

a single row of denticles and 2-3 larger ones basally, glabrous except for a few setae, rest of leg with felty pubescence. 3rd-5th legs slender, 6th joint of 5th leg in ♂ (missing in ♀) equal to (smaller specimen) or greater than (larger specimen) distance between hepatic spines. Abdomen obscurely pitted dorsally, in ♂ granulate on all pleurae, telson and exposed parts of uropods, feebly so in ♀. No ventral tooth between bases of uropods.

Length ♂ 105 mm., larger cheliped (base of 3rd joint to end of thumb) 170 mm.; ovig. ♀ 54, cheliped 32 mm.

Localities.—Isipingo River, and Umgeni River, Natal (S. Afr. Mus.).

Distribution.—*idae*: Mauritius, Seychelles, Zanzibar, East Indies.

idella: Tanganyika Territory.

Remarks.—The large ♂ is from Isipingo, the smaller ♂ (69 mm., both 2nd legs lost) and ovig. ♀ from Umgeni River.

The large cheliped is described by Hilgendorf, and also Henderson and Matthai, as rough, with felty pubescence confined to the finger and thumb, which are considerably shorter in *idae* and *idella* than in the present ♂ specimen.

The variety *idella* has large eggs.

Palaemon (Eupalaemon) rudis Heller

Furry-armed River Prawn.

1878. Hilgendorf, MB. Ak. Wiss. Berlin, p. 839, pl. 4, fig. 17 (*mossambicus*).

1898. *Id.*, *l. c.*, pp. 27 (in key), 29 (*mossambicus*).

1908. Stebbing, *l. c.*, p. 41.

1910. *Id.*, *l. c.*, p. 385.

1910. Henderson and Matthai, *l. c.*, p. 291, pl. 17, fig. 5, *a-h*.

1915. Kemp, *l. c.*, p. 268.

Carapace granulate antero-laterally, smooth on hinder part dorsally, pitted on branchial region. Rostrum extending to end of antennal scale, $1\frac{1}{2}$ in post-orbital length of carapace, similar to that of "*sundaicus*," *i.e.* dorsal profile slightly concave apically, with 11 teeth above, of which 2 are post-orbital, and 3 below. 2nd leg slender, wholly covered with felty pubescence, including thumb (finger missing), 5th joint longer than 4th and than palm, latter a little longer than 4th joint, thumb scarcely as long as palm, 1 tooth and 2 denticles at base, followed by a double row of denticles, cutting-edge

obscure and concealed in pubescence. Abdomen, telson, and exposed parts of uropods pitted.

Length of carapace 48 mm., of cheliped (from base of 3rd joint) 152 mm.

Locality.—Quelimane and Mozambique (Hilgendorf); Durban (Stebbing, and S. Afr. Mus.).

Distribution.—*rudis*: Ceylon, India, Madagascar.

mossambicus: Tanganyika Territory.

Remarks.—The South African Museum has only pieces of a ♂ specimen (formerly in the exhibited collection), which appears to belong to this species. The chelipeds have been painted blue (*cf.* Kemp).

Hilgendorf said the felt covers whole of cheliped except finger and 4th joint, and that under the felt there is a fine granulation.

Palaemon (Parapalaemon) dolichodactylus Hilg.

Strong-arm River Prawn.

1878. Hilgendorf, MB. Ak. Wiss. Berlin, p. 840, pl. 4, fig. 18.

1898. *Id.*, *l. c.*, pp. 27 (in key), 31.

1910. Stebbing, *l. c.*, p. 385.

1910. Henderson and Matthai, *l. c.*, p. 300, pl. 18, fig. 8, *a, b*.

1913. Calman, Proc. Zool. Soc. Lond., p. 926.

Carapace ♂ granulate anteriorly, pitted posteriorly. Rostrum extending to or nearly to end of antennal scale, apex scarcely upturned, 13–15 teeth above, of which 3–5 are post-orbital, 2–4 below. 2nd legs ♂ decidedly unequal, 5th joint short, scarcely longer than 4th in the larger, slightly longer in the smaller leg, palm a little longer than 4th joint, finger and thumb in larger leg much longer ($1\frac{1}{2}$ times) than palm, in smaller leg shorter than palm, larger leg with fine granulation and sparsely setose, palm and bases of finger and thumb with long felty pubescence, finger and thumb each with a single row of denticles decreasing in size distally, one or two near base larger than the others. No ventral tooth between bases of uropods.

Length ♂ 93 mm.

Localities.—Zambesi River at Tete, and Quelimane (Hilgendorf).

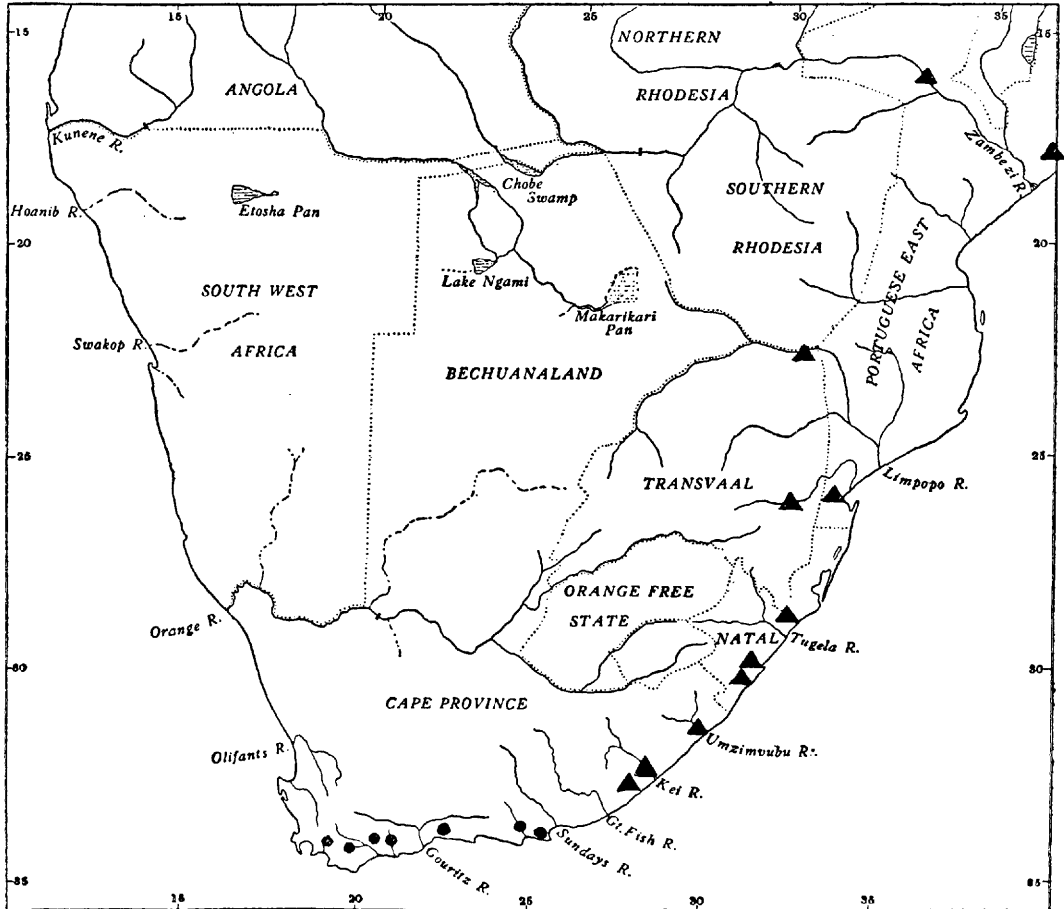
Distribution.—Tanganyika Territory; India; Madagascar.

Remarks.—Henderson and Matthai found this species and *scabri-culus* living together, and incline to the view that they are different ♂ forms of one species.

Palaemon (Parapalaemon) petersii Hilg.

1878. Hilgendorf, MB. Ak. Wiss. Berlin, p. 841, pl. 4, fig. 19.

1897. Weber and de Meijere, Zool. Jahrb., x, p. 166.

1910. Stebbing, *l. c.*, p. 385.1910. Henderson and Matthai, *l. c.*, p. 300 (note).Recorded localities of the species of *Palaemon*, ▲, and of *Leander capensis*, ●.

Similar to *dolichodactylus*, but rostrum not extending beyond apex of peduncle of ant. 1, larger 2nd leg completely covered with felty pubescence except finger and thumb, which are polished, with scattered pits, and shorter ($\frac{3}{4}$) than palm. Rostrum with 12 teeth above, 3 below.

Length ♂ 50 mm. (Hilgendorf), 82 mm. (Weber and de Meijere), ovig. ♀ 55 mm. (Weber and de Meijere).

Localities.—Zambesi River at Tete (Hilgendorf); Umhloti River at Verulam, Umgeni River at Durban, and Illovo River, Natal (Weber and de Meijere).

Remarks.—Among 18 large ♂♂ from the Umhloti River, Weber and de Meijere found one in which the larger leg corresponded with that of *dolichodactylus* (finger and thumb longer than palm), but which in other respects (rostrum, finger and thumb without felt) resembled *petersii*. As these two forms were originally found in the same locality, possibly *petersii* will eventually have to be regarded as a synonym or variety of *dolichodactylus*. Henderson and Matthai suggested that *petersii* was a connecting link between *dolichodactylus* and *scabriculus*.

Gen. LEANDER Desm.

1900. Coutière, *Ann. Sci. Nat.*, ser. 8, xii, p. 336 (wrongly dated in Stebbing).

1910. Doflein, *Festschr. R. Hertwig*, iii, pp. 1-76, pls. 1-4 (habits, coloration, reactions).

1910. Stebbing, *l. c.*, p. 386.

1914. *Id.*, *Trans. Roy. Soc. Edin.*, 50, p. 286.

1917. Kemp, *Rec. Ind. Mus.*, xiii, pp. 203 *sqq.*

1925. *Id.*, *ibid.*, xxvii, pp. 287 *sqq.* (synopsis of species).

1924. Gurney, "Terra Nova" *Exp. Rep.*, zool., viii, p. 121 (larval stages).

1938. *Id.*, *l. c.*, p. 3 (larval stages).

1939. *Id.*, *Ann. Mag. Nat. Hist.* (xi), 3, p. 120, figs. (late larval stage).

1942. Kubo, *J. Imp. Fish. Inst.*, xxxv, pp. 17 *sqq.*

Carapace with antennal and branchiostegal (pterygostomial) spines, but no hepatic spine (in 2 Indian species branchiostegal spine absent, and rostrum with elevated basal crest). Antenna 1 with 3 flagella. Mandibular palp 3-jointed (three exceptions, the European *squilla* being one). Mxp. 3 with arthrobranch and pleurobranch. Dactyls of 3rd-5th legs simple. Telson with 4 apical spines. Gills 7 plus 2 epipods.

Remarks.—In contrast with *Palaemon*, the species of this genus are mainly marine and estuarine, though certain species ascend rivers and others are known only from fresh waters.

Key to the South African Species.

- I. Wrist (5th joint) of 2nd leg longer than chela (hand with finger and thumb) *maculatus*.
- II. Wrist not longer than chela (in typical *squilla* a very little longer) (fig. 149, *c, o*).
- A. Fused part of outer flagellum of ant. 1 at least half as long as free part.
1. Mandibular palp 2-jointed. Finger of 2nd leg scarcely more than half length of palm *squilla*.
2. Mandibular palp 3-jointed. Finger much more than half length of palm *affinis*.
- B. Fused part of outer flagellum of ant. 1 less than half length of free part (fig. 149, *b, p*).
1. Rostrum apically curving upwards (normally).
- a. Wrist of 2nd leg slightly shorter than 4th joint, and not more than $\frac{3}{8}$ length of chela (fig. 149, *c*). Marine and estuarine *pacificus*.
- b. Wrist subequal to 4th joint, and $\frac{3}{4}$ length of chela. Estuarine *pacificus* var.
2. Rostrum almost symmetrically lanceolate, scarcely, if at all, curving upwards. Wrist of 2nd leg subequal to 4th joint, and nearly as long as chela (fig. 149, *o*). Fused part of outer flagellum of ant. 1 very short ($\frac{1}{8}$ of free part) (fig. 149, *p*). Fluvial *capensis*.

Leander quoianus, a New Zealand species, was recorded by Krauss from Natal (as *Palaemon quoianus*; see Stebbing, 1910, *l. c.*, p. 384). My field experience of the Natal fauna is not extensive enough to permit a guess as to what species of shrimp Krauss actually collected, unless it be *L. pacificus* var. (see *infra*) or possibly a species of *Hippolyte*; but *Leander* does not seem to be common on the Natal coast.

L. concinnus Dana is recorded from Mozambique and Zanzibar by Hilgendorf (1878, MB. Ak. Wiss. Berlin, p. 842).

Leander maculatus Thallwitz

1891. Thallwitz, Abh. Zool. Mus. Dresden, iii, p. 19, fig. 4.

1916. Balss, Beitr. Kenntn. Meeresf. Westaf., ii, p. 26, figs. 7, 8 (*edwardsii*, non Heller).

1925. Kemp, *l. c.*, p. 290 (in key), and footnote.

1926. Schmitt, Bull. Amer. Mus. Nat. Hist., liii, p. 25, fig. 65 (*Palaemon m.*).

Rostrum with 7 teeth above, of which one is post-orbital, a long bare interval between the foremost tooth and the next, 3 teeth below.

Branchiostegal spine on margin of carapace. Mandibular palp 3-jointed. Outer flagellum of ant. 1 with the fused part much shorter than free part ($1\frac{1}{2}$ times in free part: Balss, fig.). 5th joint of 2nd leg $1\frac{1}{2}$ times as long as chela. 3rd leg distinctly shorter than 4th and 5th legs.

Locality.—Gt. Fish Bay, Angola (Balss).

Distribution.—West Africa, to Congo River mouth.

Remarks.—The above description is taken from Kemp's synopsis and Balss' and Schmitt's figures. Kemp is responsible for the synonymy. Distinguished by the length of the wrist of 2nd leg.

Leander squilla (Linn.)

1910. Kemp, Fish. Irel. Sci. Invest. [1908], p. 132, pl. 20, fig. 3, *a-e*.

1913. Balss, Schultze Reise., v, p. 107.

1916. *Id.*, *l. c.*, p. 24.

1925. Kemp, *l. c.*, p. 292 (in key), and footnote 7 on p. 291.

1926. Schmitt, Bull. Amer. Mus. Nat. Hist., liii, p. 24, fig. 64 (*Palaemon s.*).

1943. Höglund, Sv. Hydrogr. Biol. Komm. Skr., n.s., ii, no. 6 (biology and larval development).

[Not *squilla* Stebbing, 1910. = *pacificus*.]

Rostrum with 6–10 teeth above, of which 2–3 are post-orbital, and 2–4 teeth below. Branchiostegal spine on margin of carapace. Mandibular palp 2-jointed. Outer flagellum of ant. 1 with fused part shorter than but at least half as long as free part. 5th joint of 2nd leg a little longer than 4th, subequal to chela, finger and thumb scarcely more than half length of palm.

Localities.—Swakopmund and Luderitzbucht, South West Africa (Balss).

Distribution.—Mediterranean and eastern Atlantic, from Norway to the French Congo and Angola.

Remarks.—Distinguished by the short finger and thumb of 2nd leg, and the 2-jointed mandibular palp.

Leander affinis M. Edw.

1914. Stebbing, Trans. Roy. Soc. Edin., 50, p. 287 (references).

? 1914. Lenz and Strunck, D. Südpol Exp., xv, p. 322 (*affinis* Bate).

1922. Verrill, Trans. Connect. Ac. Arts Sci., xxvi, p. 142, pl. 43, figs. 3–3, *b*, pl. 47, fig. 7.

1925. Kemp, *l. c.*, p. 282 (in key).

Rostrum with 8-9 teeth above, of which 2-3 are post-orbital, and 3-4 below, the apex bifid. Branchiostegal spine on margin of carapace. Outer flagellum of ant. 1 with fused part shorter than but at least half as long as free part. Mandibular palp 3-jointed. 5th joint of 2nd leg shorter than chela, finger and thumb much more than half length of palm.

Length up to 70 mm. (Stebbing).

Localities.—Saldanha Bay and Reitz Bay (Stebbing); Cape Town harbour (Lenz and Strunck).

Distribution.—West Indies; New Zealand.

Remarks.—Until the above two records are checked, this species must be included in the South African fauna-list. The s.s. *Pieter Faure* captured no examples of *Leander* in the Saldanha Bay area, nor are there any in the South African Museum. The above description is taken from Kemp's synoptic key.

Leander pacificus Stimpson

Sand-shrimp.

Fig. 149, *a-k.*

1906. Nobili, Ann. Sci. Nat. zool. (9), iv, p. 73.

1910. Stebbing, *l. c.*, p. 386 (*squilla*, non Linn.).

1915. *Id.*, Ann. S. Afr. Mus., xv, p. 75 (*affinis*, non M. Edw.).

1915. *Id.*, *ibid.*, p. 75, pl. 17 (Crust., pl. 81) (*peringueyi*, specimen with malformed rostrum).

1915. *Id.*, *ibid.*, p. 76, pl. 18 (Crust., pl. 82) (*gilchristi*, specimen with abnormal rostrum).

1917. *Id.*, *ibid.*, xvii, p. 34, pl. 4, fig. B (Crust., pl. 93, fig. B).

1925. Kemp, *l. c.*, pp. 293 (in key), 307 (references).

1938. Gurney, Gt. Barrier Reef Exp. Rep., vi, p. 3, figs. 1-7 (larva).

1942. Kubo, *l. c.*, p. 42, figs. (animal, appendages).

1947. Barnard, Ann. Mag. Nat. Hist. (xi), 13, p. 390.

Rostrum curving slightly upwards apically, reaching to end of antennal scale (or slightly beyond in specimens with rostral formula $\frac{1}{5}$), 7-10 teeth above (usually 8-9), of which 2, sometimes 3, are post-orbital; 3-5, usually 4, below; the interval between the foremost dorsal tooth and the next one is usually longer than any of the other intervals; the tip may also be minutely bifid. Branchiostegal spine on margin of carapace. In adult the fused part of outer flagellum of ant. 1 is 3 to nearly 4 times in the length of the free part, but less in juv.

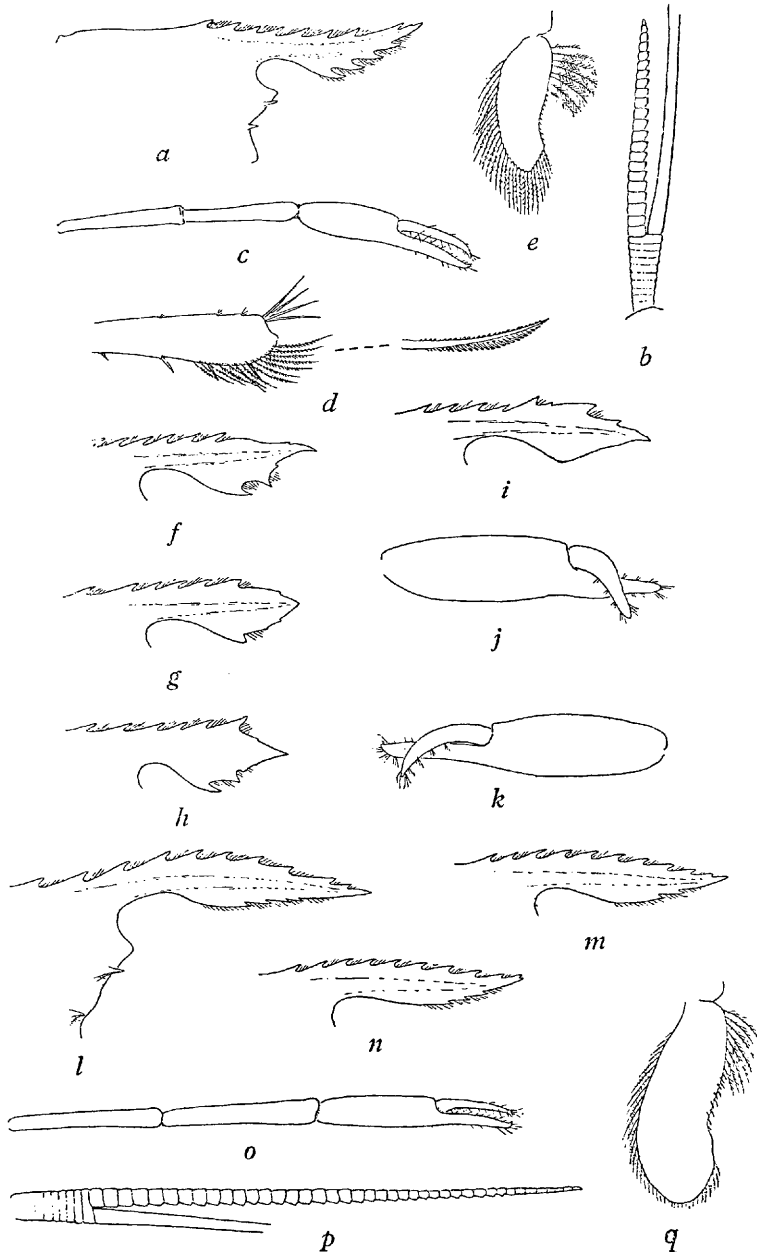


FIG. 149.—*Leander pacificus* Stimpson. *a*, front of carapace and rostrum. *b*, outer flagellum of antenna 1, setae omitted. *c*, 2nd leg. *d*, posterior surface of rostrum. *e*, endopod of pleopod 1 ♂. *f*, *g*, *h*, *i*, three malformations of rostrum from St. James (False Bay) and one from Port Elizabeth. *j*, *k*, outer view of chela of (right and left respectively) 2nd legs of a ♂ from Cape Town docks. *Leander capensis* de Man. *l*, front of carapace and rostrum of specimen from Baakens River (Stebbing's "serrifer"). *m*, *n*, rostra of specimens from other localities. *o*, 2nd leg. *p*, outer flagellum of antenna 1, setae omitted. *q*, endopod of pleopod 1 ♂.

and immature (e.g. in specimens 18–25 mm. long, fused part only $1\frac{1}{2}$ in free part), fused part with 7–8 segments and free part with 20–24 segments in adult (juv. 18 mm. has 3–4 and 7–8 segments resp., one 25 mm. has 5–6 and 12–13 segments resp.); outer margin of free part conspicuously serrate. Mandibular palp 3-jointed. 1st legs reaching slightly beyond apex of antennal scale, 5th joint a little longer ($1\frac{1}{4}$ times) than 4th, $1\frac{1}{2}$ (juv.)–2 (adult) times as long as chela, palm and finger subequal. 2nd legs, 4th joint slightly longer than 5th, the latter a little more than half length of chela, palm a little longer than finger. 6th joint of 5th leg with spaced spines on lower margin, the distal 2 (or 3) being on the anterior surface, postero-inferior surface distally with a series of doubly-serrate spines (often slightly more extensive than shown in fig. 149, *d*). No appendix interna on pleopod 1 ♂ (fig. 149, *e*); endopod about half length of exopod. Mxp. 3 with large arthrobranch and small pleurobranch. Between bases of 5th legs in ♂ a forwardly directed process, usually linguiform and flattened, sometimes with bifid apex, sometimes bluntly spiniform; a median sternal process on each of abdominal segments 1–3, flattened fore and aft and apically bifid on segments 1 and 2, conical on segment 3; in ♀ these sternal processes very obscure or obsolete.

Length ♂ up to 61 mm., ♀ 66 mm. Smallest ovig. ♀ 37 mm. Transparent, with streaks composed of greyish or pinkish dots, longitudinal and oblique on carapace and 6th abdominal segment, transverse on abdominal segments 1–5; eyes brownish grey; orange spots on legs, chiefly conspicuous at the junctions of 4th and 5th, 5th and 6th joints, and at bases of finger and thumb of 2nd leg, base of dactyls on 3rd–5th legs; orange dots on peduncles of pleopods, an orange spot on either side of 6th abdominal segment near base of telson, and one on outer margin of outer ramus of uropod; eggs grey (K. H. B., False Bay specimens) (*cf.* Doflein, *l. c.*, 1910, pl. 1, fig. 4).

Localities.—Muizenberg Vlei (“*squilla*”), Algoa Bay (*peringueyi*), East London (*gilchristi*),* and Mossel Bay (Stebbing); Table Bay, False Bay, St. Sebastian Bay, Mossel Bay, Ruigte Vlei near Knysna, Knysna Lagoon, Plettenberg Bay, Algoa Bay, Kasouga Lagoon, and East London, 0–25 fathoms, entering estuaries but rarely fresh water (S. Afr. Mus.).

Distribution.—Red Sea, Indo-Pacific to Japan.

Remarks.—Kemp has already stated (*l. c.*, p. 294) that *peringueyi* was founded on a specimen with malformed rostrum; and he did not include *gilchristi* in his synopsis. The latter “species” is likewise

* Stebbing’s locality should read “East London, collected by Mr. Wood.”

founded on a specimen with unusual, if not malformed, rostrum. Amongst a hundred specimens from St. James (False Bay), 3 specimens were found with malformed rostra, which are here figured (fig. 149, *f-h*). In 85 specimens from Zwartkops River estuary, Port Elizabeth, there were three with malformed rostral tips, one of which is figured here (fig. 149, *i*).

Tabulation of the rostral formulae of the specimens at hand shows some remarkable results, although these must be checked on a very much larger number of specimens before they can be accepted as indicating definite facts. Only specimens with well-formed rostra were counted. The numbers of specimens with some extreme rostral formulae are added.

Thus, while 4 is the most frequent number of ventral teeth in all

L. pacificus.

Area.	Table Bay.	False Bay.	Mossel Bay.	Knysna.	Port Elizabeth.	East London.	Nahoon River.
Number of specimens examined	80	100	60	75	85	50	14

Percentages with:

Dorsal teeth	7	5	6	8	8	10	10	14
	8	22	29	38	56	67	70	50
	9	60	57	49	32	23	20	29
	10	13	8	5	4	..	..	..
	11	..	..	..	..	..	..	7
Ventral teeth	2	..	..	..	1	2	..	7
	3	25	4	2	3	6	..	50
	4	58	76	75	71	80	78	43
	5	17	20	23	24	12	22	..
	6	..	..	..	1	..	..	..

Number of specimens with rostral formula:

$\frac{7}{3}$	3	1	4	..	4	..	..
$\frac{7}{5}$	..	..	..	1	..	..	..
$\frac{8}{5}$	..	..	..	1	1	..	..
$\frac{9}{6}$	..	..	..	1	..	..	..
$\frac{10}{5}$	5	2	2	2	..	..	..

Number of specimens with malformed rostra:

	..	3	3
--	----	---	----	----	---	----	----

areas, the preponderance of 9 dorsal teeth in the Table Bay area decreases and eventually gives place to 8 at Knysna, and the preponderance of 8 becomes successively greater farther eastwards. Similarly there is a decrease in the number of specimens with 10 dorsal teeth, and an increase in the number of those with only 7.

Stebbing at first identified the Muizenberg Vlei specimens as *squilla*, a species with a 2-jointed palp, afterwards as *affinis*. The proportions of the joints of the 2nd legs, and the outer flagellum of ant. 1, preclude the specimens from being either of these species. But curiously there is amongst the duplicates not sent to Stebbing one specimen in which the mandibular palp is 2-jointed (on both mandibles). Possibly one of the specimens sent to Stebbing had this peculiarity, thus leading to his original identification; but I have found no other specimen (except in "*serrifer*," *v. infra*).

Amongst the Table Bay specimens there is a 48 mm. ♀ in which both 2nd legs are regenerating from the 3rd joints onwards, their length from base of this joint being 6 mm. Also a 50 mm. ♂ in which the finger of the chela of left 2nd leg is falcate, crossing the thumb externally; in the right chela the finger also crosses the thumb, but both are malformed (fig. 149, *k, j*). Also a 48 mm. ♀ in which the fingers and thumbs of both chelae are more or less crossed. A juvenile from Plettenberg Bay has one of the pair (the other is missing) of 2nd legs with finger and thumb crossed.

The present specimens agree with Kemp's description except that the 5th joint (wrist) of 1st leg is a little *longer* than the 4th (merus) instead of shorter, and attains in the adult twice the length of the chela (Kemp gives 1.4–1.65 times).

This is the common Sand-shrimp of the rock-pools and estuaries around the coast. It occurs in the brackish parts of estuaries, but the only specimens which the South African Museum has from purely fresh water are juveniles from Ruigte Vlei near Knysna.

Ovigerous ♀♀ have been taken: in Table Bay in July and November, at St. James (False Bay) in January and February, in Mossel Bay in March and July, at Knysna in August and October, at Port Elizabeth in November, and at East London in April, July and December.

No parasites were found on any of the specimens.

Leander ? pacificus var.

Fourteen ovigerous and non-ovigerous ♀♀ from the Nahoon River, near East London (? from purely fresh part or from the estuary), show certain features of *pacificus* as detailed above.

The rostrum curves slightly upwards apically, with the following formulae (number of specimens of each in brackets): $\frac{7}{3}$ (1), $\frac{7}{4}$ (1), $\frac{8}{2}$ (1), $\frac{8}{3}$ (4), $\frac{8}{4}$ (2), $\frac{9}{3}$ (1), $\frac{9}{4}$ (3), $\frac{11}{3}$ (1). In the last-mentioned one, two of the teeth are small and obviously supernumerary. The percentages of the teeth are given in the above table for what they are worth. The branchiostegal spine is on the margin and projects beyond it.

The 2nd leg, however, differs from that of typical *pacificus*: the 5th joint (wrist) is a trifle longer than 4th joint, and nearly as long as the chela (= distance from base of palm to distal third of finger).

The fused part of outer flagellum of ant. 1 is relatively longer; it contains 8-10 joints, its length is not more than $1\frac{1}{2}$ times in the free portion, which contains 11-18, usually 13-15, feebly serrate joints.

With so few specimens no decision as to the specific identity of this form is justifiable.

Four specimens from Isipingo Lagoon, Natal, seem to indicate that these specimens are merely variants of *pacificus*. The rostral formulae are $\frac{8}{3}$ (2), $\frac{8}{4}$ (1), and one with short rostrum and $\frac{4}{6}$ teeth, evidently due to injury. The outer flagellum of ant. 1 of the 2 smaller ♂♂ are like those of the Nahoon River specimens, but those of the 2 larger ♀♀ are like typical *pacificus*.

The 2nd leg has the wrist nearly as long as the chela, as in the Nahoon River specimens. Sternal processes as in *pacificus*.

Leander capensis de Man

Cape River Shrimp

Fig. 149, l-q.

1897. de Man in Weber, Zool. Jahrb., x, p. 174, pl. 15, fig. 3, a-g.

1910. Stebbing, *l. c.*, p. 386 (authorship wrongly credited to Weber).

1914. *Id.*, Ann. S. Afr. Mus., xv, p. 31 (*serrifer*, non Stimpson).

1925. Kemp, *l. c.*, p. 291 (in key).

1947. Barnard, Ann. Mag. Nat. Hist. (xi), 13, p. 391.

Rostrum straight, with gently and evenly convex dorsal and ventral profiles, sometimes with a slight upward trend apically, extending to end of antennal scale, 9-12 teeth above, usually 11, of which 2 are post-orbital, 1-4 below, usually 3 or 4, the lower teeth not prominently outstanding, often scarcely projecting beyond the general profile. Branchiostegal spine smaller than antennal spine, arising

within, and its point not projecting beyond, margin of carapace. Fused part of outer flagellum of ant. 1 relatively very short, with 5-7 joints, 6-7 times in length of free part which has 35-45 joints, and is serrate on outer margin. Palp of mandible 3-jointed. 1st legs reaching beyond antennal scale by a little more than length of chela, 5th joint $1\frac{1}{2}$ times as long as 4th, and twice as long as chela, finger and thumb subequal to palm (or a trifle shorter). 2nd legs, 5th joint subequal or a very little longer than 4th, and almost equal to chela; in some large specimens length of 5th joint may reach only to distal third of finger, in one case only half-way along finger; finger and thumb slightly shorter than ($1\frac{1}{2}$ times in) palm. 6th joint of 5th leg with serrate spines as in *pacificus*. No appendix interna on endopod of pleopod 1 ♂; endopod about $\frac{2}{3}$ length of exopod, *i.e.* relatively larger than in *pacificus*, similar in shape but with a shorter setae around distal margin. Mxp. 3 with large arthrobranch and small pleurobranch. No sternal process between bases of 5th legs, a small conical tubercle on hind margin of 1st and 2nd abdominal sternites in ♂.

Length ♂ up to 48 mm., ♀ 66 mm. Semi-transparent, with minute pinkish speckling over carapace and abdomen, 3-4 obliquely longitudinal stripes on carapace composed of pinkish-brown dots, the hinder margins of the abdominal segments and outer margins of rami of uropods darker pink, a small grey spot in middle of side on hind margin of abdominal segments 1, 2, and 4-6; 2nd legs pinkish, apex of 4th joint, whole of the wrist, and finger and thumb yellowish, apex of palm at base of finger grey (2 dark dots in this position remain visible for a long time in specimens in alcohol), eyes dark brown.

Localities.—Knysna River (de Man); Baakens River, Port Elizabeth (Stebbing: as *serrifer*); Palmiet River near Kleinmond (Cape) and River Zonder End near "Lindeshof" (Caledon Division), Buffelsjagt River near Swellendam, Duivenhoks River near Heidelberg (Cape), Gt. Brak River (Mossel Bay), Gamtoos River near Patentie (S. Afr. Mus.).

Remarks.—Well distinguished from the marine and estuarine *pacificus* by the nearly symmetrical lancet-shaped rostrum, with its almost regularly spaced teeth, the shortness of the fused part of outer flagellum of antenna 1, and the position of the branchiostegal spine.

In 65 specimens the frequency of the numbers of dorsal and ventral rostral teeth is as follows: dorsal 9, 10 per cent., 10, 26.5 per cent., 11, 53.5 per cent., and 12, 10 per cent.; ventral 1, 3.5 per cent., 2, 18.5 per cent., 3, 39 per cent., and 4, 39 per cent.

Stebbing's specimen from the Baakens River, identified by him as *serrifer*, is really *capensis* with an unusually strongly arched dorsal rostral profile (fig. 149, l). Its right mandible has a 2-jointed palp, the left is normal. I have not seen any more specimens from this locality, but a couple of specimens from the Duivenhoks River have similarly arched rostra.

The River Zonder End locality is some 60 miles above tidal limit of the Breede River (of which the River Zonder End is a tributary).

Ovigerous ♂♂ were taken in the Palmiet River in mid-November, and in the Gamtoos River at the end of October.

The Cape River Shrimp is almost certainly to be found in other southern Cape rivers. None were captured during fish-netting operations in the Zwartkops River near Uitenhage, and the Baakens River is up to the present the most easterly recorded locality. Nor have any been taken in the Berg River or the Olifants River (Clanwilliam), which I have extensively examined in the course of fish-netting operations. The tentative comparison may thus be made between the distribution of Freshwater Eels (*Anguilla*) and that of the River Shrimp.

The hydrogen-ion concentration in the recorded localities (no observation in the Baakens River) varies from pH 4.5 (Palmiet River) to 8.5 (Gamtoos River).

Gen. PALAEMONETES Heller

1925. Kemp, *l. c.*, pp. 285 (in key), 314.

Distinguished from *Leander* by the absence of the mandibular palp. Mostly inhabitants of fresh and brackish water.

P. africanus Balss 1916 occurs in Nigeria. Kemp (*l. c.*, pp. 317, 327) considers that *P. natalensis* Stebb. 1915 is probably a species of *Periclimenes* (*v. infra*).

Subfamily PONTONINÆ.

1917. Borradaile, Trans. Linn. Soc. Lond., 2nd ser., zool., xvii, pp. 323 *sqq.*

1922. Kemp, Rec. Ind. Mus., xxiv, pp. 113 *sqq.* (key to genera).

1924. Gurney, "Terra Nova" Rep., zool., viii, p. 127 (larval stages).

1935. Gordon, J. Linn. Soc. Lond., xxxix, pp. 339 *sqq.* (position of *Anchistioides*, key to species).

1938. Gurney, Gt. Barrier Reef Exp. Rep., vi, pp. 15 *sqq.* (larval stages).

1940. Kubo, J. Imp. Fish. Inst. Tokyo, xxxiv, p. 31 (Japanese species).

Gen. ANCHISTUS Borradaile.

1898. Borradaile, Ann. Mag. Nat. Hist. (7), ii, p. 387.

1917. *Id.*, l. c., p. 387.

1922. Kemp, l. c., pp. 120 (in key), 247.

1925. *Id.*, Rec. Ind. Mus., xxvii, p. 327.

Rostrum curved downwards, distally compressed, not dentate except sometimes at apex. Carapace smooth, antennal spine sometimes present. Eyes small. Outer flagellum of ant. 1 not deeply cleft. Antennal scale broad. Mandible without palp. Inner lobe of mx. 1 broad, setose. All three maxillipeds with exopods; the 2 distal joints of mxp. 3 always slender, not twisted. 2nd legs with robust chelae, often unequal. Dactyls of 3rd–5th legs curved, simple or biunguiculate, without basal process. Postero-lateral corner of abdominal segment 6 more or less rounded. Dorsal spinules on telson very small. Commensal in bivalve Mollusca (*Pinna*).

Anchistus inermis (Miers)

Fig. 150, *a–d*.

1884. Miers, Crust. H.M.S. *Alert*, p. 291, pl. 32, fig. B (*Harpilius i.*).

1894. Ortmann, Semon's Austral. Reise, v, p. 16, pl. 1, figs. 3, 3, *a*, 3, *n* (*Pontonia pinnae*).

1921. Tattersall, J. Linn. Soc. Lond., xxxiv, p. 391, pl. 27, fig. 4.

1922. Kemp, l. c., p. 249, fig. 81.

1925. *Id.*, l. c., p. 322.

1926. Barnard, Trans. Roy. Soc. S. Afr., xiii, p. 121.

1927. Hale, Crust. S. Austral., pt. 1, p. 57, fig. 52.

1940. Kubo, J. Imp. Fish. Inst. Tokyo, xxxiv, p. 48, figs. 15–17.

Rostrum apically rounded and toothless. Antennal spine sometimes represented by a minute process. Basal process of ant. 1 apically rounded, with a small subapical denticle on outer margin. Antennal scale with convex outer margin ending in a small spine not reaching the rounded apex of lamellar part. Antepenultimate joint of mxp. 3 much broader than the 2 distal joints. Chela of 1st leg with margins produced like flaps, setose, the hand in cross-section semi-circular. 2nd legs unequal, the right or the left the larger, chela

robust. Dactyls of 3rd–5th legs strongly hooked, simple, basal width about half the distal width of 6th joint.

Length up to 25 mm. (Kemp: one ♀ 39 mm.). Pale translucent buff, yellowish or pink, the colour formed by numerous stellate specks

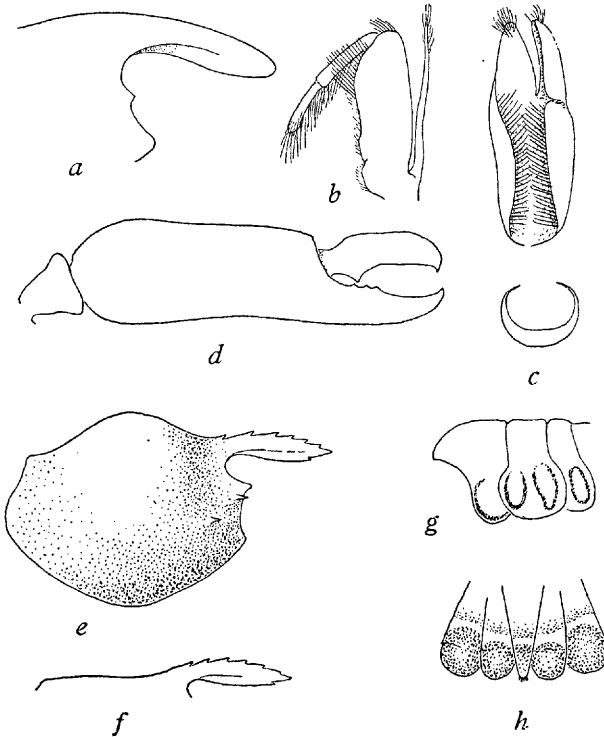


FIG. 150.—*Anchistus inermis* (Miers). *a*, rostrum. *b*, mpx. 3. *c*, chela of 1st leg, with cross-section through palm. *d*, 2nd leg, larger chela. *Periclimenes (Ancyllocaris) brevicarpalis* (Schenkel). *e*, carapace of adult ♀. *f*, dorsal profile of carapace, and rostrum, ♂. *g*, pleurae of abdominal segments 1–3. *h*, apices of telson and uropods, to show colour pattern.

on a translucent (white) ground colour, eyes dark brown, chelae pinky-white, deepest apically. Kemp says the body and legs in ♀ are covered with minute white dots.

Locality.—Delagoa Bay (Barnard; and coll. C. J. van der Horst).

Distribution.—Dar-es-Salaam, Red Sea, Indian Seas, Australia, Polynesia, Japan.

Remarks.—The specimens taken by Professor van der Horst were found in *Pinna* shells. It is a matter for conjecture to what use the remarkable 1st chela may possibly be put.

Gen. PERICLIMENES Costa

1922. Kemp, *l. c.*, p. 134 (references, synonyms, discussion on subdivision).

1927. Gurney, *Trans. Zool. Soc. Lond.*, pt. 2, p. 264 (larvae).

1938. *Id.*, *Gt. Barrier Reef Exp. Rep.*, vi, p. 16 (larvae).

Rostrum dentate. Carapace not depressed, with antennal spine, supra-orbital and hepatic spines present or absent. Outer flagellum of ant. I not deeply cleft. Eyes well developed. Mandible without palp. Inner lobe of mx. 1 narrow. All three maxillipeds with exopods. 2nd legs with stout chelae. Dactyls of 3rd-5th legs simple or biunguiculate, without basal process.

Remarks.—As noted above (p. 791), Kemp (1925) considered that Stebbing's "*Palaemonetes*" *natalensis* (1915, *Ann. S. Afr. Mus.*, xv, p. 78, pl. 19 (Crust., pl. 83)) was a species of *Periclimenes*. The depth at which it was caught (440 fathoms) is certainly against its being a *Palaemonetes*. The single specimen was defective (1st legs), Stebbing did not give the gill-formula, and no further specimens have come to hand. It must therefore be regarded as a *species dubia*.

Subgen. *Ancylocaris* Schenkel

1922. Kemp, *l. c.*, pp. 137, 167 (key to species).

1940. Kubo, *l. c.*, p. 41.

Dactyls of 3rd-5th legs simple. Hepatic spine usually present.

Perclimenes (Ancylocaris) brevicarpalis (Schenkel)

Fig. 150, *e-h*.

1893. Saville-Kent, *Gt. Barrier Reef*, pp. 33, 145, chromo pl. 2 ("*Palaemon*").

1902. Schenkel, *Vern. naturf. Ges. Basel*, xiii, p. 563, pl. 13, fig. 21, *a-m*.

1905. Lenz, *Abh. Senckenb. Ges.*, xxvii, p. 380, pl. 47, figs. 14, 14, *a-c* (*Harpilius latirostris*).

1906. Nobili, *Bull. Sci. Fr. Belg.*, xl, p. 52, pl. 4, figs. 9, 9, *a-b* (*A. aberrans*).

1914. Rathbun, *Proc. Zool. Soc. Lond.*, p. 655, pl. 1, figs. 1-3 (*P. hermitensis*).

1917. Borradaile, *l. c.*, pp. 355, 356.

1922. Kemp, *l. c.*, p. 185, figs. 40-42, and pl. 6, fig. 8.

1940. Kubo, *l. c.*, p. 46, figs. 13, 14.

1947. Barnard, *Ann. Mag. Nat. Hist.* (xi), 13, p. 391.

Carapace strongly swollen in adult ♀, in juv. and ♂ dorsal profile nearly straight; hepatic spine at a lower level than antennal spine, no supra-orbital spine. Rostrum not extending to end of antennal scale, lanceolate, 5-7, usually 6, teeth above, 0-2, usually 1, below. Lamellar part of antennal scale extending well beyond spine on outer margin. 1st leg extending beyond end of scale by the length of chela, 4th joint slightly longer than 5th, which is distinctly longer than chela, finger and thumb nearly or quite as long as palm, cutting-edges entire. 2nd legs subequal, in ♂ extending beyond end of scale by length of chela or chela plus wrist, shorter in juv. and ♀; no teeth on 3rd, 4th, or 5th joints, 5th joint less than half length of palm in ♂, nearly or quite equal to half in ♀, finger and thumb at least $\frac{2}{3}$ length of palm, cutting-edges with small denticles proximally in ♂, obscure or obsolete in ♀. Dactyls of 3rd-5th legs simple, broad at base, curved. 6th abdominal segment $1\frac{1}{2}$ times length of 5th; pleurae of abdominal segments 1-3 large in ovig. ♀. Telson with 2 pairs of minute spinules in distal half.

Length ♂ up to 23 mm., ♀ 39 mm. Coloration brilliant. Transparent (Kemp: with pure white patch on either side of carapace in ♀), hepatic and other internal organs dull reddish; on sides of each of abdominal segments 1-3 oval patches of white outlined with reddish brown (Kemp: black, violet, blue, or orange); Kemp seems to imply that there is only one patch on each segment, but in the present specimens there were (when fresh) *two* patches on the 2nd segment, *i.e.* 4 in all (Rathbun also says 4); at the ends of both rami of uropods and the telson there is a yellow or orange spot, bordered proximally with white, then yellow; in Kemp's description and Saville-Kent's picture the yellow spots are bordered with black, purple, or red-brown; legs with blue or violet rings at ends of the joints, especially of the 4th and 5th joints and palm of 2nd legs; a subapical band of same colour on the finger and thumb of 2nd leg. Young specimens may lack the lateral abdominal patches and the spots on the tail-fan.

Locality.—Delagoa Bay, associated with the Giant Anemone *Stoichactis* (coll. C. J. van der Horst).

Distribution.—Mauritius?, Zanzibar, Red Sea, Persian Gulf, Indian Seas, N. and N.E. Australia, Polynesia.

Remarks.—The association of this shrimp with the Giant Anemone (*Discosoma* or *Stoichactis*) has been described by Saville-Kent, Kemp,

Kubo, and others. Kemp (1916, Rec. Ind. Mus., xii, pp. 389-390) records the occurrence of a fish, *Amphiprion*, also with white patches or streaks, similar to that figured by Saville-Kent. Professor van der Horst also found an *Amphiprion* in association with the Anemone.

Kemp says that there is no sexual difference in the 2nd leg, and in the key and fig. 41, *b*, the wrist is less than half the length of palm. This applies for the ♂ and young ♀, but in the adult ♀ it is at least equal to half the palm.

Gen. HARPILIUS Dana

1852. Dana, U.S. Expl. Exp., Crust., p. 575.

1917. Borradaile, *l. c.*, pp. 379, 380 (*Harpiliopsis* and *Harpilius*).

1921. Tattersall, J. Linn. Soc. Lond., xxxiv, p. 388.

1922. Kemp, *l. c.*, pp. 120 (in key), 226 (key to species).

1940. Kubo, J. Imp. Fish. Inst. Tokyo, xxxiv, p. 1.

Differs from *Periclimenes* only in its more clumsy and depressed form. Distal spine of basal joint of ant. 1 usually very long; antepenultimate joint of mxp. 3 often broadened; 2nd legs heavily built, with 4th joint apically flattened or hollowed for reception of the wrist when folded; 3rd-5th legs stout, without spines on 6th joint, and with simple strongly hooked dactyls. This combination of characters produces a distinct facies, though each character separately may be paralleled in the species of *Periclimenes* (Kemp).

Differs from *Coralliocaris*, which is also found associated with corals, in the simple 3rd-5th dactyls without basal protuberances.

Key to the South African Species.

1. Hepatic spine on a lower level than antennal spine. Antepenultimate joint of mxp. 3 narrow (fig. 151, *c*) *depressus*.
2. Hepatic spine on same level as antennal spine. Antepenultimate joint of mxp. 3 broad (fig. 151, *g*) *beaupresii*.

Harpilius depressus Stimpson

Fig. 151, *a-e*.

1860. Stimpson, Proc. Ac. Nat. Sci. Philad., p. 38.

1906. Rathbun, Bull. U.S. Fish. Comm. for 1903, p. 920, fig. 68, and pl. 24, fig. 12.

1917. Borradaile, *l. c.*, p. 380, pl. 56, fig. 22, *e-i* (mx. 1, 2, mxp. 1-3) (*Harpiliopsis d.*).

1921. Tattersall, *l. c.*, p. 389, pl. 28, fig. 7 (3rd leg).

1922. Kemp, *l. c.*, p. 231, figs. 69, 70, and p. 234, fig. 71 (var. *gracilis*).

1947. Barnard, *Ann. Mag. Nat. Hist.* (xi), 13, p. 391.

Carapace strongly depressed, no supra-orbital spine, hepatic spine at a lower level than antennal spine; rostrum not extending to end of antennal scale, with 5-7 (usually 6 or 7) teeth above, none of them post-orbital, 2-5 (usually 3 or 4) below. Antepenultimate joint of mxp. 3 narrow (Kemp, *typ. err.*: broad), about 6 times as long as wide. 2nd leg, 3rd joint with apical spine on lower margin, 4th with apical spine on both upper and lower margins, 5th with apical spine on lower margin, outer margin of finger convex, no longitudinal keel on lower surface. 3rd-5th legs stout, 5th joint apically produced over base of 6th, dactyls stout, curved, hollowed below. Postero-inferior angles of 4th and 5th abdominal segments acutely pointed. Posterior pair of dorso-lateral spinules on telson nearer to the anterior pair than to apex.

Length ♀ up to 24 mm. Striped with deep blue on a pale grey ground-colour, a narrow mid-dorsal yellow stripe on 3rd abdominal segment, and a yellow stripe near lower margins of pleurae of 1st-3rd segments, uropods blotched with blue, with milk-white tips, chela of 2nd leg greenish, with yellow finger and thumb, basal joints and other legs spotted with blue, dactyls of 3rd-5th legs reddish. Eggs pale brown (Kemp).

Locality.—Delagoa Bay (Lourenzo Marques Mus., 1 ovig. ♀).

Distribution.—Red Sea, Seychelles, Madras, Andaman Is. (var. *gracilis*), Loyalty Is., Hawaiian Is.

Remarks.—The single specimen has lost both of the 2nd legs, but appears to be in agreement with the description of this species in other respects.

Harpilius beaupresi (Audouin)

Fig. 151, *f-h*.

1829. Audouin in Savigny, *Descr. d'Egypte*, p. 91, pl. 10, fig. 4 (*Palaemon b.*).

1917. Borradaile, *l. c.*, p. 379, pl. 55, fig. 21 (mxp. 3) (*Harpiliopsis b.*).

1921. Tattersall, *l. c.*, p. 389, pl. 28, fig. 8 (dactyl, 3rd leg).

1922. Kemp, *l. c.*, p. 229, figs. 67, 68 (carapace, 2nd leg).

1938. Gurney, *l. c.*, p. 18, figs. 67-74 (larva).

1947. Barnard, *Ann. Mag. Nat. Hist.* (xi), 13, p. 391.

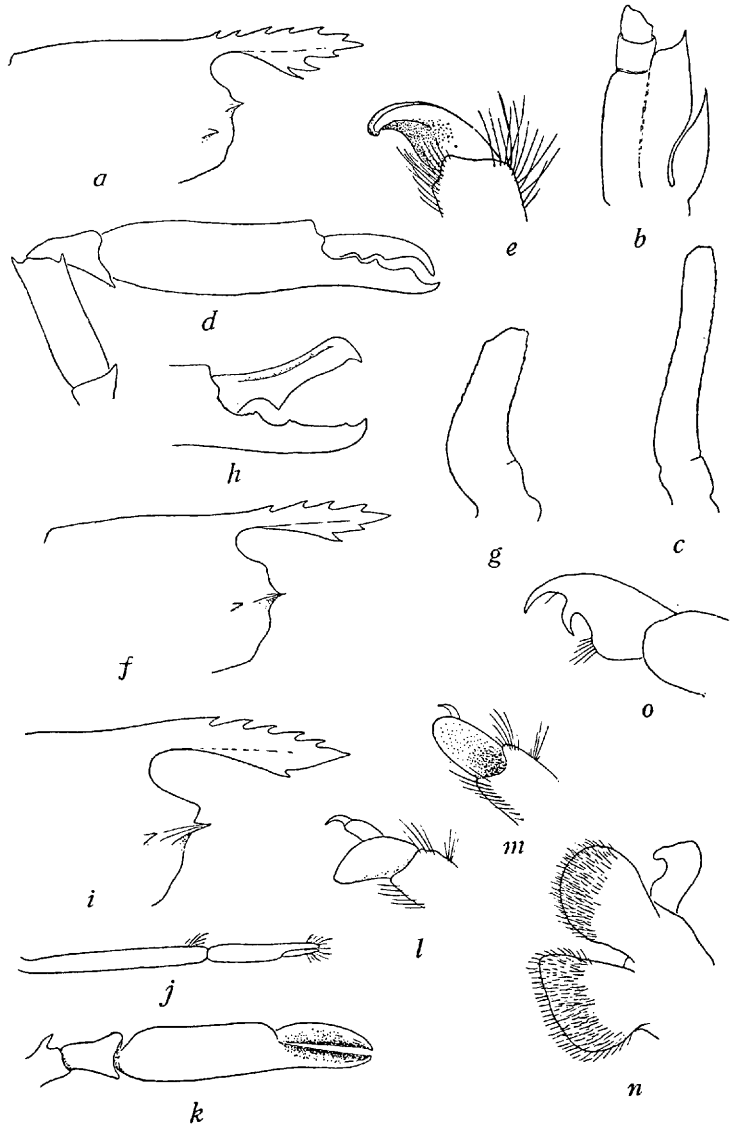


FIG. 151.—*Harpilius depressus* Stimpson. *a*, front of carapace and rostrum. *b*, peduncle of ant. 1. *c*, antepenultimate joint of mxp. 3. *d*, 2nd leg (after Kemp). *e*, inner view of dactyl of 3rd–5th legs.

Harpilius beaupresi (Audouin). *f*, front of carapace and rostrum. *g*, antepenultimate joint of mxp. 3. *h*, lower surface of finger and thumb of chela of 2nd leg (after Kemp).

Coralliocaris lucina Nob. *i*, front of carapace and rostrum. *j*, 1st leg. *k*, outer view of chela of smaller 2nd leg. *l*, *m*, lateral and ventral views of dactyl of 3rd–5th legs.

Conchodytes meleagrinae Peters. *n*, mx. 1. *o*, dactyl of posterior legs (both figures after Borradaile).

Differs from *depressus* as follows: rostrum shallower, with 4-7 (usually 4 or 5) teeth above, 2-4 (usually 2 or 3) below; the antennal spine remote from suborbital angle, supported by a keel extending to the hepatic spine, which is about on the same level; antepenultimate joint of mxp. 3 broad, about 3 times as long as wide, strongly curved; 3rd joint of 2nd leg with 1 apical spine above, 2 below, outer margin of finger straight or concave, with a longitudinal keel on lower surface; hinder pair of spinules on telson midway between anterior pair and apex.

Length up to 16 mm.

Locality.—Delagoa Bay (coll. C. J. van der Horst. 1 specimen in coral).

Distribution.—Red Sea, Chagos Archipelago, Seychelles, Maldives, Andaman Is., East Indies.

Remarks.—The present specimen has lost both the 2nd legs.

Gen. CORALLIOCARIS Stimpson

1860. Stimpson, Proc. Ac. Nat. Sci. Philad., p. 38.

1917. Borradaile, *l. c.*, p. 381 (part: excl. *Onycocaris*).

1922. Kemp, *l. c.*, pp. 121 (in key), 268 (key to species).

Carapace depressed, with or without hepatic spine; rostrum compressed, usually dentate. Inner lobe of mx. 1 slender. Distal endite of mx. 2 narrow, with setae only at tip. All three maxillipeds with exopods. 2nd legs similar or dissimilar. Dactyls of 3rd-5th legs with single claw, but with a large swollen, hoof-shaped basal protuberance. Associated with Madrepora corals.

Key to the South African Species.

1. Hepatic spine present. 2nd legs dissimilar *lucina*.
2. Hepatic spine absent. 2nd legs similar *graminea*.

Coralliocaris lucina Nobili

Fig. 151, *i-m*.

1901. Nobili, Ann. Mus. Univ. Naples, n.s., I, no. 3, p. 5.

1902. de Man, Abh. Senckenb. Ges., xxv, p. 842, pl. 26, figs. 55, 55, *a-h* (*lamelli-rostris* Stimpson).

1917. Borradaile, *l. c.*, p. 384, pl. 56, figs. 23 (*superba* var. *japonica* and *lucina*).

1922. Kemp, *l. c.*, p. 276, fig. 102 (m.xp. 3).

1925. *Id.*, Rec. Ind. Mus., xxvii, p. 322.

1935. Boone, Bull. Vanderbilt Mar. Mus., vi, p. 174, pl. 47 (*lamelli-rostris*).

1947. Barnard, Ann. Mag. Nat. Hist. (xi), 13, p. 392.

Rostrum with 3–6 (usually 4 or 5) teeth above, 1–3 (usually 2 or 3) below; antennal spine strong, supported by a keel extending to the hepatic spine. Mxp. 3 slender, antepenultimate joint 4 times as long as wide. 1st leg very slender, 5th joint longer than chela, finger and thumb less than length of palm. 2nd legs unequal and dissimilar, finger of larger chela angulate on outer margin, carinate; finger and thumb of smaller chela excavate on outer surface, with straight cutting-edge on inner side. 3rd–5th legs very stout, dactyl (fig. 151, *l–m*).

Length up to 16 mm. Transparent, carapace and abdomen longitudinally streaked and speckled with bright red, chelae colourless (Kemp).

Locality.—Delagoa Bay (coll. C. J. van der Horst. 1 specimen in coral).

Distribution.—Red Sea, Arabian coast, Ceylon, Chagos Archipelago, Maldives, Andaman Is., Nicobars, East Indies.

Remarks.—The present specimen has lost the larger chela.

Coralliocaris graminea (Dana)

1852. Dana, U.S. Explor. Exp., Crust., i, p. 573, pl. 37, fig. 3, *a–e* (*Oedipus g.*).

1884. Miers, Zool. H.M.S. *Alert*, p. 563.

1902. de Man, Abh. Senckenb. Ges., xxv, p. 840.

1905. Lenz, *ibid.*, xxvii, p. 381.

1922. Kemp, *l. c.*, p. 269, figs. 96, 97 (m.xp. 3, 2nd leg).

1925. *Id.*, Rec. Ind. Mus., xxvii, p. 322.

1935. Boone, Bull. Vanderbilt Mar. Mus., vi, p. 176, pl. 48.

1938. Gurney, Gt. Barrier Reef Exp. Rep., vi, p. 20, figs. 81–89 (larval stages).

1940. Kubo, J. Imp. Fish. Inst. Tokyo, xxxiv, p. 70, figs. 33–35.

Rostrum with 4–6 teeth above, 1 or 2 below, usually 5 and 2 resp. Hepatic spine absent. Mxp. 3 stout, antepenultimate joint 3 times as long as wide. 2nd legs equal or unequal but similar in structure, 4th joint in full-grown specimens with 1–2 denticles on upper apex and a larger one on lower apex, wrist with denticles on its upper border as

well as a large tooth on its lower border, outer margin of finger semi-circular, inner surface with deep hollow to receive a large blunt process on thumb.

Length up to 23 mm. (Kemp). Pale green, dotted with yellow and dark brown, ♀ with red streaks on sides of abdomen (Kemp).

Locality.—St. Juan de Nova, Mozambique Channel (Lenz).

Distribution.—Red Sea, Zanzibar, Seychelles, Indo-Pacific to Japan.

Gen. CONCHODYTES Peters

1851. Peters, Ges. Naturf. Fr. Berlin, 18th February.

1852. *Id.*, MB. Ak. Wiss. Berlin, p. 588.

1917. Borradaile, *l. c.*, p. 392.

1922. Kemp, *l. c.*, pp. 121 (in key), 279.

Rostrum depressed, toothless, without dorsal carina, little if at all longer than antennal scale, carapace smooth, lower angle of orbit produced. Flagella of ant. 1 short. Mandible without palp. Inner lobe of mx. 1 very broad, setose. Distal endite of mx. 2 broad, setose along whole of inner margin. All three maxillipeds with exopods. 2nd legs unequal, with robust chelae. Dactyls of 3rd–5th legs biunguiculate, with flat basal protuberance. Commensal in bivalve Molluscs.

Conchodytes tridacnae Peters

1851. Peters, *l. c.*

1878. Hilgendorf, MB. Ak. Wiss. Berlin, p. 835.

1917. Borradaile, *l. c.*, p. 393.

1922. Kemp, *l. c.*, p. 283, fig. 105 (ant. 1 and telson).

1931. Chopra, Rec. Ind. Mus., xxxiii, p. 306.

1940. Kubo, J. Imp. Fish. Inst. Tokyo, xxxiv, p. 62, figs. 26, 27.

Conchodytes meleagrinae Peters

Fig. 151, *n, o.*

1851. Peters, *l. c.*

1878. Hilgendorf, *l. c.*, p. 836.

1888. Bate, Rep. H.M.S. *Challenger*, xxiv, p. 707, pl. 124, figs. 1, 2 (*Pontonia m.*).

1917. Borradaile, *l. c.*, p. 393, pl. 57, fig. 26.

1922. Kemp, *l. c.*, p. 285.

1940. Kubo, J. Imp. Fish. Inst. Tokyo, xxxiv, p. 58, figs. 24, 25.

Remarks.—Both these species are recorded from Ibo, Portuguese East Africa, by Hilgendorf, and will probably be found to occur within our limits (lat. 15° S.).

Both are distinguished from other species of the genus by the shape of the basal process on dactyls of 3rd–5th legs which is rounded and without a small tooth. For characters supposed to distinguish the two species see Hilgendorf, Borradaile, Kemp, and Kubo.

C. tridacnae lives in the Giant Clam (*Tridacna*), and *meleagrinae* in the Pearl Oyster (*Meleagrina*) and occasionally also in *Tridacna*.

FAMILY CRANGONIDAE.

1900. Stebbing, Mar. Invest. S. Afr., i, p. 46 (key to genera at that date).

1910. Kemp, Fish. Irel. Sci. Invest. [1908], p. 134 (key to British genera).

1910. Stebbing, *l. c.*, p. 382.

1920. de Man, Siboga Exp. monogr., xxxixa, 3, pp. 247 *sqq.* (key to genera and list of species).

Rostrum short or spiniform. Carapace sometimes more or less sculptured. Eyes well developed (but in *Argis* concealed by carapace, and in *Prionocrangon* eye-stalks modified, cornea absent). Mandible simple, without palp (except in *Coralliocrangon* and *Naushonia*). Mxp. 2 with 7th joint small, attached obliquely at apex of 6th. Mxp. 3 with exopod, epipod present or absent. 1st leg strong, subchelate. 2nd leg slender, sometimes reduced, in one genus absent. 3rd leg slender; 4th and 5th legs more robust, sometimes with dilated dactyls. Telson tapering. No epipods on legs (but see *infra*). Exopods on legs; if present, on 1st leg only. Gills 5–8 plus 2–3 epipods.

Remarks.—The strong subchelate 1st pair of legs is a distinctive character.

A feature, which is not mentioned in the few books of reference available to me, is the presence of an epipodial process on the dorsal surface of the basal joint of 2nd leg in some species. It occurs in *Crangon vulgaris* as a blunt-ended process, but in *Sclerocrangon bellmarleyi* and *Pontophilus gracilis* as an acute process (figs. 152, *c*, 153, *d*). It is not present in any of the other South African species mentioned below. It is figured by Stebbing for *P. gracilis* (1905, pl. 25), but not by de Man for *P. occidentalis* var. *indica* (1920, pl. 21, fig. 63, *k*), but the figure here seems to be cut off at the critical part.

Sars (Norw. N. Atl. Crust., pl. 2) does not figure it for *Sclerocrangon salebrosus*.

The proposal to use *Crangon* instead of *Alpheus* and to substitute *Crago* for *Crangon* (and *Cragonidae* for *Crangonidae*) has been referred to under the family *Alpheidae* (see Stebbing, J. Linn. Soc. Lond., xxix (1905), pp. 332-334).

Key to the South African Genera.

1. Exopod on 1st leg, if present, rudimentary, minute (fig. 153, c).
Gills 5-7 with lower apices curving backwards.
 - a. 2nd leg as long as the others, finger and thumb shorter than palm.
 - i. Carapace smooth *Crangon*.
 - ii. Carapace carinate and dentate *Sclerocrangon*.
 - b. 2nd leg shorter, often much shorter, than the others, finger and thumb as long as, or much longer than, palm *Pontophilus*.
2. Exopod on 1st leg well developed, setose. Gills 8, with lower apices curving forwards *Aegeon*.

Gen. CRANGON Fabr.

- 1910. Kemp, *l. c.*, p. 136.
- 1910. Stebbing, *l. c.*, p. 382.
- 1916. Kemp, *Rec. Ind. Mus.*, xii, p. 379.
- 1920. de Man, *l. c.*, p. 249 (list of species only).
- 1931. Lebour, *Proc. Zool. Soc. Lond.*, i, p. 3 (larva).

Rostrum depressed. Carapace without dentate keels. Eyes well developed. Basal process of ant. 1 apically acute. 1st leg without exopod. 2nd leg as long as 1st, chelate, finger and thumb less than half length of palm. Dactyls of 4th and 5th legs not dilated. Endopods of last 4 pleopods shorter than exopods, divided into 2 segments, without appendix interna. Gills 5-6 plus 3 epipods, lower apices of the gills curving backwards.

Remarks.—The genus is confined to the northern hemisphere with the exception of *C. antarcticus* Pfeffer (subgen. *Notocrangon* Cout.), and the following species.

Crangon capensis Stimpson

- 1860. Stimpson, *Proc. Ac. Nat. Sci. Philad.*, p. 93.
- 1910. Stebbing, *l. c.*, p. 382.
- Description inadequate. Length 22.5 mm. Simon's Bay, 12 fathoms. Not since recorded.

Gen. SCLEROCRANGON G. O. Sars

1910. Kemp, *l. c.*, p. 139.

1914. Stebbing, *Ann. S. Afr. Mus.*, xv, p. 29.

1920. de Man, *l. c.*, p. 251 (list of species only).

Rostrum compressed and expanded below, or spiniform. Carapace sculptured, dentate and keeled, antero-lateral angle large. Eyes well developed. Basal process of ant. 1 apically acute. Mxp. 3 without epipod or arthrobranch. 1st leg without exopod. 2nd leg nearly as long as 1st, finger and thumb less than half length of palm. Dactyls of 4th and 5th legs not dilated. Endopod of last 4 pleopods as in *Crangon*. Gills 5 plus 2 epipods (Kemp, 1910), lower apices of gills curving backwards. Eggs large. Development abbreviated.

Remarks.—With the exception of the South African species, the genus has been found only in the northern hemisphere.

Sclerocrangon bellmarleyi Stebb.

Fig. 152.

1914. Stebbing, *l. c.*, p. 29, pl. 10 (*Crust.*, pl. 74).

Integument minutely and sparsely granular or villose. Rostrum spiniform, directed upwards. A large upturned tooth behind rostrum, and a smaller one on the cardiac region; no denticle between these two teeth; hepatic spine and another between it and the dorsal cardiac tooth; a small denticle on lower (incurved) margin behind the antero-lateral spine, concealed by a series of plumose setae. Abdomen not carinate, 6th segment medio-dorsally channelled between blunt ridges, with a blunt dorso-lateral ridge on either side. Telson feebly concave dorsally, with small apical point and 2 pairs of minute dorso-lateral spinules distally. A pointed (epipodial) process on base of 2nd leg (fig. 152, c). Endopods of pleopods about half as long as exopods in ♀, less in ♂, becoming relatively shorter in 4th and 5th pleopods, no appendix interna; peduncle of 1st pleopod ♂ with very long spine-setae on inner margin proximally and distally, endopod with a single long spine-seta attached to posterior surface and projecting inwards (when appendage is *in situ*); in ♂ corresponding spines are present, but shorter and thicker, margins of endopod without long plumose setae. No sternal processes or spines on thorax or abdomen in ♀, in ♂ one spine on each of thoracic sternites 2-5 and abdominal sternites 1-5, those on 3rd and 4th thoracic sternites less

spiniform than the others, that on 5th abdominal sternite merely a small tubercle.

Length ♂ up to 35 mm., ♀ 37 mm. (Stebbing: ♀ 40 mm.).

Localities.—Off Cape Natal (Durban), 440 fathoms (Stebbing); Natal coast, 400 fathoms (S. Afr. Mus.).

Remarks.—One ♀, returned undissected by Stebbing, and a large ♂ not seen by him form the basis of the above description.

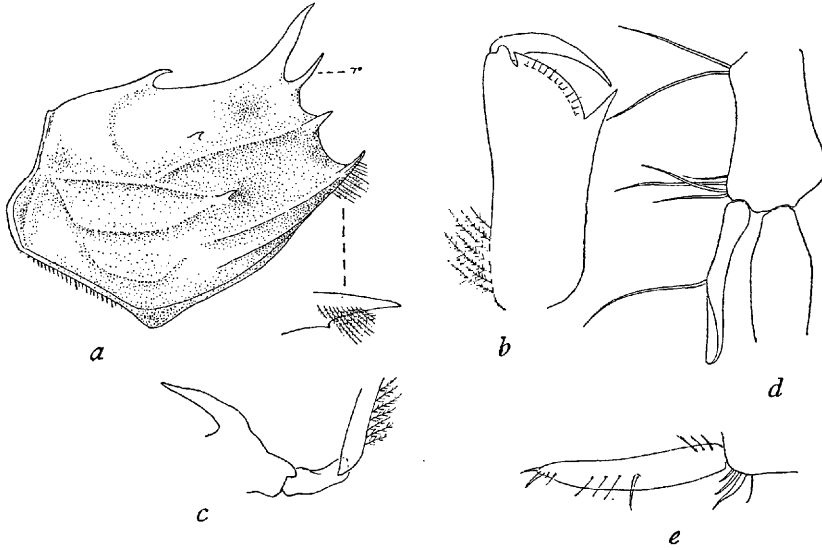


FIG. 152.—*Sclerocrangon bellmarleyi* Stebb. *a*, carapace, with ventral view of antero-lateral spine to show denticle on lower margin (*r*=rostrum). *b*, chela of 1st leg, outer view. *c*, base of 2nd leg with epipodial process. *d*, peduncle and endopod of pleopod 1 ♀, ordinary setae omitted. *e*, endopod of pleopod 1 ♂.

Gen. PONTOPHILUS Leach

1900. Stebbing, *Mar. Invest. S. Afr.*, i, p. 48 (*Philocheras*).

1905. *Id.*, *ibid.*, iv, p. 93.

1910. Kemp, *l. c.*, p. 143 (*Philocheras*) and p. 159 (*Pontophilus*).

1911. *Id.*, *Rec. Ind. Mus.*, vi, pp. 5 and 8 *sqq.*

1915. Stebbing, *Ann. S. Afr. Mus.*, xv, p. 71 (*Philocheras*).

1916. Kemp, *Rec. Ind. Mus.*, xii, pp. 355–374 and 381–384.

1920. de Man, *l. c.*, pp. 252, 257 *sqq.* (list of species, key to species).

Rostrum depressed. Carapace with or without dentate keels. Eyes well developed. Basal process of ant. 1 truncate or rounded (*Philocheras*) or acutely pointed (*Pontophilus*). Mxp. 3 with or

without epipod and arthrobranch. 1st leg with or without exopod. 2nd leg shorter than 1st, finger and thumb longer or shorter than palm. Dactyls of 4th and 5th legs not dilated. Endopods of last 4 pleopods variable (see Kemp, 1916, p. 381), composed of 1 or 2 segments, with or without appendix interna. Gills 6-7 plus 2-3 epipods, apices of gills curving backwards.

Remarks.—*Philocheras* is now merged in *Pontophilus* for reasons given by Kemp in 1911 and 1916, and the proposal was accepted by de Man without comment.

Key to the South African Species.

1. Rostrum spiniform. 2 medio-dorsal teeth on carapace. A process (epipodial) on upper margin of basal joint of 2nd leg (fig. 153, *d*) *gracilis*.
2. Rostrum short, blunt or bifurcate. No process on base of 2nd leg.
 - a.* Outer margin of antennal scale without a tooth. Rostrum apically rounded-truncate.
 - i. Rostrum shorter than its basal width (fig. 153, *i*). Animal 20-23 mm. *megalocheir*.
 - ii. Rostrum as long as basal width (fig. 153, *l*). Animal 9-10 mm. *hendersoni*.
 - b.* Outer margin of antennal scale with a tooth (fig. 153, *g*). Rostrum apically bifurcate *sculptus*.

Pontophilus gracilis S. I. Smith

Fig. 153, *a-h*.

1905. Stebbing, *l. c.*, p. 94, pl. 25.

1910. *Id.*, *l. c.*, p. 383.

1920. de Man, *l. c.*, p. 260 (in key), pp. 264-269 (comparison).

1925. Balss, *D. Tiefsee Exp.*, xx, p. 296.

Rostrum slender, usually slightly curved downwards, 1 or 2 pairs of minute denticles near base. Carapace with 1 gastric and 1 cardiac tooth on middle line, 1 hepatic and 1 epigastric laterally. Abdomen not carinate, 6th segment and telson slightly flattened or feebly channelled medio-dorsally. Mxp. 3 with epipod and arthrobranch. Basal process of ant. 1 lanceolate, apex acute; outer flagellum of ant. 1 thickened in ♂. 1st leg with rudimentary exopod (fig. 153, *c*); a spine on upper apex of 4th joint; a spine on lower, one on upper, and a third and larger one on middle of outer margin of 5th joint (see Stebbing's figure pp. 1, outer view). 2nd leg extending to middle

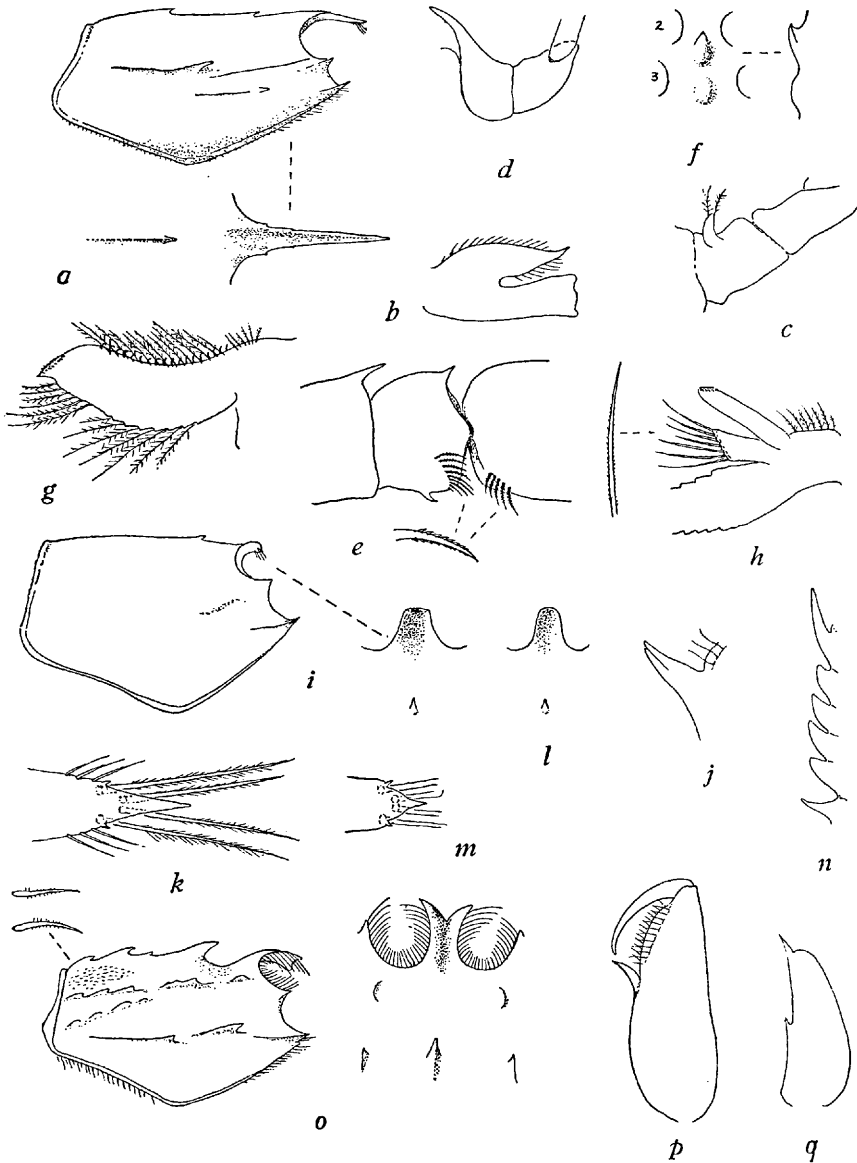


FIG. 153.—*Pontophilus gracilis* S. I. Smith. *a*, carapace, with dorsal view of rostrum further enlarged. *b*, basal process of 1st joint of ant. 1. *c*, base of 1st leg with exopod. *d*, base of 2nd leg with epipodial process, setae omitted. *e*, inner view of 5th joint, with apex of 4th and base of 6th, of 1st leg (long plumose setae omitted). *f*, 2nd and 3rd thoracic sternites, with profile. *g*, endopod of pleopod 1 ♂. *h*, endopod of pleopod 2 ♂.

Pontophilus megalocheir (Stebb.). *i*, carapace, with dorsal view of rostrum. *j*, thumb-like process of hand of 1st leg. *k*, apex of telson.

Pontophilus hendersoni Kemp. *l*, dorsal view of rostrum. *m*, apex of telson, setae not fully drawn in. *n*, profile of 1st-5th thoracic and 1st abdominal sternites.

Pontophilus sculptus (Bell). *o*, carapace, with dorsal view of rostrum further enlarged, and 2 setae. *p*, hand of 1st leg. *q*, antennal scale.

of 4th joint of 1st leg, its base dorsally with a pointed process (fig. 153, *d*), finger and thumb subequal to palm, gaping. 3rd leg very slender. Endopods of pleopods ♂ and ♀ well developed, with appendix interna, endopod of pleopod 1 ♂ (fig. 153, *g*), appendix masculina on pleopod 2 ♂ stout, shorter than appendix interna (fig. 153, *h*). A low rounded knob with forwardly-directed point on sternite between bases of 2nd legs, followed by a less conspicuous knob on 3rd sternite; both less conspicuous in ♀ than in ♂. Gills 7 plus 3 epipods. Eggs small, numerous.

Length ♀ up to 38 mm., ♂ smaller. Bright red (s.s. *Pieter Faure* log-book).

Localities.—Off Cape Peninsula, 250 fathoms (Stebbing); off west coast of Cape Peninsula, 190–470 fathoms (S. Afr. Mus.).

Distribution.—East coast of N. America; Bay of Bengal and Andaman Sea, Indian Ocean, Hawaiian Is.

Remarks.—The most that can be said of these specimens is that, as Stebbing said, they resemble *gracilis* very closely; and that they are not *occidentalis* var. *indica* of which de Man has figured the ♂ 1st and 2nd pleopods. Whether they are really *gracilis* or one of the closely allied species such as *junceus*, *profundus*, *abyssi*, must remain uncertain until the ♂ pleopods of these other species are described. Calman (1939, John Murray Exp., vi, p. 219) has compared one of Stebbing's Cape specimens with material from Aden, Zanzibar, and the Maldives, but says nothing about the ♂ pleopods.

Ovigerous ♀♀ were taken by the s.s. *Pieter Faure* in April to June.

Pontophilus megalochair (Stebb.)

Fig. 153, *i-k*.

1915 (September). Stebbing, *l. c.*, p. 71, pl. 15 (Crust., pl. 79) (*Philocheiras m.*, part: excl. the specimens No. A1316).

1920. de Man, *l. c.*, p. 262 (in key).

1926. Barnard, Trans. Roy. Soc. S. Afr., xiii, p. 127.

♀. Rostrum short and broad, scarcely as long as basal width, the subtruncate apex curved downwards. Carapace smooth, one gastric tooth in middle line, no lateral teeth. Abdomen not truly carinate, a slight indication of a short ridge near hind margin of 3rd segment, and segments 4–6 bluntly ridged. Telson ending in a narrow point, slightly or considerably longer than its basal width, flanked by a minute spinule on each side at base, with 2 pairs of long plumose

setae arising from ventral surface (exaggerated and incorrectly described and figured by Stebbing). Mxp. 3 with arthrobranch. Apex of lamellar portion of antennal scale nearly rectangular, projecting slightly beyond the spine (slightly exaggerated in Stebbing's figure). 1st leg without exopod; spinous process ("thumb") of 6th joint (hand) apically bifid. 2nd leg without process on basal joint, 3rd and 4th joints slender, each about 5 times as long as wide; finger and thumb longer than palm, not gaping. Endopods of pleopods ♀ well developed, a little more than half length of exopods, no appendix interna. A slender spiniform sternal process projecting forwards between bases of 1st legs (♀), 2nd-5th thoracic and all abdominal sternites smooth.

Length ♀ 23 mm.

Localities.—Off Cove Rock, East London, 25 fathoms (Stebbing; S.A.M. No. A1317); Delagoa Bay (Barnard).

Remarks.—Both the type and the Delagoa Bay specimens are ♀♀. Stebbing's description and figure of the telsonic apex are incorrect, and his figure of the projecting lamellar portion of the antennal scale is exaggerated. The hand of 1st leg does not seem unduly large for a Crangonid.

I have seen 3 specimens, not in very good condition, collected in False Bay by the University of Cape Town Ecological Survey, which may be referable to this species.

Pontophilus hendersoni Kemp

Fig. 153, *l-n*.

1915 (September). Stebbing, *l. c.*, p. 72 (*P. megalocheir* part: specimens No. A1316).

1915 (December). Kemp, *Mem. Ind. Mus.*, v, p. 261, pl. 13, fig. 8, and text-fig. 25.

1916. *Id.*, *l. c.*, pp. 357 (in key), 372.

1947. Barnard, *Ann. Mag. Nat. Hist.* (xi), 13, p. 392.

Very closely allied to *megalocheir*, but distinguished by the smaller size, relatively narrower rostrum (fig. 153, *l*), shorter apical point on telson (fig. 153, *m*), less prominent lamellar portion of antennal scale, and relatively broader 3rd and 4th joints of 2nd leg (each about 3 times as long as wide).

A spiniform process on 1st thoracic sternite (relatively stronger than in *megalocheir* ♀) in both ♂ and ♀; in ♂ only 2nd-5th thoracic

sternites with dentiform keels, and abdominal sternites 1-4 each with a spiniform projection (fig. 153, *n*). Peduncles of pleopods broader in ♂ than ♀; endopods in both sexes moderately well developed on last 4 pairs, about half length of exopods but shorter in ♂ than in ♀; on 1st pleopod small in ♂, at most $\frac{1}{3}$ length of exopod; no appendix interna. Outer flagellum of ant. 1 thickened in ♂.

Length up to 9-10 mm. (♂ and ovig. ♀).

Localities.—33° 13' S., 27° 39' E. (south of East London), 37 fathoms (Stebbing; S.A.M. No. A1316, as *megalocheir* part); off Cape St. Blaize, from stomach of gurnard (S. Afr. Mus.).

Distribution.—Chilka Lake and Orissa coast, India, 0-4 $\frac{1}{2}$ fathoms.

Remarks.—Kemp made no mention of sternal spines on the abdominal segments, and the present specimens do not show the dorsal tubercle on 3rd abdominal segment. Possibly the South African specimens represent a distinct species.

Pontophilus sculptus (Bell)

Fig. 153, *o-q*.

1910. Kemp, *l. c.*, p. 148, pl. 21, fig. 6, *a, b* (*Philocheras s.*).

1920. de Man, *l. c.*, p. 263 (in key).

1923. Odhner, Medd. Göteb. Mus., xxxi, p. 6.

1933. Monod, Bull. Com. Et. sci. Afr. occid. Franç., xv, p. 10, fig. 1, F (antennal scale) (pagination of separate copy).

1947. Barnard, Ann. Mag. Nat. Hist. (xi), 13, p. 392.

♀. Integument pubescent. Rostrum apically bifurcate, curved downwards, dorsally concave. Carapace with transverse depression behind rostrum, a medio-dorsal keel with 4 teeth, of which the foremost is prominent and the 2nd small or minute, a dorso-lateral series of partly disconnected short keels, the 1st rounded, behind orbit, 2nd and 3rd dentiform, below and slightly behind 1st medio-dorsal tooth, followed by 3 dentiform keels, a lateral keel divided into 2, both dentiform anteriorly; on hinder part of carapace between dorso-lateral and lateral keels an oblique row of 3-4 obscure short keels. Orbit fringed with long setae. Basal process of ant. 1 transversely oblong, the outer apex acute, upper apices of 1st and 2nd peduncular joints (viewed from the side) dentiform, 3rd joint with upper margin produced into 2 teeth. Antennal scale with tooth in middle of outer margin, lamellar portion not extending as far as apical spine. Mxp. 3 with arthrobranch. 1st leg, 4th joint with small tooth on upper apex, 5th with blunt tooth on inner lower margin, a sharp one on lower

outer margin, and a smaller one on outer upper margin, 6th joint widest proximally, thumb-like process strong, slightly sunken at base and mobile. 2nd leg extending to basal $\frac{1}{3}$ of hand of 1st leg, finger and thumb longer than palm, not gaping. A sternal spiniform process between bases of 1st legs. Abdomen sculptured, 3rd-5th segments medio-dorsally carinate, 6th segment channelled, no sternal processes in ♀. Telsonic apex as in *hendersoni* (cf. fig. 153, m). Endopods of pleopods about half length of exopods, both exopod and endopod shorter in 5th pleopod, appendix interna on 2nd and 3rd, reduced on 4th, absent on 5th.

Length ovig. ♀♀ 14 mm. and 21 mm.

Localities.—Off Cape Recife (Algoa Bay), 52 fathoms; off Gt. Fish Point, 30 fathoms; and off Cape Natal (Durban), 54 fathoms (S. Afr. Mus.).

Distribution.—Mediterranean; N.W. Europe; Cape Blanco; Port Alexander, Angola.

Remarks.—Kemp neither mentioned nor figured the short keel behind the orbit. Nevertheless there seems no reason to separate these specimens from *sculptus*. The pleopods of the ♀ agree with Kemp's statement (1916, *l. c.*, p. 381), but a ♂ from South Africa is not available for comparison. In the present specimens the "thumb" on hand of 1st leg is mobile, as it is in the Indian species *candidus* Kemp and *plebs* Kemp.

The 2nd medio-dorsal tooth is minute (fig. 153, o) in the two smaller ♀♀, as in Odhner's Angolan specimens, but in the larger ♀ is merely smaller than the 1st and 3rd teeth.

Kemp (1910, *l. c.*, p. 149) said the outer apex of 4th joint of 1st leg was without a spine in Irish specimens.

The ovigerous ♀♀ were taken in August, November, and December.

Gen. AEGEON (Guér. Men.) Kinahan

1900. Stebbing, Mar. Invest. S. Afr., i, p. 49 (references).

1910. Kemp, *l. c.*, p. 155.

1910. Stebbing, *l. c.*, p. 383 (authorship of genus, as spelt above, attributed to Kinahan).

1916. Kemp, Rec. Ind. Mus., xii, p. 374 (key to Indian species).

1920. de Man, *l. c.*, pp. 254 (list of species), 290 (key to species).

1947. Holthuis, Zool. Med., xxvii, p. 319 (*Pontocaris*).

Rostrum depressed. Carapace with longitudinal dentate keels. Abdomen sculptured, with keels and/or knobs. Eyes well developed.

Basal process of ant. 1 apically pointed. Mxp. 3 with arthrobranch, without epipod. 1st leg with setose exopod. 2nd leg a little shorter than or nearly as long as 1st leg, finger and thumb shorter than palm. Dactyls of 4th and 5th legs not dilated. Endopods of last 4 pleopods nearly as long as the exopods, composed of only one segment, with appendix interna, no appendix masculina in ♂. Gills 8 plus 2 epipods, apices of gills curving forwards.

Remarks.—To judge by the figures of the species of this genus, there appear to be two types of “thumb” on hand of 1st leg: the one spiniform and corresponding with that found in the species of *Pontophilus*; the other blunt, not outstanding, and appearing as a separated part of the thin cutting-edge of the hand (*cataphractus* and *lacazei*). Kemp (1916, *l. c.*, p. 374) examined all the then known species of *Aegeon*, but made no comment on this difference in the shape of the “thumb.”

Key to the South African Species.

1. Most of the teeth on the 3 lateral keels flattened. An oblique row of 1-3 small tubercles between the medio-dorsal and dorso-lateral keels *cataphractus*.
2. All teeth on the 3 lateral keels sharply dentiform. Areas between keels smooth *lacazei*.

Aegeon cataphractus (Oliv)

Fig. 154.

1900. Stebbing, *l. c.*, p. 50 (references).
 1910. *Id.*, *l. c.*, p. 383.
 1916. Balss, Beitr. Kenntn. Meeresf. Westafrik., ii, p. 31.
 1916. Kemp, *l. c.*, p. 375.
 1920. de Man, *l. c.*, p. 292 (in key).
 1925. Calman, Fish. Mar. Biol. Surv., Rep. iv, Spec. Rep. 3, p. 17 (Miers' Senegambian specimen).
 1939. *Id.*, John Murray Exp., vi, p. 222.

Integument firm, pilose. Rostrum very short, bifid. Carapace with 4 teeth on medio-dorsal keel, separated from rostrum by a transverse depression which is continued laterally as an hepatic groove dividing the 2 lateral keels; of these, the dorso-lateral one has 2 post-orbital teeth and 7 behind the hepatic groove, the lateral keel has 1 tooth behind the antennal angle and 7 teeth behind the groove; a ventro-lateral ridge from the antennal angle with 13-14 teeth; most

of the lateral teeth are flattened and slightly concave, and often inconspicuous in juveniles; on either side of 3rd medio-dorsal tooth a line of 1-3 tubercles or granules running obliquely forwards; one or two similar granules near the hepatic groove above the lateral keel. Abdominal segments 1, 5, and 6 each with a submedian keel on either side of median line, those on segment 6 divided into 3 short keels, segments 2-4 with median keel, which is posteriorly cleft on segments 2 and 3; lateral portions of the segments sculptured with blunt knobs and short ridges; pleurae angular below. In both sexes a spiniform



FIG. 154.—*Aegon cataphractus* (Olivi). Carapace, and cutting-edge of hand of 1st leg.

forwardly-directed process between bases of 3rd legs, a blunt knob on hind margin of 5th thoracic sternite, and a spiniform process on each of abdominal sternites 1-5. Hand of 1st leg subcylindrical, the distal sharp cutting-edge oblique, non-setose, with a notch proximally, in other words the thumb-like process is blunt and not outstanding, finger only slightly curved. 2nd leg extending to basal third of hand of 1st leg. Telson trapezoidal in cross-section.

Length up to 41 mm.; smallest ovig. ♀ 29 mm.

Localities.—Near East London, 40 fathoms (Stebbing); off Gt. Fish Point, and coast of Natal and Zululand, 24-54 fathoms (S. Afr. Mus.).

Distribution.—Mediterranean; Senegambia; west coast of India, Ceylon, south Arabian coast.

Remarks.—The oblique series of tubercles or granules between the medio-dorsal and dorso-lateral keels is often reduced to a single granule, and often inconspicuous.

Ovigerous ♀♀ were taken by the s.s. *Pieter Faure* from December to February.

Aegeon lacazei (Gourret)

1888. Gourret, Ann. Mus. Hist. Nat. Marseille, iii, p. 143, pl. 12, figs. 19-23, pl. 13, figs. 1-10.

1910. Kemp, *l. c.*, p. 156, pl. 22, figs. 1-5.

1920. de Man, *l. c.*, p. 293 (in key).

1925. Calman, Fish. Mar. Biol. Surv., Rep. iv, Spec. Rep. 3, p. 17.

1939. *Id.*, John Murray Exp., vi, p. 222.

♀. Integument (as preserved) not very firm. Rostrum bifid. Carapace with 4 subequal teeth on medio-dorsal keel, a feeble hepatic depression laterally below the dorso-lateral keel, the latter with 8 sharp teeth, the anterior 2 near the orbit, lateral keel with 7-9 sharp teeth (decreasing in size posteriorly) behind hepatic depression and 1 in front of it; behind the antennal angle a smaller (but distinct) tooth and a minute one, followed by indications of some (about 10) flat teeth or little ridges (so feeble that they cannot be exactly counted). Abdominal segment 1 with 2 submedian keels, a dorso-lateral divided into two parts, and a lateral keel, all of which (incl. both parts of the dorso-lateral keel) end anteriorly in projecting teeth; segment 2 with a medio-dorsal keel ending anteriorly in a projecting tooth; 3rd and 4th segments with 3 keels, the dorso-lateral keels divergent posteriorly, 5th and 6th segments with a pair of keels, those on 6th segment bearing 2 denticles; pleurae rounded below. A small sternal spine between bases of 3rd legs, and a small sternal process on each of abdominal segments 1-5. Antennal scale twice as long as broad, outer margin slightly concave. 1st leg with exopod, cutting-edge of hand similar to that of *cataphractus*. 2nd leg reaching to middle of hand of 1st leg, no process on basal joint, 4th joint slightly shorter than 5th, 5th slightly longer than chela, finger and thumb a little shorter than palm, slightly gaping. Endopods of pleopods well developed, with appendix interna on 2nd-5th.

Length ovig. ♀ 23 mm. (Kemp: up to 32 mm.).

Localities.—Natal coast, 205 fathoms (Calman); off Umhloti River, Natal, 100 fathoms, and off Cape St. Blaize, 90 fathoms, 2 ovig. ♀♀ and 1 ? ♂ resp.; stockfish grounds off Table Bay, 1 mutilated specimen from stomach of *Macrurus* (S. Afr. Mus.).

Distribution.—Gulf of Marseilles, Bay of Biscay, S.W. Ireland; Zanzibar area; New Zealand.

Remarks.—The 2 ovig. ♀♀ and 1 ? ♂ agree with Kemp's description and figures. One of the 2 anterior teeth of the dorso-lateral keel in the above description corresponds with the "spinule" at base of rostrum in Kemp's description. The "thumb" of hand of 1st leg is proportionately slightly larger than shown in Kemp's figure 5.

The species differs from *orientalis* Hend. in having only 4 medio-dorsal teeth on carapace, antennal scale longer than broad, and a definite hepatic depression.

FAMILY ? (CARIDEA).

Gen. PROBLEMACARIS Stebb.

1921. Stebbing, *Ann. Mag. Nat. Hist.* (9), viii, p. 626.

1924. *Id.*, *Ann. S. Afr. Mus.*, xix, p. 9.

Mandibles without palp, no cleft between incisor process and molar. 1st and 2nd maxillae normal. Maxillipeds and legs with long flagellate exopods. Mxp. 2 with 7th joint attached apically to 6th. Mxp. 3 slender, pediform. 1st and 2nd legs chelate, wrist of 2nd leg not subdivided. 3rd-5th legs simple. Telson linguiform, apically truncate.

Problemacaris spinetum Stebb.

1921. Stebbing, *l. c.*, p. 626.

1924. *Id.*, *l. c.*, p. 10, pls. 6, 7 (*Crust.*, pls. 121, 122).

Rostrum pointed, without ventral teeth, dorsally with 4 large spines, followed by 2 on the carapace, a small denticle behind the last. Antero-lateral angle of carapace produced in a long spine, postero-inferior angle shortly acute. Abdominal segments with numerous spines. Ant. 1 with short acute basal process, and a long spine on upper margin of 1st peduncular joint. Peduncle of ant. 2 spinose, antennal scale with 2 apical spines. Pleopod 1 with short endopod; other pleopods with endopod nearly as long as exopod, with short appendix interna.

Length 15 mm.

Locality.—Off Cape Peninsula, 300 fathoms (Stebbing).

ADDENDA.

Page 31. *Platymaia turbynei* Stebb.

The following supplemental characters may be given.

First abdominal segment ♂ as long as wide, in ♀ a little wider than long; distal margin slightly protuberant, with indications of a median spine. Cheliped hand nearly parallel-sided, with long stiff (but pliable) bristles between the spines on inner and lower surfaces (as in Miers' figure of *wyville-thomsoni*, and Doflein's pl. 22, but not shown in the latter's excellent photograph on pl. 23). Fringes of setae on 6th and proximal part of 7th joints of 4th and 5th legs along the lower front margin and upper hind margin; on the 5th joint on upper margin only; 6th joint narrow throughout its whole length.

I have recently (1948) seen a ♂ specimen, carapace 45 × 45 mm., caught by the Fisheries Survey vessel s.s. *Africana*, 29° 53' S., 31° 13' E., 369 metres.

This specimen corresponds with the smaller specimens described on p. 31, except the carapace is granular and the spines greatly reduced; 1st abdominal segment nearly twice as wide as long with 3 spines on hind margin; cornea elongate oval (Doflein, *l. c.*, pl. 50, figs. 5, 6); 6th joints of 3rd-5th legs shorter than 4th joints and broader relatively to their length.

The conclusion can scarcely be avoided that this is an older example of *turbynei*. But it seems impossible to separate it from the East African examples described by Doflein as *wyville-thomsoni*, renamed *alcocki* by Rathbun (1916, 1918). If *turbynei* and *alcocki* (the former of course having priority) be regarded as one species, it means that the assumption of the adult characters proceeds at a slower rate relatively to the increase in size in the Natal area than farther north (Dar-es-Salaam).

P. turbynei and *alcocki* are sharply distinguished from the true *wyville-thomsoni* by the absence of an outwardly directed spine on inner upper orbital margin (Rathbun, 1918).

Page 108. *Tylodioplax blephariskios* (Stebb.)

A large number of specimens of both sexes collected at St. Lucia Bay, Zululand, by the University of Cape Town Ecological Survey (July 1948) provides the following supplemental details.

The cheliped of ♂ is much more robust than in Stebbing's figure

(presumably that of an immature ♂); the hand is almost as broad as its length (exclusive of thumb); the finger and thumb are widely gaping, so that the square tooth on the former does not meet the inner margin of the latter.

The most remarkable feature of the ♂ is the thick brushes of yellowish-brown fur on the forwardly directed surfaces (upper margin, upper half of outer surface, and whole of inner surface) of the 4th and 5th joints of 2nd-4th (1st-3rd walking) legs.

Pleopod 1 ♂, distal $\frac{1}{2}$ bent inwards against the basal $\frac{2}{3}$, which is gently curved and fringed on outer margin with plumose setae; on the distal $\frac{1}{2}$ in the bend is a triangular projection; apex truncate with a small projecting ovate lobe, and on the outer margin (but projecting medianly when the appendage is folded *in situ*) a slender sinuous apically acute process, with 3 spines midway along its margin.

Page 122. After *Varuna litterata* insert the following two genera belonging to the subfamily *Varuninae*:—

Ptychognathus onyx Alcock

See Kemp, Mem. Ind. Mus., v, p. 234, fig. 11 (♂ chela), 1915.
St. Lucia Bay, 1 ♂ (Univ. Cape Town Ecol. Surv., 1949).

Pseudograpsus erythraeus Kossmann

See Tesch, Siboga Exp. monogr., xxxixc, p. 97 (key to genus), 1918.
Kosi Bay, 2 ♂♂ (Univ. Cape Town Ecol. Surv., 1949).

Page 131. After *Sesarma eulimene* insert:

Sarmatium sp.

St. Lucia Bay and Kosi Bay (Univ. Cape Town Ecol. Surv., 1949).

Page 146. *Lissocarcinus laevis* Miers

Distinguished from *orbicularis* by the notched front. One from 28° 28' S., 32° 25' E., 27 metres (Fisheries Surv., 1948).

Page 152. After *Ovalipes punctatus* insert:

Elliptodactylus rugosus Doflein

1904. Doflein, D. Tiefsee Exp., vi, p. 94, text-figs. 7, 8, and pl. 30, figs. 1-3, pl. 32, fig. 7.

Seven specimens (♂♂ ♀♀) collected by the Fisheries Survey, 26° 36' S., 14° 37' E., 130 fathoms, agree with Doflein's description, except the 4th joint of mxp. 3 is not squarely truncate as in his fig. 7, but produced in a rounded lobe; the position of the sutures on the fused 3rd-5th abdominal segments is faintly indicated.

♂ 35 × 53 mm., ♀ 28 × 38 mm. (length to tip of median rostral tooth, and breadth incl. lateral teeth). Brick-red, under surface greyish; bright iridescent patches as follows: on antero-lateral margin between each pair of teeth, and a larger crescentic patch behind the last lateral tooth, in the smooth grooves between the regions of the carapace, anterior surface of the palp of mxp. 3, on the smooth distal portion of upper surface of arm of cheliped, the spine and other smooth areas on wrist, the smooth areas on upper surface of hand, and in the groove on upper margin of finger.

In the key to genera on p. 141 this genus falls into II.A.1, and is distinguished from *Ovalipes* by the basal joint of ant. 1 not being visible in dorsal view. The tridentate front distinguishes it from *Ovalipes punctatus*, but not from the North American *O. ocellatus*.

Pages 163, 164. *Gonioneptunus smithii* (McLeay)

Leene and Buitendijk (1949, Bijdr. Dierk., xxviii, p. 296, figs. 3, 4, c) have renamed the *Goniosoma truncatum* of Milne Edwards, *Charybdis (Goniohellenus) edwardsi*. If Ward is correct in considering *smithii* to be the same as *truncatus* M. Edw. (non Fabr.), then McLeay's name *smithii* must be accepted, and *edwardsi* L. & B. will fall into synonymy. Leene and Buitendijk (p. 298) state that *truncatum* was described from specimens from Malabar and Port Natal [= Durban].

Page 201. Add to the genera of *Hyperolissa*: *Halimede* de Haan.

A single specimen of a species of this genus found in Delagoa Bay (Lourenzo Marques Mus.).

Page 248. *Menippe rumphii* (Fabr.)

A specimen from Delagoa Bay submitted by the Lourenzo Marques Museum.

Eurüppellia annulipes (M. Edw.)

Kosi Bay (Univ. Cape Town Ecol. Surv., 1949).

Page 252. After *Lybia plumosa* insert:

Ozius rugulosus Stimpson

Kosi Bay (Univ. Cape Town Ecol. Surv., 1949).

Page 281. Gen. QUADRELLA

Key to the South African Species.

1. One spine on lateral margin *coronata.*
2. Two spines on lateral margin *bispinosa.*

Quadrella bispinosa Borradaile

1902. Borradaile, F. Geogr. Mald. Laccad., i, p. 266, fig. 58.

Specimens from off Chai Chai, Portuguese East Africa. Largest specimen (♀) length 14 mm., breadth 15 mm. (Lourenzo Marques Mus.).

Page 387. *Leucosia marmorea* Bell

One ♂, 42 × 46 mm. Natal (Fisheries Surv., 1948).

Pleopod 1 ♂ stout, calcified, corkscrew-like, seminal groove winding round spirally to the slender horny falcate apical projection; the apex of the calcified part forms a rounded setose knob ventro-laterally at the base of the horny apical projection.

Carapace and upper surface of arms, wrist and hand of chelipeds mauvy-russet, hinder part of carapace pale, with 2 pale brownish rings or oval spots, legs tinged with salmon.

Page 472. Gen. PORCELLANELLA White

1852. White, Voy. *Rattlesnake*, ii, p. 394.

Porcellanella triloba White, 1852

See Lenz, Abh. Senckenb. Ges., xxvii, p. 375, 1905.

One specimen, 28° 28' S., 32° 25' E., 27 metres (Fisheries Surv., 1948).

Zanzibar, Indian Ocean to China and Australia. A frequent habitat is between the leaf-like branches of *Pennatula*.

Porcellanella quadrilobata Miers

Off Inhambane, Portuguese East Africa, in Alcyonarian (Lourenzo Marques Mus.).

First described from Port Denison, N.E. Australia.

Page 546. After *Palinustus mossambicus* add the following genus:—

Gen. LINUPARUS Gray

1847. Gray in White, List Crust. Coll. Brit. Mus., p. 70.

1901. Ortmann, Zool. Jahrb. Abt. Syst., vi, p. 21 (*Avus*).

1909. Calman, Ann. Mag. Nat. Hist. (8), iii, p. 442.

1911. Gruvel, Ann. Inst. oceanogr., iii, 4, p. 26.

1916. de Man, Siboga Exp. monogr., xxxixa, 2, pp. 33, 36.

Carapace nearly quadrangular in cross-section, sides behind cervical groove vertical. Rostral processes fused. Flagellum of ant. 2 stout, not whip-like, not longer than body of animal. Pleopod 2 ♀ similar to those of the three following segments, endopod narrow and appendix interna large.

Linuparus trigonus (von Siebold)

1824. von Siebold [quoted from de Man].

1850. de Haan, Fauna Japon., p. 157, pls. 39, 40, L and M [quoted from Ortmann].

1911. Gruvel, *l. c.*, p. 26, text-fig. 10, and pl. 1, fig. 5.

Exp. 1-3 as described by Gruvel, except that exopods of mxp. 2 and 3 are setose, especially distally where the setae are plumose (the Paris Museum specimen is probably dry and the setae not very obvious). Sternite of abdominal segment 1 with a median denticle, sternites of segments 2-6 each with 2 denticles, the pair on 6th segment further apart than those on preceding segments, and followed by a second pair closer together, and some additional denticles laterally (in front of the soft anal membrane). Pleura of 1st abdominal segment with a single tooth, pleurae of segments 2-6 each with 3 main teeth and some smaller ones posteriorly, on segment 2 the 1st and 2nd teeth are equal but widely separated, the 3rd smaller and close to the 2nd, on segments 3-6 the teeth are equidistant, but the middle one (2nd) is noticeably larger than the 1st and 3rd, especially on segments 3-5. Claws of 1st and 2nd legs convex externally, with lateral and medio-internal fringes of setae. Claws of 3rd leg triquetral, with 3 fringes of setae; of 4th and 5th legs flattened externally, with 2 lateral fringes of setae. Genital openings ♂ on prominent coxal projections which nearly meet in the middle line.

Length of carapace 140 mm., of abdomen to end of telson 210 mm., total 350 mm. Breadth of carapace across outer antero-lateral angles 80 mm., behind cervical groove 70 mm. Flagellum of 2nd antenna 255 mm. Colour as preserved reddish brown.

Locality.—Off Inhambane, Portuguese East Africa, 180 fathoms, on rocky ground (Lourenzo Marques Mus., 1 ♂).

Distribution.—Japan; New South Wales.

Remarks.—The discovery of this Crayfish off the East African coast is noteworthy. Unfortunately there is little probability of obtaining further specimens, as the Director of the Lourenzo Marques Museum informs me that trawling has been discontinued in that area owing to the rocky nature of the ground. In Japan the species occurs *in locis saxosis* (de Haan, quoted by Ortmann). Another specimen of apparently the same species has recently been obtained off the coast of New South Wales (1949. McNeill, Austral. Mus. Mag., ix, p. 337, fig.), but misidentified as *Puerulus carinatus*.

Page 635.

Eusicyonia Stebb.

Key to the South African Species.

1. Two post-rostral teeth. No abdominal sternal spines . . . *longicauda*.
2. Five to seven post-rostral teeth. Sternal spines on abdominal segments 1-5 cf. *lancifer*.

Eusicyonia cf. *lancifer* (Oliv.)

1913. de Man, Siboga Exp. monogr., xxxixa, p. 123 (references).

Three ♀ specimens from Delagoa Bay, submitted by the Lourenzo Marques Museum, appear to be this species.

Two, 50 and 57 mm. in length, have 3 rostral and 7 post-rostral teeth. Pleurae of abdominal segments 1-3 are unidentate, of 4 and 5 tridentate. Fingers of chelae $1\frac{1}{2}$ times as long as palm.

The third specimen, 55 mm. in length, has 4 rostral and 5 post-rostral teeth, the hindmost of the latter has a longer posterior slope than the hindmost tooth in the other two specimens. Pleurae of abdominal segments 1 and 2 unidentate, of 3-5 tridentate.

All three specimens have a pair of sternal spines between the bases of both 1st and 2nd legs; and a strong sternal spine on each of abdominal segments 1-5, those on segments 1-3 inclined forwards, that on segment 4 vertical, and that on segment 5 inclined backwards. No horizontal keels on the sides of the abdominal segments.

E. lancifer is recorded from Japan, East Indies, Indian Seas and Ceylon.

A correct identification can only be made by examination and comparison of the ♂ petasma.

Page 638.

*Sergestidae.**Key to the South African Genera.*

1. 4th and 5th pairs of legs present *Sergestes.*
2. 4th and 5th pairs of legs absent, 5th pair in ♂ represented by
coxal protuberances *Acetes.*

Gen. ACETES M. Edw.

1830. Milne Edwards, Ann. Sci. Nat., xix, p. 350.
 1917. Kemp, Rec. Ind. Mus., xiii, pp. 47 *sqq.*
 1919. Hansen, Siboga Exp. monogr., xxxviii, p. 31.
 1928. Okada, Ann. Mag. Nat. Hist. (x), i, p. 308 (tail organs).
 1933. Menon, Bull. Madras Govt. Mus., iii, 3, p. 2 (development).
 1934. Burkenroad, Bull. Bingham Oceanogr. Coll., iv, 7, p. 99.
 1935. Boone, Bull. Vanderbilt Mar. Mus., vi, p. 101.
 1940. Colefax, Rec. Austral. Mus., xx, pp. 341 *sqq.*
 1948. Morris, Proc. Linn. Soc. N.S.W., lxxiii, pp. 1 *sqq.*, text-figs.
 (life-history).

Rostrum short, acute, with 1 or 2 denticles dorsally. Supra-orbital and hepatic spines present. Mx. 1 without palp, mx. 2 with a single lobe, mxp. 1 without palp. 1st-3rd pairs of legs with minute chelae; 4th and 5th pairs absent, but 5th pair represented in ♂ by coxal protuberances.

Remarks.—Atlantic and Indo-Pacific; coastal, frequently estuarine, or even fluviatile.

The ♀♀ are sometimes considerably larger than the ♂♂.

Acetes erythraeus Nob.

1905. Nobili, Bull. Mus. d'Hist. Nat. Paris, p. 394, fig. 1.
 1906. *Id.*, Ann. Sci. Nat. (9), iv, p. 23, pl. 1, figs. 5, 5, *a-f.*
 1917. Kemp, *l. c.*, p. 51, figs. 1, *c-e*, 2, *b*, 3, *b*, 4, *b*, 5, *a*, *d*, 7, *b.*
 1933. Menon, *l. c.*, p. 2, pls. 1-3, figs. 1-38 (larval stages and adult).
 Rostrum with 2 dorsal denticles. Outer flagellum of ant. 1 subequal to 1st peduncular joint, its shaft obscurely (?3) jointed, flagellar portion also obscurely jointed, in ♂ with a notch proximally, on the proximal slope of which are 4 short blunt curved spines directed forwards, and on the distal slope 1 spine directed backwards; a single long curved spine, distally serrulate, opposed to a row of 6 spines

on the flagellar portion. A curved antrorse spine between bases of 1st pleopods in both sexes. Uropodal organs present (*cf.* Okada).

Length ♂ 32 mm., ♀ 40 mm.

Locality.—Richards Bay, Natal (Univ. Cape Town Ecol. Surv., 1948, 1949, ♂♂ ♀♀, and immature).

Distribution.—Red Sea to Siam.

Remarks.—Although living a considerable distance from all the hitherto recorded localities, these specimens agree so well with *erythraeus* that they must be identified as this species.

INDEX

Synonyms in italics.

A		PAGE	PAGE
<i>aberrans</i> (Ancylocaris)	794	alcocki (Eupagurus)	460
<i>abyssorum</i> (Parapagurus)	450	alcocki (<i>Latreillopsis</i>)	341
Acanthephyra	663, 666	alcocki (Thelxiope, Moloha)	341
acanthitelsonis (Acanthephyra)	668	algoense (Solenocera)	616
acanthomerus (Pilmnoplax)	283	Alope	687, 693
Acanthonychidae	10, 35	Alpheidae	648, 724
Acanthonyx	43	Alpheus	725, 739
Acanthophrys	58, 61	<i>alphonsi</i> (Heterocarpus)	684
<i>acanthopus</i> (Dehaanius)	44	<i>Amalopenaeus</i>	627
Acanthosoma	638	<i>americanum</i> (Gnathophyllum)	765
acanthus (Axius)	449	Amphion	567, 574
acclivirostris (Parapenaeopsis)	604	<i>Amphitrite</i>	155, 156
Acetes	822	anaglyptus (Etisus)	247
Achaeopsis	11, 23	Anapagurus	416, 465
Achaeus	11, 18	<i>anatum</i> (Philyra)	383
Achelous	141, 159	Anchistus	770, 792
<i>Achelous</i>	160	Ancylocaris	770, 794
Actaea	202, 227	<i>andamanensis</i> (Penaepsis <i>coniger</i> , var.)	593
<i>actaeiformis</i> (<i>Maxillothrix</i>)	337	<i>andamanica</i> (<i>Homola</i>)	340
<i>Actaeodes</i>	227	andamanica (Nephrops)	528
Actacomorpha	360, 361	andersoni (Pilmunus)	266
Actumnus	248, 271	Angasia	687, 707
<i>aculeata</i> (Micippa)	63	angolensis (Actaea)	227
adactyla (Hippa)	404	angulata (Goneplax)	283
admete (Thalamita)	176	angulata (Heteronucia)	363
Aegeon	803, 811	Aniculus	415, 430
aegibotus (Dromidia)	322	aniculus (Aniculus)	431
<i>Aegle</i>	235	anisocheir (Synalpheus)	736
aeneus (Zosimus)	210	<i>Anisopus</i>	150
<i>aequabilis</i> (Clibanarius)	435	annulata (Charybdis)	169
affinis (Achaeus)	19	annulipes (Eurippellia)	248
<i>affinis</i> (Eucrate)	295	annulipes (Uca)	97
<i>affinis</i> (Geryon)	291	ANOMURA	400
affinis (Leander)	783	<i>antarcticus</i> (Inachus)	27
<i>affinis</i> (Leander)	784	Antilibinia	35, 36
affinis (Metapenaeus)	600	<i>arabicus</i> (<i>Inachus</i>)	43
<i>affinis</i> (Sesarma)	127	Arcania	361, 375
<i>affinis</i> (Xantho)	223	arcticus (Sergestes)	639
africana (Caridina)	661	<i>arcuata</i> (Uca)	90, 93
<i>africana</i> (Caridina)	657	<i>arcuatus</i> (<i>Xantho</i>)	236
africana (Upogebia)	519	areolata (Chlorodopsis)	214
africanum (Macropetasma)	606	Arete	725
africanum (Solenocera)	613	argentata (Monomia)	156
africanus (Gonionoptunus)	164	<i>Aristaeopsis</i>	622
agulhasensis (Merhippolyte)	690	Aristeomorpha	582, 625
Albunea	405	<i>Aristeus</i>	621
Albuneidae	402, 405	armata (Angasia)	708
alcocki (Calocaris)	502	armata (Mursia)	356

	PAGE		PAGE
<i>canaliculata</i> (Processa)	715	<i>comatum</i> (Solenocera)	617
<i>canaliculatus</i> (Penaeus)	590	<i>complectens</i> (<i>Pseudocolloides</i>)	29
<i>canaliculatus</i> (Penaeus)	590	<i>compressipes</i> (Atergatis)	207
Cancelus	415, 446	Conchodytes	770, 801
Canceridae	77, 194	Conchoecetes	307, 308
<i>capensis</i> (Astacus)	526	<i>coniger</i> (Penaepsis)	593
<i>capensis</i> (Campylonotus)	646	<i>consobrinus</i> (Dehaanius)	44
<i>capensis</i> (Crangon)	803	<i>convexa</i> (<i>Menippe</i>)	254
<i>capensis</i> (Gennadas)	630	<i>convexus</i> (Carpilius)	205
<i>capensis</i> (Leander)	789	<i>coppingeri</i> (<i>Paramithrax</i>)	62
<i>capensis</i> (Mamaia)	59	Corallicaris	770, 799
<i>capensis</i> (Neolithodes)	410	cordimanus (Ocyppode)	84
<i>capensis</i> (Plagusia)	136	cornuta (Dromidiopsis)	311
<i>capensis</i> (Upogebia)	515	coronata (Quadrella)	281, 819
<i>capensis</i> (Upogebia)	519	Corycodus	388, 393
<i>capensis</i> (<i>Virbius</i>)	702	Corystidae	77, 302
<i>Carcinaspis</i>	370	Cosmonotus	397, 399
Carcinides	3, 140	<i>costatus</i> (Diogenes)	443
Carcinoplax	282, 286	<i>costatus</i> (Diogenes)	440
Cardisoma	109	<i>Crago</i>	803
CARIDEA	576, 646	Crangon	803
Caridina	654	<i>Crangon</i>	724
<i>carinata</i> (Myra)	373	Crangonidae	648, 802
<i>carinatus</i> (Penaeus)	584	crassicornis (Chlorotocus)	685
<i>carinimanus</i> (Macrophthalmus)	103	<i>crassimanus</i> (<i>Achelous</i>)	160
<i>carinipes</i> (Zozymodes)	211	crassimanus (Alpheus)	756
<i>cariosus</i> (<i>Carpilodes</i>)	240	<i>crassus</i> (Sergestes)	642
Carpilius	201, 203	crebripunctata (Matuta lunaris, var.)	358
<i>Carpilodes</i>	237	crenata (Thalamita)	172
carnifex (Cardisoma)	110	<i>crinipes</i> (Geograpsus)	116
Carupella	141, 146	cruciata (Charybdis)	166
Catapaguroides	416, 467	<i>cristata</i> (Mursia)	354
cataphractus (Aegeon)	812	cristimanus (Mursia)	354
catenata (Sesarma)	128	<i>crucifera</i> (Charybdis)	166
<i>catenata</i> (Sesarma)	130	cruentatus (Ateleocyclus)	198
CATOMETOPA	76	Cryptodromia	307, 327
<i>cavimana</i> (Tetralia)	280	Cryptodromidiopsis	308, 329
cavipes (Actaea)	229	ctenifera (Spirontocaris)	696
cavipes (Coenobita)	470	euansensis (Eupagurus)	462, 465
caystrus (Pseudozys)	253	cultrifer (Scyllarus)	557
<i>cellulosa</i> (Actaea)	229	<i>cultrimanus</i> (Xanthias)	242
ceratophthalmus (Ocyppode)	86	<i>cupheus</i> (<i>Persephona</i>)	373
chabrus (Plagusia)	136	cursor (Ocyppode)	88
charon (Symalpheus)	738	<i>cursor</i> (Ocyppode)	86
Charybdis	142, 161, 165	<i>Cycloblepas</i>	227
Chiromantes	126	<i>Cyclodius</i>	215
Chlorinoides	61	Cyclodorippinae	388
<i>Chlorodius</i>	213	Cyclograpsus	112, 131
Chlorodiella	202, 213	CYCLOMETOPA	76
Chlorodopsis	202, 214	<i>cymbifer</i> (<i>Glyptoxanthus</i>)	231
chlorophthalmus (Uca)	95	cymodoce (Trapezia)	276
<i>chlorophthalmus</i> (Uca)	94, 97	Cymonomus	388, 391
Chlorotocus	676, 685	Cyrtomaia	12, 32
cinctimanus (Liomera)	238		
Cleistostoma	83, 104	D	
Clibanarius	415, 431	Daira	248
clibanarius (Clibanarius)	433	Dairoides	247, 258
<i>clypsydra</i> (Dotilla)	99	<i>Daldorfia</i>	64
<i>coalita</i> (Myra)	373		
Coenobita	468		
Coenobitidae	406, 468		

Descriptive Catalogue of South African Decapod Crustacea. 827

	PAGE		PAGE
<i>dama</i> (Schizophrys)	61	Dromidia	307, 319
<i>danae</i> (Thalamita)	174	Dromidiopsis	307, 311
<i>Dardanus</i>	422	Dromiidae	306
<i>dasyopus</i> (Panulirus)	549	Dromiidea	306
<i>debilis</i> (Systellaspis)	663	<i>dubius</i> (Potamon)	191
<i>deformis</i> (Pagurus)	428	<i>dubius</i> (Potamon)	189
<i>dehaanii</i> (Porcellana)	476	<i>duorarum</i> (Penaeus)	584
<i>dehaanii</i> (Porcellana)	474	<i>durbanensis</i> (Hippolysmata)	710
<i>dehaanii</i> (<i>Xantho</i>)	216	<i>durbanensis</i> (Rhynchocinetes)	763
Dehaanius	35, 43	<i>durhani</i> (Penaeus)	584, 589
<i>delagoae</i> (Palaemon)	776	<i>dussumieri</i> (Uca)	93
<i>delagoae</i> (Palinurus <i>gilchristi</i> , var.)	543	Dynomene	336
<i>delagoae</i> (Thalamita)	178	Dynomenidae	306, 334
<i>demani</i> (Polycheles)	570	E	
<i>dentata</i> (Ranina)	397	Ebalia	361, 363
<i>dentatus</i> (Dehaanius)	44	<i>Echinoplax</i>	34
<i>dentatus</i> (Enoplometopus)	532	<i>edulis</i> (Processa)	718
<i>dentatus</i> (Etisus)	244	<i>edwardsi</i> (Charybdis)	818
<i>dentatus</i> (Glyphocrangon)	722	<i>edwardsianus</i> (Plesiopenaeus)	624
<i>dentatus</i> (<i>Grapsillus</i>)	276	<i>edwardsii</i> (Alpheus)	759
<i>dentatus</i> (Menaethius)	43	<i>edwardsii</i> (Alpheus)	756
<i>dentifrons</i> (<i>Chlorodius</i>)	245	<i>edwardsii</i> (Cleistostoma)	105
<i>depressa</i> (Actaea)	229	<i>edwardsii</i> (Jasus <i>lalandii</i> , var.)	540
<i>depressa</i> (Plagusia)	134	<i>edwardsii</i> (Leander)	782
<i>depressus</i> (Harpilius)	796	Elamena	67, 73
<i>depressus</i> (Menaethius)	43	Elaphocaris	638
<i>depressus</i> (Pagurus)	427	<i>electra</i> (Etisus)	245
<i>depressus</i> (Potamon)	190	<i>elegans</i> (Atergatis)	218
<i>deprofundis</i> (Eupagurus)	464	<i>elegans</i> (Calcinus)	438
<i>deuteropus</i> (Alpheus)	743	<i>elegans</i> (Eurynome)	57
<i>diacanthus</i> (<i>Halimus</i>)	53	<i>elegans</i> (Galathea)	487
<i>diadumena</i> (Ebalia)	367	<i>elegans</i> (Gennadas)	631
<i>difficilis</i> (Haploptyx)	496	<i>elegans</i> (Hymenocera)	767
<i>digitalis</i> (Trapezia)	278	<i>elegans</i> (Latreillia)	344
<i>dimorphus</i> (Parapagurus)	452	<i>elegans</i> (Marestitia)	136
Diogenes	415, 439	<i>elisabethae</i> (Scyllarides)	561
<i>disjunctipes</i> (Corycodus)	393	Elliptodactylus	817
<i>dispersa</i> (Galathea)	486	<i>Emerita</i>	402
<i>dissodontonotus</i> (Alpheus)	749	<i>emeritus</i> (Emerita)	403
<i>dissothrix</i> (Dromidia)	321	<i>engyops</i> (Paguristes)	421
<i>distinctendus</i> (<i>Xantho</i>)	219	Enoplometopus	497, 525, 531
<i>diverticulatus</i> (Hypocolpus)	209	<i>ensifera</i> (Hippolyte)	703
<i>djiboutensis</i> (Athanas)	732	<i>Epialtus</i>	35
Doclea	48, 49	Epixanthus	247, 259
<i>dodone</i> (Lophozozymus)	218	<i>Ergasticus</i>	34
<i>dofeini</i> (Pinnotheres)	79	Eriphia	248, 273
<i>dolichodactylus</i> (Palaemon)	779	<i>erosa</i> (Actaeomorpha)	361
<i>Dorippe</i>	388	Eryoneicus	567, 574
Dorippidae	346, 387	Eryonidae	535, 565
Dorippinae	387	<i>erythraeus</i> (Acetes)	822
<i>dormia</i> (Dromia)	310	<i>erythraeus</i> (Pseudograpsus)	817
<i>dormia</i> (Dromia)	322	<i>espinosus</i> (<i>Chlorodius</i>)	244
<i>dornica</i> (Dromia, typ. err.)	310, 322	Ethusa	348
<i>dorsalis</i> (Heterocarpus)	684	Etisodes	243
<i>dorsettensis</i> (Inachus)	29	Etisus	203, 243
<i>dorsipes</i> (Dorippe)	390	Eualus	695
<i>Dorynchus</i>	23	<i>eucheir</i> (Xeinstoma)	395
Dotilla	83, 98	Eucrate	282, 295
Dromia	307, 309	<i>Eudromia</i>	314
DROMIACEA	9, 305		

	PAGE		PAGE
Eudromidia	307, 314	Galatheidæ	471, 481
eulimene (Sesarma)	130	GALATHEIDEA	401, 470
euopsis (Pagurus)	427	<i>Galene</i>	259, 261
Eupagurinae	416	gallus (Calappa)	350
Eupagurus	416, 458	gamianus (Paguristes)	418
<i>Eupalaemon</i>	775	<i>garstangi</i> (Portumniodes)	142
<i>Euplax</i>	103	Gecarcinidæ	76, 109
Eurüppellia	248	Gecarcinus	109
Eurycarcinus	247, 260	<i>Gelasimus</i>	89
Eurynome	48, 54	Gelastocaris	688, 713
Euryplax	282, 283	Gennadas	582, 627
eurysternus (Clibanarius)	434	Geograpsus	111, 115
Eusicyonia	582, 635, 821	<i>geometricum</i> (Hymenosoma)	68
Euxanthus	248	Geryon	282, 290
Evaxius	499	<i>giglioniana</i> (Aristaeomorpha)	625
<i>exanthematosæ</i> (Calappa)	352	gilchristi (Callianassa)	509
<i>exaratus</i> (Xantho)	223	gilchristi (Gennadas)	633
Exhippolysmata	709	<i>gilchristi</i> (Leander)	784
eximia (Acanthephyra)	667	gilchristi (Palinurus)	542, 554
Exodromidia	307, 324	<i>gilesii</i> (Glyphocrangon)	722
<i>exsulptus</i> (Hypocolpus)	209	glaberrima (Tetralia)	280
<i>exsulcatus</i> (Penæus <i>semisulcatus</i> , var.)	584	<i>glabra</i> (Psaumis)	232
extricatus (Diogenes)	445	glacialis (Hymenodora)	665
exuens (Acanthephyra)	666	gladiator (Monomia)	156
F		Glaucothoë	416, 417, 425, 449, 453
Faba	692, 701, 725	globosa (Philyra)	380
fabimanus (Pagurus)	427	globosus (Pinnotheres)	80
falcifera (Macropodia)	16	globulosa (Philyra)	383
<i>fasciatus</i> (Panulirus)	553	glomus (Ebalia)	365
fascicularis (Menaethiops)	39	gloriosus (Sergestes)	642
fasciolarum (Gnathophyllum)	765	Glyphocrangon	719
<i>faxonii</i> (Eryoneicus)	575	Glyphocrangonidæ	648, 718
fenestrata (Dotilla)	99	<i>Glyptoxanthus</i>	227
ferruginea (Trapezia)	276	<i>Glypturus</i>	505
fissurus (Parapenæus)	601	<i>Gnathochasmus</i>	131
flammea (Calappa)	3, 347	Gnathophyllidæ	648, 764
<i>flavipes</i> (Grapsus)	115	Gnathophyllum	765
flavo-maculatus (Atergatopsis)	206	Gomeza	302, 304
<i>flavopunctata</i> (Trapezia)	278	Goneplacidæ	77, 281
floridus (Atergatis)	207	Goneplax	282, 283
foliacea (Aristaeomorpha)	625	Gonioneptunus	141, 161
<i>fordii</i> (Eriphia)	273	gracilipes (Alpheus)	744
formosa (Macropodia)	17	gracilipes (Metopograpsus messor, var.)	118
fornasinii (Menippe, Myomenippe)	256	gracilis (Harpilius depressus, var.)	797
<i>fossulatus</i> (Cancer)	229	gracilis (Pontophilus)	606
<i>fragifer</i> (Pilumnus)	269	graminea (Coralliocaris)	800
<i>frontalis</i> (Actæodes)	245	<i>grandidieri</i> (Eurycarcinus)	261
frontalis (Alpheus)	743	<i>grandidieri</i> (Huenioides)	41
frontalis (Epixanthus)	259	<i>grandidieri</i> (Macrophthalmus)	102
frontalis (Eudromia)	315	<i>grandirostris</i> (Galathea)	487
fugax (Myra)	373	<i>grandis</i> (Sergestes)	641
Funchalia	581, 608	<i>granulatus</i> (Cancer)	231
furcata (Stenocionops)	3, 58	<i>granulatus</i> (Pilumnus)	229
G		granulatus (Polycheles)	569
gaimardii (Calcinus)	439	<i>granulosa</i> (Ebalia)	368
Galacantha	482, 494	granulosa (Platypodia)	208
Galathea	482	granulosus (Medæus)	219
		Grapsidæ	76, 110
		<i>Grapsillus</i>	276
		Grapsus	111, 112

Descriptive Catalogue of South African Decapod Crustacea. 829

	PAGE		PAGE
grapsus (Grapsus)	113	<i>Homaridae</i>	524
grayi (Geograpsus)	115	<i>Homarus</i>	525
grayii (Cosmonotus)	400	Homola	338
<i>Grimaldiella</i>	608	Homolidae	306, 338
grimaldii (Athanas)	729	HOMOLIDEA	306
grimaldii (Oplophorus)	662	<i>Hoplophoridae</i>	662
Grimothea	488	<i>Hoplophorus</i>	662
<i>guerinii</i> (Albunea)	405	horrida (Parthenope)	64
guntheri (Inachus)	27	Huenia	35, 40
guttata (Sesarma)	126	<i>Huenioides</i>	35
guttata (Trapezia)	277	Hyastenus	48, 53
guttatus (Pagurus)	428	hydrophilus (Xantho)	223
Gymnopleura	9, 396	<i>Hymenicus</i>	71
H		Hymenocera	765, 767
haeckelii (Acanthephyra)	668	Hymenodora	663, 665
Halimede	818	Hymenopenaeus	582, 619
<i>Halimede</i>	269	Hymenosoma	67
Halimus	53	Hymenosomatidae	11, 66
<i>Haliporoides</i>	619	Hyperolissa	200, 201
<i>Haliporus</i>	619	Hyperomerista	200, 247
Hapaloptyx	495, 496	<i>Hypocoelus</i>	209
<i>Harpiliopsis</i>	796	Hypocolpus	210, 209
Harpilius	770, 796	I	
hastatoides (Hellenus)	158	Ibacus	557, 563
Hellenus	141, 158	idae (Palaemon)	777
helleri (Actaea)	228	idella (Palaemon idae, var.)	777
<i>Hemipenaeopsis</i>	608	impressus (Xantho)	220
hendersoni (Anapagurus)	465	Inachidae	10, 11
hendersoni (Eudromia)	315	Inachus	11, 27
hendersoni (Pontophilus)	809	incerta (Munida)	492
hepatica (Calappa)	348	<i>incertus</i> (Chlorotocus)	685
<i>herbstii</i> (Calcinus)	437	incisus (Ibacus)	563
<i>hermitiensis</i> (Periclimenes)	794	indica (Callianassa)	512
hertwigi (Scyramathia)	50	indicus (Carcinoplax longimanus, var.)	287
<i>Hetairocaris</i>	693	<i>indicus</i> (Gennadas <i>scutatus</i> , subsp.)	634
Heterocarpus	676, 682	indicus (Penaeus)	588
heterochir (Pilumnoplax)	289	<i>indicus</i> (Petrolisthes)	479
<i>heterodon</i> (Atelecyclus)	197	indistincta (Caridina)	650
Heteronucia	361, 362	inermis (Anchistus)	792
Heteropilumnus	268	inflatus (Potamon)	90
Hexapus	283, 299	<i>infraciliaris</i> (Pilumnus)	269
hibernicus (Eryoneicus)	575	inhacae (Thalamita)	179
hilarulus (Penaeopsis)	595	insignis (Alpheus)	744
hilgendorfi (Macrophthalmus)	103	integra (Thalamita)	177
Hippa	402, 404	integrifrons (Pseudodromia)	316
<i>hippeus</i> (Ocypode)	88	intermedia (Bentheogennema)	634
Hippidae	402	intermedia (Galathea)	483
HIPPIDEA	401	inversa (Uca)	94
Hippolysmata	688, 709	investigatoris (Parapenaeus)	602
Hippolyte	687, 701	<i>ippeus</i> (Ocypode)	88
Hippolytidae	648, 686	ischurodous (Geryon)	292
hippotoë (Alpheus)	744	J	
hirsutissima (Actaea)	234	jallae (Potamon dubium, var.)	191
hirsutissima (Dromidia)	329	japonica (Calappa)	352
hirsutus (Pilumnus)	263	<i>japonica</i> (Coralliocaris <i>superba</i> , var.)	799
hirta (Naxioides)	52		
hispida (Dynomene)	337		
hispidus (Stenopus)	578		
Holometopus	130		

	PAGE		PAGE
japonicus (Anapagurus pusillus, var.)	467	Leontocaris	687, 699
<i>japonicus</i> (Aristeus)	626	lepidactylus (Palaemon)	772
japonicus (Carcinoplax longimanus, var.)	287	lepidota (Cryptodromidiopsis)	332
japonicus (Panulirus)	550	leptochele (Lybia)	251
japonicus (Penaeus)	590	Leptodius	220
Jasus	537	<i>lessueri</i> (Matuta)	358
jedanensis (Synalpheus)	738	Leucifer	644
johnstoni (Potamon)	194	Leuciferidae	580, 644
jucundus (Betaeus)	733	Leucisca	361, 370
Justitia	544	leucodactyla (Trapezia)	278
K			
kempi (Eryoneicus)	575	Leucosia	361, 385
kempi (Gennadas)	630	Leucosiidae	346, 360
kingsleyi (Litocheira)	294	leviusculus (Alpheus)	745
kraussi (Callianassa)	506	<i>limbatus</i> (Cancer)	208
Kraussia	195	Linuparus	537, 820
kraussiana (Hippolyte)	702	liochele (Pylopagurus)	455
<i>kraussii</i> (Hippolyte)	688	<i>Liolophus</i>	138
kraussii (Pachygrapsus)	117	Liomera	202, 237
kuhlii (Ocypode)	87	Lissocarcinus	141, 145
kükenthali (Hippolysmata)	712	<i>Lithadia</i>	361, 363
L			
<i>labidolepta</i> (Galathea)	483	Lithodidae	407
lacazei (Aegeon)	514	Litocheira	282, 293
lacertosus (Achaeus)	19	litterata (Varuna)	122
Lachnopus	202, 236	lividus (Geograpsus)	116
lactea (Uca)	96	lividus (Xanthias)	242
laevigatus (Heterocarpus)	684	<i>lobidens</i> (Alpheus)	760
laevimanus (Calcinus)	437	longecarinatus (Alpheus)	745
laevimanus (Eriphia)	273	longicauda (Eusicyonia)	635
laevimanus (Etisus)	244	longicornis (Nematopagurus)	467
laevioculis (Achaeus)	20	<i>longicornis</i> (Penaeus)	589
<i>laevis</i> (Alpheus)	748	longicornis (Pilumnus)	265
<i>laevis</i> (Eucrate)	295	<i>longimana</i> (Eurynome)	55
laevis (Lissocarcinus)	817	<i>longimana</i> (Philyra)	382
lagostoma (Gecarcinus)	109	longimanus (Carcinoplax)	287
lalandii (Jasus)	538, 554	longimanus (Palinurus)	544
lamarekii (Petrolisthes)	477	<i>longipes</i> (Panulirus)	550
lamarekii (Xanthias)	242	longipes (Sesarma)	124
Lambrus	65	longirostris (Elamena, Trigono-	
<i>lamellirostris</i> (Coralliocaris)	799	plax, unguiformis, var.)	75
lanata (Dorippe)	389	longirostris (Enoplometopus)	533
<i>lanceopes</i> (Nematocarcinus)	671	longirostris (Glyphocrangon)	721
lancifer (Eusicyonia)	821	longirostris (Nematocarcinus)	671
latens (Calcinus)	438	longirostris (Penaeus indicus, var.)	589
latens (Pseudodromia)	316	longirostris (Plesionika)	681
<i>latirostris</i> (Harpillius)	794	longispina (Acanthophrys)	62
latreillei (Macrophthalmus)	102	longispina (Meticionaxius)	500
Latreillia	342, 344	longispinis (Calocaris)	503
Latreilliidae	306, 342	longitarsus (Clibanarius)	434
Latreillopsis	342, 343	<i>Lophactaea</i>	208
Latreutes	687, 705	lophopus (Liomera)	238
latus (Scyllarides)	562	lophos (Calappa)	351
leachii (Cleistostoma)	107	Lophozozymus	202, 218
Leander	770, 781	lorina (Achaeus)	22
Lebbeus	695, 696	lottini (Alpheus)	748
		luciae (Alpheus)	755
		<i>Lucifer</i>	644
		<i>Luciferinae</i>	644
		lucina (Coralliocaris)	799
		lunaris (Matuta)	358
		Lupa	141, 152
		Lupocyclus	141, 157

Descriptive Catalogue of South African Decapod Crustacea. 831

	PAGE		PAGE
Lybia	247, 248	megistos (Pagurus)	425
Lydia	248	meinerti (Sesarma)	125
M			
<i>mabahissae</i> (Glyphocrangon)	722	meleagrinae (Conchodytes)	801
<i>macgillivrayi</i> (<i>Xantho</i>)	219	<i>Melia</i>	248
<i>macleaii</i> (Dehaanuis)	47	<i>membranaceus</i> (<i>Penaeus</i>)	612
<i>Macrobrachium</i>	771	Menaethiops	35, 38
macrochirus (Alpheus)	743	Menaethius	35, 41
<i>macrodactylus</i> (Étius)	244	Menippe	247, 248, 256
Macropetasma	581, 605	<i>Menippe</i>	254
Macrophthalmus	83, 101	merguiensis (Charybdis)	168
Macropodia	11, 13	Merhippolyte	687, 690
<i>Macroerocheir</i>	771	messor (Metopograpsus)	118
<i>maculata</i> (Trapezia)	277	Metapenaeopsis	592
maculatus (Carpilius)	203	Metapenaeus	581, 596
<i>maculatus</i> (<i>Grapsillus</i>)	278	<i>Metaxius</i>	499
maculatus (Grapsus)	113	Meticonaxius	498, 499
maculatus (Leander)	782	Metopograpsus	111, 118
maenas (Carcinides)	3, 140	Micippa	58, 62
<i>major</i> (<i>Nautilograpsus</i>)	120	<i>micronyx</i> (Cryptodromia)	330
<i>major</i> (Upogebia)	515	Microprosthema	577
makrognathus (Spirontocaris)	698	<i>Miersiidae</i>	662
makrothrix (Cancellus)	447	<i>miles</i> (Diogenes)	440
malabaricus (Alpheus)	761	minikoensis (Athanas)	731
<i>malabaricus</i> (Alpheus)	752	minutus (Planes)	120
maldivensis (Pilumnus)	264	<i>minutus</i> (Planes)	294
malensis (Alpheus bisincisus)	760	<i>modestus</i> (<i>Pandalus</i>)	676
Mamaia	58	moebii (Xenopthalmodes)	297
Mamaiidae	11, 58	<i>mogiensis</i> (<i>Metapenaeus</i>)	595
Marestia	136	Moloha	341
margaritatus (Dairoides)	258	monoceros (Menaethius)	43
marginatus (Atergatis)	207	monoceros (Metapenaeus)	597
<i>marginatus</i> (<i>Carcinaspis</i>)	371	monodon (Penaeus)	584
marionis (Uca)	90	<i>monodon</i> (Penaeus)	588
<i>marleyi</i> (Hippolysmata)	712	monodous (Cryptodromia)	328
marmoratus (Saron)	688	Monomia	141, 155
marmorea (Leucosia)	386, 819	monticulosus (Liomera)	240
martensi (Callianassa)	506	monticulosus (Phymodius)	217
<i>martensii</i> (<i>Menippe</i>)	213	<i>mosambicana</i> (<i>Lambrus serratus</i> , var.)	65
martensii (Scyllarus)	558	moseleyi (Pleistacantha)	34
martia (Plesionika)	679	<i>mossambicus</i> (Palaemon)	778
Mastigopus	638	<i>mossambicus</i> (Palinustus)	545
mathaei (Elamena)	73	<i>mossambicus</i> (Petrolisthes)	479
<i>mathaei</i> (Elamena)	75	<i>mossambicus</i> (<i>Virbius</i>)	704
Matuta	346, 357	mucronatus (Latreutes)	706
Matutinae	346	multispinosa (Latreilopsis)	343
mauritanicus (Palinurus vulgaris, var.)	544	Munida	482, 488
mauritiana (Callianassa)	506	Munidopsis	482, 493
<i>mauritanus</i> (Lupa)	153	muricata (Doclea)	49
mauritanus (Palinurus longi- manus, var.)	541, 544	murigera (Xanthasia)	81
mawsoni (Marestia)	136	murrayi (Cyrtoamaia)	33
<i>Maxillothrix</i>	199, 336	Mursia	346, 353
mcleayi (Portumnus)	143	mutica (Megalops)	136
Medaeus	202, 218	Myomenippe	247, 256
megalocheir (Pontophilus)	808	Myra	361, 372
<i>megalocheir</i> (Pontophilus)	809	N	
Megalops	136	naifaroensis (Athanas)	731
		nana (Stereomastis)	573, 575
		<i>Nasinatalis</i>	393

	PAGE		PAGE
<i>nasutus</i> (<i>Platyonichus</i>)	142	Ocypodidae	76, 82
<i>natalensis</i> (<i>Callianassa</i>)	511	<i>ocyroe</i> (<i>Atergatis</i>)	207
<i>natalensis</i> (<i>Caridina nilotica</i> , var.)	687	<i>Oedipus</i>	800
<i>natalensis</i> (<i>Carupella</i>)	147	<i>Oeidea</i>	304
<i>natalensis</i> (<i>Eurycarcinus</i>)	261	Ogyrides	725
<i>natalensis</i> (<i>Galene</i>)	259	<i>Ogyris</i>	725
<i>natalensis</i> (<i>Latreutes</i>)	706	oktahedros (<i>Cryptodromia</i>)	328
<i>natalensis</i> (<i>Pachycheles</i>)	472	Ommatocarcinus	282, 285
<i>natalensis</i> (<i>Palaemonetes</i>)	791, 794	onyx (<i>Ptychognathus</i>)	817
<i>natalensis</i> (<i>Palinurus gilchristi</i> , var.)	542	Oplophoridae	647, 662
NATANTIA	575	Oplophorus	662
<i>natator</i> (<i>Charybdis</i>)	169	orbiculare (<i>Hymenosoma</i>)	68
Naupliosoma	536, 538	orbicularis (<i>Achelous</i>)	159
<i>Nautilocorystes</i>	302	orbicularis (<i>Lissocarcinus</i>)	145
<i>Nautilograpsus</i>	120	orbitospinis (<i>Pilumnus</i>)	264
<i>Naxia</i>	52	orientalis (<i>Actaea rüppellii</i> , var.)	235
<i>Naxioides</i>	48, 52	orientalis (<i>Alope</i>)	693
<i>Neaxius</i>	498	orientalis (<i>Charybdis</i>)	170
Nematocarcinidae	647, 670	<i>orientalis</i> (<i>Hippolyte</i>)	704
<i>Nematocarcinus</i>	671	<i>orientalis</i> (<i>Merhippolyte</i>)	712
<i>Nematopagurus</i>	416, 467	orientalis (<i>Parathranites</i>)	148
<i>Neoliomera</i>	203, 240	orientalis (<i>Thelxiope</i>)	340
<i>Neolithodes</i>	407	orientalis (<i>Thenus</i>)	565
<i>Neoxanthias</i>	221	<i>orientalis</i> (<i>Thenus</i>)	558
<i>Nephrops</i>	525, 527	orientalis (<i>Uca annulipes</i> , var.)	97
<i>Nephropsidae</i>	524	ornatus (<i>Panulirus</i>)	552
<i>Nephropsis</i>	525, 529	ornatus (<i>Petrolisthes</i>)	479
<i>Neptunus</i>	153-159	<i>ortmanni</i> (<i>Menippe</i>)	254
<i>nexa</i> (<i>Galathea</i>)	486	Ortmannia	654
<i>niger</i> (<i>Chlorodius</i>)	213	Ostracotheres	78, 81
<i>nigrifrons</i> (<i>Tetralia glaberrima</i> , var.)	280	<i>ostrearius</i> (<i>Pinnotheres</i>)	79, 80
<i>Nika</i>	715	Ovalipes	141, 150
<i>nilotica</i> (<i>Caridina</i>)	657	<i>ovalis</i> (<i>Remipes</i>)	404
<i>nilotica</i> (<i>Potamon</i>)	189	OXYRHYNCHA	9
<i>Nisto</i>	556, 561, 567	OXYSTOMATA	9, 345
<i>nitescens</i> (<i>Athanas</i>)	729	Ozius	819
<i>nitida</i> (<i>Uca</i>)	91		
<i>nitidus</i> (<i>Plesiopenaeus</i>)	622	P	
<i>nitidus</i> (<i>Sphaerozius</i>)	254	<i>Pachycheles</i>	471, 475
<i>nitidus</i> (<i>Uroptychus</i>)	495	<i>pachydactylus</i> (<i>Xantho</i>)	236
<i>nodipes</i> (<i>Actaeodes</i>)	232	<i>Pachygrapsus</i>	111, 116
<i>nodulosa</i> (<i>Actaea</i>)	228	<i>pacifica</i> (<i>Huenia</i>)	41
<i>notabilis</i> (<i>Alpheus</i>)	747	<i>pacificus</i> (<i>Hippa</i>)	404
<i>Notoseeles</i>	399	<i>pacificus</i> (<i>Leander</i>)	784
<i>Notostomus</i>	663, 669	<i>pacificus</i> (<i>Phye</i>)	651
<i>Nursia</i>	368	<i>padavensis</i> (<i>Clibanarius</i>)	433
		<i>paederus</i> (<i>Marestia</i>)	136
		<i>Paguridae</i>	406, 414
O		PAGURIDEA	401, 406
<i>obesomanus</i> (<i>Alpheus</i>)	743	<i>Pagurinae</i>	415
<i>obesus</i> (<i>Potamon</i>)	192	<i>Paguristes</i>	415, 417
<i>obscurus</i> (<i>Phymodius</i>)	217	<i>Pagurus</i>	415, 422
<i>obtusus</i> (<i>Xantho</i>)	238	<i>Palaemon</i>	770
<i>occidentalis</i> (<i>Enoplometopus</i>)	532	<i>Palaemonetes</i>	770, 791
<i>occidentalis</i> (<i>Ogyrides</i>)	728	<i>Palaemonidae</i>	648, 769
<i>ocellata</i> (<i>Nautilocorystes</i>)	303	<i>Palaemoninae</i>	770
<i>octodentatus</i> (<i>Nautilocorystes</i>)	303	PALINURA	535
<i>oculatus</i> (<i>Paguristes</i>)	418	<i>Palinurellus</i>	537
<i>Ocyrope</i>	83	<i>Palinuridae</i>	535
		<i>Palinurus</i>	537, 541

Descriptive Catalogue of South African Decapod Crustacea. 833

	PAGE		PAGE
Palinustus	537, 544	<i>phaenomma</i> (Leucisca)	371
Pandalidae	647, 675	<i>phalangium</i> (Stenorhynchus)	14
Pandalina	676	philippii (Penaeopsis)	592
Panulirus	537, 547	<i>philippinensis</i> (Penaeopsis)	592
Paracleistostoma	104	<i>Philocheras</i>	805
Paramithrax	61	<i>Philonicus</i>	619
Parapagurus	416, 450	Philyra	361, 376
<i>Parapalaemon</i>	780	<i>Phlyxia</i>	363
Parapasiphaë	649	phoreus (Sergestes)	641
Parapenaeopsis	581, 604	Phye	649, 651
Parapenaeus	581, 600	Phyllosoma	536, 554, 556 561, 562, 566
Parapilumnus	248, 269	Phymodius	202, 215
Parasesarma	127	<i>picta</i> (Matuta)	359
Parathranites	141, 148	<i>picta</i> (Sesarma)	127
parazebra (Eupagurus)	459	<i>picta</i> (Thalamita)	175
parkeri (Jasus)	540	pictus (Enoplometopus)	532
paronae (Gelastocaris)	714	pilosimanus (Parapagurus)	450
Parribaeus	557, 565	Pilumnoides	247, 256
Parthenope	64	pilumnoides (Dynomene)	337
<i>Parthenope</i>	65	Pilumnoplax	282, 288
Parthenopidae	11, 63	Pilumnus	248, 262
parvula (Actaea)	234	<i>pinnae</i> (Pontonia)	792
<i>parvula</i> (Actaea)	229	Pinnotheres	78
parvidentatus (Nematocarcinus)	674	Pinnotheridae	76, 77
parvirostris (Alpheus)	753	pisifer (Parapilumnus)	269
Pasiphaë	651	pisum (Pinnotheres), and footnote to fig. 16	80
Pasiphaëidae	647, 648	placens (Eupagurus)	462
paucipara (Caridina nilotica, var.)	657	Plagusia	112, 133
<i>paulensis</i> (Geryon)	291	Planes	111, 120
paulsoni (Leontocaris)	699	planipes (Matuta)	357
<i>pavimentatus</i> (Pagurus)	426	planissimum (Percnon)	138
pax (Spirontocaris)	696	Plastocrangon	719
pectinifera (Spirontocaris)	696	platyarthrodes (Speodromia)	334
pedunculatus (Pagurus)	429	platyceros (Cyrtoimaia)	33
pelagica (Lupa)	153	platychira (Pilyra)	382
Pelagopenaeus	581, 608	Platylambrus	64, 65
<i>Pelias</i>	657	Platymaia	12, 30
Penaeidae	580	<i>Platyonichus</i>	142, 195
PENAEIDEA	576, 579	<i>Platyonychus</i>	150
Penaeopsis	581, 592	Platyrodia	201, 208
Penaeus	581, 582	<i>Platyzoisus</i>	295
penicillatus (Panulirus)	550	plebejus (Penaeus)	583
penicillifer (Leucifer)	645	Pleistacantha	12, 34
pennifera (Latreillia)	344	<i>Pleoticus</i>	619
<i>Pentacheles</i>	568	Plesionika	676, 679
pentagonalis (Cryptodromia)	328	Plesiopenaeus	582, 621
Percnon	112, 138	plicata (Sesarma)	127
Periclimenes	770, 794	plicatus (Pachygrapsus)	117
<i>peringueyi</i> (Leander)	784	plumosa (Lybia)	252
<i>perlatus</i> (<i>Chlorodius</i>)	214	<i>Podopisa</i>	52
<i>perlatus</i> (Coenobita)	469	<i>polita</i> (Philyra)	380
perlatus (Pilumnoides)	257	<i>politus</i> (Petrolisthes)	478
perlatus (Potamon)	183	<i>pollicaris</i> (Eupagurus)	460
peronii (Glaucothoë)	417	Polycheles	567, 568
<i>peronii</i> (Ibacus)	563	<i>Polycheles</i>	570
Persephona	373	polydous (Pachygrapsus)	118
Petalomera	307, 312	Polyonyx	472, 480
petersii (Palaemon)	780	polyphagus (Panulirus)	548
<i>petersii</i> (<i>Podopisa</i>)	52	Pomatocheles	413
Petrochirus	3, 416		
Petrolisthes	472, 477		

	PAGE		PAGE
Pomatochelidae	406, 413	<i>quadridens</i> (<i>Pugettia</i>)	44
Pontocaris	811	<i>quadridentata</i> (<i>Dorippe</i>)	390
Pontoniinae	770, 791	4-dentatus (<i>Dehaaninus</i>)	46
Pontophilus	803, 805	<i>quadridentatus</i> (<i>Milhrax</i>)	60
Porcellana	472, 473	quadrilobata (<i>Porcellanella</i>)	819
Porcellanella	472, 819	quadrispinosa (<i>Acanthephyra</i>)	668
Porcellanidae	471	<i>queketti</i> (<i>Mamaia</i>)	59
<i>Portumniodes</i>	142	quemvis (<i>Platylambrus</i>)	65
Portumnus	141, 142	quinquedens (<i>Geryon</i>)	291
Portunidae	77, 139	quinquedentata (<i>Penaeopsis</i>)	593
<i>Portunus</i>	152	quinquedentatus (<i>Xantho</i>)	225
<i>postulans</i> (<i>Nursia</i>)	368	quoianus (<i>Leander</i> , <i>Palaemon</i>)	782
Potamon	180		
Potamonantes	180	R	
Potamonidae	77, 179	<i>Ranina</i>	397
pransor (<i>Platylambrus</i>)	66	ranina (<i>Ranina</i>)	397
Problemacaris	815	Raninidae	396
Processa	715	Raninoides	397, 399
Processidae	648, 715	rapacida (<i>Alpheus</i>)	750
<i>proporcellana</i> (<i>Kraussia</i>)	195	rapax (<i>Alpheus</i>)	752
proteus (<i>Hippolyte</i>)	703	regius (<i>Panulirus</i>)	551
proteus (<i>Huenia</i>)	41	<i>Remipes</i>	404
prymna (<i>Thalamita</i>)	174	REPTANTIA	9
<i>Psautis</i>	231, 232	<i>reticulata</i> (<i>Sesarma</i>)	128
Pseudibacus	556, 561	retusa (<i>Camposcia</i>)	12
Pseudocolloides	27	rhadames (<i>Upogebia</i> , <i>Calliadne</i>)	523
Pseudodromia	307, 315	Rhynchocinetes	763
Pseudograpsus	817	Rhynchocinetidae	648, 762
Pseudozius	247, 252	Rhynchoplax	67, 71
<i>Pseudozius</i>	295	robillardi (<i>Naxioides</i>)	53
Ptychognathus	817	rosaceus (<i>Paguristes</i>)	420
<i>pubescens</i> (<i>Lupa</i>)	153	roseus (<i>Atergatis</i>)	207
<i>pubescens</i> (<i>Neoliomera</i>)	241	rostrata (<i>Galacantha</i>)	494
Puerulus	536, 554, 556	rostrata (<i>Macropodia</i>)	14
<i>pugil</i> (<i>Lybia</i>)	251	<i>rostridentatus</i> (<i>Aristaeomorpha</i>)	626
pugilator (<i>Diogenes</i>)	440	rotunda (<i>Pseudodromia</i>)	317
pugnatrix (<i>Dynomene</i>)	337	rotundatus (<i>Lupocyclus</i>)	148
pulchella (<i>Actaea</i>)	228	rotundicaudata (<i>Callianassa</i>)	512
<i>pulchella</i> (<i>Xaiva</i> , <i>Portumnus</i>)	142	ruber (<i>Liomera</i>)	238
<i>pulchellus</i> (<i>Lissocarcinus</i>)	145	<i>rubidus</i> (<i>Typhlocarcinus</i>)	297
pulcher (<i>Ommatocarcinus</i>)	285	rudis (<i>Palaemon</i>)	778
<i>pulchricaudatus</i> (<i>Penaeus</i>)	591	<i>rufescens</i> (<i>Petrolisthes</i>)	477
<i>punctata</i> (<i>Myra</i>)	373	rufopunctata (<i>Actaea</i>)	228
<i>punctata</i> (<i>Persephona</i>)	373	rufopunctata (<i>Trapezia</i>)	278
<i>punctata</i> (<i>Philyra</i>)	377	rugatus (<i>Liomera</i>)	237
<i>punctata</i> (<i>Philyra</i>)	381	rugosus (<i>Coenobita</i>)	469
punctatus (<i>Cyclograpsus</i>)	131	rugosus (<i>Elliptodaetylus</i>)	817
punctatus (<i>Ovalipes</i>)	150	<i>rugosus</i> (<i>Scyllarus</i>)	560
<i>punctulatus</i> (<i>Pagurus</i>)	425	rugulosa (<i>Kraussia</i>)	195
<i>pungens</i> (<i>Echinoplax</i>)	34	<i>rugulosus</i> (<i>Evucanthus</i>)	248
<i>purpurea</i> (<i>Acanthephyra</i>)	668	rugulosus (<i>Ozius</i>)	819
<i>pusilla</i> (<i>Micippa</i>)	63	<i>rumphii</i> (<i>Dromia</i>)	310
<i>pusillus</i> (<i>Anapagurus</i>)	465	<i>rumphii</i> (<i>Menippe</i>)	248, 818
pygmaeus (<i>Latreutes</i>)	707	rüppellii (<i>Actaea</i>)	235
Fylochelidae	413		
Fylopagurus	416, 453	S	
		sabaea (<i>Neoliomera</i>)	241
Q		<i>sagittarius</i> (<i>Stenorhynchus</i>)	13
<i>quadrata</i> (<i>Sesarma</i>)	127	<i>salamensis</i> (<i>Ebalia</i>)	368
Quadrella	248, 280, 819	saldanhae (<i>Ogyrides</i>)	726

Descriptive Catalogue of South African Decapod Crustacea. 835

	PAGE		PAGE
saldanhae (Spirontocaris)	698	siphonoceras (Solenocera)	612
sancti-pauli (Munida)	489	skoogi (Paguristes)	420
sanguineus (Xantho)	220	smithii (Antilibinia)	38
sanguinolenta (Lupa)	154	smithii (Eriphia)	274
Saron	687, 688	smithii (Gonioneptunus)	163, 818
savignyi (Actaea)	231	smithii (Nautilograpsus)	120
savignyi (Upogebia, Calliadne)	522	smithii (Sesarma)	124
scabra (Ranina)	397	smithii (Uca)	94
scabricula (Eriphia)	275	Solenocera	582, 611
scabriuscula (Philyra)	381	sordidus (Scyllarus)	557
scandens (Nursia)	368	speciosa (Actaea)	232
Schizophrys	58, 60	speciosa (Munida)	492
Sclerocrangon	803, 804	speciosus (Petrolisthes)	478
sculpta (Stereomastis)	572, 575	Speodromia	308, 333
sculptilis (Etisus)	244	Sphaerozius	247, 253
sculptus (Glyphocrangon)	719	spinifer (Pilumnus)	263
sculptus (Hypocolpus)	209	spinetum (Problemacaris)	815
sculptus (Pontophilus)	810	spinimanus (Mursia)	356
scutatus (Gennadas)	634	spinosa (Exodromidia)	325
scutellatus (Dehaanius)	47	spinosa (Plagusia)	136
scutellatus (Epiatus)	35, 47	spinosissima (Acanthophrys longi-	
scutellatus (Eurynome aspera, var.)	56	spina, var.)	62
Scylla	141, 160	spinosissima (Calappa hepatica, var.)	347 footnote, 348
Scyllaridae	535, 556	spinus (Hyastenus)	53
Scyllarides	556, 561	spinulentus (Eupagurus)	460
Scyllarus	556, 557	spinulicauda (Penaeopsis)	597
Seyramathia	48, 49	spinulosus (Achaepsis)	24
Scytoleptus	498, 499	spiralis (Thaumastoplax)	301
sebana (Eriphia)	273	Spirontocaris	687, 695
semilaevis (Plesionika martia, var.)	679	splendens (Sergestes)	642
semisulcatus (Penaeus)	588	splendens (Sergestes)	642
semisulcatus (Penaeus)	584, 588	spongiosa (Cryptodromidiopsis)	329
semoni (Munida)	491	squalina (Leucisca)	371
senex (Diogenes)	446	squammosus (Scyllarides)	561
septedentatus (Atelectocyclus)	197	squamosa (Plagusia)	134
septemspinosa (Arcania)	375	squilla (Leander)	783
Sergestes	638, 822	squilla (Leander)	784
Sergestidae	580, 637, 822	squinado (Mamaia, var.)	59
serrata (Scylla)	160	stebbingi (Hexapus)	299
serratifrons (Raninoides)	399	stebbingi (Metapenaeus)	599
serratus (Lambrus)	65	Stenocionops	3, 58
serratus (Stylodactylus)	652	Stenopodidae	577
serrifer (Leander)	789	STENOPODIDEA	576
serripes (Scytoleptus)	499	Stenopus	577
Sesarma	112, 122	Stenopusculus	577
seticornis (Stenorhynchus)	13	Stenorhynchus	13
setifer (Actumnus)	271	Stenorhynchus	13
setifer (Pagurus)	426	Stereomastis	567, 570
setifer (Pagurus)	428	stewarti (Nephropsis)	531
sexdentata (Charybdis)	168	stimpsonii (Angasia)	708
sexpes (Hexapus)	299	stimpsonii (Cryptodromidiopsis spongiosa, var.)	329
sexspinosa (Acanthephyra)	669	stormi (Geograpsus lividus, subsp.)	116
sica (Acanthephyra)	668	strenuus (Alpheus)	760
Sicyonia	635	streptocheles (Porcellana)	474
sidneyi (Potamon)	187	strigatus (Aniculus)	431
signata (Atergatopsis)	206	strigosus (Grapsus)	115
sima (Thalamita)	175	striolatus (Clibanarius)	434
simplex (Munidopsis)	493	Stylodactylidae	647, 651
sindensis (Uca inversa, var.)	94	Stylodactylus	652

	PAGE		PAGE
stylorostratis (Acanthephyra)	666	trichophoroides (Pilumnus, Hetero-	
subacutus (Lachnopus)	236	pilumnus)	268
subinteger (Grapsillus)	278	tridacnae (Conchodytes)	801
subseratus (Menaethius mono-		tridacnae (Ostracotheres)	82
ceros, var.)	43	trifurcus (Cymonimus)	392
subspinosa (Upogebia)	515	Trigonoplax	73, 75
suhmi (Stereomastis)	574, 575	trigonus (Linuparus)	820
sulcatifrons (Eucrate)	295	trimaculatus (Ovalipes)	150
sulcatifrons (Parapasiphaë)	649	trispinosa (Mursia armata, var.)	356
sulcatipes (Athanas)	732	trispinosus (Geryon)	293
sulcatus (Doto)	99	tristanensis (Eupagurus)	460
sulcatus (Macrophthalmus)	101	tristis (Liomera)	237
sundaicus (Palaemon)	775	tristis (Carpilodes)	236
superba (Coralliocaris)	799	triscalatus (Penaeus)	584
symnista (Albunea)	405	trituberculatus (Lupa)	153
Synalpheus	725, 735	truncatus (Gonionep tunus)	164, 818
systellaspis	663	tuberculata (Ebalia)	367
		tuberculata (Plagusia depressa,	
		var.)	134
		tuberculatus (Scyllarus)	560
		tuberculatus (Xenocarcinus)	36
		tuberculidens (Xanthias)	243
		tuberculosa (Ebalia)	368
		tuberosa (Ebalia)	367
		tugelae (Hippolysmata, Exhippo-	
		lysmata)	712
		tugelae (Lupocyclus)	148
		turbynei (Platymaia)	31, 816
		Tylodiplax	83, 107
		Typhlocarcinus	297
		typhlops (Polycheles)	568, 575
		typus (Caridina)	655
		typus (Leucifer)	645
		typus (Rhynchocinetes)	763
		U	
		Uca	83, 89
		uncifer (Hyastenus)	54
		undulatus (Debaanius)	47
		unguiformis (Elamena, Trigono-	
		plax)	75
		ungulatus (Phymodius)	216
		ungulatus (Pylopagurus)	454
		unidentata (Dromidia)	323
		unirecedens (Nauticaris)	710
		Upogebia	514
		Upogebiidae	497, 513
		urania (Leucosia)	387
		Urocaridella	775
		Uroptychidae	471, 475
		Uroptychus	495
		ursus-major (Parribacus)	565
		urvillei (Ocylope)	86
		urvillei (Uca)	93
		V	
		vallantianus (Liomera)	238
		valens (Gennadas)	631

T

taeniatus (Clibanarius)	434
taeniatus (Panulirus ornatus, var.)	553
Talieptus	36
talismani (Gennadas)	633
talismani (Sergestes)	642
taprobatica (Thalamita wood-	
masoni, var.)	177
tenuicrustatus (Grapsus)	113
tessellata (Lybia)	249
testudinarius (Remipes)	404
tetragona (Sesarma)	125
Tetralia	248, 279
Thalamita	142, 171
THALASSINIDEA	401, 497
thalia (Micippa)	63
Thaumastoplax	283, 300
Thelxiope	338
Thelxiopeidae	306, 338
Thelxiopeidea	306
Thenus	557, 564
Thompsonia	236
thomsoni (Achaeopsis)	25
thomsoni (Nephrops)	528
tibicen (Calcinus)	437
tigrina (Trapezia)	277
timidus (Catapaguroides)	468
togoensis (Caridina)	661
tomentosa (Actaea)	233
tomentosa (Plagusia)	136
tomentosus (Actumnus)	271
Tozeuma	707
Trapezia	248, 276
triangularis (Eupagurus)	464
triangularis (Schizophrys, var.)	60
triarthrus (Hymenopenaeus, Hali-	
poroides)	619
tricarinatus (Evaxius)	499
tricarinatus (Heterocarpus)	682
Trichodactylus	180

Descriptive Catalogue of South African Decapod Crustacea. 837

	PAGE		PAGE
<i>variabilis</i> (<i>Alpheus bisincisus</i> , var.)	760	<i>whitei</i> (<i>Leucosia</i>)	386
<i>variabilis</i> (<i>Eupagurus</i>)	464	<i>Willemoesia</i>	567
<i>variegata</i> (<i>Charybdis</i>)	170	<i>wilsoni</i> (<i>Petalomera</i>)	313
<i>variegata</i> (<i>Philyra</i>)	382	<i>wood-masoni</i> (<i>Thalamita</i>)	177
<i>variolosa</i> (<i>Actaea</i>)	235	<i>woodwardi</i> (<i>Funchalia</i>)	609
<i>varipes</i> (<i>Pagurus</i>)	429	<i>wyckii</i> (<i>Caridina</i>)	657
<i>Varuna</i>	111, 121	<i>wyville-thomsoni</i> (<i>Platymaia</i>)	31
<i>ventricosus</i> (<i>Hippolyte</i>)	704		
<i>ventrosus</i> (<i>Alpheus</i>)	748		
<i>verdi</i> (<i>Ibacus</i>)	563		
<i>verreauxi</i> (<i>Jasus</i>)	540	X	
<i>verrucosipes</i> (<i>Pilumnus</i>)	269	<i>Xaiva</i>	142
<i>versicolor</i> (<i>Panulirus</i>)	553	<i>Xanthasia</i>	78, 81
<i>vespertilio</i> (<i>Pilumnus</i>)	263	<i>Xanthias</i>	203, 241
<i>vestita</i> (<i>Carcinoplax</i>)	288	<i>Xanthidae</i>	77, 198
<i>vestitus</i> (<i>Curtonotus</i>)	265	<i>Xantho</i>	201, 202, 220
<i>vetchi</i> (<i>Epialtus</i>)	35, 73	<i>Xanthodes</i>	241
<i>victor</i> (<i>Matuta</i>)	358	<i>xanthoides</i> (<i>Zozymodes</i>)	211
<i>victrix</i> (<i>Matuta</i>)	358	<i>Xeinostoma</i>	388, 395
<i>vigintispinosa</i> (<i>Gomezia</i>)	305	<i>Xenocarcinus</i>	35
<i>villosus</i> (<i>Alpheus</i>)	744	<i>Xenophthalmodes</i>	282, 296
<i>violascens</i> (<i>Cocnobita</i>)	470	<i>Xiphocaris</i>	653
<i>Virbius</i>	702, 704		
<i>virescens</i> (<i>Clibanarius</i>)	435	Z	
<i>vittata</i> (<i>Hippolysmata</i>)	710	<i>zebra</i> (<i>Eupagurus</i>)	459
<i>vocans</i> (<i>Uca</i>)	90	<i>zebra</i> (<i>Gnathophyllum</i>)	765
<i>voeltzkowii</i> (<i>Xantho</i>)	226	<i>Zozymodes</i>	211
<i>vulgaris</i> (<i>Clibanarius</i>)	433	<i>Zozymus</i>	210
		<i>Zosimus</i>	201, 210
W		<i>Zozymodes</i>	201, 211
<i>warreni</i> (<i>Potamon</i>)	189	<i>Zozymus</i>	210
<i>westergreni</i> (<i>Notostomus</i>)	670		

Descriptive List of South African Stomatopod Crustacea (Mantis Shrimps).—By K. H. BARNARD, D.Sc., F.L.S.

(With 4 Text-figures.)

THIS paper contains no new researches, and is merely for the purpose of bringing up to date the list of species recorded from South Africa, and facilitating the identification of specimens.

All the species are represented in the South African Museum collection except *Lysiosquilla insignis*. The Museum has to thank Dr. C. von Bonde, Director of the Fisheries Survey, for presenting a magnificent male specimen of *L. crassispinosa*. I am indebted to Dr. C. J. van der Horst (Witwatersrand University) and the Lourenzo Marques Museum for submitting material for identification from Delagoa Bay, and to Professor T. A. Stephenson (formerly of the University of Cape Town) for material from Natal.

Beyond quoting Bigelow's key for identification purposes, no account of the larval forms is given here.

The limits of the South African faunal region for purposes of this paper are reckoned as extending north to 15° S. lat. on both the west and east coasts.

STOMATOPODA.

1893. Stebbing, History of Crustacea, pp. 279–290.
1909. Calman in Lankester's Treatise Zool. Crust., p. 319.
1910. Stebbing, Gen. Cat. S. Afr. Crust. (Ann. S. Afr. Mus., vi), p. 404.
1913. Kemp, Mem. Ind. Mus., iv, pp. 1 *sqq.*
1926. Hansen, Siboga Exp. Monogr., xxxv, pp. 1–48, 2 pls.
1927. Hale, S. Austral. Crust., pt. 1, p. 27.
1938. Balss, Bronn's Klass. Ordnung. Tierreich., v, Abt. 1, Book 6, pt. 2.

[Not seen; quoted from Schmitt, 1940.]

Body more or less flattened dorso-ventrally. Carapace relatively small, anteriorly not covering the two movable segments which carry the stalked eyes and the antennules, and posteriorly leaving exposed at least the last four thoracic segments. A small movable rostrum overlies the antennular segment. Antennule (1st antenna) with

3 flagella; antenna (2nd) with an elongate oval scale on the outer branch, and one flagellum on inner branch. First 5 pairs of thoracic limbs similar in structure, each consisting of only 6 joints, the terminal one (dactylus) folding against the penultimate (propodus) to form a prehensile "hand" or subchela; the 1st limb is very slender, the 3rd-5th more robust, and the 2nd is greatly enlarged, forming the characteristic Mantis-like, raptorial limb. Epipods present (usually) on basal joints of all 5 limbs. Last 3 pairs of limbs (6th-8th) slender, biramous. Abdomen large; pleopods biramous, and carrying tufts of branchial filaments; uropods and telson forming a tail-fan. In the ♂ there is a slender penial process at base of each of the last (8th) pair of thoracic limbs, and the inner branch of the 1st pleopod is modified. Genital openings of ♀ on the 6th thoracic segment on either side of a pocket (*receptaculum seminis*). Eggs very small, cemented together into a mass which either lies free in the burrow inhabited by the female, or is attached to the 3rd-5th pairs of thoracic limbs. Larval development pelagic (see p. 864). Exclusively marine. Most Mantis shrimps live in burrows, but they may hunt for prey far from their burrows. Their bodies are rarely covered with barnacles, Hydroids or other foreign bodies.

List of South African species, with the number of teeth (incl. the terminal one) on the dactylus of the raptorial claw as a preliminary aid to identification.

<i>Squilla desmarestii</i>	. . . . .	5
<i>latreillei</i>	. . . . .	(4) 5
<i>hieroglyphica</i>	. . . . .	6
<i>armata</i>	. . . . .	(6) 7 (8)
<i>nepa</i>	}	. . . . . 6
<i>holoschista</i>		
<i>mikado</i>		
<i>raphidea</i>	. . . . .	8 (9)
<i>investigatoris</i>	. . . . .	(10) 13-16 (18)
<i>Pseudosquilla ciliata</i>	. . . . .	3
<i>Lysiosquilla maculata</i>	. . . . .	9-11
<i>capensis</i>	. . . . .	15-16
<i>insignis</i>	. . . . .	7-8
<i>crassispinosa</i>	. . . . .	(10) 11
<i>Gonodactylus chiragra</i>	}	. . . . . none
<i>demanii</i>		
<i>glabrous</i>		

FAMILY SQUILLIDAE.

1910. Stebbing, *l. c.*, p. 405.*Key to the South African Genera.*

- I. Articulation of ischium and merus (*i.e.* 2nd and 3rd visible joints) of raptorial claw terminal; merus grooved ventrally throughout its length.
- A. Carapace with well-marked keels.* Cervical groove defined across dorsum of carapace. Raptorial dactylus not inflated *Squilla*.
- B. Carapace without keels. Cervical groove not extending across dorsum. Raptorial dactylus not inflated.
1. Abdomen compressed. Raptorial dactylus with 2 (rarely 3) teeth in addition to the terminal one. Telson with median keel *Pseudosquilla*.
2. Abdomen depressed. Raptorial dactylus with at least 4 teeth in addition to the terminal one. Telson without median keel *Lysiosquilla*.
3. Abdomen depressed. Raptorial dactylus inflated at base, with 3 teeth in addition to the terminal one. Telson closely studded with fine spinules or large tubercles, with or without a pair of submedian keels [*Coronida*].†
- II. Ischio-meral articulation in front of proximal end of latter, which thus projects backwards; merus grooved ventrally for not more than three-quarters of its length. Raptorial dactylus inflated at base.
- A. Raptorial dactylus without teeth on its inner margin *Gonodactylus*.
- B. Raptorial dactylus with 2-9 teeth on its inner margin [*Odontodactylus*].†

Gen. SQUILLA Fabr.

1910. Stebbing, *l. c.*, p. 405.1913. Kemp, *l. c.*, p. 16.

1917. Calman, Brit. Antarct. Exp. Zool., iii, p. 141.

1921. Kemp and Chopra, Rec. Ind. Mus., xxii, p. 297.

1926. Hansen, *l. c.*, p. 3.

1931. Bigelow, Bull. Mus. Comp. Zool. Harv., lxxii, p. 174.

1939. Chopra, John Murray Exp., vi, p. 141.

1939. Foxon, *ibid.*, vi, p. 255 (larval forms).

* Except *S. desmarestii*, where they are very feeble or even untraceable. This species has 5 teeth on raptorial dactylus (incl. terminal one).

† Species recorded from Mauritius, and likely to occur on the South African coast, are put in square brackets.

Coronida trachurus (von Martens) from Mauritius, Red Sea, etc.

Odontodactylus scyllarus (Linn.) from Mauritius, Zanzibar, Madagascar, etc.

1940. Schmitt, Allan Hancock Pac. Exp., v, no. 4, p. 139 (key to Pacific American species).

1941. Nair, Proc. Ind. Ac. Sci., xiv, p. 543 (embryology).

1945. Opinion 186, Intern. Comm. Zool. Nomencl. (retention of name).

Carapace with conspicuous gastric and cervical grooves, the latter groove continuous across the mid-dorsal area; longitudinal keels usually distinct, never completely absent; antero-lateral angle usually sharply pointed. Cornea of eyes bilobed, narrow or very wide. Mandibular palp, when present, 3-jointed. Epipods present on all of the first 5 thoracic limbs, or absent from some of the hinder ones. Ventral process of uropod ending in 2 sharp spines. Telson with median keel, and 3 pairs of strong marginal teeth, the submedian pair with or without movable tips.

(Characters already given in the key to genera are not as a rule repeated in the generic diagnoses.)

Key to the South African Species.

- I. Upper edge of propodus of raptorial claw with fine close-set and even pectinations, a few movable spines at base on inner side (fig. 1, f).
 - A. Antero-lateral angle of carapace rounded-quadrate . . . *desmarestii*.
 - B. Antero-lateral angle produced in a sharp point.
 - 1. Lateral margin of 5th thoracic segment in dorsal view with a single acute process.
 - a. Cornea of eye very small, width less than width of stalk. Mandibular palp present *latreillei*.
 - b. Cornea much wider than stalk. Mandibular palp absent.
 - i. Longitudinal keels on either side of median keel on telson [*fallax* *].
 - ii. No keels on either side of median keel *armata*.
 - 2. Lateral margin of 5th thoracic segment with 2 processes on same level, the anterior one acute and antrorse.
 - a. Lateral margin of 6th thoracic segment not bilobed. Mandibular palp absent *hieroglyphica*.

* *S. fallax* Bouvier, 1915, Bull. Sci. Fr. Belg., xlviii, p. 308, figs. 39-42. Mauritius.

A small species (up to 19 mm.), *Squilla schmeltzii* M. Edw., is also recorded from Mauritius (Richters, 1880; Miers, 1884). Miers (1880) created the genus *Leptosquilla* for it. Kemp (1913, p. 93) considered it a post-larval form of a species of *Squilla*. Holthuis (1941, Temminckia, vi, p. 257, fig. 2) on 3 ♂♂ and 4 ♀♀ considers it an adult and valid species.

- b.* Lateral margin of 6th thoracic segment bilobed. Mandibular palp present.
- i.* Raptorial dactylus with 6 teeth (incl. terminal one).
- a.* Cornea transverse on stalk.
Surface of body pitted or rugulose.
- * Posterior half of median keel in front of cervical groove on carapace simple (fig. 2, *a*). Submedian keels on 4th abdominal segment ending in spines . . . *nepa*.
- ** Posterior half of keel double (fig. 2, *b*). Submedian keels on 4th abdominal segment not ending in spines . . . *holoschista*.
- β.* Cornea very oblique on stalk.
Surface smooth and polished. Anterior bifurcation of median keel on carapace faint or obsolete. *woodmasoni*.
- ii.* Raptorial dactylus with 13-16 (10-18) teeth . . . *investigatoris*.
3. Lateral margin of 5th thoracic segment with 2 processes, both acute, but the anterior one at a lower level (subventral). Lateral keels (submarginal, not the actual marginal keels) of abdominal segments 1-5 bicarinate *mikado*.*
- II. Upper edge of propodus of raptorial claw with stiff spines, large and small ones alternating (fig. 1, *g*) . . . *raphidea*.

Squilla desmarestii Risso

Fig. 1, *a*.

1895.† Bigelow, Proc. U.S. Nat. Mus., xvii, p. 515.

1910. Giesbrecht, Faun. Flora Golf. Neapel., xxxiii, pp. 25 *sqq.*, pp. 87 *sqq.*, pp. 138 *sqq.*, pl. 1, figs. 6, 7, pl. 6, figs. 59-68 (juv.), pl. 10, figs. 1-99 (pelagic stages).

* *Squilla mikado* Kemp and Chopra, 1921, Rec. Ind. Mus., xxii, p. 301, fig. 2. A specimen of this Japanese species, caught off the coast of Portuguese East Africa, submitted by the Lourenzo Marques Museum, 1949.

† Stebbing (1910), Kemp (1913), and Bigelow himself (1931) quote the date of Bigelow's paper as 1894. The table of contents of vol. xvii gives the date of publication as "February 5, 1895."

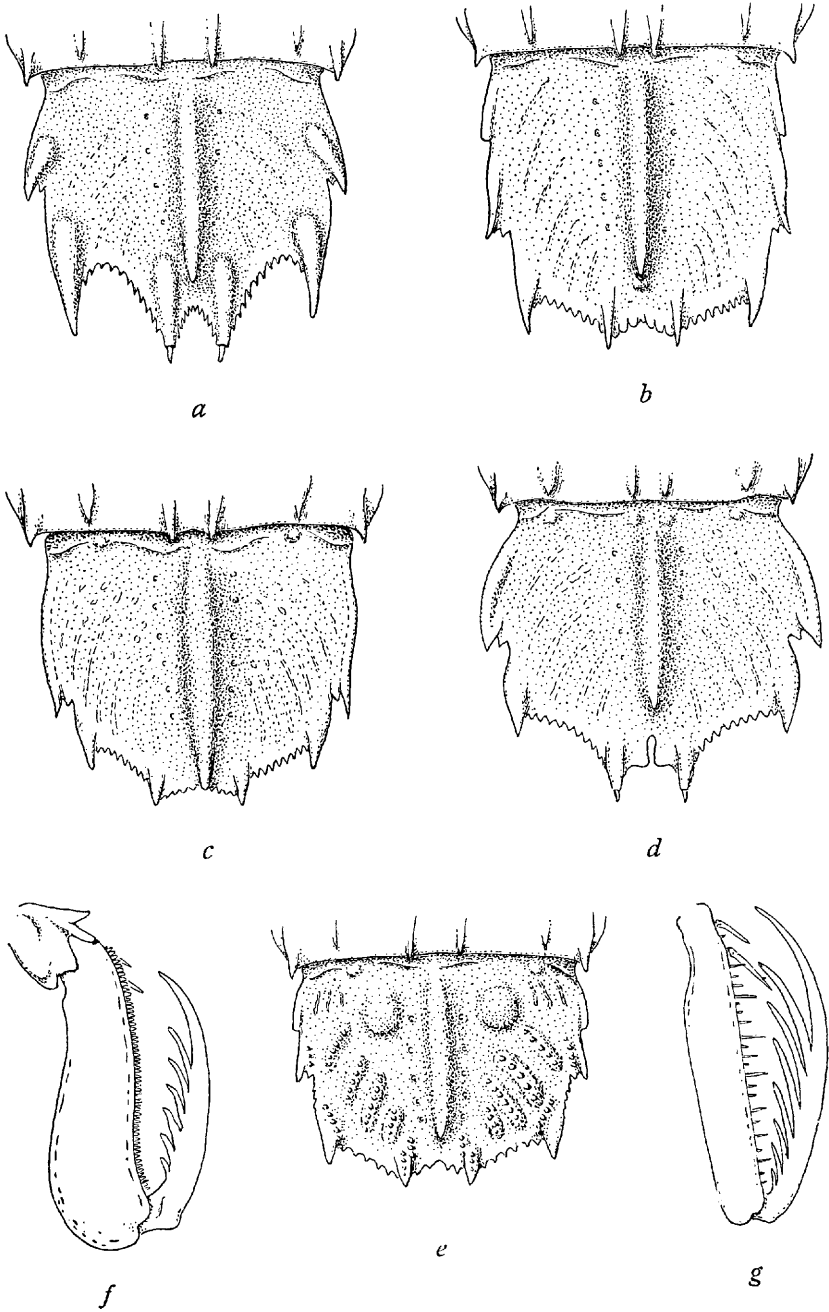


FIG. 1.—*a*, *Squilla desmarestii* Risso, telson. *b*, *S. nepa* Latr., telson. *c*, *S. raphidea* Latr., telson. *d*, *S. armata* M. Edw., telson. *e*, *S. latreillei* (E. & S.), telson. *f*, *S. armata* M. Edw., raptorial claw. *g*, *S. raphidea* Latr., raptorial claw.

Rostrum as long as basal width, triangular, sides gently tapering to a rounded apex. Carapace smooth, without keels, only the reflexed portion of the marginal keel developed. Lateral margin of 5th thoracic segment, viewed dorsally, with a subacute twisted process projecting laterally; when viewed from side a sinuous edge runs down almost to the sharp spine on ventral surface. Segments 6 and 7 laterally rounded. On segments 6-8 only the intermediate keels developed. On abdomen, submedian keels on segment 6 ending in spines; intermediate, lateral and marginal keels on all segments, all 3 pairs of keels ending in spines on segment 5, the intermediate and lateral ones ending in spines on segment 6. Telson broader than long, with strong median keel ending in a sharp point; submedian teeth ending in movable spines; 5-6 submedian, 11 intermediate denticles and 1 lateral one, all rather long and spiniform. Cornea oblique to axis of peduncle, its width about equal to length of peduncle. Peduncle of antennule longer than the longest flagellum, 1st peduncular joint subequal to 2nd or 3rd, middle joints of the sensory flagellum twice as long as broad, the portion bearing sensory setae nearly half the total length of the flagellum. Mandibular palp absent. Raptorial dactylus with 5 teeth including the terminal one. Epipods on first 4 pairs of thoracic legs only. Inner margin of bifurcate process of uropod crenulate or feebly serrulate. Spinous process (coupling-hook) on endopod of 1st abdominal appendage of ♂ shorter than the tubular process (Röhrenfortsatz).

Length up to 100 mm. Brownish, more or less mottled and speckled (Giesbrecht, pl. 1, figs. 6, 7).

Locality.—12½ miles off Cape Natal (Durban), 85 fathoms, 1 ♂ 31 mm. (s.s. *Pieter Faure*, December 1900).

This small specimen agrees in all respects with Giesbrecht's description, and with an actual Mediterranean specimen, except in the relative lengths of the antennular peduncle and its longest flagellum, the length of the joints of the sensory flagellum, and the relative lengths of the two processes on the endopod of 1st abdominal appendage in ♂; in these characters the specimen resembles *pallida*.

It is impossible to say whether this one specimen was a chance importation by ship from Europe. *S. pallida*, which in spite of the small differences from *desmarestii* seems to be a good species, is recorded from the coast of Morocco and Mauretania, as well as the Mediterranean and English Channel (Monod, Bull. Soc. Sci. Nat. Maroc., v, p. 87, 1925).

Squilla latreillei (Eyd. & Soul.)

Fig. 1, e.

1913. Kemp, *l. c.*, p. 24, pl. 1, figs. 1-4.
1926. Barnard, *Trans. Roy. Soc. S. Afr.*, xiii, p. 121.
1934. Chopra, *Rec. Ind. Mus.*, xxxvi, p. 20.
1938. Gravier, *Mem. Inst. d'Egypte*, xxxvii, p. 164, fig. A (carapace).
1938. Dollfus, *ibid.*, p. 194, fig. 4 (telson).

Rostrum twice as broad at base as median length, margins slightly raised, apex rounded. Cornea of eyes very small, width less than width of peduncle. Mandibular palp present. Lateral margin of 5th thoracic segment, viewed dorsally, produced in a slightly forwardly directed point, of segments 6 and 7 rounded, of 8 anteriorly subacute; no pair of spines on ventral surface of 5th segment. First 5 abdominal segments with faint but distinct submedian keels; the 6 keels on 6th segment swollen in adult ♂; a small transversely grooved medio-dorsal tubercle on each of segments 2-5. Telson broader than long, median keel and bases of marginal teeth swollen in adult ♂, prelateral tooth present; 2 submedian, 4-7 intermediate denticles, and 1 lateral one; ventral surface smooth on either side of post-anal keel. Raptorial dactylus with 5 (sometimes 4) teeth, including the terminal one. Inner margin of bifurcate process of uropod with several spines.

Length up to 71 mm. Brownish or pinkish, a dark dot on the eye-stalk touching the cornea. Kemp says the hind margins of last 3 thoracic and first 5 abdominal segments are narrowly bordered with black.

Locality.—Delagoa Bay (Barnard).

Distribution.—Gulf of Suez, Persian Gulf, Indian coast, Singapore, Japan.

Squilla armata M. Edw.

Fig. 1, d, f.

1895. Bigelow, *Proc. U.S. Nat. Mus.*, xvii, p. 515, figs. 9, 10.
1902. Stebbing, *Mar. Invest. S. Afr.*, ii, p. 45.
1910. *Id.*, *l. c.*, p. 405.
1913. Kemp, *l. c.*, p. 41, pl. 2, figs. 28, 29.
1914. Stebbing, *Trans. Roy. Soc. Edin.*, 50, p. 257.
1916. Balss, *Beitr. Kenntn. Meeresf. Westafr.*, ii, p. 51.
1940. Schmitt, *l. c.*, p. 150, fig. 4 (after Bigelow).

Rostrum tapering to a rounded apex, without medio-dorsal keel. Cornea of eyes greatly expanded, breadth equal to (or nearly) length

of whole organ. Mandibular palp absent. Ocular segment with a pair of sharp, forwardly directed spines. Antennular segment with a sharp, forwardly curving spine on each side. Fifth thoracic segment with a sharp, laterally directed process; 6th and 7th segments laterally rounded in front and produced in a point posteriorly (feeble in juv. up to 80 mm.). Abdominal segments with the submedian keels obsolete in adults, except on segment 6, where they end in spines. No spines between the submedian and intermediate keels on hind margin of segment 5 (in this respect the Cape specimens differing from those described by Bigelow and Kemp, who mention a group of 1-4 spines). Telson with 6 marginal teeth, the submedian pair ending in movable spines; between these there are two rounded lobes separated by a narrow slit; 8-12 intermediate denticles and 1 lateral one. Wrist of raptorial claw with a dorsal keel ending in a spine; dactylus with 7 (rarely 6 or 8) teeth, including the terminal one. Epipods on first 4 thoracic legs only. Inner margin of bifurcate process of uropod finely serrulate, outer edge of inner spine with a rounded tooth beyond the middle.

Length up to 170 mm. A living specimen was horny-amber, the hind margins of the abdominal segments red, more intense posteriorly, a squarish purplish spot on each abdominal segment between the intermediate and lateral keels, telson with orange-red margin, cornea green with black tips, basal margin of wrist of raptorial claw crimson, dactylus white, endopod and 2nd joint of exopod of uropod orange, the row of spines on 1st joint of exopod crimson-orange.

Localities.—Off Cape Point and off Dassen Island (Stebbing); Luderitzbucht (Balss); Table Bay harbour, Saldanha Bay, Luderitzbucht, 0-45 fathoms (S. Afr. Mus.). Numerous young specimens from Cape Point to Paternoster Point (Saldanha Bay), 27-100 fathoms (S. Afr. Mus.).

Distribution.—Chile and Patagonia; New Zealand; New South Wales.

Squilla hieroglyphica Kemp

Fig. 2, *c*, *d*, *e*.

1911. Kemp, Rec. Ind. Mus., vi, p. 96.

1913. *Id.*, *l. c.*, p. 51, pl. 3, figs. 38-41.

Rostrum as long as basal width, triangular. Anterior width of carapace half the (median) length (excl. rostrum), smooth, median keel without anterior bifurcation. Lateral margin of 5th thoracic segment bilobed, anterior lobe forming a strong antrorsely curved

spine, the posterior lobe rounded. No spines on ventral surface of 5th segment. Segments 6 and 7 laterally not-bilobed; segment 8 with sharp, but small, antero-lateral point. Segments 6-8 with submedian, intermediate and lateral keels. On abdomen submedian and marginal keels ending in spines on segment 6; intermediate and lateral keels ending in spines on segments 5 and 6. Telson slightly broader than long, with median keel ending in a sharp point; no movable spines; 5 or 6 submedian denticles, 11 or 12 intermediate, and 1 lateral, all spiniform. No prelateral denticle. No sharp post-anal keel on ventral surface. Cornea oblique to axis of stalk (as in *laevis*). Ophthalmic segment not projecting prominently between bases of eye-stalks. Mandibular palp absent. Raptorial dactylus with 6 teeth (incl. terminal one) (as in *laevis*); propodus without tooth at lower distal corner. Epipods on first 4 thoracic limbs only. Inner margin of bifurcate process of uropod feebly crenulate, distal margin between the spines with 2 rounded lobes; outer margin of basal joint of exopod with 5 (left) or 6 (right) movable spines.

Length 40 mm. Creamy-white, with scattered black chromatophores arranged more or less in longitudinal series on carapace and abdominal segments, but on the latter also transversely; a black median line on rostrum; a line of chromatophores on upper apical margin of 4th joint of 1st leg; one dot in middle of antennal scale, 2 on upper surface of eye-stalk and a third on lower surface; scattered chromatophores on uropods, chiefly along inner margin of 2nd joint of exopod; on telson as in fig. 2, *c*.

Locality.—Delagoa Bay (Dr. C. J. van der Horst, Witwatersrand University, 1939. 1 immature.)

Remarks.—The type and hitherto only known specimen of *hieroglyphica* (♀ 53 mm.) was from an unknown locality, but assumed to be most probably Indo-Pacific. The present specimen agrees more closely with it than with any other species, although it differs in having two features found in *laevis*: the setting of the cornea on the eye-stalk, and the number of teeth on the raptorial dactylus. There are certain other minor differences between it and Kemp's specimen.

Squilla nepa Latr.

Figs. 1, *b*, 2, *a*.

? 1869. Bianconi, Spec. Zool. Mosamb., p. 344. ("*Squilla mantis* Rond."; see note in Kemp, *l. c.*, 1913, p. 205. The date in Kemp's

work is typ. err. Bianconi's work first appeared in Mem. Ac. Bologna, with different pagination.)

1895. Bigelow, Proc. U.S. Nat. Mus., xvii, p. 535, fig. 21.

? 1908. Stebbing, Ann. S. Afr. Mus., vi, p. 44.

? 1910. *Id.*, l. c., p. 405.

1913. Kemp. *l. c.*, pp. 60, 195, pl. 4, fig. 49.

1917. Stebbing, Ann. Durban Mus., ii, p. 28.

1926. Barnard, Trans. Roy. Soc. S. Afr., xiii, p. 121.

1934. Chopra, Rec. Ind. Mus., xxxvi, p. 23.

1941. Holthuis, Temminckia, vi, p. 245 (references).

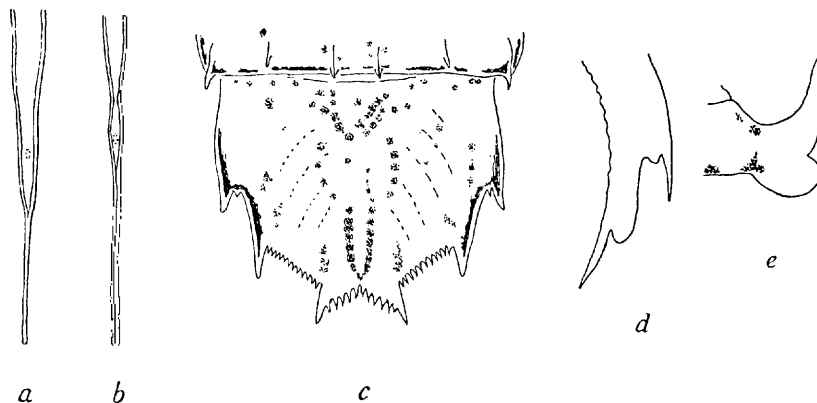


FIG. 2.—*a*, *S. nepa* Latr. and *b*, *S. holoschista* Kemp, median keel in front of cervical groove on carapace. *c*, *S. hieroglyphica* Kemp, telson. *d*, right uropodial process. *e*, right lateral process of 5th thoracic segment.

Rostrum triangular. Cornea of eyes at right angles to peduncle, width less than length of whole organ. Mandibular palp present. Median keel of carapace distinct, bifurcate in front for half or a little more than half its length anterior to the cervical groove. Lateral margins of 5th–7th thoracic segments bilobed, the anterior process on 5th segment acute and curving forwards, the anterior process on 7th segment much smaller than the posterior process. Submedian keels on 4th abdominal segment ending in spines. Telson with median keel ending in a spine which overhangs a blunt tubercle; prelateral tooth present; 3–4 submedian, 7–9 intermediate denticles, 1 lateral one. Epipods on first 4 pairs of thoracic legs only. Raptorial dactylus with 6 teeth including the terminal one, the outer margin sinuous in both sexes.

Length up to 166 mm. A living specimen was pale biscuit-colour,

keels on carapace, abdomen and telson orange-red, distal parts of uropods blackish, outer margin of the exopod bluish.

Localities.—Durban (Stebbing); Delagoa Bay (Barnard).

Distribution.—Indo-Pacific.

Remarks.—As Kemp (p. 61) points out, there is a possibility of confusion with *holoschista* in Stebbing's 1908 record, as at that date the latter species had not been distinguished from *nepa*. The same applies to the 1910 catalogue reference, and probably also to Stebbing's 1917 record.

A Durban specimen in the South African Museum may be this species, but the critical features are damaged.

Squilla holoschista Kemp.

Fig. 2, b.

1911. Kemp, Rec. Ind. Mus., vi, p. 97.

1913. *Id.*, l. c., p. 64, pl. 4, figs. 50–53.

1921. Kemp and Chopra, Rec. Ind. Mus., xxii, p. 301.

1934. Chopra, *ibid.*, xxxvi, p. 23.

1941. Holthuis, Temminckia, vi, p. 246.

Distinguished from *nepa* as follows: the median carina on carapace in front of cervical groove is bifurcate anteriorly for less than a third of its length, and is finely bicarinate (double) throughout the greater part of its length; the submedian keels of the 4th abdominal segment do not end in spines.

Kemp mentions other differences which are more easily appreciated if actual specimens are at hand. The dark patches on the 2nd and 5th abdominal segments, which are frequently found in *nepa*, are always absent in *holoschista*.

Locality.—Off Tugela River mouth, 12–14 fathoms (S. Afr. Mus.).

Distribution.—East coast of India to Ceylon; Sunda Straits.

Remarks.—The single specimen, 60 mm. in length, was taken by the Cape Government trawler s.s. *Pieter Faure* in January 1901.

Squilla investigatoris Lloyd

1907. Lloyd, Rec. Ind. Mus., i, p. 10.

1908. *Id.*, *ibid.*, ii, p. 29, pls. 2, 3.

1913. Kemp, l. c., p. 80, pl. 6, figs. 67, 68.

1921. Kemp and Chopra, l. c., p. 298.

1939. Chopra, John Murray Exp., vi, p. 151, fig. 6 (telson).

Rostrum as long as basal width, lateral margins very slightly

converging to broadly rounded apex. Anterior width of carapace half the median length (excl. rostrum), smooth, anterior half of median keel very feeble or obsolete, 2 feeble ridges near anterior margin. Lateral margin of 5th thoracic segment bilobed, anterior lobe forming an antrorse curved spine, the posterior small, acute. Lateral margin of 6th segment bilobed, anterior lobe acute, much smaller than posterior lobe; anterior lobe of 7th segment also acute, smaller than that of 6th segment; antero-lateral lobe of 8th segment square (not acute). Segments 6-8 with submedian, intermediate and lateral keels, the submedian ones feeble on segment 6, and obsolete on segment 5. Abdominal segments 1-5 with 8 keels, segment 6 with 6; keels ending in spines as described by Kemp. Telson with median keel notched near base, intermediate marginal teeth slightly inturned; (3) 4-5 submedian denticles, 8-11 (12) intermediate, and 1 lateral; prelateral lobe distinct. Post-anal ventral keel not strong, slightly denticulate proximally. Cornea wide, one-third median length of carapace, slightly oblique to axis of stalk. Mandibular palp present. Raptorial dactylus with 11-18 teeth (incl. the terminal one) (S. African specimens). Epipods on first 4 thoracic appendages only. Inner margin of bifurcate process of uropod feebly crenulate, outer margin of the longer spine with one rounded lobe.

Length up to 94 mm. (tip of rostrum to hind margin of telson) (up to 105 mm. Chopra, 1939). Greyish, the keels slightly darker, telson darker brownish, hind margin paler; endopod, bifurcate process, basal joint and proximal half of 2nd joint of exopod dark brownish or blackish, distal half of 2nd joint of exopod (and less noticeably the extreme tip of endopod) pale ochraceous (possibly reddish when alive).

Locality.—North-west of Table Bay (stockfish grounds), 28th December 1944 (Drs. Molteno and Roux, Vitamin Oils Ltd., Cape Town). The skipper of the vessel reported that "during darkness the surface was swarming with them." 3 ♂♂, 5 ♀♀ were preserved.

Distribution.—South coast of Arabia, 110 fathoms; Persian Gulf; Gulf of Aden, 183-220 metres.

Remarks.—These eight specimens have been compared with Kemp's detailed description, and no specific differences can be found. If this really is a case of specific identity, the geographical distribution is remarkable; at least it seems so at present; there is always the possibility of this species being discovered at some intermediate locality.

The remarkable feature of *investigatoris*, as discussed by Lloyd, Kemp, and Chopra, is the variation in the number of teeth on the raptorial claw; in other species of the genus exceptions to the specifically characteristic number are very rare. Chopra, using material from the Indian Museum and the John Murray Expedition, tabulated the variation in 68 claws, and found that the number varied between 10 and 18. In three-quarters of the examples the number ranged between 13 and 16, and a few examples showed asymmetry. Among the 8 South African specimens the ♂♂ are asymmetrical, having 15/16, 17/16, and 18/16 teeth on the left and right dactyli respectively, while all 5 ♀♀ are symmetrical (11, 16, 16, 16, and 17).

Squilla raphidea Latr.

Fig. 1, c, g.

1910. Balss, Abh. Bayer Ak. Wiss., Suppl., Bd. II, p. 8, fig. 2, a-b (and var. *africana*).

1913. Kemp, *l. c.*, p. 88, pl. 7, fig. 77.

1934. Chopra, Rec. Ind. Mus., xxxvi, p. 27.

1939. *Id.*, John Murray Exp., vi, p. 158.

1941. Holthuis, Temminckia, vi, p. 256 (references).

Rostrum rather variable, triangular, tapering to an acute apex, lateral margin thickened and raised. Cornea of eyes at right angles to peduncle, wider than length of whole organ. Mandibular palp present. Lateral margin of carapace with angular lobe in the hinder third of its length. Fifth thoracic segment laterally obtuse; 6th and 7th segments with an acute point on postero-lateral corner. Submedian keels of 5th abdominal segment (if visible) not ending in spines. Telson thick, margins often inflated in large specimens of both sexes, the strong median keel ending in a spine (often worn away), and projecting beyond as a median tubercle on hind margin; 4-6 submedian, 7-13 intermediate denticles, one lateral one. Raptorial dactylus with 8 (rarely 9) teeth including the terminal one. Epipods on first 5 pairs of thoracic legs.

Length up to 335 mm. A narrow blackish transverse line on hind margins of 6th thoracic to 6th abdominal segments inclusive; usually 2 black spots on upper margin of merus of raptorial claw, a spot on either side of propodus at distal end, and a round spot on either side of median keel on telson at base; ends of uropods suffused with black, the black coloration on the 2nd joint of exopod being confined to the inner longitudinal half.

Locality.—Durban (S. Afr. Mus.).

Distribution.—East coast of Africa; Indo-Pacific.

Gen. PSEUDOSQUILLA Dana

1913. Kemp, *l. c.*, p. 94.

1940. Schmitt, Allan Hancock Pac. Exp., v, p. 170.

Carapace with gastric grooves, but cervical groove usually absent, never visible mid-dorsally; antero-lateral angles rounded. Cornea rarely bilobed. Mandibular palp 3- (rarely 2-) jointed. Epipods present on first 5 thoracic limbs. Upper margin of propodus of raptorial claw finely pectinate. First 5 abdominal segments without keels. Ventral process of uropod ending in 2 spines, with or without additional spines on inner margin. Telson with median keel, and 3 pairs of strong marginal teeth, the submedian pair with movable tips.

Key to South African and [Mauritian] Species.

Basal process of uropod ending in 2 large spiniform teeth, its inner margin smooth.

1. Telson with 3 (incl. the marginal) keels on either side of median keel.
 - a. Eyes long, cylindrical, cornea set obliquely. Upper surface of process at base of antenna flat. Inner tooth of uropodal process slightly longer than outer *ciliata*.
 - b. Eyes short, flattened, cornea set transversely. Upper surface of antennal process deeply channeled [*ornata*].
2. Telson with 4 (incl. marginal) keels on either side of median keel [*oculata*].

Pseudosquilla ciliata (Fabr.)

Fig. 3, a.

1869. Clark, Proc. Zool. Soc. Lond., p. 3 (colour, habits, etc.) (*S. stylifera*).

1913. Kemp, *l. c.*, pp. 96, 196 (references).

1926. Barnard, Trans. Roy. Soc. S. Afr., xiii, p. 121.

1926. Hansen, *l. c.*, p. 17.

1931. Bigelow, Bull. Mus. Comp. Zool., lxxii, p. 152, figs. 5, 6 (references).

1934. Chopra, Rec. Ind. Mus., xxxvi, p. 39.

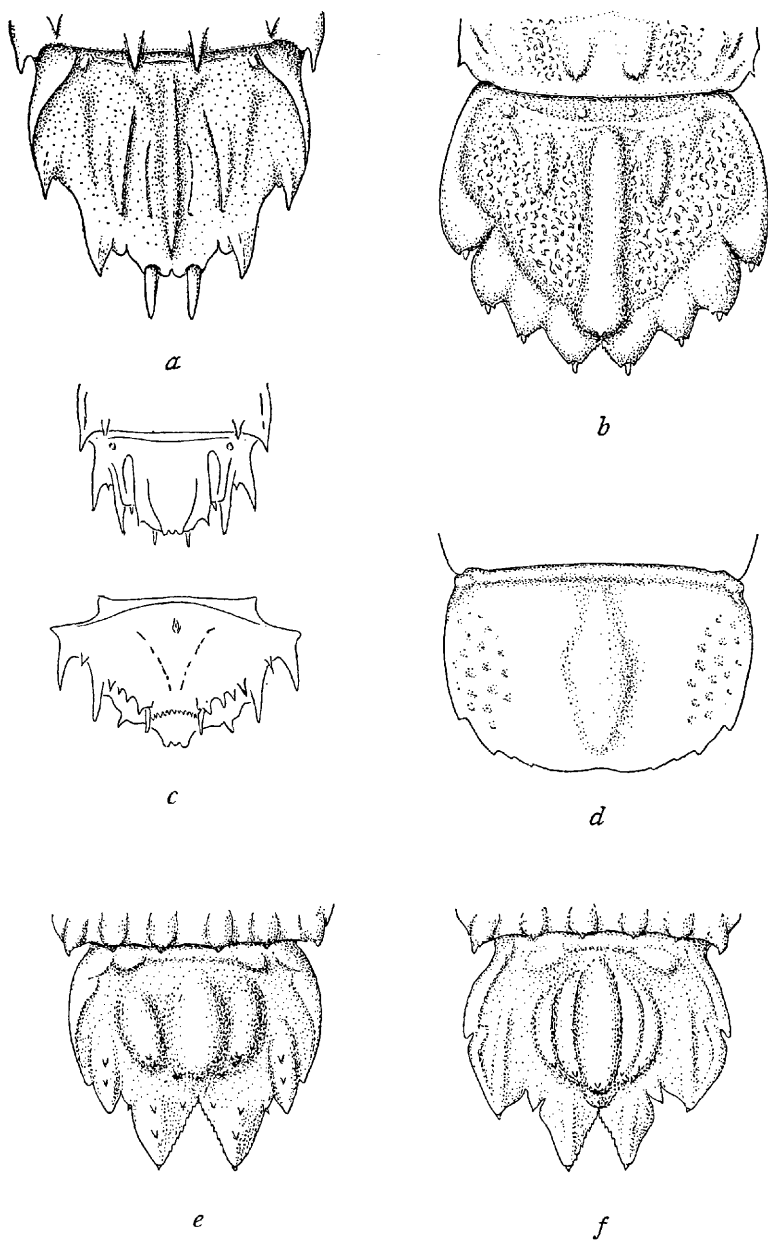


FIG. 3.—*a*, *Pseudosquilla ciliata* (Fabr.), telson. *b*, *Lysiosquilla crassispinosa* Fukuda, telson. *c*, *L. insignis* Kemp, last abdominal segment and telson in dorsal view, and ventral view of telson (after Kemp). *d*, *L. maculata* (Fabr.), telson. *e*, *Gonodactylus demanii* Hend., telson. *f*, *G. glabrous* Brooks, telson.

Larval Form.

1895 Hansen, Plankton Exp., II, G.c., p. 84, pl. 8, figs. 5, 5, *b* (*Pseuderichthus communis*).

1926. *Id.*, *l. c.*, p. 42.

1938. Dollfus, Mem. Inst. d'Egypte, xxxvii, p. 198, fig. 8 (telson).

1939. Chopra, John Murray Exp., vi, p. 160 (*monodactyla* stage).

1939. Foxon, *ibid.*, vi, p. 260.

1941. Holthuis, Zool. Meded., xxiii, p. 35 (references).

1941. *Id.*, Temminckia, vi, p. 261 (references).

Antero-lateral angle of carapace rounded. Rostrum much broader than long, broadly rounded in front. Eyes cylindrical, cornea set very obliquely on, and scarcely wider than, peduncle. Basal joint of antenna with an acute process, flat dorsally, its lower keel concave in lateral view. 5th thoracic segment with deep groove laterally; 6th and 7th thoracic segments laterally rounded-truncate; 8th narrowly rounded, with apical notch. Submedian, intermediate, and lateral keels on 6th abdominal segment ending in spines, the submedian and lateral ones especially strong. Postero-lateral angle of 4th abdominal segment usually not spinous in Indo-Pacific specimens; of 5th segment always ending in a sharp point, with a notch above it. Telson with strong median keel, submedian feeble (especially in juv.), intermediates slightly divergent, laterals oblique; submedian teeth ending in strong movable spines. Raptorial dactylus with 3 teeth including the terminal one.

Length up to 87 mm. Gamboge yellow, uniform, or greenish with a grey medio-dorsal stripe, and sides of carapace and abdomen speckled with grey; a dark spot laterally on 2nd free segment behind carapace, 1st abdominal segment, and at base of telson.

Locality.—Delagoa Bay (Barnard; also Dr. C. J. van der Horst, and Lourenzo Marques Museum).

Distribution.—Red Sea, Indo-Pacific; south-east coast of United States, Bahamas, Bermuda, West Indies, Brazil.

Gen. *LYSIOSQUILLA* Dana

1910. Stebbing, *l. c.*, p. 406.

1913. Kemp, *l. c.*, p. 109.

1926. Hansen, *l. c.*, p. 18.

1937. Gurney, Proc. Zool. Soc. Lond., ser. B, pp. 323-326, figs. (larval stages).

1940. Schmitt, Allan Hancock Pac. Exp., v, p. 184 (Key to Pacific American species).

Carapace with gastric grooves, but cervical groove absent (or scarcely traceable); without longitudinal keels; antero-lateral angles rounded. Cornea either small or considerably expanded. Mandibular palp 3-jointed. Epipods on first 5 thoracic limbs. Thoracic and abdominal segments depressed, without keels. Ventral process of uropod with 2 large spines, the inner longer than the outer. Telson with hind margin either nearly smooth with small blunt teeth, or with large sharp spines.

Key to the South African Species.

1. Upper margin of propodus of raptorial claw with close-set and even pectination, no long spines (except the 4 movable ones at base). Cornea bilobed.
 - a. Telson dorsally smooth, without strong marginal teeth.
 - i. Raptorial claw with 9-11 teeth including the terminal one. Body with black cross-bands *maculata.*
 - ii. Raptorial claw with 15-16 teeth including the terminal one. No cross-bands *capensis.*
 - b. Telson with dorsal keels, and a median lobe, 2 pairs of strong marginal teeth *insignis.*
2. Upper margin of propodus of raptorial claw with numerous spinules not closely set, and with 10 or more stiff spines. Cornea subglobular *crassispinosa.*

Lysiosquilla maculata (Fabr.)

Fig. 3, *d.*

1902. de Man, Abh. Senckenb. Ges., xxv, p. 910.

1910. Stebbing, *l. c.*, 406.

1913. Kemp, *l. c.*, p. 111, pl. 8, figs. 86-91.

1931.* Bigelow, Bull. Mus. Comp. Zool., lxxii, p. 169, fig. 9.

1934. Chopra, Rec. Ind. Mus., xxxvi, p. 28.

1939. *Id.*, John Murray Exp., vi, p. 161.

* Quoted throughout Chopra's 1934 paper as issued in "1932." Part 4 of vol. 72, Bull. Mus. Comp. Zool., bears date "September 1931."

Larval Form.

Fig. 4, c, d.

1895. Hansen, Plankton Exp., II, G.c., pp. 65, 74 (*Lysierichthus duvaucellii*).

1904. Jurich, Wiss. Erg. D. Tiefsee Exp., vii, p. 393, pl. 26 (2), fig. 7.

1910. Stebbing, *l. c.*, p. 408.

1926. Hansen, *l. c.*, p. 40.

1939. Chopra, John Murray Exp., vi, p. 161.

1939. Foxon, *ibid.*, p. 261.

1940. Schmitt, *l. c.*, p. 190, fig. 21.

1941. Armstrong, Amer. Mus. Novit., no. 1137, p. 14.

1941. Holthuis, Temminckia, vi, p. 269, fig. 5 (abnormal carapace) (references).

Rostrum cordiform, usually widest just in front of its base, sides sinuous, apex more or less acute. Cornea as wide as whole length of ocular organ, very oblique. Ocular segment with a pair of blunt lobes upstanding one on either side of rostral point, and a ventral keel ending in a sharp point anteriorly. Shorter ramus of the last 3 pairs of thoracic legs linear. Telson broader than long, a feeble medio-dorsal swelling, laterally with large shallow foveoles or pits, postero-lateral margin with 2, 3, or more usually 4 small blunt lobes (sharper in juv. than adult). Ventral process of uropod with the inner spine much longer than the outer.

Length up to 300 mm. Whole body with black or bluish-black cross-bands, the bands usually broad, but somewhat variable; bands usually remain distinct in spirit specimens for a long time.

Localities.—Durban (Stebbing); Natal coast, and Delagoa Bay (S. Afr. Mus.); *L. duvaucellii*, Bathurst coast (S. Afr. Mus.).

Distribution.—Indo-Pacific to Equador. West Indies (but see footnote by Kemp, *l. c.*, p. 116, also Schmitt, *l. c.*, p. 191).

Remarks.—Armstrong records a ♂ (155 mm.) taken at surface near a submerged light at 8 p.m. at Penrhyn Island (Central Pacific).

Lysiosquilla capensis Hansen

1895. Hansen, *l. c.*, p. 74.

1910. Stebbing, *l. c.*, p. 406.

1913. Kemp, *l. c.*, p. 117.

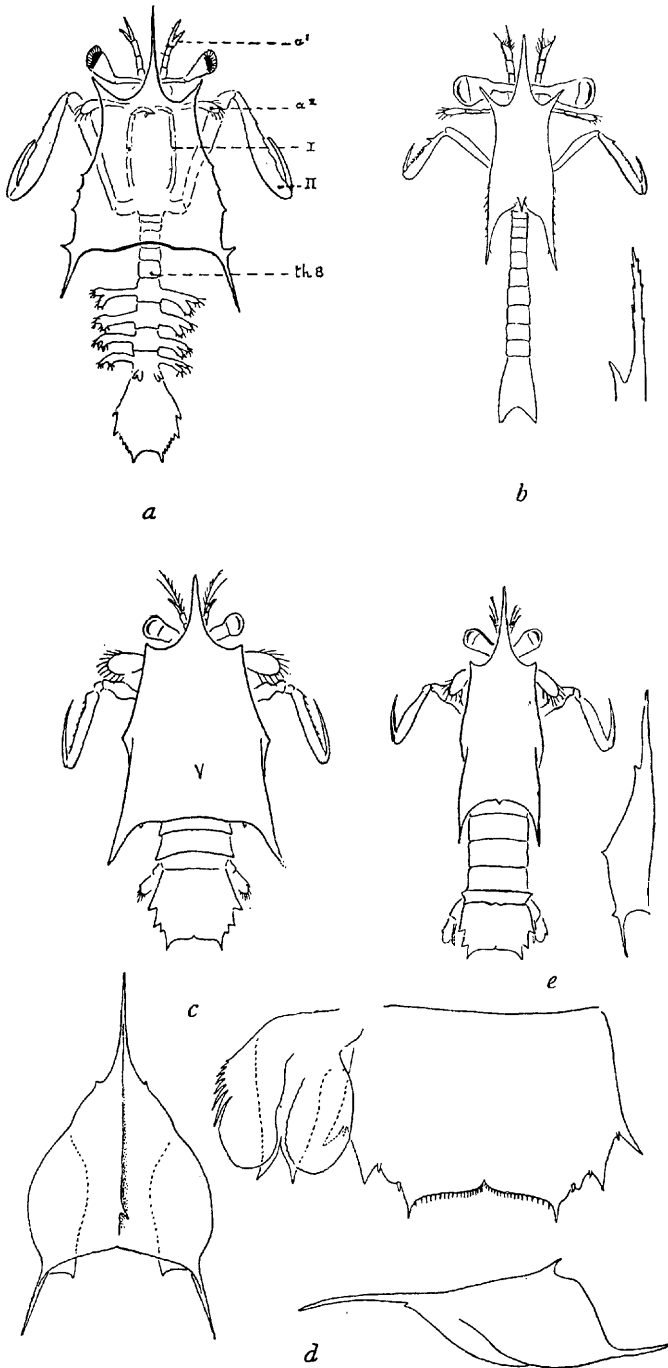


FIG. 4.—*a*, *Alima*. *b*, *Alima paradoxa* Jurich, Agulhas Bank, 57 mm. *c*, *Lysierichthys duvaucellii* (Guerin), median length of carapace 85 mm. *d*, *L. duvaucellii*, specimen in South African Museum, median length of carapace 28 mm., with lateral view of carapace, telson and uropod. *e*, *L. pulcher* Hansen, median length of carapace 15 mm., with lateral view of carapace.

(*a*, after Calman; *b*, *c*, *e*, after Jurich.)

Larval Form.

Fig. 4, e.

1895. Hansen, *l. c.*, p. 74 (*Lysierichthus pulcher*, sine descr.).

1904. Jurich, *Wiss. Erg. D. Tiefsee Exp.*, vii, p. 390, pl. 29 (5), figs. 2, 2, a, b.

1910. Stebbing, *l. c.*, p. 409.

Rostrum cordiform, as wide as median length, the sinuous margins converging to a sharp median point in front, dorsally smooth. Cornea as wide as whole length of ocular organ. Ocular segment with a pair of sharp, forwardly directed spines (very similar to those in *S. armata*), and a ventral keel ending in a sharp point anteriorly and posteriorly. Three soft, pointed, subequal papillae on basal joint of antenna (as in *maculata*). Shorter ramus of last 3 pairs of thoracic legs narrow-oval (length nearly thrice width). Postero-lateral angles of abdominal segments rounded. Telson twice as wide as median length, similar to that of *maculata*, dorsally very convex, with very slight triangular swelling medianly and very shallow foveoles laterally, outermost 2 teeth distinct and sharply pointed. Ventral process of uropod with inner spine considerably longer than outer one.

Length up to 96 mm. As preserved uniform buff or pinkish, without any trace of cross-bands.

Localities.—Port Elizabeth (Hansen); False Bay and Agulhas Bank to Algoa Bay, 10–48 fathoms (S. Afr. Mus.).

Remarks.—All the smaller examples (40–51 mm.) have a distinct tooth or a small denticle at the base of the raptorial claw, making the total number of teeth 16. In the largest specimen (96 mm.) the rostrum is semicircular, twice as wide at base as median length, without any median point; although showing no sign of injury, it would appear to be abnormal; Hansen would certainly have noticed and mentioned it if the type specimen had a semicircular rostrum.

Genital opening ♀ as in *maculata*; a short more or less sharp median longitudinal ridge on sternum of 8th thoracic segment in both sexes, and no spinous process on hind margin of sternum of 6th segment.

Lysiosquilla insignis Kemp

Fig. 3, c.

1911. Kemp, *Rec. Ind. Mus.*, vi, p. 94.

1913. *Id.*, *l. c.*, p. 126, pl. 9, figs. 99–102.

1929. Gordon, *Ann. Mag. Nat. Hist.* (10), iv, p. 462.

Rostrum narrowly triangular, the feebly sinuous margins converging to a very finely pointed apex. Cornea oblique, width about equal to length of whole eye. Raptorial claw with 7-8 teeth, including the terminal one, the penultimate tooth distinctly shorter than the antepenultimate, outer margin with an acute tooth at base; propodus with 4 movable spines on inner (upper) edge. Shorter ramus of 6th thoracic limb broadly oval, those of 7th and 8th limbs successively narrower. Postero-lateral angles of abdominal segments 4-6 acute. Telson not quite twice as broad as long, with 4 pairs of keels, the outermost pair bifurcated proximally; a trilobed median prominence, a sharp intermediate spine and an angular lateral lobe, connected by a sharp transverse ridge; on the margin the intermediate and lateral teeth very large, 2 movable submedian spines, and between the latter 6 pairs of denticles; 4 short spines between the movable one and the intermediate tooth, and one between the latter and the lateral tooth. Ventral process of uropod with outer spine not much shorter than the inner one.

Length up to 52 mm.

Locality.—North of Durban, 150 fathoms (Gordon).

Distribution.—Andaman Is., 235 fathoms.

Remarks.—Besides the type only the single Natal specimen is known. Both are males.

Lysiosquilla crassispinosa Fukuda

Fig. 3, b.

1910. Fukuda, Annot. Zool. Jap., vii, p. 146, pl. 4, figs. 4, 4, a.

1913. Kemp, *l. c.*, p. 117.

1927. Komai, Mem. Coll. Sci. Kyoto Univ., B, iii, p. 331.

1929. Gordon, Ann. Mag. Nat. Hist. (10), iv, p. 462, figs. 1, 2.

1932. von Bonde, Fish. Mar. Biol. Surv., Rep. 9, p. 62 (locality record).

Rostrum triangular, median length greater than basal width, sinuous margins converging to a long slender apical point, dorsal surface medianly concave. Cornea subglobular, oblique, width subequal to length of outer margin of peduncle. Ocular segment without dorsal spines, ventrally with a (subacute) spinous process. No papillae on basal joint of antenna. Propodus of raptorial claw with numerous spinules on upper outer edge, each pair separated by a distance

about equal to the length of the spinules; on inner edge 3 movable spines and a jointed, but immovable, one proximally, followed by 9-10 (or more) stiff upstanding immovable spines; lower distal corner of propodus with a subacute denticle; dactylus with (10) 11 teeth including the terminal one (the proximal one being very small in the ♂ specimen). Shorter ramus of last 3 pairs of thoracic legs linear. Postero-lateral angles of all abdominal segments with sharp points. A prominent spine on the hind margins of the sterna of 8th thoracic and 1st-5th abdominal segments in male. Ventral process of uropod with inner spine much longer than outer. Telson, see fig. 3, *b*.

Length up to 297 mm.

Localities.—North of Durban, 150 fathoms (Gordon); off Durban (Fish. Surv. St., 67 A, 29° 42' S., 31° 29' E.), 132 fathoms (S. Afr. Mus. don. Fish. Survey).

Distribution.—Japan.

Remarks.—The specimen (245 mm.) in the South African Museum is a ♂, both the type (297 mm.) and the Natal specimen (200 mm.) being females.

The "jointed" spines on the propodus of raptorial claw are jointed in the sense that they are not non-articulated spinous projections of the integument; they are not, however, movable like the large proximal spines, though possibly they may be in young specimens.

The South African Museum specimen has several sessile catenulate Polyzooan colonies on the telson and 6th abdominal segment.

Gen. GONODACTYLUS Latr.

1910. Stebbing, *l. c.*, p. 406.

1913. Kemp, *l. c.*, p. 145.

1923. Odhner, *Medd. Göteb. Mus.*, xxx, pp. 8 *sqq.*

1926. Hansen, *l. c.*, p. 24, and (larval stages), p. 46.

1940. Schmitt, *Allan Hancock Pac. Exp.*, v, p. 208 (key to Pacific American species).

Carapace without longitudinal keels, cervical groove completely absent. Cornea of eyes sometimes indistinctly bilobed. Mandibular palp present (2- or 3-jointed) or absent. Epipods present on all of the 1st-5th thoracic legs. Ventral process of uropod ending in 2 spines, the inner usually shorter than the outer. Telson with variable sculpturing.

Key to the South African Species.

1. Median portion of telson with 3 longitudinal keels.
 - a. Median keel on telson not very strongly arched. No spinules on dorsal surface of telson *chiragra*.
 - b. Median keel very strongly arched. Dorsal surface with spinules *demanii*.
2. Median portion of telson with 5 longitudinal keels *glabrous*.

Gonodactylus chiragra (Fabr.)

1878. Hilgendorf, M.B. Ak. Wiss. Berlin, p. 846.
 1902. de Man, Abh. Senckenb. Ges., xxv, p. 912 (with vars.).
 1903. Lanchester, Fauna Geogr. Mald. Laccad. Archip., i, p. 445, pl. 23, figs. 1-5, 10, 11, 13, 14 (part: varieties).
 1910. Stebbing, *l. c.*, p. 406.
 1913. Kemp, *l. c.*, p. 155, pl. 9, fig. 107, and text-figs. 1, 2.
 1916. Shelford, Naturalist in Borneo, p. 302 (habits).
 1917. Stebbing, Ann. Durban Mus., ii, p. 28.*
 1923. Odhner, *l. c.*, p. 8.
 1926. Hansen, *l. c.*, p. 24.
 1931. Bigelow, Bull. Mus. Comp. Zool., lxxii, pp. 107 *sqq.*, pl. 2, fig. 1.
 1938. Gravier, Mem. Inst. d'Egypte, xxxvii, p. 178.
 1938. Dollfus, *ibid.*, p. 205, figs. 14, 15 (telson).
 1939. Chopra, John Murray Exp. Rep., vi, p. 179.
 1941. Holthuis, Temminckia, vi, p. 277, fig. 7 (abnormal telson) (references).

Antero-lateral angles of carapace in advance of base of rostrum, which has its antero-lateral angles subacutely rounded, and a stout median spine. On the ocular segment 2 large subtriangular processes separated distally by a narrow cleft. Propodus of raptorial claw with a single movable spine at base of inner (upper) edge. 2nd-5th abdominal segments quite smooth, without any pits. Outer spine of ventral process of uropod without a tooth or lobe on its inner margin. Inner ramus of uropod narrow-oval, with fringe of plumose setae around whole margin.

Length up to 105 mm. Colour variable: greenish, yellowish, pinkish, buff, etc. (see also Stebbing, 1917).

Localities.—Durban, Natal (Krauss, Stebbing); Mozambique

* The reference to Kemp is wrongly given as "Trans. Linn. Soc. Lond." instead of "Mem. Ind. Mus."

(Hilgendorf); St. Lucia Bay (S. Afr. Mus.); Umtwalumi, Natal (Professor Stephenson, 1938; specimen seen by me).

Distribution.—Mauritius, Zanzibar, Madagascar, Gulf of Suez, Indo-Pacific, Australia.

Remarks.—Stebbing (1910) remarks that Krauss' form seems to correspond best with Lanchester's var. *tumidus* (*l. c.*, fig. 1), which according to Bigelow (1931, *l. c.*, pp. 110, 111) is identical with var. *platysoma* Wood-Mason.

Since Krauss' time the only records of this species in South African waters are Stebbing's 1917 record, the St. Lucia Bay specimen, and the specimen taken by Professor Stephenson.

Gonodactylus demanii Henderson

Fig. 3, *e*.

1893. Henderson, Trans. Linn. Soc. Lond., zool. 2, v, p. 455, pl. 40, figs. 23, 24.

1913. Kemp, *l. c.*, p. 164, pl. 9, figs. 108–111 (*demani*), with vars. *spinosus* Big. and *espinosus* Borrard.

1921. Tattersall, J. Linn. Soc. Lond., zool., xxxiv, p. 359.

1921. Kemp and Chopra, Rec. Ind. Mus., xxii, p. 309.

1926. Hansen, *l. c.*, p. 26 (as var. of *chiragra*).

1938. Dollfus, Mem. Inst. d'Egypte, xxxvii, p. 213, fig. 16 (*demani*, telson), and fig. 17 (var. *spinosus*, telson).

1939. Chopra, John Murray Exp., vi, p. 172 (*demani* var. *spinosus*) and p. 176 (var. ? *espinosus*).

1941. Holthuis, Temminckia, vi, p. 282, fig. 8 (telson vars.) (references).

Distinguished from *chiragra* by the very small dorsal processes on the ocular segment, the very strongly convex median keel of telson, all the keels on telson being much more swollen and not separated by smooth interspaces, and the presence of small spinules or tubercles in varying number on the telson.

Length up to 40 mm.

Localities.—Mozambique Island (Barnard coll. 1912); Delagoa Bay (Lourenzo Marques Mus.).

Distribution.—Ibo, Portuguese East Africa (Kemp), Zanzibar, Red Sea, Indian Seas, East Indies.

Remarks.—In the Mozambique specimen the inner margin of inner ramus of uropod possesses a fringe of setae, thus agreeing with Kemp's

specimen from Ibo; it also confirms Kemp and Chopra's remarks that this form usually has only a few spinules on the telson. In the typical form as figured by Henderson the inner ramus of uropod has no setae on inner margin.

Hansen, after a lengthy discussion, regards *demanii* as a variety of *chiragra*.

Gonodactylus glabrous Brooks

Fig. 3, f.

1886. Brooks, *Challenger* Rep., xvi, p. 62, pl. 14, fig. 5, pl. 15, figs. 7 and 9.

1902. de Man, *Abh. Senckenb. Ges.*, xxv, p. 913, pl. 27, fig. 67.

1903. Lanchester, *Fauna Geog. Mald. Laccad. Archip.*, i, p. 448, pl. 23, figs. 8, 9, 15 (as var. of *chiragra*).

1913. Kemp, *l. c.*, p. 167, pl. 9, fig. 113, and text-fig. 2 on p. 170.

1923. Odhner, *l. c.*, p. 8.

1926. Barnard, *Trans. Roy. Soc. S. Afr.*, xiii, p. 121.

1926. Hansen, *l. c.*, p. 29.

1931. Bigelow, *Bull. Mus. Comp. Zool.*, lxxii, p. 127, fig. 1.

1934. Chopra, *Rec. Ind. Mus.*, xxxvi, p. 40.

1937. Gurney, *Proc. Zool. Soc. Lond.*, ser. B, p. 321, pl. 1, figs. 1-16, pl. 2, figs. 17-26 (larval stages).

1938. Gravier, *Mem. Inst. d'Egypte*, xxxvii, p. 179, figs. D (telson) and 5.

1938. Dollfus, *ibid.*, p. 217, figs. 18, 19 (telson) (*glaber*).

1941. Holthuis, *Temminckia*, vi, p. 284, fig. 9, a (abnormal telson) (references) (*falcatus* Forsk.).

Distinguished from *chiragra* and *demanii* by the 5 keels in the middle of the telson, the absence of the movable spine at base of propodus of the raptorial claw, and the presence of a distinct pit on the sides (dorso-laterally) of each of 2nd-5th abdominal segments, and a small lobe at base of inner margin of outer spine of the ventral uropodial process. The processes on the ocular segment are longer than in *demanii* and much narrower than in *chiragra*.

Length up to 78 mm. Various shades of green or blue-green, uniform or mottled with darker patches on abdomen.

Locality.—Delagoa Bay (Barnard; also coll. Dr. C. J. van der Horst, and Lourenzo Marques Mus.).

Distribution.—Ibo, Portuguese East Africa (Kemp); east coast of Africa, Red Sea, Indo-Pacific, Australia.

Larval Forms.

1886. Brooks, *Challenger Rep.*, xvi, pp. 15-20, 81-114.
 1895. Bigelow, Proc. U.S. Nat. Mus., xvii, p. 543 (key to larvae).
 1904. Jurich, *Wiss. Erg. D. Tiefsee Exp.*, vii, pp. 377 *sqq.*
 1910. Giesbrecht, *Fauna Flora Golf. Neapol.*, xxxiii, pp. 47-231.
 1910. Stebbing, *l. c.*, p. 407.
 1926. Hansen, *l. c.*, p. 39.
 1932. Foxon, *Gr. Barrier Reef Exp.*, iv, p. 375.
 1937. Gurney, *Proc. Zool. Soc. Lond.*, ser. B, cvii, p. 319, pls. 1-8.
 1939. Foxon, *John Murray Exp.*, vi, p. 251 (key to adults and larvae).

The larvae are hatched at a stage later than the *Nauplius*. The pelagic larval stages are of considerable duration.

As there is no adequate material in the South African Museum, and as no special studies have been made on the pelagic stages in South African waters, it will suffice to refer to Stebbing's 1910 list of records, adding to his bibliography Bigelow's 1895 paper (containing the key incorporated below), Jurich, 1904; Hansen, 1926; Foxon, 1932 and 1939; Gurney, 1937; and also one species which Stebbing omitted.

Key to Larval Stages (after Bigelow).

1. Telson with 4 or more spines (denticles) between the 2nd lateral tooth and the postero-lateral corner (fig. 4, a) *Alima*, larva of *Squilla*.
2. Telson with only 1 spine in the above-mentioned position (fig. 4, c).
 - a. Body short, carapace wide with prominent ventral angles, the postero-lateral angles widely separated from the middle line . . . *Lysierichthus*, larva of *Lysiosquilla*.
 - b. Carapace without prominent ventral angles.
 - i. Abdomen very long, telson longer than wide. Carapace short and narrow, rostrum and postero-lateral angles short . *Pseuderichthus*, larva of *Pseudosquilla*.
 - ii. Postero-lateral angles of carapace long . . . *Gonerichthus*, larva of *Gonodactylis*.

Alima paradoxa Jurich

Fig. 4, b.

1904. Jurich, *l. c.*, p. 387, pl. 27 (3), figs. 2, 2, a, b.
 Shallow water, northern part of Agulhas Bank, St. 93 [*sic*, probably should be St. 96].

The *ANNALS OF THE SOUTH AFRICAN MUSEUM* are issued in parts at irregular intervals as material becomes available. As far as possible each volume is devoted exclusively to a particular subject (Zoology, Botany, etc.). Two or more volumes may be in course of publication concurrently.

Most of the Geological and Palaeontological papers are issued in conjunction with the Geological Survey of the Union of South Africa.

Some volumes and parts are out of print, and others are only sold as parts of a set, or volume, respectively.

Out of print: Vols. I, II, VII (Part 2), VIII, IX (Part 1).

Vol.			£	s.	d.
III.	1903-1905	Zoology	1	12	6
IV.	1903-1908	Palaeontology	2	10	6
V.	1906-1910	Geology, Palaeontology, Zoology, Anthropology	1	17	6
VI.	1908-1910	Zoology	2	13	0
VII.	1908-1913	Palaeontology (excl. Part 2)	1	4	6
IX.	1911-1918	Botany (excl. Part 1)	2	7	0
X.	1911-1914	Zoology	4	0	6
XI.	1911-1918	Zoology	2	11	6
XII.	1913-1924	Palaeontology and Geology	4	1	0
XIII.	1913-1923	Archaeology and Zoology	2	19	0
XIV.	1915-1924	Zoology	2	15	6
XV.	1914-1916	Zoology	3	11	0
XVI.	1917-1933	Botany	2	19	6
XVII.	1917-1920	Zoology	2	18	6
XVIII.	1921	Zoology	3	11	6
XIX.	1924-1925	Zoology	2	16	0
XX.	1924-1926	Zoology	2	3	6
XXI.	1925-1927	Zoology	2	15	0
XXII.	1925-1928	Palaeontology	1	13	6
XXIII.	1925-1926	Zoology	1	9	6
XXIV.	1929-1938	Anthropology and Ethnology	2	4	0
XXV.	1927-1928	Zoology	1	12	6
XXVI.	1928	Zoology	1	5	0
XXVII.	1929	Anthropology	1	5	0
XXVIII.	1929-1932	Palaeontology	2	3	6
XXIX.	1929-1931	Zoology	2	0	0
XXX.	1931-1935	Zoology	3	1	6
INDEX of papers, authors, and subjects, published in Vols. I-XXX			0	1	6
XXXI.	1934	Palaeontology. Part 1, 20/-; Part 2, 13/6; Part 3	0	17	6
XXXII.	1935-1940	Zoology	2	18	0
XXXIII.	1939	Zoology Part 1	1	15	0
XXXIV.	1938	Zoology	2	0	0
XXXV.	Reserved for conclusion of monograph in Vol. XXXIV.				
XXXVI.	1942-1947	Zoology	2	11	0
XXXVII.	1947-	Archaeology Part 1	1	6	0
XXXVIII.	1950	Zoology	3	15	0

Copies may be obtained from—

MESSRS. WHELDON & WESLEY, LTD.,

2, 3, and 4 ARTHUR STREET, NEW OXFORD STREET, LONDON, W.C. 2; or,

The LIBRARIAN, SOUTH AFRICAN MUSEUM, CAPE TOWN.

Except the Geological and Palaeontological parts which are obtainable from the GOVERNMENT PRINTER, PRETORIA.

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 01206 5728