

***Macrophthalmus (Macrophthalmus) ceratophorus* Sakai, 1969
(Crustacea: Decapoda: Brachyura: Ocypodidae) recorded from the
Amirante Islands, western Indian Ocean**

C.H.J.M. Fransen

Fransen, C.H.J.M. *Macrophthalmus (Macrophthalmus) ceratophorus* Sakai, 1969 (Crustacea: Decapoda: Brachyura: Ocypodidae) recorded from the Amirante Islands, western Indian Ocean. Zool. Verh. Leiden 323, 31.xii.1998: 341-348, figs 1-4.— ISSN 0024-1652/ISBN 90-73239-68-0. C.H.J.M. Fransen, Nationaal Natuurhistorisch Museum, Naturalis, P.O. Box 9517, 2300 RA Leiden, The Netherlands, e-mail: fransen@naturalis.nnm.nl.

Key words: Crustacea; Decapoda; Brachyura; Ocypodidae; *Macrophthalmus*; *Octolasmis*; Hydrozoa; Amirante Islands.

A note is presented on the crab *Macrophthalmus (Macrophthalmus) ceratophorus* Sakai, 1969, formerly only known from the holotype male specimen which was collected in Japanese waters. The species is redescribed on the basis of a large sample, collected from the Amirante Islands in the western Indian Ocean. All specimens were associated with the epizoic lepadid cirriped *Octolasmis warwickii* Gray, 1825, and an encrusting athecate hydroid.

Introduction

During the Dutch 'Oceanic Reefs' Expedition to the Seychelles (1992-1993) (van der Land, 1994) a large number of specimens of the crab *Macrophthalmus (Macrophthalmus) ceratophorus* Sakai, 1969, was collected. The deck of the Research Vessel 'Tyro' was literally covered by floundering crabs. The specimens were caught at a depth of 54 m while trawling on a soft bottom with sponges and seagrass rhizomes, N of Ile Desnoeuvs, which belongs to the Amirante Islands. Additional fauna in the trawl comprised soft corals, fishes, sponges and molluscs.

Macrophthalmus (M.) ceratophorus is known only by the holotype male which was collected from Shimogusui, Kii Province, Honshu, Japan, at a depth between 30 and 50 m, and from a photograph taken from a specimen (depository unknown) collected in Gokashyo Bay, Mie Prefecture. The holotype specimen has been deposited in the National Museum of Natural History, Smithsonian Institution (No. 125879). Sakai (1969: 280) described the species briefly and provided photographs of the male from Gokashyo Bay. Barnes (1976) redescribed the holotype in more detail when revising the *Macrophthalmus telescopicus* complex. The present specimens are compared with the description given by Barnes.

Descriptive part

Macrophthalmus (Macrophthalmus) ceratophorus Sakai, 1969
(figs 1-3)

Macrophthalmus (Macrophthalmus) ceratophorus Sakai, 1969: 280, pl. II figs. 3a-d; Barnes, 1976: 140-143, fig. 5; Barnes, 1977: 276, 279.

Material.— RMNH D 46133; 38 males, 88 ovigerous females; NIOP-E, Sta. 782, Amirante Islands, N of Ile Desnoeufs, 6°08'S 53°02'E; soft bottom with sponges and seagrass roots; depth 54 m; 3.5 m Agassiz trawl; 2.i.1993.

Additions to and emendations of the description by Barnes (1976: 140-142, fig. 5).— Upper orbital border with fringe of hairs along entire margin. Lower orbital border with fringe of hairs along distal $1/3-1/2$.

Ocular peduncles with terminal filament, divided into (7-) 8 (-9) segments, increasing in length distally. Total length of terminal filament between half-length of ocular peduncle in males, to slightly shorter or longer than ocular peduncle in females.

Dactylus of male cheliped $2/3$ rd of palm length in small specimens to $1/3$ of palm length in large specimens; upper margin with 3 to 7 (usually 4 or 5) large spines proximally and some small tubercles distally.

Female cheliped. Much smaller in relation to male chelipeds; merus reaching just beyond anterolateral corner of carapace. (a) Merus. Upper margin with row of small granules and row of long hairs; inner margin with row of small, rounded or pointed granules and long hairs; outer margin with scattered, small rounded granules, without hair. Inner, outer and lower surface smooth. (b) Carpus. With rows of long hairs along upper and lower margins. Outer and inner surface smooth. Upper margin with few small rounded and 1-3 large pointed granules; lower margin with few small rounded granules. (c) Palm. Outer surface smooth with few scattered small rounded granules on central shallow vault and poorly developed longitudinal ridge near to and subparallel with lower margin which bears small rounded granules. Inner surface smooth with very few scattered central small rounded granules; row of long hairs near and parallel to upper margin; no discrete thick patch of hair near joint with dactylus. Anterior margin not excavated between base of fingers. Upper margin with

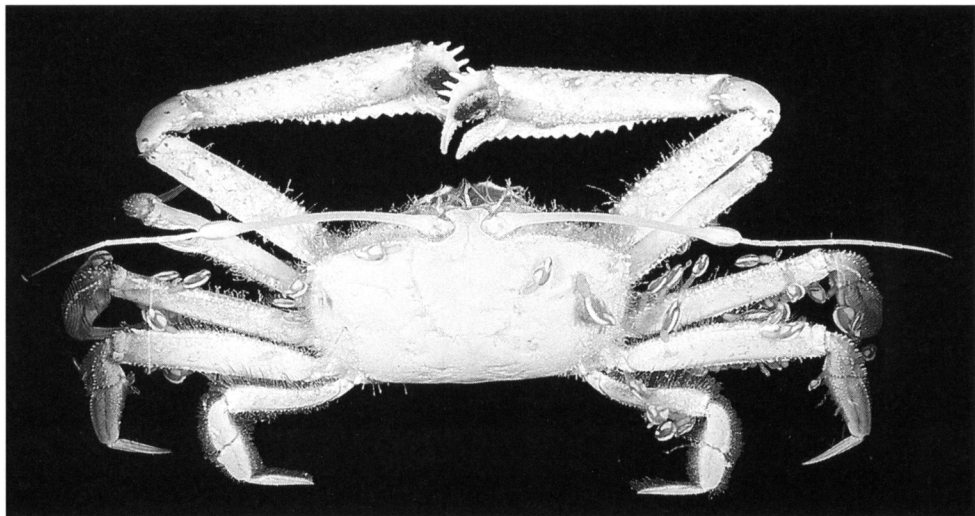


Fig. 1. *Macrophthalmus (M.) ceratophorus* Sakai, 1969 (RMNH D 46133). Female, dorsal aspect: carapace breadth 45 mm.

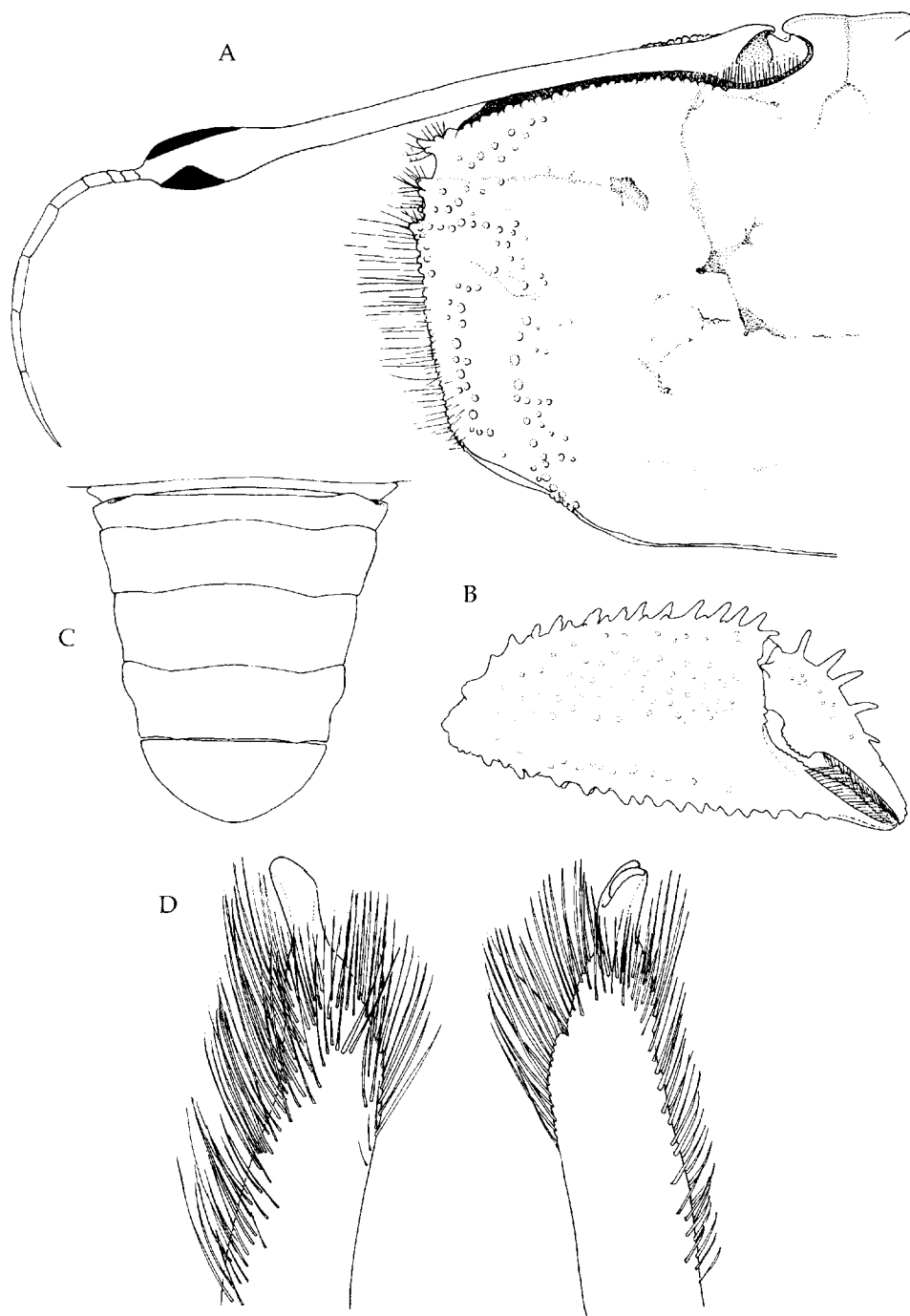


Fig. 2. *Macrophthalmus (M.) ceratophorus* Sakai, 1969 (RMNH D 46133). Male: carapace breadth 35 mm, carapace length 21.5 mm. A, stylophorus, ocular peduncle and left anterolateral carapace in dorsal view; B, right chela, outer surface; C, abdomen; D, left first pleopod, dorsal and ventral aspects.

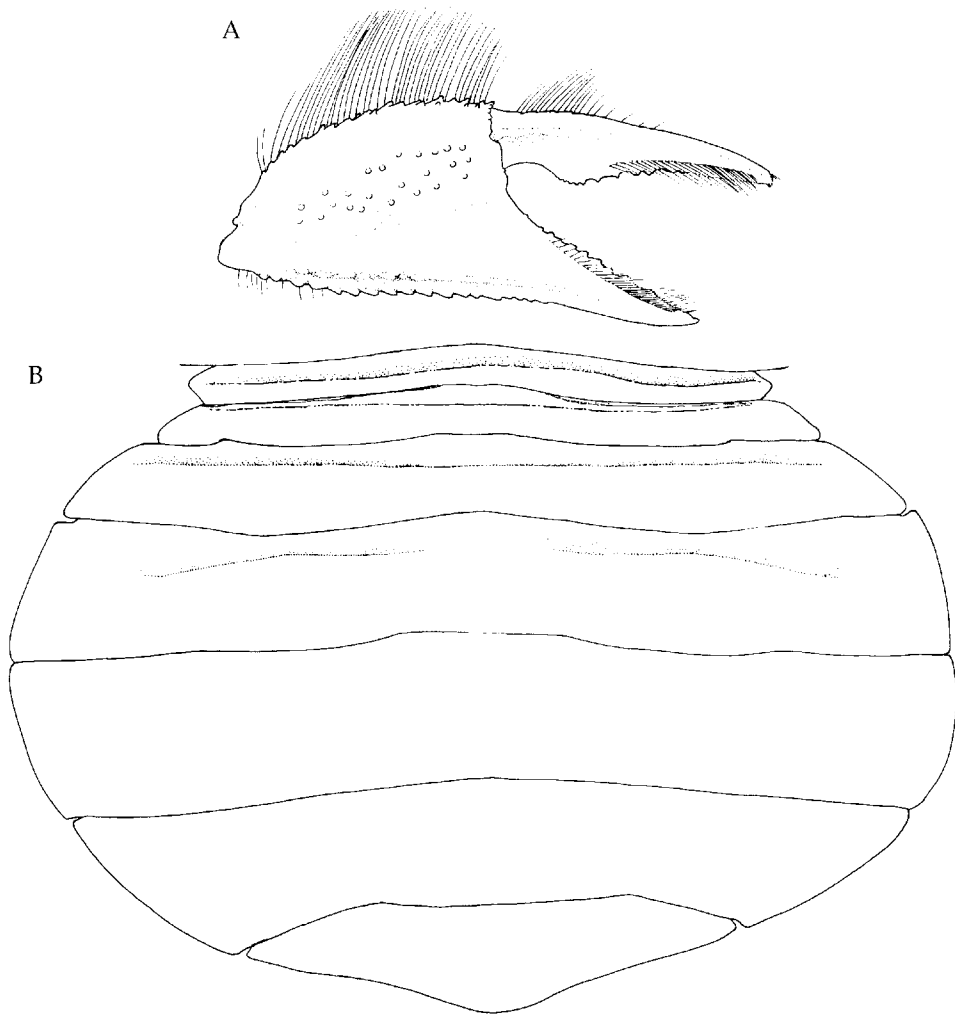


Fig. 3. *Macrophthalmus (M.) ceratophorus* Sakai, 1969 (RMNH D 46133). Female: carapace breadth 45 mm, carapace length 28 mm. A, right chela, outer surface; B, abdomen.

row of small rounded and medium sized pointed granules along whole length. Lower margin with row of pointed granules, decreasing in size distally. (d) Index. Slightly deflected. Outer surface without granules, with row of hairs distally near to and subparallel with cutting edge, with smooth continuation of longitudinal ridge of palm; inner surface smooth, with row of long hairs near cutting edge. Cutting edge without differentiated tooth, with row of pointed granules from base to about 2/3rds of distance to tip, granules increasing in size distally; lower margin with continuation of row of pointed tubercles of palm proximally, smooth distally. (e) Dactylus. As long as palm, almost straight, slightly curved distally. Outer surface smooth without granules, with row of hairs close to cutting edge in distal half; inner surface also without

granules and without patch of dense hair; with two rows of long hairs in proximal part subparallel with upper margin; with row of hairs near cutting edge. Upper margin with 4 to 6 shallow pointed tubercles in proximal part; cutting edge similar to that of index, with crenulated crest near base.

Female abdomen covering entire sternum. Lateral margins of sixth segment broadly rounded. First, second and third segment with transverse ridge across centre.

Dimensions.— Males: carapace breadth 33-43 mm; carapace length 21-27 mm; length of chela 28-41 mm. Females: carapace breadth 36-47 mm; carapace length 23-28 mm; length of chela 14-20 mm.

Colour.— Both males and females are of porcelain white speckled with fine red dots on the pereopods. These red dots are largest and most conspicuous on the carpus and distal part of the merus in male specimens. The elongate patch of dense hair in the centre of the proximal surface of the dactylus is usually dark brown to black.

Remarks.— The male holotype is slightly smaller (carapace breadth 30.3 mm) than the smallest male in the present sample. The ratio between carapace length and breadth, and chela length of the holotype and the present material is similar.

Epifauna

All specimens are infested with the cirriped *Octolasmis warwickii* Gray, 1825 (Pedunculata, Lepadoidea, Poecilasmataidae).

Further epizoic fauna consists of an encrusting athecate hydroid species, also present on each crab.

Octolasmis warwickii Gray, 1825 (fig. 4)

Restricted synonymy:

Octolasmis Warwickii Gray, 1825: 100.

Dichelaspis Warwickii, Darwin, 1851: 120-122, pl. II figs 6, 6a, b.

Dichelaspis equina Lanchester, 1902: 385, pl. Xxxv, figs. 7, 7a-d.

Dichelaspis warwickii, Annandale, 1909: 105, 110-112.

Octolasmis warwicki, Nilsson-Cantell, 1928: 18; 1934a: 59-60; 1934b: 40-41, fig. 3; Anderson, 1994: 295, fig. 10.4b.

Material.— Many specimens (RMNH C 2985). Same data as host.

Diagnosis.— Capitulum with occludent margin almost straight. Tergum axe-shaped. Carina longer than occludent segment of scutum; with transverse fissure near base; with basal part running parallel to and below basal margin of scutum, deeply buried, terminating in large, broad, oval, flat transverse disk, edge knobbed. Scutum with two branches or segments, separation usually complete; occludent segment cone-shaped, slanting outward from above, apex separated from scutal margin of tergum but corresponding with deep excavation therein; carinal segment much shorter than occludent segment, subtriangular. Peduncle equal to or slightly shorter than length of capitulum, sometimes annulated, covered with chitinous plates.

Remarks.— Specimens of the lepidid cirriped are usually located on the antero-lateral margins of the carapace and on the dorsal and ventral margins of the walking

legs. The number ranges from one to about 50 per crab. Lepadids are common on the meri and less common on carpi and propodi of the walking legs. In few instances lepadids are present on the merus of male chelipeds.

In many of the crab specimens, remnants of the cementation of the lepadids on the carapace and pereopods are still visible. It is assumed that many lepadids were torn off during trawling. The position of the lepadids on the dorsal and ventral margins of the meri can be explained by the movement of the legs in relation to each other. As the lateral margins of the meri are almost in contact during swimming and walking, there is no room for the lepadids to grow. The anterolateral position of the lepadids on the carapace can be explained in a similar way. The hirsute meri of the fifth pereopods can be folded over the lateral parts of the carapace except for the anterolateral part. During locomotion

these lateral parts are brushed by the fifth pereopods. This prevents the lepadids from settling there. Why the central part of the carapace and the abdomen are almost always devoid of lepadids cannot be explained this way. If *Macrophthalmus (M.) ceratophorus* lives in burrows, like many of the littoral species do, the contact between these surfaces and the wall of the burrow might prevent the lepadids to grow there.

Most *Octolasmis* species are found on gills and in the branchial chamber of decapods. Only the present species and *O. tridens* (Aurivillius, 1893) have been recorded externally. *Octolasmis warwickii* prefers the spiny parts of the carapace and proximal segments of the walking legs. *Octolasmis tridens* is recorded externally on the external surface of the mouthparts in *Thenus orientalis* (Lund, 1793); on crabs this species occurs internally, on the inner sides of the gills (Anderson, 1994).

Darwin (1851) mentions *O. warwickii* from an unidentified crab collected near the coast of Borneo. Annandale (1909) recorded the species from various crabs (*Goniosoma* spec., N end of Persian Gulf; *Goniosoma crucifer* [= *Charybdis (Charybdis) feriata* (Linnaeus, 1758)], Orissa coast, India; *Neptunus sanguinolentus* [= *Portunus sanguinolentus* (Herbst, 1796)], Orissa coast, India; *Dorippe* spec., eastern Asia; *Doclea japonica* Ortman, 1893, *Doclea hybrida* [= *Doclea muricata* (Fabricius, 1787)], E coast of India; *Doclea ovis* (Fabricius, 1787), *Xantho scaberrimus* [= *Demania scaberrima* (Walker, 1887)], Balasore Bay, Bengal coast; and from several unidentified crabs) and lobsters (*Panulirus* spec., off Orissa coast, India; *Thenus orientalis*, mouth of Hughli River, India, and from Sumatra, Indonesia; *Scyllarus* spec., 0°14'N 104°4'E). Nilsson-Cantell (1934a) recorded the species from the chelipeds of *Portunus pelagicus* (Linnaeus, 1758) caught



Fig. 4. *Octolasmis warwickii* Gray, 1925 (RMNH D 2985). General aspect. Capitulum length 4.6 mm.

at two localities in Singapore. Nilsson-Cantel (1934b) recorded the species from several unidentified crab species, and from *Thenus orientalis*, *Calappa* spec., *Neptunus pelagicus* [= *Portunus pelagicus*] and from several specimens of an unidentified stomatopod. Jeffries et al. (1982) looked for *Octolasmis* species on decapod Crustacea indigenous to Singapore and found *O. warwickii* on 16 crab species as well as on *Thenus orientalis*.

According to Annandale (1909), the species has also been recorded from non-Crustacea: from the back of a large specimen of *Serranus lanceolatus* [= *Epinephelus lanceolatus* (Bloch, 1790)] (Pisces) caught in the mouth of the Hughli River, India; from a living shell of *Murex* spec. and from "mussels", collected in the Bay of Bengal; and from the skin of the sea snake *Hydrus platurus* [= *Pelamis platurus* (Linnaeus, 1766)]. Nilsson-Cantell (1934b) found some specimens on wood (6°7'-6°44'S 107°55'-111°55'E).

Distribution.— *O. warwickii* is distributed in the Indian Ocean and Indo-West Pacific.

Athecate hydroid

The encrustations of the athecate hydroid are usually situated on the sternum and abdomen, the third maxillipeds, the orbits, the chelipeds, the ventral and dorsal parts of the walking legs, and the anterolateral parts of the carapace. The dorsal part of the carapace is seldom covered by the hydroid.

Acknowledgements

I gratefully acknowledge L.B. Holthuis and J.C. den Hartog for commenting on the manuscript.

I take this opportunity to thank Prof. Dr W. Vervoort for his guidance and support he gave me in the world of systematic zoology. In this publication, Crustacea and Hydrozoa, the animal groups to which Prof. Vervoort dedicated his life, come together.

References

- Anderson, D.T., 1994. Barnacles. Structure, function, development and evolution: i-xii, 1-357.— Chapman & Hall.
- Annandale, N., 1909. An account of the Indian Cirripedia Pedunculata. Part. I. Family Lepadidae.— *Memoirs of the Indian Museum* 2 (2): 59-137, pls. 6, 7.
- Barnes, R.S.K., 1976. Contribution towards a revision of *Macrophthalmus* (Crustacea: Brachyura), VIII. A re-examination of the *M. telescopicus* (Owen) complex; the status of *M. laevis* A. Milne Edwards; and the affinities of *M. holthuisi* Serène.— *Zoologische Mededelingen Leiden* 50 (10): 133-151, figs. 1-7.
- Barnes, R.S.K., 1977. Concluding contribution towards a revision of, and a key to, the genus *Macrophthalmus* (Crustacea: Brachyura).— *Journal of Zoology, London* 182: 267-280, figs. 1-3.
- Darwin, C., 1851. A monograph of the sub-class Cirripedia, I. The Lepadidae.— Ray Society, London: 1-400.
- Gray, J.E., 1825. A synopsis of the genera of Cirripedes arranged in natural families, with a description of some new species.— *Annals of Philosophy, new series*, 10 (2): 97-107.
- Jeffries, W.B., H.K. Voris & Chang Man Yang, 1982. Diversity and distribution of the pedunculate barnacle *Octolasmis* in the seas adjacent to Singapore.— *Journal of Crustacean Biology* 2 (4): 562-569.

- Lanchester, W.F., 1902. Crustacea of the "Skeat Expedition".— Proceedings of the Zoological Society of London 2: 369-377.
- Land, J. van der, 1994. The 'Oceanic Reefs' Expedition to the Seychelles (1992-1993).— Zoologische Verhandelingen Leiden 297: 5-36, figs 1-13.
- Nilsson-Cantell, C.A., 1928. Studies on Cirripeds in the British Museum (Nat. Hist.).— Annals and Magazine on natural History (10 2 (7): 1-39, figs. 1-16.
- Nilsson-Cantell, C.A., 1934a. Indo-Malayan cirripeds in the Raffles Museum, Singapore.— Bulletin of the Raffles Museum 9: 42-73.
- Nilsson-Cantell, C.A., 1934b. Cirripeds from the Malay Archipelago in the Zoological Museum of Amsterdam.— Zoologische Mededelingen 17: 31-63, figs. 1-12.
- Sakai, T., 1969. Two genera and twenty two new species of crabs from Japan. – Proceedings of the Biological Society of Washington 82: 99-116.