Tattersall, W. M., 1940. Sydney University plankton investigations, under the direction of Professor W.J. Dakin, D.Sc. Report on a small collection of Mysidacea from the coastal waters of New South Wales. *Records of the Australian Museum* 20(5): 327–340. [15 March 1940].

doi:10.3853/j.0067-1975.20.1940.583

ISSN 0067-1975

Published by the Australian Museum, Sydney

SYDNEY UNIVERSITY PLANKTON INVESTIGATIONS,
under the Direction of Professor W. J. Dakin, D.Sc.

REPORT ON A SMALL COLLECTION OF MYSIDACEA FROM THE COASTAL WATERS OF NEW SOUTH WALES.

By

WALTER M. TATTERSALL, D.Sc.,
Professor of Zoology, University College, Cardiff, Wales.

(Figures 1–6.)

I am indebted to Professor W. J. Dakin for the opportunity of examining this small collection of Australian Mysidacea. It proved of considerable interest since in it are included three species new to science and a further two species new to the Australian fauna.

The species new to science are *Siriella longidactyla*, *Gastrosaccus dakini* and *Afromysis australiensis*. The species now added to the Australian fauna are *Anchialina penicillata* Zimmer and *Gastrosaccus indicus* Hansen, while the remaining two species, *Siriella australis* Tattersall and *Rhopalophthalmus egregius* Hansen, have already been recorded from Australian waters. The number of species of Mysidacea now known from the coasts of Australia is thirty-eight, and the papers of Tattersall (1927, 1928 and 1936) will provide a full guide to these species.

The shallow water planktonic Mysid fauna of Australia, as evinced by the known species, is distinctly Indo-Pacific in facies, and it is clear that the shallow water fauna of the Indo-Pacific region extends at least as far south as the coasts of New South Wales. Sixteen of the thirty-eight Australian species were recorded by the "Siboga" from the waters of the Dutch East Indies. The species peculiar to Australia are either shallow water non-planktonic species or deep water forms, and it is evident that a great number of species in both these categories still await discovery in Australia.

MYSIDACEA.

Suborder MYSIDA.

Family MYSIDAE.

Subfamily SIRIELLINAE.

Genus **Siriella** Dana.

Siriella australis Tattersall.

S. australis Tattersall, 1927, p. 242.

S. australis Hale, 1927, p. 321.

Occurrence.—Port Stephens, June 1938, over one hundred adult males and females, 8–10 mm., females carrying eggs and embryos.

Remarks.—These specimens agree closely with those described by me from the Gulf of St. Vincent. The number of spines on the lateral margins of the telson varies somewhat in individuals of the same size and also with age. In some of the specimens in this collection there are twenty spines on each lateral margin, two large ones at the proximal end followed by a short unarmed portion of the margin, and then a graded series of eighteen spines gradually increasing in length to the spines at the apex. The "prominent spine" which I described as present on the inner margin of the dactylus of the endopods of the third to the eighth thoracic limbs should more properly be called a spiniform seta.

Distribution.—The type specimens were collected in the Gulf of St. Vincent, S. Australia. I have also recorded specimens which I believed to be this species from the north coast of Kangaroo Island, S. Australia, and from Port Hacking, New South Wales. In the light of the present material I think that my identification of these specimens was correct. It would appear that this species is common off the south-eastern shores of Australia.

Siriella longidactyla, n. sp.
(Figs. 1*a*–1*d*.)

Occurrence.—Port Stephens, June 1938, three adult males and one adult female carrying embryos, 9 mm.

Description.—Carapace produced in front into a short rostral plate, triangular in shape, apex not very acute, apical angle at least a right angle.

Eyes moderate in size, pigment black.

Antennal scale (Fig. 1*a*) not reaching forward to the distal end of the antennular peduncle and slightly longer than its own peduncle; three and a half times as long as broad; without a distal joint; terminal lobe not quite as long as broad and extending some way beyond the terminal outer spine; second joint of the antennal peduncle four times as long as the third.

Endopods of the third to the eighth thoracic limbs (Fig. 1*d*) rather long and slender; sixth joint (protopodite) divided by a suture into two parts, the distal of which is the longer; dactylus exceedingly long, longer than the distal portion of the protopodite; copulatory organ of the male acutely pointed.

Pseudobranchial rami of the second to the fourth pleopods of the male spirally twisted; pleopods of the male without any modified setae at the apex of the rami, but the setae arming the branches appear to be more densely feathered than is normally the case.

Telson (Fig. 1*c*) three times as long as broad and of the usual elongated triangular shape; lateral margins armed with a series of twenty-eight spines, two long ones near the proximal end, then a short unarmed portion of the margin followed by the remaining spines, which are more or less equal to begin with, but with a tendency to be arranged in groups of larger and smaller spines towards the apex; terminal spines the longest and equal to one-tenth of the length of the telson; between the apical spines there are three subequal spinules and a pair of plumose setae; some of the distal spines distinctly barbed.

Inner uropod (Fig. 1*b*) longer than the telson, with a row of about fifty-five spines on the inner margin, commencing some distance behind the statocyst and extending to the apex, arranged in groups towards the distal end.

Outer uropod (Fig. 1*b*) slightly longer than the inner, distal joint half as long as the proximal and not quite twice as long as broad; outer margin of the proximal joint armed by twelve spines which occupy rather more than half the margin.

Length of adult specimens of both sexes, 9 mm.

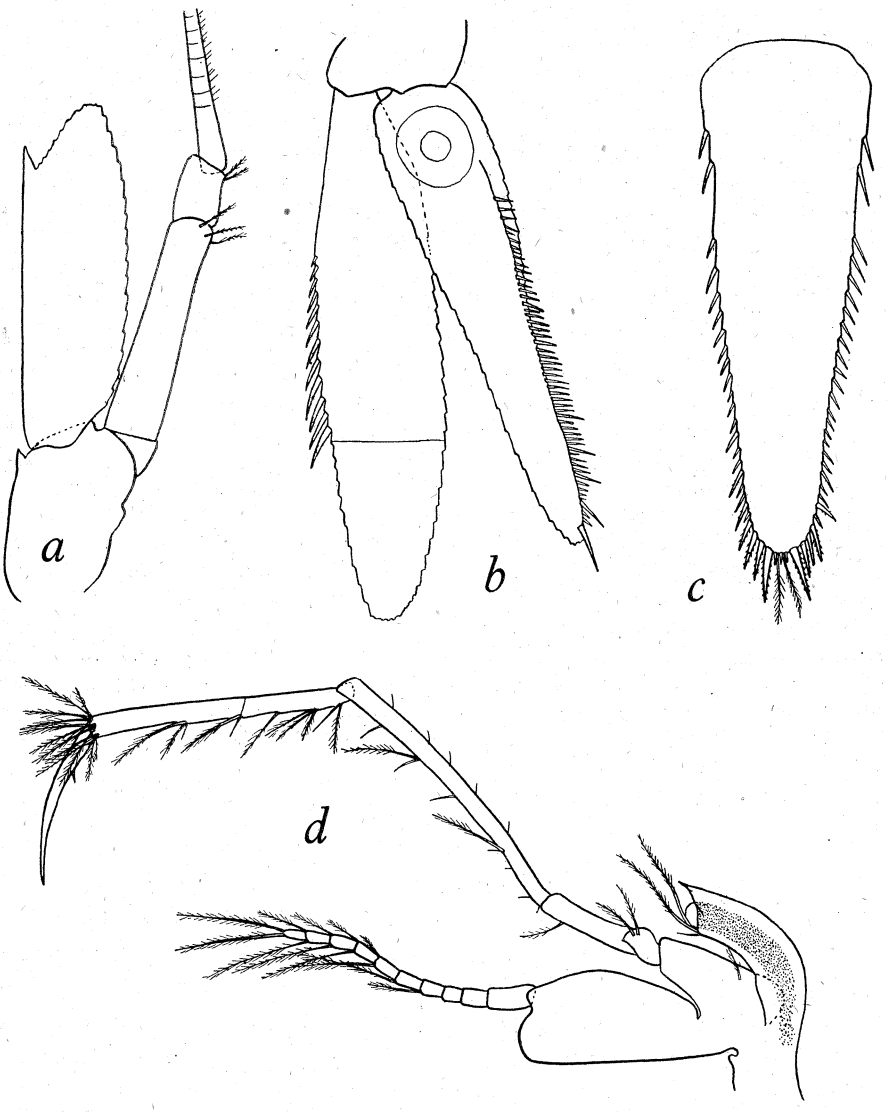

Fig. 1.—*Siriella longidactyla*, n. sp.

a. Antennal scale and peduncle. *b*. Uropods. *c*. Telson. *d*. Eighth thoracic limb of male with copulatory organ. All figures × 49.

Remarks.—The genus *Siriella* is a very difficult one. It includes at the moment thirty-four more or less distinct species, in addition to the present one. These species are exceedingly difficult to distinguish and can in some cases only be identified with certainty after the examination of adult male specimens. Hansen (1910) has suggested a grouping of the species into four sections, but this grouping only applies to Asiatic species (and not to all of these) and is not comprehensive enough to permit the inclusion of the remaining species.

S. longidactyla could be included in Hansen's group 2 except for the fact that the fourth pair of pleopods in the male have no modified setae at the apex of the branches. Most of the European species of the genus agree with *S. longidactyla* in this respect. If, therefore, Hansen's group 2 were further divided into (*a*) those in which none of the male pleopods have modified setae and (*b*) those in which some of the male pleopods have modified setae at the apex of the branches, it would be more useful as a basis for the grouping of the species.

Group 2*a* would then include the following species, to the exclusion of all other species of the genus: *armata, frontalis, norvegica, brooki, jaltensis, gordonae, clausii* and *longidactyla.* Of these eight species, *S. armata* and *S. frontalis* are distinguished at once by the very long acutely pointed rostral plate extending as far forward as the distal end of the second joint of the antennular peduncle. *S. norvegica, S. brooki, S. jaltensis* and *S. gordonae* form a group of species in which the median spinule of the three spinules between the long spines at the apex of the telson is about twice as long as the lateral ones. This leaves *S. clausii* as the nearest relative of *S. longidactyla.* The latter may be distinguished from *S. clausii* by the fact that the antennal scale does not possess a distal joint, by the longer and more slender endopods to the thoracic limbs, and especially by the very long dactylus of these limbs, by the different arrangement of the spines on the telson and uropods, by the more densely feathered setae on the male pleopods and by the shape of the male copulatory organ.

Among Australasian species of the genus, *Siriella longidactyla* comes nearest to *S. denticulata* from New Zealand. In the latter species, however, the spines on the outer margin of the proximal joint of the outer uropods occupy less than half the margin, there are only seventeen spines on the inner margin of the inner uropods, the arrangement of the spines on the telson is different and the dactylus of the thoracic endopods much shorter.

Subfamily RHOPALOPHTHALMINAE.

Genus **Rhopalophthalmus** Illig.

Rhopalophthalmus egregius Hansen.

R. egregius Hansen, 1910, p. 49; Nakazawa, 1910, p. 255; Tattersall, 1915, p. 151; Colosi, 1918, p. 6; Colosi, 1920, p. 237; Tattersall, 1921, p. 408; Tattersall, 1922, p. 457; Sewell and Annandale, 1922; Aiyar and Menon, 1936; Tattersall, 1936, p. 147; Pannikar and Aiyar, 1937.

Occurrence.—Lake Illawarra, April 1937, enormous numbers of both sexes.

Distribution.—East Indian Archipelago (Hansen); Japan (Nakazawa); several localities on the east coast of India (Tattersall, Aiyar and Menon, Pannikar and Aiyar); Siam (Tattersall); Torres Strait (Colosi); Great Barrier Reef (Tattersall); between New Caledonia and New Zealand (Colosi). The species is a shallow water form and usually planktonic. It is frequently found in brackish

water, as, for instance, in Lake Chilka, India, Madras, and the Talé Sap, Siam. It is a gregarious species and occurs generally in immense swarms. It is evidently widely distributed in the Indo-Pacific region.

Subfamily GASTROSACCINAE.

Genus **Anchialina** Norman.

Anchialina penicillata Zimmer.

A. penicillata Zimmer, 1915, p. 161.

Occurrence.—Port Stephens, June 1938, five males and one female.

Remarks.—The setae on the antennules of the male are only present in completely adult specimens, and are not developed in immature forms.

Distribution.—The type specimen was found in a collection of plankton made between Ceylon and the Dampier Strait. No other specimens are recorded.

Genus **Gastrosaccus** Norman.

Gastrosaccus indicus Hansen.

(Fig. 2*a*–2*h*.)

G. indicus Hansen, 1910, p. 56.

G. indicus Tattersall, 1911, p. 125.

Occurrence.—Port Stephens, June 1938, eleven females, twelve males and one immature.

Remarks.—These specimens agree very closely with Hansen's description and figures. I have figured the main features of an adult male from the present material for comparison with Hansen's figures. The closest agreement is manifested. I should perhaps explain that, in the preparation from which Fig. 5*f* was made, the lobe from the basal joint of the exopod of the third pair of pleopods of the male, which probably represents the endopod, had become folded under the exopod. In the unmounted condition it is exactly as figured by Hansen.

Distribution.—East Indian Archipelago (Hansen); Indian Ocean near the Seychelles (Tattersall). Its occurrence off the coast of Australia marks a considerable extension of its known geographical distribution.

Gastrosaccus dakini, n. sp.

(Figs. 3*a*–3*c*, 4*a*–4*f*.)

Occurrence.—Lake Illawarra, April 1937, ten females, fourteen males and two immature, 11 mm.

Description.—A species of the *G. normani* group.

Carapace with a short triangular rostral plate below which is a prominent acute spiniform subrostral process. No lobes or filaments on the posterior dorsal margin of the carapace and no median dorsal process on the fifth abdominal somite.

Eyes small, pigment black, cornea rather shorter than the eyestalk and twice as broad as long.

Antennular peduncle with the first joint longer than the combined length of the second and third; second joint quite short with two spines on the outer margin.

Antennal peduncle with the second joint about twice as long as the third and extending forward to the level of the distal end of the first joint of the antennular peduncle.

Antennal scale (Fig. 3*a*) reaching forward to about the distal end of the second joint of its peduncle; three times as long as broad; no suture across the terminal lobe.

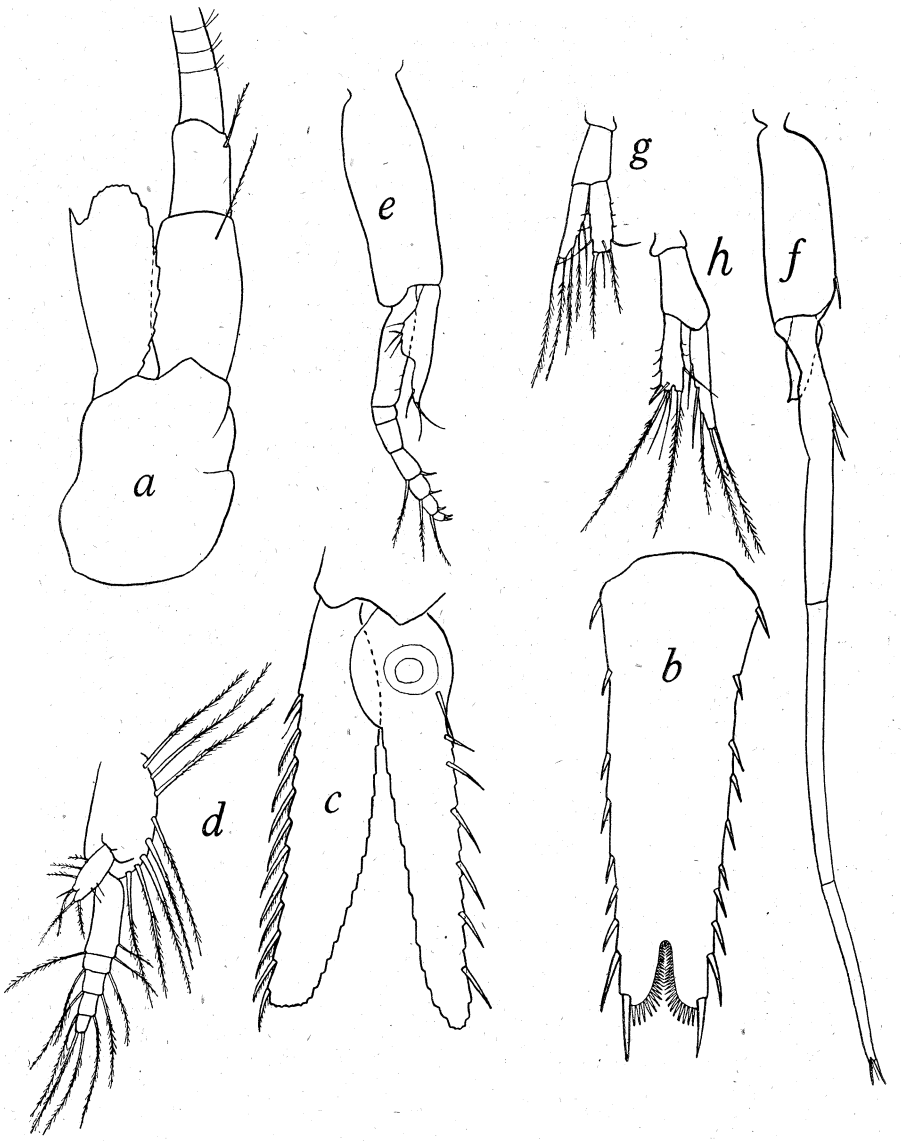

Fig. 2.—*Gastrosaccus indicus* Hansen.

a. Antennal scale and peduncle. *b*. Telson. *c*. Uropods. *d*. First pleopod of male. *e*. Second pleopod of male. *f*. Third pleopod of male. *g*. Fourth pleopod of male. *h*. Fifth pleopod of male. *f* × 42; all other figures × 49.

Telson (Fig. 3*c*) slightly more than two and a half times as long as broad at the base; terminal cleft about one-ninth of the total length; lateral margins armed with seven spines, rather widely spaced, the terminal and penultimate of which are much longer than the others.

Uropods (Fig. 3*b*) slightly longer than the telson; exopod with fourteen spines on the outer margin; endopod with six spines on the inner margin.

First pleopod of the male (Fig. 4*a*) with the endopod very short and composed of one joint only, the exopod nine-jointed.

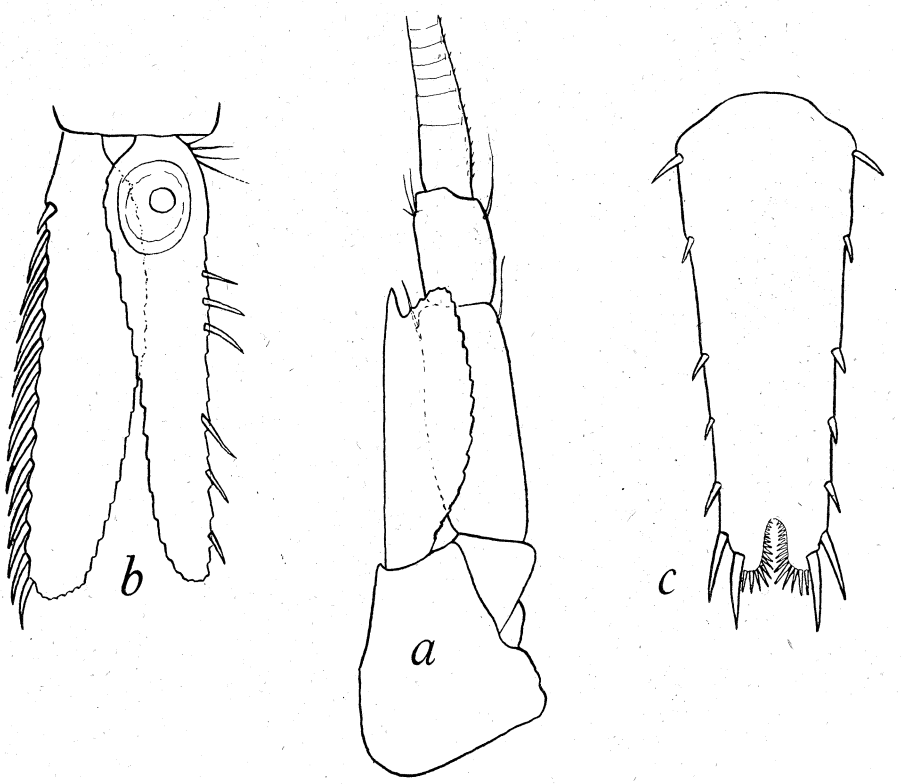

Fig. 3.—*Gastrosaccus dakini*, n. sp.
a. Antennal scale and peduncle. *b*. Uropods. *c*. Telson. All figures × 49.

Second pleopod of the male (Fig. 4*b*) with the protopodite as long as the endopod; endopod six-jointed, slightly curved, terminal joint with two simple setae; basal joint with three long simple setae on the inner margin; second joint with a single simple and rather long seta; third, fourth and fifth joints unarmed; exopod slightly curved, composed of nine joints; sixth, seventh and eighth joints with a long plumose seta on the outer distal corner and a short simple seta on the inner corner; terminal joint with two simple somewhat curved setae.

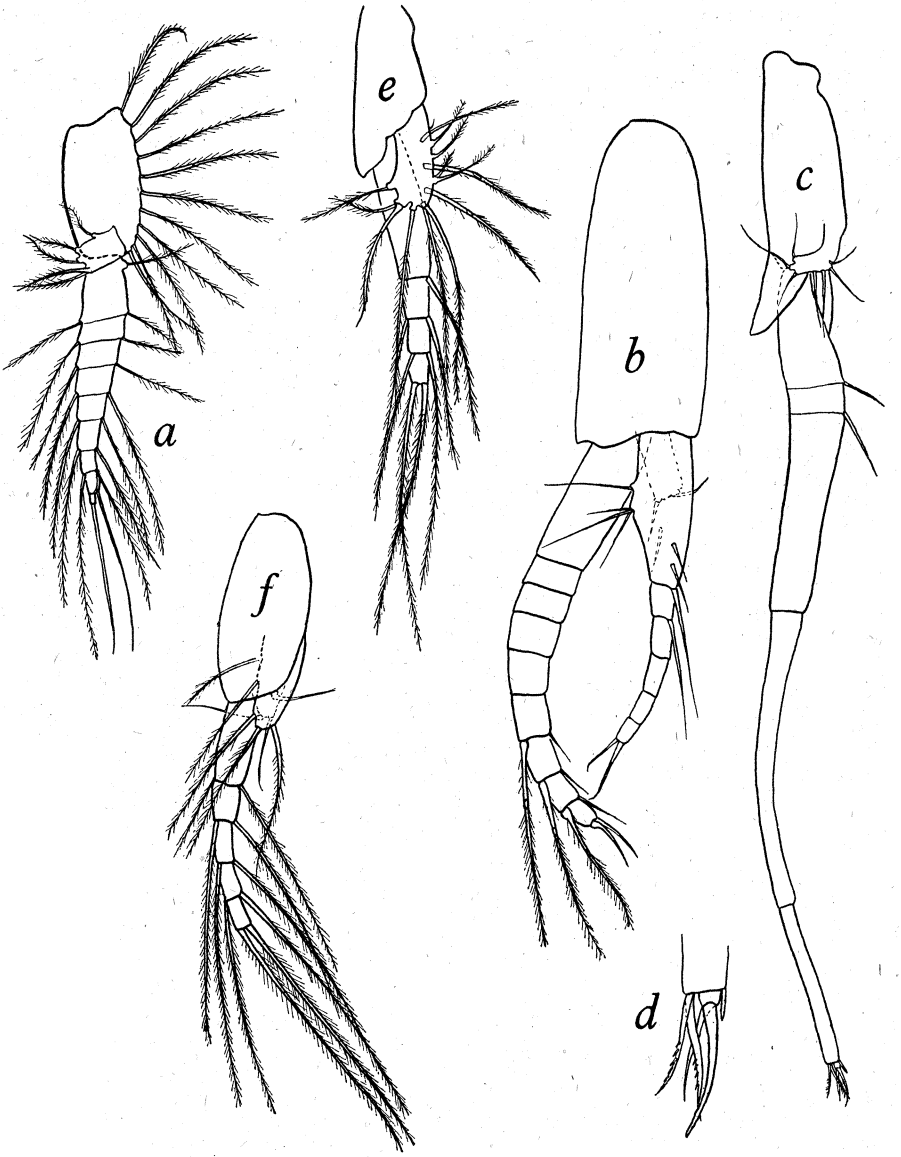

Fig. 4.—*Gastrosaccus dakini*, n. sp.

a. First pleopod of male. *b*. Second pleopod of male. *c*. Third pleopod of male. *d*. Distal end of third pleopod of male. *e*. Fourth pleopod of male. *f*. Fifth pleopod of male. *a* and *c* × 42; *b*, *e* and *f* × 73; *d* × 127.

Third pleopods of the male (Figs. 4*c* and 4*d*) very long, reaching backward almost to the end of the telson; endopod represented by a short pointed lobe which appears to be fused with the peduncle; exopod composed of three joints (the joints are very difficult to make out, and in one specimen there appear to be four joints), first joint the longest and broadest with two setae at the middle of the outer margin, terminal joint with four setae and one small spine, two of the setae at least being barbed.

Fourth and fifth pleopods of the male (Figs. 4*e* and 4*f*) essentially similar to one another, with the endopod composed of a single joint and the exopod with four joints in the fourth pair and five in the fifth.

Remarks.—The species of the genus *Gastrosaccus*, like those of *Siriella*, are notoriously difficult to separate. The genus is at present comprised of nineteen species, but, in many cases, certain identification can only be made by examination of adult males, since it is on the characters of the male pleopods that specific distinction is based. The following summary of the known species will serve to indicate the relationships of this new species.

I. Fringe of filaments on the posterior dorsal margin of the carapace.
  a. Spinous process on the fifth abdominal somite.
    G. spinifer.
  b. No process on fifth abdominal somite.
    G. muticus.
    G. simulans.

II. Reflected lobes on the posterior dorsal margin of the carapace.
    G. sanctus.
    G. dunckeri.

III. No filaments or reflected lobes on the carapace.
  a. Spinous process on the fifth abdominal somite.
    G. australis.
    G. dissimilis.
  b. No spine on the fifth abdominal somite.
    Telson with small spines between the major spines.
      G. kempii.
    No subsidiary spines on the telson.
      G. kojimanus.
      G. parvus.
      G. indicus.
      G. pacificus.
      G. erythraeus.
      G. bengalensis.
      G. vulgaris.
      G. normani.
      G. pusillus.
      G. johnsoni.

Gastrosaccus dakini belongs to the last group of species, which are mainly separated on the structure of the male pleopods. I have compiled a table showing the chief characters of this group of species, and have inserted this new species in its appropriate place so that its position among the other species can be seen at a glance.

Species.	Male Pleopods.										Spines on Telson.	Spines on Outer Uropod.	Spines on Inner Uropod.	Remarks.
	1		2		3		4		5					
	Joints in Exopod.	Joints in Endopod.	Joints in Exopod.	Joints in Endopod.	Joints in Exopod.	Joints in Endopod.	Joints in Exopod.	Joints in Endopod.	Joints in Exopod.	Joints in Endopod.				
pacificus ..	5	1	6	1	3	R	1	1	1	1	12	12	4	
indicus ..	5	1	6	1	4	R	1	1	1	1	10	13	5	
parvus ..	4	1	5	6	5	R	1	1	1	1	8	10	4	
pusillus ..	4	1	9	7	5	1	1	1	1	1	8	12	4	
johnsoni ..	4	1	7	1	3	1	2	1	2	1	9	13	2	Very complicated pleopod three.
vulgaris ..	7	1	7	1	4	1	3	1	3	1	8	14	6	
erythraeus ..	5	1	5	4	5	1	3	1	3	1	9	11	5	
bengalensis ..	6	1	9	6	4	1	3	1	3	1	13	13	?	
dakini ..	9	1	9	6	3	1	4	1	5	1	7	14	6	
normani ..	8	1	9	6	4	1	3	1	3	1	9	13	7	
kojimanus ..											14	20	10	Structure of pleopods not detailed.

R=rudimentary or fused with the exopod.

It will be seen that *G. dakini* is most nearly allied to *G. bengalensis* Hansen. The pleopods of the male are very similar, but in *G. bengalensis* the exopod of the first pleopod has six joints as against nine in *G. dakini*, and the fourth and fifth pairs have three joints in the endopod as against four and five in *G. dakini*. The number of spines on the margins of the telson forms the most easily seen difference between the two species, seven in *G. dakini* and thirteen in *G. bengalensis*.

G. dakini is readily separated from *G. indicus* by the form of the pleopods of the male, especially the form of the fourth and fifth pairs. The females are closely allied, but *G. indicus* has a somewhat longer and narrower telson, with ten spines on the lateral margins as against seven in *G. dakini*.

Subfamily MYSINAE.

Tribe LEPTOMYSINI.

Genus **Afromysis** Zimmer.

Afromysis australiensis, n. sp.

(Figs. 5*a*–5*g*, 6*a*–6*d*.)

Occurrence.—Broken Bay, April 1937, fifty-six males and twenty females, 7 mm.

Description.—Carapace rather short, leaving the last three thoracic somites exposed; produced in front into a short rostral plate not extending forward beyond

the base of the eyestalk; apex obtusely pointed and depressed in lateral view; antero-lateral corners rounded.

Eye (Fig. 5*a*) short, not extending beyond the distal end of the basal joint of the antennular peduncle, cornea almost as large as the eyestalk, pigment black.

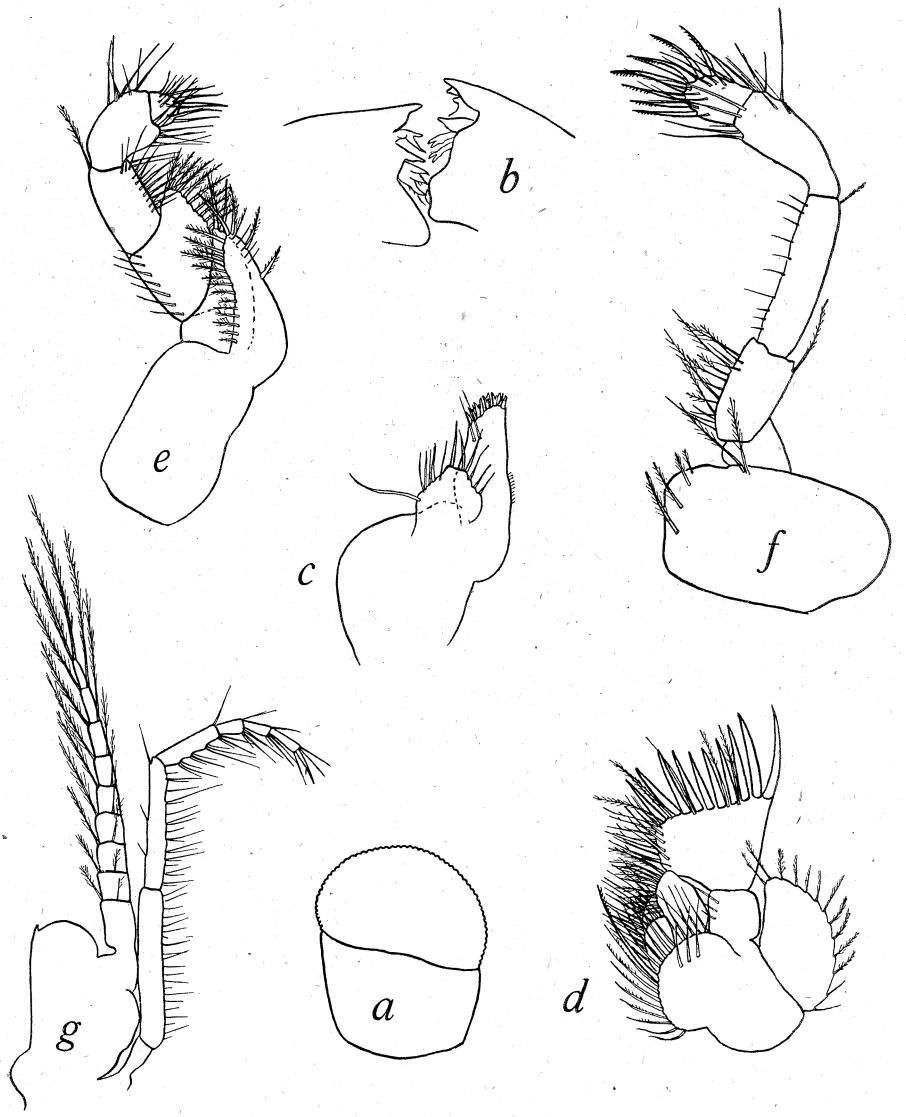

Fig. 5.—*Afromysis australiensis*, n. sp.

a. Eye. *b*. Mandibles. *c*. Maxillule. *d*. Maxilla. *e*. Endopod of first thoracic limb. *f*. Endopod of second thoracic limb. *g*. Third thoracic limb. *a* and *g* × 49; all other figures × 91.

Antennal scale (Fig. 6*a*) six times as long as broad, setose all round, a distal joint clearly marked off and equal to one-ninth of the total length of the scale, a prominent spine on the outer corner of the joint from which the scale arises. The scale extends for one-quarter of its length beyond the distal end of

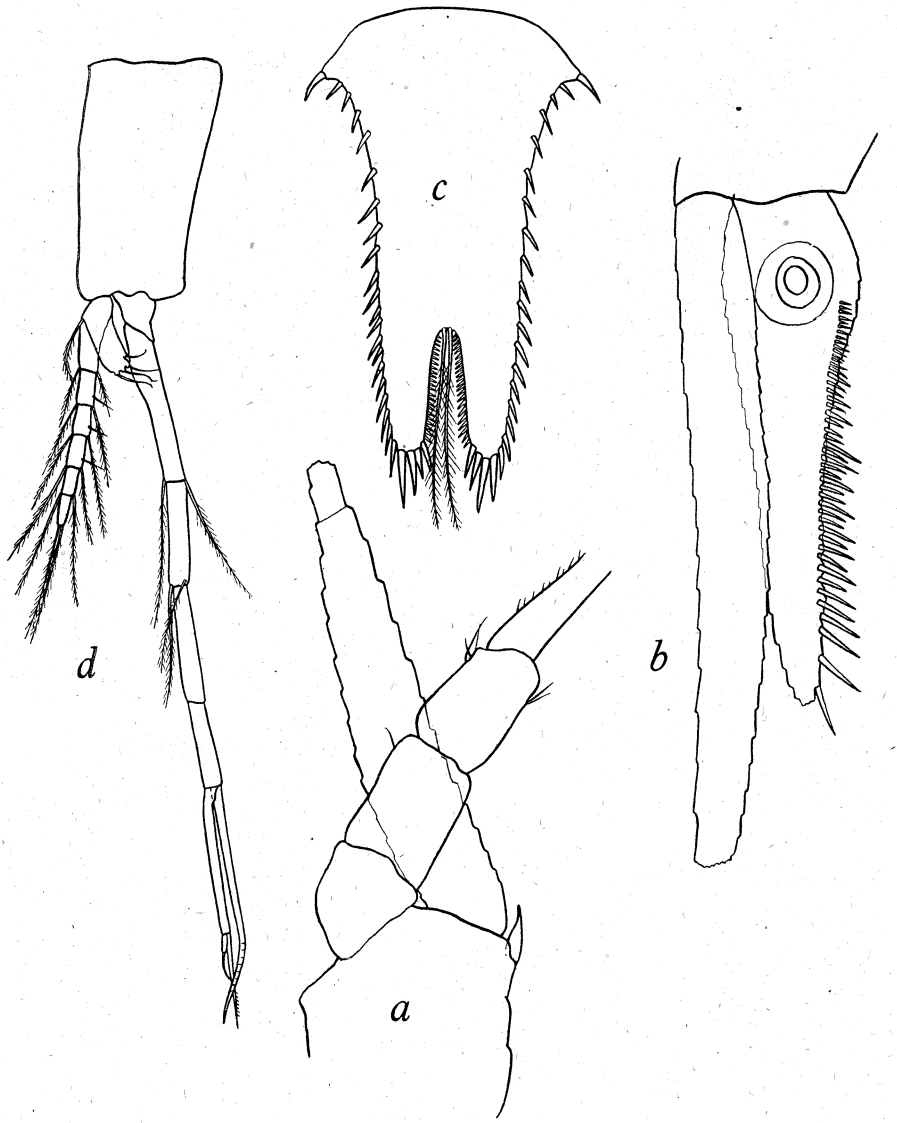

Fig. 6.—*Afromysis australiensis*, n. sp.

a. Antennal scale and peduncle. *b*. Uropods. *c*. Telson. *d*. Fourth pleopod of male. *a*, *b* and *c* × 84; *d* × 67.

the antennular peduncle. The antennal peduncle is equal to the combined length of the first two joints of the antennular peduncle and has the second and third joints subequal in length.

The details of the mouth parts, the endopods of the first and second thoracic limbs and a complete third thoracic limb are shown in Figs. 5*b*, 5*c*, 5*d*, 5*e*, 5*f* and 5*g*, and need not be further described. The outstanding feature of the genus is the form of the terminal joint of the palp of maxilla (Fig. 5*d*), which is exceptionally broad and strongly armed. The outer distal corner of this joint is not so much produced as it is in the type species nor as in *A. macropsis*, but is essentially of the same form. The protopodite of the third to the eighth thoracic limbs is divided into four joints and the large basal joint of the exopod has an acute spine at the outer corner.

Telson (Fig. 6*c*) one and three-quarter times as long as broad at the base; deeply cleft at the apex, the cleft three-eighths of the total length of the telson and armed on each side by twenty-three small spines and a pair of long plumose setae; apical lobes of the telson armed by four stout spines, the outer of which is about one-eighth of the length of the telson, the remaining three each slightly shorter than its outer neighbour; lateral margins of the telson armed by about twenty spines extending the full length of the margins.

Inner uropod (Fig. 6*b*) extending for about half its length beyond the distal end of the telson; inner margin armed by a row of about forty-eight rather stout spines commencing at the level of the statocyst and extending practically to the apex, the proximal spines short, the distal spines rather long and the whole showing a graduated series in regard to size, with a tendency to be arranged in series of shorter and longer spines.

Outer uropod about twice as long as the telson.

Pleopods of the male as in the genus *Leptomysis*; fourth pair greatly elongate and reaching backward to the distal end of the telson, exopod long and modified, composed of seven joints, fifth joint with a very long and strong seta on the outer corner, sixth joint with a similar but smaller seta, seventh joint with a slightly curved simple seta at its apex. The fourth pleopod is very similar to that of the type species, *A. hansoni* Zimmer, 1916.

Length of adults of both sexes, 7 mm.

Remarks.—Three species of the genus *Afromysis* are now known: the type *A. hansoni* Zimmer, *A. macropsis* Tattersall, and the present species. *A. hansoni* is known from the west coast of South Africa, and *A. macropsis* from the Orissa coast of India. The Australian species is distinguished from the other two by the combination of characters afforded by the maxilla, telson and antennal scale, and by the fourth pleopod of the male.

Bibliography.

Aiyar, R. G., Menon, K. S., and Menon, M. G. K. (1936).—Plankton records for the years 1929 and 1930. *Journ. Madras Univ.*, pp. 1-43, 1936.

Colosi, G. (1918).—Nota preliminare sui Misidacei raccolti dalla R.N. "Liguria" nel 1903-05. *Bull. soc. Entom. Ital.*, xlix, 1917, pp. 1-11.

Colosi, G. (1920).—Raccolte planctoniche fatte dalla R. Nave "Liguria". Vol, ii, Fasc. ix, Crostacei-Parte iv. Misidacei, pp. 229-260.

Hale, H. M. (1927).—The fauna of Kangaroo Island, South Australia. I. The Crustacea. *Trans. R. Soc. S. Austral.,* li, pp. 307-321.

Hansen, H. J. (1910).—The Schizopoda of the Siboga Expedition. *Siboga-Expeditie Mon.* xxxvii.

Hansen, H. J. (1912).—The Schizopoda. Reports on the U.S. Fish Commission by the steamer "Albatross". *Mem. Mus. Comp. Zool. Harvard,* xxxv, 4, pp. 173-296

Nakazawa, K. (1910).—Notes on Japanese Schizopoda. *Annot. Zool. Jap.,* vii, pp. 247-261.

Pannikar, N. K., and Aiyar, R. G. (1937).—The brackish water fauna of Madras. *Proc. Indian Acad. Sci.,* vi, 5, pp. 284-337.

Sewell, R. B. S., and Annandale, N. (1922).—Fauna of Chilka Lake. No. 10. The hydrography and invertebrate fauna of Rambha Bay. *Mem. Indian Mus.,* v, pp. 677-710.

Tattersall, W. M. (1911).—On the Mysidacea and Euphausiacea collected in Indian Ocean during 1905. *Trans. Linn. Soc. London,* Zool. (2), xv, pp. 119-136.

Tattersall, W. M. (1915).—Fauna of Chilka Lake. The Mysidacea of the Lake, with description of a species from the coast of Orissa. *Mem. Indian Mus.,* v, pp. 149-161.

Tattersall, W. M. (1921).—Zoological results of a tour in the Far East. Pt. vii. Mysidacea, Tanaidacea and Isopoda. *Mem. Asiatic Soc. Bengal,* vi, pp. 403-433.

Tattersall, W. M. (1922).—Indian Mysidacea. *Rec. Indian Mus.,* xxiv, 4, pp. 445-504.

Tattersall, W. M. (1923).—Crustacea. Part vii. Mysidacea. British Antarctic ("Terra Nova") Expedition, 1910. Natural History Report, Zoology, iii, 10, pp. 273-304.

Tattersall, W. M. (1927).—Australian Opossum Shrimps. *Rec. S. Austr. Mus.,* iii, 3, pp. 235-257.

Tattersall, W. M. (1928).—Further records of Australian Opossum Shrimps (Mysidacea). *Rec. S. Austr. Mus.,* iv, 1, pp. 105-110

Tattersall, W. M. (1936).—Mysidacea and Euphausiacea. Great Barrier Reef Expedition, 1928-29. Sci. Rep., v, 4, pp. 143-176.

Zimmer, C. (1915).—Schizopoden des Hamburger naturhistorischen (zoologischen) Museums. *Mitt. nat. Mus. Hamburg,* xxxii, pp. 159-182.

Zimmer, Carl (1916).—Crustacea. iv. Cumacea und Schizopoda. Michaelsen. Beiträge zur Kenntnis der Meeresfauna Westafrikas, ii, pp. 55-66.

Zimmer, C. (1918).—Neue und wenig bekannte Mysidaceen des Berliner zoologischen Museums. *Mitt. zool. Mus. Berlin,* ix, 1, pp. 13-26.