

A redescription of the sea hare *Aplysia gigantea* Sowerby, 1869

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ABSTRACT

Aplysia gigantea is the largest species in Australia of the opisthobranch genus *Aplysia* but is poorly known. The species is redescribed using live collected material.

INTRODUCTION

Sea hares of the family Aplysiidae are the largest of living opisthobranchs (Thompson, 1976). Species of the genus *Aplysia* occur throughout the world in tropical and, to a lesser extent, temperate waters. In her revision of the world species of *Aplysia* Eales (1960) recognized 34 species, 70% of which were included in the subgenus *Varria*. One of these, *A. gigantea*, is a poorly known species endemic to Western Australia. *A. gigantea* was described by Sowerby (1869) from three shells from "Swan River," which was the early name for Western Australia. O'Donoghue (1924) later had two specimens available from Fremantle and discussed them in his paper on the opisthobranchs from the Houtman Abrolhos. Hedley (1916), Thiele (1930), Allan (1950) and Kandel (1979) all mentioned the species briefly. Eales (1960) examined the two specimens of O'Donoghue, but had no other material available. Bebbington (1979) examined the same two *A. gigantea*. There are apparently no other literature references to *A. gigantea* which discuss additional specimens and the species is poorly known scientifically. In fact *A. gigantea* is regularly encountered during summer on intertidal platforms at Rottnest I. and is common enough to be used by university zoology students for class dissections. It is occasionally washed onto local beaches during summer or early autumn, prompting public enquiries about "livers" on the beaches. In view of the lack of published information of *A. gigantea* further data are provided here.

***Aplysia (Varria) gigantea* Sowerby, 1869**
Conch. Icon. 17 (*Aplysia*), species 1

Material examined:

Syntypes: British Museum (Natural History) 1958.1.9. 260-262 (shell only).

O'Donoghue's (1924) topotypes: BM(NH) 1923.1.26. 10-11.

W.A. Museum material (Figure 1): (p, preserved animal; s, shell only).

Duke of Orleans Bay (p); Cheyne Beach (p); Blackwood River, Augusta (s); Canal Rocks (s); Garden I. (p); Woodman Pt. (p); South Fremantle (s); Rottnest I. (p); Gun I., Pelsart Group, Houtman Abrolhos (p); Beacon I. (p) and West Wallabi I. (p), Wallabi Group, Houtman Abrolhos; West of Bluff Pt. (p).

Range:

South western corner of Western Australia only, from Duke of Orleans Bay, east of Esperance to Bluff Point, north of Geraldton. The species has been collected at depths ranging from the intertidal zone to 180 m.

Description:

The immediate feature of *A. gigantea* is the massive size of the adults, up to 60 cm long with a stout body, high back, and large, rounded parapodia (Figure 2). All measurements refer to WAM 2095-83, a specimen collected at Gun I., Pelsart Group, Houtman Abrolhos in April 1976. When preserved the animal was 26 cm long, 12 cm high and 9 cm wide. In life the animals are a uniform dark brown or black in colour. When preserved or washed up on the beach the external colour is easily removed, revealing an off-white underlying colour. The secretion is purple.

The head is broad with a moderately long neck. The cephalic tentacles are wide, 10 cm across, and fleshy. They are triangular and reach a definite point. The tentacles do not meet in the centre, but attach to the side of the head above the mouth. The right cephalic tentacle overlies the male opening. The penis is small and blade shaped. The rhinophores are well back on the neck, just posterior to the eye and are about 2 cm apart. The rhinophores are about 25 mm long, originating at a width of about 5 mm and tapering to a fine point. The outer edge is bifurcated to form a shallow groove.

The foot is broad, about 5 cm wide, muscular and not well separated from the parapodia, but the junction between the foot and the base of the head is distinct. The foot extends the full length of the body posteriorly from the head and protrudes a short distance behind the parapodia. The parapodia are large, emerge separately on the dorsal surface of the body, behind the neck and are fused only at their posterior margin. The parapodia are long, extending 9 cm above the mantle cavity in the preserved animal and are strong enough that the animal can swim for short distances. They are thin and uneven at the margins. The parapodia are easily separated to reveal a voluminous mantle cavity and visceral hump inside.

The mantle cavity is well back in the body. The common genital pore is located at the right anterior margin of the visceral mass. The sperm groove originating at the common genital pore is distinct and extends forward along the right side of the neck to the penial opening on the right side of the head. The opening of the opaline gland is uniporous. The shell is located at the left posterior corner of the mantle cavity and completely covers the underlying viscera. A small aperture occurs over the centre of the shell. The tissue overlying the shell is black and the shell itself is not visible in life. The anus is on a small spout at the posterior of the visceral mass.

The shell (Figure 3) is thin, horny and uncalcified, light brown in colour and flexible, though it is brittle when dried out. The shell of WAM 2095-83 is 9.5 cm long, 8 cm wide and convex with a height of 2 cm. Concentric growth lines are easily seen on the surface. The anterior margin of the shell is rounded into a semi-circle. The apex, at the posterior end, is broadly pointed and there is a distinct concave anal notch to the right of the apex.

The buccal mass is large and muscular with a large set of jaws. The radula is almost square with about 65 rows of teeth. One specimen (WAM 703-85) had a formula of 53.1.53. The specimen examined by O'Donoghue (1924) had 83-85 rows of teeth and a maximum of 59 lateral teeth. The rachidian tooth (Figure 4A) has flat basal plate that is subtrapezoidal in shape with a deep notch along its anterior margin. The tooth itself is bilaterally symmetrical with about five fine denticulations on its outer margin. These are smallest at the tip and increase in size down the side of the tooth. The first lateral tooth (Figure 4A) has an almost rectangular basal plate. The teeth are divided, with

a major cusp in the centre, large denticle on the outer side, and a smaller denticle on the inner side. All bear finer denticulations. Middle lateral teeth (Figure 4B) have relatively larger and more pointed denticles and are serrated in appearance. The inner and outer denticles are also more distinct. Towards the outer edge of the row the teeth lose their denticles but still have serrated margins. The radula is clearly different from that figured by Bebbington (1977), which must have been from a different species.

Biological notes:

A. gigantea appear to come into shallow water in summer and early autumn to spawn, and can be found most often from about January to March though specimens have been collected at other times of the year. During the summer strandings of hundreds of animals can be encountered on the beach. When this happens few or none can be observed alive subtidally. *A. gigantea* can be collected live in small numbers in good condition on the platforms at the western end of Rottnest I.

A copulating group of animals was observed at Canal Rocks on a rock bottom overlaid with sand at a depth of 21 m on 16 April 1985. Where rock was present it was overgrown with the macroalga *Ecklonia*. Mating groups of 2, 3, 5, 8, and 17 individuals were found, with each animal climbing up the back of the one in front and acting as a male for it. Spawn are typically aplysiid and are orange in colour.

Other species:

A. gigantea co-occurs with at least five other species of the subgenus *Varria* in Western Australia: *A. denisoni* Smith, 1884; *A. oculifera* Adams and Reeve, 1850; *A. reticulata* Eales, 1960; *A. sydneyensis* Sowerby, 1869; and *A. dactylomela* Rang, 1828. The first four of these species are small (under 15cm long) and thus cannot be confused with *A. gigantea*. *A. dactylomela* reaches at least 25cm in W.A. but can be distinguished from *A. gigantea* by its shorter head and neck and green colour. The characteristic feature of *A. dactylomela* is 20 to 30 dark brown or black circles, each with a diameter of up to 25mm, scattered over the body surface. No such circles occur on *A. gigantea*.

Status of *A. tasmanica*:

In her revision of *Aplysia*, Eales (1960) also recorded *A. gigantea* from New South Wales and Tasmania. This was apparently based on her belief that the holotype *A. tasmanica* Tenison Woods, 1876 (a shell only) was *A. gigantea*, though Eales apparently did not examine the holotype of *A. tasmanica*. Turner and Dartnall (1971) considered *A. tasmanica* to be a synonym of *A. sydneyensis* Sowerby, 1869. I have examined the holotype of *A. tasmanica* (Figure 5), and it is clearly not the same species as *A. gigantea*. The shell of *A. tasmanica* is relatively thinner than that of *A. gigantea*, is narrower anteriorly, and lacks the anal notch of *A. gigantea*. Whole animals of *Aplysia* from Tasmania (Tasmanian Museum E 8253 and E 9010) appear to be conspecific with *A. sydneyensis* from Sydney as suggested by Turner and Dartnall (1971). Searches of the collections of the Australian Museum, Museum of Victoria, South Australian Museum and Tasmanian Museum by curators have revealed no specimens of *A. gigantea* from those states and the records of New South Wales and Tasmania for the species by Eales (1960) should be considered erroneous.

ACKNOWLEDGEMENTS

The following people from other museums are thanked for information and/or loan of specimens: K. Way (British Museum, Natural History); Dr. W.B. Rudman (Australian Museum); S. Boyd (Museum of Victoria); A. Green and E. Turner (Tasmanian Museum) and W. Zeidler (South Australian Museum). C. Bryce provided the photographs and a slide of a living animal from which the drawing of *A. gigantea* in life was done by R. Swainston. R. Burn and Dr R. Willan kindly criticised the manuscript.

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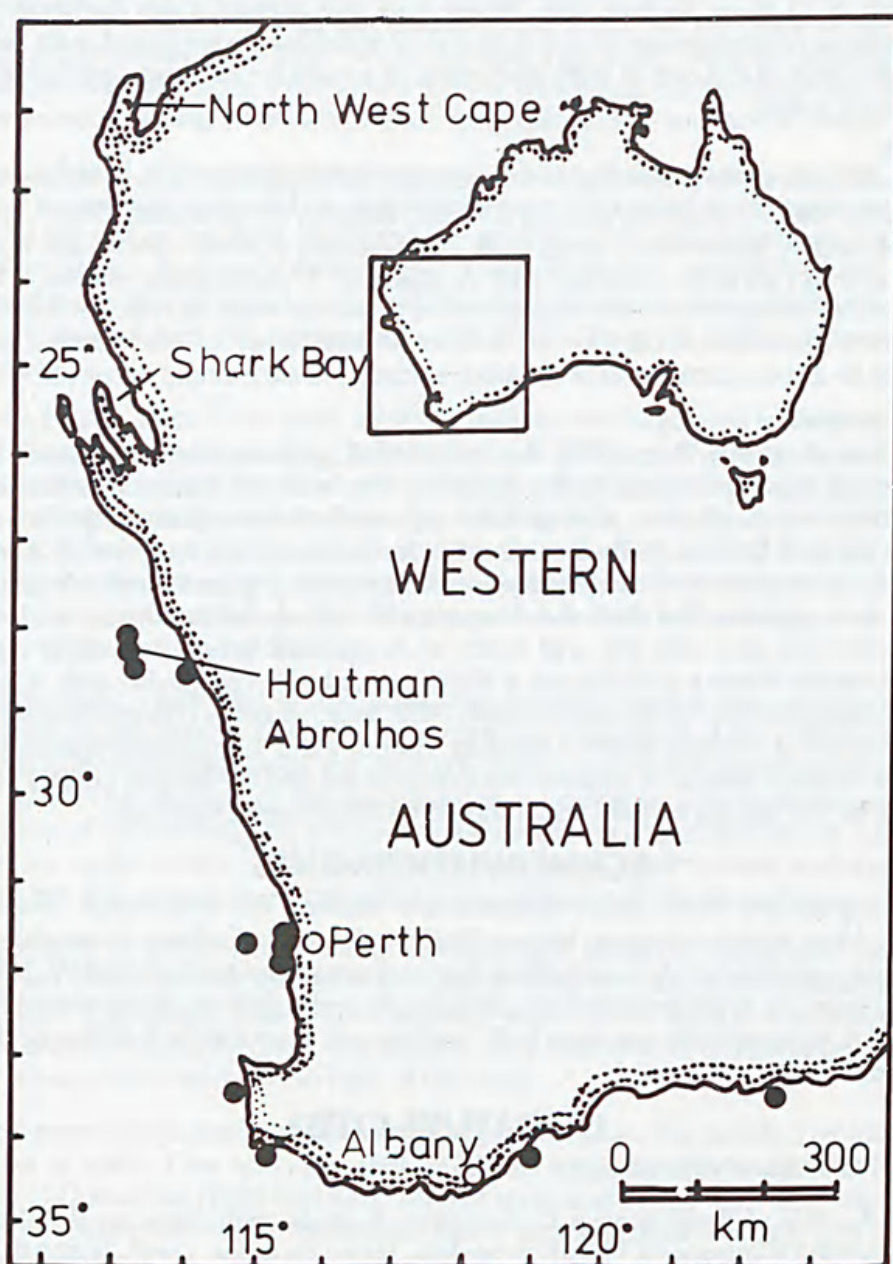


Figure 1. Map of southern Western Australia showing localities at which *Aplysia gigantea* has been collected.

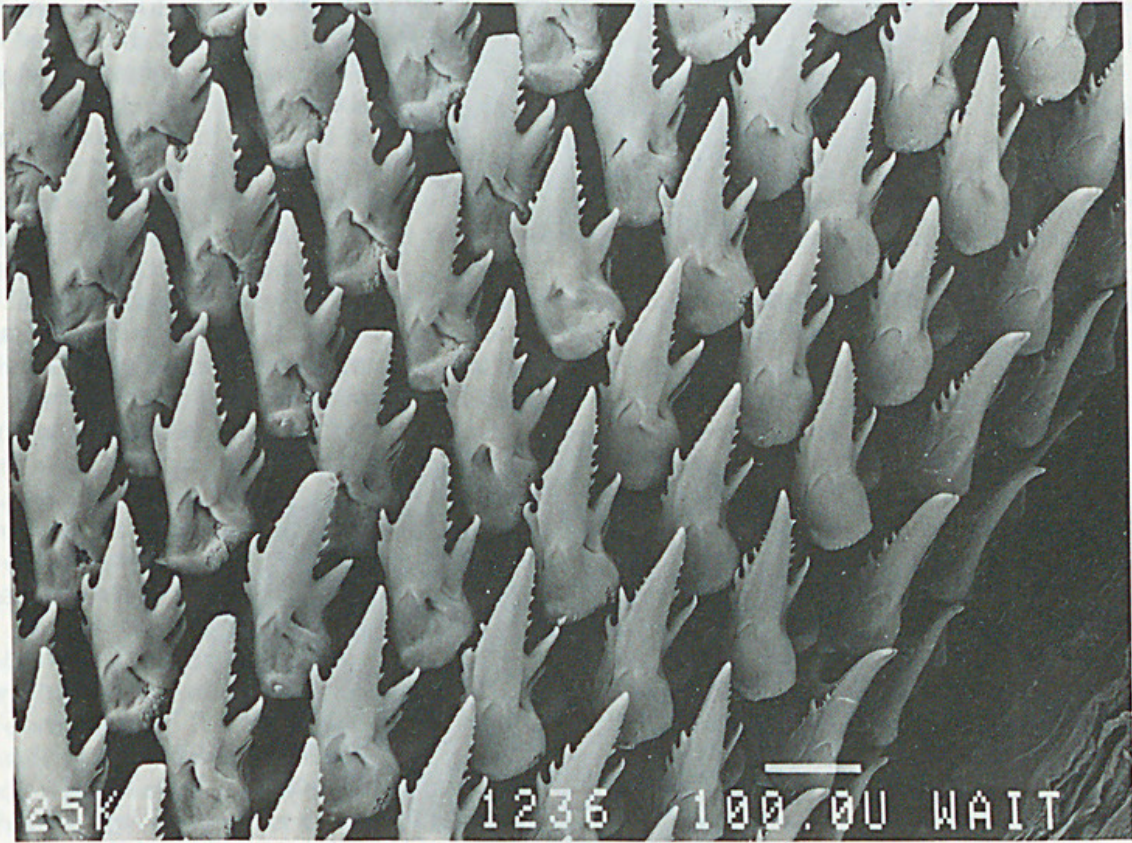
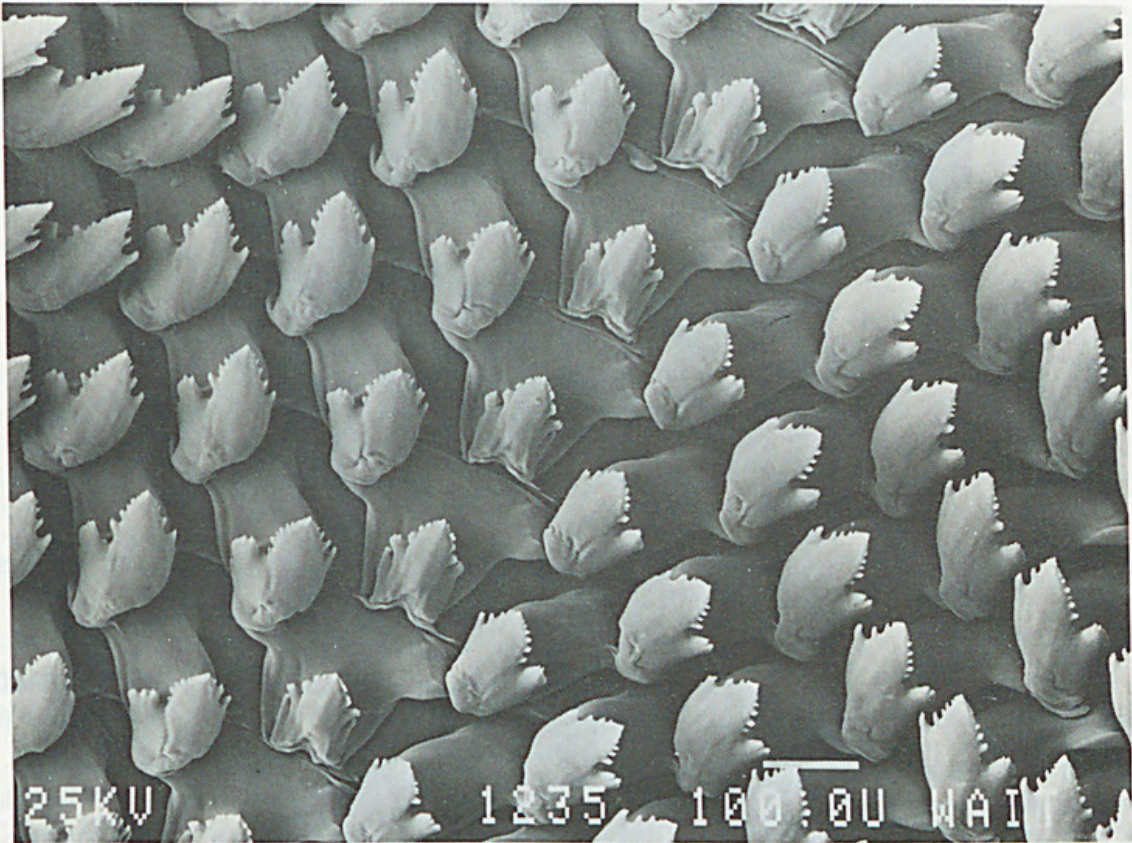


Figure 4. Radula of *Aplysia gigantea* (WAM 114-85) X1200. A. Rachidian and central lateral teeth. B. Outer lateral teeth.

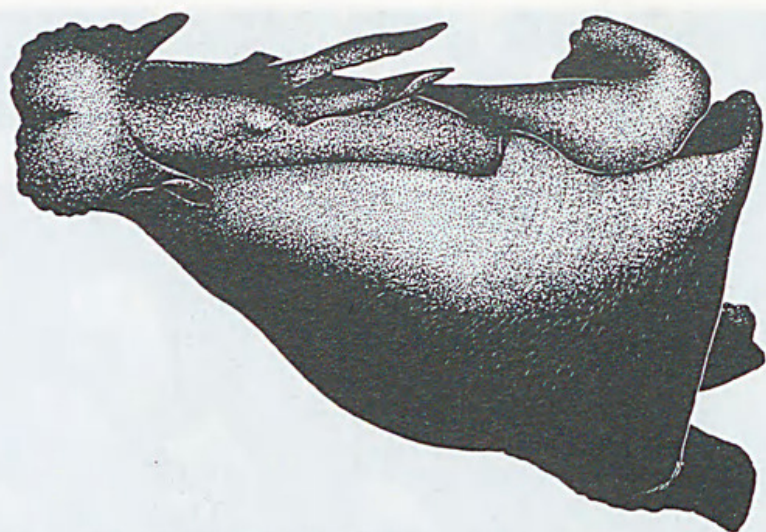


Figure 2. Drawing of *Aplysia gigantea* (WAM 114-85) in life. The 25cm long specimen was collected at Duke of Orleans Bay on 26 February, 1985.

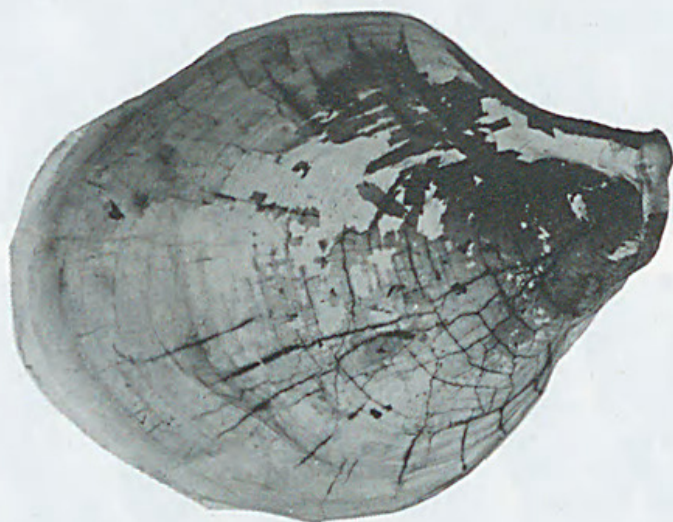


Figure 3. Shell of *Aplysia gigantea* (WAM 114-85). XI.



Figure 5. Holotype of *Aplysia tasmanica* (Tas. Mus. E 1198/8539).



Wells, Fred E. 1986. "A redescription of the sea hare *Aplysia gigantea* Sowerby, 1869." *Journal of the Malacological Society of Australia* 7(3-4), 173–178.
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