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***PNEUMODERMA HERONENSIS* NOV. SP.: A NEW PTEROPOD (OPISTHOBRANCHIA; GYMNOSOMATA) FROM AUSTRALIAN WATERS**

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ABSTRACT

In April 1987, seven specimens of a new species of the gymnosomatous pteropod, *Pneumoderma heronensis*, were collected from surface waters between Heron and Wistari Reefs, southern Great Barrier Reef, Australia (23° 27'S 151° 55'E). Additional specimens were identified from CSIRO plankton collections from the Northwest Shelf, Western Australia (19° 25'S 119° 30'E). This new species is described and illustrated from living specimens. Uniquely, *P. heronensis* possess 12 lateral buccal arm suckers, arranged alternately in two rows. Morphological comparisons are made with closely related species; *P. mediterraneum* (Van Beneden, 1838), *P. atlanticum atlanticum* (Oken, 1815) forma *eurycotylum* (Meisenheimer, 1905) and *P. degraaffi* Spoel & Pafort-van Iersel, 1982.

INTRODUCTION

Pneumodermatidae are rare within Australian waters, only three species have been previously reported. *Pneumoderma mediterraneum* (Van Beneden, 1836) is known from the Great Barrier Reef and Arafura Sea (Russel & Coleman, 1935; Spoel, 1976). *Pneumoderma paucidens* (Boas, 1886) and *P. spoeli* Newman and Greenwood, 1988 occur within Great Barrier Reef waters (Newman & Greenwood, 1988). The family Pneumodermatidae is distinguished from all other gymnosomatous pteropods by the presence of acetabuliferous (sucker bearing) lateral buccal arms. In the genus, *Pneumoderma* the median buccal arm is reduced or lacking, and both lateral and posterior gills are fringed (Van der Spoel, 1976). Spe-

cies are distinguished by the number of lateral buccal arm suckers, the number of lateral radula teeth, and the arrangement of the gills.

METHODS

All specimens were collected *situ* while SCUBA diving or by dipnet from surface waters of Heron Island. Animals were immediately relaxed with Ms222 and four specimens everted their buccal apparatus within 20 minutes. Radulae were dissected out, soaked in 10% KOH for 24 hours, sonically cleaned and prepared for light microscopy and scanning electron microscopy. Hooksacs were stained with acid fuchsin and mounted for light microscopy.

Pneumoderma heronensis nov. sp.**Material examined**

Holotype: Collected while SCUBA diving from surface waters off the north side of Heron Reef on April 19, 1987. The animal was sexually mature and measured 12.5 mm in length when relaxed (Australian Museum C# 156728).

Paratypes: Six paratypes were collected by dipnet from surface waters off the northeast side of Wistari Reef (23° 27'S 151° 55'E) on April 20, 1987. Relaxed body lengths ranged from; 10.9 to 15.9 mm. All specimens are preserved in buffered 5% formalin and lodged at the Australian Museum, Sydney Australia C# 156729 - 156732, and the Institute for Taxonomic Zoology, University of Amsterdam ITZ, ZMA. Moll. 389010.

Type Locality

North side of Heron Reef, southern Great Barrier Reef, off Gladstone, Queensland, Australia (23° 27'S 151° 55'E); bottom dept approximately 20 m.

Twenty-three specimens were identified from CSIRO plankton samples, collected on October 27, 1983 from the Northwest Shelf, of Western Australia (19° 25'S 119° 30'E). Lengths of these contracted specimens (stored in 70% ethanol) ranged from 5.85 to 10.2 mm.

DESCRIPTION

The extended body is barrel shaped, with brown and black chromatophores over all surfaces excludng the wings. The median footlobe is long and pointed; the lateral footlobes joint at the anterior margin. The wings are short, and broad distally. The lateral gill is well developed and fringed. The posterior gill is fringed, with four radiating crests that join medially. The visceral mass does not extend to the posterior end of the body (fig. 1A). All specimens had developed ovotestes, as seen through the body wall.

The everted buccal apparatus displays two lateral arms with 12 stalked suckers arranged alternately in two rows (fig. 1B). The suckers are flat, disc-shaped, on short stalks and unequal in size. The largest suckers (up to 1 mm in diameter) are situated medially on the buccal arm and the terminal four to live suckers are extremely small. The proboscis can extend to the same length as the body and, uniquely, bears two short 'tentacles' medially. The hooksacs are long, approximately one-half to two-thirds the length of the

proboscis. Each hooksac is armed with numerous (approximately 100) fine hooks. The hooks are arranged in four longitudinal rows along the inner margin, decreasing in size towards the proximal end; even smaller hooks are distributed over the entire surface of the hooksac (fig. 1C). The radula formula is 6-0-6, with 23- 25 rows (fig. 2A & B).

REMARKS

Pneumoderma heronensis closely resembles *P. mediterraneum* which has been previously reported from the Great Barrier Reef (Russel & Coleman, 1935). The major difference between these species is in the number of lateral buccal arm suckers, there being 7 suckers per arm in *P. mediterraneum* and 12 in *P. heronensis*. The arrangement of these suckers also differs between species as they alternate in two rows in *P. heronensis*, but are arranged in a single row in *P. mediterraneum*. Russel & Coleman (1935) noted that the lateral arm in their one specimen was only partially extended. Without dissection, these authors may not have observed all the suckers present and hence mistakenly ascribed it to *P. mediterraneum*. Additionally, Tesch (1950) noted that there is an increase in the number of suckers with age in Pneumodermatidae. However, *P. heronensis* cannot be confused with *P. mediterraneum*, as adults of the latter species have fewer suckers despite their greater body size (length 20 mm; Van der Spoel, 1976).

The two formae of *P. atlanticum* have between 8 to 16 suckers on each lateral buccal arm. Forma *eurycotylum* (Meisenheimer, 1905) differs from *P. heronensis* in having a reduced number of lateral radula teeth, a median radular tooth, a rounded median footlobe, and only the posterior gill is fringed. Forma *pygmaeum* (Tesch, 1903) differs in possessing four lateral radular teeth, a short lateral gill, eight suckers, and being small in size (length 3 mm; Van der Spoel, 1976).

Pneumoderma heronensis differs from *P. degraaffi* in possessing twice the number of buccal suckers (stalked), whereas in the latter, the suckers are attached to the buccal wall. The radula formula also differs, whereby in *P. heronensis* there is double the number of lateral teeth (Van der Spoel & Pafort-van Iersel, 1982).

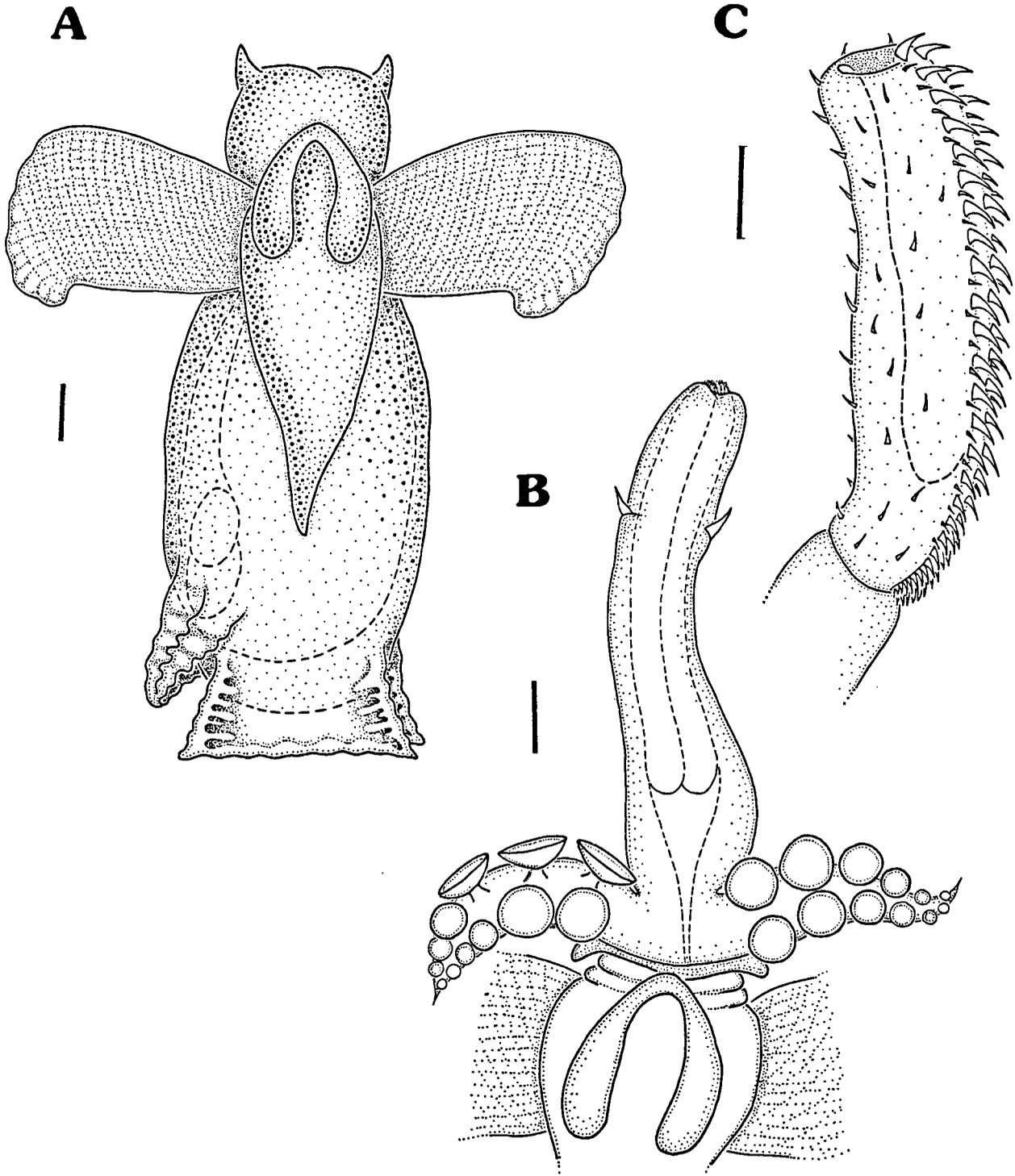


Fig. 1 *Pneumoderma heronensis* nov. sp. A, holotype, whole animal; B, paratype, everted buccal apparatus, C, partially everted hooksac, Northwest Shelf (bar= 1 mm).

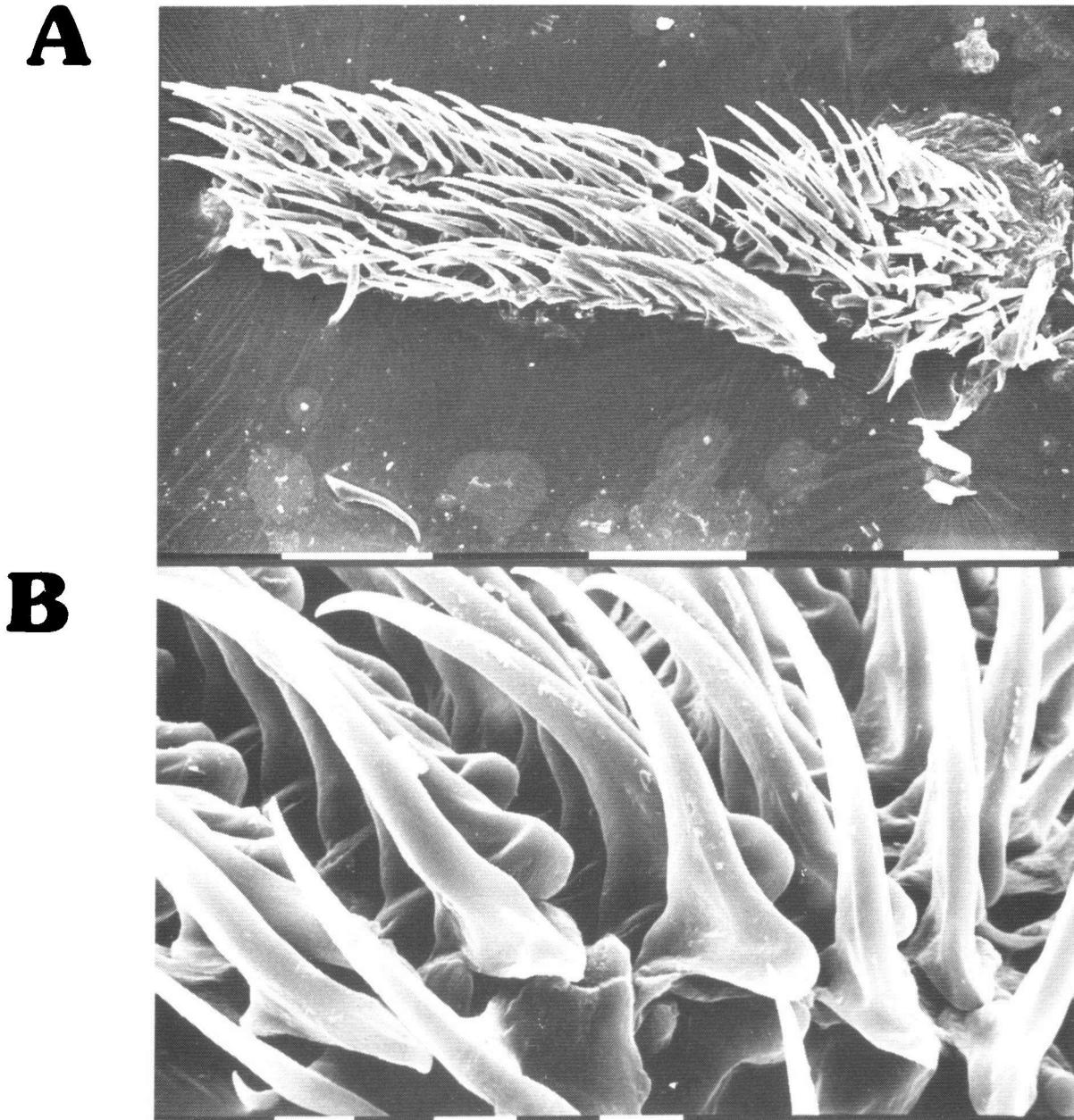


Fig. 2 Scanning electron micrograph of the radula of *Pneumoderma heronensis* 20 KV: A, one complete side of the radula, bar= 0.1 mm; B, details of the lateral radular teeth, bar- 0.01 mm.

BIOLOGY

Heron Island specimens were observed *in situ*, within a plankton swarm of predominantly ctenophores, larvae, siphonophores and the euthecosomatous pteropod *Diacavolinia longirostris* forma *longirostris* (Blainville, 1821). The Northwest Shelf specimens were also found in samples full of *D. longirostris* forma *longirostris*. Gymnosomes are carnivorous and their selective feeding on euthecosomatous pteropods has been investigated by Lalli (1970a & b). Boas (1886) found specimens of *Pneumoderma* with *Cavolinia tridentata* in their guts. It is assumed that *P. heronensis* were feeding on the abundant euthecosome *D. longirostris* f. *longirostris* both at Heron Island and off the Northwest Shelf.

These gymnosomes were observed, to be rapid swimmers, frequently avoiding capture by a SCUBA diver or dipnet. Paratypes were only successfully captured by using a dipnet at the surface and following individuals from a dinghy.

Etymology

The specific name *heronensis* is given in honour of the Heron Island Research Station (a facility of the University of Queensland), Gladstone, Queensland, Australia.

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