

A REDESCRIPTION OF THE KELP CURLER *AMPITHOE HUMERALIS*
(CRUSTACEA, AMPHIPODA) FROM SOUTH AFRICA
AND ITS RELATIONSHIP TO *MACROPISTHOPOUS*

By

CHARLES L. GRIFFITHS

Zoology Department, University of Cape Town

(With 3 figures)

[MS. accepted 24 July 1979]

ABSTRACT

Ampithoe humeralis Stimpson, to date known only from west North America, is redescribed and figured from material collected from the west coast of the Cape Peninsula, South Africa. Individuals of this species appear to co-operate in the construction of nests made from the folded fronds of living kelp plants and to consume the walls of these nests while progressively extending them back along the fronds. The relationship between *Ampithoe* and *Macropisthopous* K. H. Barnard 1916, is discussed and *Macropisthopous* reduced to a junior synonym of *Ampithoe*.

CONTENTS

	PAGE
Introduction	131
Description of material	132
Notes on ecology	133
Relationships	137
Acknowledgements	137
References	137

INTRODUCTION

Amphipods of the family Ampithoidae are usually large-bodied, conspicuous species normally associated with algae in the intertidal or shallow sublittoral zones. Most members of the group are tubicolous, spinning soft parchment-like tubes amongst the holdfasts and fronds of various algae (J. L. Barnard 1965). Exceptions include *Pseudoamphithoides incurvaria* (Just, 1977) (formerly *Amphyllodomus*—Just's 1977 genus being synonymous with that of Ortiz 1976), which cuts oval sections from algal fronds and glues these together to form a 'mobile-home', and the kelp curler, *Ampithoe humeralis*, which constructs nests from the curled blades of the giant kelp *Macrocystis* (Jones 1971) or lives in *Macrocystis* holdfasts (J. L. Barnard 1969a).

Ampithoe humeralis has to date been recorded only from the west coast of North America, where it may on occasion reach sufficient densities significantly to damage the *Macrocystis* beds (North 1971). The range of *A. humeralis* is

extended herein to include the west coast of South Africa, where it is associated with a different species of kelp—*Ecklonia maxima*—and appears to have somewhat modified its habits accordingly.

A redescription from this material has highlighted the similarity between *A. humeralis* and the monospecific genus *Macropisthopous* K. H. Barnard and necessitated a re-examination of the taxonomic status of that genus.

DESCRIPTION OF MATERIAL

Ampithoe humeralis Stimpson, 1864

Figs 1–3

Ampithoe humeralis Stimpson, 1864: 156. Calman, 1898: 271, pl. 33 (fig. 4).

Ampithoe humeralis: Stebbing, 1906: 636. J. L. Barnard, 1954: 29; 1965: 7, figs 2–3; 1969a: 83.

Description (of male, 15 mm)

Head length of first two pereon segments, rostrum absent, ocular lobes rounded, eyes oval, red; antenna 1 length of pereon, articles 1 and 2 subequal, sparsely setose, article 3 a quarter size of 2, accessory flagellum absent, flagellum 35-articulate; antenna 2 approximately 60 per cent length of 1, sparsely setose, gland cone small, acute, articles 4 and 5 of peduncle equal in size, flagellum 16-articulate.

Upper lip apically rounded, distally densely setulose; article 3 of mandibular palp shorter than 2, bearing eight terminal pectinate setae, primary cutting edge of mandible of eight teeth, lacinia mobilis with seven teeth, spine row of thirteen spines, molar triturative; lower lip with outer lobes deeply notched, outer portion considerably the larger; inner plate of maxilla 1 with one apical plumose seta, outer plate with ten strong terminal spines ranging from thick and smooth laterally to slender and strongly comb-like medially, palp exceeding outer plate, biarticulate, article 2 with six apical spines and one pectinate seta; plates of maxilla 2 equal in length, inner more slender than outer and setose medially as well as apically; maxilliped bearing stout 4-articulate palp, outer plate extending to centre of article 3 of palp, thirteen short stout serrate spines along medial margin, seven pectinate setae on lateral margin, inner plate with numerous medial and apical setae but no spines.

Pereon dorsally smooth, coxae 1–4 progressively longer, oval, ventrally rounded, a few setae at posterodistal corner; coxa 5 slightly deeper than 4, with broad posterior lobe, 6 bilobed, 7 semicircular; gnathopods 1 and 2 of similar structure, 2 slightly the larger and heavier, article 2 not lobed, 5 slightly lobed in gnathopod 1, more strongly in 2, strongly setose posteriorly, article 6 hardly wider than 5, slightly chelate, margin of palm minutely crenulate, defined by a small spine largely concealed by dense pectinate setae along palm and posterior margin, dactyl almost twice length of palm, bearing closely appressed serrations; article 2 of pereopods 1 and 2 greatly expanded and filled with glandular

material, article 4 broadly lobed anteriorly; pereopod 3 shorter than 1 and 2, article 2 subcircular, posterior margin of article 6 bearing seven short stout spines, dactyl short, strongly curved; pereopod 4 longer than 3, article 2 broadly oval, none of distal segments greatly expanded, article 4 somewhat longer than 5 or 6, dactyl moderately curved; pereopod 5 slightly longer than 4 but of similar structure, none of segments greatly enlarged or expanded.

Pleon and urosome dorsally smooth; pleonal epimera rounded with slight lateral ridges; peduncle of uropod 1 with stout interramal spine about 25 per cent length of rami, laterodorsal margin of peduncle with four short spines, mediodorsal margin with seven small spines, outer ramus slightly the shorter, with two dorsal and two apical spines, inner ramus narrower, with one dorsal and four apical spines; uropod 2 extending as far as 1, peduncle with one lateral and one apical spine on each dorsal margin, outer ramus with four short dorsal and three apical spines, inner ramus slightly the longer, with four dorsal and four apical spines; uropod 3 extending slightly beyond 1 and 2, peduncle stout with a few dorsal and apical setae, outer ramus somewhat less than half length of peduncle, dorsally setulose, bearing two large strongly recurved apical hooks, inner ramus slightly shorter, broadly oval, distally truncated and setose with one small spine; telson semicircular, two small plumose setae on each margin and a small spine and plumose seta at each distal corner.

Variation

Females are very similar to males except for presence of brood-plates. The largest individual recorded, a female of 19.5 mm, had flagellum of antenna 1 40-articulate, of antenna 2 20-articulate, while the smallest juvenile, of 6 mm, had flagellum of antenna 1 18-articulate, of antenna 2 8-articulate.

Material

136 individuals from Oudekraal (33°58'S 17°21'E). Collected from the fronds of *Ecklonia maxima* at 5 m depth, 29 May 1978. Representative material has been deposited in the collections of the South African Museum (SAM-A13660) and the University of Cape Town (CP 838A).

Distribution

Pacific North America (Puget Sound to Guadalupe Island), west coast of South Africa. Intertidal to approximately 80 m, usually associated with kelp species, rarely with other algae.

NOTES ON ECOLOGY

The nests of South African *Ampithoe humeralis* are formed by folding a secondary blade of the frond of the large kelp *Ecklonia maxima* longitudinally

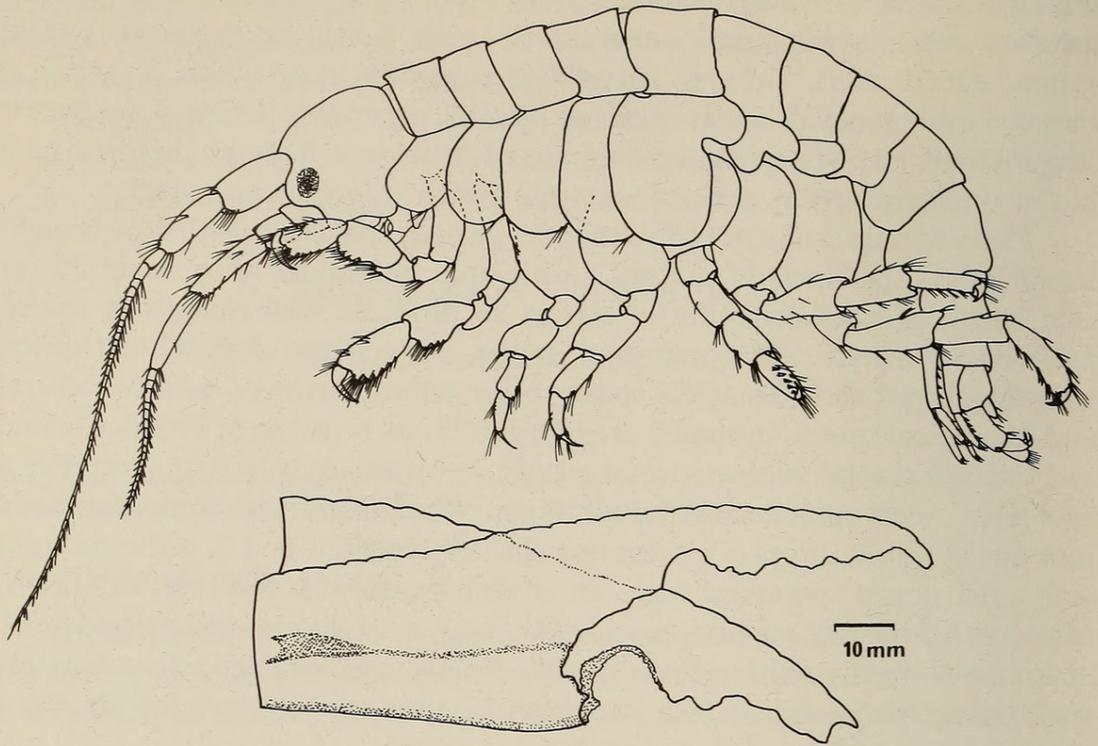


Fig. 1. *Ampithoe humeralis* Stimpson, 1864.

Male, 15 mm. Lateral aspect and sketch of nest formed from frond of *Ecklonia maxima*.

and sealing together the adjoining surfaces some 10–20 mm above the fold. A tubular chamber is thus formed along the middle of the blade, the marginal portions of which extend freely. The two intact dwellings examined were constructed from fronds of 70 and 90 mm total width and the enclosed areas measured 55×10 and 80×20 mm respectively. The larger chamber contained a tightly-packed colony of 121 individuals of all sizes (the smaller chamber was preserved together with loose individuals and its population could not be accurately assessed). The interior of both chambers was strongly eroded, especially around the distal margins where the walls were paper-thin. The long, tattered streamers of frond adjacent to both chambers (Fig. 1) clearly indicate that the nests are initially formed at the tip of the blades and progressively extended backwards as the occupants feed upon their walls. The method of chamber formation is unknown but the rigidity of the blade and turbulence encountered at the collection site would indicate that a considerable communal effort must be required. The sealant used to form the chamber is invisible along most of its length, where the walls are closely appressed, but emerges as a triangular area of transparent mucous-like material, containing distinct transverse fibres, where it stretches between the diverging walls of the blade proximally.



Fig. 2. *Ampithoe humeralis* Stimpson, 1864.

Male, 15 mm. A. Mandible. B. Lower lip. C. Maxilla 1, with tips of spines enlarged. D. Maxilla 2. E. Maxilliped. F-G. Gnathopods 1, 2. H-I. Articles 6 and 7 of pereopods 3, 5.

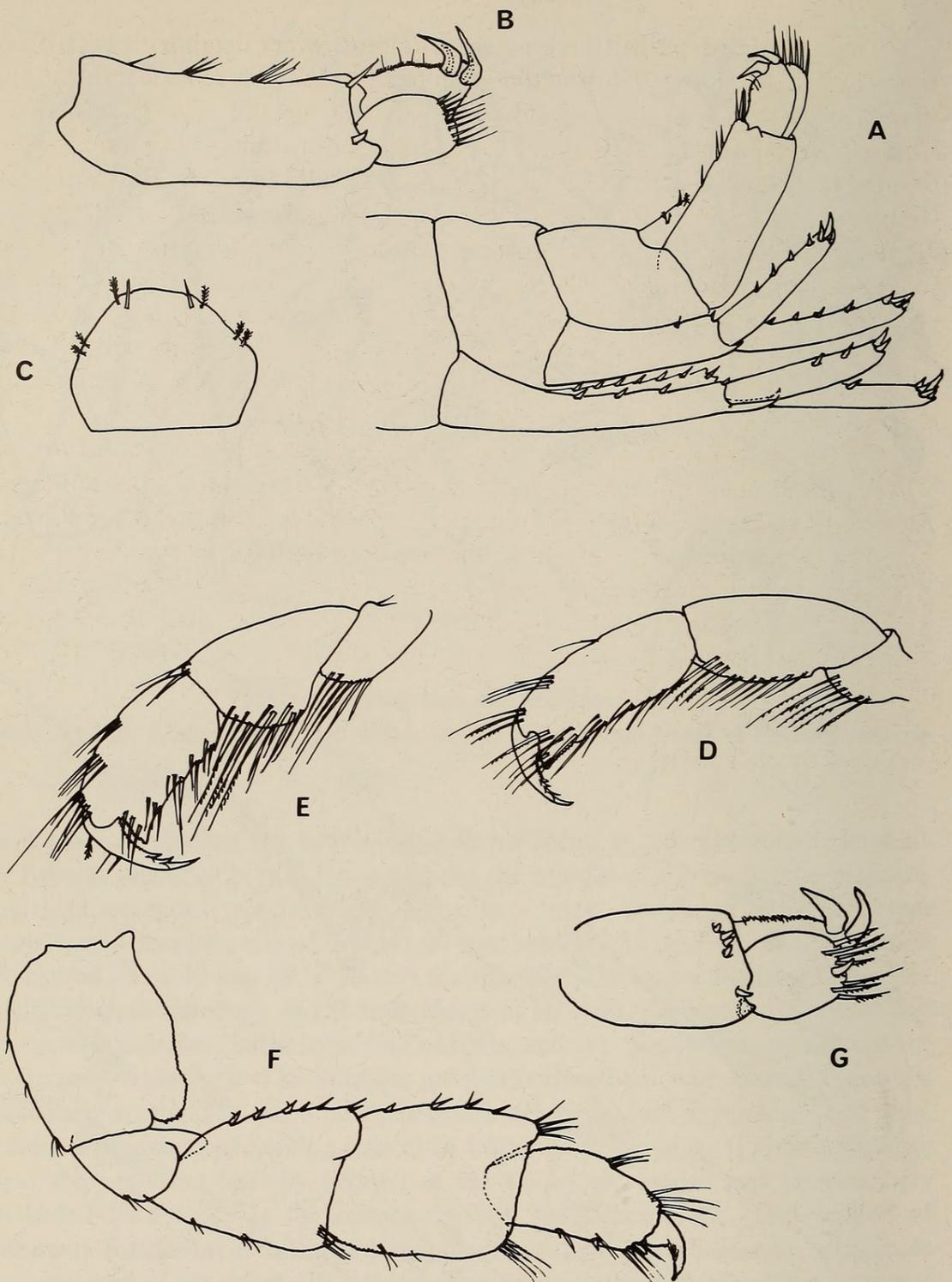


Fig. 3. *Ampithoe humeralis* Stimpson, 1864.

Male, 15 mm. A. Urosome, lateral aspect. B. Uropod 3, medial view. C. Telson.

Macropisthopous stebbingi K. H. Barnard, 1916.

Male, 5,5 mm. D-E. Articles 5-7 of gnathopods 1, 2. F. Pereiopod 5. G. Uropod 3, medial view.

RELATIONSHIPS

The material described here agrees in almost every detail with that illustrated by J. L. Barnard (1965) and there can be little doubt as to its identification. *Ampithoe humeralis* is unique in *Ampithoe* for having the male gnathopod 2 almost as small as 1 (J. L. Barnard 1965) and there is thus a temptation when running it through a generic key (J. L. Barnard 1969b) to allocate it to *Macropisthopous*. This genus, a monospecific one erected by K. H. Barnard (1916) for *M. stebbingi* from South Africa, is distinguished from *Ampithoe* primarily by the feebly chelate gnathopods (the enlarged pereopod 5 cannot be regarded as generically significant—e.g. *U. platypoda* in *Urothoe*, various *Orchestia* species). A re-examination of *M. stebbingi* (Fig. 3) shows that the gnathopods of this species are very similar to those of *A. humeralis* (Fig. 2), the original sketches of K. H. Barnard (1916) being somewhat misleading in this regard.

On the basis of the above evidence it appears that a generic distinction between *M. stebbingi* and *A. humeralis* cannot be justified. Moreover, although the weakly chelate gnathopods of these two species do distinguish them from those of other *Ampithoe* species, this condition appears to be merely the extreme of a wide range of gnathopod types occurring in the genus. For this reason a transfer of *A. humeralis* to *Macropisthopous* would not be justified and hence *Macropisthopous* must be incorporated into *Ampithoe*. *A. stebbingi* (K. H. Barnard, 1916) would then be distinguished from other *Ampithoe* species by the enlarged oar-like pereopod 5 (Fig. 3F) and from all except *A. humeralis* by the condition of the gnathopods.

ACKNOWLEDGEMENTS

My thanks to Mr G. S. Dieckmann, who collected the material of *Ampithoe humeralis* and brought it to my attention. Mrs S. Hardman kindly typed the manuscript.

REFERENCES

- BARNARD, J. L. 1954. Marine Amphipoda of Oregon. *Ore. St. Monogr. Stud. Zool.* **8**: 1–103.
BARNARD, J. L. 1965. Marine Amphipoda of the family Ampithoidae from southern California. *Proc. U.S. natn. Mus.* **118**: 1–46.
BARNARD, J. L. 1969a. Gammaridean Amphipoda of the rocky intertidal of California: Monterey Bay to La Jolla. *Bull. U.S. natn. Mus.* **258**: 1–230.
BARNARD, J. L. 1969b. The families and genera of marine gammaridean Amphipoda. *Bull. U.S. natn. Mus.* **271**: 1–535.
BARNARD, K. H. 1916. Contributions to the crustacean fauna of South Africa. 5. The Amphipoda. *Ann. S. Afr. Mus.* **15**: 105–302.
CALMAN, W. T. 1898. On a collection of Crustacea from Puget Sound. *Ann. New York Acad. Sci.* **11**: 259–292.
JONES, L. G. 1971. Studies on selected small herbivorous invertebrates inhabiting *Macrocystis* canopies and holdfasts in southern California kelp beds. In: NORTH, W. J. ed. The biology of giant kelp beds (*Macrocystis*) in California. *Nova Hedwigia* (Suppl.) **32**: 1–600.
JUST, J. 1977. *Amphyllodomus incurvaria* gen. et sp. n. (Crustacea, Amphipoda), a remarkable leaf-cutting amphithoid from the marine shallows of Barbados. *Zool. Scr.* **6**: 229–232.

- NORTH, W. J. *ed.* 1971. The biology of giant kelp beds (*Macrocystis*) in California. *Nova Hedwigia* (Suppl.) **32**: 1-600.
- ORTIZ, M. 1976. Un nuevo genero y una nueva especie de anfipodi de aguas Cubanas (Amphipoda, Gammaridea, Ampithoidae). *Ciencias La Habana* (8) **27**: 3-12.
- STEBBING, T. R. R. 1906. Amphipoda 1. Gammaridea. *Das Tierreich* **21**: 1-806.
- STIMPSON, W. 1864. Descriptions of new species of marine invertebra from Puget Sound, collected by the naturalists of the North-west Boundary Commission, A. H. Campbell, Esq., Commissioner. *Proc. Acad. nat. Sci. Philad.* **16**: 153-165.



Griffiths, Charles L. 1979. "A redescription of the kelp curler *Ampithoe humeralis* (Crustacea, Amphipoda) from South Africa and its relationship to *Macropisthopous*." *Annals of the South African Museum. Annale van die Suid-Afrikaanse Museum* 79, 131–138.

View This Item Online: <https://www.biodiversitylibrary.org/item/126255>

Permalink: <https://www.biodiversitylibrary.org/partpdf/75002>

Holding Institution

Smithsonian Libraries and Archives

Sponsored by

Biodiversity Heritage Library

Copyright & Reuse

Copyright Status: In Copyright. Digitized with the permission of the rights holder.

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://www.biodiversitylibrary.org/permissions/>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.