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TWO NEW SPECIES OF *ACHAEUS*
(CRUSTACEA, DECAPODA, MAJIDAE) FROM
SOUTH AFRICA

By

D. J. G. GRIFFIN

Cape Town

Kaapstad

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TWO NEW SPECIES OF *ACHAEUS* (CRUSTACEA, DECAPODA,
MAJIDAE) FROM SOUTH AFRICA

By

D. J. G. GRIFFIN

Australian Museum, Sydney, Australia

(With 4 text-figures)

[MS. received 15 January 1968]

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INTRODUCTION

The small, long-legged spider crabs of the genus *Achaeus*, belonging to the majid subfamily Inachinae, have most recently been reviewed by Griffin & Yaldwyn (1964), who considered that about 20 species were known. A more detailed count (Griffin, unpublished) shows that 27 species of good status are at present placed in the genus; two of these have recently been described from the south Atlantic by Forest & Guinot (1966). Three others are of uncertain status. Two of these are from South Africa and were discussed by Barnard (1950): '*Achaeus* cf. *lorina* Adams and White' and '*Achaeus* cf. *affinis* Miers'. Re-examination of the material studied by Barnard shows that both these are distinct, unnamed species of *Achaeus*. The first is similar in some ways to a few species of the genus *Macropodia*. Examination of the holotype of *A. lorina*, of a specimen of that species from the Philippines and of one specimen from the series recorded by Rathbun (1911) from Amirante in the Indian Ocean permits a further diagnosis of *A. lorina* and reveals that Rathbun's material is probably referable to *A. fissifrons* (Haswell). Barnard's '*A. cf. affinis*' is similar to *A. brevirostris* (Haswell).

In the present paper the new species are described and figured and compared with other species of *Achaeus*. The terminology and system of measurements used follow Griffin & Yaldwyn (1964). In general, carapace length is abbreviated as c.l.

SYSTEMATIC ACCOUNT

Achaeus spinosissimus n.sp.

(Figs 1, 2, 4a, b)

Achaeus cf. *lorina*: Barnard, 1950: 22-23, fig. 3g.[non] *Inachus lorina* Adams & White, 1848.

Holotype: Male, c.l. 10.0 mm, off Hood Point (East London), South Africa (S. Afr. Mus. reg. A8309) — South African Museum, Cape Town.

Description: Carapace elongate subtriangular (length 1.3 times width), narrowed anteriorly, not markedly constricted behind orbits, branchial regions swollen, lateral margins and dorsal surface armed with numerous spines and spinules and a few scattered short hairs; regions moderately well defined. Surface of carapace, sternum, abdomen and third maxillipeds coarsely granular.

Rostrum of two very short, slender, blunt spines separated by a narrow slit.

Supraorbital cave bearing midway along a long, slender, weakly curved, acuminate spine directed outwards, upwards and forwards; cave otherwise unarmed. Postorbital region with about four short spines laterally, one longer than others, and two or three dorsal spinules near lateral margin. Eystalks stout, a narrow process extending above cornea terminating in a small tubercle; a small pointed spinule on anterior surface close to cornea; cornea large, ovoid, obliquely terminal.

Hepatic region not greatly expanded, with four or five spines on margin, one longer spine on dorsal surface posteriorly and some spinules anteriorly.

Dorsal surface of carapace with two prominent short, blunt tubercles in mid-line, one spinous gastric and a blunt one on tumid cardiac region; a low swelling behind cardiac tubercle. Protogastric regions each with a curved spine just in front of hepatic regions with one or two spinules at its base. Branchial regions with six spines on, or close to, margin; eight or nine spines and spinules on outer slope of each mesobranchial region and a very low swelling on metabranchial region above last legs.

Basal antennal article very slender, armed with four equidistant, broad-based, long, subacute spines mostly directed outwards situated towards lateral border. First segment of flagellum short, with an outwardly-directed terminal spine. Second segment long, with a small spinule laterally. Flagellum of moderate length, with a few long hairs.

Antennular fossae large, longitudinally subovate; basal segment of antennules bearing medially a row of seven prominent spinules; inter-antennular spine slender, projecting downwards as an obtuse, triangular process; anterior process of epistome extremely slender.

Epistome about as wide as long with several spinules laterally, two behind antennal article and others near anterolateral angle of mouthfield. Pterygostomian regions with a spine midway along lateral border. Several spinules ventrally on branchial regions.

Third maxillipeds almost meeting in midline, spinous and hairy. Ischium

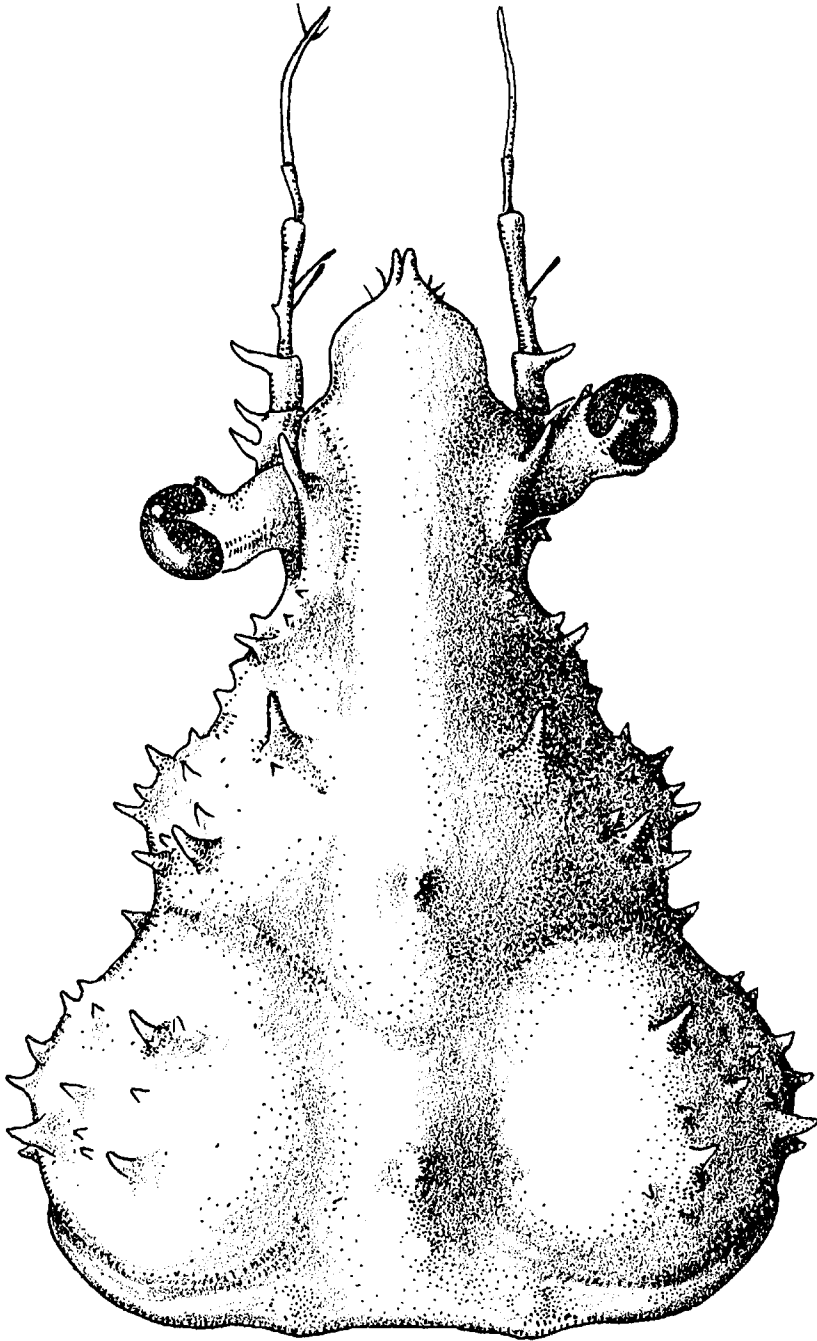


Fig. 1. *Achaeus spinosissimus* n.sp. Holotype, male, carapace, dorsal aspect.

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bearing spines in two oblique rows, one row of two or three laterally and a central row of seven similar spines; medial edge finely toothed, overlaid by long hairs. Merus narrow, subovate, with four spines near medial edge, three in a central row and two smaller ones at anterolateral angle; several long hairs arising from medial edge. Palp long and stout, dactyl as long as carpus and propodus together, carpus and propodus each with a spine near distal border on medial surface; long hairs arising from medial surface and tips of all three segments.

Chelipeds long and stout, with numerous spines and spinules more or less in longitudinal rows, and long sparse hairs. Ischium with several spines. Merus subcylindrical, swollen, bearing numerous spinules and curved spines largest along outer lateral surface where five, larger than others, stand in a row. Carpus subcylindrical, with numerous curved spines which are generally longest laterally. Chela about half total length of cheliped, compressed, fingers not much shorter than palm which is deep, dorsally weakly convex and ventrally strongly convex; dorsal surface and dorsal part of outer surface with short, curved spines and blunt tubercles in poorly defined rows in proximal two-thirds; a few, similar but smaller, spinules and tubercles on ventral part of outer surface and along ventral surface; distal part of outer surface smooth. Fingers stout, very widely gaping for about proximal two-thirds; fixed finger with a very large, apically truncate tooth proximally filling gape, its straight apex spinulate, remainder of inner edge denticulate, strongly concave proximally, obtusely angled at distal end of gape. Dactyl with large truncate tooth, smaller than, and just beyond, that on fixed finger, remainder of inner edge irregularly dentate. Chela with long hairs dorsally, ventrally, on outer surface of palm distally, along both fingers and filling gape.

Ambulatory legs very long, slender, with curled hairs arising singly on dorsal surface of propodi and long hairs, especially on distal two-thirds of propodi and on dactyls; first leg the longest, remainder decreasing to last; bases of all legs and ischia of first with some spinules ventrally, meri of all with a terminal dorsal spine; dactyls almost straight in first pair and unarmed, second with a single, strong, subterminal, curved spinule ventrally, dactyls of third and fourth legs short, weakly curved with several small denticles and two curved, subterminal spines ventrally, the distal the longer.

Sternum with spinules in transverse rows opposite base of each leg and two on each side along margin of abdominal fossa anteriorly at base of chelipeds.

Abdomen in male of six segments, segments 6 and 7 coalesced. All segments wider than long, first segment the longest, second very short, remainder subequal in length, third and last a little longer than others. Abdomen widest about middle of laterally convex third segment, lateral margin concave to just beyond base of last segment, then tapering rapidly, apically rounded but with surface deeply concave and appearing bilobate in ventral view. Surface with a broad medial elevation distally in segments 1-5 and proximally in last, each bearing a pair of long hairs. Third segment with two oblique rows of three spines

on each side of midline on swollen lateral surfaces. Proximal part of last segment laterally swollen.

Male first pleopod moderately stout, uniformly tapering apically, curved outwards, terminally blunt; aperture terminal, a narrow slit at end of groove along medial surface; lacking hairs except for several at base laterally.

Measurements: Carapace length 10.0 mm, carapace width 7.1 mm, rostral length 0.5 mm, rostral width 0.5 mm, cheliped length 17.5 mm, chelar length 8.4 mm, chelar height 3.6 mm, dactyl length 5.1 mm, first ambulatory leg length 26.2 mm.

Remarks: This new species agrees with Adams & White's original description and figures only in a number of general features, including shape of the carapace, presence of two tubercles in the midline, presence of a larger tooth near the base of each finger of the chela, setose anterior ambulatory legs and curved dactyls on the posterior ambulatories.

Examination of drawings of the holotype (a male, c.l. 11 mm (approx.), 'Eastern Seas', in the British Museum (Natural History)) of *Inachus lorina* by Dr. A. L. Rice and the availability of a specimen from the United States National Museum collections—1 ovigerous female, c.l. 10.5 mm (reg. no. 49837), *Albatross* Philippine Expedition 1907-1910, Sta. 5355, North Balabac Strait, 44 fms—which is certainly conspecific with the holotype, show that the diagnostic features of *A. lorina* include the weakly bilobed, apically rounded rostrum, acute but not markedly expanded hepatic regions, single gastric elevation, two small tubercles side by side on elevated cardiac region, a small spine or tubercle close to posterior margin above last ambulatory leg, supraorbital cave without spines or tubercles, eyestalks with a sharp tubercle, basal antennal article with a spine centrally and an apical spine. The Philippine specimen possesses a small spinule at the base of the basal antennal article and there is an oblique row of three low tubercles on the branchial regions medially extending forward from opposite the cardiac prominence; neither of these features are apparently obvious in the holotype. The third maxillipeds are of the usual form in this genus and are spinous and hairy; there is one longitudinal row of spines on the ischium, the surface of which is weakly excavate immediately lateral to the spines; there are two spines not far from the lateral edge, one proximal, one distal; the merus is also weakly excavate centrally and lateral to this there are three sharp spines; the medial and anterolateral edges bear sharp spines and the carpus and propodus each bear a single, slender spine. The slender chelipeds are spinous and hairy, long spines and hairs arising from the ventrolateral edge of the merus, the dorsomedial surface of the carpus and the ventral edge of the palm of the chela; there are long hairs and shorter spines along the dorsal surface of the merus and palm of the chela; fringes of long hairs continue on to the dorsal edge of the dactyl and the ventral edge of the fixed finger. The ambulatory legs are extremely long and slender and the propodus and dactyl of all bear very long hairs; the dactyl of the last ambulatory leg is weakly falcate with a double row of short spines on the proximal two-thirds and three longer back-

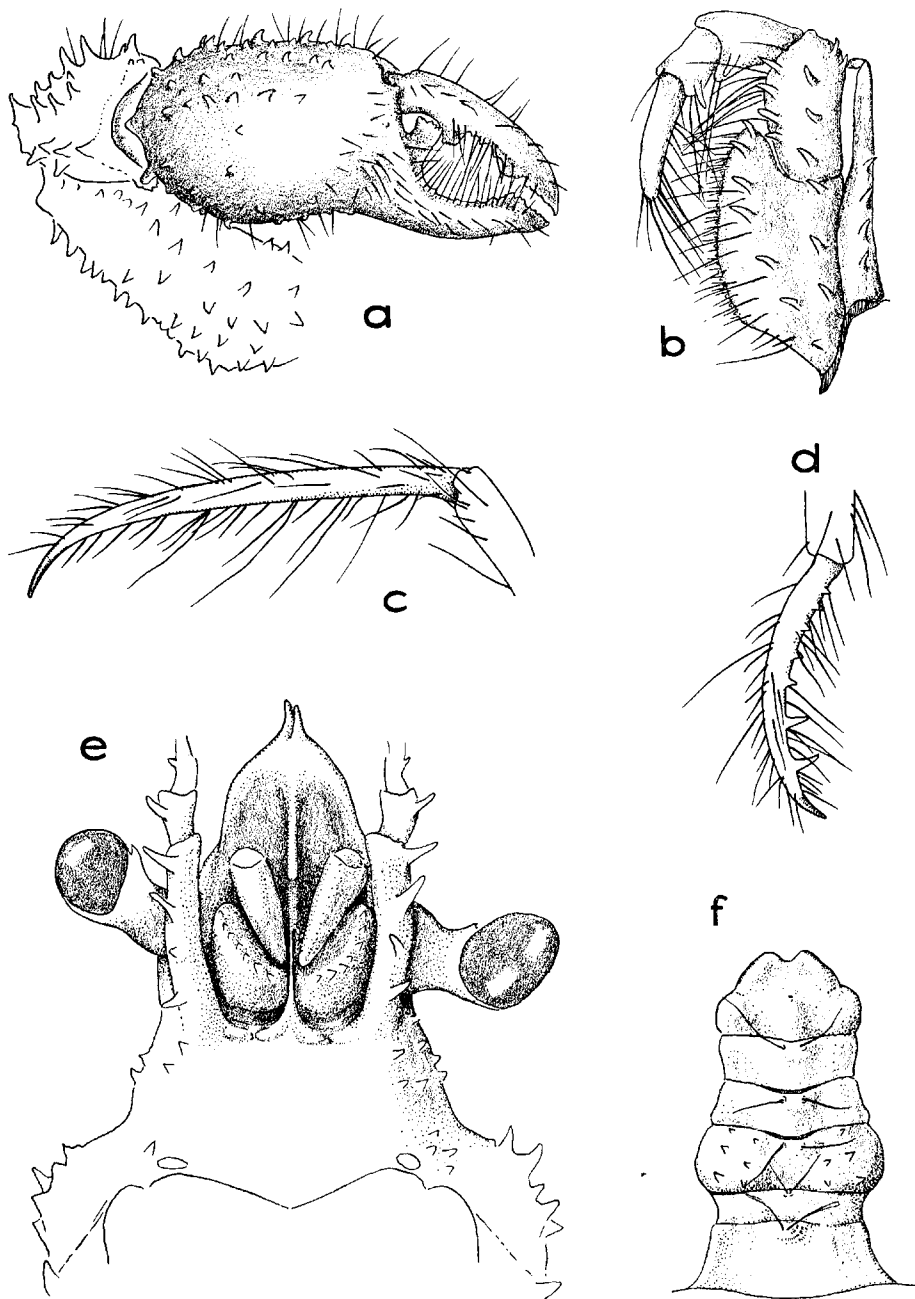


Fig. 2. *Achaeus spinosissimus* n.sp. Holotype, male: a, right cheliped; b, left third maxilliped; c, left first ambulatory dactyl; d, left fourth ambulatory dactyl; e, front of carapace, ventral aspect; f, abdomen.

wardly curved spines, equally spaced, distally, the last distant from the tip; there is a short spine just beyond the penultimate large spine.

Thus, *A. spinosissimus* differs from *Achaeus lorina* notably in the presence of a supraorbital spine, larger spines on the dorsal surface of the carapace, particularly the protogastric ones, more numerous spines on the hepatic and branchial margins, in the form of the rostrum and in the presence of much larger spines on the basal antennal article. As Barnard (1950) states, this species agrees reasonably well with the description of *Achaeus lorina* given by De Man (1902) of specimens from Ternate and Halmahera in Indonesia. However, none of the most notable features of this species are present in the holotype of *Achaeus lorina*. The material reported on by De Man may be conspecific with *A. spinosissimus*.

Examination of one specimen—an ovigerous female, c.l. 5.9 mm (reg. no. 1912:2:10:82), Percy Sladen Trust—*Sealark* Expedition to the Indian Ocean Sta. E14, Amirante, 34 fms—in the collections of the British Museum (Natural History) from the series recorded by Rathbun (1911:244) as *Achaeus lorina* shows that this identification by Rathbun was incorrect. The specimen is definitely not conspecific with *A. lorina* but possesses the general features of the carapace, orbit, maxillipeds and cheliped of *A. fissifrons* (Haswell) (see Griffin & Yaldwyn, 1964: 38-41, figs. 1-8) except that the eyestalks are much longer, the postorbital spinules are minute and the palm of the chela possesses fewer spinules on the dorsal and ventral surfaces than does *A. fissifrons*. The fact that the specimen is a female without ambulatories makes precise determination difficult. Positive identification of Rathbun's series thus awaits further study.

Among the known species of *Achaeus*, *A. spinosissimus* appears to be most closely related to those such as *A. inimicus* Rathbun, *A. akanensis* Sakai, *A. anauchen* Buitendijk, *A. fissifrons* (Haswell) and *A. cadelli* Alcock, in which the supraorbital cave possesses 1-3 large spines. From these it is distinguished by its more spiny carapace and chelae, the form of the rostrum and the presence of long spines on the basal antennal article. The closely approximated rostral spines are reminiscent of species of *Macropodia* in which, however, the rostrum is nearly always much longer. The species of *Macropodia* most similar to *A. spinosissimus* is *M. formosa* Rathbun (see Barnard, 1950: 17, figs 2g-i).

Achaeus barnardi n.sp.

(Figs 3, 4c-g)

Achaeus cf. *affinis*: Barnard, 1950: 19-20, figs 3d-f.

[non] *Achaeus affinis* Miers, 1884 (= *A. brevisrostris* (Haswell)—see Griffin & Yaldwyn, 1964: 46-48).

Holotype: Male, c.l. 8.5 mm, chelipeds and legs missing, off Cape Morgan, South Africa (S. Afr. Mus. reg. A1392)—South African Museum, Cape Town (this is the specimen figured previously by Barnard).

Paratypes: Two males, c.l. 6.7, 5.5 mm, 1 female (ovig.) c.l. 7.0 mm, same data as for holotype—South African Museum, Cape Town.

Description: Carapace elongate subtriangular, narrowed anteriorly, not markedly constricted behind orbits, branchial regions swollen, lateral margins and dorsal surface with a few tubercles, regions well defined. Surface of carapace, sternum, abdomen and third maxillipeds coarsely granular.

Rostrum of two short, slender, subacute lobes separated apically by a very narrow, V-shaped slit.

Supraorbital eave with up to six or seven very small, sharp spinules anteriorly on dorsal surface near margin. Postorbital region unarmed. Eye-stalks stout, a narrow process extending above cornea terminating in a small but prominent tubercle; anterior surface with a prominent rounded or subacute lobe midway along; cornea large, ovoid, obliquely terminal.

Hepatic region not greatly expanded, with a small tubercle at summit and one or two tubercles or spinules in front of this.

Branchial regions smooth or with three very low tubercles laterally in a shallow arc, one anteriorly, one just forward of cardiac prominence and one close to posterior margin on metabranchial region above last leg; anterolateral margins with two or three small tubercles, posterior margins laterally with some minute spinules.

Dorsal surface of carapace with four low tubercles in midline, one far back on mesogastric region, two small tubercles side by side surmounting tumid cardiac region and a low tubercle on posterior slope.

Protogastric regions smooth or with a small, low tubercle on each side just in front of marginal hepatic tubercle.

Basal antennal article with surface weakly convex, oblique, smooth or with up to four very small tubercles in a row centrally. First segment of flagellum stout, short, a small, apically curved spine laterally midway along and two smaller spines ventrally, one midway along and one apically; second segment almost three times as long. Flagellum of moderate length, with a few long hairs.

Antennular fossae large, longitudinally subovate, distal part of lateral edge slightly outwardly splayed; basal segment of antennules with a row of spinules medially; interantennular spine and anterior process of epistome slender, the former projecting down as an obtuse lobe.

Epistome slightly longer than wide, with one or two spinules just lateral to opening of green gland, otherwise smooth.

Third maxillipeds almost meeting in midline, spinulose and hairy. Ischium bearing spinules in two oblique rows, one laterally and one centrally bordering a broad, shallow groove; medial edge coarsely toothed. Merus narrow, subovate, with four or five spinules centrally in proximal half, a similar number of spinules close to medial margin and three spinules on anterolateral angle. Palp long and stout.

Chelipeds long and stout in male, short and slender in female, tuberculate or spinous. Ischium tuberculate. Merus subcylindrical, bearing three sharp tubercles dorsally in both sexes, two proximal, one distal and a row of tubercles ventrally which are blunt in male and become small distally but sharp in female

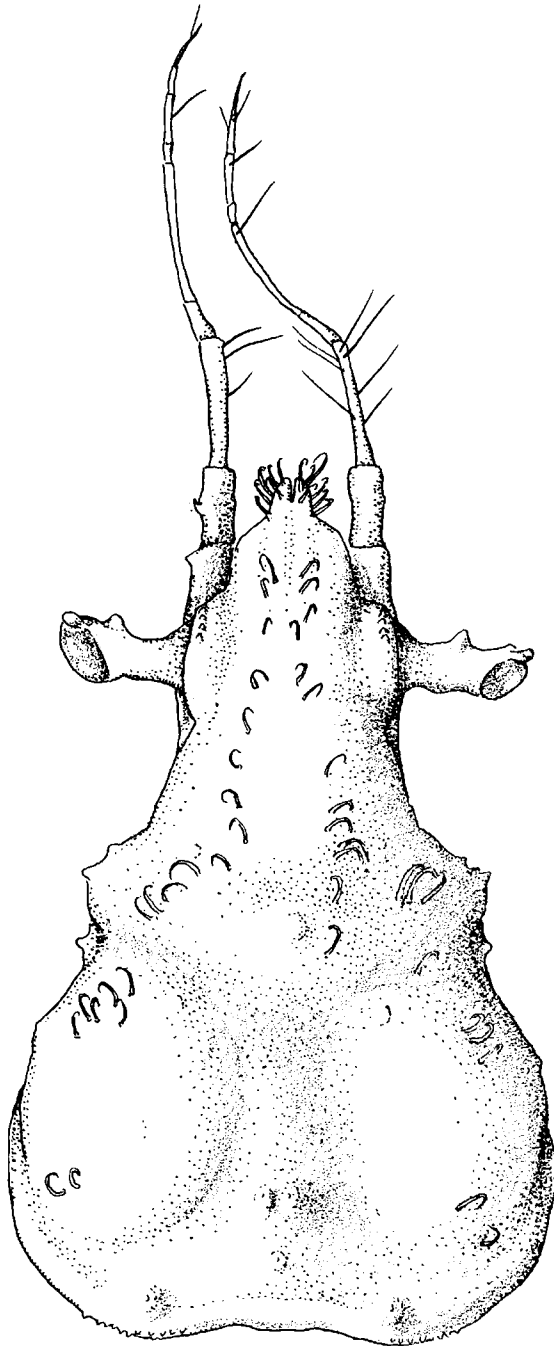


Fig. 3. *Achaeus barnardi* n.sp. Holotype, male, carapace, dorsal aspect.

and of equal length throughout. Carpus medially bearing about five sharp spinules. Chela in male about half length of cheliped, compressed, robust, palm dorsally weakly convex and ventrally strongly convex, outer surface granular, dorsal and ventral surface with a few small spinules proximally, without spines or tubercles; fingers as long as palm, stout, very widely gaping for proximal half, fixed finger with a narrow, apically truncate tooth proximally almost filling gape, remainder of inner edge strongly concave in proximal half, obtusely angled at distal end of gape; dactyl with a small truncate tooth, slightly shorter than, and just beyond, that on fixed finger, a broader, minutely dentate tooth near distal part of gape, distal half of inner edge irregularly dentate; a few short hairs on both fingers extending into gape. Chelae slender in female, fingers with inner edges adjacent for entire length.

Ambulatory legs very long, slender, with curled hairs arising singly on dorsal surface of propodi, long hairs on distal two-thirds of propodi and on dactyls; first leg the longest, remainder decreasing to last, all legs without spines; dactyls almost straight in first and second pair, strongly falcate to semicircular in last two legs, third dactyl with strong spinules ventrally along whole length, last dactyl with strong spinules for distal half to two-thirds.

Sternum with tubercles in transverse rows along each sternite; anterior margin of sternum subtruncate, bearing spinules close together.

Abdomen in male of six segments, segments 6 and 7 coalesced. All segments wider than long, last segment the longest, almost as long as wide, first slightly shorter, second the shortest; fifth also short, third and fourth subequal, about half length of last. Abdomen widest about middle of laterally convex third segment, lateral margin concave to just beyond base of last segment, then tapering to subtruncate, weakly concave distal edge. Surface with a broad medial elevation distally in segments 1-5 and proximally in last segment. Third segment with small spinules in three ill-defined longitudinal to oblique rows on swollen lateral surfaces; proximal part of last segment laterally swollen.

Male first pleopod moderately stout, uniformly tapering apically and outwardly curved, terminally blunt; aperture subterminal, a broad slit at end of groove on medial surface; lacking hairs.

Measurements (paratype male): carapace length 6.7 mm, carapace width 4.8 mm, rostral length 0.5 mm, rostral width (at base) 0.9 mm, chelar length 5.0 mm, chelar height 1.5 mm, dactyl length 3.0 mm, first ambulatory leg length 21.0 mm.

Remarks: This species is very similar to *A. brevirostris* (Haswell) (of which *A. affinis* Miers is a synonym). Comparison with the series from Australia examined by Griffin & Yaldwyn (1964: 46-47) shows the following differences. In *A. brevirostris* the carapace is narrower, the rostral lobes are somewhat broader, usually more widely separated and blunter, the supraorbital lobe lacks spinules or tubercles, the cardiac elevation is usually very much more prominent, the branchial margin is without tubercles or spinules, the merus and carpus of the cheliped in both sexes are tuberculate but without spines, the fourth ambulatory

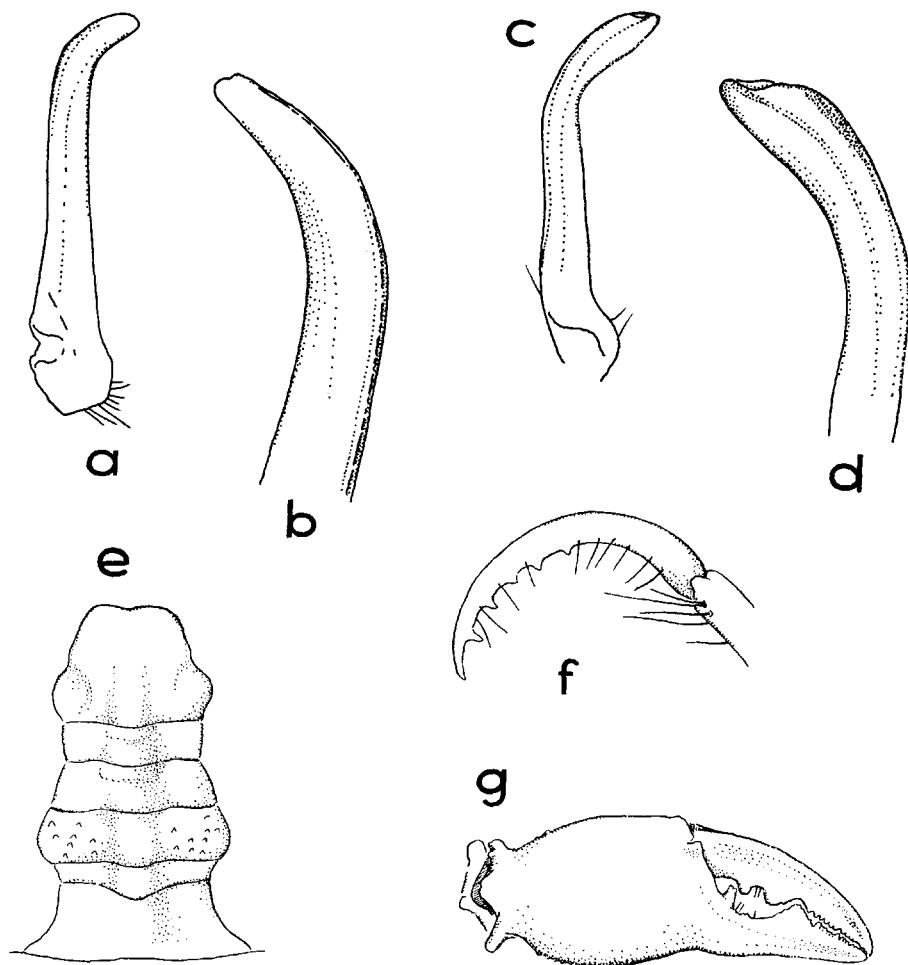


Fig. 4. *Achaeus spinosissimus* n.sp. Holotype, male, left first pleopod (a, b): a, abdominal aspect; b, tip, sternal aspect. *Achaeus barnardi* n.sp. (c-g): c, holotype, male, left first pleopod, abdominal aspect; d, tip of same, sternal aspect; e, abdomen of holotype; f, fourth left ambulatory dactyl, posterior aspect, of male paratype, c.l. 6.7 mm; g, right chela, outer aspect, of male paratype.

dactyl is falcate but not semicircular and possesses spinules ventrally along the whole length, and the sternum in the male is anteriorly weakly convex and bears only minute spinules or lacks spinules altogether. Lastly, the male first pleopod is almost straight, not curved distally.

Barnard's description of this species is in error only in the following particulars. He did not mention the mesogastric tubercle or the spinules on the anterior part of the supraorbital eave and he described and illustrated the third ambulatory dactyl in mistake for the fourth. He also stated that the male first

pleopod resembled that of *Macropodia falcifera*. In that species, however, the distal part is rather abruptly bent, not smoothly curved as in this species.

The new species is named for the late Keppel Harcourt Barnard, former director of the South African Museum, Cape Town, who made so many notable contributions to what is known of South African Crustacea.

DISCUSSION

The total number of species of *Achaeus* in South African waters is four. These are *A. spinosissimus* and *A. barnardi*, described in this report, *A. lacertosus* Stimpson and a species which is almost certainly *A. laeviculis* Miers (*A. cf. laeviculis* of Barnard). Re-examination of the three specimens which Barnard identified tentatively as this species and comparison with Miers's (1884: 520, pl. XLVI, figs A, a) description does not suggest that the South African species is distinct. However, the following remarks are necessary: Barnard figures one specimen with the rostrum bearing denticles on the anterior margin—the other two specimens have the rostrum medianly divided apically, the lobes rounded and entire with a submarginal fringe of hairs; the hepatic margin bears a few low tubercles; the anterior tubercle near the medial margin of the branchial regions has one or two small tubercles near by; the lateral margin of the branchial regions possesses spinules anteriorly; there is a very low tubercle near the posterior margin above the base of the last legs; the meri of the chelipeds have one dorsal tubercle and several tubercles ventrally, especially along the ventro-lateral edge; the carpi of the chelipeds possess a few tubercles dorsally; and the palm of the chela has tubercles on the dorsal and ventral edges distally.

Of these four species the two described in this report are restricted to South African waters, *A. laeviculis* is known from the western Indian Ocean and *A. lacertosus* is widespread in the Indo-Pacific, from Australia and Japan through the Gulf of Siam and the Gulf of Martaban to India and the Iranian Gulf.

SUMMARY

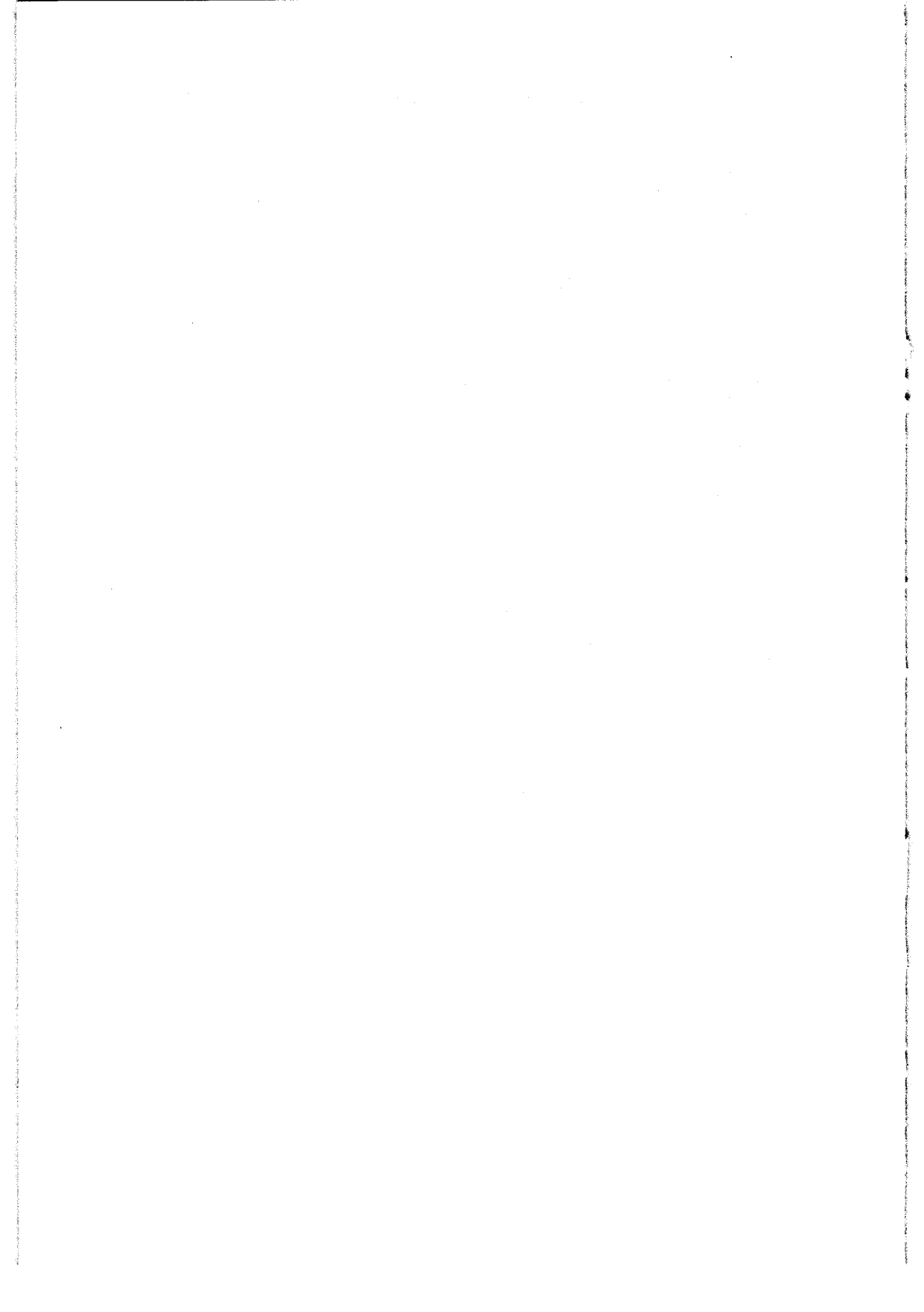
A re-evaluation of the material from South African waters, of two species of majid spider crab belonging to the genus *Achaeus* discussed recently by Barnard shows that they are distinct and previously unnamed species. The two species are described and figured and compared with closely related species. Additional descriptive notes are given on *A. lorina* (Adams & White) which is known with certainty only from Indonesia and the Philippines and the material recorded from the western Indian Ocean by Rathbun as *A. lorina* is considered to belong to the widespread *A. fissifrons* (Haswell). The new species appear to be confined to South Africa; one other species, *A. laeviculis* Miers, is found in other parts of the western Indian Ocean whilst *A. lacertosus* Stimpson is found throughout most of the Indo-West Pacific.

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MANUSCRIPT

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Harvard system (name and year) to be used: author's name and year of publication given in text; full references at the end of the article, arranged alphabetically by names, chronologically within each name, with suffixes *a*, *b*, etc. to the year for more than one paper by the same author in that year.

For books give title in italics, edition, volume number, place of publication, publisher.

For journal articles give title of article, title of journal in italics (abbreviated according to the *World list of scientific periodicals*, 4th ed. London: Butterworths, 1963), series in parentheses, volume number, part number (only if independently paged) in parentheses, pagination.

Examples (note capitalization and punctuation)

BULLOUGH, W. S. 1960. *Practical invertebrate anatomy*. 2nd ed. London: MacMillan.

FISCHER, P.-H. 1948. Données sur la résistance et de la vitalité des mollusques. *J. Conch., Paris* **88**: 100-140.

FISCHER, P.-H., DUVAL, M. & RAFFY, A. 1933. Etudes sur les échanges respiratoires des littorines. *Archs Zool. exp. gén.* **74**: 627-634.

KOHN, A. J. 1960a. Ecological notes on *Conus* (Mollusca: Gastropoda) in the Trincomalee region of Ceylon. *Ann. Mag. nat. Hist.* (13) **2**: 309-320.

KOHN, A. J. 1960b. Spawning behaviour, egg masses and larval development in *Conus* from the Indian Ocean. *Bull. Bingham oceanogr. Coll.* **17** (4): 1-51.

THEILE, J. 1910. Mollusca: B. Polyphacophora, Gastropoda marina, Bivalvia. In Schultze, L. *Zoologische und anthropologische Ergebnisse einer Forschungsreise im westlichen und zentralen Süd-Afrika*. **4**: 269-270. Jena: Fischer. *Denkschr. med.-naturw. Ges. Jena* **16**: 269-270.

ZOOLOGICAL NOMENCLATURE

To be governed by the rulings of the latest *International code of zoological nomenclature* issued by the International Trust for Zoological Nomenclature (particularly articles 22 and 51). The Harvard system of reference to be used in the synonymy lists, with the full references incorporated in the list at the end of the article, and not given in contracted form in the synonymy list.

Example

Scalaria coronata Lamarck, 1816: pl. 451, figs. 5 *a*, *b*; Liste: 11. Turton, 1932: 80

