



Resurrection of *Galathowenia australis* (Polychaeta, Oweniidae) based upon type material

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Abstract: From the examination of the syntypes, *Psammocollus australis* (Polychaeta: Oweniidae), type locality Saint Paul Island (subantarctic region of the Indian Ocean), is considered valid and resurrected. The species is redescribed and a lectotype and paralectotypes are designated. The genus *Psammocollus* is removed from synonymy with *Myriochele* and is considered to be a senior subjective synonym of the genus *Galathowenia*. The species *Galathowenia australis*, characterized by the presence of notopodial short capillary chaetae, is compared with other eleven species of *Galathowenia*.

Résumé : Rétablissement de *Galathowenia australis* d'après l'étude du matériel type. A partir de l'examen des syntypes, *Psammocollus australis* (Polychaeta: Oweniidae), dont la localité type est l'île de Saint Paul (région subantarctique de l'Océan Indien), est rétablie comme une espèce valide. Cette espèce est redécrite et le lectotype et des paralectotypes sont désignés. Le genre *Psammocollus* n'est plus considéré comme synonyme de *Myriochele* mais comme un synonyme subjectif ancien du genre *Galathowenia*. L'espèce *Galathowenia australis*, caractérisée par la présence de petites soies capillaires notopodiales, est comparée à onze autres espèces de *Galathowenia*.

Keywords: Annelida, Polychaeta, Oweniidae, *Psammocollus*, *Galathowenia*, *G. australis*

Introduction

The genus *Psammocollus* was established by Grube (1866, p. 178) for *Psammocollus australis*, collected during the Austrian "Novara" Expedition to Saint Paul Island in the Southern Indian Ocean from 1857 to 1859. In this work, the author published a Latin diagnosis of the genus *Psammocollus* and the species *P. australis* together with a discussion on the genus *Clymenia*, in German, in which he recognized the similarity between *P. australis* and *C. tenuissima* Örsted, 1844, described from Denmark. At

present, the polychaete genus *Clymenia*, whose original material is presumed to be lost (Nilsen & Holthe, 1989), has been suppressed because it is considered to be a junior homonym of *Clymenia* Münster, 1834, a name in use for a Devonian ammonoid (BZN, 1991).

Soon after the erection of *Psammocollus australis*, Malmgren (1867) established the genus *Myriochele* for *Myriochele heeri* from Greenland, and Grube (1867) published a second Latin diagnosis of both the genus *Psammocollus* and the species *P. australis* together with a description in German and accompanying figures. Despite the fact that Grube (1866) gave the description of *P. australis* one year before that of *M. heeri*, later authors took the work published in 1867 as the original description, mistakenly dating it to 1868 (see Fauchald, 1977, 115 and

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Nilsen & Holthe, 1985, 18). Due to this confusion of dates and the general assumption that both type material belonged to the same species, *Psammocollus* and *Myriochele* were soon considered synonyms (Mc Intosh, 1885, p. 410; Webster & Benedict, 1887, p. 746), with the latter being given priority over *Psammocollus* in recent literature of standard reference (e.g. Hartman, 1959, p. 469; Fauchald, 1977, p. 115; Nilsen & Holthe, 1985).

The only work reporting *P. australis* in the 20th century is Augener (1932, p. 47-48) in the Bridgman Islands and Port Lockroy (Bransfield Strait, Antarctica), but this author also proposed that it should be synonymized with *M. heeri*. Given that Augener did not support his proposal with any objective observations, his reasoning might likely stem from the widespread use of the taxon *M. heeri* which was in use in the early 20th century, 65 years after its original description. Two examples of this are Monro (1939) and Hartman (1966). Monro (1939, 137-138) reports *M. heeri* off Mac Robertson Land (Antarctica), from only one specimen, in spite of the fact that: "*The condition of the specimen is too poor for comparison with the northern form*" (sic.). Hartman (1966, 73-76) in the compilation of the sedentary polychaetes of Antarctica reports *M. heeri* and *Owenia* sp. as the only Oweniid polychaetes in Antarctic waters, including an illustration of the entire animal of the former taken from Malmgren's original description of *M. heeri* from boreal waters.

The genus *Galathowenia* was established by Kirkegaard (1959, p. 67) for the single species *Galathowenia africana* collected by the "Atlantide" and "Galathea" expeditions off the west coast of Africa. The author characterizes this species as compared to *Myriochele heeri* in the shape of the prostomium, which bears a membrane with a faintly waved border and two ventral lobes, one of which overlaps the other. Other characters included in the diagnosis are the achaetous peristomium fused with the prostomium, the presence of two eye-spots and three (thoracic) chaetigers without neuropodial hooks. At present, there is no consensus concerning the validity of this genus. While authors like Fauchald (1977), Kirkegaard (1983; 1996), Blake (1984; 2000), Imajima & Morita (1987) and Parapar (2001; in press) accept the shape of the prostomium as a differentiating trait, other authors such as Blake & Dean (1973), Nilsen & Holthe (1985; 1989), Hartmann-Schröder & Rosenfeldt (1989; 1991), Hartmann-Schröder (1996), Cantone & Di Pietro (1998) and Fiege, Kröncke & Barnich (2000) consider it to be a synonym of *Myriochele*.

Recently, on the basis of the assumption that the type material of *Psammocollus australis* had been lost, given that it was not mentioned by Wiktor (1980) among the types of Grube deposited at the Museum of Natural History of

Wrocław University (Poland), Nilsen & Holthe (1989) consider *Psammocollus* Grube, 1866 to be a senior subjective synonym of *Myriochele* Malmgren, 1867 (*sensu lato*). Moreover, since it had not been used for over 50 years, these authors proposed to the ICZN the inclusion of *Psammocollus* in the Official Index of Rejected and Invalid Generic Names in Zoology for the purpose of the Principle of Priority but not the Principle of Homonymy. This proposal was accepted (BZN, 1991).

The location of the type material of *Psammocollus australis* Grube, 1866 at the Zoological Museum of Berlin (see Hartwich, 1993) made it possible to examine several specimens, providing conclusive evidence that this species is different from *Myriochele heeri* Malmgren, 1867 and belongs to the genus *Galathowenia* Kirkegaard, 1959.

Materials and methods

The type series of *Psammocollus australis* is deposited at the Zoological Museum, Berlin (ZMB). The material consists of two vials labelled Q.4675 and Q.4676. In one of these vials (Q.4676), four individuals were found to be out of their tubes, presumably extracted by Grube (Fig. 1), while the rest of the specimens, of an undetermined number, are still inside their tubes. An attempt to remove one of these specimens proved to be impossible due to the fragile condition of the material. Only fragments could be obtained and were used in the SEM preparations.

As no holotype or paratypes were initially designated by the author in the original description (see Grube, 1866), following ICZN art. 74, one of the syntypes of vial Q.4676 was designated as a lectotype and the others as paralectotypes. Since no illustrations were included, the specimen selected as a lectotype was the one supposedly illustrated in a later publication (Grube, 1867), following ICZN recommendation 74B.

Fragments of one specimen from vial Q.4676, used in scanning electron microscopy (SEM), were dehydrated via a graded ethanol series, then critical-point dried using CO₂, covered with gold in a BAL-TEC SCD 004 sputter coater, and examined and photographed under a JEOL JSM-6400 Scanning Electron Microscope at the Servicios Xerais de Apoio á Investigación (SXAIN) of the Universidade da Coruña, Spain.

The "thoracic formula", T.F., proposed by Parapar (in press) for the first three body segments, is followed here: TF = No₁:Ne₁-No₂:Ne₂-No₃:Ne₃, where No means "notopod", Ne "neuropod", the sub-index denotes the position of each chaetiger in the thorax, and 1 = presence, 0 = absence.

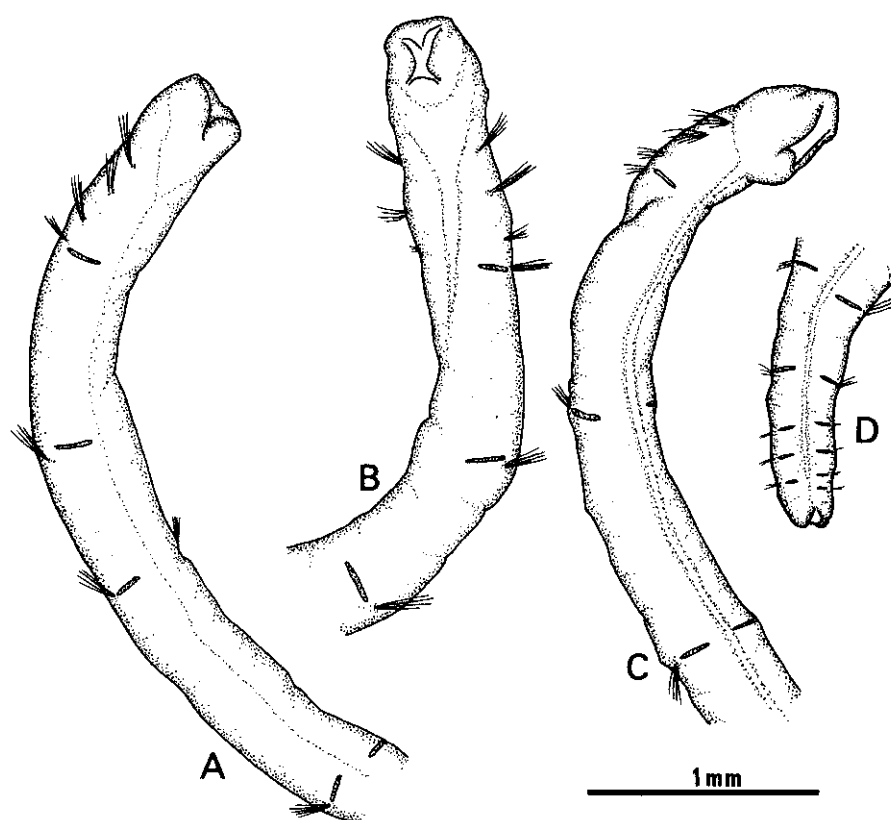


Figure 1. *Galathowenia australis* (Grube, 1866). A-C. anterior end in ventro-lateral view A. of lectotype (ZMB 4676), B. and C. of paralectotypes (ZMB 11170 a, b). D. posterior end of lectotype in ventral view.

Figure 1. *Galathowenia australis* (Grube, 1866). A-C. extrémité antérieure en vue ventro-latérale A. du lectotype (ZMB 4676), B. et C. des paralectotypes (ZMB 11170 a, b). D. vue ventrale de l'extrémité postérieure du lectotype.

Results

Family Oweniidae Rioja, 1917

Genus *Galathowenia* Kirkegaard, 1959

Galathowenia australis (Grube, 1866) (n. comb.)

resurrected

Figs. 1-2, Table 1

Psammocollus australis Grube, 1866: 178-179, no figures.
Grube, 1867: 30-31, pl. III, fig. 5 a-f.

Type material

Zoological Museum, Berlin, Germany; lectotype, complete specimen 10 mm long with 16 chaetigers (reg. No. ZMB Q. 4676), 3 paralectotypes (reg. No. ZMB 11170 a, b, c) and fragments of one specimen on SEM stub (reg. No. ZMB 11170 d).

Non type material

An undetermined number of specimens inside their tubes (reg. No. ZMB 4675 and ZMB 11171).

Type locality

St. Paul Island (Sub Antarctic Indian Ocean).

Description based on lectotype

Body short, thin, cylindrical, 10 mm long, 0.5 mm wide, with 16 chaetigers, posteriorly not tapering; pale brown pigmented with mid-ventral glandular Y-shaped line beginning just posterior to peristomium as two lines which converge and merge in thoracic region (Fig. 1A-C, 2D). Head region truncated anteriorly, with terminal mouth, when open extending midventrally as an elongate slit (Fig. 1A). When mouth closed, anterior end becomes rounded with mouth located in a more ventral position (Fig. 1B, C). Eye-spots not visible on peristomium. Thoracic region with three short uniramous segments (T.F. = 1:0-1:0-1:0); first two chaetigers provided with fascicle of 7 to 10 long capillary chaetae; third thoracic chaetiger also with short capillary chaetae (2). Third thoracic chaetiger short, with fewer chaetae; relative length of thoracic chaetigers about 2:2:1. Abdominal chaetigers biramous (Fig. 1, 2A); first to third abdominal chaetigers (fourth to

sixth body chaetigers) slightly elongate. Abdominal notopodia provided with a dorsal bundle of long capillary chaetae and a ventral bundle of short and smooth capillary chaetae (Fig. 2B), reaching maximum number in mid-body chaetigers. About 16-18 long capillary and 7-10 short capillary chaetae in mid-body chaetigers. Long capillary chaetae coated in the distal end by closely packed slender spinules with a length/width ratio 3/1 (Fig. 2C). Neuropodial tori from first abdominal chaetiger, nearly rectangular in shape and with numerous uncini irregularly arranged in dense fields. Uncini with two long and slender teeth obliquely arranged (Fig. 2E-G). Posterior end distally tapered, with two blunt lobes on the pygidium (Fig. 1D).

Discussion

The examination of the type material of *Psammocollus australis* Grube, 1866 (type species of *Psammocollus* by monotypy) revealed that this material belongs to the genus

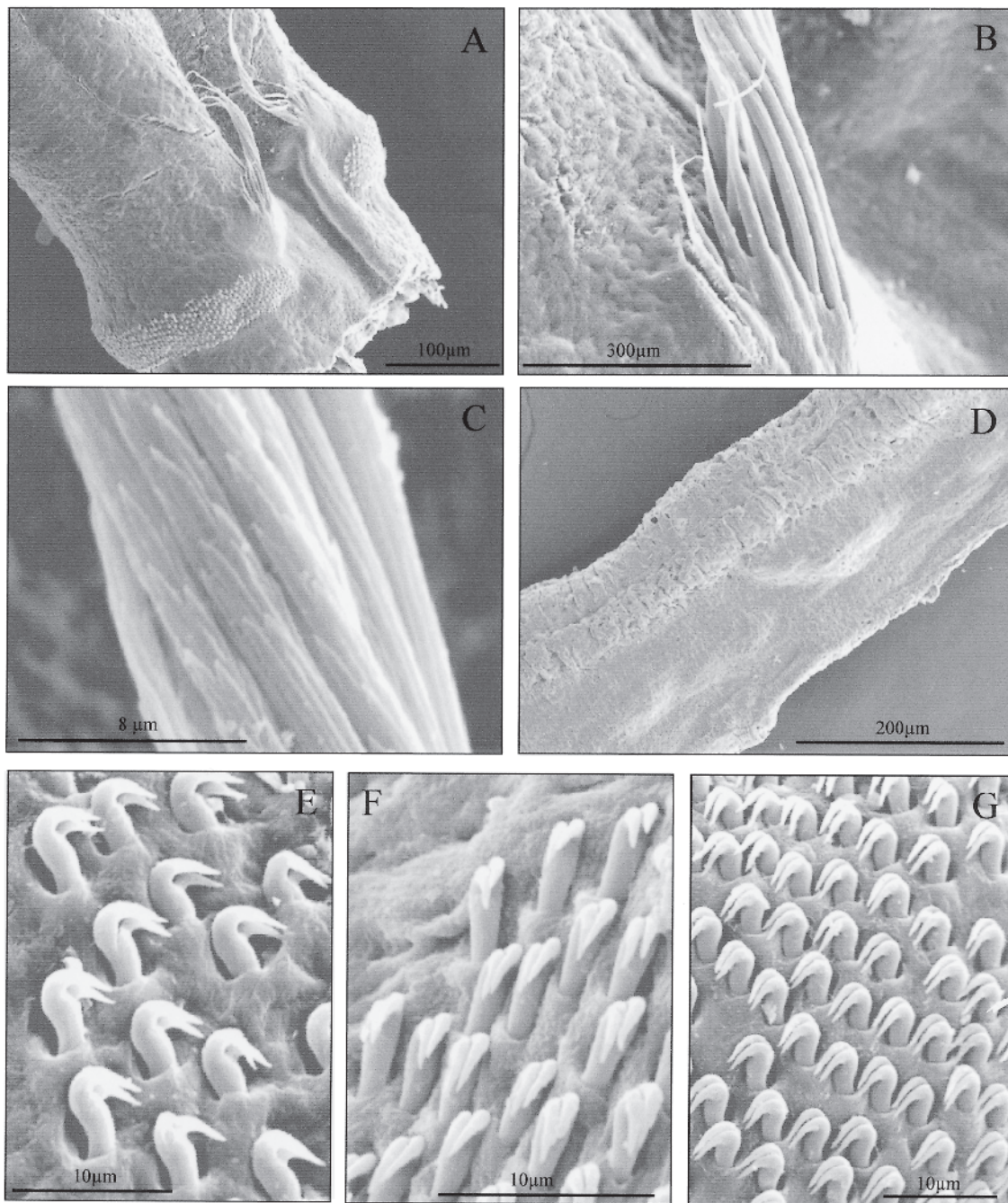


Figure 2. *Galathowenia australis* (Grube, 1866). SEM micrographs of paralectotype (ZMB 11170 d). **A.** dorso-lateral view of a mid-body chaetiger. **B.** detail of a short capillary notochaetae. **C.** detail of spinules covering of long capillary notochaetae. **D.** general view of ventral glandular rows. **E-G.** lateral, frontal and fronto-lateral view of neuropodial uncini.

Figure 2. *Galathowenia australis* (Grube, 1866). Vues en microscopie à balayage d'un paralectotype (ZMB 11170 d). **A.** vue dorso-latérale d'un segment sétigère du milieu du corps. **B.** détail des courtes soies capillaires d'un notopode. **C.** détail des spinules présentes sur les longues soies capillaires d'un notopode. **D.** vue générale des rangées ventrales glandulaires. **E-G.** vues latérales, frontales et fronto-latérales des uncini d'un neuropode.

Galathowenia Kirkegaard, 1959; therefore *Psammocollus* should be considered a senior subjective synonym of

Galathowenia. A strict application of the Code would require accepting the name *Psammocollus* for the species

Table 1. Comparison of some morphological characters, bathymetry and geographical distribution in twelve species belonging to genus *Galathowenia*.
Tableau 1. Comparaison de quelques caractères morphologiques, de la bathymétrie et de la distribution géographique de quelques espèces du genre *Galathowenia*.

Species	References	Size	Chaetigers	Eye-spots	TC	RLTC	EC	TAHC	Pygidium	Tube covering	Bathymetry	Type locality
<i>G. africana</i> Kirkegaard, 1959	Kirkegaard (1959)	50-70 x 0,5	3:35	Yes	No?	1 : 1 : 1	n.d.	n.d.	"No anal cirri"	Sand grains	32 to 42	West Africa
<i>G. australis</i> (Grube, 1866)	This study	15x1	3:13-15	No	No	2 : 2 : 1	4th-6th	Obliquely arranged	2 blunt lobes	Sand grains	n.d.	St. Paul Island (Indian Ocean)
<i>G. eurystoma</i> (Caulley, 1944)	Caulley (1944) Gibbs (1971)	15 x 0,5 (a.f.)	n.d.	Yes	No	1 : 1 : 1	n.d.	n.d.	n.d.	Sponge spicules	32 to 1570	East Indies
<i>G. fragilis</i> (Nilsen & Holthe, 1985)	Nilsen & Holthe (1985) ; Parapar (in press)	30 x 0,8	3:22	No	Yes	1 : 2 : 1	5th - 6th	Obliquely arranged	5 - 6 lobes	Sand grains, foraminifers and sponge spicules	800 to 2600	Boreo-Arctic
<i>G. haplosoma</i> (Gibbs, 1972)	Gibbs (1972)	4,0-7,5 x 0,15-2,0	n.d.	Yes	No	1 : 1 : 1	4th - 6th	Obliquely arranged	2 blunt lobes	Coralline sand grains	1 to 5	Cook Islands (Central Pacific)
<i>G. joinvillensis</i> (Hart.-Schr. & Ros., 1989)	Hartmann-Schröder & Rosenfeldt (1989)	36 x 1,2	2:28	No	No	1 : 1	4th - 6th	Obliquely arranged	about 10 short lobes and 1 larger dorsal	Sand grains	68 to 458	Joinville Island (Antarctica)
<i>G. longicollaris</i> (Hart.-Schr. & Ros., 1989)	Hartmann-Schröder & Rosenfeldt (1989)	15 x n.d.	3:18	No	Yes	1 : 2 : 4	4th - 8th	Obliquely arranged	n.d.	Sand grains	68	Bransfield Strait (Antarctica)
<i>G. oculata</i> (Zachs, 1922)	Nilsen & Holthe (1985) ; Parapar (in press)	30 x 0,6	3 : 21-31	Yes	No	1 : 1 : 1	5th	Obliquely arranged	2 blunt lobes	sand grains	12 to 2500	Borso-Arctic
<i>G. pilizi</i> Blake, 2000	Blake (2000)	27 x 0,5	3:29	No	No	1 : 1 : 1	4th - 6th	Obliquely arranged	2 large dorsal lobes and 2 low lateral lobes	Small clear sand grains and sponge spicules	92	Santa Maria Basin (California)
<i>G. pygidialis</i> (Hartman, 1960)	Blake (2000)	57-90 x 0,65-1	3:39-40	No	Yes	1,5 : 1 : 1	5th - 7th	Side by side at same levels	7 to 9 short lobes	Clear and dark sand grains	> 2000	California and Baja California (Mexico)
<i>G. scotiae</i> (Hartman, 1978)	Parapar (2001)	32-64 x 1,0-1,5	3:22-25	No	Yes	1 : 2 : 1	4th - 8th	Obliquely arranged	5 - 11 short lobes	Sand grains	48 to 1592	Antarctica
<i>G. terranovensis</i> (Cantone & Di Pietro, 1998)	Cantone & Di Pietro (1998)	10 x 0,3	3:14	No	Yes	1 : 2 : 1	5th - 6th	Obliquely arranged	Three small ventro-lateral and two minute dorsal lobe	Sand grains and sponge spicules	120 to 332	Terra Nova Bay (Antarctica)

TC : Thoracic constriction ; RLTC : Relative length of thoracic chaetigers ; EC : Elongated chaetigers ; TAHC : Teeth arrangement on hooked chaetae. Size : mm in length / width ; Chaetigers : thoracic/abdominal ; n.d. : no data ; a.f. : anterior fragment. Some bibliographic data, not explicitly referred by authors, are personally extracted from description and/or illustrations of species.

now included in *Galathowenia*, but *Psammocollus* is currently included in the *List of Rejected and Invalid Names in Zoology* (BZN, 1991). In my opinion, the conservation of *Galathowenia* is essential in order to maintain nomenclature stability for this cosmopolitan and widely accepted genus.

Whether or not *Galathowenia* Kirkegaard, 1959 should be considered a junior synonym of *Myriochele* Malmgren, 1867 is widely debated today. Although I did not examine the type material of *G. africana* (type species of *Galathowenia* by monotypy), in view of its original description (Kirkegaard, 1959, 67, fig. 17), I still consider the shape of the head region, anteriorly truncated with a prostomium forming a low collar, as the main diagnostic character in *Galathowenia* as opposed to the rounded head in *Myriochele* (Parapar, 2001, in press).

Three oweniid species belonging to the genus *Galathowenia*, were previously described in the Antarctic-Subantarctic seas: *G. scotiae* (Hartman, 1978), *G. longicollaris* (Hartmann-Schröder & Rosenfeldt, 1989) and *G. joinvillensis* (Hartmann-Schröder & Rosenfeldt, 1989). Two species are now considered junior synonyms of *G. scotiae* in keeping with Parapar (2001): *G. wilsoni* Blake, 1984 and *G. terranovensensis* (Cantone & Di Pietro, 1998) - both of them also originally described from the Antarctic seas. *Galathowenia australis* differs from these species in that it has two types of notopodial capillary chaetae (long and coated with spinules, and short and smooth). Moreover, *G. australis* also differs from *G. longicollaris* owing to the fact that it has a shorter head region; from *G. joinvillensis* in that it has three thoracic chaetigers instead of two, and from *G. scotiae* as it has two blunt pygidial lobes instead of 5-11.

Blake (2000) has recently reported two galathowenid species from California and Mexico: *Galathowenia piltzi* Blake, 2000 and *G. pygidialis* (Hartman, 1960). Both species also differ from *G. australis* in the absence of notopodial short and smooth (= acicular) chaetae and in the shape of the pygidium and number of pygidial lobes.

The high variability in the shape of the prostomium depending upon the degree of distension during preservation, would seem to be a common trait in this genus. This characteristic, observed in *G. australis* (see Fig. 1 A-C), was also reported in *G. oculata* (Martín, 1989, Fig. 3 a-d), *G. pygidialis* (Blake, 2000, Fig. 5.3. b-c) and *G. scotiae* (Parapar, 2001, Fig. 1 f-g).

The presence of two kinds of notopodial capillary chaetae (long and short) in *G. australis* invalidates the use of the character “*Notopodial fascicle with [long] capillary setae only*” in the diagnosis of the genus *Galathowenia* proposed by Parapar (2001, pg. 412). The existence of short capillary chaetae (acicular notochaetae *sensu* Nilsen & Holthe, 1986 and Parapar, 2001) - a highly prevalent trait in the genus *Myriochele* - may also be similarly widespread in *Galathowenia*, but may have been overlooked in many

species. Only a revision of the genus *Galathowenia*, whose main diagnostic character appears to be “*Prostomium collar like, with terminal mouth, midventral oral cleft or slit concealed by overlapping ventral membranes*” (Blake, 2000, pg. 102), will it be possible to shed light on the real presence of this character in the group. Other characters that seem to be widespread in the genus (see Table 1) are the presence of three thoracic chaetigers (except *G. joinvillensis*), elongated abdominal chaetigers, and abdominal hooks with teeth obliquely arranged (except *G. pygidialis*).

The partial review of some morphological and ecological characteristics of twelve species belonging to the genus *Galathowenia* (Table 1) would suggest that there are two groups characterized by presence/absence of eye-spots and thoracic constriction (TC), relative length of thoracic segments (RLTS) and shape of the pygidial lobes. The first group, composed of *G. africana*, *G. eurystoma*, *G. haplosoma* and *G. oculata*, is characterized by the presence of eyes, no TC, RLTS = 1:1:1, and the presence of 2 blunt lobes in the pygidium. Although in the original description of *G. africana* the author does not suggest the presence of a thoracic body constriction, it does, in fact, appear to exist (Kirkegaard, 1959, Fig. 17b). Moreover, the description of the pygidium with “no anal cirri” would probably correspond to a two blunt lobes pygidium type (there are no original figures and no type material was examined). The second group, composed of *G. fragilis*, *G. longicollaris*, *G. pygidialis*, *G. scotiae* and *G. terranovensensis*, is characterized by the absence of eyes, the presence of TC, RLTS different from 1:1:1, and a large number of short pygidial cirri (no data for *G. longicollaris*). As happens with *G. joinvillensis* and *G. piltzi*, it is not possible to assign *G. australis* to either of these groups; they may belong to a third group without eyes or TC. In any event, only a cladistic analysis in the framework of a review of the genus *Galathowenia*, will be able to shed light on the true phylogenetic affinities among the species, which is not within the scope of this work.

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