

Monogenean Parasitic on Marine Fishes from Perú and Chile: Three New Species and Two New Combinations

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Five species of monogeneans collected from marine fishes of the Pacific coast of Chile and Perú were studied. Three of them are new species: *Interniloculus chilensis* n. sp. (Capsalidae), *Neoheterobothrium insularis* n. sp. (Dyclidophoridae) and *Loxura peruensis* n. sp. (Axinidae) parasitic on *Sebastes capensis* (Scorpaenidae), *Paralichthys* sp. (Bothiidae) and *Belone scapularis* (Belonidae), respectively. Two new combinations are proposed, *Intracotyle neghmei* (Microcotylidae) for *Neobivagina neghmei* Villalba, 1987 and *Hargicotyle conceptionensis* (Dyclidophoridae) for *Choricotyle conceptionensis* Villalba, 1987.

Key words: Monogenea - marine fishes - Perú - Chile - new species

Knowledge of the parasite fauna of marine fishes from the Peruvian Faunistic Province (central and northern Chilean coast plus the southern and central Peruvian coast, mainly influenced by the Chile-Perú cold current) is sparse and some taxa such as the Monogenea are poorly known.

The pioneer papers on Monogenea from Chile were written in 1896 and 1889 by Braun and von Linstow, respectively (see Price 1938). The next paper was written by Brinkmann (1952), and recent articles include those of Suriano and Beverly-Burton (1979), Oliva (1987), and Villalba (1987 a,b). The scarcity also applies to Perú, where the first articles about Monogenea were those of Tantalean (1974a,b). Recently Luque et al. (1991) published a checklist of parasites of marine fishes from Perú that includes 31 species of monogeneans. In the present paper, the description of three new species and two new combinations of monogeneans parasitic on marine fishes from Perú and Chile, are given.

MATERIALS AND METHODS

The fishes were obtained fresh from the fish market of Chorrillos, Perú (12° 30' S 76° 50' W), the fish market of Antofagasta, Chile (23° 42' S 70° 24' W), or were caught with gill nets in the vicinity of Antofagasta or in Caleta Constitucion (23° 28' S 70° 36' W). However, specimens of *Sebastes capensis*, were caught in 1972 in the Patagonian region (southern Chile) and specimens

of their Monogenea were kindly sent to us by Raúl Castro (Univ. Antofagasta, Chile). Monogeneans were removed of the gills or body surface, fixed in 8% hot formalin, stained with Semichon's carmine or Delafield's haematoxylin, and mounted in Canada balsam. When necessary, sclerotized structures were examined from specimens mounted in Gray & Wess medium (Humason 1979). Drawings were made with the aid of a camera lucida. Measurements are given in millimeters (mm) (mean plus range in parenthesis), except when otherwise stated.

The classification of monogeneans used follow Lebedev (1988). The following abbreviations apply: USNMHC: United States National Museum - Helminthological Collection. MHNJ: Collection Helminthologique du Museum National d'Histoire Naturelle de Paris. MHNJP: Museo de Historia Natural "JAVIER PRADO" (Perú).

Descriptions

Capsalidae Baird, 1858

Interniloculus sebastidis n.sp.
(Figs 1-4)

Host: *Sebastes copensis* (Scorpo)

Site of infection: gills

Locality: Chilean Patagonian shelf

Holotype: USNMHC 82034

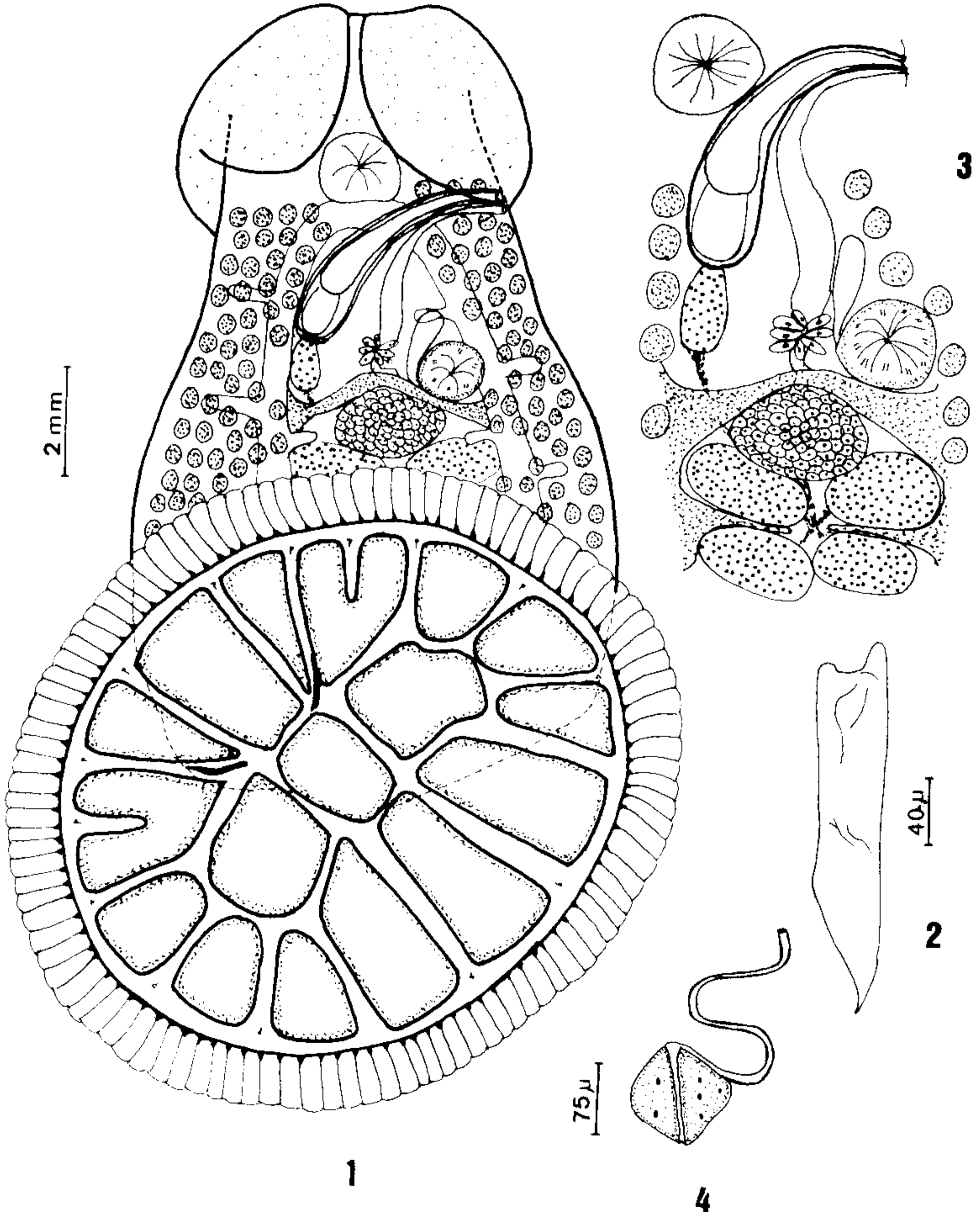
Paratype: USNMHC 82036, MHNJP 1102

Description: (based on three stained and mounted specimens). Total body length 2.3 (2.01-2.7), maximum width 1.34 (1.2- 1.50). Haptor a circular disc 1.26 (1.12- 1.35) in diameter, joined to body proper by short peduncle. Ventral surface of haptor divided into 14 peripheral, 3 central loculi

by 16 muscular septa (Fig. 1). Haptor with 14 peripheral hooks 0.019 long, two central robust sclerites, 0.13 long, with roots of central sclerites unequal (Fig. 2).

Prohaptor armed with two muscular suckers,

each 0.5 in diameter. Pharynx 0.175 (0.17-0.18) long, 0.205 (0.20-0.21) wide. Two intestinal caeca, each branch with 5-7 lateral or median branches. Four ovoid, postovarian testes 0.20 (0.17-0.22) in diameter. Vas deferens ascending. Seminal vesicle



Interniloculus sebastidis n. sp. Fig. 1: holotype, ventral view. Fig. 2: central sclerite. Fig. 3: reproductive system. Fig. 4: egg.

formed by wider anterior portion of vas deferens. Cirrus sac 0.81 (0.80-0.83) long, with internal accessory gland. Genital atrium ventral, on left side of the body at level of posterior end of pharynx. Ovary globular, 0.26 (0.1-0.32) in diameter. Ootype, Mehlis gland conspicuous, associated with glandular field. Vaginal pore ventral, on left side of body (Fig. 3); short vaginal duct joins vaginae with seminal receptacle. Seminal receptacle anterior to vitelline reservoir. Vitellaria occupying body proper including testicular field. Eggs tetrahedral 0.12 long, with 1 polar filament. (Fig. 4). Remarks: *Interniloculus* was proposed by Suriano and Beverley-Burton (1979) for capsalids with 4 postovarian testes, a vaginal pore opening ventrally on the left side of the body, eye spots absent, and haptor divided into 14 peripheral and 3 central loculi. *I. sebastidis* is distinguished from *I. chilensis*, the only previously described species in the genus, by the more developed haptor and the body length/ haptoral diameter ratio (1: 1.7 in *I. sebastidis* n. sp.: 1: 5 in *I. chilensis*). In the new species the haptor overlaps the testes but in *I. chilensis* the haptor does not reach the testicular field. The haptoral sclerite in the new species has 2 developed roots, but in *I. chilensis* only 1 of the roots is developed. *I. chilensis* also differs from the new species in the total body length (*I. sebastidis* 0.74 - 1.15; *I. chilensis* 2.01-2.7), the size of the testes (*I. sebastidis* 0.054-0.100, *I. chilensis* 0.17-0.22) and cirrus sac (*I. sebastidis* 0.142-0.206, *I. chilensis* 0.80-0.83). Known species of *Interniloculus* parasitize Scorpaenid fishes from the Southeastern Pacific coast of America.

DICLIDOPHORIDAE Cerfontaine, 1895

Hargicotyle conceptionensis (Villalba 1987) n. comb.

Remarks: this species was originally described from the sciaenid fish *Sciaena deliciosa* from Concepcion, Southern Chile, as *Choricotyle conceptionensis* by Villalba (1987b). This species is transferred to *Hargicotyle* Mamaev 1972, since figures and description given by Villalba (1987b) agree well with the generic diagnosis of *Hargicotyle*. All known species of *Hargicotyle* are parasites of sciaenid fishes (Oliva & Luque 1989).

Neoheterobothrium insularis n. sp. (Figs 5-7)

Type Host : *Paralychthys* sp.(Bothiidae)

Site of infection: gills

Type locality : Juan Fernandez Islands, Chile

Holotype : USNMHC 82031

Description (Based on one specimen): body fusiform (Fig. 5); total length 15.6, maximum width 2.12. Haptor with 8 clamps (each 0.52 in diameter). Clamps with ring shaped anterior midsclerite typical of genus (Fig. 6). Lappet not observed.

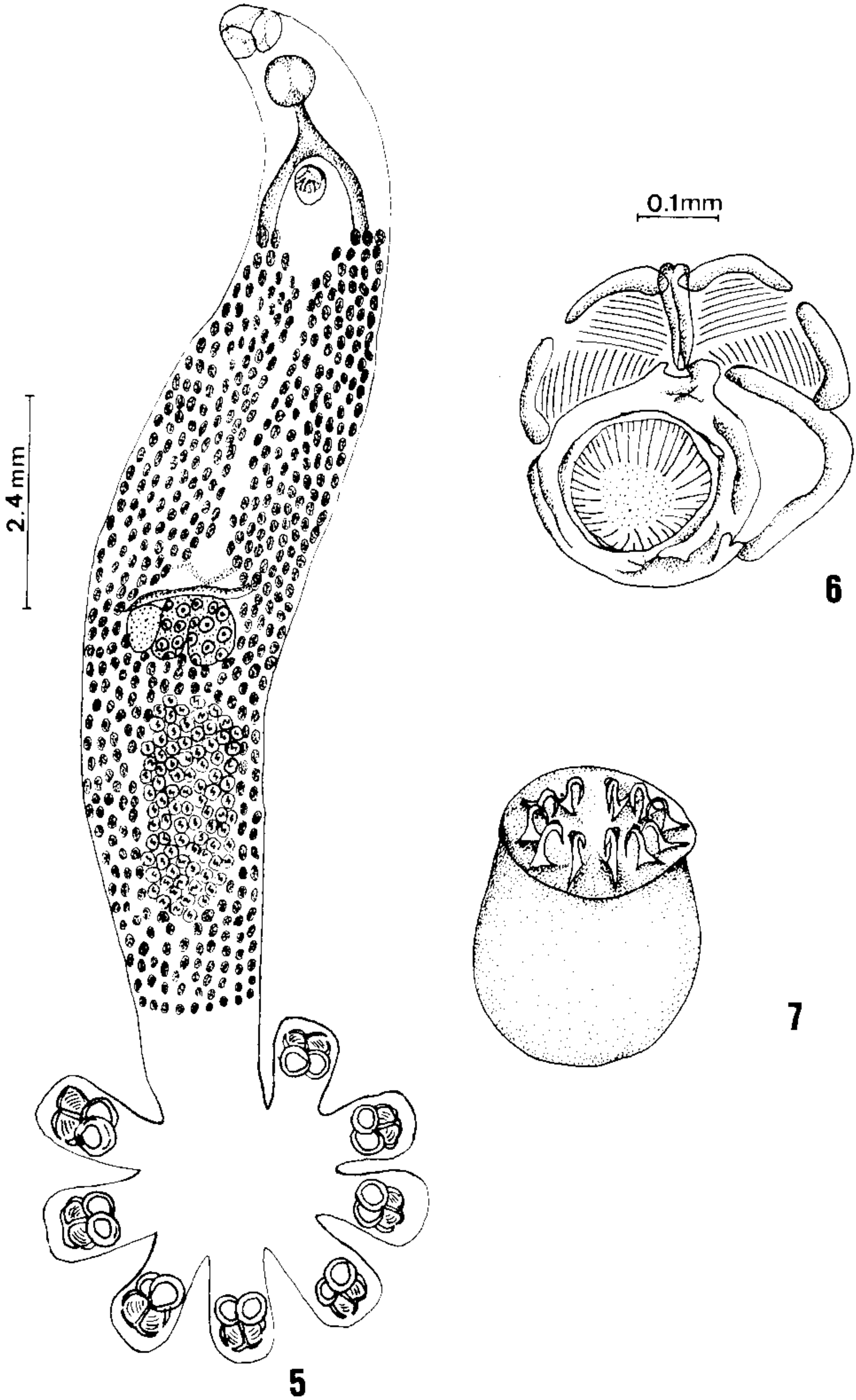
Prohaptor with two suckers each 0.36 long, 0.26 wide; mouth subterminal; pharynx muscular, ovoid, 0.26 long, 0.17 wide; intestinal ceca with numerous lateral branches in body proper, extend into haptor, penetrate haptoral peduncles. Testes 99, spherical (each 0.13 in diameter) postovarian, intercecal. Vas deferens extending to level of ovary. Genital atrium, 0.82 in diameter, armed with 11 curved hooks with bifid bases (Fig. 7). Ovary bilobed, seminal receptacle ovate, parovarian. Vitelline follicles coextensive with ceca but do not penetrate peduncles. Eggs not observed.

Remarks: according to Mamaev (1987), *Neoheterobothrium* Price, 1943 includes the following species: *N. affine* [Linton, (1898); *N. exilis* (Crane, 1972); and *N. syacii* (Mamaev, 1987)]. Payne (1987) described an additional species, *N. mcdonaldi*, from the Mexican Pacific coast. *N. insularis* n. sp. differs from *N. affine* in testicular number (less than 50 in *N. affine*, 99 in *N. insularis*); the general body shape (isthmus between body proper and haptor is very long in *N. affine*) and the root of the spines in the genital atrium (bifid in the new species, pointed in *N. affine*). The new species can be separated from *N. exilis* on general body shape and comparative length of the clamp peduncles, the total body length/haptor length ratio (1:4.5 in the new species, 1:2.5 in *N. exilis*) and by the number of testes (30-45 in *N. exilis*). The new species can be distinguished from *N. syacii*, by the pharynx length/oral sucker length ratio (1:4 in *N. syacii*, 1:1.5 in the new species), the number of genital atrium spines (8 in *N. syacii*, 11 in the new species) and by the number of testes (28-42 in *N. syacii*). *N. insularis* can be differentiated from *N. mcdonaldi* by the number of genital atrium spines (5-6 in *N. mcdonaldi*), the number of testes (16-19 in *N. mcdonaldi*) and the position of the seminal receptacle (postovarian in *N. mcdonaldi*, parovarian in *N. insularis*).

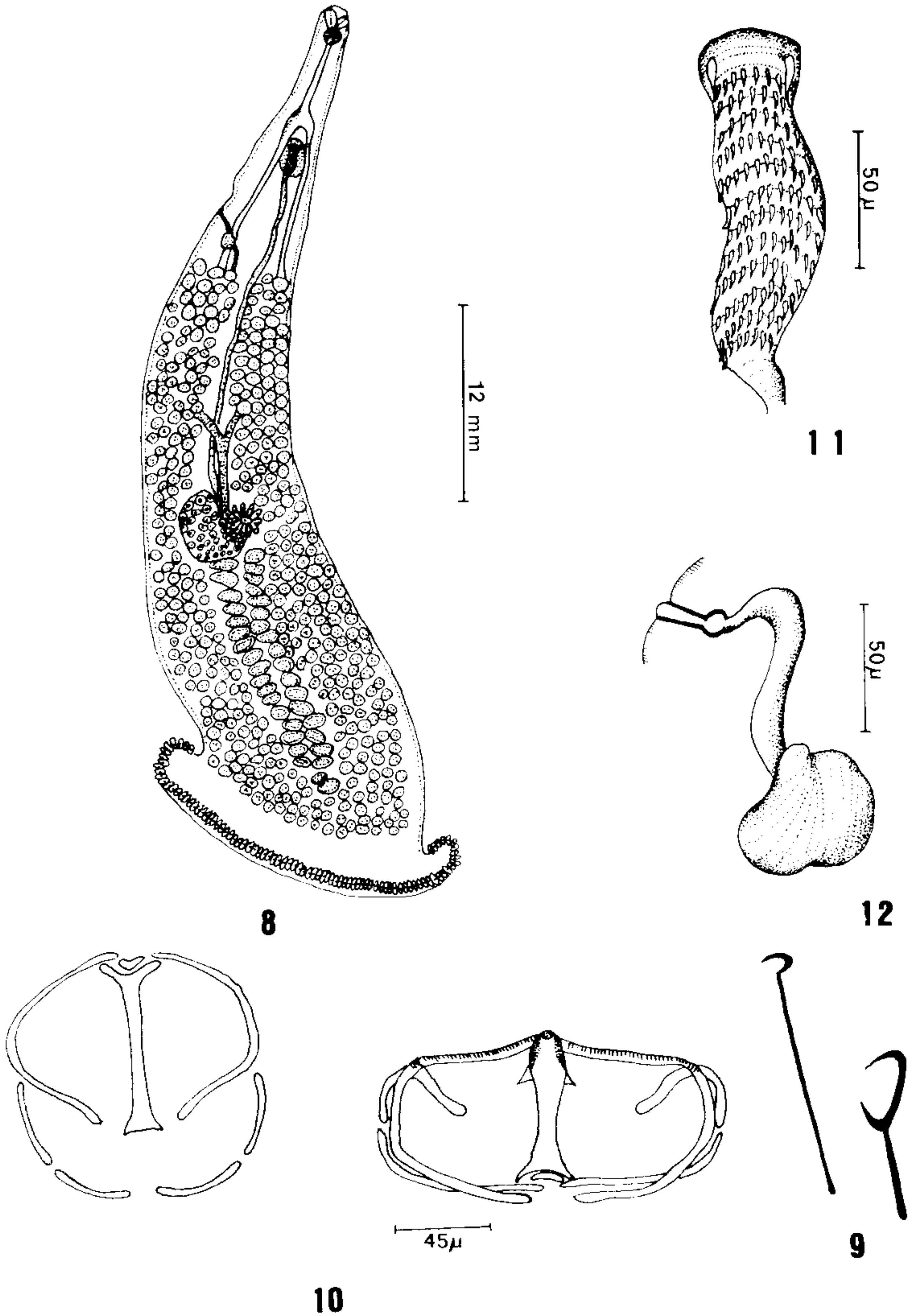
MICROCOTYLIDAE Taschenberg, 1879

Intracotyle neghmei (Villalba, 1987) n. comb.

Remarks: this species was originally described by Villalba (1987b) as *Neobivagina neghmei* on the basis of material from the haemulid *Anisotremus scapularis* from Arica (18° 30'S, 69° 50'W) and Pan de Azucar (26° 09'S, 70° 42'W) in northern Chile. We were able to obtain specimens of this species from the same host from Antofagasta (intermediate between Arica and Pan de Azucar) and Callao, Perú. Specimens agree well with the description of Villalba, but closely resemble *Intracotyle* Mamaev, 1970, since the armature of the genital atrium (see Mamaev, 1977) is typical of this genus and is not present in *Neobivagina* Dillon and Hargis, 1965. The new combination *Intracotyle neghmei* is proposed.



Neoheterobothrium insularis n. sp. Fig. 5: holotype, ventral view. Fig. 6: clamp. Fig. 7: genital atrium.



Loxura peruensis n. sp. Fig. 8: holotype, ventral view. Fig. 9: armature (hook) of lappet. Fig. 10: clamp. Fig. 11: cirrus. Fig. 12: vagina

AXINIDAE Monticelli, 1893

Loxura peruensis n. sp.
(Figs 8-12)

Host: *Belone scapularis* (Jordan & Gilbert)
(Belonidae)

Site of infection: gills

Locality: Chorrillos, Perú

Holotype: USNMHC 82038

Paratypes: USNMHC: 81338 (Four stained whole mounts)

MHNP: TJ-246 (Two stained whole mounts)

Description (Based on six stained whole mounts): body subtriangular (Fig. 8), with asymmetrical haptor; haptor 5.57 (5.35-5.98) long, tapering gradually from haptor anterior end. Body width at testicular level 0.91 (0.78-1.00); haptor 1.94 (1.8-2.12) wide. Haptor with 80-102 clamps. Small lappet with two pairs of hooks at level of clamps 45-48 (from left to right in ventral view); hooks differ in size and shape (Fig. 9). Clamps (Fig. 10) of axinid type, 0.038 (0.03-0.045) long, 0.108 (0.102-0.115) wide; additional small sclerite occurs close to distal extremity of midsclerite. Anterolateral sclerites not subdivided. Prohaptor with two suckers 0.06 (0.05-0.07) in diameter, without denticles; mouth subterminal; pharynx 0.02 (0.01-0.03) long, 0.03 (0.02-0.04) wide, esophagus slender; intestinal ceca with lateral, medial diverticula; intestinal bifurcation anterior to genital pore; ceca not confluent posteriorly. Testes intercecal, postovarian, 34 (31-37) in number, in 2 longitudinal rows that do not reach haptor. Genital atrium unarmed. Cirrus (Fig. 11) pineapple-shaped, 0.14 (0.13-0.15) long, armed with long narrow spines, similar in size. Ovary "J"-shaped; vitelline fields coextensive with intestinal ceca; vitelline ducts "Y"-shaped, joined at preovarian level. Vaginal pore (Fig. 12) ventrolateral anterior end sclerotized. Seminal receptacle, genito-intestinal ducts not observed. Eggs fusiform, with polar filament on each pole.

Remarks: *Loxura* was erected by Unnithan (1957) for those axinids with unarmed genital atrium and a pineapple-shaped cirrus densely covered with minute spines. The type species is *Loxura ananaphallus*, a parasite of the belonid *Tylosurus leiurus* from the Indian coast. To the best of our knowledge, no additional species has been described in the genus. The main differences of the species described herein include testes and clamp number (15 and 39 in *L. ananaphallus*, 31-37 and 80-102 in the new species, respectively). The presence of an additional moon-shaped sclerite in *L. peruensis* and presence of a long basal spine in the cirrus in *L. ananaphallus* are further differentiating features.

REFERENCES

- Brinkmann A 1952. Some Chilean monogenetic trematodes. Report Lund University Chile Expedition 1948-1949. p. 1-26. *Lunds Universitets Arsskrift*. N. F. Aud. 2., 47 No. 1.
- Humason GL 1979. *Animal tissue techniques*. 4th ed, WH Freeman & Co. San Francisco. 661 pp.
- Lebedev BI 1988. Monogenea in the light of new evidence and their position among platyhelminthes. *Ang Parasitol* 29: 149-167.
- Luque JL, Ianacone J, Farfan C 1991. Parásitos en peces oseos marinos del Perú: Lista de especies conocidas. *Boletín de Lima (Perú)* 74: 17-28.
- Mamaev YL 1977. *Two new species of Monogeneans from Arabian sea: Intracotyle caballeroi sp. nov. and Heteraxinoides argiropsi sp. nov.* Excerta Parasitológica en memoria del Doctor Eduardo Caballero y Caballero. Instituto de Biología, Univ. Nac. Autón. México. Pub Especial 47: 79-84.
- Mamaev YL 1987. On the systematic position of the genus *Neoheterobothrium* Price, 1943 (Monogenea, Diclidophoridae) in connection with the description of a new species *N. syacii* sp. n. (In Russian) *Parazitologiya* 21: 69-73.
- Oliva ME 1987. *Choricotyle anisotremi* n. sp. (Monogenea: Diclidophoridae) parasitic on *Anisotremus scapularis* (Tschudi) from the northern Chilean coast. *Syst Parasitol* 10: 129-133.
- Oliva ME, Luque JL 1989. Four new species of *Hargicotyle* Mamaev, 1972 (Diclidophoridae) parasites on sciaenid fishes from Perú and Chile. *Jour Nat Hist* 23: 1389-1395.
- Payne RR 1987. Some diclidophorid Monogenea (Trematoda), including two new species, from marine fishes of the eastern Pacific Ocean off California USA and Baja California Mexico. *Trans Amer Microsc Soc* 106: 256-264.
- Price EW 1938. *The monogenetic trematodes of Latin America*. In Libro Jubilar Prof. Travassos. Rio de Janeiro. Brasil. 3: 407-413.
- Suriano DM, Beverley-Burton M 1979. *Interniloculus chilensis* gen. et sp. nov. (Monogenea: Capsalidae) representant d'une nouvelle sous-famille: Interniloculinae parasite des branchies de *Helicolenus lengerichi* Norman (Pisces: Scorpaenidae) de l'Océan Pacifique Sud. *Can Jour Zool* 5: 1201-1205.
- Tantalean M 1974a. Monogeneos de la Familia Microcotylidae Taschenberg, 1879 parasitos en peces marinos del mar Peruano, con descripción de una nueva especie *BIOTA* (Perú) 10: 120-127.
- Tantalean M 1974b. Dos nuevas especies de monogeneos parasitos de peces comerciales del mar Peruano. *BIOTA* (Perú) 10: 235-242.
- Unnithan V 1957. On the functional morphology of a new fauna of Monogenea on fishes from Trivandrum and environs. Part 1. Axinidae fam. nov. *Bull Center Res Inst Univ of Kerala* 5: 27-122.
- Villalba C 1987a. *Chalguacotyle mugiloidis* n. gen., n. sp. (Monogenea: Diclidophoridae) en el pez *Mugiloides chilensis*, con la proposición de una subfamilia nueva. *Parasitol al Dia* (Chile) 11: 61-64.
- Villalba C 1987b. Nuevas especies de Monogenea en peces marinos de Chile. *Parasitol al Dia* (Chile) 11: 141-148.