in a Jeol JSM-35CF SEM.

Type specimens were deposited in the Colección Helmintológica Fundación Miguel Lillo (CH-N-FML), Miguel Lillo 251, (4000) San Miguel de Tucumán, Argentina. The fishes were deposited in the Colección Ictiológica Fundación Miguel Lillo (CI-FML).

RESULTS

Camallanidae Railliet & Henry, 1915

Procamallanus (Denticamallanus) ana sp. nov.

(Figures 1-14)

General: Medium sized nematodes with transversally striated cuticle. Mouth opening circular, surrounded six elevations, provide with eighth cephalic papillae arranged in two circlets and two lateral amphids (Figs. 3, 11). Orange-brown buccal capsule almost spherical in both sexes, with well development basal ring, with 5-7 in females and one saw-like spiral thickening but provided with two conical teeth at its posterior half in males. Buccal capsule surrounded by outer, colourless hyaline layer (Figs. 4, 5). Muscular esophagus is considerably shorter than glandular one. Glandular esophagus length is two-fold in males and three-fold in females in relation to esophagus muscular length. Minute deirids situated just below nerve ring level (Figs. 2, 13); excretory pore somewhat posterior to nerve ring level (Fig. 1). Spicules small and equal (Fig. 10). Conical shaped tail with digitiform ending process for both sexes.

Diagnosis. Males and females with saw-like spiral thickenings of buccal capsule (Fig. 12) and outstanding basal ring. Females with 5-7 saw-like spiral thickenings in the inner surface of posterior half of capsule without tooth-like structure; males with two pairs of postanal papillae and one saw-like spiral thickening in the inner surface of capsule although with two single and conical teeth at its posterior half.

Male (n=12) measurements of holotype in parentheses. Body 2.80-4.00 (3.68) long, 0.13-0.18 (0.18) wide. Buccal capsule with basal ring; capsule 0.030-0.033 (0.033) long, 0.030-0.045 (0.036) wide; basal ring 0.003-0.004 (0.003) long, 0.020-0.030 (0.020) wide. Muscular esophagus 0.16-0.20 (0.18) long, 0.05-0.07 (0.06) wide; glandular esophagus 0.33-0.50 (0.49) long, 0.05-0.10 (0.08) wide. Length ratio of muscular and glandular esophagus 1:2.5 (2.7). Esophagus and buccal capsule length represents 19-24% (19%) of total body length. Deirids, nerve ring and excretory pore 0.10-0.16 (0.12), 0.10-0.13 (0.12) and 0.20-0.31 (0.20), respectively, from anterior extremity. Caudal alae absent. Caudal papillae: 2-3 pairs preanal, 1 pair adanal and 2 pairs postanal (Fig. 9). Spicules well sclerotized, short, equally long 0.040-0.046 (0.046). Gubernaculum absent. Phasmids not observed. Tail 0.13-0.18 (0.14) long with bluntly pointed tip.

Female (n=12 gravid specimens) measurements of allotype in parentheses. Body 17.00-23.40 (20.2) long, 0.31-0.53 (0.48) wide. Buccal capsule with basal ring;

capsule 0.037-0.050 (0.037) long, 0.043-0.063 (0.043) wide; basal ring 0.006 (0.006) long, 0.027-0.040 (0.033) wide. Muscular esophagus 0.25-0.32 (0.26) long, 0.10-0.12 (0.12) wide; glandular esophagus 0.93-1.15 (0.95) long, 0.09-0.20 (0.10) wide. Length ratio of muscular and glandular esophagus 1:3.1-4.1 (3.6). Esophagus and buccal capsule length represents 6-8% (6.2%) of total body length. Distance from anterior end of deirids, nerve ring, and excretory pore 0.14-0.20 (0.17), 0.12-0.17 (0.13) and 0.22-0.30 (0.22), respectively. Vulva near body centre, 8.00-11.00 (9.00) from posterior end (Fig. 6). Uterus containing numerous larvae 0.34-0.37 (0.36) long, 0.02 (0.02) wide (Fig. 7). Short tail bluntly pointed appendage. Tail length including caudal appendage about 0.14-0.19 (0.17), appendage 0.06-0.10 (0.07) long (Figs. 8, 14). Phasmids not observed.

Type materials: Holotype: male CH-N-FML # 07475; allotype: female CH-N-FML # 07476, and paratypes (2 males, and 2 females) CH-N-FML # 07477.

Type host: *Thoracocharax stellatus* (Kner, 1858) (Pisces, Gasteropelecidae), CI-FML # 4926, collected in 2006.

Type locality: Río Teuquito (24°12'0.5"S; 62°54'13"W), Rivadavia Department, Province of Salta, Argentina.

Prevalence: 86% (25/29). *Thoracocharax stellatus* harbored 42 specimens of *Procamallanus (Spirocamallanus) ana* sp. nov.

Site of infection: Intestine.

Mean intensity: 1.7 nematodes per fish.

Etymology: The specific name is given in honor to Ana Valdez Fanjul, Elisa Fanjul's first daughter, colleague, friend, and bird ecologist.

Remarks: *Procamallanus (Denticamallanus) dentatus* specimens are larger than those of *P. (D.) ana* n. sp.. Main differences are observed in total length (22.78-35.77 vs. 17.00-23.40) and spicules length (0.078-0.110 vs. 0.043).

There are difficulties to observed vulva in both species, likewise Moravec (1998) vulva of only one specimen of *P. (D.) dentatus* was observed. A cause of this would be great uterus size for the presence of high quantity of embryos in different development stage (until first-stage larvae).

Procamallanus (Denticamallanus) dentatus and *P. (D.) ana* n. sp. differ for basal ring of buccal capsule (indistinct vs. well development), cuticle morphology (almost smooth vs. transversally striated), postanal papillae number (three pairs vs. two pairs), adanal papillae (absent vs. one pair), spiral thickenings of buccal capsule (smooth vs. saw-like), inner surface of female capsule provided with (4-5 spiral tickening vs. 5-7 spiral tickening), low tooth-like structures (present vs. absent), inner surface of male capsule provided with (ten conical teeth vs. 2 teeth) and (without spiral tickening vs. with one spiral thickening).

In this paper we describe the first species of subgenus *Procamallanus (Denticamallanus)* from Argentina and the second species of the subgenus from South America.

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LITERATURE CITED

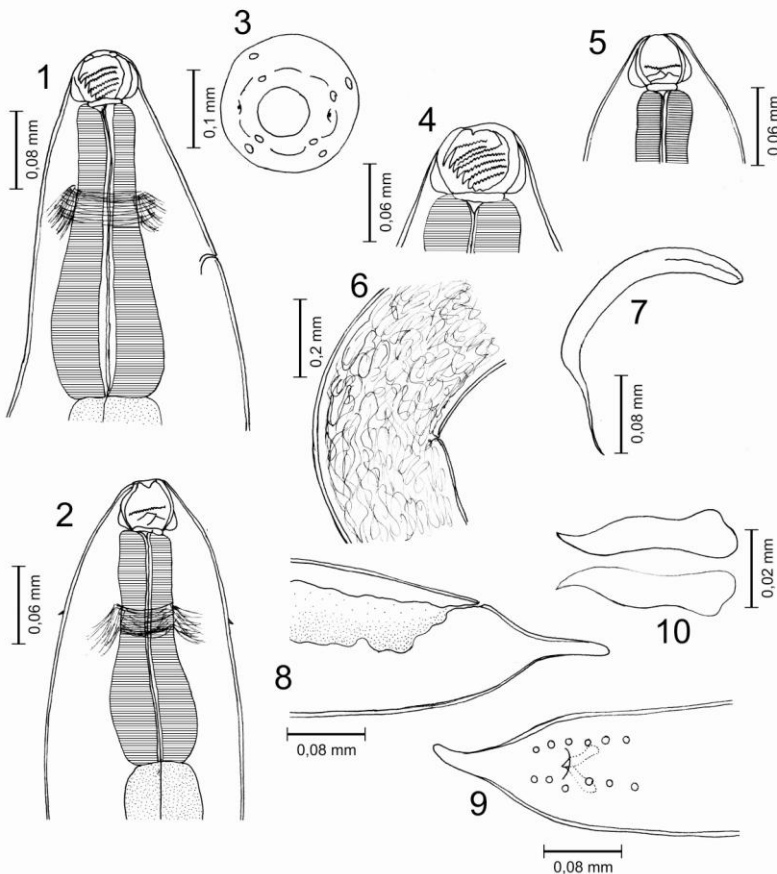
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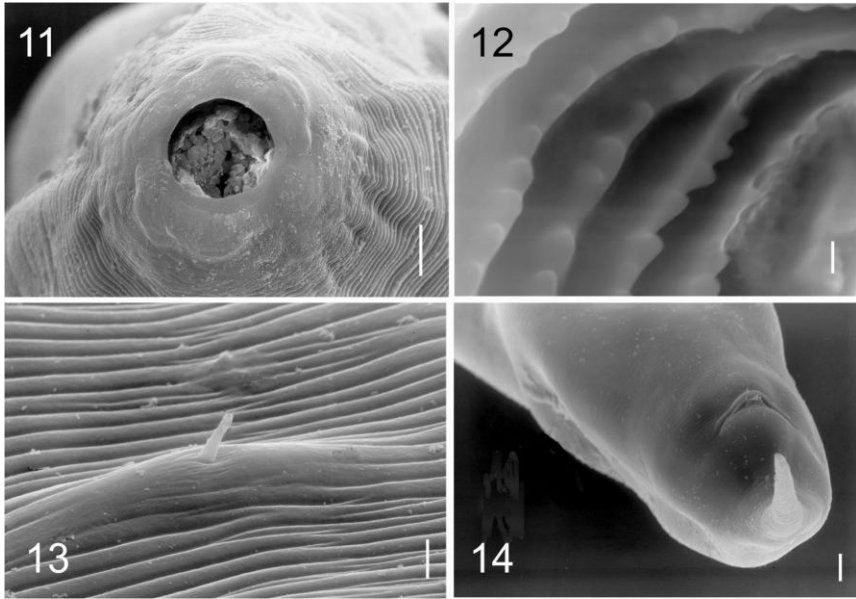
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Figures 1-10. *Procamallanus (Denticamallanus) ana* Ramallo n. sp. 1. Female, anterior end, lateral view, 2. Male, anterior end, ventral view, 3. Female, apical view, 4. Female, cephalic end, 5. Male, cephalic end, 6. Female, vulva, 7. First-stage larva from female's uterus, 8. Female, posterior end, lateral view, 9. Male, posterior end, ventral view, 10. Spicules.



Figures 11-14. *Procammallanus (Denticamallanus) ana* Ramallo n. sp. 11. Female, apical view. Scale = 32.2 μ , 12. Detail of spiral tickenings. Scale= 3.2 μ , 13. Deirid. Scale=6.4 μ , 14. Female, posterior end, ventral view. Scale= 10 μ .