

1969

SWIMMING CRABS (CRUSTACEA,
DECAPODA, PORTUNIDAE) FROM
ONE TREE ISLAND, CAPRICORN
GROUP, QUEENSLAND

by

D. J. G. GRIFFIN

**RECORDS OF
THE AUSTRALIAN MUSEUM**

**Vol. 27, No. 19. Pages 349-354.
Plates 47-49. Figure 1.**

SYDNEY

21st March, 1969

Price, 35c

LIBRARY
DIVISION OF CRUSTACEA

CARDED

Printed by Order of the Trustees

SWIMMING CRABS (CRUSTACEA, DECAPODA, PORTUNIDAE) FROM ONE TREE ISLAND, CAPRICORN GROUP, QUEENSLAND

By D. J. G. GRIFFIN

Australian Museum, Sydney

Plates 47-49. Figure 1.

Manuscript received, 16th April, 1968

Two species of portunid swimming crab, *Charybdis* (*Goniosuhradens*) *obtusifrons* Leene and *Thalamitoides quadridens* A. Milne Edwards, are recorded from Australia for the first time and a species of *Portunus* considered to belong to *P. longispinosus* (Dana) is recorded from Australia for the second time; the status of Australian specimens of this species is discussed. The ecological distribution on One Tree Island of these three species and eight other portunids collected in 1966 and 1967 by Australian Museum expeditions is briefly discussed.

INTRODUCTION

One Tree Island forms part of the Capricorn Group straddling the Tropic of Capricorn at the outer edge of the southern part of the Great Barrier Reef (see Gillett and McNeill, 1967: pls 16, 17). During October–November, 1966, and September–October, 1967, parties from the Australian Museum led by Dr F. H. Talbot spent about 10 weeks on the island (see Talbot, 1967). The main purpose of these expeditions was to investigate several aspects of the ecology of the coral reef fishes. The opportunity was taken on both occasions to collect decapod Crustacea from the lagoon with the aid of a small triangle dredge and from various parts of the reef crest by hand; they were also taken from coral samples both inside and outside the reef and, by SCUBA diving, they were collected, along with fishes within the lagoon and from the outer face of the reef. Eleven species of portunid swimming crabs were collected by these two expeditions; three species are dealt with in detail in this report. Notes are given on the ecological distribution of the eleven species on One Tree Island.

The references for each species include the first description and the most recent accounts. The measurement given is of carapace width (c.w.) unless otherwise indicated and was taken with dial calipers; carapace length is abbreviated as c.l. Drawings were completed with the aid of a camera lucida. All specimens have been placed in the collections of the Australian Museum (A.M.).

I wish to thank Mr and Mrs D. W. Kinsey, who accompanied the 1967 expedition, for collecting several of the specimens dealt with here. I am indebted to Professor W. Stephenson (University of Queensland, Brisbane) for his advice and comments and for making available unpublished manuscripts. I am grateful to Dr J. C. Yaldwyn (Australian Museum) for reading the manuscript, and to Charles Turner (Australian Museum) and Anthony Healy for their care in taking a series of photographs of these crabs.

Family **PORTUNIDAE**Subfamily **PORTUNINAE** Stephenson and Campbell, 1960Genus **Portunus** Weber, 1795**Portunus longispinosus** (Dana)

Figs 1 a, b. Pls 47, 48

Amphitrite longi-spinosa Dana, 1852a: 277-278; 1855: pl. 17 fig. 2a-c.*Portunus longispinosus*; Stephenson and Campbell, 1959: 104-106, figs 2F, 3F, pl. 2 fig. 2, pls 4F, 5F.*Material*: 1 ♂, c.w. 21.7 mm, c.l. 11.4 mm, lagoon, just north of western end of island, 4-20 ft, dredged, sand and shell fragments, 27th September, 1967, M. Cameron and D. J. G. Griffin (P.15770).

1 ♂, c.w. 24.3 mm, c.l. 11.7 mm, lagoon, off western side of island, 6-10 ft, dredged, sand and shell fragments, 10th October, 1967, M. Cameron and D. J. G. Griffin (P.15771).

Remarks: These two relatively very large males and the female from One Tree Island reported on by Stephenson and Rees (1968) agree with the Lord Howe Island material recorded by Stephenson and Campbell (1959) under the name *Portunus longispinosus* (Dana) in the following important features:

- 1, lateral frontal lobes much longer than medials and subacute;
- 2, last anterolateral spine in length about one quarter of the width of carapace exclusive of spines, the posterior edge weakly convex;
- 3, densely granular carapace, the granules round and mainly covering the numerous elevations but the groups barely discrete near the midline;
- 4, proximally strongly convex, distally straight, lateral borders of the penultimate segment of the abdomen;
- 5, weakly concave medial edge and rounded distal border of the merus of the third maxilliped; and
- 6, outwardly bent but distally straight first pleopod, the tip oblique, truncate and weakly flared, the lateral surface ("outer surface" of Stephenson and Campbell) with a dense array of spinules near the tip, spinules sparse elsewhere.

In addition there is precise agreement as to spines and ridges on the carpus and palm of the cheliped. There are eight or nine anterolateral spines including that forming the outer angle of the orbit, the fourth and the sixth being small or absent.

The only important differences from the Lord Howe Island material appear to be that the penultimate segment of the abdomen has the lateral margins parallel in the distal half, rather than gradually tapering or sinuous. The chelipeds are very long, ca 2.4 cl in the smaller, ca 2.7 c.l. in the larger, there are 4 or 5 spines on the anterior border of the cheliped merus, the most distal being well separated from the others; and finally, the last anterolateral spine projects backwards rather than outwards.

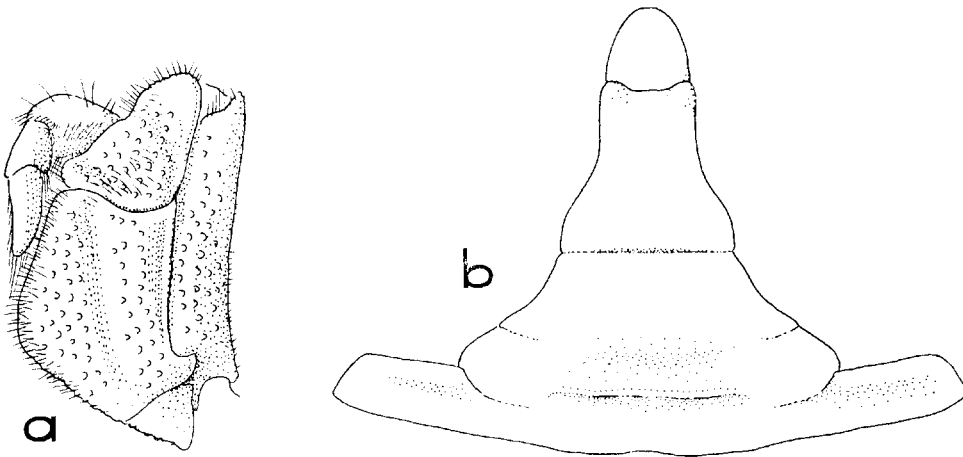


Figure 1. *Portunus longispinosus*, male, 24.3 mm. One Tree Island lagoon (AM P.15771): a, left third maxilliped; b, abdomen—segments 3-7

Until 1962 *P. longispinosus* was considered to occur throughout the Indo-west Pacific from Mauritius through New Caledonia and Fiji to Japan and Hawaii. Crosnier (1962:65), however, considered that both the Japanese and Hawaiian specimens, recorded by Sakai (1939) and by Rathbun (1906) respectively, were distinct from Dana's species. In this he was followed by Stephenson and Rees (1967: 28-31), who provided a key to the several species forming the difficult "*longispinosus* complex." Stephenson and Rees also regarded *P. longispinosus* Stephenson and Campbell as not clearly referable to Dana's species and preferred to consider the former as probably conspecific with *P. emarginatus* Stephenson and Campbell, originally recorded from northeastern Australia and now known also from Madagascar (see Crosnier, 1962: 66). Examination of the holotype of this last species shows that it differs in a number of features, which are surely reliable, from the Lord Howe Island and the present material referred to *P. longispinosus*. These include relative prominence of the lateral lobes, shape of the mcrus of the third maxilliped, shape of the penultimate segment of the abdomen in the male and shape and ornamentation of the first pleopod in the male. The action of Stephenson and Rees thus seems unwarranted.

The apparent differences between the Lord Howe Island and One Tree Island specimens and the description and figures by Dana are small enough, allowing for some inaccuracies in Dana's figures, to permit these Australian specimens to be regarded as referable to Dana's species. The only major apparent differences concern the granulation of the carapace: this is not mentioned in the description and the carapace is shown as smooth in the figure.

The characters given in keys to distinguish the Hawaiian and Japanese forms from the others until recently regarded as *P. longispinosus* do not seem reliable enough to allow specific distinction.

Distribution: Indian and western Pacific Oceans.

Genus **Charybdis** De Haan, 1833

Charybdis (Goniosupradens) obtusifrons Leene

Pl. 49

Charybdis (Goniosupradens) obtusifrons Leene, 1936: 124, figs 11-12; 1938: 140-143, figs 85-87. Crosnier, 1962: 84-85, figs 146, 146 *bis* a-c, pl. VI fig. 2. Stephenson and Rees, 1967: 13-14.

Material: 1 ♂, 57.6 mm, outer, southern face of reef, near island, about 70 metres from reef crest, on open, gently sloping coral bottom, 9 metres, 23rd September, 1967, F. H. Talbot and party (P.15768).

1 ♀, 28.6 mm, outer, southern face of reef, near island, about 40 metres from reef crest, at seaward lip of long gutter, 4 metres, 22nd September, 1967, F. H. Talbot and party (P.15769).

Remarks: The two specimens agree in all important features with the material described in detail by Leene (1938) and by Crosnier (1962). This is particularly true of the shape of the anterior and anterolateral teeth of the carapace, the presence of ridges on the dorsal surface of the carapace and the very distinctive form of the first pleopod in the male. The basal antennal article has a short crest proximally and several tubercles distally and around the base. The sixth segment of the abdomen of the male has the lateral edges parallel except distally (see Crosnier's fig. 146 *bis* c), not slightly divergent as illustrated by Leene (fig. 8) for De Man's "*C. erythrodactyla*." The six or more spines on the posterior border of the natatory propodus are regularly spaced in the female, in which the fourth anterolateral spine is minute, but irregularly spaced in the male.

Distribution: Indo-west Pacific from the Red Sea and Madagascar in the west through India and Melanesia to Japan (Stephenson and Rees, 1967). Previously unrecorded from Australia.

Genus **Thalamitoides** A. Milne Edwards, 1869

Thalamitoides quadridens A. Milne Edwards

Thalamitoides quadridens A. Milne Edwards, 1869: 147-149, pl. 6 figs 8-15. Crosnier, 1962: 144-145, figs 249, 251. Stephenson and Rees, 1967: 101-102, fig. 37.

Material: 1 ♂ (without pereopods), 12.6 mm, lagoon, near island, 120 yards from southern crest of reef, in "piecrust", from dead *Acropora* coral, 20th September, 1967, F. H. Talbot and party (P.15775).

Remarks: This specimen agrees with the figure and description given by Crosnier in the very broad carapace, the four anterolateral spines decreasing in size from front to back, the first (external orbital spine) with its posterior margin serrated, the front is quadrilobate, the laterals being much the smaller and obliquely directed laterally (the anterior margin of left median frontal lobe is damaged so that it appears to be incompletely divided into two lobes), the dorsal surface possesses only frontal, mesogastric and epibranchial ridges and the basal antennal article is extremely long with a granular ridge and a group of granules proximally.

This genus has not previously been recorded from Australia.

Distribution: Indo-west Pacific: Red Sea, Madagascar, Amboina, Philippines, Marshall Islands, Johnston Island, Jaluit, Samoa, Hawaii (Stephenson and Rees, 1967).

DISCUSSION

So far eleven species of portunid swimming crab have been collected from One Tree Island by the Australian Museum expeditions in 1966 and 1967. Two species not dealt with here have been reported on by Stephenson and Rees (1968). They are *Portunus orbitosinus* Rathbun and *P. granulatus* (H. Milne Edwards). Stephenson and Rees (1967) have given the most recent account of the synonymies and distributions of the other six species not dealt with in systematic detail in the present report.

Table 1. Ecological distributions of eleven species of portunids at One Tree Island

Species	Area			
	Lagoon floor	Lagoon coral	Reef crest	Outer reef slope
<i>Caphyra rotundifrons</i> A.M.Edw.	..	x	..	..
<i>Portunus granulatus</i> (H.M.Edw.)	x	..	..	..
<i>Portunus longispinosus</i> (Dana)	x	..	..	..
<i>Portunus orbitosinus</i> Rathbun	x	..	..	..
<i>Charybdis obtusifrons</i> Leene	..	..	..	x
<i>Thalamita admete</i> (Herbst)	x	..	x	..
<i>Thalamita coerulipes</i> Jacq. and Lucas	..	x	..	..
<i>Thalamita integra</i> Dana	x	..	..	..
<i>Thalamita picta</i> Stimpson	x	..	..	..
<i>Thalamita stimpsoni</i> A.M.Edw.	..	..	x	..
<i>Thalamitoides quadridens</i> A.M.Edw.	..	x	..	..

The habitats at One Tree Island in which these eleven species have been taken are shown in table 1. The three species of *Portunus* are confined to the open floor of the lagoon whilst three species of *Thalamita* are also found on the lagoon floor. One of these, *T. admete*, is also found on the reef crest where *Thalamita stimpsoni* is one of the most abundant crabs [the other two abundant crabs of the intertidal area are the xanthid *Eriphia sebana* (Shaw and Nodder) and the grapsid *Grapsus albolineatus* Lamarck, both of which are common on beach rock] (see also Ward, 1928). *T. coerulipes* appears to be the common portunid inhabiting coral heads; *Caphyra rotundifrons* is found amongst the green algae, *Chlorodesmis comosa*, growing in small crevices in the coral heads. The dominant crabs of coral heads are, however, xanthids. This situation appears equally true for both the area inside the reef crest and the outer reef slope. The discovery in the lagoon of two such closely similar species as *Portunus orbitosinus* and *P. granulatus* and the finding of *Thalamitoides quadridens* in the coral just inside the lagoon make the One Tree Island portunid fauna worth further investigation. Finally, it is clear that the collections to date have taken only a few of the portunids from this area if the fauna is in any way similar to that of the rest of the Capricorn Group (see papers by Stephenson and co-workers).

LITERATURE CITED

- CROSNIER, A., 1962. Crustacés décapodes Portunidae. *Faune de Madagascar* 16: 1-154, figs 1-256, pls I-XIII.
- DANA, J. D., 1852a. Crustacea. In "United States Exploring Expedition during the years 1838-42, under the command of Charles Wilkes, U.S.N." Vol. 13 (1): i-viii, 1-685, Atlas (1855): 1-27, pls 1-96. Philadelphia.
- GILLETT, K. and F. McNEILL, 1967. "The Great Barrier Reef and Adjacent Isles." Third edition. Sydney: Coral Press. Pp. xiii, 209, 168 pls.
- LEENE, Jentina, 1936. Notes on *Charybdis erythrodactyla* (Lamarck), *Ch. acutifrons* (de Man) and *Ch. obtusifrons* nov. sp. *Zool. Meded.* 19: 165-176, text-figs 1-4.
- LEENE, Jentina, 1938. The Decapoda Brachyura of the Siboga Expedition. VII. Brachygnatha: Portunidae. *Siboga exped. monogr.* 39c³ (livre 131): 1-156, text-figs 1-87.
- MILNE EDWARDS, A., 1869. Description de quelques Crustacés nouveaux de la famille des portuniens. *Nouv. Arch. Mus. nat. Paris* 5: 145-160, pls 6, 7.
- SAKAI, T., 1939. Studies on the crabs of Japan. IV. Brachygnatha, Brachyrhyncha: 365-741. text figs 1-129, pls XIII-CXI. Tokyo: Yokendo Co.
- RATHBUN, Mary J., 1906. The Brachyura and Macrura of the Hawaiian Islands. *U.S. Fish. Comm. Bull.* 23: 827-930, text-figs 1-79, pls 1-24.
- STEPHENSON, W. and B. CAMPBELL, 1959. The Australian portunids (Crustacea: Portunidae). III. The genus *Portunus*. *Aust. J. mar. Freshwat. Res.* 10: 84-124, text figs 1-3, pls 1-5.
- STEPHENSON, W. and May REES, 1967. Some portunid crabs from the Pacific and Indian Oceans in the collections of the Smithsonian Institution. *Proc. U.S. natn. Mus.* 120: 1-114, figs 1-38, pls 1-9.
- STEPHENSON, W. and May REES, 1968. The "Endeavour" and other Australian Museum collections of portunid crabs (Crustacea, Decapoda, Portunidae). *Rec. Aust. Mus.* 27: 285-298, fig. 1, pl. 43.
- TALBOT, F. H., 1967. Expedition to One Tree Island. *Aust. nat. Hist.* 15: 343-346.
- WARD, M., 1928. The Crustacea of the Capricorn and Bunker groups, Queensland. *Aust. Zool.* 5: 241-246, fig. 1, pls XXVII, XXVIII.

EXPLANATION OF PLATES

- Plate 47. *Portunus longispinosus*. Male, 24.3 mm, One Tree Island lagoon, 10th October, 1967 (P.15771). Photograph: Charles Turner.
- Plate 48. *Portunus longispinosus*. Male, 24.3 mm (P.15771), carapace showing detail of granulation. Photograph: Anthony Healy.
- Plate 49. *Charybdis obtusifrons*. Male, 57.6 mm, One Tree Island reef, 23rd September, 1967 (P.15768). Photograph: Anthony Healy.



