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THE GENUS *CHLORINOIDES*
(CRUSTACEA, BRACHYURA, MAJIDAE).

2. *CHLORINOIDES GOLDSBOROUGHII*
RATHBUN FROM EASTERN AUSTRALIA,
C. TENUIROSTRIS HASWELL AND A NEW
SPECIES FROM WESTERN AUSTRALIA

by

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RECORDS OF
THE AUSTRALIAN MUSEUM

Vol. 28, No. 3. Pages 65-76

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SYDNEY

29th September, 1970

Price, 50c

Printed by Order of the Trustees

The Genus *Chlorinoides* (Crustacea, Brachyura, Majidae). 2. *Chlorinoides goldsboroughi* Rathbun from Eastern Australia, *C. tenuirostris* Haswell and a New Species from Western Australia

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Australian Museum, Sydney

Figures 1-4

Manuscript received 1st May, 1969

ABSTRACT

Chlorinoides goldsboroughi Rathbun, previously known from Hawaii, is recorded formally for the first time from eastern Australia near Sydney in 70-125 fms. A new species of the genus, superficially similar to *C. goldsboroughi*, is recorded from off Western Australia between Geraldton and Rottnest Island near Perth in 62-103 fms. The known geographic range of *C. tenuirostris* is extended from northeastern Australia to Western Australia near Pt Cloates. *C. goldsboroughi* and the new species are described and figured.

INTRODUCTION

The Indo-west Pacific spider crabs of the genus *Chlorinoides* Haswell were reviewed in detail by Griffin (1966a), a key to the species was provided, and the type species, *C. tenuirostris* Haswell, was redescribed and figured. A key to the Australian and New Zealand species was provided by Griffin (1966b) and to the Australian species only by Griffin (1966c). Sakai (1965) has illustrated most of the Japanese species and Serene (pers. comm.) has recently studied some others.

From 1961 through 1965 the Australian CSIRO Division of Fisheries and Oceanography carried out surveys off New South Wales on benthic invertebrates (led by Dr R. J. MacIntyre) and, in co-operation with the Western Australian Department of Fisheries and Fauna, off Western Australia on the Western Crayfish (led by Dr R. G. Chittleborough). In Western Australia Drs R. W. George and B. R. Wilson, of the Western Australian Museum, have also carried out investigations into the benthic invertebrate fauna. The results of these surveys have included the finding of *Chlorinoides goldsboroughi* Rathbun, previously known only from Hawaii (Rathbun 1906), off New South Wales, and of a new species superficially similar to this off Western Australia. In addition, *C. tenuirostris*, formerly known in Australia from northern Queensland, has also been found off Western Australia.

In this paper *C. goldsboroughi* is redescribed, the new species is described, and further notes are given on *C. tenuirostris*. Terminology follows that used by Griffin (1966a). The system of measurements is as explained previously (Griffin, 1966b) and the measurements were made to the nearest 0.1 mm with dial calipers; unless otherwise stated, dimensions given are carapace length (including rostrum). Drawings were completed with the aid of a camera lucida. All material is in the collections of the Australian Museum, Sydney (AM) or the Western Australian Museum (WAM); the number following the abbreviation of the institution is the registration number of the specimens.

Dorsal surface of carapace with four short to moderately long, conical, apically blunt spines in midline, one on posterior part of mesogastric region, followed closely by a metagastric, a transverse, submedial divergent pair surmounting tumid cardiac region and one almost overlying posterior intestinal margin and directed weakly posteriorly. A pair of very small tubercles submedially on urogastric region and a similar pair sometimes on posterior intestinal margin. Two small tubercles laterally on branchial regions between mesogastric spine and largest marginal branchial spine.

Basal antennal article moderately broad, of more-or-less equal width throughout, anterolateral angle bearing a long, flattened lobe with tubercles on surface and anterior edge and spinules at tip, a shorter, conical, tuberculate lobe at anteromedial corner directed outwards and downwards; medial edge of article bearing a small elevation midway along. Antennae long, extending beyond rostrum, two stout, subequal, proximal segments together making up one quarter of this length, both proximal segments spinulose.

Antennular fossae large, subpentagonal. Basal two segments of antennules tuberculate, first elevated in midline. Interantennular spine blunt. Anterior process of epistome slender, reaching interantennular spine.

Epistome wider than long, a low elevation or small tubercle lateral to opening of green gland. Anterior edge and anterolateral corners of mouthfield carinate. Pterygostomian regions bearing a small tubercle midway along lateral margin. Subhepatic regions with three low tubercles laterally just ventral and anterior to marginal hepatic lobes.

Third maxillipeds with ischium large, subrectangular, longer than broad, medial half of distal edge produced anteriorly, anteromedial angle rounded, medial edge very coarsely toothed, overlaid but not concealed by a sparse fringe of long hairs; outer surface excavated medially as a very shallow, broad, longitudinal groove. Merus subcircular, slightly wider but shorter than, ischium, anterolateral angle outwardly produced, rounded, distal edge notched; outer surface weakly concave. Palp arising from notch of, and slightly longer than, merus, cylindrical, the three segments subequal, fringed by hairs, a dense array of long hairs at tip. Exognath granular, lateral edge densely hairy.

Sternum in male granular.

Chelipeds in male of moderate length (slightly exceeding carapace length), stout, cylindrical except for weakly compressed palm, naked, granular, ischium, merus and carpus tuberculate. Merus with about 15 tubercles, four or five weakly compressed ones laterally including large one on distal edge, six to eight small tubercles in an adjacent row on dorsal surface, and five large tubercles in a ventral row. Carpus with a weakly developed lateral ridge including three weakly compressed tubercles, three tubercles on medial surface and several on lateral surface. Chelae long, about half total length of cheliped, weakly inflated, palm slightly expanded midway along, almost twice as long as high, dorsal and ventral edges granular, proximally carinate; fingers short, dactyl slightly more than one-third chela length, gaping proximally, fixed finger excavate and bearing several small low teeth, dactyl bearing a large tooth projecting into gape, distal half of fingers coarsely toothed. Cheliped of female about as long as postrostral portion of carapace; chelae slender, palm tapering distally, fingers adjacent throughout their length.

Ambulatory legs moderately long, cylindrical, bearing a few scattered long simple hairs and short curled hairs in dense rows along all surfaces of meri, and in groups on dorsal surfaces of carpi and propodi, dense felt of short hairs on propodi ventrally and covering dactyls; round, blunt tubercles or spines in four, ill-defined,

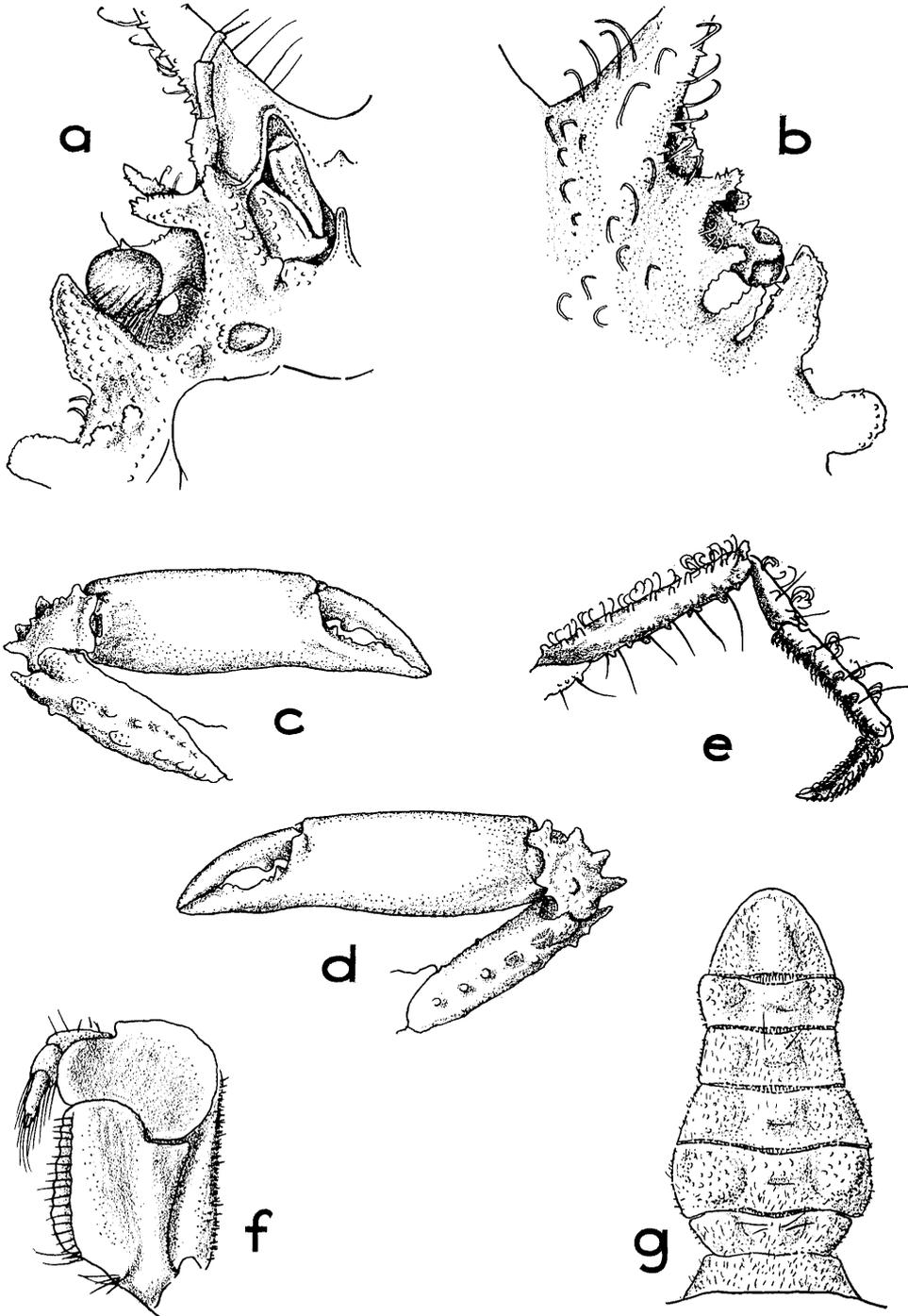


Fig. 2. — *Chlorinoides goldsboroughi* Rathbun, male (AM P.13945). a orbit, ventral view; b orbit dorsal view; c cheliped, inner view of chela; d cheliped, outer view of chela; e right first ambulatory leg, posterior view; f left third maxilliped; g abdomen.

longitudinal rows on meri, in two dorsal rows on carpi and in a single dorsomedial row on propodi; dactyls weakly curved, unarmed. First leg the longest, as long as total length of carapace, following legs decreasing uniformly in length, the last as long as postrostral portion of carapace.

Abdomen of seven distinct segments in both sexes. Male abdomen narrow, widest at base of third segment, following segments laterally concave to distal edge of sixth, seventh segment subtriangular, rounded distally. Segments wider than long, subequal in length except for slightly longer, seventh segment. Surface elevated distally in midline of each segment except last; third segment laterally elevated. Surface of abdomen granular.

Male first pleopod long, stout basally, tapering, slender and outwardly curved distally, tip pointed, aperture subterminal, lateral, covered by broad lateral flap; lateral surface bearing long simple hairs from near base of pleopod to base of flap, short simple hairs in row on lateral surface from tip of pleopod to base of flap, those adjacent to flap partly obscured by it, three or four on abdominal surface opposite flap, some short hairs on sternal surface near base of flap.

Measurements

Male (AM P.13945)—carapace length 19.2 mm, carapace width 11.3 mm, rostrum length 5.0 mm, rostrum width (base) 3.3 mm, cheliped 22.5 mm, chela length 13.5 mm, chela height 3.9 mm, dactyl 5.4 mm, first ambulatory leg ca 20.2 mm.

Ovigerous female (AM P.7482)—carapace length 19.2 mm, chela length 7.1 mm, chela height 1.8 mm, dactyl 3.4 mm.

Remarks

The most obviously variable features in this species include the relative sizes of the spines and tubercles on the carapace including those on the orbital border, chelipeds and ambulatory legs and the shape and relative length of the rostral spines.

These specimens agree in all diagnostic features with the original brief description and figure of the species by Rathbun.

Chlorinoides goldsboroughi appears to most closely resemble *C. brevispinosus* Yokoya, so far known only from the type localities (near Tanabe and east of Tanegasima, Japan). *C. brevispinosus*, however, has only a single mesogastric spine and there are four marginal branchial spines subequal in length.

Distribution

Hawaii; southeastern Australia. The presence of this species in Australia has previously been noted (Griffin 1966c: 285).

***Chlorinoides occidentalis* n.sp.**

(Figs. 1b; 3; 4a, d, e)

Material examined.—A total of 30 specimens, as follows:

Holotype: 1 male, 17.1 mm, NW. of Rottneest Island, Western Australia, dredged, 85 fms, 15-8-1962, R. W. George on *Bluefin* (WAM 319-67).

Paratypes: 1 male, 14.1 mm, NW. of Bluff Pt, Geraldton, W.A., 27° 40' S., 113° 03' E., 70 fms, midwater trawl on bottom, 22-8-1963, HMAS *Diamantina* cruise 4-63, CSIRO Sta. 131 (WAM 204-67); 1 male, 10.9, 13.5 mm (WAM 275-67). 1 female, 14.3 mm, NW. of Bluff Pt, Geraldton, W.A., 27° 40' S., 113° 20' E., beam trawl, 71½ fms, 10-10-1963, HMAS *Diamantina* cruise 6-63, CSIRO Sta. 208 (WAM 302-67). 1 female, 12.2 mm, SW. of Geraldton, W.A., 29° 05' S.,

113° 56' E., triangle dredge, 71–81 fms, 16–2–1964, HMAS *Diamantina* cruise 1–64, CSIRO Sta. 54 (WAM 280–67). 1 female, 13.2 mm, W. of Lancelin Island, W.A., 31° 05' S., 110° 55' E., beam trawl, 62–67 fms, 5–2–1964, HMAS *Diamantina* cruise 1–64, CSIRO Sta. 46 (WAM 340–67). 1 male, 15.1 mm, NW. of Rottneest Island, W.A., 100–103 fms, R. W. George on *Bluefin*, 14–8–1962 (WAM 318–67); 1 male, 15.5 mm (WAM 341–67). 1 male, 16.0 mm, NW. of Rottneest Island, W.A., dredged, 85 fms, B. R. Wilson on *Bluefin*, 15–8–1962 (WAM 343–67). 1 female, ca 11.5 mm, WNW. of Rottneest Island, W.A., 80–90 fms, R. W. George on *Bluefin*, 14–8–1962 (WAM 344–67). 1 female (ovig.), 12.7 mm, W. of Rottneest Island, W.A., 32° 00' S., 115° 16' E., beam trawl, 75–78 fms, 12–10–1963, HMAS *Diamantina* cruise 6–63, CSIRO Sta. 225 (WAM 17–67); 11 males, 5 females, 10.9–15.1 mm (WAM 339–67—3 males, 1 ovig. female from this series now AM P.16822). 1 female, 12.2 mm, W. of West End, Rottneest Island, W.A., dredged, 85–95 fms, R. W. George on *Bluefin*, 12–8–1962 (WAM 342–67). 1 male, 13.4 mm, W. of West End, Rottneest Island, W.A., 80 fms, R. W. George on *Bluefin*, 10–8–1962 (WAM 338–67).

Description

Carapace narrowly pyriform (postrostral length about 1.4 times width), margins and dorsal surface with a few long spines and short lamellate lobes; surfaces smooth, bearing groups of long curled hairs laterally, around bases of spines and lobes and along sides of rostral spines.

Rostrum of two long spines (about one-half postrostral length of carapace in males, slightly shorter in females), each very weakly outwardly curved, slender, cylindrical, acuminate, pointed, separate from close to base and widely divergent, distance between tips almost three times basal width of rostrum and slightly exceeding rostral length; numerous spinules along medial and lateral surfaces.

Orbit consisting above of supraorbital eave, intercalated spine and postorbital lobe, the three separated by U-shaped fissures, intercalated spine closer to postorbital lobe than to eave. Eave broad, bearing a moderately long, acuminate, weakly flattened, upwardly curved preorbital spine and a slightly shorter, pointed antorbital lobe directed outwards basally, distal third directed abruptly upwards. Intercalated lobe flattened, elongate subovate, broad based. Postorbital lobe extending outwards beyond preorbital spine, flattened, subtriangular in shape, subtrigonal in section, posterior edge carinate, constricted at base, anterior surface weakly concave, anterior margin dorsally fringed by long hairs. Edges, tip and ventral surface of preorbital spine and edges and tips of antorbital and intercalated lobes spinulose, anterior edge of postorbital lobe dorsally bearing spinules along proximal two-thirds, most distal spinule longest, remainder of margin very minutely crenulate. Eyestalk reaching postorbital lobe, two small, conical tubercles and some stout hairs on anterior surface close to tip; cornea subterminal, somewhat ventral, circular, large.

Hepatic margin bearing two short, subequal, subovate, flattened lamellae with minutely spinulose margins, the first set slightly obliquely.

Branchial margin anteriorly with a subovate, obliquely set, minutely tuberculate lamella, slightly longer and narrower than hepatic lamellae and less strongly flattened, two very low conical tubercles immediately behind lamella; two long, slender, acuminate spines posteriorly subdorsally, subequal in length and covered by minute spinules.

Dorsal surface of carapace with seven straight, acuminate, spinulose spines in midline, one far back on mesogastric region followed closely by a metagastric, both very long, subequal in length to marginal branchial spines; two shorter, submedial, divergent spines transversely surmounting tumid cardiac region; a short, broad-based intestinal spine and a second pair of short, weakly-flattened, backwardly directed

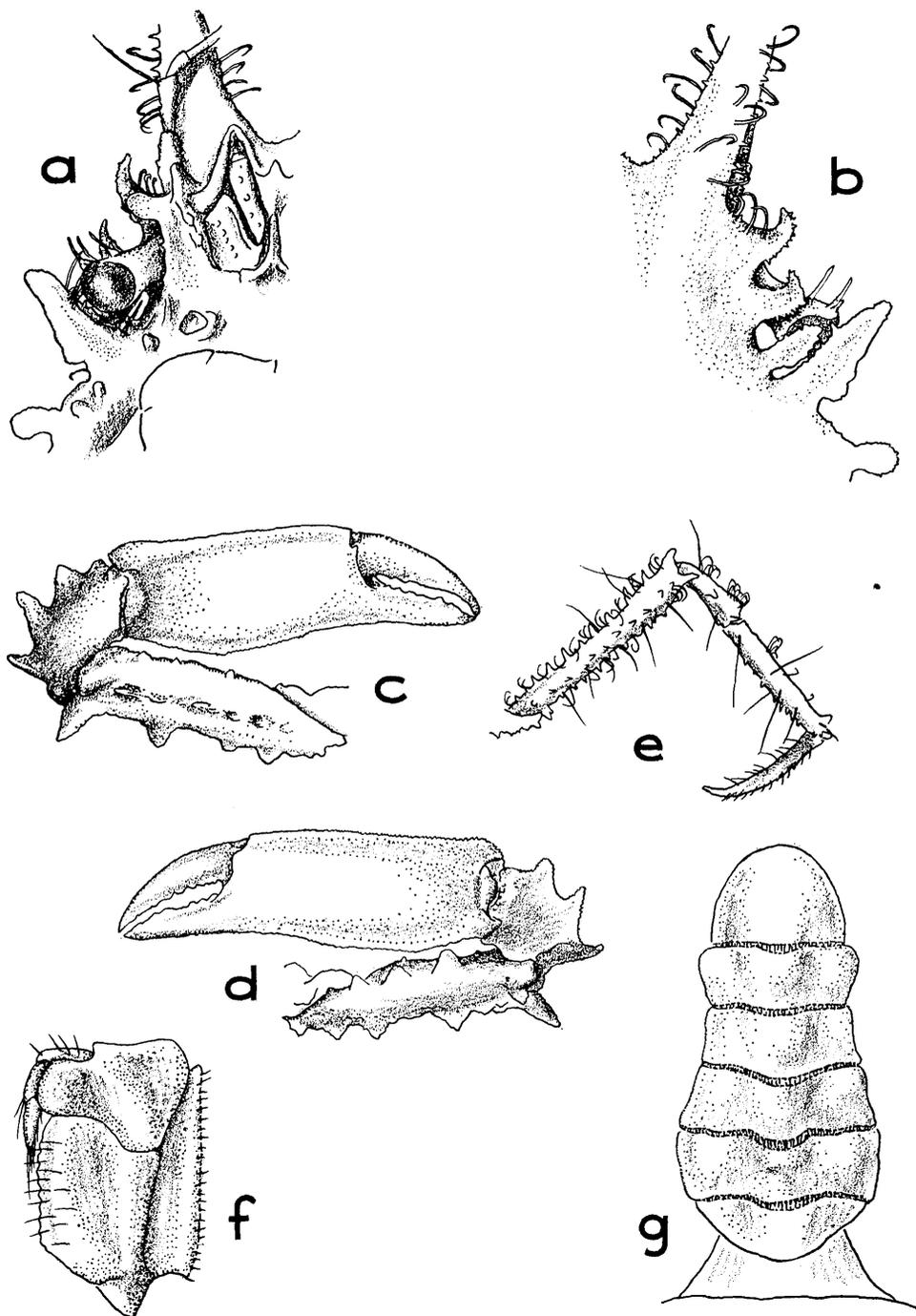


Fig. 3.—*Chlorinoides occidentalis* n.sp., HOLOTYPE, male. a orbit, ventral view; b orbit, dorsal view; c cheliped, inner view of chela; d cheliped, outer view of chela; e right first ambulatory leg, posterior view; f left third maxilliped; g abdomen.

spines overlying posterior margin. Protogastric regions with several low tubercles not far from midline. Several small tubercles in a group on branchial regions in front of posterior marginal spines.

Basal antennal article moderately broad, straight-sided, anterolateral angle bearing a short, broad, apically rounded, flattened lobe directed outwards, a similar but shorter, more conical, subacute lobe at anteromedial corner directed weakly outwards and downwards; lateral and medial edges of article weakly tuberculate, surface weakly concave. Antennae long, extending a little beyond rostrum, two subequal basal segments short, stout, together making up about one-seventh of length, both proximal segments spinulose.

Antennular fossae large, subpentagonal. Basal two segments of antennules tuberculate. Interantennular spine blunt. Anterior process of epistome extremely slender, reaching interantennular spine.

Epistome wider than long, a low elevation lateral and posterior to opening of green gland. Anterior edge and anterolateral corners of mouthfield carinate. Pterygostomian regions bearing a small tubercle midway along lateral border and a broad lobe posteriorly followed by a small tubercle. Subhepatic regions with three or four tubercles in a group immediately below and in front of anterior marginal hepatic lobe.

Third maxillipeds with ischium large, subrectangular, longer than broad, medial half of distal edge produced anteriorly, rounded, anteromedial angle obtuse, medial edge coarsely toothed, overlaid but not concealed by scattered long hairs; outer surface excavated medially as a very shallow, broad, longitudinal groove. Merus subquadrate, slightly wider but shorter than ischium, anterolateral edge weakly outwardly produced, anterolateral corner rounded, distal edge notched; outer surface with a low central ridge. Palp arising from notch of, and slightly longer than, merus, cylindrical, the three segments subequal, fringed by long hairs, a dense array of long hairs at tip. Exognath smooth, laterally bearing some stout hairs.

Sternum in male weakly tuberculate.

Chelipeds in male of moderate length (almost as long as total carapace length), stout, subcylindrical except for weakly compressed palm, naked, merus and carpus with several spinulose tubercles and minutely serrate lobes forming carinate ridges. Merus with a carinate, quadrilobate ridge laterally, a row of five tubercles along proximal half of dorsal surface followed by two larger compressed lobes, and three large tubercles in a ventral row, some small tubercles along dorsomedial surface; a large, compressed, subtriangular lobe laterally overlying distal edge. Carpus with a prominently quadrilobate ridge laterally and a low, tuberculate ridge, medially; some very low tubercles along dorsal surface. Chelae long, about half total length of cheliped, palm weakly inflated and slightly expanded about one-third along its length, almost twice as long as high, dorsal and ventral edges carinate and minutely serrate, outer surface weakly granular proximally. Fingers short, dactyl little more than one-third length of chela, inner edges weakly gaping in proximal half, coarsely toothed along entire length. Chelipeds in female short, about two-thirds postrostral length of carapace, ridges of merus and carpus less well-developed than in male, chelae slender, palm about three times as long as high, dorsal edge with small tubercles along proximal half, outer surface granular proximally, fingers very weakly gaping proximally.

Ambulatory legs moderately long, cylindrical, bearing a few scattered long and short curled hairs in rows on all surfaces of meri and in groups on dorsal surfaces of

carpi and propodi, dactyls with short and long simple hairs more dense distally; ischia spinulous, meri, carpi and propodi all with stout spinules and tubercles of various lengths in three or four ill-defined longitudinal rows, three sharply pointed, spinulous, distal lobes on meri, one dorsal and one on each side and a similar lobe laterally and medially on distal edges of carpi, dactyls dorsally and ventrally tuberculate and spinulous, weakly curved. First leg the longest, about as long as carapace, following legs decreasing uniformly in length, the last as long as postrostral portion of carapace.

Abdomen of seven distinct segments in both sexes. Male abdomen narrow, widest at base of third segment, following segments tapering almost uniformly to rounded tip, sixth segment weakly laterally expanded distally, seventh segment semiovalate. Segments 1-6 wider than long, subequal in length, seventh segment as long as wide. Surface elevated distally in midline of each segment except last and surmounted by a prominent tubercle which is bilobate in segments 4 to 6 and bears one or two long hairs; third segment laterally elevated. Surface of abdomen otherwise with a few tubercles. Female abdomen large, covering all of sternum in mature specimens.

Male first pleopod long, stout basally, tapering and outwardly curved distally, tip slender, pointed, aperture subterminal, lateral, covered by broad flap; lateral surfaces bearing long simple hairs in a row from near base of pleopod to base of flap, short simple hairs on abdominal surface laterally from tip of pleopod to base of flap, about six short hairs on medial part of abdominal surface opposite flap, some long and short hairs on sternal surface near base of flap.

Measurements

Male (holotype)—carapace length 17.1 mm, carapace width 7.7 mm, rostrum length 6.0 mm, rostrum width (base) 2.5 mm, cheliped ca 15.5 mm, chela length 7.9 mm, chela height 2.5 mm, dactyl 3.1 mm.

Female (WAM 302-67)—carapace length 14.3 mm, chela length 3.9 mm, chela height 0.8 mm, dactyl 1.9 mm.

Remarks

Although superficially similar to *Chlorinoides goldsboroughi*, the new species differs from it in about 20 features. *C. occidentalis* possesses only a single lobe on the anterior part of the branchial margin and two submedial intestinal spines on the posterior margin of the carapace. In addition, the carapace is slightly narrower, the rostral spines are relatively much longer and the distance between the tips greater, the antorbital lobe, intercalated spine, postorbital, hepatic and branchial lobes are of a different shape, the spines on the dorsal surface of the carapace and the subdorsal spines on the branchial margin are much longer, the shape of the antero-lateral lobe of the basal antennal article and of the merus of the third maxilliped are different, the shape of the abdomen in the males and the details of the gape and ornamentation of the fingers of the cheliped in the male are different. The carapace in *C. occidentalis* bears groups of curled hairs whereas in *C. goldsboroughi* the curled hairs are not in groups, *C. occidentalis* is much more spinulous, the protogastric and branchial regions are more tuberculate and the crests on the cheliped are more strongly developed. Finally, there are remarkably slight but definite differences between the two species in the shape and ornamentation of the first pleopod in the male with respect to curvature, slenderness of the distal portion, shape of the flap and arrangement of hairs distally.

Distribution: Southwestern Australia.

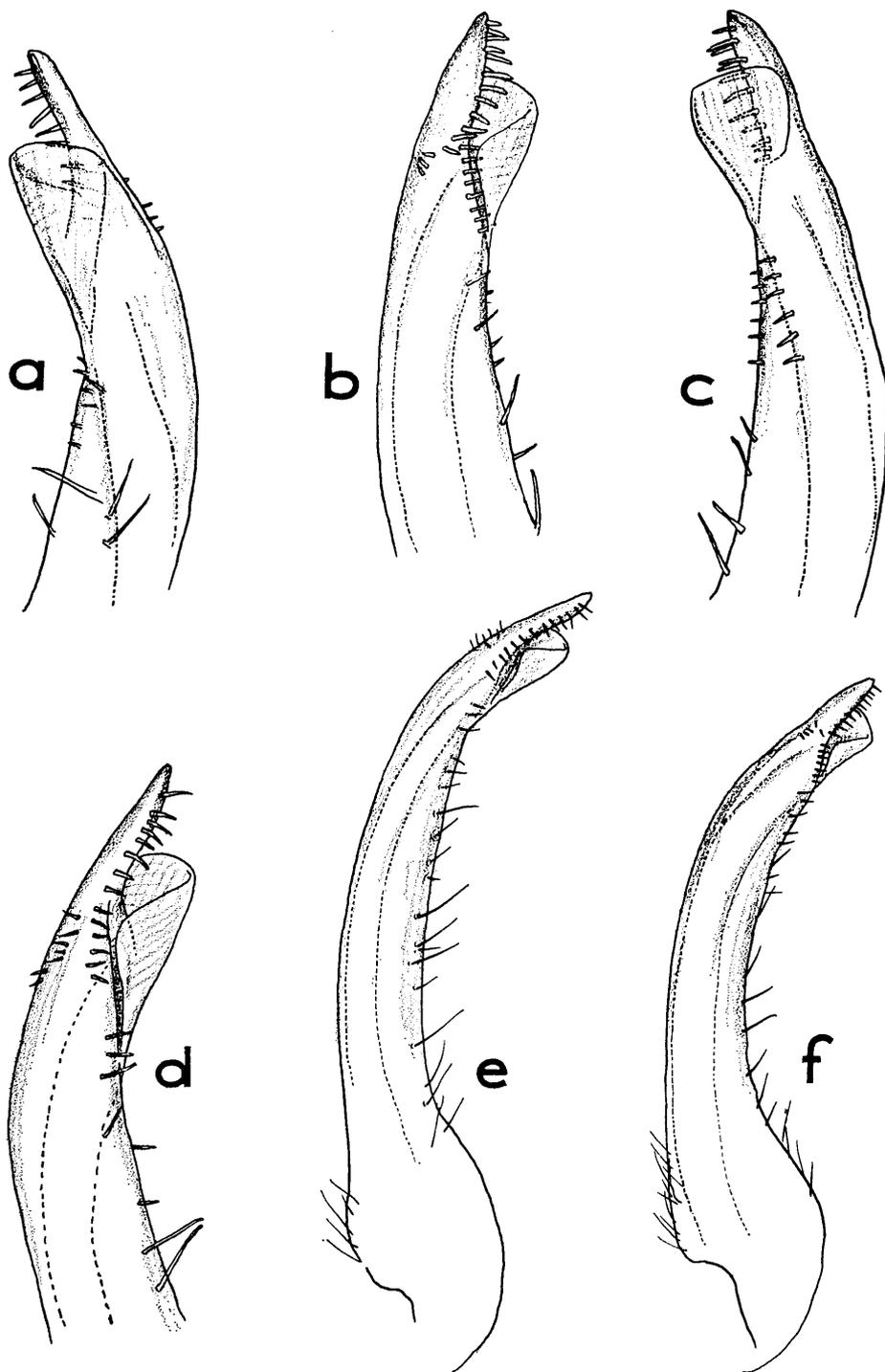


Fig. 4.—Male left first pleopod of *Chlorinoides occidentalis* n.sp., HOLOTYPE (a, d, e) and *Chlorinoides goldsboroughi* Rathbun (AM P.13945) (b, c, f). a, c tip, sternal view; b, d tip, abdominal view; e, f whole pleopod, abdominal view.

***Chlorinoides tenuirostris* Haswell, 1880**

Chlorinoides tenuirostris; Griffin, 1966a: 4, 6-9, 12, figs 2-11; 1966b: 82 (in key); 1966c: 285 (in key).

Material examined

SW. of Point Cloates, W.A., 23° 05' S., 113° 23' E., 73 fms, triangle dredge, 7-10-1963, HMAS *Diamantina* cruise 6-63, CSIRO Sta. 182, 1 female, 31.8 mm (WAM 99-67).

Remarks

This specimen agrees in all important features with the material previously reported on by Griffin (1966a). The only differences are that the spinule on the dorsal surface of the rostral spines is halfway between the base and the tip, the anterior part of the carapace is dorsally more convex, there are three short, subequal spines in the midline of the mesogastric region and two short spines in the midline in the cardiac region, the posterior one slightly longer, the spine on the hepatic margin is short and the subhepatic spine is also short and the lobe on the posterior edge of the postorbital lobe is large so that the tip of the latter appears subtruncate.

Distribution

Restricted to Australia, previously known from Darnley Island to Cape Grenville, northern Queensland and now recorded from Western Australia.

ACKNOWLEDGMENTS

I wish to thank Dr J. C. Yaldwyn, formerly of the Australian Museum, and Dr R. W. George, Western Australian Museum, for advice in the early stages of this study. Examination of the collections of the Western Australian Museum was made possible by a research grant from the CSIRO Science and Industry Endowment Fund.

REFERENCES

- Griffin, D. J. G., 1966a. The genus *Chlorinoides* (Crustacea, Brachyura, Majidae). I. A redescription of *C. tenuirostris* Haswell and the status of the genus *Acanthophrys* A. Milne Edwards. *Rec. Aust. Mus.* 27: 1-16, 11 figs.
- Griffin, D. J. G., 1966b. The marine fauna of New Zealand: spider crabs, family Majidae (Crustacea, Brachyura). *Bull. N.Z. Dep. scient. ind. Res.* 172: 1-112, 23 figs, 4 pls.
- Griffin, D. J. G., 1966c. A review of the Australian majid spider crabs (Crustacea, Brachyura). *Aust. Zool.* 13: 259-298, 3 figs, pls XV-XVII.
- Rathbun, Mary J., 1906. The Brachyura and Macrura of the Hawaiian Islands. *Bull. U.S. Fish. Comm.* 23: 827-930, 79 figs, pls 3-25.
- Sakai, T., 1938. Studies on the crabs of Japan. III. Brachygnatha, Oxyrhyncha: 193-364, 55 figs, pls XX-XLI Tokyo: Yokendo Co.
- Sakai, T., 1965. The crabs of Sagami Bay collected by His Majesty The Emperor of Japan. Tokyo: Maruzen. Pp. i-xvi, 1-206, 1-26 (English), 1-92, 27-32 (Japanese), 26 figs, 100 pls, 1 map.
- Yokoya, Y., 1933. On the distribution of decapod crustaceans inhabiting the continental shelf around Japan, chiefly based upon the materials collected by S.S. *Sôyô-Maru*, during the year 1923-1930. *J. Coll. Agric. Tokyo Imp. Univ.* 12: 1-226, 71 figs.