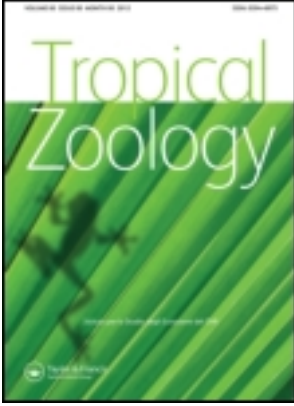


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### Interstitial fauna of the Galapagos: Porrocystidinae (Platyhelminthes Polycystididae)

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# Interstitial fauna of the Galapagos: Porrocystidinae (Platyhelminthes Polycystididae)

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Three new species, from the Galapagos Isles, of the ill-defined taxon Porrocystidinae Evdonin 1977 are described. *Austrorhynchus galapagoensis* n. sp. is mainly characterized by the shape of the male accessory organ. The other two species represent new genera: *Galapagorhynchus hoxholdi* n. gen. n. sp. and *Pygmorhynchus pygmaeus* n. gen. n. sp. The main characteristics of *Galapagorhynchus* n. gen. are the presence of hard teeth in the male atrium, the lack of an accessory stylet, the long spermatic ducts and the very elongated common genital atrium. *Pygmorhynchus* n. gen. lacks an accessory stylet, has short but strongly muscular spermatic ducts and has nuclei near the junction of the epithelia of the proboscis sheath and cone. The systematic positions of the three new taxa are discussed, and a brief phylogenetic analysis of the Porrocystidinae is given. Diagnoses of the new taxa are given, and the diagnosis of the subfamily Porrocystidinae is emended.

KEY WORDS: Porrocystidinae, Polycystididae, Galapagos, new taxa, phylogeny.

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## INTRODUCTION

Thirty-three species of Kalyptorhynchia were present in the material collected by S. Hoxhold and P. Schmidt during the Galapagos Project of the Zoological Institute II of the University of Göttingen (see AX & SCHMIDT 1973). The species of

Schizorhynchia were studied by NOLDT & HOXHOLD (1984). Of the Eukalyptorhynchia, only one species has been discussed in the literature: *Polycystis ali* f. 'Galapagos' Schockaert 1982 (KARLING 1986). The other Polycystididae and two Koinocystididae were the subject of an unpublished work by I. Henze (Diplomarbeit, University of Göttingen, 1987). Some of the new taxon names proposed here are in fact names from that work.

In this first contribution on the Eukalyptorhynchia of the Galapagos, we describe three new species of Polycystididae, one belonging to the genus *Austrorhynchus* Karling 1952. To classify the other two, we erect new genera, *Galapagorhynchus* n. gen. and *Pygmorhynchus* n. gen. All three genera belong to the Porrocystidinae Evdonin 1977.

This contribution is part of a series of papers describing the meiofauna of the Galapagos Isles. A survey of these papers can be found in MIELKE (1997).

#### MATERIAL AND METHODS

Details of sampling procedures and localities are provided by Ax & SCHMIDT (1973). The Eukalyptorhynchia were collected by S. Hoxhold and P. Schmidt, who also studied the living animals. The measurements of body length are those made by S. Hoxhold on live material. Measurements of hard parts given herein are always taken axially using S. Hoxhold's measurements on live material as a scale. Paraffin sections (4 µm) were stained with Heidenhain's iron hematoxylin with eosin as counterstain.

Figures without a scale are freehand.

Brief locality data are followed by a number that refers to the detailed descriptions of these localities in Ax & SCHMIDT (1973: 21-26).

Type material will be deposited in the Zoological Museum of the University of Göttingen.

#### ABBREVIATIONS

*acg*: accessory glandular organ; *b*: female bursa; *br*: brain; *ca*: common atrium; *de*: ejaculatory duct; *ds*: spermatic duct; *e*: eye; *g*: glands; *gp*: gonopore; *m*: muscle; *ma*: male atrium; *mb*: male bursa; *od*: oviduct; *ov*: ovarium; *p*: proboscis; *ph*: pharynx; *s*: stylet; *sph*: sphincter; *ss*: accessory stylet; *t*: testis; *ut*: uterus; *vg*: prostate vesicle; *vi*: vitellarium; *vid*: vitellogduct; *vs*: vesicula seminalis.

#### RESULTS

##### *Austrorhynchus galapagoensis* n. sp. (Figs 1-2)

*Locality*. Santa Cruz: Bahia Academy: northern side (IX. 5b) (type locality).

*Material*. Drawings and photographs of live material by Dr Siegmund Hoxhold. Nine serially sectioned animals, a frontally sectioned animal designated as holotype.

*Derivation of species name*. Named after the Galapagos Isles.

*Description.* Animals about 0.5-0.6 mm long, with two eyes. The proboscis is about 20% of the body length (measured about 120  $\mu\text{m}$  in one live animal).

The internal organization corresponds with that of the other *Austrorhynchus* species. The main differences are in the shape and dimensions of the hard structures. The double-walled prostate stylet is very short, about 21  $\mu\text{m}$  long. It bears no

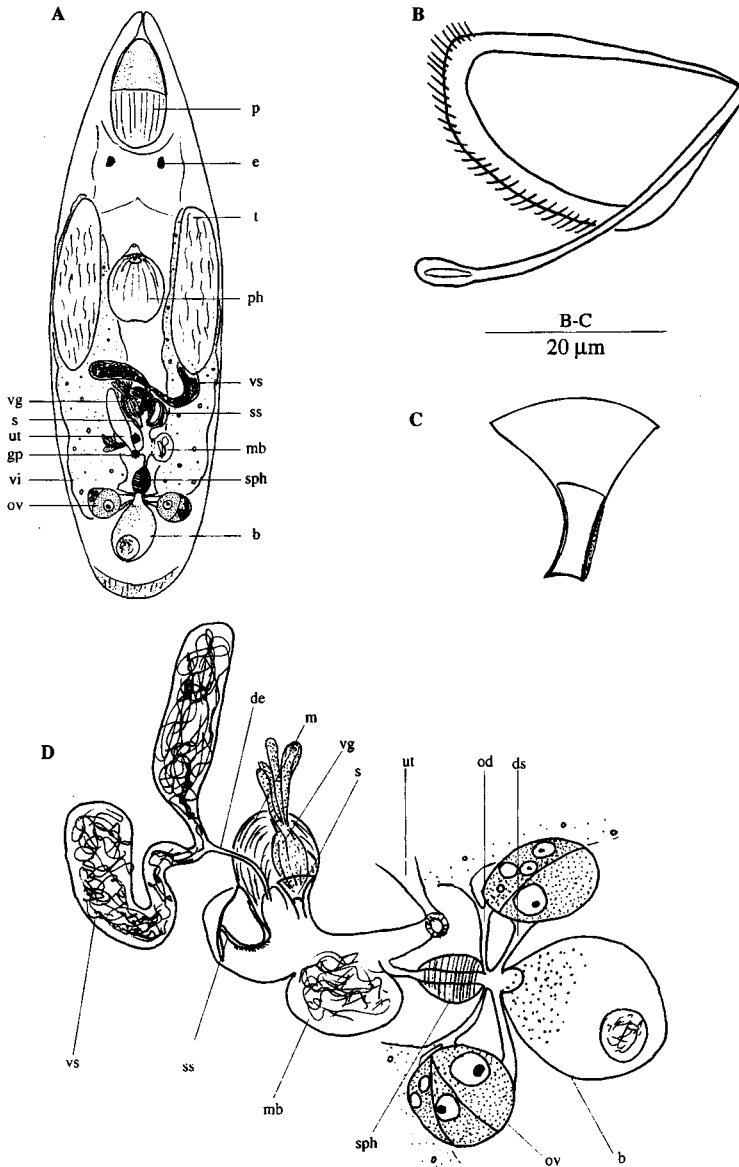


Fig. 1. — *Austrorhynchus galapagoensis* n. sp. A, general structure; B, accessory stylet; C, stylet; D, organisation of the atrial organs; (all from live animals).

hook, and the tube is half as long as the funnel. As in all *Austrorhynchus* species, the inner stylet is about half as long as the outer stylet, and is found in the distal half of the latter. The accessory stylet (A-organ) is relatively simple, consisting of a

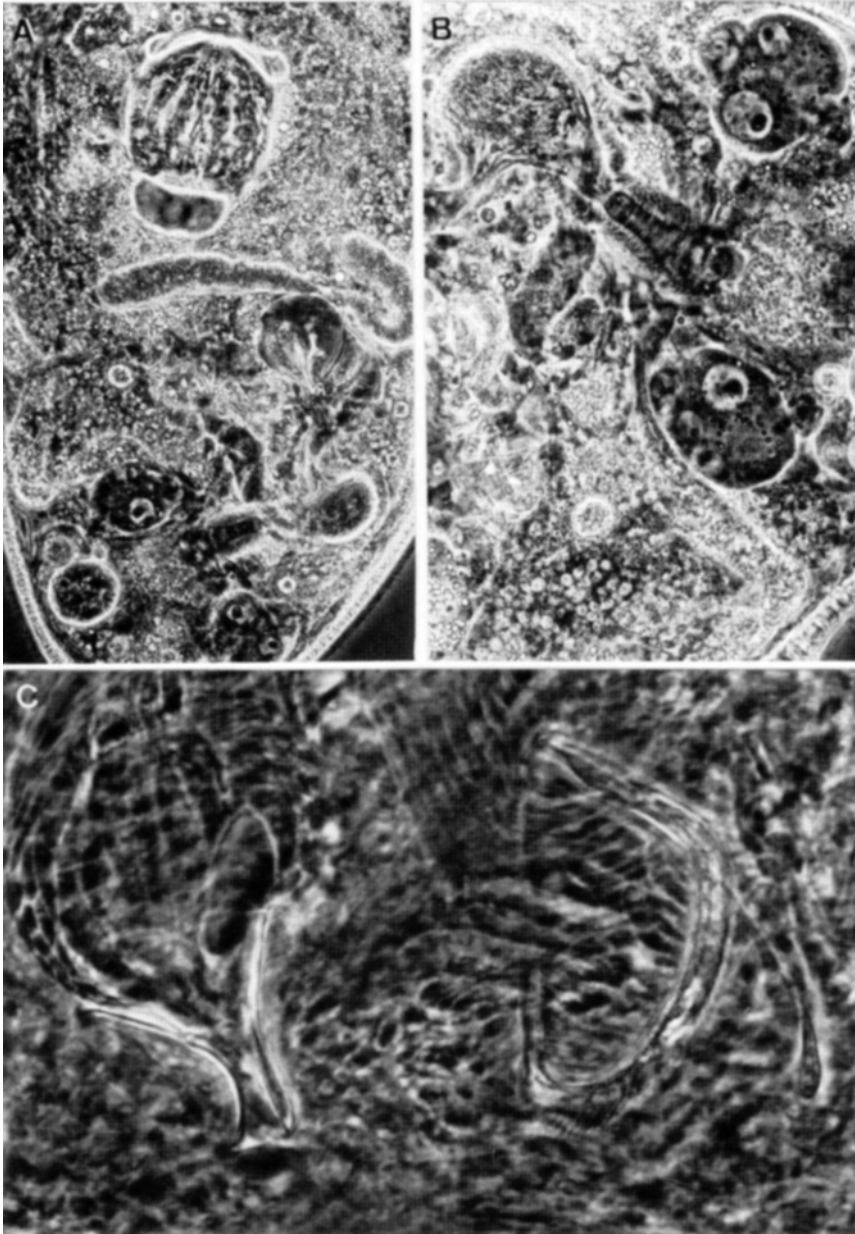


Fig. 2. — *Austrorhynchus galapagoensis* n. sp. A, caudal body end showing the atrial organs and the pharynx; B, female organs and male bursa; C, stylet and accessory stylet; (all from live animals).

ring and a flagellum (terminology of KARLING 1977). The ring is 36  $\mu\text{m}$  long and, distally, 31  $\mu\text{m}$  wide; the flagellum is 41  $\mu\text{m}$  long. Distally, the ring bears a comb, while no comb is found on the flagellum.

A widening of the male atrium, filled with sperm in all the specimens examined, can be regarded as a male bursa. Diffuse accessory glands enter the male atrium near the seminal duct.

The organization of the female system is identical to that of *Austrorhynchus scoparius* Brunet 1965. A large bundle of eosinophilic glands enters the bursal stalk. In one specimen the uterus contains an egg.

*Discussion.* Two other *Austrorhynchus* species have a more or less ring-shaped A-organ: *A. calcareus* Karling 1977 and *A. magnificus* Karling 1952. Their A-organs have only a small "window" (KARLING 1977), and do not show a true annular structure as does the A-organ of the new species. Furthermore, the stylet of these two species bears a short hook. They have only been found in the South Atlantic.

Among the *Austrorhynchus* species that occur in the Pacific or the Indian Ocean, only *A. pacificus* Karling 1977 and *A. californicus* Karling 1977 have A-organs resembling that of *A. galapagoensis* in many respects. The A-organs of Karling's species, however, are very thin plates and not rings. Bearing this in mind, the A-organ of *A. galapagoensis* should be re-examined carefully on whole mounts. If the A-organ is in fact a plate instead of a ring, *A. pacificus* is likely to be the sister species, because the stylet has no hook. The stylet of *A. californicus* has a hook, as in most *Austrorhynchus* species. If it is really an open ring, then *A. galapagoensis* is unique in the Pacific. Such a ring can result from fusion of the style and the foot (terminology of KARLING 1977) as in the A-organs of *A. hawaiiensis* Karling 1977 and *A. maldivarum* Karling 1977, and one of those species might be the sister species. For details of the possible evolution of the A-organ: see KARLING 1977.

***Galapagorhynchus hoxholdii* n. gen. n. sp. (Figs 3-5)**

*Localities.* Santa Cruz: Bahia Academy: north side (IX. 5b) (type locality). Santa Cruz: Bahia Academy: southern beach (IX. 6b).

*Material.* Drawings and photographs of live animals by Dr Siegmur Hoxhold. A total of 30 animals serially sectioned, a frontally sectioned animal designated as holotype.

*Derivation of name.* Genus name refers to the Galapagos Isles. Species name in honour of Dr S. Hoxhold.

*Description.* Animals 1.4-1.9 mm long, opaque orange to red, without eyes. The epidermis is syncytial containing numerous empty vacuoles and numerous rhabdites that are 1/3 of the epithelium height. Rhabdites are absent around the proboscis pore.

The proboscis is of the normal polycystidid type, with six fixators. It is 15-20% of the body length. The proboscis sheath is lined with a low, nucleated epithelium and is surrounded by an inner circular and an outer longitudinal muscle coat. Proximally, the circular muscles are relatively thick. There are no nuclei at the junction of the sheath and cone epithelia. There are four pairs of proboscis retractors and one weakly developed pair of ventral integument retractors.

The pharynx is of the normal polycystidid type, situated in the first body half and inclined forwards. There are two kinds of pharyngeal glands: eosinophilic and basophilic ones. There are 24 internal pharyngeal longitudinal muscles. Around the proximal third of the prepharyngeal cavity the longitudinal muscles are arranged in 12 groups of ca 10 fibers each. The epithelium of the pharyngeal lumen is relatively high, but lacks intraepithelial nuclei.

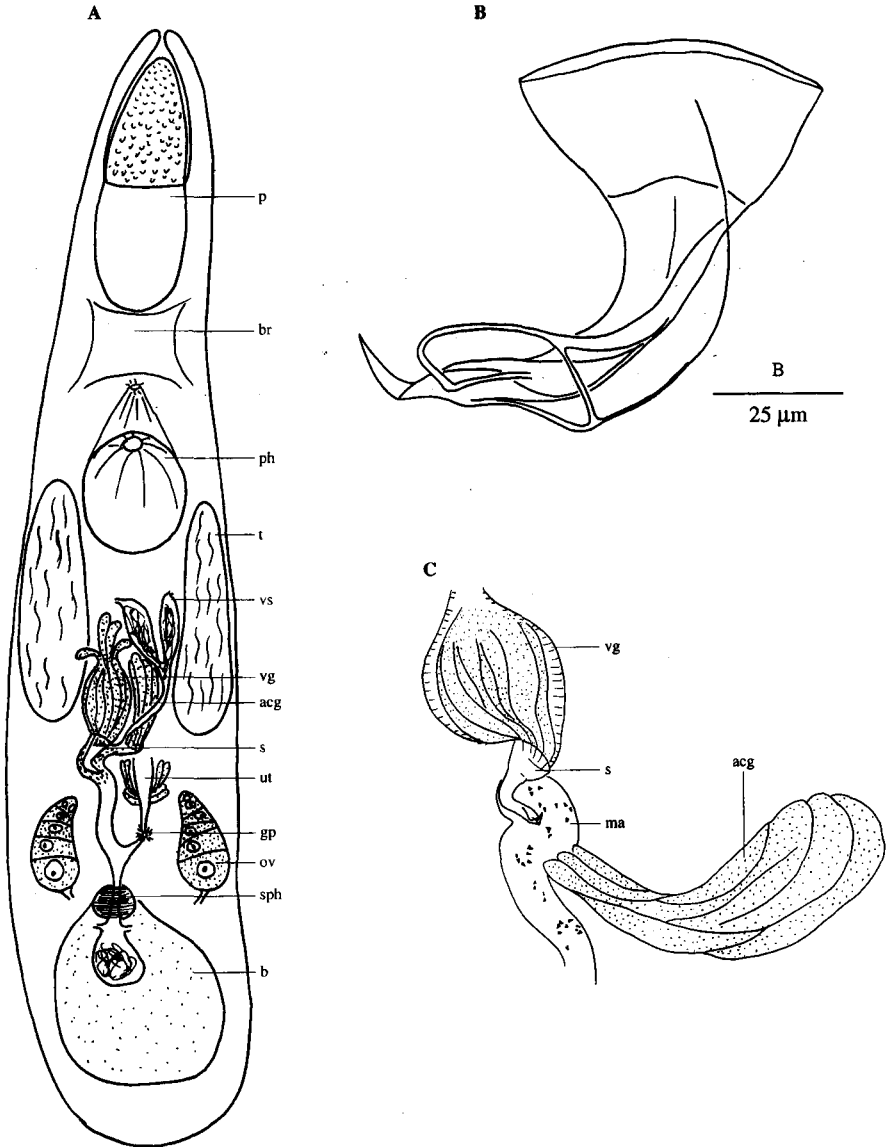


Fig. 3. — *Galapagorhynchus hoxholdii* n. gen. n. sp. A, general structure; B, stylet; C, male atrial organs; (all from live animals).



Male and female gonads are paired. The testes lie dorsolaterally behind the pharynx, extending from the caudal end of the pharynx to the proximal part of the male atrium. The ovaries lie dorsolateral to the common gonopore, which is ventral at  $\pm 75\%$ . The oocytes are arranged in rows. The vitellaria are dorsal to all other reproductive organs and extend from behind the eyes to the caudal end of the body. The common genital atrium is very long and tubiform, lined with a pseudociliation (ruffled, degenerating epithelium), except in the most distal part, which can have a nucleated epithelium. Inner circular and outer longitudinal muscle sheaths surround the atrium throughout its length.

The male atrium enters the common atrium laterally. It is rather long and narrow. Its epithelium is degenerated to a pseudocuticula (leaving only the basement membrane) and the musculature is the same as noted for the common atrium, at least for most of its length. The longitudinal muscles taper proximally, where the circular muscles become thicker and multi-layered. The male atrium is much broader here and is divided into two compartments. The most ventral one receives the accessory glands and the ejaculatory duct, while the dorsal one contains the prostate stylet. The accessory organ consists of a large mass of coarse-grained basophilic glands and is surrounded by a thin, spirally running muscle sheath. The seminal vesicles are paired, lined with a flat epithelium with flattened nuclei and a more or less longitudinal muscle sheath. The ejaculatory duct is rather broad at its proximal end, where it is lined with a high, nucleated epithelium. For the rest of its length it has a very low epithelium. The ejaculatory duct runs very near to, and dorsolateral from, the accessory glandular organ, entering the male atrium just above the latter. It is surrounded by a circular muscle coat throughout its length. An inner, more or less longitudinal muscle layer and an outer, thicker, spiral, almost circular muscle sheath surround the prostate vesicle. The former attaches to the inner side of the proximal end of the stylet, while the latter contin-

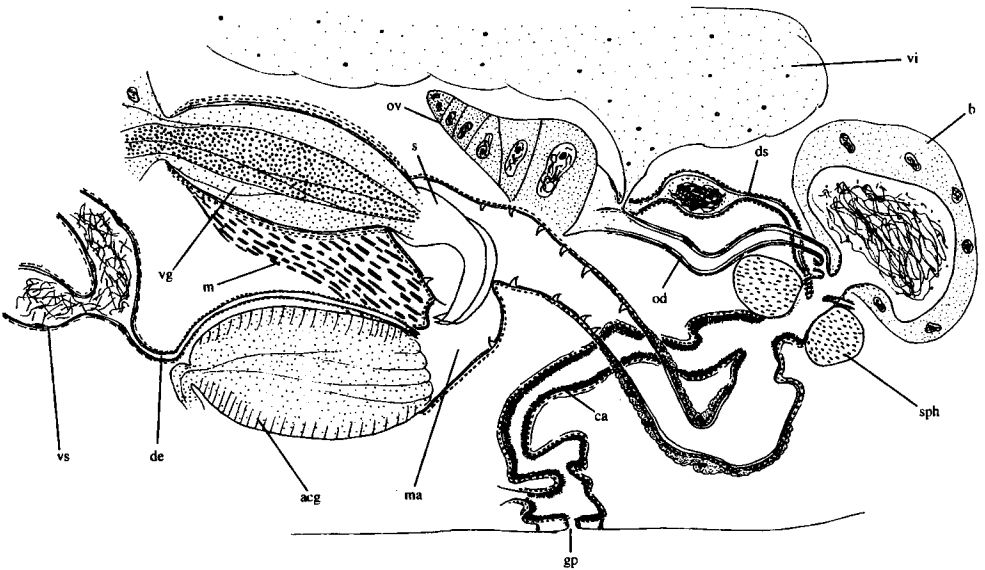


Fig. 4. — *Galapagorhynchus hoxholdii* n. gen. n. sp. Reconstruction of the atrial system from the left side.

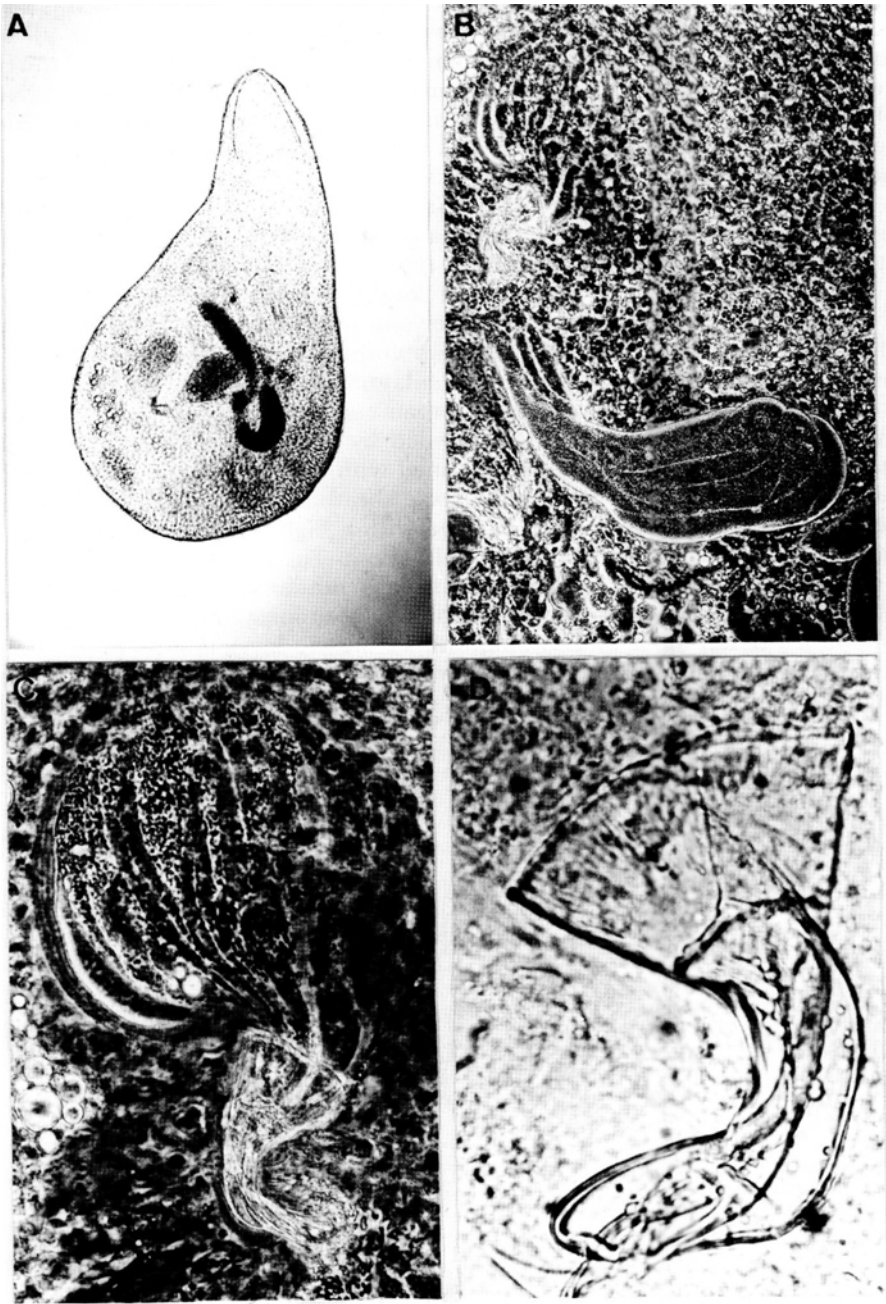


Fig. 5. — *Galapagorhynchus hoxholdi* n. gen. n. sp. A, habitus; B, male atrial organs; C, prostate vesicle and stylet; D, stylet; (all from live animals).

ues in the muscle sheath of the male atrium. Ventrally, the outer muscles are continuous with a very thick muscle bundle that connects the prostate vesicle with the accessory glandular organ and surrounds the distal part of the accessory organ. There are two kinds of prostate glands: one producing an eosinophilic secretion, the other a basophilic secretion. The nucleated parts of the prostate glands are entirely extracapsular. The prostate secretions are discharged into the double-walled stylet that is 94-108  $\mu\text{m}$  long ( $m = 101$ ,  $n = 2$ ). The stylet is hook-shaped with a complicated distal end with a pointed, upward-folded tip. The basal membrane of the proximal part of the male atrium forms numerous triangular teeth, each about 3-4.5  $\mu\text{m}$  long, with distally pointing tips. The distal part of the male atrium is provided with diffuse, coarse-grained basophilic glands, and in some specimens is swollen with sperm, thus functioning as a male bursa.

The female duct is short, entering the genital atrium caudally. Its distal part is surrounded by a very thick sphincter. It ends caudally in the female bursa. Distal to the sphincter the epithelium lining the female duct is pseudociliated, while proximal to the sphincter it is degenerated to a pseudocuticula. Proximal to the sphincter the female duct is surrounded by a thick circular muscle sheath. The bursa is not well defined. It contains vacuoles filled with sperm and/or an eosinophilic secretion. A short, common oviduct enters the female duct dorsally just behind the sphincter. It is surrounded by a sphincter consisting of two fibers, and it almost immediately splits into the two long oviducts. These are lined with a high, nucleated epithelium and with longitudinal muscles. Just before they reach the ovaries they broaden and the vitelloglands enter the oviducts here. The spermatid (or insemination) ducts leave the female duct laterally. Distally these ducts are very narrow. Here they are lined with a membranous epithelium and surrounded by a spirally-running, almost circular muscle coat. Proximally they broaden into seminal receptacles that are surrounded by a higher, irregular epithelium and a circular muscle sheath. The spermatid ducts continue towards the ovaries as broad, muscular ducts. The uterus of the normal polycystidid construction opens in the genital atrium close to the genital pore.

*Discussion.* See the general discussion.

***Pygmorhynchus pygmaeus*** n. gen. n. sp. (Figs 6-7)

*Localities.* James: Bahia James: rockpools (VI. 1b) (type locality). Santa Cruz: Bahia Academy: northern side (IX. 5d).

*Material.* Drawings and photographs of live animals by Dr Siegmund Hoxhold. A total of 8 serially sectioned specimens, a sagittally sectioned specimen designated as holotype.

*Derivation of name.* Both generic and species names refer to the very small size. Pygmaios (Gr.): dwarf.

*Description.* The animals are very small, of maximum length 0.5 mm, and with two eyes. The epidermis is syncytial with numerous vacuoles, some filled with a light eosinophilic secretion. Rhabdites are lacking in most specimens, though in some they were found in the ventral body wall of the anterior body half. Coarse-grained basophilic caudal glands are present.

The proboscis is 1/6 to 1/5 of the body length, with a distinct apex. The sheath epithelium is anucleated, with some delicate dilators. At the junction between sheath epithelium and cone epithelium, some nuclei were observed. As in all Polycystididae, there are six fixators. There is one well-developed pair of ventral integument retractors, and four pairs of retractors: a dorsal, a dorsolateral, a lateral and a ventral pair, all weakly developed. Close to the proboscis, the dorsal retractors consist of about three fibers. More caudally, only one thicker fiber remains, attached to the dorsal body wall. The lateral retractors also attach to the dorsal body wall, while the dorsolateral and ventral ones attach to the ventral wall. Eosinophilic glands are present at both sides of the brain. Their necks extend towards the proboscis pore.

The pharynx is situated in the first body half, has a short prepharyngeal cavity and is inclined forwards. As in some other polycystidids there is a ring of ruffled epithelium in the middle of the cavity. There are three kinds of pharyngeal glands: two eosinophilic ones and a basophilic one. The basophilic glands open into the pharyngeal lumen between the two eosinophilic glands. The epithelium of the pharyngeal lumen lacks nuclei.

The gonads are paired. The testes are situated dorsolaterally and extend from the pharynx to the level of the prostate vesicle. The ovaries are caudal, at both sides of the body, rather small and globular, and contain only a few oocytes. The vitellaria lie dorsal to all other reproductive organs, extending from the level of the brain to the caudal end of the body, where they are joined. The gonopore is ventral at  $\pm 80\%$ . The common genital atrium is lined with a low anucleated epithelium and is surrounded by an inner circular and an outer longitudinal muscle layer.

The male atrium enters the common atrium dorsally. It is lined with a low epithelium, and surrounded by an inner circular and thinner outer longitudinal muscle sheath. Two relatively well separated compartments can be recognized in the proximal part of the male atrium: the most ventral contains the prostate stylet, the other receives the ejaculatory duct and the accessory glands. The epithelium of the anterior wall of the dorsal compartment is glandular and produces an eosinophilic secretion. The seminal vesicles are paired and lined with a very low epithelium showing some flattened nuclei. The ejaculatory duct is lined with the same epithelium. Both ejaculatory duct and seminal vesicles are surrounded by almost longitudinal muscles. The ejaculatory duct opens in the male atrium just beside the accessory organ, which is surrounded by a circular muscle layer. It contains eosinophilic and basophilic glands, their nuclei being extracapsular. The eosinophilic secretion has a smooth appearance in some specimens, in others it is clearly granular. At the distal end of the accessory organ four degenerated nuclei can be seen in some specimens. The prostate vesicle is spindle-shaped, surrounded by a spiral muscle coat that partly attaches to the inner side of the proximal end of the stylet. The outer part of the muscle coat is continuous with the muscle coat of the male atrium. The prostate glands (with extracapsular nucleated parts) produce a coarse basophilic granular secretion. The prostate stylet is only 13.5  $\mu\text{m}$  long, tubiform and slightly curved in its distal end. Without whole mounts, we were unable to determine if it is double-walled, but it most probably is (as in a congeneric species from Australia, presently being described by the authors).

The female duct enters the atrium at the caudal side, ending in the bursa, which contains masses of sperm. The female duct is lined with a very low, anucleated epithelium and surrounded by a circular muscle sheath. In some individuals the epithelium becomes a pseudocuticle close to the bursa. More or less in the middle

of its length there is a bundle of eosinophilic glands, arranged in a circle around the duct. Just proximal to these glands, the circular muscles form a sphincter of four fibers. After that, the female duct widens and contains a large amount of sperm, clearly functioning as the seminal receptacle. The spermatic ducts and the oviducts

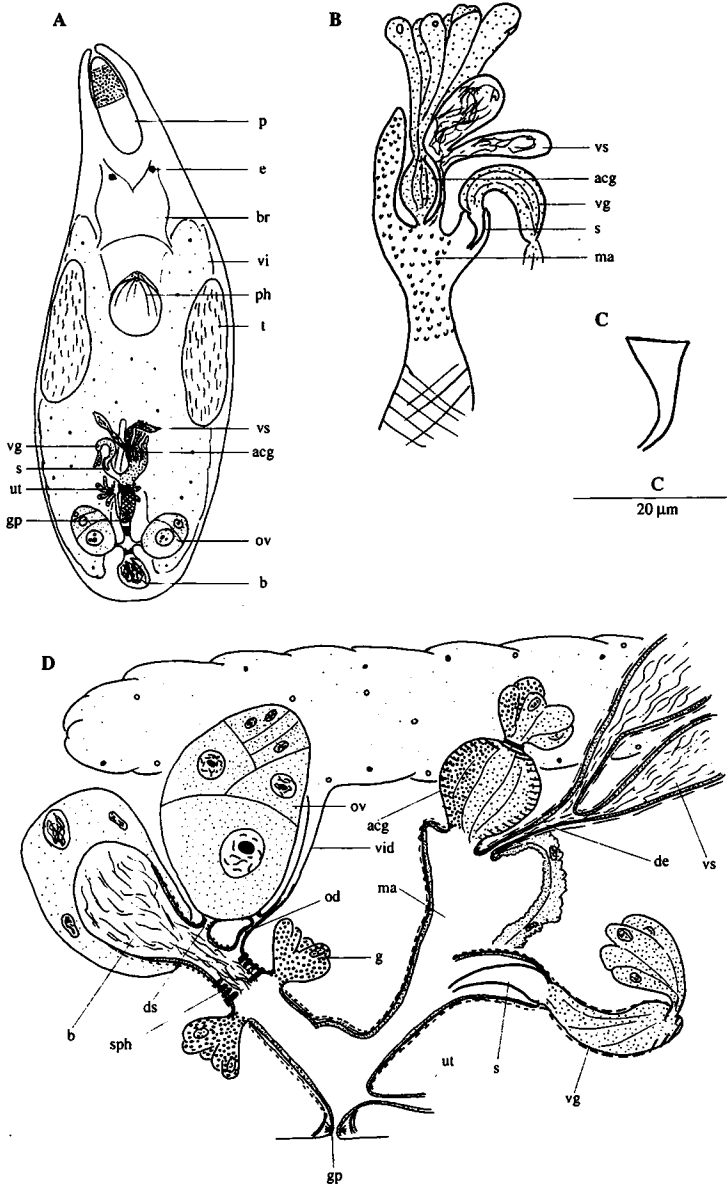


Fig. 6. — *Pygmorhynchus pygmaeus* n. gen. n. sp. A, general structure; B, male atrial organs; C, styllet; D, reconstruction of the atrial system from the right side; (A-C from live animals).

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open here. In the holotype, the openings of the spermatic ducts and of the oviducts are clearly separated, with the oviducts opening most distally. In other specimens these openings lie much nearer to each other, connected to the seminal receptacle at

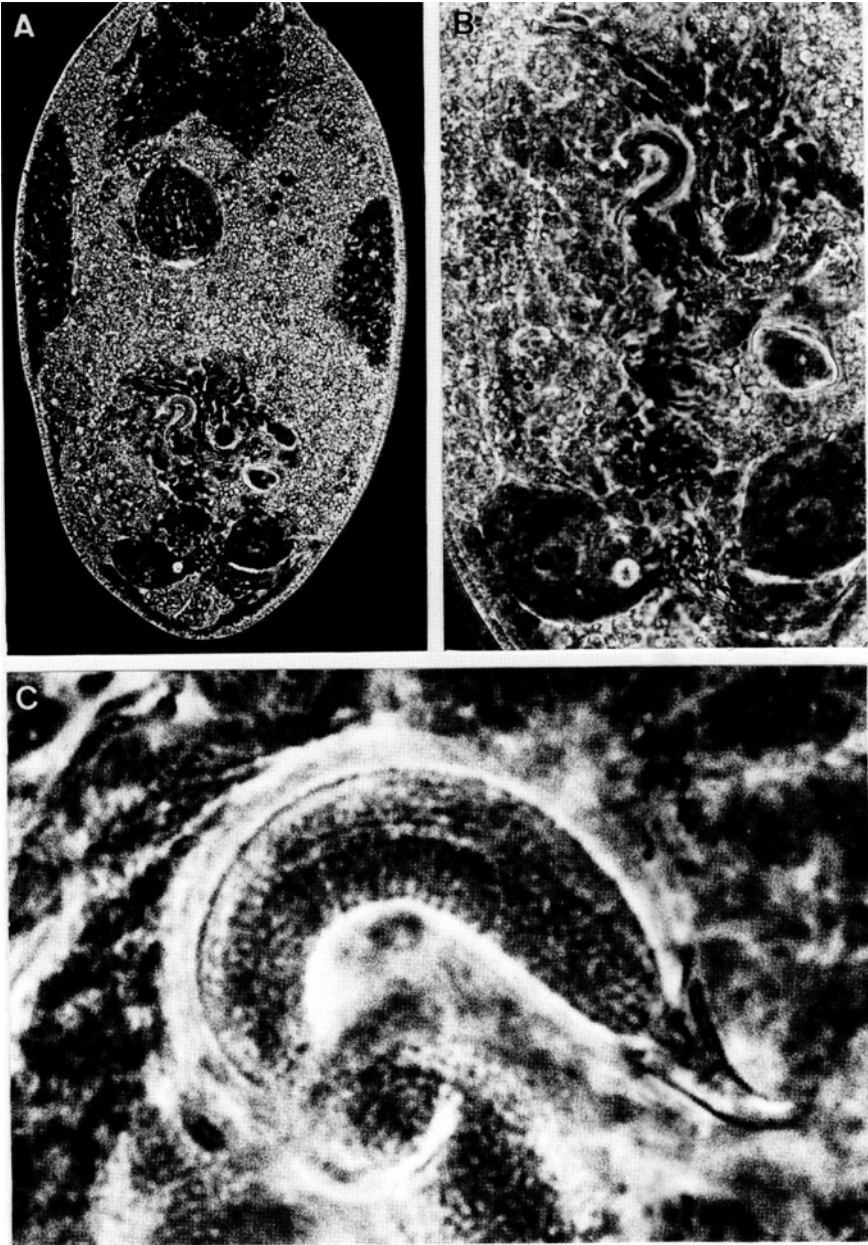


Fig. 7. — *Pygmorhynchus pygmaeus* n. gen. n. sp. A, live animal (part behind the proboscis); B, atrial organs; C, prostate vesicle with stylet; (all from live animals)

almost the same place. The spermatic ducts are very short and surrounded by thick circular muscles, leaving the seminal receptacle from both sides. The oviducts, lined with a low, nucleated epithelium and surrounded by longitudinal muscles, enter the female duct through a common muscular pore. The vitelloducts enter the oviducts near the ovaries. The uterus is of the normal polycystidid type.

*Discussion.* See the general discussion.

#### GENERAL DISCUSSION

(Fig. 8)

EVDONIN (1977) erected the subfamily Porrocytidinae to contain the genera *Porrocystis* Reisinger 1926, *Austrorhynchus* Karling 1952, *Antiboreorhynchus* Karling 1952, *Phonorhynchus* Graff 1905, *Cincturorhynchus* Evdonin 1970 and *Megaloascos* Evdonin 1970. *Megaloascos psammophylum* Evdonin 1970 is, in our opinion, insufficiently known and will not be discussed. These genera are characterized (diagnosis of EVDONIN 1977, excluding *Megaloascos*) by paired gonads, accessory hard parts present or not, accessory glandular reservoir present or not, male bursa present or not, female bursa present or not. The new genera *Pygmorhynchus* and *Galapagorhynchus* thus fit this diagnosis, and the genus *Paraaustrorhynchus* Karling & Schockaert 1977 can also be added to the group (considered related to *Antiboreorhynchus* and *Austrorhynchus* by KARLING & SCHOCKAERT 1977, but see discussion below). We now consider a number of characteristics of these genera.

Except in *Antiboreorhynchus* and *Paraaustrorhynchus*, the female system shows a number of particular similarities: there is a terminal female bursa, and the ovaries are connected to the female duct not only by the oviducts, but also by so-called insemination ducts (or spermatic ducts). The terminal female bursa is probably a plesiomorphy (present in many polycystidids and also in other taxa, e.g. the Koinocystididae). The presence of insemination ducts may be a synapomorphy, present only in these genera. *Alcha* Marcus 1949 also has paired insemination ducts (KARLING & SCHOCKAERT 1977), but these are of a different nature and probably not homologous.

As in the vast majority of the Polycystididae, there is a prostate vesicle with a double-walled stylet, undoubtedly homologous and clearly a symplesiomorphy for the genera mentioned. This is indeed also the case for *Paraaustrorhynchus* and *Antiboreorhynchus*, in contrast with the ideas of KARLING & SCHOCKAERT (1977) who considered the double-walled stylet in these two genera as accessory.

In *Galapagorhynchus*, *Pygmorhynchus*, *Cincturorhynchus*, *Phonorhynchus*, *Paraaustrorhynchus* and *Antiboreorhynchus* there are accessory glands in the male system, which have their own muscle coats in the first four genera. A bundle of accessory glands can be found in several Polycystididae, often also forming a reservoir with a muscular wall as e.g. in *Typhlopolycystis* Karling 1956, *Limipolycystis* Schilke 1970, *Psammopolycystis* Meixner 1938, but of a completely different structure to that in *Galapagorhynchus*, etc. The accessory glandular reservoir of *Phonorhynchus* is again somewhat different. A bundle of accessory glands in the male system, with or without a muscle sheath, clearly may have arisen several times and thus may not necessarily be homologous. Accessory glands are absent in *Porrocystis* and in *Austrorhynchus*.

Accessory hard parts are present in all Porrocystidinae, except for *Pygmorhynchus* and *Galapagorhynchus*. If an accessory glandular organ is present, it is always associated with the accessory hard part. This accessory hard part is a single-walled tube in *Phonorhynchus*, but not in the other genera. The fact that the accessory hard part is single-walled and tubiform is almost unique within the Polycystididae. It is only encountered in the unrelated genera *Phonorhynchoides* Beklemishev 1927 and *Annalisella* Karling 1978 and is a clear autapomorphy for *Phonorhynchus*.

In most of the Polycystididae with a copulatory organ of the divisa-type (terminology of KARLING 1956) the ejaculatory duct enters the male atrium near the prostate vesicle and the double-walled stylet. In *Cincturorhynchus*, *Galapagorhynchus* and *Pygmorhynchus*, as well as in *Paraustorhynchus* and *Antiboreorhynchus* the ejaculatory duct enters the male atrium near the accessory glands and thus near any accessory hard parts that are present. In *Porrocystis* (lacking accessory glands) the ejaculatory duct also enters the male atrium near the accessory hard part. Only in *Austorhynchus* and *Phonorhynchus* is the ejaculatory duct associated with the prostate stylet; the plesiomorphic situation.

In *Phonorhynchus*, *Pygmorhynchus* and *Cincturorhynchus*, nuclei are present at the junction of the sheath epithelium with the cone epithelium. The same feature is also encountered in some genera of the Gytracinae Graff 1905 (see KAR-

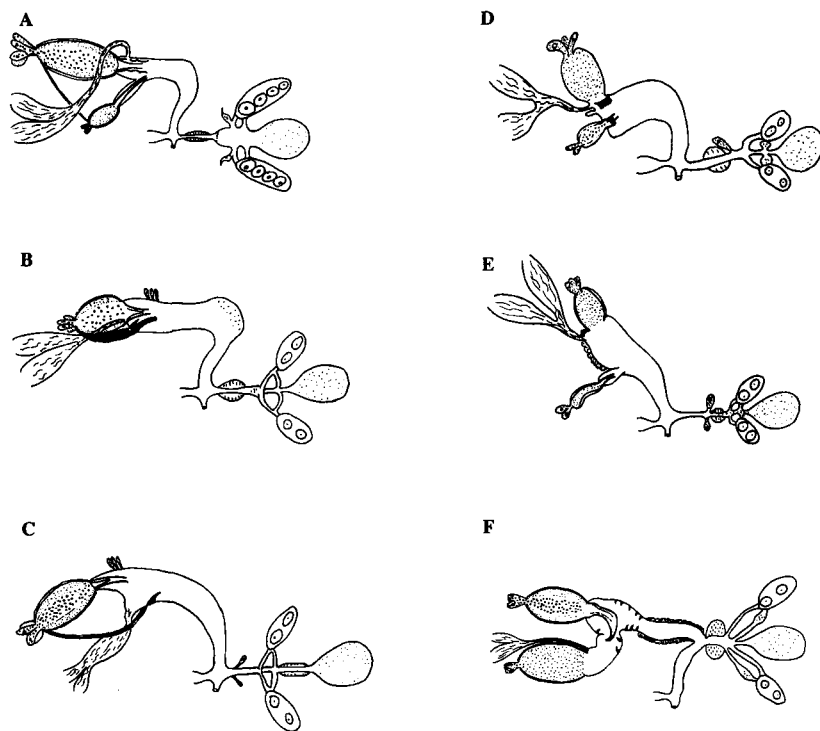


Fig. 8. — Schematic representation of the atrial organs of the six genera of Porrocystidinae as now defined. A, *Phonorhynchus*; B, *Austorhynchus*; C, *Porrocystis*; D, *Cincturorhynchus*; E, *Pygmorhynchus*; F, *Galapagorhynchus*.



LING 1955). In all cases, electron microscopy revealed that these nuclei belong to the apical cone epithelium and the proximal belt of the sheath epithelium (A. DE VOCHT unpublished data; see also SCHOCKAERT & BEDINI 1977 for *Polycystis naegelii*).

Conclusions concerning the phylogeny of these genera would be very tentative at the moment and should include other taxa as well. However, the paired insemination ducts are unique and may represent a synapomorphic feature for the genera in which they occur. This group can thus be considered monophyletic, under the name Porrocystidinae. It contains all the genera that EVDONIN (1977) placed within it (excluding *Antiboreorhynchus* and *Megaloascos*: see above) and the two new genera presented in this contribution. Within the Porrocystidinae a possible monophyletic group is formed by the genera *Porrocystis*, *Cincturorhynchus*, *Pygmorhynchus* and *Galapagorhynchus* sharing the feature of the ejaculatory duct shifted away from the prostate vesicle. A synapomorphic feature for *Galapagorhynchus* and *Pygmorhynchus* may be the loss of the accessory stylet.

#### DIAGNOSES

Porrocystidinae Evdonin 1977 (emend. after EVDONIN 1977). Polycystididae with a proboscis with four retractors and a ventral pair of integument retractors. Nuclei can be present in the junction between the proboscis cone and the proboscis sheath epithelia. Gonads paired. With a double-walled stylet associated with a prostate vesicle. Accessory hard structure present or not. Accessory glandular organ present or not. If both are present they are always associated with each other. Ejaculatory duct opens in the male atrium near the prostate organ or near the accessory organ (divisa type). The male atrium is always very broad and proximally more or less divided into two compartments. Female duct mostly with a relatively strong muscle coat, sometimes forming a strong sphincter. Paired spermatic ducts present. Terminal female bursa present. Type genus: *Porrocystis* Reisinger 1926. Other genera: *Austrorhynchus* Karling 1952, *Phonorhynchus* Graff 1905, *Cincturorhynchus* Evdonin 1970, *Pygmorhynchus* n. gen. and *Galapagorhynchus* n. gen.

*Austrorhynchus galapagoensis* n. sp. *Austrorhynchus* species with a stylet of 21  $\mu\text{m}$  long without hook, with tube and funnel of equal length. Accessory stylet 36  $\mu\text{m}$ , annular (or possibly a plate). With distal comb with fine teeth and a 41  $\mu\text{m}$  long flagellum without comb.

*Galapagorhynchus* n. gen. Porrocystidinae without nuclei in the junction of the proboscis cone and proboscis sheath epithelia. Common atrium very long. Two glandular organs in the male system. One of them connected to a double-walled stylet and thus considered a prostate. No accessory hard structures. Ejaculatory duct opening in the male atrium near the accessory glandular organ. Male atrium with small teeth in its proximal half. Spermatic ducts very long, the distal part narrow with a circular muscle coat. Female duct with a huge sphincter. Type species: *G. hoxholdii* n. sp., provisionally with the same diagnosis as the genus. Stylet double-walled, hook-shaped,  $\pm 101 \mu\text{m}$  long.

*Pygmorhynchus* n. gen. Porrocystidinae with nuclei in the junction of the proboscis cone and proboscis sheath epithelia. Two glandular organs in the male system. One of them, the prostate vesicle, provided with a small, double-walled stylet. No accessory hard structures. Ejaculatory duct opening in the male atrium near the accessory glandular organ. Spermatic ducts short and very muscular. Female

duct with glands arranged in a ring. Type species *P. pygmaeus* n. sp., provisionally with the same diagnosis as the genus. Stylet very small (13.5  $\mu\text{m}$ ), double-walled (?), slightly curved.

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