

Fig. 70. *Apseudella typica* n.gen., n.sp., ♂; a, last four pereopods and pleon, ventral view ($\times 27$); b, pleon, dorsal view ($\times 43$); c, antennula, ventral view ($\times 58$); d, antenna, ventral view ($\times 58$), detail ($\times 200$); e, labrum rostral view ($\times 145$).

the proximal third of the second joint of the six-jointed flagellum and it bears two terminal setae.

Labrum (Fig. 70e) with the basal part laterally set with long hairs and some rows of diminutive hairs; front margin of terminal part somewhat incurved in the middle part.

Mandibles (Fig. 71a-f) strongly calcified, partly hairy on the surface and finely crenated on the outer surface above the palp. Processus molaris straight

inwards-directed, subcylindrical with the distal part bent downwards and partly set with fine hairs. Pars incisiva of either mandible five-dentate. Lacinia mobilis of left mandible seven-dentate. Pars incisiva and lacinia horny, yellowish brown. The spiniferous lobe of either mandible is set with one spiniform seta and a number of forked spines arranged as shown in the figures.

Labium (Fig. 71g) with one group of long and one



Fig. 71. *Apseudella typica* n.gen., n.sp., ♂; a-b, right and left mandibles, oblique internal and oblique external view ($\times 92$); c-d, distal part of same ($\times 363$); e-f, distal part of processus molaris of same ($\times 175$); g, left side of labium, caudal view ($\times 145$), seta ($\times 290$); h, maxillula, caudal view ($\times 118$); i-j, distal end of outer and inner endites of same ($\times 320$).

group of diminutive hairs on the caudal surface near the anterior margin. The ovate lobes are for the greater part margined with long hairs and at the tip set with a single spiniform seta, the outer margin of which is finely ciliated.

Maxillula (Fig. 71h-j). The endites are set with hairs as in Fig. 71h. Caudal setae on outer endite

one-sidedly serrated. The inner endite has a rounded dentiform projection near the middle of the outer margin, and the inner margin bears a strong spiniform and one-sidedly hairy seta in the proximal part; the terminal setae are plumose along the distal half.

Maxilla (Fig. 72a-c) broadly lamellar with groups



Fig 72. *Apseudella typica* n.gen., n.sp., ♂; a, right maxilla, caudal view ($\times 205$); b-c, fixed endite of right and left maxillae, caudal and rostral views ($\times 425$); d, maxilliped, caudal view ($\times 112$); e, endite of same, caudal view ($\times 245$); f, epignath ($\times 245$).

of spinules on the caudal surface. Setae of inner row bare and simple at the tip. The outer row numbers eight spiniform plumose setae. Fixed endite hairy on the outer margin and set with two strong, palm-leaf-like spines on the caudal surface; the distal margin of either endite bears five cylindrical bare setae and three strong forked spines, the one of the

right maxilla moreover an inner strong, hairy and pectinate spine. Outer lobe of movable endite with five setae, inner lobe with eight setae, shaped as in Fig. 72a; outer and inner margins partly hairy.

Maxilliped (Fig. 72d-f). Coxa and basis bare. The first joint of the palp has a very long seta near the inner distal end. The two succeeding joints are



Fig. 73. *Apseudella typica* n.gen., n.sp., ♂; a, cheliped, rostral view ($\times 122$); b, part of the finger of same, rostral view ($\times 130$); c-e, peracopods II-IV, caudal view ($\times 47$); f-g, distal part of carpus and propus of peracopods III and IV, rostral view ($\times 80$).

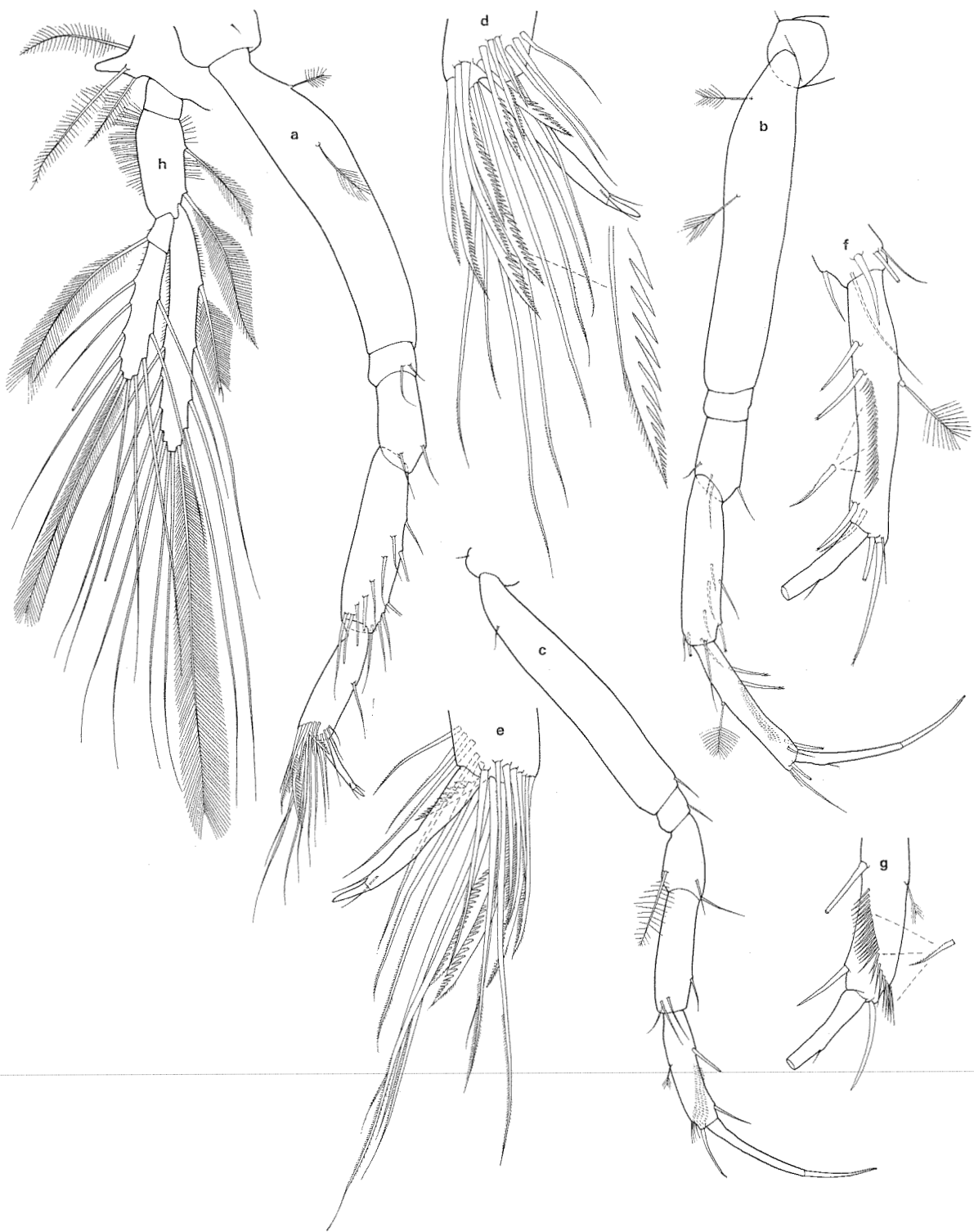


Fig. 74. *Apseudella typica* n.gen., n.sp., ♂; a, peraeopod V, caudal view ($\times 47$); b-c, peraeopods VI-VII, rostral view ($\times 47$); d-e, distal end of propus and dactylus of peraeopod V, caudal and rostral views ($\times 117$), spine ($\times 320$); f, distal end of carpus and propus of peraeopod VI, caudal view ($\times 80$), spine ($\times 160$); g, distal part of propus of peraeopod VII, caudal view ($\times 80$), spine ($\times 160$); h, pleopod I, rostral view ($\times 64$).

furnished with eighteen and six inner bare setae, respectively, and the last joint with eight distal setae, the next to the outermost of which is very short. Each endite with three couplers and with two long slender caudal setae; median vertical surface with ten plumose setae on the free margin; distal margin with eleven chitinous formations, shaped as in Fig. 72e; outer margin with a short row of long hairs. Epignath (Fig. 72f) heavily long-haired with an oval lobe in front, partly set with long hairs.

Cheliped (Fig. 73a-b) rather short and robust. Basis somewhat longer than carpus, fully twice as long as broad, narrowed at the base; tergal surface somewhat concave; sternal surface strongly convex without spines or spiniform processes; rostral surface with some bare setae, tergal and sternal surfaces with a number of plumose setae (the number of setae on basis, carpus and propus is different on the two chelipeds). Exopodite with three plumose setae. Merus short with one plumose rostral seta and with four juxtaposed plumose sternal setae. Carpus shorter than propus, without spines or spiniform processes but with numerous setae arranged as shown in Fig. 73a. Propus very broad and richly set with setae; tergal surface strongly convex, sternal surface almost straight; finger very broad and somewhat longer than the rest of the joint with the distal tergal half strongly sloping; it is armed as shown in the figures. Dactylus with three juxtaposed rostral setae; terminal claw about 1.3 times longer than that of fixed finger.

Peraeopod II (Fig. 73c). Basis about as long as merus and carpus together. Exopodite with four plumose setae. Ischium very short. Merus a little longer than carpus, with one spine at the distal sternal end. Carpus about 1.4 times longer than propus with three sternal spines, and with one distal tergal spine. Propus with four sternal and three tergal spines. Dactylus with claw about as long as propus; dactylus with a sternal dentiform process in the middle; claw about 0.4 times as long as dactylus.

Peraeopods III-IV (Fig. 73d-g) very alike. Basis about 1.25 times longer than the three succeeding joints combined. Ischium about 0.4 times as long as merus which is about as long as carpus. Propus about as long as carpus, with one short tergal particular seta in about the middle. Dactylus with claw longer than propus; claw shorter than dactylus.

Peraeopod V (Fig. 74a, and d-e). The combined length of the first five joints is longer than in peraeopods III and IV. Basis about 0.9 times as long as

the four succeeding joints combined, set with at least two particular setae. Ischium short. Merus about half as long as carpus. Propus about 0.7 times as long as carpus, without particular seta; distal end surrounded with numerous setae, some of which are more or less serrated on the sternal margin and ciliated in the most distal part of the tergal margin. Dactylus with claw much shorter than propus; claw very short, being about 0.2 times as long as dactylus.

Peraeopods VI-VII (Fig. 74b-c, and f-g) differ from each other mainly in the following respects. Peraeopod VI is much longer owing to the greater length of basis, carpus and propus. Basis of peraeopod VI with particular setae. The tergal particular seta on the propus is much longer in peraeopod VI than in peraeopod VII, the row of spines on the caudal surface runs on peraeopod VII to the distal tergal end, on peraeopod VI not, and the distal end of peraeopod VI has more setae and spines than peraeopod VII. Dactylus with claw longer than propus; claw about 0.7 times as long as dactylus.

Pleopods (Fig. 74h) with short, bare coxa. Basis 3 times longer than coxa and about twice as long as broad, laterally set with hairs and with two inner plumose setae. Exopodite shorter than endopodite and distinctly two-jointed; both rami set with long, plumose marginal setae; inner proximal seta of endopodite bifid at the tip.

Uropod with rather long subcylindrical peduncle, about four times longer than the greatest width. Exopodite three-jointed, first two joints short, a little longer than broad, last joint about three times longer than the second. Endopodite lost.

Sphyrapus Norman & Stebbing, 1886

Sphyrapus Norman & Stebbing, 1886, p. 97.

Generotype: *Sphyrapus malleolus* Norman & Stebbing, 1886, p. 98, pl. XXIII, figs. II-III.

Remarks:

As has already been pointed out (see p. 27), *Sphyrapus stebbingi*, Richardson (1911, p. 518) does not belong to the present genus.

Diagnosis:

Pleon with five pleonites. Carapace without spiniform process in front of the respiratory chambers. Rostrum broad, rounded, exerted at the end to a short point. Ocular lobes well defined, small, not extended anteriorly, without visual elements. First peduncular joint of antennulae rather large

and flattened; flagellae short. Antennae without squama. Maxillulae with two-jointed palp. Epignath of maxillipeds a large, vaulted plate. Chelipeds and peraeopods II with exopodite. Peraeopods II fossorial; coxa very small, not extended as a spiniform process; carpus at least as long as merus. Pleotelson and mandibles without sexual dimorphism.

Species:

- S. anomalus* (G. O. Sars), 1869, p. 394.
S. dispar n.sp. (see below).
S. malleolus (see above).
S. serratus G. O. Sars, 1882b, p. 20; 1885, p. 66, pl. XXI.
S. tudes Norman & Stebbing, 1886, p. 99, pl. XXII, fig. I.

Key to the species

1. Pleonite 2 with a large spiniform process on each side *S. malleolus* Norman & Stebbing
Pleonite 2 laterally shaped as the other peraeonites 2
2. Posterior part of pleotelson running out into a long narrow point . . *S. tudes* Norman & Stebbing
Posterior part of pleotelson almost evenly rounded behind 3
3. Pleonites with projecting, triangular, acuminate epimera *S. anomalus* (G. O. Sars)
Pleonites with convex epimera 4
4. Rostrum acute at the tip. Antenna with inner seta on second peduncular joint . . . *S. dispar* n.sp.
Rostrum four-toothed at the tip. Antenna without inner seta on second peduncular joint *S. serratus* G. O. Sars

Sphyrapus dispar n.sp.

Material:

St. 626, Tasman Sea (42°10'S, 170°10'E), 610 m, 20 Jan 1952. Gear: 3 m sledge trawl; Bottom: globigerina ooze. Bottom temp.: c. 7.6°C. — 4 adult females (2 with rudimentary oostegites).

Description of female type:

Body (Pl. Vc) about 4.5 times longer than broad. Length about 4.2 mm. Integument moderately strongly calcified.

Carapace (Pl. Vd), rostrum included, as long as broad, a little contracted in front of the moderately swollen respiratory chambers. The dorsal surface is but slightly vaulted, without distinct areolations and furrows. The ocular lobes are well-defined, small and without visual elements. The rostrum is broad with convex margins and in the front extends as a short acute spiniform process (Fig. 75a).

Peraeonites defined by deep constrictions, without processes. Peraeonite 2 is broader than 3, the succeeding ones are slightly narrower than 3; all of them broadest behind. Peraeonites 2-4 and 7 are equally long and about 0.75 times as long as any of peraeonites 5 and 6. Coxa very small.

Pleon (Fig. 75b-c) somewhat longer than the last two peraeonites together. Pleonites subequal in length, with one tiny seta near the anterior dorsal corners, and with outstanding, obliquely triangular epimera which bear a tiny hair near the tip; the epimera of pleonite 3 have moreover one tiny hair

on the posterior margin. Ventrally they have a pointed conical process directed straight downwards. Pleotelson scarcely half as long as the pleonites together, almost semiovate in form, with a small rounded prominence at the end, set with two tiny setae or hairs; just in front of the prominence there is a small tubercle furnished with four fine setae, the lateral of which are longest; the dorsal surface bears moreover one seta at some distance from the anterior corners.

Antennula (Fig. 75d) somewhat longer than carapace. First peduncular joint much longer than the succeeding joints together, and 3.5-4 times longer than the second joint. First two joints with particular setae. Third joint very small. Inner flagellum three-jointed; last joint with particular seta. Outer flagellum four-jointed; second and third joints furnished with moderately strong aesthetasc.

Antenna (Fig. 75e) a little shorter than the antennula. The first peduncular joint is strongly tumefied, with the greater part of the surface ridged, and set with tiny hairs on the inner surface. Second joint much more slender and about twice as long as the first, with one long outer seta in the middle which is attached to a well-defined cylindrical socle. Flagellum seven-jointed. First joint very short; second joint longer than the succeeding joints together and about 1.7 times longer than the second peduncular joint, with many long, and remarkably long-haired, particular setae. The succeeding joints decrease in width distally. The third joint is about 0.26 times as long as the second, and a little longer than any of



Fig. 75. *Sphyrapus dispar* n.sp., ♀; a, rostrum, dorsal view ($\times 80$); b-c, pleon, dorsal and lateral views ($\times 69$); d, antennula, ventral view ($\times 103$); e, antenna, ventral view ($\times 103$); f, labrum, rostral view ($\times 205$); g, right mandible, rostral view ($\times 205$); h, distal part of same ($\times 320$); i, distal part of left mandible, caudal view ($\times 205$); j, pars incisiva and lacinia mobilis of same ($\times 320$); k, spiniferous lobe of same ($\times 320$); l, palp of left mandible ($\times 320$); m, left side of labium, caudal view ($\times 205$).

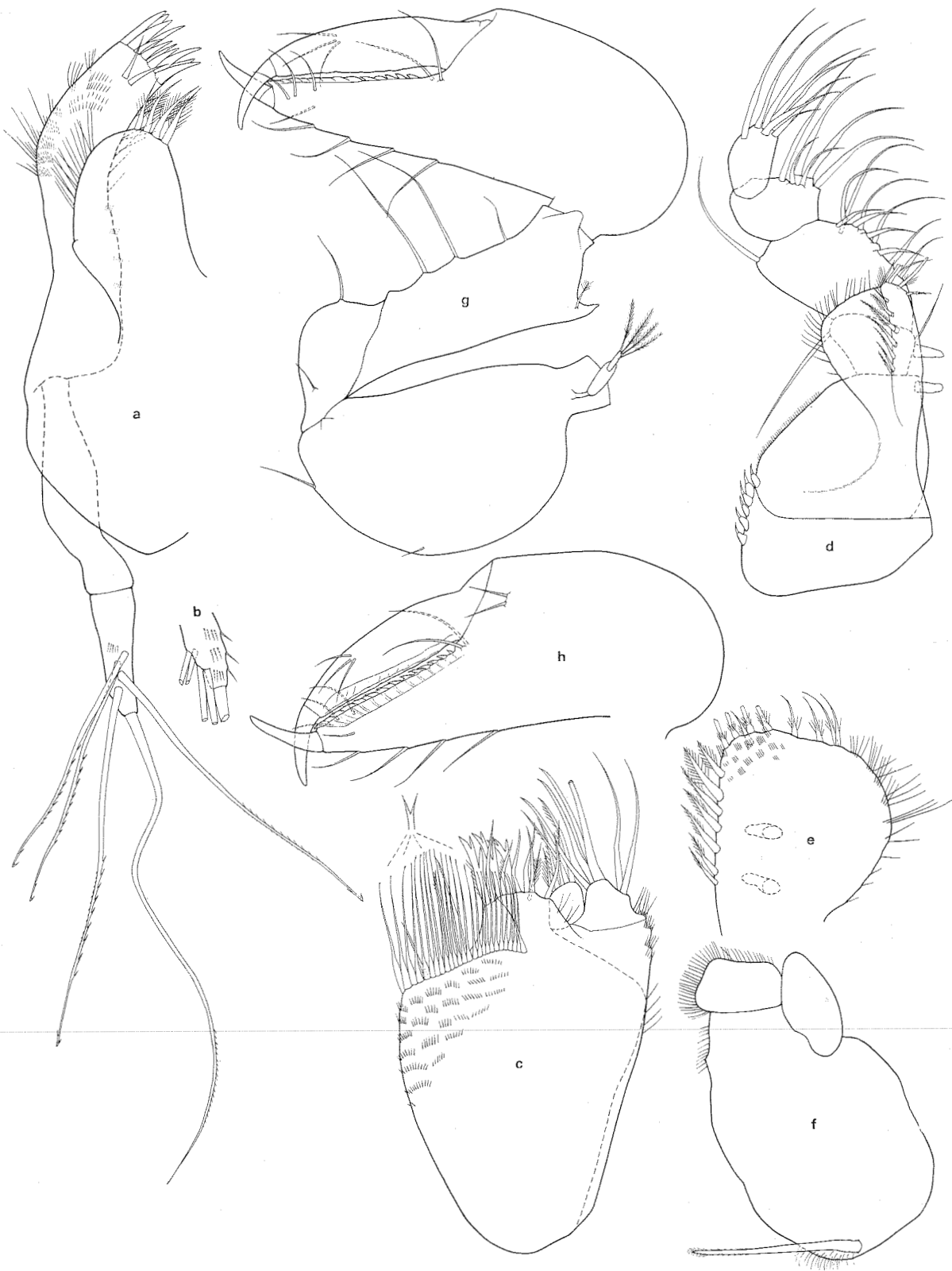


Fig. 76. *Sphyrapus dispar* n.sp., ♀; a, maxillula, caudal view ($\times 320$); b, distal end of palp of same in another position ($\times 320$); c, maxilla, rostral view ($\times 320$); d, maxilliped, rostral view ($\times 205$); e, endite of same, flattened, caudal view ($\times 320$); f, epignath ($\times 205$); g, cheliped, caudal view ($\times 90$); h, propus and dactylus of same, rostral view ($\times 90$).

the succeeding two joints, which are subequally long. The last two joints are shortest. The antepenultimate joint bears a particular seta.

Labrum (Fig. 75f) shaped and armed as shown in the figure.

Mandibles (Fig. 75g-l) with long, straight inwards directed subcylindrical processus molaris; the grinding surface of the left mandible is irregularly serrated, that of the right mandible furnished with tiny spines or hairs. Pars incisiva of right mandible unidentate, that of left mandible bidentate. Lacinia mobilis of left mandible irregularly four-dentate. Spiniferous lobe of right mandible with one strong forked spine and four simple plumose setae, that of the left mandible with two simple plumose setae and three deeply bifurcate setae which are ciliated along the margins of the forked parts. Palp very long. The first joint is bare and 0.8-0.9 times as long as the second, which bears a close row of five or six ciliated setae of different lengths just below the inner distal end. The last joint is shorter than the first and set with inner and distal setae; the setae increase in length distally and are one-sidedly ciliate, except for the outer distal seta which is completely bare.

Labium (Fig. 75m) with longer hairs on the front margin between the lobes and with a submarginal hairy zone. The lobes are narrowed distally, set with longer hairs along the distal part of the outer margin, and with two spiniform terminal setae.

Maxillula (Fig. 76a-b). The endites are set with hairs as in Fig. 76a. The outer endite has eleven terminal spines, five of which are shorter than the others. The distal joint of the palp is furnished with five setae, shaped as in Fig. 76a, and with some spinules. The inner endite is much broader than the outer one and bears four plumose terminal setae.

Maxilla (Fig. 76c) broadly lamellar. The surface is partly set with rows of tiny spinules. Setae of inner row bare and bifid at the tip. The outer row numbers three one-sidedly ciliate setae. The fixed endite has one caudal plumose seta; the distal margin bears three strong forked spines and five setae. The outer lobe of the movable endite bears six long bare setae, and the inner lobe five shorter, one-sidedly ciliate setae.

Maxilliped (Fig. 76d-f) with the coxa distinctly marked off, the outside of which bears six plug-shaped tubercles ending in a short unguiform spine. Basis finely hairy along the outside. The first joint of the palp is furnished with one seta on each side near the distal end; the two succeeding joints are

furnished with ten and six inner bare setae, respectively, the second joint moreover with one bare seta at the outer distal end; the last joint bears seven bare setae. Each endite with two couplers, and without caudal setae; median vertical surface furnished with seven plumose setae on the free margin; outer and distal margins armed as in Fig. 76e. Epignath (Fig. 76f) with two lobes in front, one of which is partly marginated with hairs; below this lobe and near the terminal spine is a short row of hairs; terminal spine finely ciliated along the distal part.

Cheliped (Fig. 76g-h). Basis about 0.7 times as broad as long, with strongly convex sternal surface, set with two setae. Exopodite with four plumose setae. Merus short, with two bare sternal setae. Carpus shorter than basis and much more slender, with a spiniform process near the distal tergal end, with three bare sternal setae, and with one short plumose seta at the base of the spiniform process. Propus oblong oval, malleolate, nearly 1.4 times longer than the two preceding joints together, and about 3 times longer than broad, set with one rostral seta and one caudal seta at the base of the finger, and with four sternal setae; finger shorter than the rest of the joint, furnished with three caudal setae just behind the claw, and with one rostral seta at some distance from the claw; tergal surface of the finger closely set with lamellae. Dactylus with three juxtaposed rostral setae; claw as long as that of the fixed finger.

Peraeopod II (Fig. 77a). Basis about as long as the three succeeding joints combined, with a long caudal particular seta at about the proximal fifth. Exopodite with four plumose setae. Ischium very short. Merus as long as carpus and about 1.7 times longer than propus, with a short spine at the distal sternal corner. Carpus with five sternal spines, the proximal of which is very small, and with one spine at the distal tergal corner. Propus with four sternal spines, with one tergal spine near the end, and with two distal spines. Dactylus with claw as long as propus; dactylus fully twice as long as the claw with two tiny hairs at the distal sternal corner.

Peraeopods III-IV (Fig. 77b-c) very alike, but the joints of peraeopod III, ischium excepted, are longer than those of peraeopod IV. Basis with two strong particular setae; basis of peraeopod III shorter than the four succeeding joints together, basis of peraeopod IV as long as these joints. Ischium well developed, much longer than that of peraeopod II. Merus about 0.9 times as long as carpus. Carpus

Fig. 77. *Sphyrapus dispar* n.sp., ♀; a-c, peraeopods II-IV, caudal view ($\times 72$).



1.4-1.5 times longer than propus. Dactylus with claw longer than propus. Dactylus with two tiny setae or hairs near the distal sternal corner; claw much shorter than dactylus.

Peraeopod V (Fig. 78a) much longer than peraeopod IV, but somewhat shorter than III. Basis about as long as the four succeeding joints together, with long particular setae. Ischium as long as in the two preceding peraeopods. Merus half as long as carpus, somewhat shorter than that of peraeopod IV. Carpus nearly 1.5 times longer than propus and furnished with long spiniform setae around the distal end. Propus with tergal particular seta in the middle, and with the distal end surrounded with setae of very different lengths. Dactylus with claw about 1.4 times longer than propus; dactylus with two tiny setae or hairs at the distal sternal corner; claw about 0.6 times as long as dactylus, finely ciliated on the sternal margin.

Peraeopods VI-VII (Fig. 78b-c) very similar to peraeopod V, but differing from it mainly in the following respects. They are somewhat shorter, and VII is a little shorter than VI. Basis of peraeopod VI with one small tergal particular seta, basis of peraeopod VII without such seta. Distal end of carpus not surrounded with long spiniform setae. Propus

is distinctly shorter, and the caudal surface has a transverse row of spinules near the distal end; propus of peraeopod VI bears a small tergal particular seta somewhat below the middle, while peraeopod VII has a small simple seta in this place. Dactylus with claw of peraeopod VI 1.4 times longer than propus, dactylus of peraeopod VII 1.2 times longer; dactylus somewhat shorter than that of peraeopod V; claw of peraeopod VI about 0.8 times as long as dactylus, claw of peraeopod VII about 0.5 times as long.

Pleopods (Fig. 78d) with short, unarmed coxa. Basis fully 4 times longer than coxa, with a moderately long plumose seta near the inner distal corner (only the first pair has been examined). Exo- and endopodites shorter than basis. Exopodite distinctly two-jointed, with a very long and comparatively short-plumose seta at the outer distal corner; distal part of second joint margined with eight long-plumose setae. Endopodite one-jointed with one long inner seta at about the proximal third, the seta being long-plumose along the greater part, and for the rest extremely short-ciliated on the one side; outer margin with three long-plumose distal setae, distal margin with four.

Uropod (Fig. 78e). Peduncle subcylindrical, some-

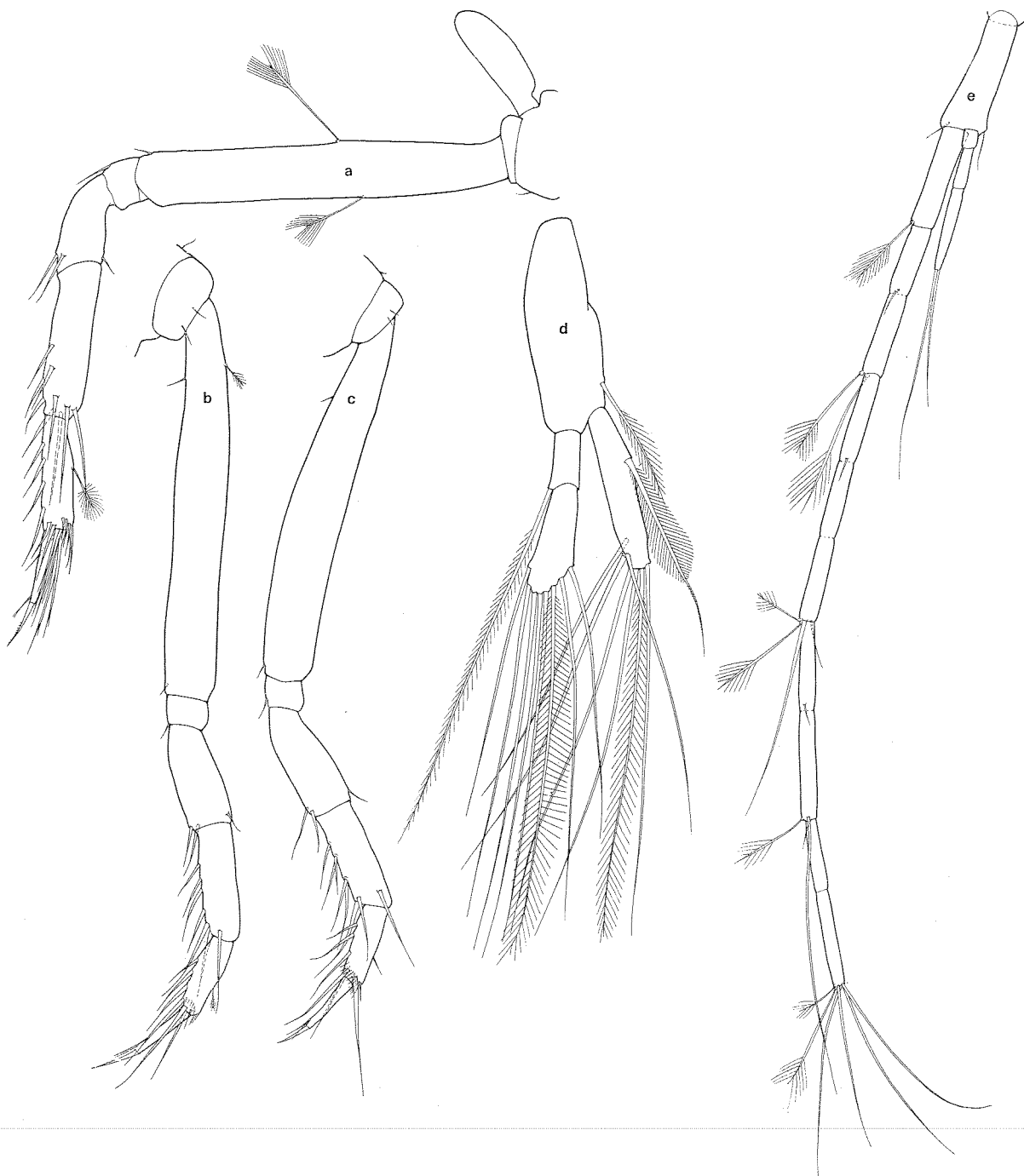


Fig. 78. *Sphyrapus dispar* n. sp., ♀; a-c, peraeopods V-VII, rostral view (×90); d, pleopod I, caudal view (×130); e, uropod, dorsal view (×145).

what widened towards the end, 2.6-2.7 times longer than broad at the end, with two short terminal setae. Exopodite three-jointed, joints increasing in length, counting distad; last joint with two terminal setae. Endopodite very indistinctly ten-jointed; first and eighth joints with one long particular seta at the inner distal corner, third, sixth and last joints with one long and one shorter particular seta at the same corner.

Remarks:

As has already been pointed out (see p. 27) *S. stebbingi* does not belong to the present genus. From the other species *S. dispar* differs in the second peduncular joint of the antenna; from *S. malleolus* and *S. tudes*, moreover, among other things in the shape of the pleotelson; from *S. anomalus* in the shape of the pleonites; and from *S. serratus* in the rostrum.

NEOTANAIDAE Lang, 1956

Neotanaidae Lang, 1956, p. 469.

The most striking characters of the family are the number of joints in the antennulae and antennae, the shape of the oral parts, and that the maxillae show sexual dimorphism. The antennulae have a four- or five-jointed flagellum and the antennae are nine-jointed. The spiniferous lobe of the right mandible bears three translucent spines, that of the left mandible two. The maxillulae have two endites, the outer one with one dwarfed and ten or eleven strong terminal spines, but no palp (the palp figured by me – LANG 1956, p. 470, fig. 8 – is nothing but the distal half of the epignath seen from the front). The female maxillae are principally as in Apseudidae while in the males only the movable endite persists. The endite of the maxillipeds is not marked off from the basis and the inner part of the basis and of the endite

is bent at right angles to the surface; the endite is set with a number of plumose setae along the margin of the decurvation and it has no couplers; the epignath is quite different from that in the other families, being subdivided into two parts. The chelipeds and peraeopods lack exopodites.

According to WOLFF (1956b, p. 212, fig. 25c; p. 221; p. 222, fig. 42a), the palp of the maxillipeds is five-jointed, and according to KUDINOVA-PASTERNAK (1965, p. 83, fig. 4f; p. 85, fig. 5b; p. 89, fig. 7d), it is also five-jointed in the three *Leptognathia* species she describes. In all tanaids, however, the palp is only four-jointed. The "first joint" is completely fused with the basis, and it is in reality nothing but a socle – which in the highest degree looks like a joint – to which the palp is attached.

The family contains only the genera *Neotanais* Beddard (1886a, p. 117), and *Herpetotanais* Wolff (1956b, p. 218).

Key to the genera

Antennula with four-jointed flagellum; pleopods biramous *Neotanais* Beddard
Antennula with five-jointed flagellum; pleopods uniramous *Herpetotanais* Wolff

Neotanais Beddard, 1856

Neotanais Beddard, 1886a (Feb.), p. 117.

Neotanais Beddard, BEDDARD, 1886b, p. 124.

Alaotanais Norman & Stebbing, 1886 (Oct.), p. 111.

Generotype: *Neotanais americanus* Beddard, 1886a, p. 118; 1886b, p. 124, pl. XVI, figs. 4-6.

The present material contains four species, all of them new to the science. Earlier twelve species and one subspecies have been described, and I have seen them all, except for *N. americanus*, *N. edwardsi*, and *N. wolffi*.

In the following list the species are mentioned in alphabetical order.

- N. affinis* Wolff (1956a, p. 51), ♀.
- N. americanus* Beddard (1886a, p. 118), ♀.
- N. armiger* Wolff (1956a, p. 47), ♀ and ♂.
- N. bacescui* n.sp. (see p. 141), ♀.
- N. barfoedi* Wolff (1956a, p. 44), ♀ and ♂.
- N. deflexirostris* n.sp. (see p. 135), ♀.
- N. edwardsi* Dollfus (1898, p. 71), ♂.
- N. giganteus* Hansen (1913, p. 20), ♂.
- N. hastiger* (Norman & Stebbing) (1886, p. 113), ♀.
- N. laevispinosus* (Norman & Stebbing) (1886, p. 114), ♂.
- N. longimanus* Wolff (1956a, p. 49), ♀.
- N. peculiaris* n.sp. (see p. 147), ♀.
- N. pfaffi* Wolff (1956a, p. 45), ♀ and ♂.

N. pfaffioides n.sp. (see p. 152), ♀.

N. robustus Wolff (1956a, p. 41), ♀ and ♂.

N. serratispinosus (Norman & Stebbing) (1886, p. 111), ♀.

N. serratispinosus subsp. *hadalis* (Wolff) (1956b, p. 210), ♀ and ♂.

N. wolffi Kudinova-Pasternak (1966, p. 522).

KUDINOVA-PASTERNAK (1966, p. 521 and figs. 3-4) has also given a very short description of the male of a "*Neotanais* sp."

Remarks on the taxonomy and morphology:

As I have already pointed out (LANG, 1956, p. 471), *N. laevispinosus* is the male of *N. serratispinosus*, and according to KUDINOVA-PASTERNAK, *N. serratispinosus hadalis* has no "raison d'être".

N. edwardsi differs so materially from the other species in the ocular lobes which are said to be pigmented, in the cheliped, in the unjointed exopodite of the pleopods, and in the armament of the pleopods that it cannot reasonably belong either to *Neotanais* or to *Herpetotanais*. The description of the species is quite valueless.

N. wolffi is described in such a way that it ought to be ignored. No information is given about the cheliped. The antennula and the pleopods are said to be as in other species of the genus, and the an-

tenna to differ from that of the other species in the first joint which is set with spines and hairs. What is the meaning of this? The length of the first peduncular joint of the antennula is very different in different species, the pleopods are described in a single species, and as is to be seen from Figs. 83h, 88, 93, and 97i in the present paper, they can be very different in different species. The first joint of the antenna has as far as I can find, been mentioned and figured only in *N. serratispinosus*. In all species examined by me, this joint is excavated dorsally, the excavation is strongly tuberculated and the inner margin of the excavation is more or less set with hairs. The first antennar joint of *N. wolffi* does not differ from that of most other species.

Some of the characters mentioned by WOLFF (1956a) are not of specific value. As is to be seen from the descriptions below the shape of the forked spines on the fixed maxillar endite varies even in the same specimen (see p. 149, Fig. 90f-g) as is also the case with the number of setae on the inner

maxillular endite (see p. 137, Fig. 80i-j). According to WOLFF (*op. cit.*, pp. 44 and 50) *N. pfaffi* and *N. longimanus* are characterized by having two-forked spine on the fixed maxillar endite. I myself have dissected one specimen of these two species. In both of them there are two forked spines, those on the right maxilla of *N. pfaffi* being two-forked those on the left maxilla three-forked and in *N. longimanus* they are three-forked on both maxillae. Peraeopods III and IV are said to be devoid of serrated spines in *N. pfaffi*, but in one of the specimens examined by me, they have one strongly serrated spine each. The presence of seven tubercles "on the cutting edge" on the finger of the cheliped in *N. longimanus* holds good for the type specimen, in the other three females there are but five.

Judging from my examinations of WOLFF's material the shape of the carapace and the various body segments and the relative length of the flagellar joints of the antennula and the second and fourth antennar joints are constant specific characters.

Key to the females

1. Peraeonites 5 and 6 longer than broad; pleonites much narrower than last peraeonite and than pleotelson *N. americanus* Beddard
These characters not combined 2
2. Pleotelson considerably broader than the last pleonite 3
Pleotelson not broader than the last pleonite 4
3. Pleotelson twice as broad as long and about as long as last two pleonites together *N. barfoedi* Wolff
Pleotelson about 1.5 times broader than long and about as long as last three pleonites together *N. hastiger* (Norman and Stebbing)
4. Dactylus of peraeopods III and IV with a strong terminal spiniform process; some of the terminal spines on the outer maxillular endite serrated; pleonites with a median ventral process *N. wolffi* Kudinova-Pasternak
These characters not combined 5
5. Inner half of cutting edge of finger of cheliped set with very fine denticles; pleonites evenly rounded ventrally; pleotelson longer than the last two pleonites together and 1.3-1.4 times broader than long; first peduncular joint of antennula slightly longer than the succeeding joints together *N. serratispinosus* (Norman & Stebbing)
These characters not combined 6
6. First flagellar joint of antennula about 4 times longer than the succeeding joints together 7
First flagellar joint of antennula at most twice as long as the succeeding joints together 9
7. Pleotelson with a median ventral keel on the anterior half *N. pfaffi* Wolff
Pleotelson evenly rounded ventrally 8
8. Rostral process strongly deflexed; pleonites with a low median ventral keel, split into two halves by a longitudinal cleft *N. deflexirostris* n.sp.
Rostral process straight forwards directed; pleonites with a low median ventral keel which is not split into two halves *N. longimanus* Wolff
9. Pleonites with a median ventral process 10
Pleonites evenly rounded ventrally 12
10. Pleotelson considerably narrower than the last pleonite *N. armiger* Wolff
Pleotelson as broad as last pleonite 11

11. Pleotelson nearly as long as last three pleonites together, without median ventral conical process..... *N. peculiaris* n.sp.
Pleotelson as long as last two pleonites together with a conical ventral process near the middle..... *N. pfaffioides* n.sp.
12. Pleotelson about as long as last three pleonites together..... *N. affinis* Wolff
Pleotelson only as long as last two pleonites together..... 13
13. Second antennar joint shorter than the fourth; propus of cheliped a little longer than broad¹..... *N. robustus* Wolff
Second antennar joint somewhat longer than the fourth; propus of cheliped about twice as long as broad..... *N. bacescui* n.sp.

1. A re-examination of WOLFF's material of *N. robustus* has shown that his statement (WOLFF, 1956a, p. 42) that the propus is a little broader than long must be a slip of the pen.

Neotanaïs deflexirostris n.sp.

Material:

St. 575, Tasman Sea (40°11'S, 163°35'E), 3710 m, 19 Dec. 1951. Gear: shrimp otter trawl. Bottom: pteropod ooze. Bottom temp.: c. 1.1°C. – 1 adult female (with rudimentary oostegites).

Description:

Body (Pl. Ve) about 6.3 times longer than broad. Integument strongly calcified. Length about 21.5 mm.

Carapace (Figs. 79a-b; Pl. Vf) 1.3-1.4 times longer than broad, and about as long as peraeonites 2-3 and half of peraeonite 4 together. Respiratory chambers strongly swollen and outstanding. In front of these chambers it is considerably narrowed and provided with a conspicuous carina which on the under side is set with a row of twenty-four long, stiff setae. Behind this row and further down there is one long, stiff seta. In front it is about as broad as behind, with the rostral process bent straight downwards. Coxa of chelipeds strongly marked off and outstanding. Dorsal surface with an oblique furrow on each side which runs parallel with the outside of the respiratory chambers and which in front branches off a short, faint transverse furrow.

Peraeonites equally broad, broader than long. They increase a little in length from 2 to 5 and 6 which are equally long while 7 is about as long as 4. They are shaped as in the figure (Pl. Ve), and they are evenly rounded ventrally. Coxae well marked off.

Pleon (Fig. 79c, and Pl. Ve) about as long as peraeonites 5-7 together. Pleonites without setae somewhat broader than the last peraeonite, much broader than long, first and last pleonites a little longer than the others. They have a longitudinal low median ventral keel, split into two halves by a longitudinal cleft. Pleotelson (Fig. 79c) shorter than

the last two pleonites together, somewhat narrower than the pleonites, broadest at the attachment for the uropods, and slightly undulated posteriorly.

Antennula (Fig. 79d). First peduncular joint fully three times longer than the second, with an outer row of eleven rather stiff setae just behind the distal end. Second joint fully twice as long as the third, with one seta at the inner distal end, and with an outer row of seven rather stiff setae just behind the distal end. Third joint with two short setae. First flagellar joint about four times longer than the succeeding joints together, without setae; second and third joints with one short aesthetasc and with two tiny setae.

Antenna (Fig. 79e-f) almost as long as antennula. First joint about 0.8 times as long as the second which has a dorsal row of eight setae along the distal half. Third joint short, being about 0.3 times as long as the second joint, and 0.5-0.6 times as long as the fourth; it bears two long dorsal setae. Fourth joint 0.5-0.6 times as long as the second, completely bare. Fifth joint about 1.3 times longer than the fourth, with five distal setae. Sixth joint about 0.6 times as long as the fifth. Seventh joint about half as long as the sixth. Last two joints very short. The last four joints bear a few setae.

Labrum (Fig. 79g) shaped as shown in the figure.

Mandibles (Fig. 80a-e) with a rounded keel as in *N. pfaffi*. The end of the processus molaris is yellowish brown, obliquely cut off and irregularly serrated. Pars incisiva and lacinia mobilis shaped as shown in the figures (the dotted parts are yellowish brown). The proximal spine on the spiniferous lobe of either mandible is more or less set with hairs, the others completely bare.

Labium (Fig. 80f-g). Basal part adorned with hairs as in the figure. Lobes partly set with spinules; inner terminal spine not marked off at the base, longer than the outer one.

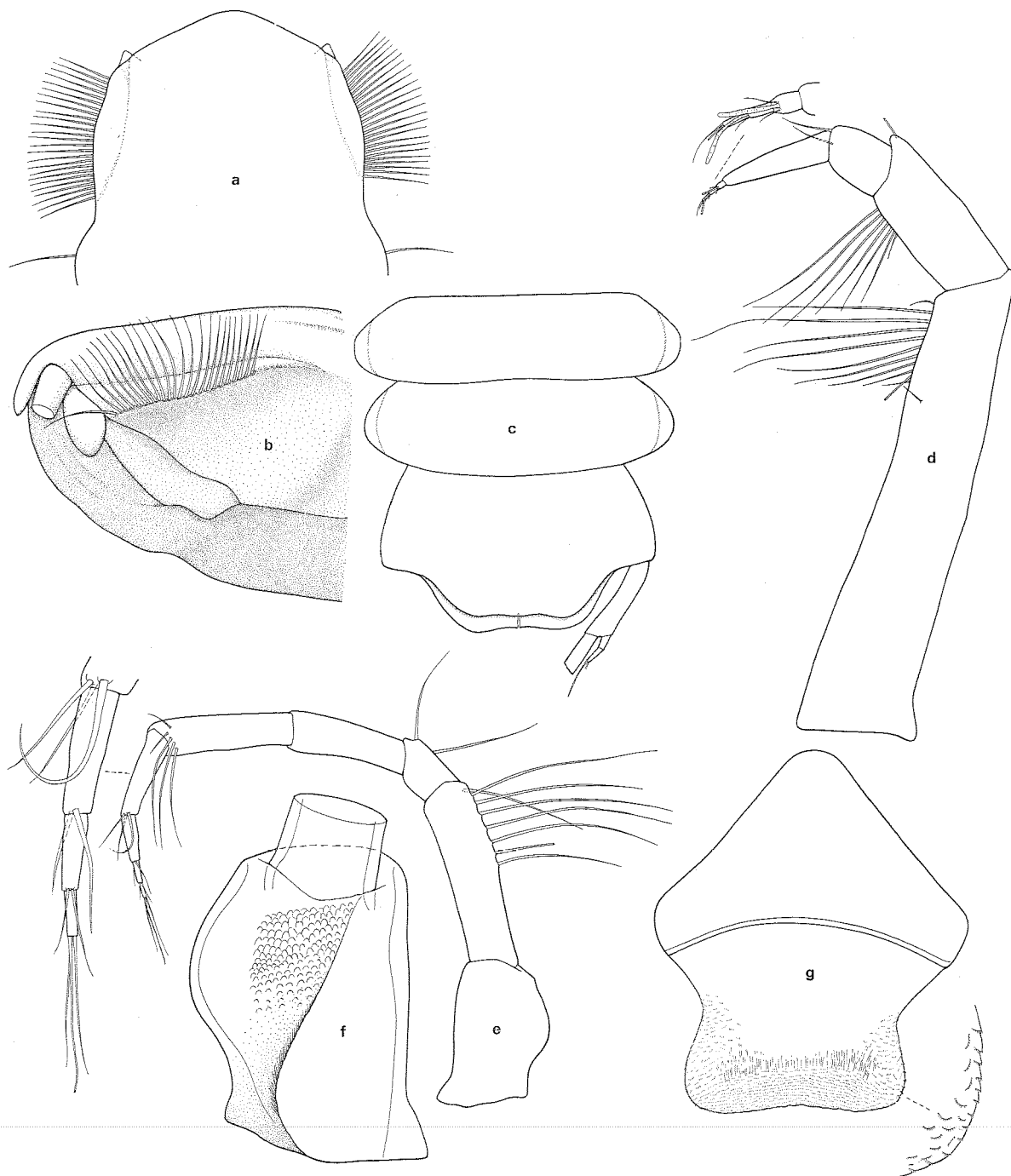


Fig. 79. *Neotanis deflexirostris* n. sp., ♀; a-b, anterior part of carapace, dorsal and lateral views ($\times 21$, and $\times 25$); c, last two pleonites and pleotelson, dorsal view ($\times 14$); d, antennula, dorsal view ($\times 30$); e, antenna, lateral view ($\times 30$); f, first peduncular joint of same, oblique dorsal view ($\times 30$); g, labrum, caudal view ($\times 53$).

Maxillula (Fig. 80h-j). Inner endite without inner seta near the base; inner endite of right maxillula with three plumose setae, that of the left maxillula with four. In both of them there is also a small spiniform process near the inner setae.

Maxilla (Fig. 80k-m). Setae of inner row finely plumose. The outer row numbers two plumose setae. The fixed endite bears six strong unforked setae,

four of which are more or less plumose, and two very strong four-forked spines which are partly set with fine spinules or hairs. Outer lobe of movable endite with three finely ciliated setae, inner lobe with seven.

Maxilliped (Fig. 81a-c). Caudal and rostral surfaces of endite partly set with fine hairs, the caudal surface moreover with two short subterminal plu-



Fig. 80. *Neotanais deflexirostris* n.sp., ♀; a, right mandible, oblique internal view ($\times 53$), detail ($\times 130$); b, spines of same ($\times 205$); c, part of left mandible, caudal view ($\times 53$), detail ($\times 130$); d-e, pars incisiva, lacinia, and spines of same ($\times 80$), spine ($\times 210$); f, left side of labium, caudal view ($\times 53$); g, lobe of same ($\times 130$); h, maxillula, caudal view ($\times 53$); i-j, distal end of inner endites of right and left maxillulae, caudal view ($\times 130$); k, left maxilla, caudal view ($\times 80$), seta ($\times 140$); l-m, distal part of fixed endite of left and right maxillae, caudal and rostral views ($\times 320$). Dotted parts yellowish brown.

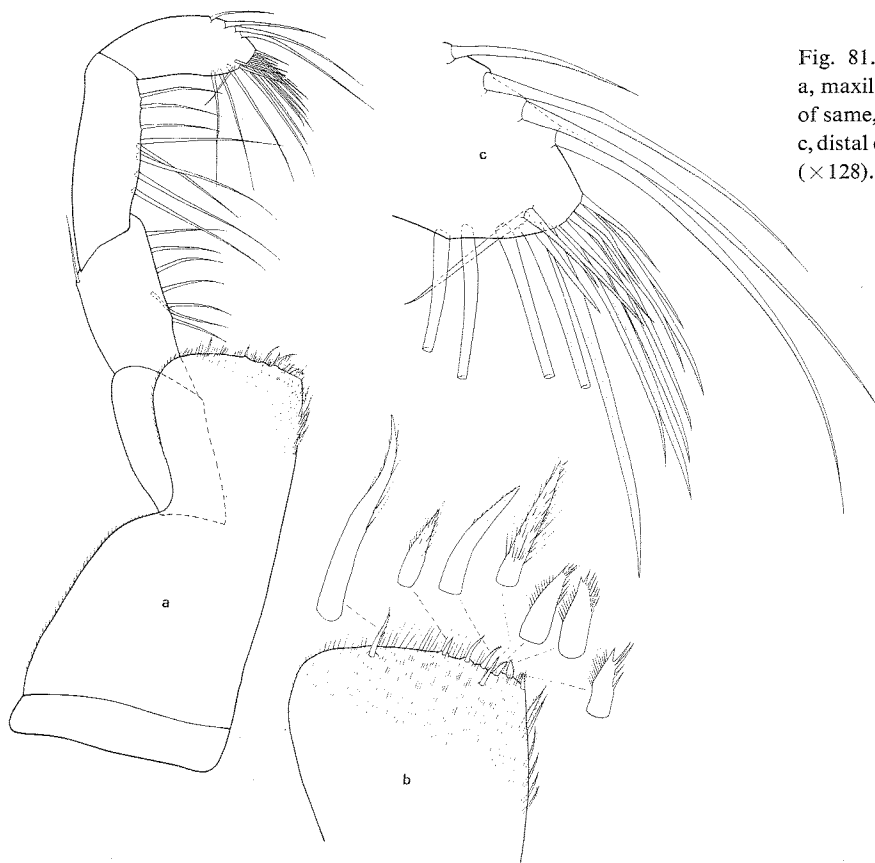


Fig. 81. *Neotanais deflexirostris* n. sp., ♀; a, maxilliped, rostral view ($\times 42$); b, endite of same, caudal view ($\times 64$), details ($\times 256$); c, distal end of last palpar joint of maxilliped ($\times 128$).

mose setae, wide apart; inner margin with six plumose setae; distal margin with six setae, shaped as in Fig. 81 b. Second palpar joint somewhat shorter than the first, with one outer distal seta and seven inner setae; third joint longest, set with eight inner setae; last joint about as long as the third, richly set with setae of very different lengths (Fig. 81 c).

Cheliped (Fig. 82a). Basis broader than long. Merus with one seta. Carpus in caudal view much shorter than propus with a small rounded sternal process at the most distal insertion of merus, with many tergal setae and two sternal setae. Propus in quite horizontal position about twice as long as broad. Finger longer than the rest of the joint with a conspicuous caudal keel just inside the sternal surface; it is set with two sternal setae, and with three caudal setae near the tergal surface which has six rounded tubercles, the posterior one being broader and lower than the others. Dactylus longer than finger, set with one rostral seta; claw much longer than that of the finger (the dotted parts in the figure are orange-coloured).

Peraeopods II-IV (Figs. 82b-d and 83a-b) very alike, with carpus and propus richly set with long setae, none of which are serrated. Basis and carpus of peraeopod II longer than the corresponding joints of peraeopods III and IV. Ischium very short. Dactylus

with claw much shorter than propus; claw very short. The dactylus is almost concealed by the numerous long setae on propus.

Peraeopods V-VII (Figs. 82e-g and 83c-g) almost alike but with the following differences. Basis of peraeopods V and VI with particular setae, basis of peraeopod VII without. Carpus of peraeopod VII shorter than in peraeopods V and VI. Propus of peraeopod V with a tergal particular seta in the middle. Dactylus with claw much shorter than propus, shaped as shown in the figures.

Pleopods (Fig. 83h). Basis twice as long as the greatest width, with three short outer setae and with two inner setae. First joint of exopodite nearly half as long as second joint, with nine outer setae; second joint set with setae along the outer and distal margins. Endopodite a little longer than exopodite, with five inner setae and with a great number of setae along the distal and inner margins.

Uropod (Fig. 83i). Exopodite shorter than the first joint of the endopodite. The latter is elevenjointed, with two or three particular setae on joints 1-3, 5, 7, 9, and with one particular seta on the last joint.

Remarks:

The species is so very similar to *N. longimanus* that I have been most uncertain as to whether it



Fig. 82. *Neotanaïs deflexirostris* n.sp., ♀; a, cheliped, caudal view ($\times 17$); b-g, peracopods II-VII, caudal view ($\times 24$). Dotted parts yellowish brown.

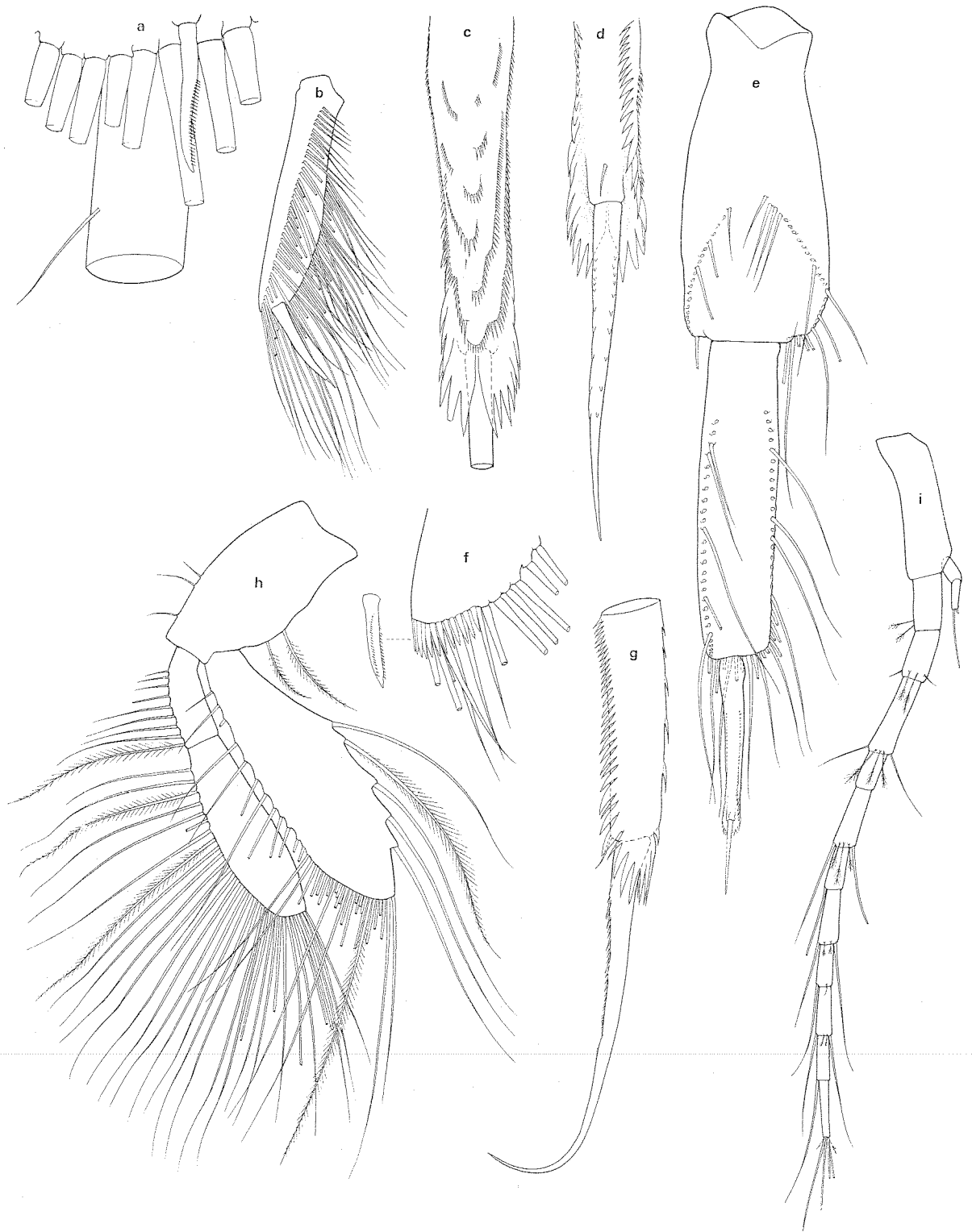


Fig. 83. *Neotanaïs deflexirostris* n.sp., ♀; distal end of propus of peraeopod II, rostral view ($\times 205$); b, propus and dactylus of peraeopod III, rostral view ($\times 30$); c, distal part of peraeopod V, tergal view ($\times 205$); d, distal part of dactylus with claw of same, sternal view ($\times 205$); e, last three joints of same, sternal view ($\times 47$); f, distal end of propus of peraeopod VII, rostral view ($\times 80$), detail ($\times 205$); g, distal part of dactylus with claw of same, caudal view ($\times 205$); h, pleopod I, caudal view ($\times 30$); i, uropod, ventral view ($\times 21$).

should be regarded as a species or a subspecies. It differs, however, materially in the shape of the anterior part of the carapace, in the peraeonites, and in the width of the pleotelson (cp. Pl. Ve-f and g-h). In *N. longimanus* the median ventral keel on the pleonites is not split into two parts.

Neotanaïs bacescui n.sp.

Material:

St. 282, Seychelles-Ceylon (5°32'N, 78°41'E), 4040 m, 11 April 1951. Gear: herring otter trawl. Bottom: blackish mud. Bottom temp.: c. 1.4°C. – 1 adult female (with rudimentary oostegites).

Description of female:

Body (Pl. VIa) about 6.6 times longer than broad. Integument thin and somewhat elastic. Length 7.2 mm.

Carapace (Pl. VIb) 1.25 times longer than broad, and about as long as peraeonites 2 and 3 together. Respiratory chambers slightly swollen, not outstanding. In front of the chambers there is a small convexity and from here the carapace is abruptly narrowed and provided with a dorso-lateral keel which bears a row of at least three stiff setae on the under side; behind and below this row there are at least two stiff setae. Posteriorly it is 1.25 times broader than in front. Rostral process short and blunt, straight forwards directed. Ocular lobes partly visible from dorsal side. Coxa of chelipeds strongly marked off, somewhat outstanding. Dorsal surface somewhat vaulted. Respiratory chambers defined by a rather faint dorsal furrow.

Peraeonites increase in length from 2 to 5 while 6 is about as long as 4 and 7 about as long as 3. Peraeonite 5 is about as broad as long, the others broader than long (the coxae which are distinctly visible from the dorsal side are included in the width). They are evenly rounded ventrally.

Pleon (Fig. 84a) nearly as long as the last three peraeonites together. The pleonites decrease somewhat in width from 2. They are evenly rounded ventrally. The convex outlines are set with three small setae at the distal corners. Pleotelson somewhat narrower than the last pleonite, and somewhat longer than the last two pleonites. Posteriorly there is a small median process with four tiny setae.

Antennula (Fig. 84b). First peduncular joint about 3.5 times longer than second joint, with an outer row of four setae of different lengths at some

distance from the distal end, and with many particular setae. Second joint about 1.7 times longer than the third, distally set with two outer setae, and with at least five particular setae. Third joint with one particular seta and three normal setae. First flagellar joint 1.4-1.5 times longer than the succeeding joints together, without setae. Second and third flagellar joints with one thick, short aesthetasc, third joint moreover with two short setae. Last joint with three short setae, one of which is almost spiniform.

Antenna (Fig. 84d-e). First joint fully 0.7 times as long as the second, which has a single dorsal seta near the distal end. Third joint very short, being about 0.3 times as long as the second, with one dorsal seta at the distal end. Fourth joint about 0.9 times as long as the second, with one long particular seta. Fifth joint fully 0.8 times as long as the fourth joint and about 1.3 times longer than the sixth, distally provided with four normal setae and four particular setae. Seventh joint about 0.6 times as long as the sixth. Eighth joint a little shorter than the seventh, last joint about half as long as the seventh. The last four joints bear one, one, two, and three setae, respectively, counting distad.

Labrum as in the preceding species.

Mandibles (Fig. 84f-m). The end of processus molaris is yellowish brown, and serrated as shown in Fig. 84g and k. Pars incisiva of right mandible with two teeth, that of left mandible finely crenate. Lacinia mobilis five-dentate. Both spines on left mandible and two distal spines on right mandible plumose.

Labium (Fig. 85a). Basal part adorned with hairs and spinules as in the figure. Lobes similar to those in the preceding species, but comparatively broader and with both terminal spines well marked off.

Maxillula (Fig. 85b-d). One of the long terminal spines on the outer endite has a small spiniform process near the proximal third. Inner endite with small inner seta near the base, the seta being bifid at the tip. The four terminal setae are shaped as in Fig. 85d. Near the inner setae there is a minute spiniform process.

Maxilla (Fig. 85e-f) adorned with hairs as shown in Fig. 85e. Setae of inner row bare. The outer row numbers two spiniform setae which are more or less forked near the tip. Fixed endite with one fine rostral seta at some distance from the end; distally it bears six strong setae, three of which are more or less plumose, and two strong two-forked spines. The outer lobe of the movable endite bears three finely ciliated setae, the inner lobe seven.



Fig. 84. *Neotanaïs bacescui* n.sp., ♀; a, pleon, dorsal view ($\times 47$); b, antennula, ventral view ($\times 100$); c, last three joints of same ($\times 320$); d, antenna, lateral view ($\times 100$), seta ($\times 320$); e, first peduncular joint, oblique dorsal view ($\times 205$); f, right mandible, rostral view ($\times 145$); g, distal end of processus molaris of same ($\times 320$); h, pars incisiva and spines of same ($\times 320$); i, left mandible, caudal view ($\times 145$); j, distal end of same ($\times 320$); k-m, distal end of processus molaris, lacinia mobilis, and pars incisiva of left mandible ($\times 320$).

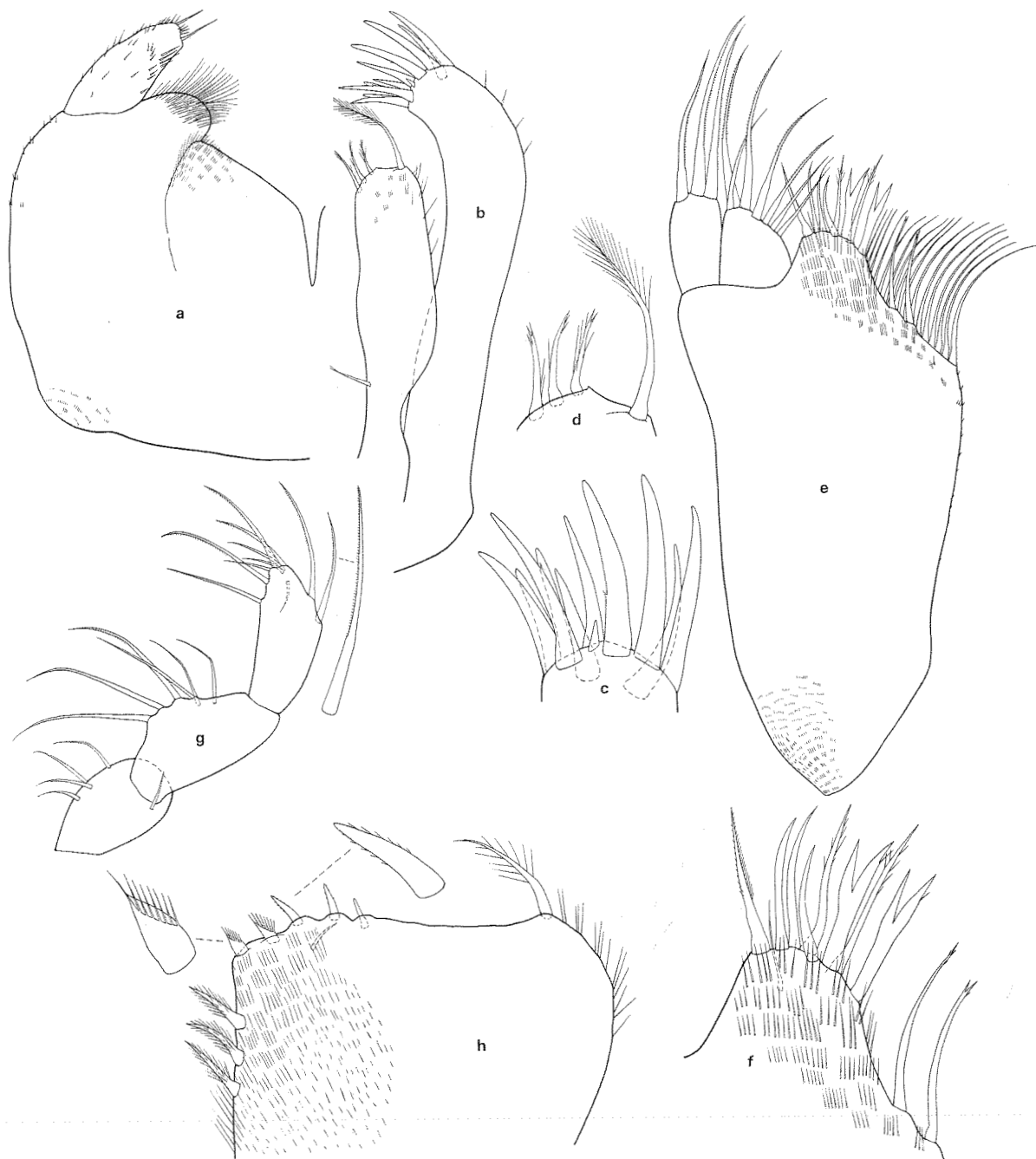


Fig. 85. *Neotanaïs bacescui* n.sp., ♀; a, right side of labium, caudal view (×205); b, maxillula, caudal view (×145); c-d, distal end of outer and inner endites of same (×320); e, maxilla, caudal view (×205); f, fixed endite of same, caudal view (×385); g, last three joints of palp of maxilliped, somewhat oblique caudal view (×108); h, endite of same, rostral view (×320).

Maxilliped (Fig. 85g-h). Caudal and rostral surfaces of endite partly set with hairs, the caudal surface moreover with one short seta in the inner part, near the distal margin. Outer margin with a row of moderately long hairs along the distal part. Inner margin with three short, strong setae, covered with hairs. Distal end with one long plumose seta at the outer corner, and with a sparse row of five short, but

strong spines along the inner part, the two innermost of which differ materially from the others (see Fig. 85h). First palpar joint without setae; second joint somewhat shorter than the first, with four inner setae and with one seta near the outer distal end; third joint slightly longer than the last one, with six inner setae; last joint with but ten setae, six of which are longer than the others and very finely



Fig. 86. *Neotanais bacescui* n.sp., ♀; a, epignath ($\times 145$); b, cheliped, caudal view ($\times 43$); c-e, peraeopods II-IV, c and e, caudal view; d, rostral view ($\times 58$), details ($\times 320$); f, distal end of propus of peraeopod II, caudal view ($\times 320$).

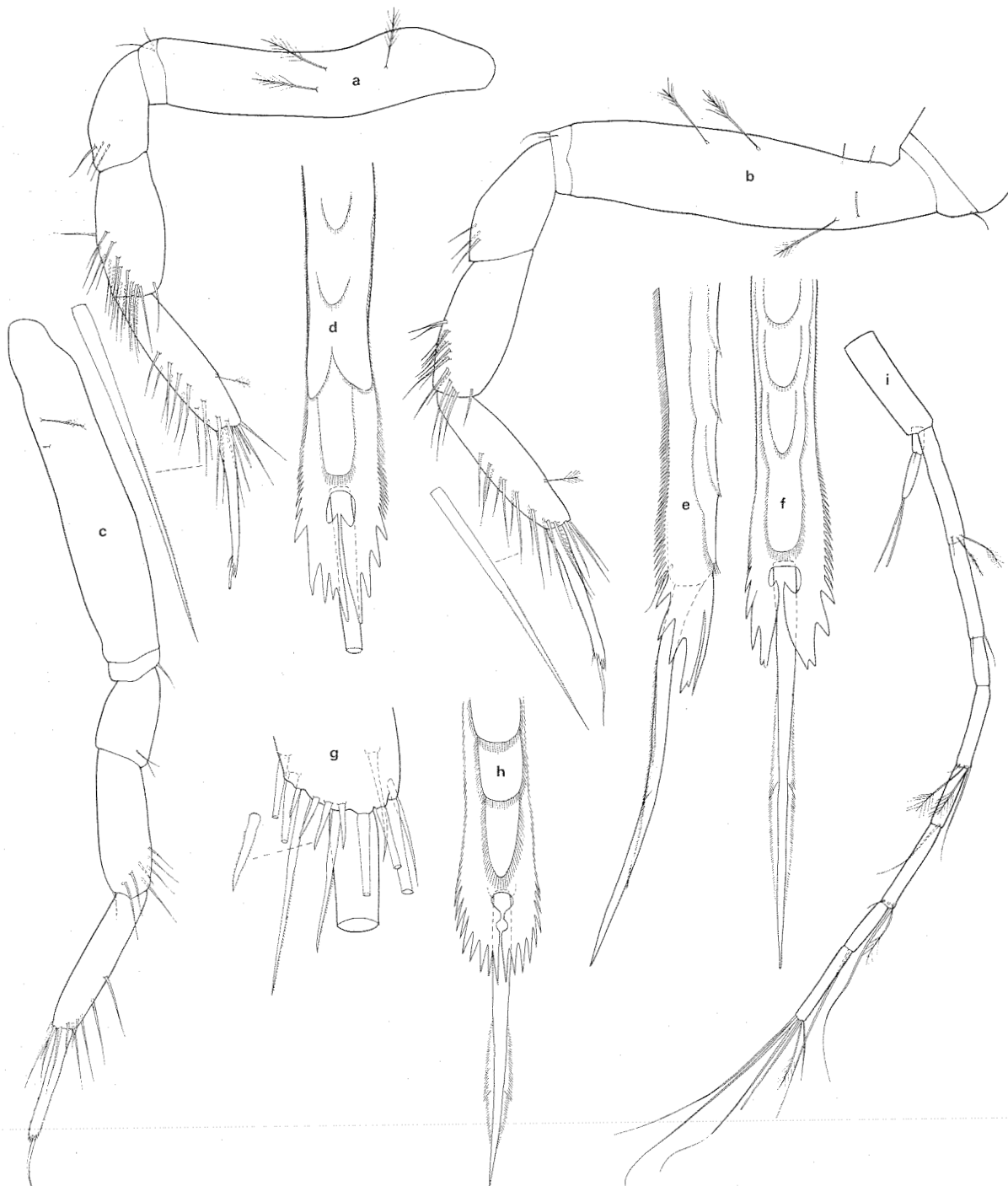


Fig. 87. *Neotanais bacescui* n.sp., ♀; a-c, pereopods V-VII, caudal view ($\times 58$); d, distal part of dactylus of pereopod V, tergal view ($\times 320$); e-f, distal part of dactylus with claw of pereopod VI, caudal and tergal views ($\times 320$); g, distal end of propus of pereopod VII, rostral view ($\times 205$); h, distal part of dactylus, and claw of pereopod VII, tergal view ($\times 320$); i, uropod, ventral view ($\times 58$).

ciliated on one side. Epignath shaped as shown in Fig. 86a.

Cheliped (Fig. 86b). Basis much broader than long with two sternal setulae. Merus with one sternal seta. Carpus shorter than propus with a small and rounded sternal process at the most distal insertion of merus; five tergal setulae, and two sternal setae.

Propus fully twice as long as broad, with one rostral seta just behind the dactylus, and with two short caudal setae near the finger. The latter is much longer than the rest of the joint; it bears two juxtaposed sternal setae at some distance from the claw, and three caudal setae, two of which are close together; tergal surface with five broad, very finely



Fig. 88. *Neotanaïs bacescui* n.sp., ♀; a, pleopod I, caudal view ($\times 80$); b, distal end of inner setae on endopodite of same ($\times 320$).

crenated processes. Dactylus with one rostral seta, and with two sternal processes; claw shorter than that of the finger.

Peraeopods II-IV (Fig. 86c-f) very alike, but basis of peraeopod II is somewhat longer and propus somewhat shorter than the corresponding joints of the other two peraeopods. Basis with at least one particular seta. Ischium very short with two sternal setae of different lengths. Merus of peraeopod II as long as carpus; merus of peraeopods III and IV shorter than carpus. Carpus and propus set with many setae – but they are not as richly setiferous as in the preceding species –, most of which are extremely fine-plumose; the terminal setae do not reach beyond the claw of dactylus. Propus distally with subterminal rostral spine, shaped as in the figures; most proximal sternal part quite smooth.

Dactylus with claw shorter than propus; claw setiform, much shorter than the proper dactylus.

Peraeopods V-VII (Fig. 87a-h) very alike, but with the following differences. Basis of peraeopods V and VII is somewhat shorter than that of peraeopod VI. Merus of peraeopod VII is shortest, that of peraeopod VI longest. Carpus of peraeopod V is somewhat shorter than that of peraeopods VI and VII, and propus of peraeopod VII is somewhat shorter than that of the other two peraeopods. Peraeopod VII is much less setiferous than the two other peraeopods, but propus of the former has rostrally a distal row of short spines (Fig. 87g) which are extremely finely ciliated. Dactylus and its claw shaped as in Fig. 87d-f, and h; claw on peraeopods V and VI much longer than that on peraeopod VII.

Pleopods (Fig. 88a-b). Coxa about half as long as basis, the latter being set with two outer and two inner setae. First joint of exopodite with two outer setae; second joint three times longer than the first, and about four times longer than the greatest width, set with long setae along about the distal half of the outer margin and along the distal margin. Endopodite a little longer than the exopodite, fully four times longer than the greatest width; it is set with three inner setae, the terminal part of which is shaped as in Fig. 88b, with nine long distal setae, and with four outer setae. All setae are plumose.

Uropod (Fig. 87i). Exopodite reaching to about the middle of the first endopodite-joint; first joint shortest. Endopodite eight-jointed; third joint shortest and without setae; last joint terminally with one particular seta and five normal setae; the other joints bear one or two normal setae, the sixth joint moreover one particular seta, and the first and fourth joints two particular setae.

Remarks:

The species differs from *N. americanus* materially in the shape of the pleon and also in the length of the peraeonites. It agrees inasmuch with *N. robustus*, *N. barfoedi*, *N. affinis*, and *N. serratispinosus*, as the pleonites are evenly rounded ventrally. It differs from *N. robustus*, among other things, in the quite different armament of peraeopods II-IV, in the length of the first flagellar joint of antennula and in the cheliped; from *N. barfoedi* and *N. affinis* in the pleotelson; and from *N. serratispinosus* in the cheliped and in the peraeopods II-IV.

Neotanaïs peculiaris n.sp.

Material:

St. 773, Gulf of Biscay (47°50'N, 8°23'W), 1680 m, 18 June 1952. Gear: Petersen-Grab 0.2 sq. m. Bottom: sand and dark clay. Bottom temp.: c. 3.7°C. – 1 female (with rudimentary oostegites).

Description:

Body (Pl. VIc) about 8 times longer than broad. Integument rather thin and somewhat elastic. Length 6.6 mm.

Carapace (Pl. VIId) about 1.3 times longer than broad, and about as long as peraeonites 2-3 and one third of peraeonite 4 together. Respiratory chambers very slightly swollen, not outstanding. It is considerably narrowed anteriorly, in front about 0.4 times as broad as behind. Rostral process short, somewhat acute, and straight forwards directed. Ocular lobes partly visible from dorsal side. Just behind the ocular lobes there is a distinct keel set with at least three stiff setae on the under side; behind and below this row there is at least one stiff seta. Coxa of chelipeds well marked off, not outstanding. Dorsal surface somewhat vaulted, without distinct furrows.

Peraeonites (Pl. VIc) increase in length from 2 to 5 and 6 which are equally long while 7 is about as long as 3. Peraeonites 5 and 6 are as broad as long, the others broader than long, (the coxae which are visible from the dorsal side are included in the width). They are evenly rounded ventrally.

Pleon (Fig. 89a-b) about as long as half of peraeonite 5 and peraeonites 6-7 together, and as broad as last peraeonite. First two pleonites somewhat longer than the others. The pleonites bear two dorsal setulae on each side near the anterior margin, and one bare lateral seta, and they have an almost conical ventral process. Pleotelson as broad as last pleonite, nearly as long as the last three pleonites together, convex laterally and with a small median process posteriorly. It bears four small dorsal setae and two dorsal particular setae arranged as shown in the figure.

Antennula (Fig. 89c-d). First peduncular joint about 3 times longer than the second joint, with two normal setae and at least three particular setae in the distal part. Second joint about 2.5 times longer than the third, distally set with two normal setae and four particular setae. Third joint without particular setae. First flagellar joint 1.4-1.5 times longer than the succeeding joints together, without setae.

Second and third flagellar joints each with one thick aesthetasc, third joint moreover with two short setae. Last joint with three setae (Fig. 89d).

Antenna (Fig. 89e-f). First joint about as long as second joint, which has a minute seta near the distal end. Third joint about half as long as the second, with one dorsal seta near the end. Fourth joint somewhat longer than the second, with one long particular seta. Fifth joint nearly 1.2 times longer than fourth, and nearly twice as long as the sixth, distally furnished with three normal setae and five particular setae. Seventh joint about 0.8 times as long as the sixth. Eighth joint somewhat shorter than the seventh. The last four joints bear zero, two, two, and four setae, respectively, counting distad.

Labrum as in *N. deflexirostris*.

Mandibles (Fig. 89g-j). Processus molaris about as in the preceding species. Pars incisiva of right mandible two-dentate, that of left mandible three-dentate. Lacinia mobilis irregularly four-dentate. Spines shaped as in Fig. 89g-i.

Labium (Fig. 89k) with long hairs on the caudal surface just inside the lobes. The latter are comparatively slender; they have some groups of tiny hairs on the outer margin and the two terminal spines are well marked off.

Maxillula (Fig. 90a-c). Terminal spines on outer endite quite smooth. Inner endite without inner seta; distal end evenly rounded with four setae (Fig. 90c).

Maxilla (Fig. 90d-g) adorned with hairs and spinules as shown in Fig. 90d-e. Setae of inner row bare. The outer row of the right maxilla has but one smooth spine, that of the left maxilla two. Fixed endite with one long rostral seta at some distance from the end; distally it bears five (right maxilla) or four (left maxilla) spiniform setae, three of which are more or less ciliated, and two strong spines, those on the right maxilla being two-forked, those on the left maxilla three-forked (Fig. 90f-g). Outer lobe of movable endite with three bare setae, inner lobe with six setae, two of which are plumose near the middle.

Maxilliped (Fig. 90h-i). Endite very similar to that in the preceding species. First palpar joint without setae; second joint about as long as the first, with one seta near the outer distal end, and with five inner setae; third joint about 1.25 times longer than the second and with nine inner setae; last joint somewhat shorter than the third and with eleven setae, seven of which are longer than the others; the setae are bare. Epignath as in the preceding species.

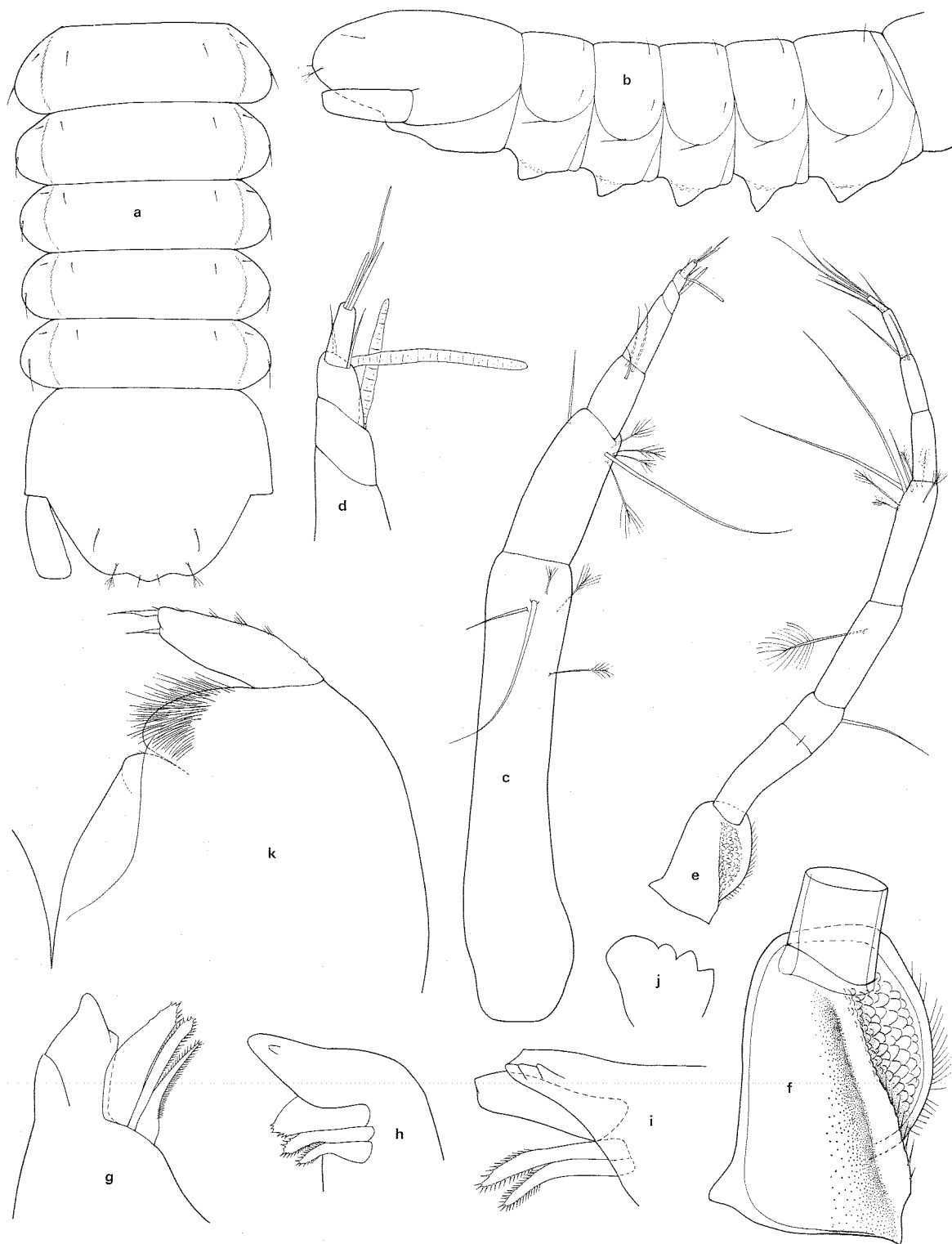


Fig. 89. *Neotanis peculiaris* n.sp., ♀; a-b, pleon, dorsal and lateral views ($\times 58$); c, antennula, somewhat oblique ventral view ($\times 108$); d, last three joints of same ($\times 225$); e, antenna, somewhat oblique dorsal view ($\times 108$); f, first joint of same ($\times 275$); g-h, distal end of right mandible, oblique internal view and rostral view ($\times 320$); i, distal end of left mandible, oblique external view ($\times 320$); j, lacinia of same, internal view ($\times 320$); k, labium, caudal view ($\times 320$).

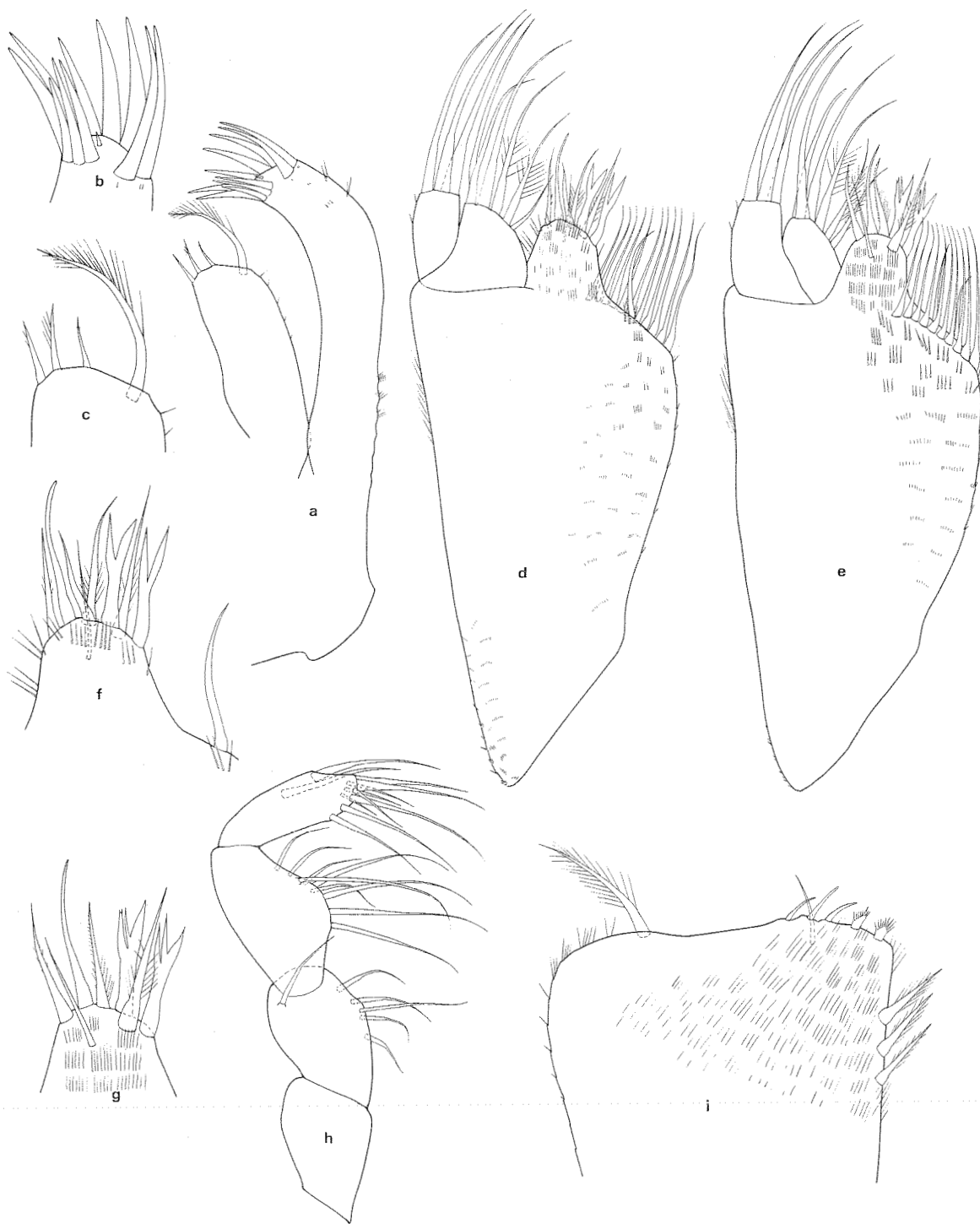


Fig. 90. *Neotanaïs peculiaris* n.sp., ♀; a, maxillula, caudal view ($\times 205$); b-c, distal end of endites of same ($\times 363$); d-e, right and left maxillae, caudal and rostral views ($\times 270$); f-g, fixed endite of right and left maxillae, caudal and rostral views ($\times 540$); h, palp of maxilliped, caudal view ($\times 120$); i, distal part of endite of same, rostral view ($\times 385$).

Cheliped (Fig. 91a-b). Basis about as broad as long, with one tiny sternal seta. Merus with a single sternal seta. Carpus about as long as propus, with a small rounded sternal process at the most distal insertion of merus; five tergal setae, two juxtaposed long sternal setae near the middle, and one very

short seta near the distal end. Propus fully twice as long as broad, with one rostral seta just behind the dactylus, and with one caudal seta just behind the gap between the finger and the dactylus. Finger about as long as the rest of the joint, with two juxtaposed sternal setae at some distance from the claw,

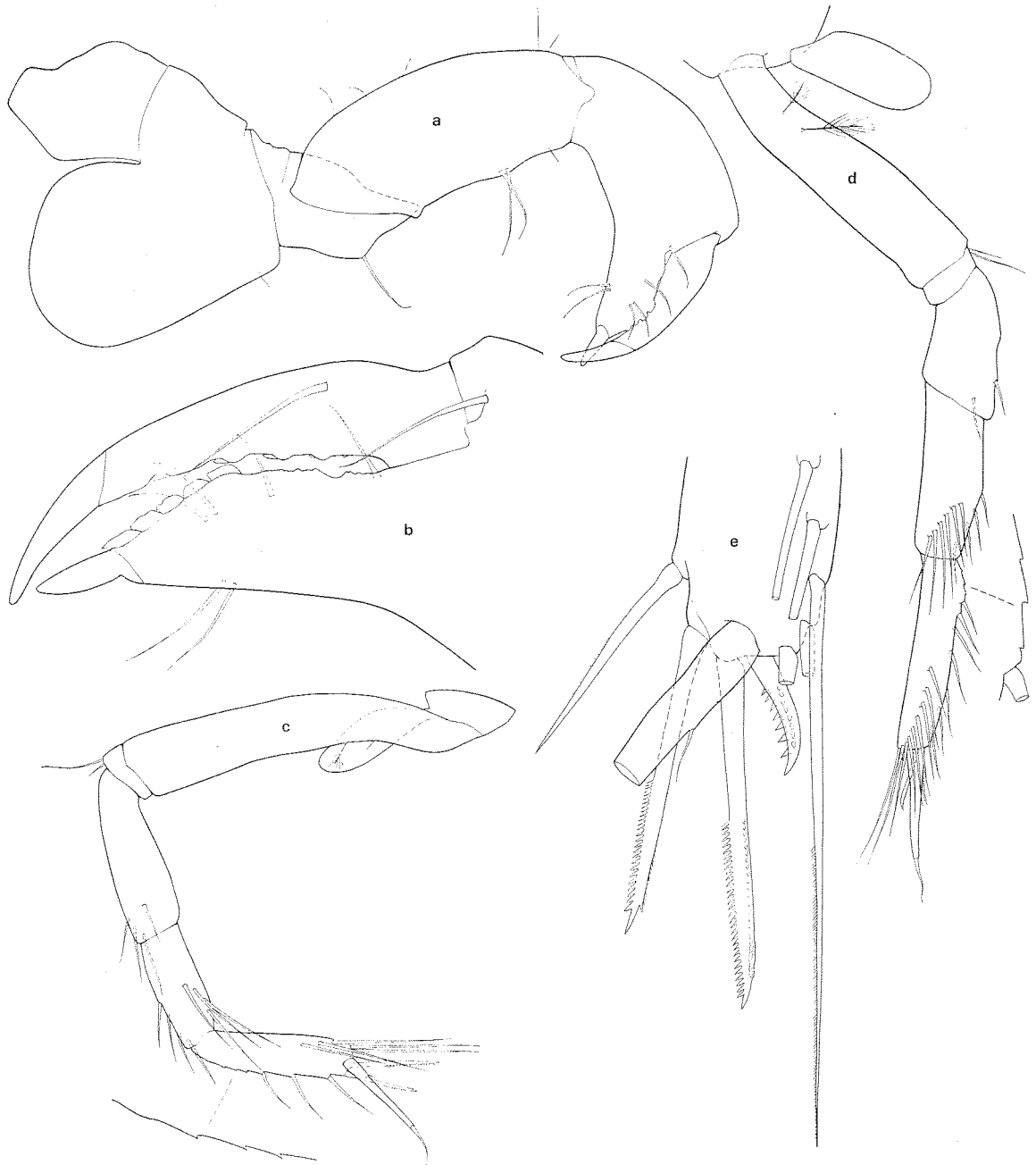


Fig. 91. *Neotanaïs peculiaris* n.sp., ♀; a, cheliped, caudal view (×58); b, distal part of propus, and dactylus of same, rostral view (×130); c-d, peraeopods II-III, caudal view (×80), details (×320); e, distal part of propus of peraeopod II, caudal view (×320).

and with four caudal setae, the two distal of which are close together; tergal surface with five very broad lamelliform processes and irregularly serrated behind the processes. Dactylus with one rostral seta; sternal surface irregularly undulated with five lamelliform processes.

Peraeopods II-IV (Figs. 91c-e, and 92a) very alike, but basis of peraeopod II is somewhat longer and propus somewhat shorter than the corresponding joints on peraeopods III and IV. Basis with at

least one particular seta. Ischium very short with two sternal setae of different lengths. Merus of peraeopod II longer than carpus; merus of peraeopods III-IV shorter than carpus. Carpus and propus armed as in the preceding species except that they are somewhat less setiferous and that propus has two serrated terminal spines. Propus with some sternal serrations above the uppermost seta. Dactylus with claw as in the preceding species.

Peraeopods V-VII (Fig. 92b-j) very alike. They

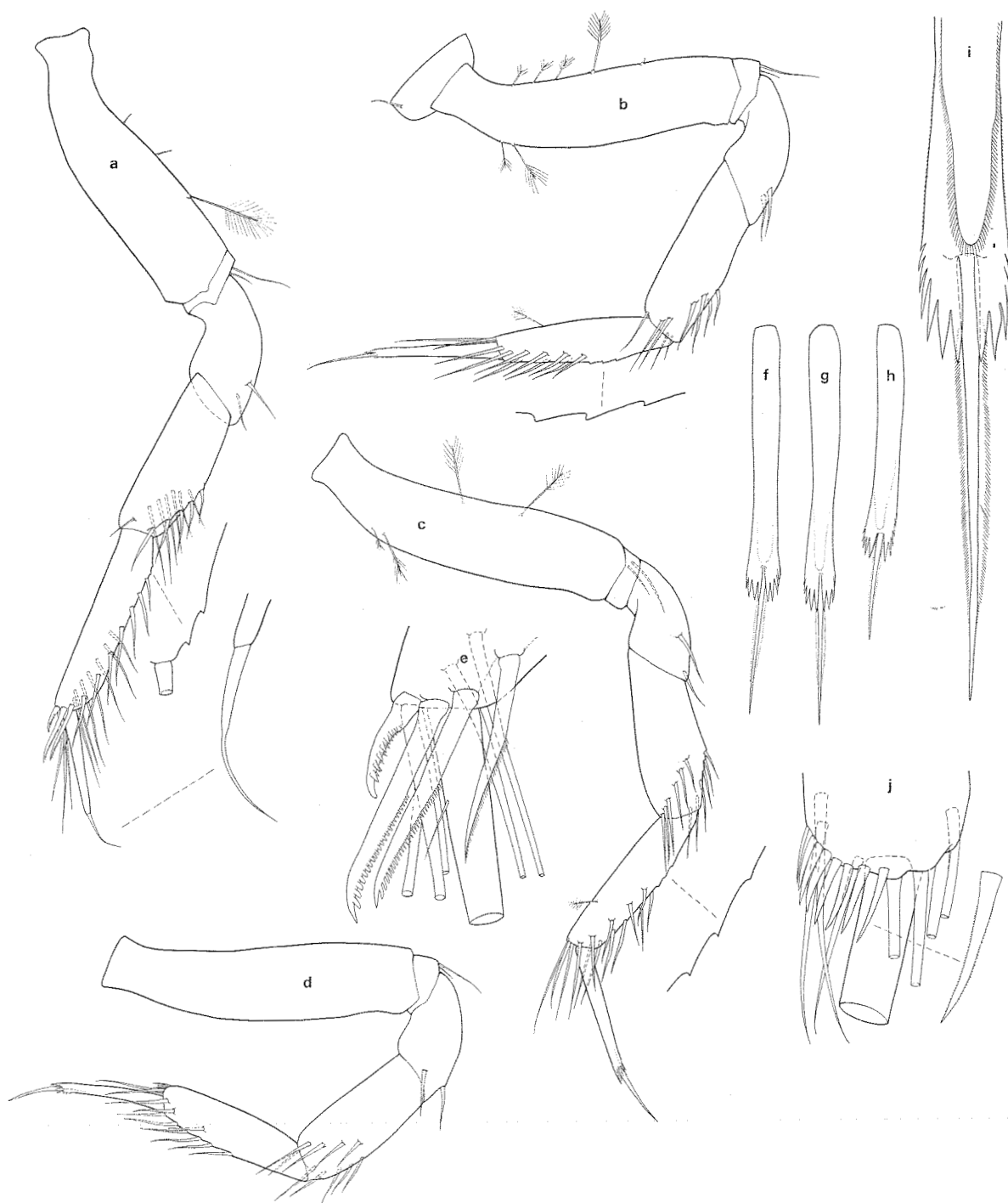


Fig. 92. *Neotanis peculiaris* n.sp., ♀; a-d, pereopods IV-VII, rostral view ($\times 80$), details ($\times 320$); e, distal end of propus of pereopod IV, rostral view ($\times 320$); f-h, dactylus of pereopods V-VII, tergal view ($\times 160$); i, distal part of dactylus of pereopod V, tergal view ($\times 450$); j, distal part of propus of pereopod VII, rostral view ($\times 320$).

differ from those of *N. deflexirostris* in the much shorter setae on carpus and propus. From those of *N. bacescui* they differ mainly in the following respects: Propus of pereopods V and VI has a few serrations just above the most proximal sternal seta, and dactylus is armed somewhat differently (cp. the figures).

Pleopods (Fig. 93). Coxa about 0.25 times as long as basis, which bears three outer setae and two inner. First joint of exopodite with two outer setae; second joint about 3 times longer than the first and about 3 times longer than the greatest width, with the setae arranged as in the preceding species. Endopodite a little longer than exopodite, about 3 times



Fig. 93. *Neotanais peculiaris* n. sp.,
♀; pleopod I, rostral view ($\times 130$).

longer than the greatest width, with the setae arranged as in the preceding species.

Uropod as in the preceding species.

Remarks:

The species differs materially from *N. americanus* in the pleon and from *N. hastiger* in the cheliped. From those species, which like the present have a ventral median process on the pleonites, it differs among other things in the much longer pleotelson.

Neotanais pfaffioides n. sp.

Material:

St. 471, Sunda Trench ($10^{\circ}26'S$, $114^{\circ}15'E$), 2780 m, 9 Sept. 1951. Gear: Petersen-Grab 0.2 sq. m. Bottom: clay. Bottom temp.: $1.7^{\circ}C$. — 1 female (with rudimentary oostegites).

Description:

Body (Pl. VIe) about 7.5 times longer than broad. Integument strongly calcified. Length about 22 mm.

Carapace (Pl. VI f) about 1.3 times longer than broad and a little longer than peraeonites 2 and 3 together. Respiratory chambers moderately strong-

ly swollen and somewhat less outstanding than in *N. serratispinosus*. In front of these chambers it is considerably narrowed and furnished with a carina which on the under side is set with a row of at least four long stiff setae. Behind this row and further down there are three long stiff setae. In front it is about 0.8 times as broad as behind, with a short, straight forwards directed rostral process. Dorsal surface with a very short obliquely backwards directed furrow on each side just in front of the respiratory chambers.

Peraeonites (Pl. Ve) equally broad. They increase a little in length from 2 to 5 and 6 which are equally long while 7 is as long as 3. Peraeonites 5 and 6 are square, the others rectangular. Coxae well marked off.

Pleon (Fig. 94a-b; Pl. VIIa-b) somewhat broader than peraeon. Pleonites laterally with four small plumose setae, ventrally with a conical process, which on the first peraeonite is split into two halves by a longitudinal cleft. Pleotelson as broad as last pleonite and as long as last two pleonites together, with some diminutive lateral setae or hairs behind the attachment of the uropods.

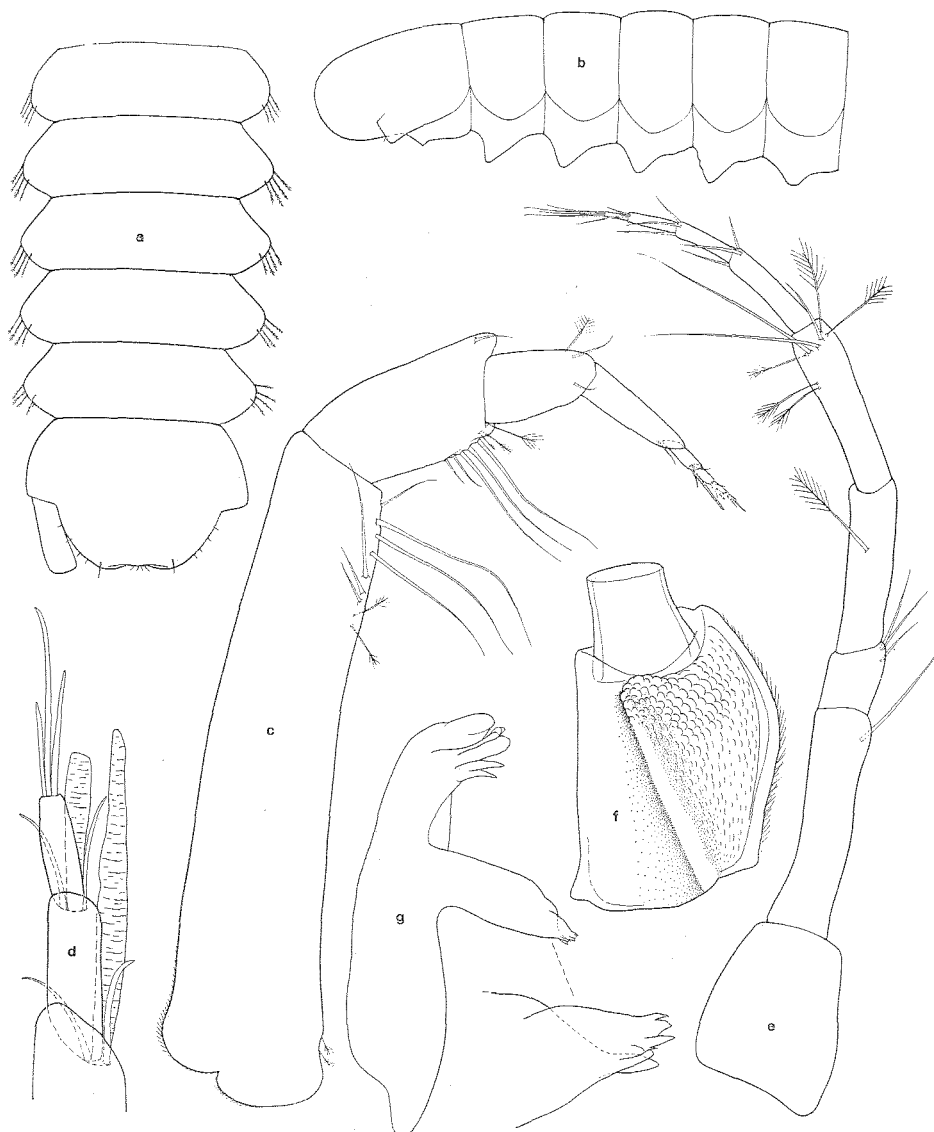
Antennula (Fig. 94c-d). First peduncular joint nearly four times longer than the second, with an outer row of seven rather stiff setae just behind the distal end, and with at least two particular setae. Second joint about 1.5 times longer than the third, with an outer row of five rather stiff setae and with three particular setae. Third joint with one particular seta and with at least two normal setae. First flagellar joint about 1.6 times longer than the succeeding joints together, with one short seta. Second and third flagellar joints with one short aesthetasc, and two short setae. Last joint with three short setae.

Antenna (Fig. 94e-f). First joint about 0.7 times as long as second joint, which has a single dorsal seta near the distal end. Third joint about 0.25 times as long as the second, with three dorsal setae near the distal end. Fourth joint 0.6-0.7 times as long as second joint with one long particular seta. Fifth joint a little longer than the fourth joint and about 1.7 times longer than the sixth, distally set with five long particular setae and three normal setae. Seventh joint about 0.6 times as long as the sixth. Eighth joint about 0.8 times as long as seventh joint and about twice as long as last joint. The last four joints bear three, three, two, and four setae, respectively, counting distad.

Labrum (Fig. 95a) as shown in the figure.

Mandibles (Figs. 94g, and 95b-f). The end of

Fig. 94. *Neotanaïs pfaffioides* n.sp., ♀; a-b, pleon, dorsal and lateral views ($\times 12$); c, antennula, dorsal view ($\times 42$); d, distal part of same ($\times 256$); e, antenna, lateral view ($\times 42$); f, first joint of same, oblique dorsal view ($\times 64$); g, left mandible, rostral view ($\times 46$).



processus molaris is yellowish brown, with few teeth. Pars incisiva of right mandible with two low, broad teeth, that of left mandible with one strong yellowish brown tooth at the outer distal end. Lacinia mobilis yellowish brown with four teeth. The spines are shaped as in Fig. 95b and e.

Labium (Fig. 95g). Basal part richly adorned with hairs. Lobes set with numerous spinules, distally bilobed with two short spines which are well marked off.

Maxillula (Fig. 95h-i). Terminal spines on outer endite completely smooth. Inner endite without inner seta near the base, and with four terminal setae, shaped as in Fig. 95i.

Maxilla (Fig. 95j) adorned with hairs in about the same way as in the preceding species. Setae of inner row bare. The outer row numbers two spines which are trifid at the tip. Fixed endite with one

rostral seta at some distance from the end; on or just below the distal end it bears five unforked setae or spines, shaped as in the figure, and two strong four-forked spines. The outer lobe of movable endite bears three one-sidedly ciliate setae of the same length as the outermost seta on the fixed endite; the inner lobe of the left maxilla bears seven setae and that of the right mandible six, the setae being finely ciliated along the distal half.

Maxilliped (Fig. 95k). Coxa with some rows of diminutive hairs on the outermost part of the caudal surface, and with two caudal spinules and one caudal seta. Basis with one seta on the socle to which the palp is attached. Endite distally armed as in the figure; inner margin with three short, strong setae, richly set with hairs. First palpar joint without setae; second joint a little shorter than the first, with six inner setae and with one seta near the outer

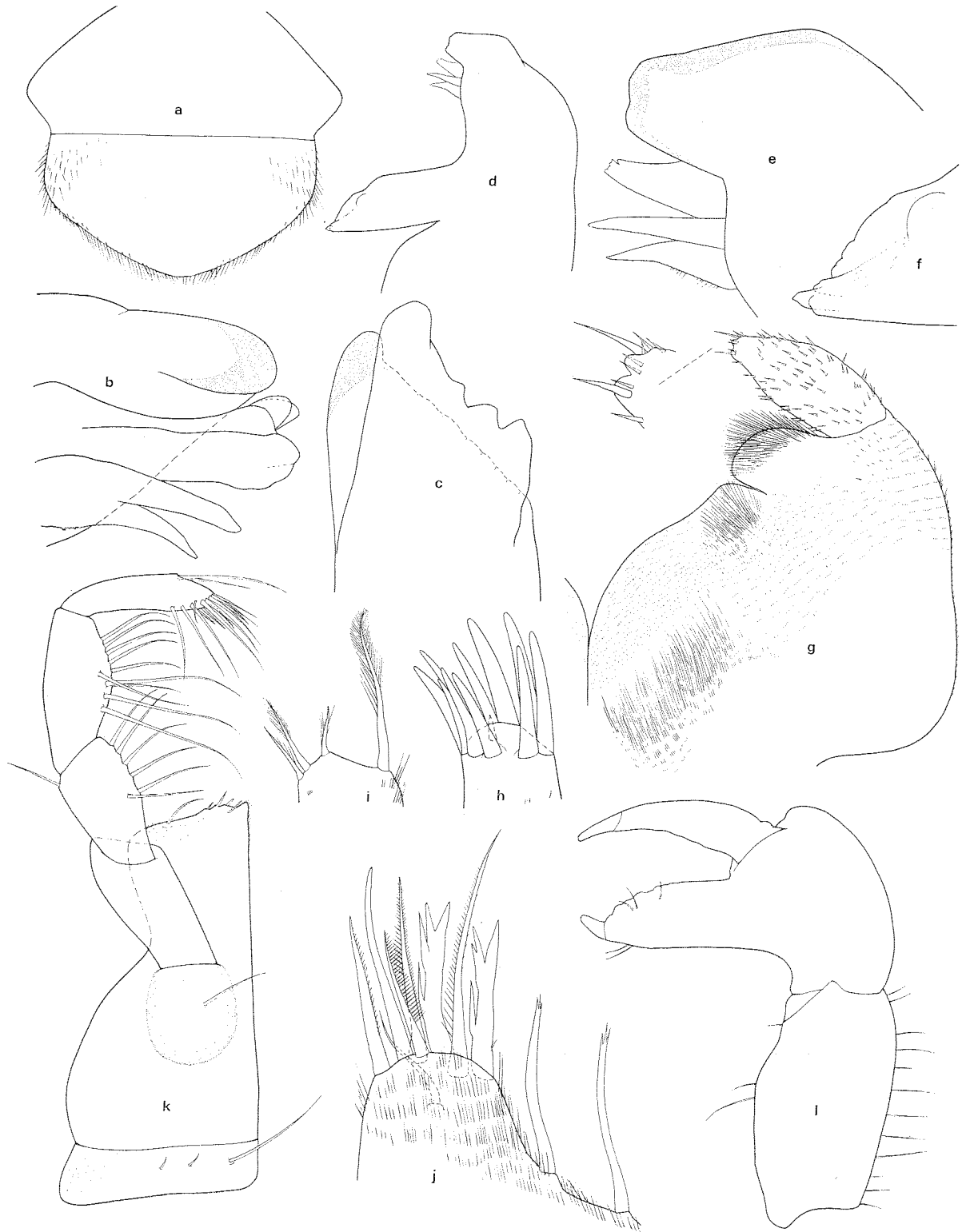


Fig. 95. *Neotanaïs pfaffioides* n.sp., ♀; a, labrum, caudal view ($\times 92$); b, distal part of left mandible, oblique internal view ($\times 205$); c, pars incisiva and lacinia of same, internal view ($\times 205$); d, right mandible, caudal view ($\times 58$); e, distal end of same ($\times 205$); f, distal end of processus molaris of same ($\times 205$); g, left side of labium, caudal view ($\times 118$), detail ($\times 320$); h-i, distal end of maxillular endites, rostral view ($\times 130$); j, fixed endite of maxilla, caudal view ($\times 230$); k, maxilliped, caudal view ($\times 58$); l, carpus, propus, and dactylus of cheliped, caudal view ($\times 20$).

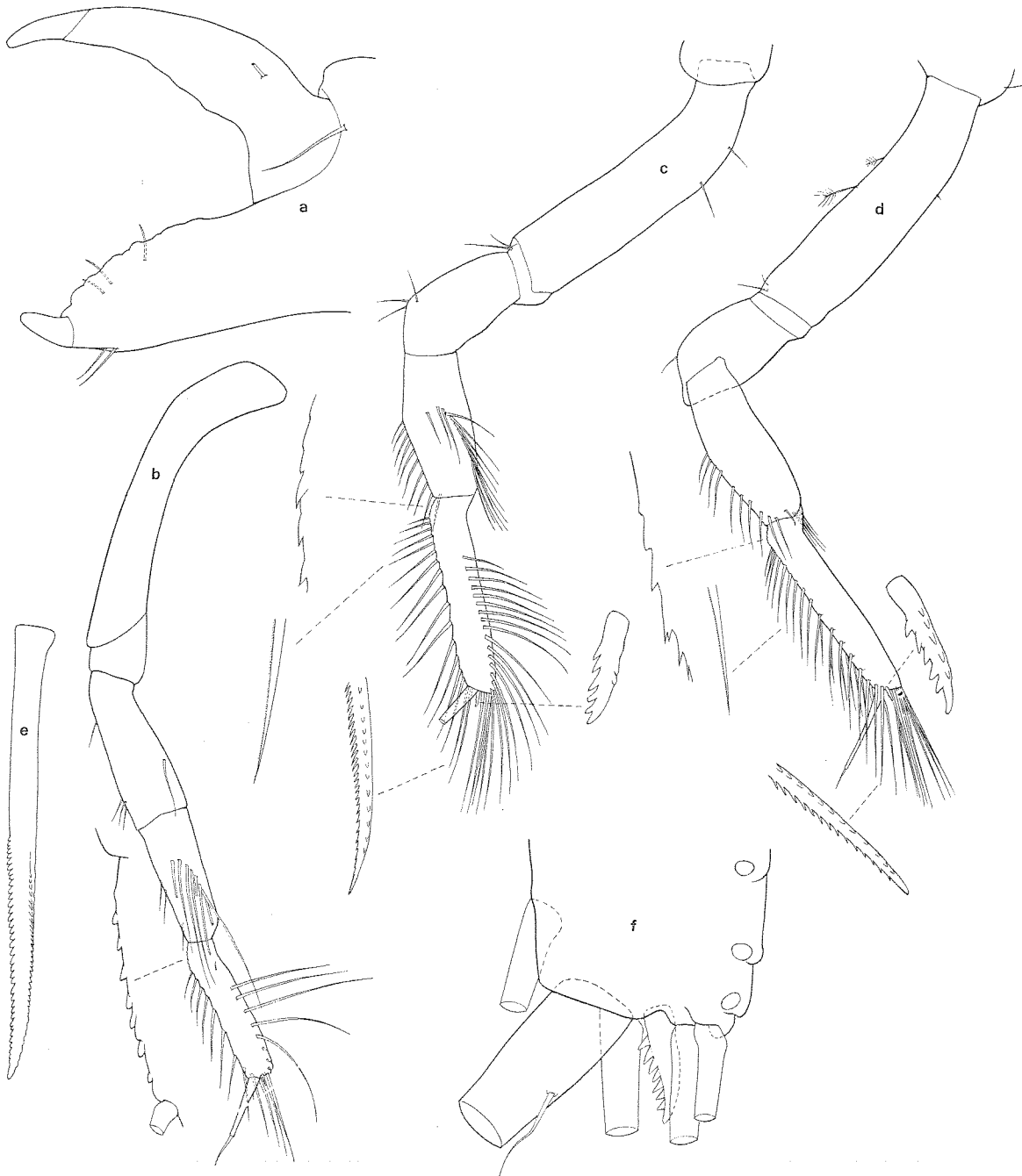


Fig. 96. *Neotanis paffioides* n.sp., ♀; a, distal part of propus, and dactylus of cheliped, rostral view ($\times 30$); b-c, peraeopods II-III, caudal view ($\times 27$); d, peraeopod IV, rostral view ($\times 27$), details ($\times 205$, except for proximal part of propus on peraeopod III and IV, which is $\times 320$); e, one of the rostral setae on propus of peraeopod II ($\times 205$); f, distal end of propus of peraeopod II, caudal view ($\times 205$).

distal end; third joint about as long as the first, with ten inner setae; last joint as long as the preceding one, with fifteen setae, five of which are shorter than the others and finely ciliated on two sides.

Cheliped (Figs. 951, and 96 a). Coxa, basis, and merus as in the preceding species. Carpus shorter than propus, with many tergal setae and three sternal setae. Propus about 1.7 times longer than broad, with one rostral seta just behind the dactylus.

Finger longer than the rest of the joint, with two juxtaposed sternal setae at some distance from the claw, with three caudal setae, two of which are close together, and with five small, rounded tergal processes. Dactylus with one rostral seta and irregularly undulated sternally; claw longer than that of the finger.

Peraeopods II-IV (Fig. 96 b-f) very alike, but basis and merus of peraeopod II somewhat longer and

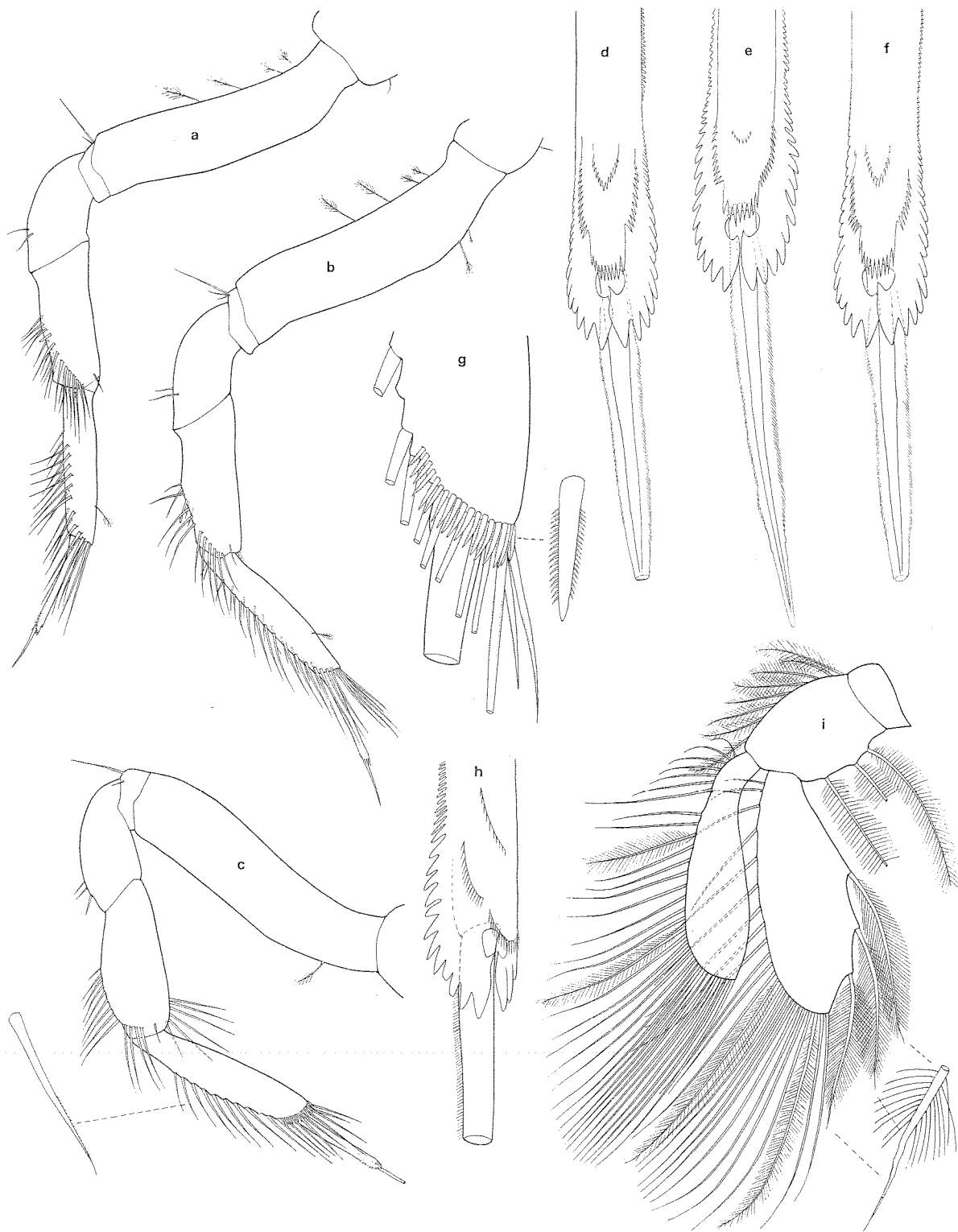


Fig. 97. *Neotanaïs pfaffioides* n.sp., ♀; a-c, pereopods V-VII, rostral view ($\times 27$), detail ($\times 160$); d-f, distal part of dactylus of pereopods V-VII, tergal view ($\times 205$); g, distal part of propus of pereopod VII, rostral view ($\times 92$), detail ($\times 363$); h, distal part of dactylus of same, somewhat oblique rostral view ($\times 230$); i, pleopod I, caudal view ($\times 30$).

propus shorter than the corresponding joints of the other two peraeopods. Basis of peraeopod IV with at least two particular setae. Ischium very short. Carpus and propus with numerous setae; all sternal and distal setae on propus of peraeopod II are serrated, while only the six distal sternal setae and the distal setae on peraeopod III, and the four distal sternal setae on peraeopod IV are serrated; propus finely serrated in the most proximal sternal part, and set with one short, strongly serrated subterminal spine.

Peraeopods V-VII (Fig. 97a-h) very alike, but propus of peraeopod VII differs from that of the two preceding peraeopods inasmuch as it is devoid of particular setae and that it distally has a rostral row of short, strong spines which are two-sidedly strongly pectinate (Fig. 97g).

Pleopods (Fig. 97i). Coxa short, bare. Basis about 3 times longer than coxa, with three inner setae and eight outer. First joint of exopodite about 0.2 times as long as second joint, with seven setae; second joint set with long setae along the outer and distal margins. Endopodite longer than exopodite, 2.6-2.7 times longer than the greatest width, with three inner setae, and with the outer and distal margins marginated with setae. All setae are plumose.

Uropods almost exactly as in *N. bacescui*.

Remarks:

The species is very similar to *N. pfaffi*, but it differs from this species materially, among other things in the antennula, the first flagellar joint of which is much shorter, and in the ventral shape of the pleonites and the pleotelson (cp. Pl. VII a-b, and c-d).

PARATANAIDAE Lang, 1949

Paratanaidae Lang, 1949, p. 10 (partim).

In a recent paper (Lang, 1967, pp. 343-344). I have asserted that *Pseudotanaeis* G. O. Sars (1882a, p. 46) and *Cryptocope* G. O. Sars (1882a, p. 49) do not belong to Tanaidae but to Paratanaidae.

According to G. O. Sars (1886, pp. 349-350, and 1896, p. 26) the genus *Leptognathia* G. O. Sars (1882a, p. 40) is chiefly characterized by the feeble structure of the mandibles, the molar process of which forms a thin acuminate lappet armed at the tip with some small denticles. HANSEN (1913, pp. 9-10), on the contrary, who divides *Leptognathia* into four groups, considers that this process cannot be used as a generic character *inter alia* because he

has found that the new species *Leptognathia subaequalis* (op. cit., p. 87) and *L. ventralis* (op. cit., p. 89) "which are rather allied in most characters and may be referred to the same group, show in the shape and equipment of the molar process such differences as those judged by Sars to be of generic value". I myself have examined these species and I can confirm HANSEN's statement. In *L. subaequalis* this process agrees with Sars's diagnosis for *Leptognathia* while in *L. ventralis* the process of the right mandible is exactly as in *Typhlotanaeis* G. O. Sars (1882a, p. 33), and that of the left mandible is something between those of *Typhlotanaeis* and *Leptognathia*. In addition to this I have found that other species of *Leptognathia* also diverge from Sars's diagnosis in this character, and in the paper mentioned above, I have among other things shown that in *Tanaopsis* G. O. Sars (1896, p. 31) the molar process can be present or absent. These findings necessitate a discussion of the justification of some genera.

Disregarding the molar process which in *Haplocope* G. O. Sars (1882a, p. 51) is shaped as in *Typhlotanaeis*, the chief distinguishing character between *Leptognathia* and *Haplocope* is that in the latter genus the female pleopods are simple oval plates without a trace of setae while this never is the case in *Leptognathia*. But in such a species as *L. manca* G. O. Sars (1882a, p. 44) the female has no pleopods at all, and according to Sars pleopods are lacking in some of the females of *Pseudotanaeis* G. O. Sars (1882a, p. 46). Why then separate a species which is intermediate in this respect? It is true that Sars also points out that the propus of the cheliped is less dilated in *Haplocope* than in *Leptognathia*. But in such species as, for example, *L. manca*, *L. acanthifera* Hansen (op. cit., p. 91, pl. IX, fig. 2b), *L. profunda* Hansen (op. cit., p. 99, pl. X, fig. 1b-c), and *L. birsteini* Kudinova-Pasternak (1965, p. 84, fig. 5i), this joint is as slender as in *Haplocope*. HANSEN (op. cit., p. 103), who is of the opinion that the best character for *Haplocope* is that the pleopods are uniramous, describes a new species *H. linearis* (op. cit., p. 103) which differs from the generotype inasmuch as the pleopods have very long setae, and he feels that the genus is so closely related to *Leptognathia* that it "would perhaps be advisable ... to cancel it" but that this hardly can be done as the genus has been established many years ago.

HANSEN (op. cit., p. 113) also discusses the genus *Tanaella* which was established by NORMAN & STEBBING (1886, pp. 117-118) on a single new spe-

cies, *T. unguicillata*. According to the diagnosis the most striking features of the genus are that the female lacks pleopods and that the uropods have unjointed endopodite and no exopodite. Concerning the first-mentioned character, however, HANSEN says that it cannot be of generic value because he has found a new species – *T. ochracea* – which possesses small pleopods but which for the rest is closely allied to the generotype. HANSEN, who is well aware that the genus is related to *Leptognathia*, gives a “brief description” of it. According to this description the second antennular joint is longer than the two succeeding joints together, the chelipeds are unusually robust, the propus of the anterior pairs of legs is longer than the dactylus with claw while in the posterior pairs the propus is considerably shorter than the dactylus with claw, the pleotelson is at least as long as the last four pleonites together, and the uropods have a styliform unjointed endopodite and no exopodite.

Some few examples may illustrate the value of these characters.

The relative length of the antennular joints in *Leptognathia* varies to a high degree, and according to HANSEN himself (*op. cit.*, p. 89), the second joint in *L. tenella* Hansen is “somewhat longer than the two distal joints combined”. *Tanaella* has the robust cheliped in common with such species as, for example, *L. inermis* Hansen (*op. cit.*, p. 76, pl. VII, fig. 4a), and *L. crassa* Hansen (*op. cit.*, p. 95, pl. IX, fig. 4b). The propus of the second and third pairs of legs in *L. tenella* is “distinctly longer” than the dactylus with its claw while the propus of the last three pairs of legs is shorter than the dactylus with its claw (HANSEN, *op. cit.*, p. 89). Thus this species agrees with *Tanaella* in the antennula and the peraeopods. The length of the pleotelson, too is quite variable in *Leptognathia*, and in *L. parabrevimanu*, described below it is longer than the last four pleonites together.

The *Galathea* material contains *inter alia* two species which, before I had studied NORMAN & STEBBING's diagnosis of *Tanaella* and HANSEN's discussion of it, I without hesitation referred to *Leptognathia*. After having made a detailed comparison between these species and the two species of *Tanaella* hitherto known, I am convinced that they are of the same genus. As the oral parts of *Tanaella* have never been described it may in this connection be enough to point out that the molar process is somewhat different in the two species (cp. Fig. 1021-o) and that the oral parts for the rest are as in *Lepto-*

gnathia. The marsupium, hitherto unknown, is formed by four pairs of oostegites.

Of the two species taken by the *Galathea* Expedition, one agrees with the generotype in having no pleopods and in the uropod (see fig. 110d, p. 178). The other species, however, possesses well-developed setiferous pleopods, and the uniramous uropod is as a rule distinctly two-jointed; sometimes, however, the boundary between the joints is very obscure.

In the paper mentioned, HANSEN has established two monotypic genera, viz. *Leptognathiella* (p. 104, pl. X, fig. 5a-i), and *Strongylurella* (p. 120, pl. XII, fig. 2a-e) which are of interest in this connection. As HANSEN has not examined the oral parts of these genera it may at once be pointed out that they agree exactly with those in typical species of *Leptognathia*. In both of them the body is very slender, 9.5-10 and 8.5 times as long as broad, respectively, and the females lack pleopods. The slenderness of the body they have in common with many species of *Leptognathia*, as, for example, *L. brevimanu* (Lilljeborg) (LILLJEBORG, 1864, p. 22) and *L. filiformis* (Lilljeborg) (LILLJEBORG, 1864, p. 23) which are 10 and 11 times longer than broad, respectively. The first-mentioned genus differs somewhat from *Leptognathia* in the second antennular joint which is “produced above into a triangle overlapping a part of the third joint”, in the pleotelson which is feebly concave between the uropods, and in the uropods which are “extremely long, curved downwards, biramous, with the endopod two-jointed, the short exopod one-jointed”. In his remarks on the genus, HANSEN admits that “the characters pointed out as generic are not very valuable” but that he has found it necessary to establish a new genus because “the aspect of the animal is so different from that of the forms of *Leptognathia*”. However, the shape of the body varies to a high degree within *Leptognathia* and the difference between such species as *L. breviremis* (Lilljeborg) (LILLJEBORG, 1864, p. 21) and *L. filiformis* is much more pronounced than that between *Leptognathiella* and some species of *Leptognathia*, as, for example, *L. manca* and *L. subaequalis* Hansen (1913, p. 87).

According to HANSEN, *Strongylurella* is allied to *Strongylura* G. O. Sars (1882a, p. 52) from which it differs in the relative length of the peraeonites which are as in *Leptognathia*, in the pleon which is shorter than in *Strongylura* and longer than in *Leptognathia*, and in the uropods which each have a two-jointed endopodite and no exopodite. I myself have described a species *Leptognathia paramanca*

Table II. Pleopods, uropods and processus molaris in some genera.

	Pleopods			Uropods		Molar
	biramous	uniramous	wanting	biramous	uniramous	process
<i>Leptognathia</i>						
<i>gracilis</i> (Kröyer)	well developed			2-2 (Fig. 98 a)		L.
<i>dentifera</i> G. O. Sars . .	dwarfed			2-2		L.
<i>manca</i> G. O. Sars . . .			+	1-2 (Fig. 98 b)		L.
<i>breviremis</i> (Lillje- borg)	well developed			1-2 (Fig. 98 c)		L.
<i>ventralis</i> Hansen	well developed			1-2		T. (r.), ab. (l.)
<i>vicina</i> Hansen	small; exopodite much smaller than endopodite			1-2		ab.
<i>brevimanu</i> (Lillje- borg)	well developed				2 (Fig. 98 d)	L.
<i>filiformis</i> (Lilljeborg)	well developed				2 (Fig. 98 e)	L.
<i>profunda</i> Hansen . . .	well developed				2 (Fig. 98 f)	?
<i>latiremis</i> Hansen	well developed				1 (Fig. 98 g-h)	ab.
<i>Haplocope</i>						
<i>angusta</i> G. O. Sars . .		without setae		2-2 (Fig. 98 i)		T.
<i>linearis</i> Hansen		with long setae		2-2		T.
<i>Tanaella</i>						
<i>unguicillata</i> Norman & Stebbing			+			ab.
<i>ochracea</i> Hansen . . .	dwarfed without setae				1 (Fig. 98 j)	ab.
<i>Leptognathiella</i> Hansen	well developed			1-2		L.
<i>Strongylurella</i> Hansen .			+		2 (Fig. 98 k)	L.

(LANG, 1958a, p. 431, figs. A-C) which in the characters mentioned by HANSEN agrees with *Strongylurella*, but which differs materially from HANSEN's species in the relative length of the body segments.

In this connection I take the opportunity to correct two errors in my description of *L. paramanca*. The maxillular endite is at the end surrounded by eleven spines, one of which is very short, two of medium length and eight very long, shaped as in Fig. 103h, and the serration of the propus and the dactylus of the cheliped is due to the fact that the specimens were preserved in Bouin's fluid. After the description was published I got many more specimens preserved in alcohol, taken near Roscoff by Dr. B. SWEDMARK, Zoological Station of Kristineberg, and in the Irish Sea by Dr. N. S. JONES, Marine Biological Station, Port Erin.

Table II gives a survey of the differences between the genera discussed. The figures denote the number of joints of the exo- and endopodite, respectively. For the shape of the molar process the following abbreviations have been used: L. and T. = that it agrees with SARS's diagnoses of *Leptognathia* and

Typhlotanais, respectively, (r.) and (l.) = right and left mandible, ab. = that it neither agrees with SARS's diagnosis of *Leptognathia* nor with his diagnosis of *Typhlotanais*.

As can be seen from the table and the figures, there are transitional forms in all characters. It must also be added that, except for the molar process, the oral parts are exactly the same in all the genera. There can be no doubt that the molar process of the *Typhlotanais*-type is the primitive one, and that this process has been reduced successively as is clear from such species as *Leptognathia ventralis* Hansen, *L. vicina* Hansen (*op. cit.*, p. 89) and *L. latiremis* Hansen (*op. cit.*, p. 101).

What are we to do with these genera? As I can see no sound reason either for splitting up *Leptognathia* or for preserving the other genera discussed, I incorporate them with *Leptognathia*.

HANSEN (*op. cit.*, p. 121) has also established a genus *Paranarthrura* for the new species *P. insignis*, *P. subtilis* and *P. clavipes* (*op. cit.*, pp. 122, 124, and 125, pl. XII, figs. 2-5). In the following year VAN-HÖFFEN (1914, pp. 478 and 479, figs. 15-16) de-

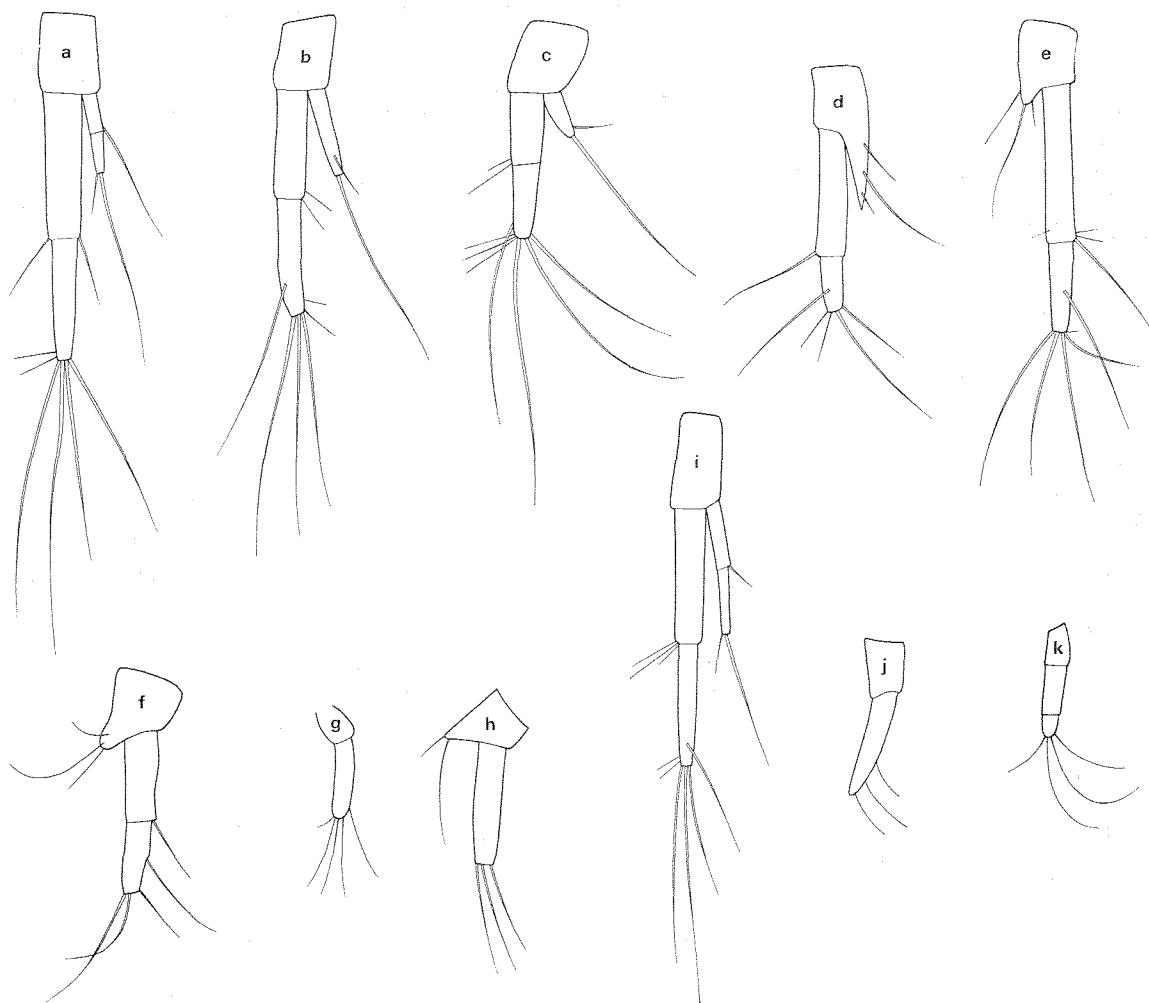


Fig. 98. Uropod of: a, *Leptognathia gracilis* (Kröyer); b, *L. manca* G. O. Sars; c, *L. breviremis* (Lilljeborg); d, *L. brevimanu* (Lilljeborg); e, *L. filiformis* (Lilljeborg); f, *L. profunda* Hansen; g-h, *L. latiremis* Hansen, dorsal and lateral views; i, *Haplocope angusta* G. O. Sars; j, *Tanaella ochracea* Hansen; k, *Strongylurella indivisa* Hansen. Figs. a-e, and i after G. O. Sars (1896), Figs. f-h, and j-k after HANSEN (1913).

scribed two more species – *P. abbreviata* and *P. monacanthus*.

According to HANSEN, who has examined the oral parts only in *P. insignis* – which must be regarded as the genotype – the genus is *inter alia* characterized by the labrum which “is produced in a somewhat long, distally obtuse triangle”, and by the mandibles which lack the processus molaris.

I have re-examined all the species (of *P. abbreviata* there exists only a canada balsam preparation of the last two joints of one cheliped).

HANSEN's statement about the labrum in *P. insignis* is correct, but in the other species the labrum is broad in front. In *P. insignis*, *P. subtilis* and the new species *P. undulata* (see p. 179), the mandibles have a thin, membranous processus molaris which is directed backwards and is very difficult to detect,

while in *P. clavipes* and *P. monacanthus* this process is strongly calcified and directed straight inwards.

The species referred to the genus have one character in common by which they differ materially from *Leptognathia*: the pleonites are very short and narrower than the last peraeonite. But for the rest, they differ from one another considerably in some characters, the most conspicuous of which is the construction of the chelipeds.

As is well known, the coxa of the chelipeds is as a rule situated above the posterior process of the basis. The only exceptions exist in the genera *Anarthrura* G. O. Sars (1882a, p. 53), *Agathotanaïs* Hansen (1913, p. 63), and *Anarthruopsis* n. gen. (see p. 000), and the species *Paranarthrura insignis*, *P. subtilis*, *P. undulata*, and *Leptognathia caudata* Kudina-Pasternak (1965, p. 88, fig. 7) – KUDINOVA-

PASTERNAK has not figured the proximal part of the cheliped and I have not had the species on loan, but she has kindly sent me a sketch of the whole cheliped – in which the coxa is situated directly behind the basis.

To this character which may be of phylogenetical importance I must ascribe generic value, and consequently I restrict *Paranarthrura* to the three *Paranarthrura* species mentioned above; possibly also *Leptognathia caudata* belongs to this genus.

In *Paranarthrura clavipes* and *P. monacanthus* the cheliped is as in most other genera, i.e. that the basis has a long posterior process. To these two species, which belong neither to *Paranarthrura* nor to *Anarthruopsis*, I will return in another paper.

Typhlotanais G. O. Sars, 1882

Typhlotanais G. O. Sars, 1882a, p. 33.

Typhlotanais peculiaris n. sp.

Material:

St. 192, off Durban (32°00'S, 32°41'E), 3530 m, 5 Feb. 1951. Gear: shrimp otter trawl. Bottom: globigerina ooze. Bottom temp.: 1.2°C. – 1 adult female.

St. 280, Seychelles-Ceylon (1°56'N, 77°05'E), 4350 m, 9 April 1951. Gear: shrimp otter trawl. Bottom: globigerina ooze. Bottom temp.: 1.3°C. – 1 adult female.

Description of female type (from St. 192):

Body (Pl. VIIe) slender, subcylindrical, about 7.5 times longer than broad. Carapace and peraeonites defined by rather deep constrictions. Peraeon a little broader than pleon. Length about 8.0 mm. Integument rather flexible.

Carapace about as long as peraeonite 2, and as long as the greatest width, almost semioval in outline, broadest behind. Rostral projection small, acute at the tip. Antero-lateral corners slightly extended forwards.

Peraeonites increase in length from 2 to 4, which is longest. Peraeonite 5 a little longer than 2, peraeonite 6 as long as 2 and peraeonite 7 about half as long as 3. Peraeonite 2 broadest in front and about 0.75 times as long as 3; peraeonites 3-5 of about the same width throughout, while peraeonites 6-7 successively widen towards the back. Peraeopods II-IV attached to the front end, peraeopods V-VII to the posterior end of the peraeonites. Pe-

raeonite 2 with a short, straight forwards directed hyposphenic just behind the front end.

Pleon (Fig. 99a) short, about as long as peraeonite 6. Pleonites 1 and 5 a little longer than the others. Pleonites 1-4 with one tiny lateral seta behind the middle, pleonite 5 with two. Pleotelson about half as long as the pleonites together, posteriorly extended as a triangular process set with two small setae at the somewhat truncate tip. On both sides of the process there is a tiny particular seta and one diminutive spinule.

Antennula (Fig. 99b) about as long as carapace. First joint about 1.5 times longer than the other joints together, last joint about 4.0 times longer than second. First joint with some particular setae, second joint with at least one particular seta, and last joint with one slender aesthetasc. Tip of the spinules and setae shaped in a very peculiar manner (see Fig.).

Antenna (Fig. 99c) six-jointed. First joint small, bare, narrower than the second, which is the deepest joint, and about 2.5 times longer than the first. Third joint nearly twice as long as the first, with two very small spinules which are somewhat clavate at the tip. Second and third joints moreover adorned with some rows of tiny hairs. Fourth joint somewhat arched, about 1.5 times longer than the preceding joints together, and fully twice as long as fifth joint; near the distal end it bears some short particular setae and some spinules which are trifid at the tip. Fifth joint with one seta near the end. Last joint very short, set with one spine which is trifid at the tip, and with five setae which are shaped in a similar manner to the terminal setae of the antennula.

Labrum (Fig. 99d), seen from the caudal surface, with a distinct neck, very broad in front, and set with hairs, spinules and spines as shown in the figure. In lateral view it is labiate.

Mandibles (Fig. 99e-f) with rows of spinules in the proximal part of the caudal surface. Processus molaris very strong and firm, straight inwards directed, with the oval end crenate and dark orange-coloured. Pars incisiva and lacinia mobilis untoothed. The end of the left mandible, the lacinia, and the margins of pars incisiva of the right mandible are light orange-coloured.

Labium (Fig. 99g). Caudal surface richly adorned with hairs, spinules and scale-like formations arranged as in the figure.

Maxillula (Fig. 100a). Endite much longer than the palp, with numerous rows of tiny spinules on



Fig. 99. *Typhlotanais peculiaris* n.sp., ♀; a, pleon, dorsal view ($\times 53$); b, antennula, ventral view ($\times 98$); c, antenna, lateral view ($\times 98$); d, distal part of labrum, caudal view ($\times 205$); e, left mandible, caudal view ($\times 108$); f, pars incisiva of right mandible, internal view ($\times 108$); g, left side of labium, caudal view ($\times 205$); h, maxilliped, rostral view ($\times 205$); i, distal end of endite of same, caudal view ($\times 205$); j, epignath ($\times 150$).

the surface, and terminally surrounded with seven long, two short, and two middle-sized bare spines. Palp sharply attenuated towards the end, with two terminal setae.

Maxilla (Fig. 100b) broadest in front, convex along the greater part of the inner margin, on the caudal surface adorned with rows of spinules as shown in the figure.

Maxilliped (Fig. 99h-j). Basis completely fused with the corresponding joint of the other maxilliped, with one long caudal seta just behind the palp, the seta being finely plumose along the distal part. The endite has two nodular processes in front; the caudal surface bears one outer plumose seta just inside the end, one plumose seta at some distance from the inner corner, and is moreover adorned with one transverse row of long slender spinules and with a number of scattered slender spinules (Fig. 99i); the rostral surface is adorned as shown in Fig. 99h. The rostral surface of the joints of the palp is set with rows of spinules as shown in Fig. 99h; the first joint is devoid of setae; the second joint has one outer distal seta and three inner setae near the end; the third joint has four setae and the last joint six; most of the setae are one- or two-sidedly ciliated. Epignath somewhat falciform, with two longitudinal rows of tiny spinules in the proximal part, and with a girdle of tiny hairs just in front of the bifid tip.

Cheliped (Fig. 100c) more robust and less slender than in most species of the genus. Coxa small, almost semicircular. Basis very large, with a short and deep posterior process; the distal part of the tergal surface inclines towards the merus, and it is in this part excavated and set with numerous nodules or scale-like formations. Merus almost triangular. Carpus shorter than propus with a sparse tergal row of tiny hairs. Propus with a rostral row of one irregularly shaped spine and three blunt tubercles at some distance from the gap between the dactylus and the finger, and with one caudal seta just inside the gap; finger with three caudal setae at some distance from the terminal claw and with two sternal setae, the two last-mentioned setae being funnel-shaped at the end; tergal surface of finger slightly undulated along the distal part. Dactylus with one short irregularly shaped tergal seta.

Peraeopod II (Fig. 100d-d.3) much longer than the succeeding peraeopods. Coxa well defined, set with a tiny seta. Basis nearly as long as the three succeeding joints and half of the next joint together, with at least one small tergal particular seta and with a few small tergal and sternal spinules which

are bifid at the tip. Ischium very short with one tiny sternal seta. Merus a little longer than carpus and about 0.4 times as long as basis. Propus fully 1.3 times longer than carpus with a well defined rostral lobule at the end, furnished with a seta extending to about the middle of the claw of the dactylus. Merus, carpus and propus are armed as in the figures.

Peraeopods III-IV (Fig. 100e-e.3, and f) very alike, but the joints of peraeopod III are somewhat shorter than those of peraeopod IV. Coxa defined, set with a tiny seta. Basis nearly as long as the four succeeding joints together, with one tergal particular seta and with some small tergal and sternal spinules. Ischium short with one tiny sternal seta. Merus slightly longer than carpus and about 0.25 times as long as basis. Propus about 2.2 times longer than carpus, at the end furnished with a well defined rostral lobule, furnished with a seta extending somewhat beyond the middle of the claw of the dactylus. Merus, carpus and propus are armed as shown in Fig. 100e.1-e.3.

Peraeopods V-VII (Fig. 101a-c) very alike, rather robust. Coxa not defined. Basis strongly tumefied, that of peraeopod V about 2.4 times longer than broad, that of peraeopods VI and VII about twice as long as broad, with at least two moderately long particular setae on peraeopods V and VI, and with at least one very small particular seta on peraeopod VII. Ischium very short, set with one sternal spinule and one tiny sternal seta. Merus longer than carpus. Propus much slenderer and longer than carpus. Dactylus with claw of peraeopods V and VI about half as long as propus, of peraeopod VII about 0.35 times as long as propus; claw much shorter than dactylus, bidentate at the tip. The last four joints are armed as shown in the figures.

Pleopods (Fig. 101d). Basis unarmed. Exopodite longer than endopodite, outer and distal margins of both rami set with long plumose setae, endopodite moreover with one plumose seta near the end of the inner margin.

Uropod (Fig. 101e). Basis almost square. Exopodite one-jointed, somewhat shorter than the endopodite, about 6 times longer than broad at the base, furnished with one tiny seta near the end and with one long terminal seta which is rather thick at the base, set with some tiny spinules around the middle part and fringed at the tip. Endopodite two-jointed, as slender as the exopodite; first joint with two terminal particular setae; second joint about 0.8 times as long as the first, with one long bare seta, two short particular setae and two short plu-

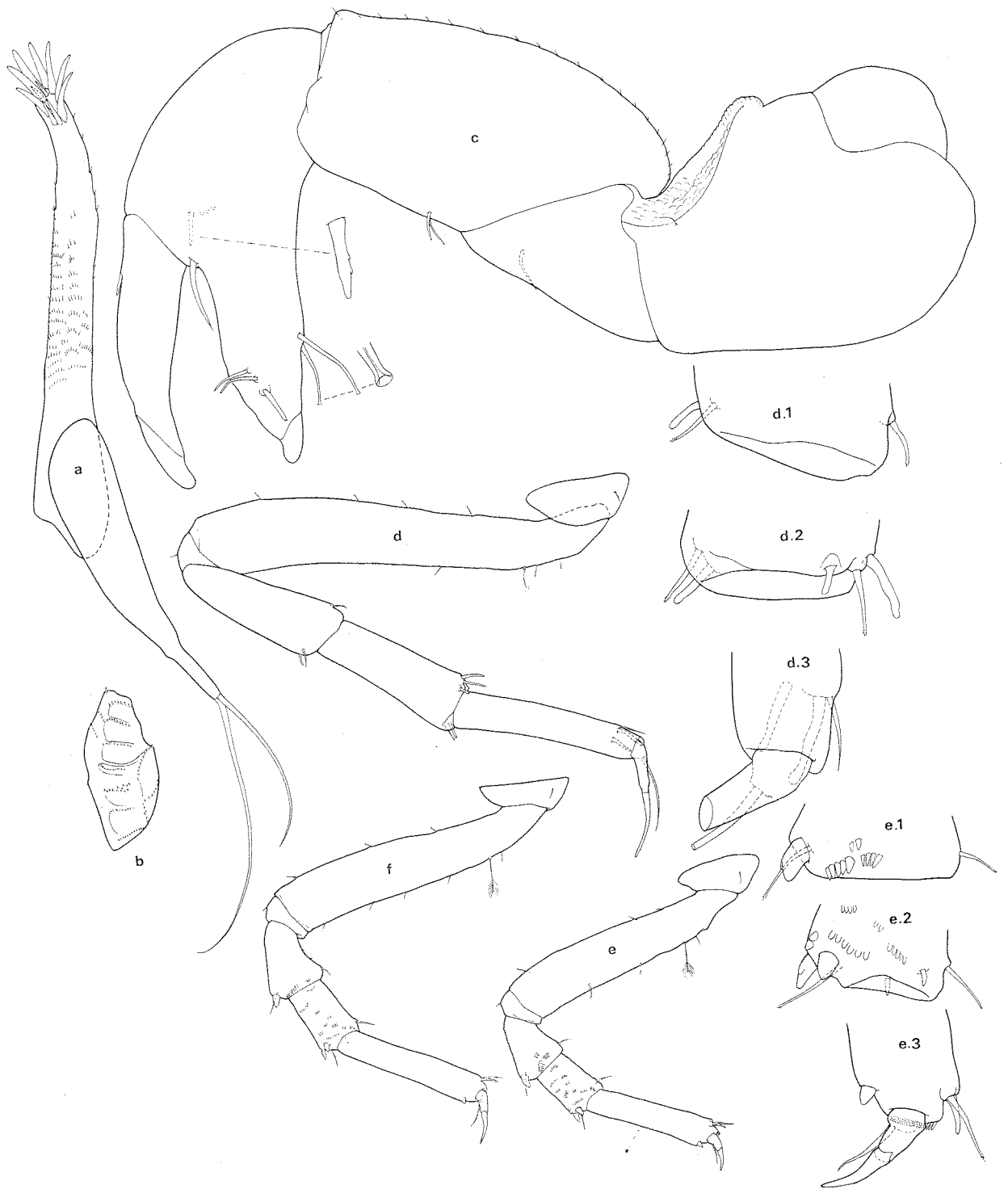


Fig. 100. *Typhlotanais peculiaris* n. sp., ♀; a, maxillula, internal view ($\times 150$); b, right maxilla, caudal view ($\times 420$); c, cheliped, caudal view ($\times 98$); d-f, pereopods II-IV, caudal view ($\times 98$); d.1-d.3 and e.1-e.3 distal part of merus, carpus and propus of pereopods II and III, caudal view ($\times 320$).

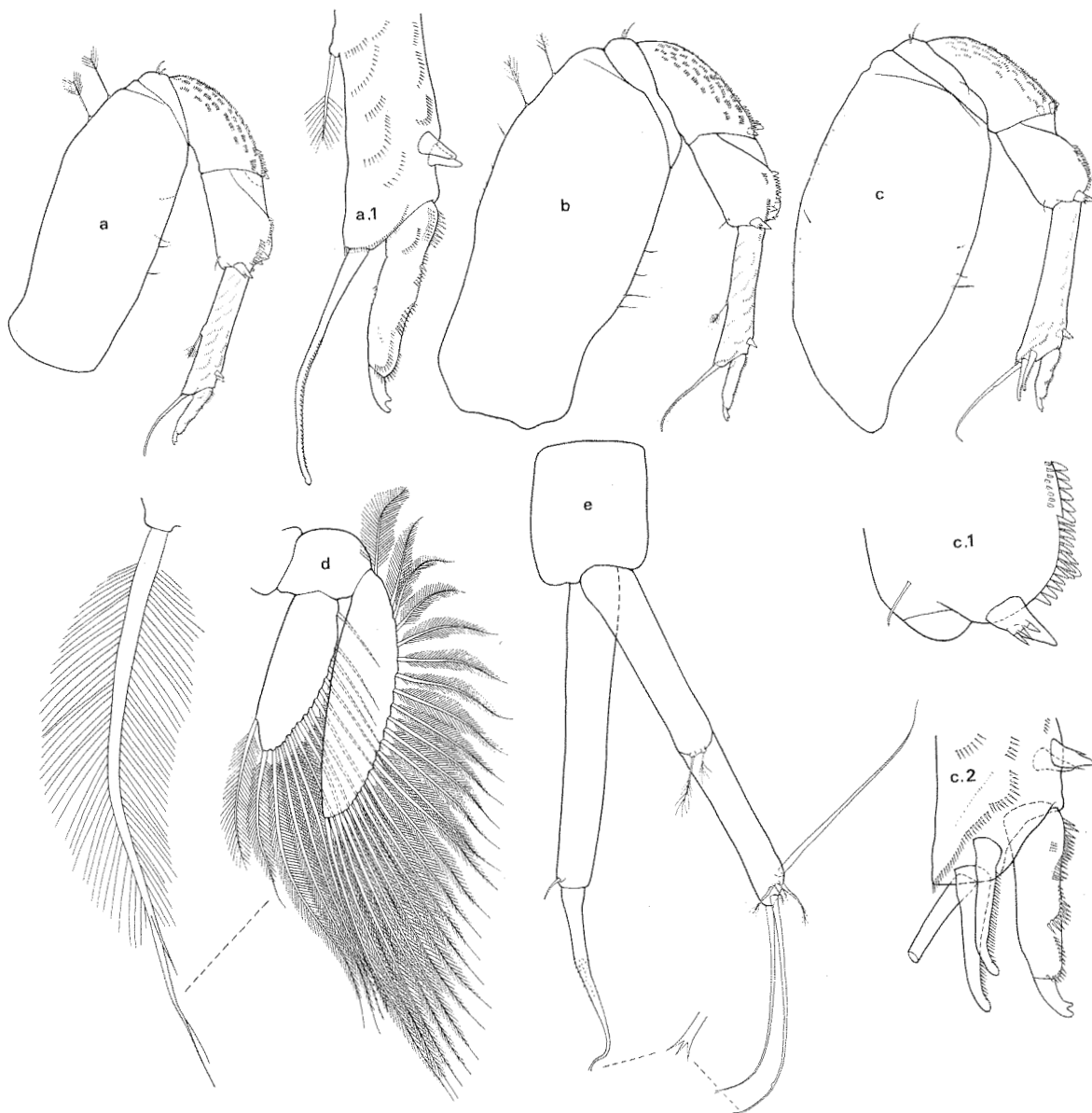


Fig. 101. *Typhlotanais peculiaris* n.sp., ♀; a-c, pereopods V-VII, rostral view ($\times 98$); a.1, distal part of pereopod V, rostral view ($\times 320$); c.1, distal end of carpus of pereopod VII, rostral view ($\times 320$); c.2, distal end of propus with dactylus of same, rostral view ($\times 320$); d, pleopod I, caudal view ($\times 98$), seta ($\times 320$); e, uropod, somewhat oblique ventral view ($\times 160$).

mose setae near the end, and with two long terminal setae, one of which has a small bulge at some distance from the tip; the terminal setae are fringed at the tip.

Remarks:

Judging from the descriptions of the species hitherto described, *T. peculiaris* differs from all other species of the genus in the peculiar shape of the spinules and setae on the antennula and antenna. However, this difference may be fictitious and attributable to insufficient observations of earlier investigators.

In the general shape of the body, *T. peculiaris* approaches *T. brevicornis* (Lilljeborg) (LILLJEBORG, 1864, p. 15; G. O. Sars, 1896, p. 23, pl. XI, fig. 1), *T. tenuicornis* G. O. Sars (1896, p. 23, pl. X, fig. 3), and *T. trispinosus* Hansen (1913, p. 49, pl. V, fig. 4a-f), but it differs from all of them in the shape of the carapace and the uropods, from the two last-mentioned species moreover in the antenna and pereopod II.

TATTERSALL (1905, p. 3, pl. I, figs. 1-9), who describes the species *T. proctagon*, says *inter alia* that the claw of the dactylus of the last three pairs of pereopods "sometimes" has "secondary teeth",

and according to his figure, the dactylus is tridentate. Consequently, this character seems either to be variable, or to be a stage character. However that may be, *T. peculiaris* differs considerably from *T. procotagon* in the peraeonites, the chelipeds, and the uropods.

T. peculiaris has the very robust cheliped in common with *T. macrocephala* Hansen (1913, p. 38, pl. III, fig. 6a-e), but from this species it differs materially in the shape of the body, the last three pairs of peraeopods, and the uropods.

Leptognathia G. O. Sars, 1882

Leptognathia G. O. Sars, 1882a, p. 40.

Haplocope G. O. Sars, 1882a, p. 51.

Tanaella Norman & Stebbing, 1886, p. 117.

Leptognathiella Hansen, 1913, p. 104.

Strongylurella Hansen, 1913, p. 120.

Remarks:

As has already been pointed out (pp. 157-159), the genera mentioned above must, in my opinion, be incorporated with *Leptognathia*.

Leptognathia parabrevimanu n.sp.

Material:

St. 726, Gulf of Panama (5°49'N, 78°52'W), 3670-3270 m, 13 May 1952. Gear: herring otter trawl. Bottom: clay. Bottom temp.: c. 2.0°C. - 1 adult female.

Description:

Body (Fig. 102a; Pl. VIIIf) very slender, almost filiform, about 11 times longer than broad. Carapace and peraeonites defined by deep constrictions. Length about 3.3 mm. Integument strongly calcified and fragile.

Carapace about 0.8 times as long as the first two peraeonites together and as broad as the first peraeonite, narrowed in its most anterior part, in front a little more than half as broad as the greatest width. Rostral projection of moderate length, rounded at the tip (Fig. 102c); antero-lateral corners somewhat extended forwards.

Peraeonites (Pl. VIIIf). Peraeonite 2 about 0.75 times as long as any of peraeonites 3-5, which are subequally long, while peraeonite 6 is a little shorter than 5, and 7 as short as 2. No hyposphenians.

Pleon (Fig. 102b) about 1.3 times longer than the last two peraeonites together. First and last pleo-

nites of the same length and a little longer than any of the others. First pleonite broadest behind, laterally convex. Last pleonite with one dorsal setula near the anterior corners and with one setula at the distal corners. Pleotelson laterally almost straight, posteriorly convex, about as long as half of the first pleonite and the succeeding pleonites together and nearly 1.2 times longer than broad, with one dorsal setula on either side of the median line at some distance from the end, and with one lateral tiny setula near the end.

Antennula (Fig. 102c). First joint about 1.3 times longer than the succeeding joints together, about 2.7 times longer than the second joint, and about 7 times longer than the third. Last joint about twice as long as the third, with short aesthetasc at the tip.

Antenna (Fig. 102d) six-jointed. Fourth joint with an indistinct borderline between the primary fourth and fifth joints. First joint shorter and much narrower than the second, which is the broadest joint. Third joint about 0.7 times as long as the second. Fourth joint about 3 times longer than the third, set with a tiny ventral setula at the borderline, and with one particular seta near the distal end. Fifth joint about 0.4 times as long as the fourth. Last joint very small.

Labrum (Fig. 102e) seen from the ventral side rounded in front and set with spinules as in the figure. Seen from the lateral side, it is labiate.

Mandibles (Fig. 102f-g) with processus molaris somewhat obliquely downwards directed, attenuated in the distal part and set with some spiniform processes. Pars incisiva of right mandible five-dentate, two of the teeth being much larger than the others. Pars incisiva of left mandible four-dentate, lacinia mobilis three-dentate.

Labium (Fig. 102h) bilobed, each lobe with some diminutive hairs near the end of the outer margin.

Maxillula (Fig. 103a) with long slender endite which at the end is surrounded by eleven spines, one of which is very short, two moderately long and the remaining ones long and set with tiny hairs along the distal half of the concave margin. There are also some hairs near the end of the outer surface. Palp much shorter than the endite, furnished with two terminal setae, which are one-sidedly ciliate along the middle part.

Maxilla (Fig. 103b) a somewhat vaulted plate, nearly 2.3 times longer than the greatest width, broadest behind; outer margin somewhat excurved.

Maxilliped (Fig. 103c-e). Basis completely fused with the corresponding joint of the other maxilliped,

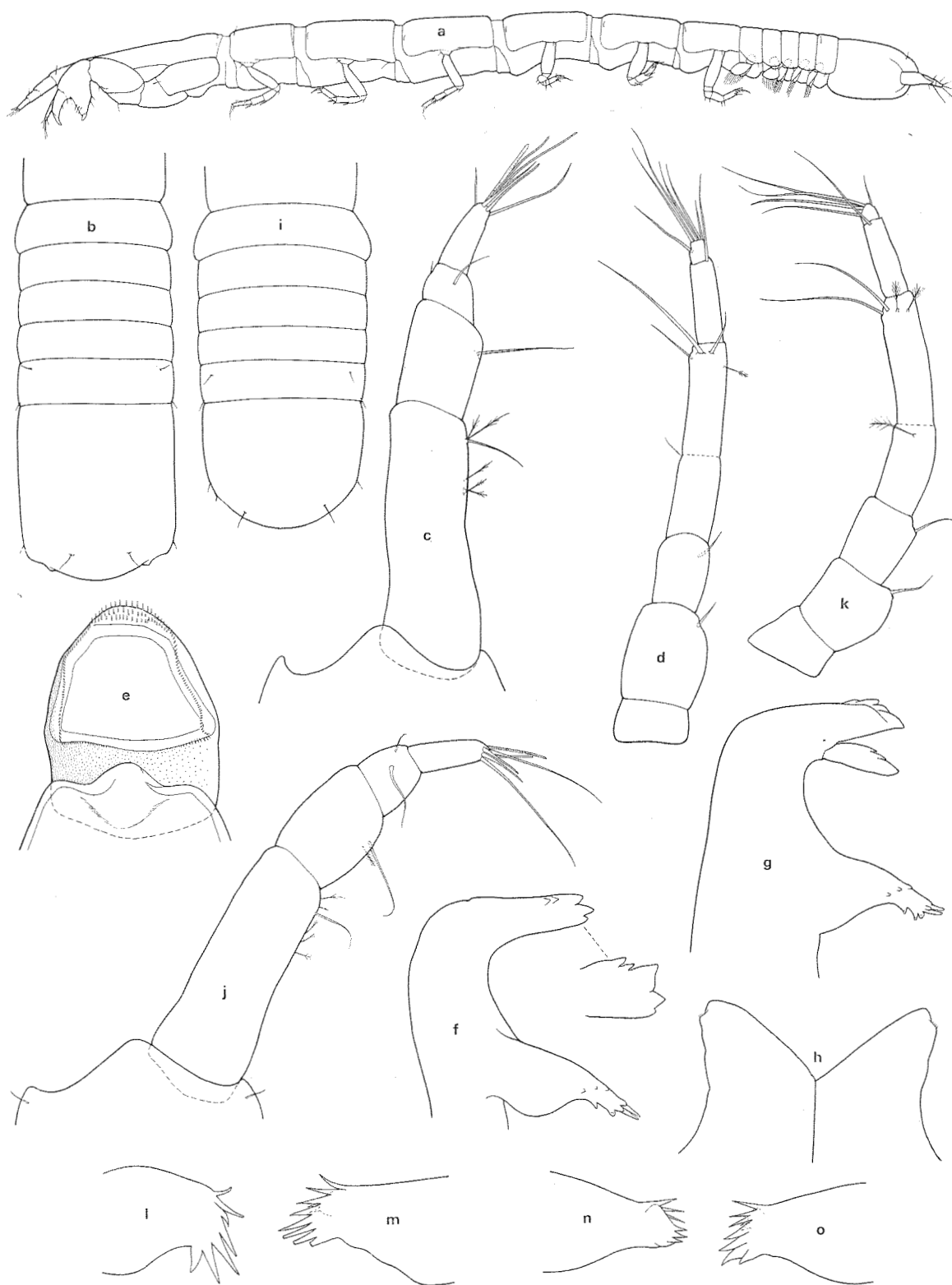


Fig. 102. a-h, *Leptognathia parabrevimanu* n. sp., ♀; a, lateral view ($\times 38$); b, pleon, dorsal view ($\times 80$); c, front end of carapace, and antennula, dorsal view ($\times 205$); d, antenna, oblique ventral view ($\times 245$); e, labrum, rostral view ($\times 450$); f-g, right and left mandibles, rostral and caudal views, pars incisiva of right mandible, internal view ($\times 450$); h, labium, caudal view ($\times 320$). i-k, *Leptognathia brevimanu* (Lilljeborg), ♀; i, pleon, dorsal view ($\times 80$); j, front end of carapace, and antennula, dorsal view ($\times 205$); k, antenna, lateral view ($\times 245$); l-m, *Tanaella unguicullata* Norman & Stebbing, ♀; distal end of processus molaris of right and left mandibles ($\times 450$); n-o, *Tanaella ochracea* Hansen, ♀; distal end of processus molaris of right and left mandibles ($\times 450$).



Fig. 103. a-g, *Leptognathia parabrevimanu* n. sp., ♀; a, maxillula, internal view ($\times 360$); b, maxilla, caudal view ($\times 360$); c, maxilliped, caudal view ($\times 360$); d, palp of same, rostral view ($\times 360$); e, epignath ($\times 360$); f, cheliped, caudal view ($\times 140$); g, propus and dactylus of same, rostral view ($\times 196$); h, *Leptognathia paramanca* Lang; distal end of maxillular endite, internal view ($\times 200$).

set with one caudal seta just behind the palp. In front the endite has a small unguiform spine near the spiniformly extended outer corner, a strong bulbiform process near the inner corner, and a tiny caudal seta just behind the process. First joint of the palp without setae; second joint with one bare seta at the outer distal corner and with three short-plumose setae near the inner distal corner; last two joints with three and six setae, respectively; except for the short distal seta of the third joint and the short outer seta of the last joint, the setae are short-plumose along the distal part; caudal surface of last joint with three rows of tiny spinules; rostral surface of first three joints with one, one and two rows of tiny spinules, respectively, counting distad. Epignath (Fig. 103e) somewhat falciform, filiform at the end.

Cheliped (Fig. 103f-g). Coxa not marked off. Basis as long as carpus with the short posterior process attached near the middle of the lower part

of carapace. Merus triangular. Carpus with some sternal processes near the middle. Propus shorter than carpus with the major part of the sternal surface distinctly convex and set with two setae; one short seta in the gap between the dactylus and the finger; rostral surface with a transverse row of one moderately long seta and three spinules at some distance from the gap and with some rows of diminutive hairs; finger with three caudal setae and with four obtuse teeth just behind the terminal claw. Rostral surface of dactylus with some rows of diminutive hairs and with one short seta at some distance from the base; sternal surface with three short spines.

Peraeopods II-IV (Fig. 104a-c) with the coxa well marked off and set with a fine rostral seta. Basis about 0.8 times as long as the four succeeding joints together and about 3 times longer than the greatest width. Ischium very short, set with one tiny sternal seta. Merus about as long as carpus, with one spine

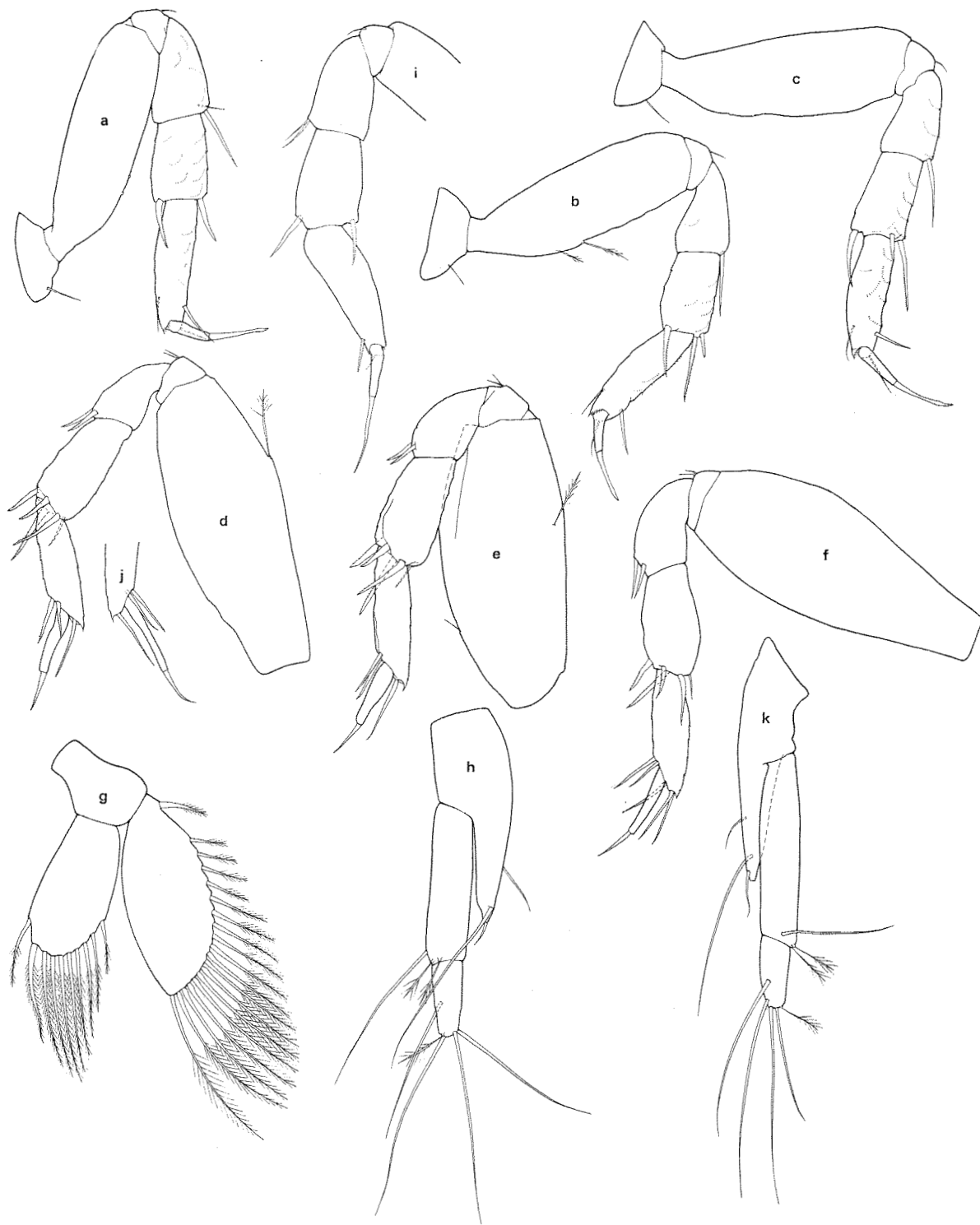


Fig. 104. a-h, *Leptognathia parabrevimanu* n.sp., ♀; a-c, peraeopods II-IV, caudal view ($\times 245$); d-f, peraeopods V-VII, rostral view ($\times 245$); g, pleopod I, caudal view ($\times 245$); h, uropod, ventral view ($\times 245$). i-k, *Leptognathia brevimanu* (Lilljeborg), ♀; i, peraeopod II, caudal view ($\times 245$); j, distal part of peraeopod V, rostral view ($\times 245$); k, uropod, ventral view ($\times 245$).

at the distal sternal corner, reaching far beyond the middle of the carpus; merus of peraeopod II moreover with a fine rostral seta just inside the spine. Distal tergal corner of carpus with one spine which does not reach to the middle of the propus; distal sternal corner of carpus of peraeopod II is set with one spine of the same length as the tergal one, while on peraeopods III and IV there are one short spine and one long one which reaches to about the middle of the propus. Last-mentioned joint 1.5-1.6 times longer than carpus, near the end set with one fine tergal seta and one short sternal spine, and furnished with a well defined terminal rostral lobule set with a seta reaching to about the end of the proper dactylus. The caudal surface of the three last-mentioned joints is adorned with some rows of tiny hairs. Dactylus with claw shorter than propus; claw longer than dactylus.

Peraeopods V-VII (Fig. 104d-f). Coxa not marked off. Basis tumefied, about as long as the four succeeding joints together. Ischium very short with two small sternal setae. Merus about 0.6 times as long as carpus with two short rostral spines near the end. Carpus at the end surrounded by one seta and four spines, two of which are shorter than the others. Propus about as long as carpus with two distal sternal spines; there is one distal tergal spine on peraeopods V and VI and three on peraeopod VII.

Pleopods (Fig. 104g). Basis widened in the distal half. Exopodite somewhat longer than endopodite, set with plumose setae along the outer and distal margins. Endopodite set with plumose setae along the distal part of the outer margin and along the distal margin; inner margin with one plumose seta near the end.

Uropod (Fig. 104h). Basis and exopodite completely fused, the latter forming a long mucroniform process, furnished with one short outer seta near the middle, and with one long subterminal seta and one very short terminal seta. Endopodite two-jointed; first joint twice as long as the second, with one long seta and two short particular setae near the inner distal corner; second joint with one long dorsal seta, and with one short particular seta and three long setae at the end.

Remarks:

In the shape of the uropods *L. parabrevimanu* shows a great resemblance to *L. brevimanu* Lilljeborg (LILLJEBORG, 1864, p. 22), to which, no doubt, it is most closely related. *L. parabrevimanu* is, how-

ever, much more slender and it has a much longer pleotelson than *L. brevimanu* (cp. Fig. 102b and i). The claw on the dactylus of peraeopods II-IV and the dactylus of peraeopods V-VII are longer in *L. brevimanu* than in *L. parabrevimanu* (cp. Fig. 104i and a, and 104j and d), and the surface of merus, carpus and propus of peraeopods II-IV are in *L. brevimanu* perfectly bare (cp. Fig. 104a and i). The species also differ somewhat from one another in the front part of carapace (cp. Fig. 102c and j) and in the antenna (cp. Fig. 102d and 102k). There are also some differences in the relative length of the joints of the uropods (cp. Fig. 104h and k).

Leptognathia forcifera n.sp.

Material:

St. 716, Acapulco-Panama (9°23'N, 89°32'W), 3570 m, 6 May 1952. Gear: herring otter trawl. Bottom: dark, muddy clay. Bottom temp.: c. 1.9°C. - 2 adult females, the one with eggs, the other without oostegites.

Description of female type:

Body (Fig. 105a, and Pl. VIIg) slender, about 7 times longer than broad. Carapace and peraeonites defined by deep constrictions and narrower than pleon. Length about 4 mm. Integument strongly calcified and somewhat fragile.

Carapace about 0.8 times as long as the first two peraeonites together and somewhat narrower than the first peraeonite, in front a little more than half as broad as in the middle. Rostral projection of moderate length, very broad and rounded at the tip (Fig. 105b); antero-lateral corners rounded.

Peraeonites broader than long, slightly convex. Peraeonite 2 about 0.7 times as long as any of the three succeeding peraeonites, which are equally long, while peraeonite 6 is somewhat shorter than 5, and peraeonite 7 a little shorter than 2. Sternites shaped as shown in Fig. 105a. No hyposphenians.

Pleon (Fig. 105c) about 0.8 times as long as the last three peraeonites together. Pleonites short, subequal in length, furnished with a small lateral seta which on the first four pleonites is situated at the end, on the last pleonite in the middle. Pleotelson about 0.8 times as long as the last three pleonites together, slightly undulated behind.

Antennula (Fig. 105d). First joint somewhat longer than the succeeding joints combined, 2.3-2.4 times longer than the second joint and about 5.3 times longer than the third. Last joint nearly 1.7

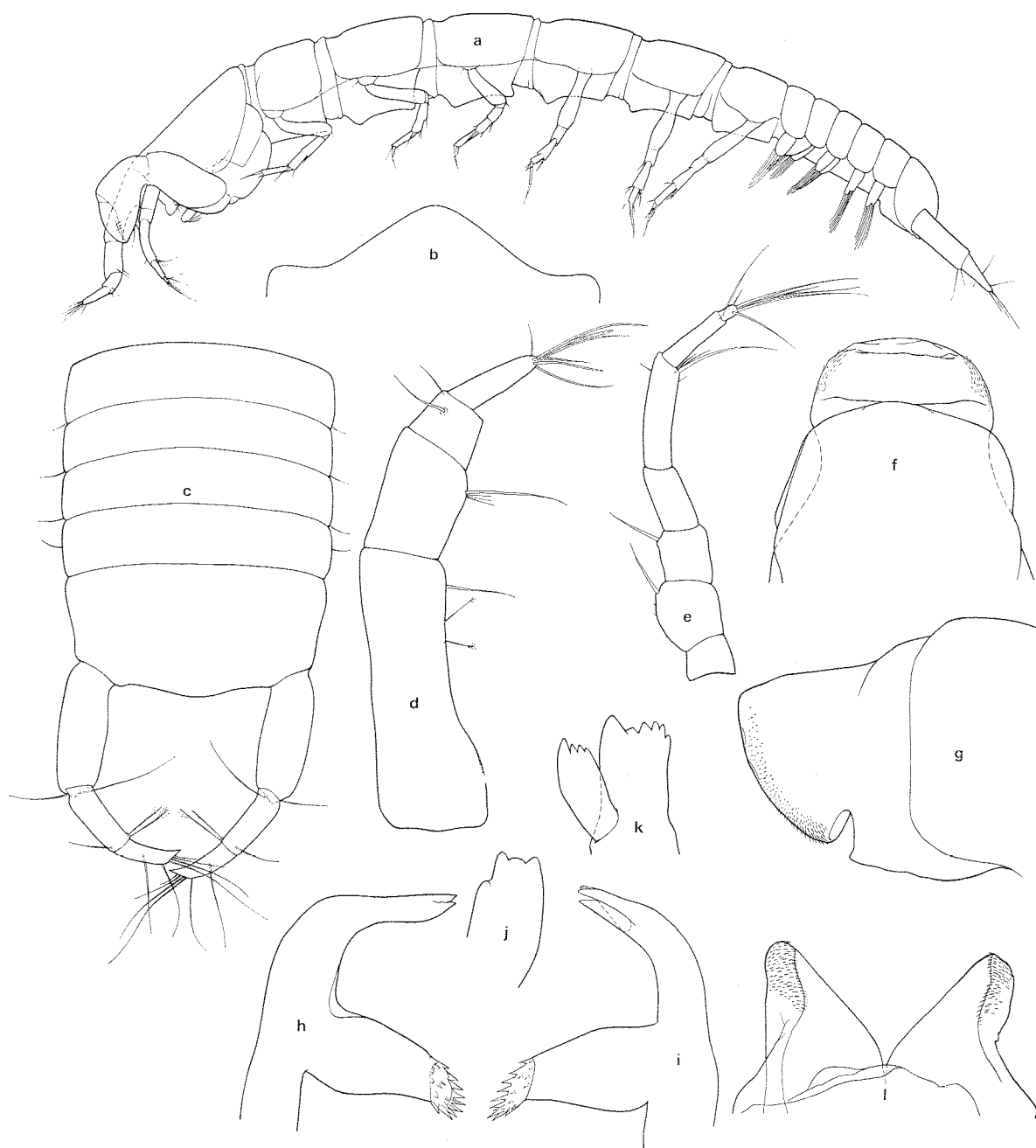


Fig. 105. *Leptognathia forcifera* n.sp., ♀; a, lateral view ($\times 30$); b, front end of carapace, dorsal view ($\times 205$); c, last four pleonites and pleotelson, dorsal view ($\times 80$); d, antennula, dorsal view ($\times 125$); e, antenna, lateral view ($\times 125$); f-g, labrum, caudal and lateral views ($\times 320$); h-i, right and left mandibles, caudal view ($\times 320$); j, pars incisiva of right mandible, internal view ($\times 600$); k, pars incisiva and lacinia mobilis of left mandible, internal view ($\times 600$); l, distal part of labium, caudal view ($\times 320$).

times longer than the third, with short terminal aesthetasc.

Antenna (Fig. 105e) seven-jointed. First joint shorter and much narrower than the second, which is the broadest joint. Second and third joints of about the same lengths, set with a dorsal seta near the distal end. Fourth joint somewhat longer and more slender than the third. Fifth joint nearly as

long as the two preceding joints together, and fully half as long again as sixth joint.

Labrum (Fig. 105f-g) broad in front and laterally set with tiny hairs. In lateral view it is labiate.

Mandibles (Fig. 105h-k) with very strong, firm and straight inwards directed processus molaris which is obliquely truncated at the end and set with strong spinules. Pars incisiva of right mandible

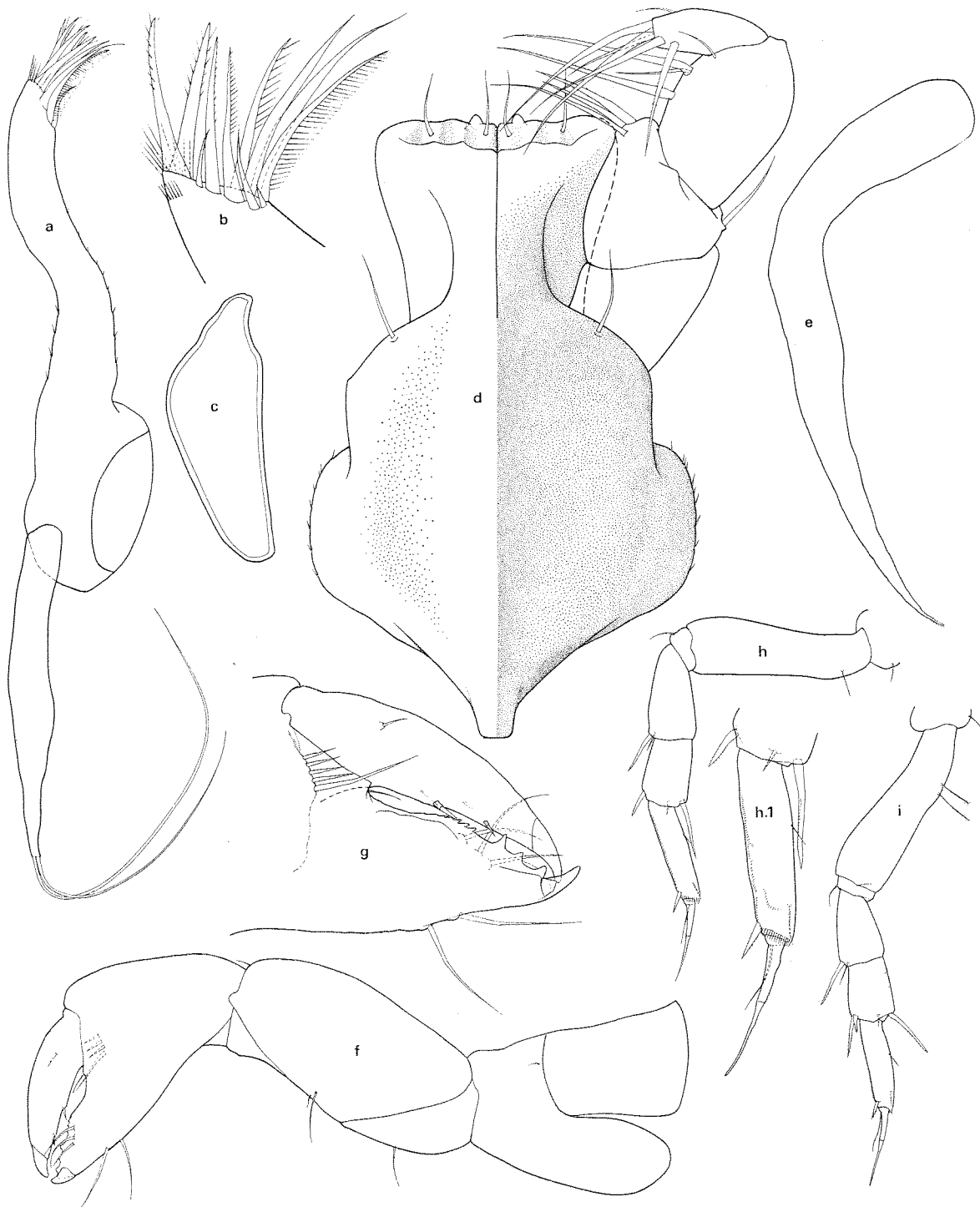


Fig. 106. *Leptognathia forcifera* n. sp., ♀; a, maxillula, caudal view ($\times 320$); d, distal end of same, caudal view ($\times 600$); c, maxilla, caudal view ($\times 420$); d, maxilliped, caudal view ($\times 320$); e, epignath ($\times 320$); f, left cheliped, caudal view ($\times 115$); g, distal end of right cheliped, rostral view ($\times 205$); h-i, peraeopods II-III, caudal view ($\times 115$); h.1, distal part of peraeopod II, caudal view ($\times 205$).

three-dentate at the end and with one marginal tooth below the end. Pars incisiva of left mandible irregularly six-dentate, lacinia mobilis four-dentate.

Labium (Fig. 1051) as usual, running out into two lobes, set with hairs in the distal part.

Maxillula (Fig. 106a-b). Endite slightly S-shaped,

terminally surrounded by eleven spines, one of which is dwarfed, two moderately long and the remaining ones very long. The three shortest and the two longest spines are bare; one of the remaining spines is two-sidedly ciliated along the distal half, one is ciliated along the concave margin, and the

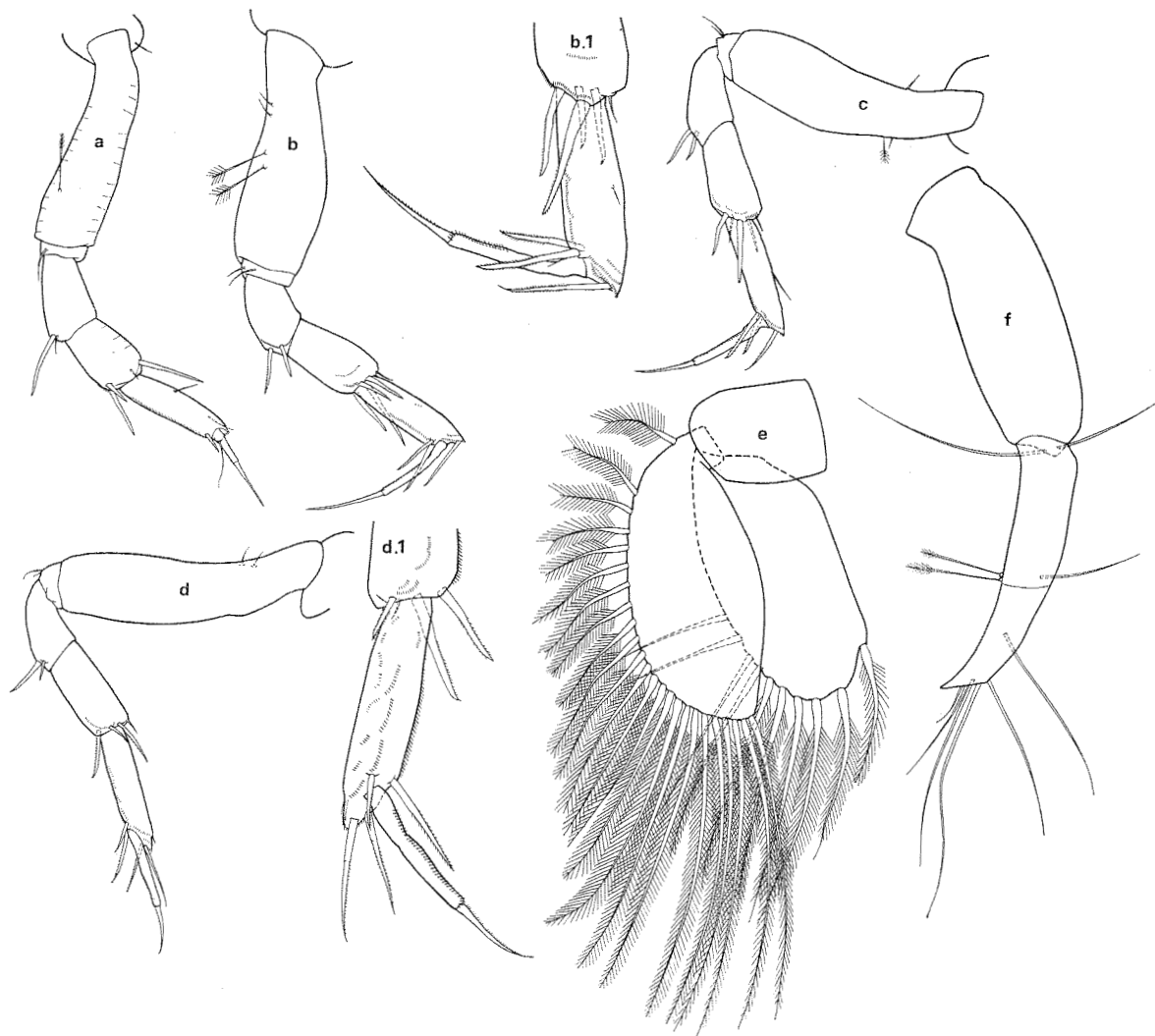


Fig. 107. *Leptognathia forcifera* n. sp., ♀; a, peraeopod IV, caudal view ($\times 115$); b-d, peraeopods V-VII, rostral view ($\times 115$); b.1, distal part of peraeopod V, rostral view ($\times 205$); d.1, the same of peraeopod VII, caudal view ($\times 205$); e, pleopod I, caudal view ($\times 205$); f, uropod, dorsal view ($\times 150$).

others are one-sidedly ciliated along the distal half. There are also some hairs at and near the outer end. Palp much shorter than the endite, furnished with two terminal setae.

Maxilla (Fig. 106c) a somewhat vaulted plate, about 2.8 times longer than the greatest width, broadest at about the anterior third and abruptly attenuated in front; outside somewhat excurved.

Maxilliped (Fig. 106d-e). Basis completely fused with the corresponding joint of the other maxilliped, set with one caudal seta just outside the endite. In front the endite has a semioval process near the inner distal corner, and it has one seta just inside the process and one seta about halfway between the process and the outer distal corner. First joint of the palp without setae; second joint with one seta at the outer distal end and with three setae near the inner distal end; last two joints with four and six

setae, respectively; rostral surface of second joint with two rows of diminutive spinules or hairs, that of third and fourth joints with one row. Epignath falciform (Fig. 106e), covered with very tiny spinules (omitted in the figure).

Cheliped (Fig. 106f-g). Coxa well defined, situated above the posterior process of the basis, almost rectangular and reaching to the front margin of peraeonite 2. Posterior process of basis very long. Merus almost triangular. Carpus about as long as propus. Propus robust, with a transverse rostral row of one moderately long seta and three or four spines just behind the lower part of the dactylus and with one small seta in the gap between the finger and the dactylus; finger with three strong tergal dentiform processes behind the claw and irregularly serrated along the middle tergal part, with one tooth at the base of the claw, with three caudal setae

at some distance from the terminal claw, and with two sternal setae.

Peraeopods II-IV (Figs. 106h-i, and 107a) rather short and robust with well defined coxa set with one short fine rostral seta. Basis about 0.7-0.8 times as long as the four succeeding joints together. Ischium very short, set with short sternal seta. Merus of peraeopod II about half as long as basis, merus of the two succeeding peraeopods somewhat shorter; it bears one sternal spine of moderate length and one very short sternal seta. Distal sternal end of carpus with one short spine on peraeopod II, and with one short spine and one longer one on peraeopods III and IV; distal tergal end with one long spine, reaching to about the middle of the propus; rostral surface with one very small spine near the end. Propus of peraeopod II about 1.5 times longer than carpus, propus of peraeopods III and IV somewhat shorter; one tiny tergal seta near the proximal third, and one tiny rostral seta at some distance from the tergal corner; caudal surface of peraeopod II moreover adorned with rows of hairs and tiny spinules as shown in Fig. 106h.1; each propus with a well defined rostral lobule at the end, furnished with a seta which reaches somewhat beyond the proper dactylus. The sternal spines of merus, carpus and propus are finely ciliated along the distal part of the margins. Dactylus with claw shorter than propus; claw longer than dactylus.

Peraeopods V-VII (Fig. 107b-d) rather short and robust. Coxa not defined. Basis a little shorter than the four succeeding joints together. Ischium very short, with two small sternal setae of different lengths. Merus somewhat shorter than carpus, with two short sternal spines of different lengths. Carpus 0.3-0.4 times as long as basis; carpus of peraeopods V and VI distally surrounded by one small seta and four spines of different lengths, the longest spine reaching beyond the middle of the propus; in peraeopod VII the longest spine is lacking. Propus somewhat longer than carpus, furnished with two long spines near the distal sternal end; peraeopods V and VI with one long distal spine, peraeopod VII with two distal spines. The spines of carpus and propus are ciliated, and both joints are adorned with some rows of tiny hairs (Fig. 107b.1 and d.1). Dactylus with claw longer than propus; dactylus longer than claw and set with a longitudinal sternal row of tiny spinules; claw ciliated along the sternal margin.

Pleopods (Fig. 107e). Basis almost rectangular. Exopodite a little longer than endopodite, both rami furnished with plumose setae.

Uropod (Fig. 107f). Basis about as long as endopodite. Exopodite represented by a minute knob-like projection, furnished with two long setae. Endopodite two-jointed, second joint shortest. The endopodites together form a forceps-like formation (the name of the species alludes to this character).

Remarks:

The species differs from all other species of the genus in the shape of the uropods. It is, no doubt, most closely related to *L. profunda* Hansen, *L. latiremis* Hansen and *L. glacialis* Hansen (HANSEN, 1913, pp. 99, 101 and 102, respectively) and *L. paraforcifera*, described below.

Leptognathia paraforcifera n.sp.

Material:

St. 234, Madagascar-Mombasa (5°25'S, 47°09'E), 4800 m, 10 March 1951. Gear: Petersen-Grab 0.2 sq. m. Bottom: globigerina ooze. Bottom temp.: c. 1.3°C. — 2 adult females (one with emptied marsupium), 1 subadult male.

Description of female type:

Body (Fig. 108a, and Pl. VIIh-i) fully 5 times longer than broad. Length about 2.7 mm. Integument strongly calcified, fragile.

Carapace (Pl. VIIIa) about as long as the first three peraeonites together, and about 1.2 times longer than the greatest width, broadest in about the middle, in front about half as long as the greatest width. Rostral process of moderate length, narrowly rounded in front. Antero-lateral corners somewhat extended forwards (Fig. 108b).

Peraeonites broader than long, successively increasing in length from 2 to 5 and 6 which are equally long while peraeonite 7 is about as long as 3. Sternites of peraeonites 2 and 3 with a posterior bulge, which on peraeonite 2 ends in a short point (Fig. 108a).

Pleon (Fig. 108c) about 0.7-0.8 times as long as the last three peraeonites together. Pleonites a little narrower than the last peraeonite; last pleonite with a tiny lateral seta about in the middle. Pleotelson somewhat longer than the last four pleonites together, broadly triangular behind and set with a very tiny hair on each side of the tip.

Antennula (Fig. 108d). First joint about as long as the succeeding joints together, about 1.8 times longer than the second joint, and about 5.4 times longer than the third, adorned with some pectinate scale-like formations near the base. Second joint

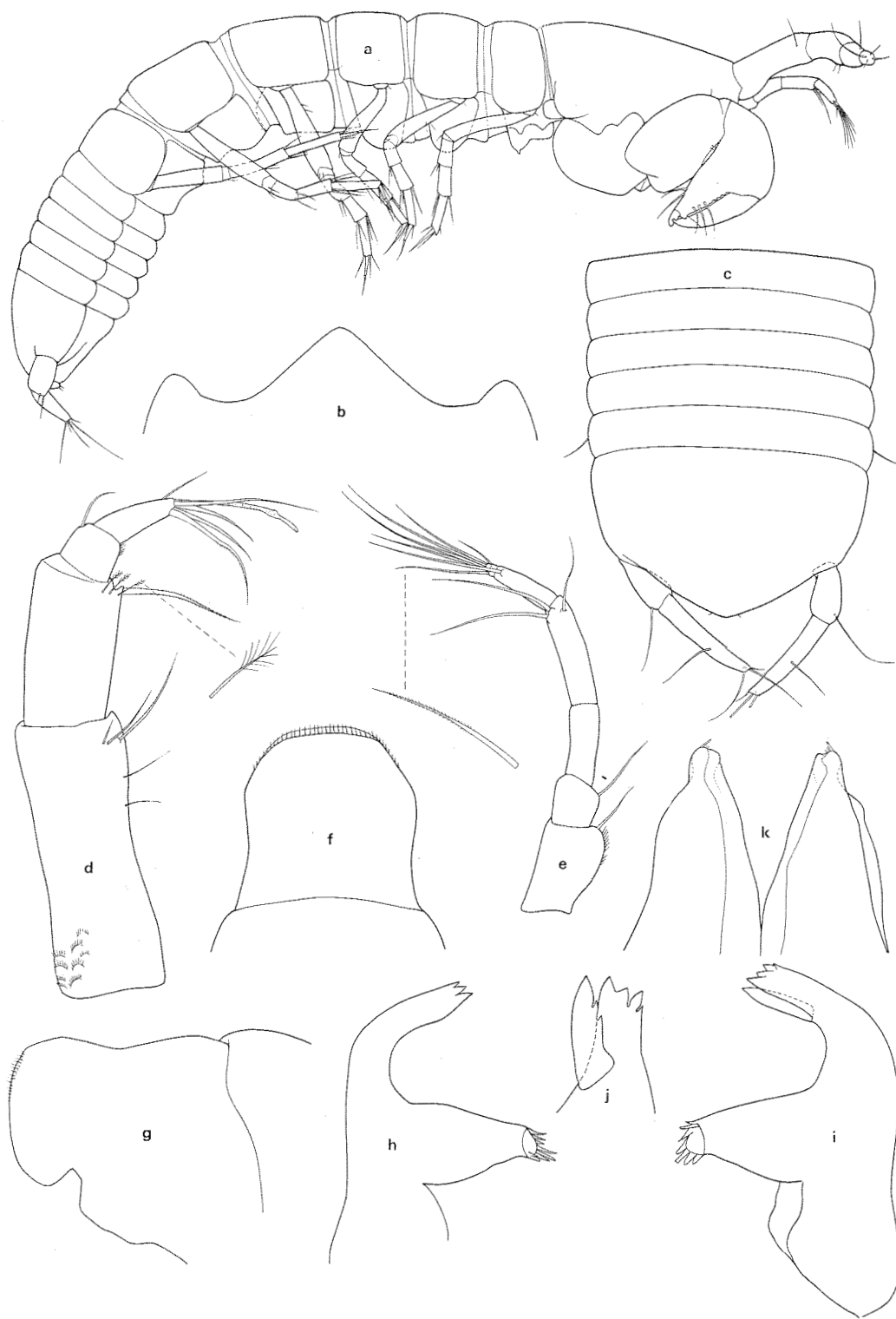


Fig. 108. *Leptognathia paraforcifera* n.sp., ♀; a, lateral view ($\times 50$); b, front end of carapace, dorsal view ($\times 205$); c, pleon, dorsal view ($\times 80$); d, antennula, ventral view ($\times 130$); e, antenna, lateral view ($\times 130$), seta ($\times 230$); f-g, labrum, caudal and lateral views ($\times 320$); h-i, right and left mandibles, caudal view ($\times 320$); j, pars incisiva and lacinia mobilis of left mandible ($\times 425$); k, distal part of labrum, caudal view ($\times 320$).

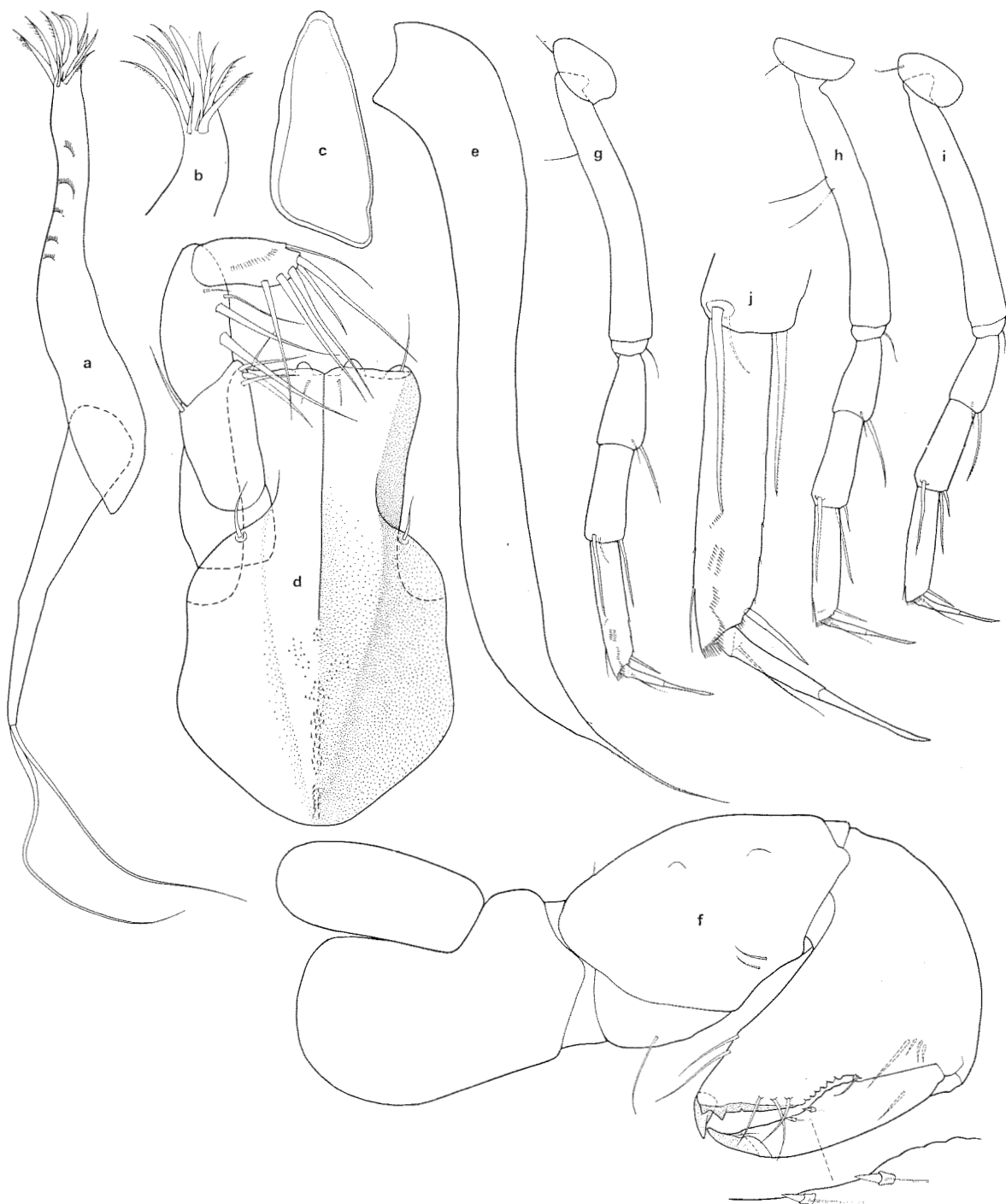


Fig. 109. *Leptognathia paraforcifera* n.sp., ♀; a, maxillula, oblique internal view ($\times 320$); b, distal end of same ($\times 425$); c, maxilla, rostral view ($\times 420$); d, maxilliped, caudal view ($\times 320$); e, epignath ($\times 320$); f, cheliped, caudal view – dotted parts orange-coloured ($\times 130$), detail ($\times 320$); g-i, pereopods II-IV, caudal view ($\times 130$); j, distal part of pereopod II, caudal view ($\times 320$).

with particular setae. Last joint fully 1.4 times longer than the third, with aesthetasc.

Antenna (Fig. 108e) six-jointed owing to the fact that the first two joints are completely fused; last joint indistinctly subdivided. First joint nearly twice as long as the second, each of them with a moderate-

ly long dorsal seta at the end, first joint moreover with tiny hairs behind the seta. Third joint somewhat shorter than the first and more slender. Fourth joint nearly 1.5 times longer than the third, and 1.6 times longer than the fifth. Some of the setae are very finely plumose.

Labrum (Fig. 108f-g) in caudal view broad in front and set with a row of spinules, in lateral view somewhat labiate.

Mandibles (Fig. 108h-j). Processus molaris strong and firm, straight inwards directed, rounded at the end and partly set with strong spinules. Pars incisiva of right mandible three-dentate, that of left mandible four-dentate. Lacinia mobilis three-dentate, slender.

Labium (Fig. 108k) running out into two lobes, set with one spinule and some hairs at the tip.

Maxillula (Fig. 109a-b). Endite somewhat curved, set with some fine-haired scale-like formations on the surface, and with eleven terminal spines, one of which is very short, one middle-sized, the others long and four of them plumose along the distal part of the concave margin. Palp shorter than the endite, set with two terminal setae.

Maxilla (Fig. 109c) a somewhat vaulted plate, about 2.5 times longer than the greatest width, broadest behind and successively attenuated towards the front end; inside somewhat shorter than outside.

Maxilliped (Fig. 109d-e). Basis almost completely fused with the corresponding joint of the other maxilliped, set with one caudal seta just outside the endite. In front the endite has one semioval process near the inner corner, one caudal seta just behind the process, and one caudal seta at the rounded outer corner. First joint of palp without setae; second joint with one outer distal seta and with three setae near the inner distal end, last two joints with four and six setae, respectively; caudal surface of last joint with one row of tiny spinules or hairs. Epignath falciform with the filiform end finely ciliated (Fig. 109e).

Cheliped (Fig. 109f). Coxa well defined, situated above the posterior process of the basis, almost rectangular and reaching to the front margin of peraeonite 2. Merus somewhat triangular. Carpus as long as basis and somewhat shorter than propus. Propus robust, furnished with two moderately long sternal setae, and with a transverse rostral row of one moderately long seta and three short spiniform setae behind the middle part of dactylus; one short caudal seta just inside the gap between the dactylus and the finger; finger with three caudal setae just inside the obtuse-angled tergal surface which has a bipartite tooth at the base of the terminal claw and which is crenated along the proximal part. Dactylus with one short rostral seta near the base, and with two sternal spinules. The dotted parts in the figure are orange-coloured.

Peraeopods II-IV (Fig. 109g-j) moderately long

and slender. Coxa well defined and furnished with a short, fine rostral seta. Basis 0.8-0.9 times as long as the succeeding four joints together. Ischium short, set with one short sternal seta. Merus about 0.3 times as long as basis, set with one short sternal seta and one long sternal spine which on peraeopod II reaches somewhat beyond the middle of the carpus, on peraeopods III and IV to about the distal third of the carpus. Carpus somewhat longer than merus; carpus of peraeopod II with one small rostral seta, one sternal spine and one tergal one, the spines reaching beyond the middle of the propus; carpus of peraeopods III and IV with two sternal spines, one of which is much longer than the other, and with one long tergal spine. Propus somewhat longer than carpus, the one of peraeopod II longest; propus of each peraeopod with a well defined rostral lobule at the end, furnished with one seta which reaches a little beyond the proper dactylus; one short fine tergal seta and one somewhat longer sternal spine; caudal surface adorned with some rows of tiny spinules or hairs (Fig. 109j). Dactylus about as long as the claw, both together shorter than propus.

Peraeopods V-VII (Fig. 110a-c) as slender as the preceding peraeopods. Peraeopod V shorter than the others. Coxa not defined. Basis somewhat shorter than the succeeding four joints together. Ischium short, furnished with two short sternal setae of different lengths. Merus about 0.7 times as long as carpus, furnished with two sternal spines of somewhat different lengths, the longest one reaching somewhat beyond the middle of the carpus. Carpus of peraeopods V and VI at the end surrounded by five spines, the tergal of which is very short, the others much longer, the longest ones reaching far beyond the middle of the propus; carpus of peraeopod VII at the end surrounded by one very short tergal spine and three longer spines, the longest of which reaches beyond the middle of the propus. Propus about as long as carpus with one long distal tergal and two long sternal spines on peraeopods V and VI and with one more distal tergal spine on peraeopod VII. Dactylus long, somewhat curved, groove-shaped and set with spinules along the margins of the groove (Fig. 110a.1); dactylus with claw longer than propus; claw shorter than dactylus.

Pleopods absent.

Uropod (Fig. 110d). Basis subcylindrical, about twice as long as broad and about half as long as the endopodite. Exopodite represented only by a long seta at the end of the basis. Endopodite one-jointed,

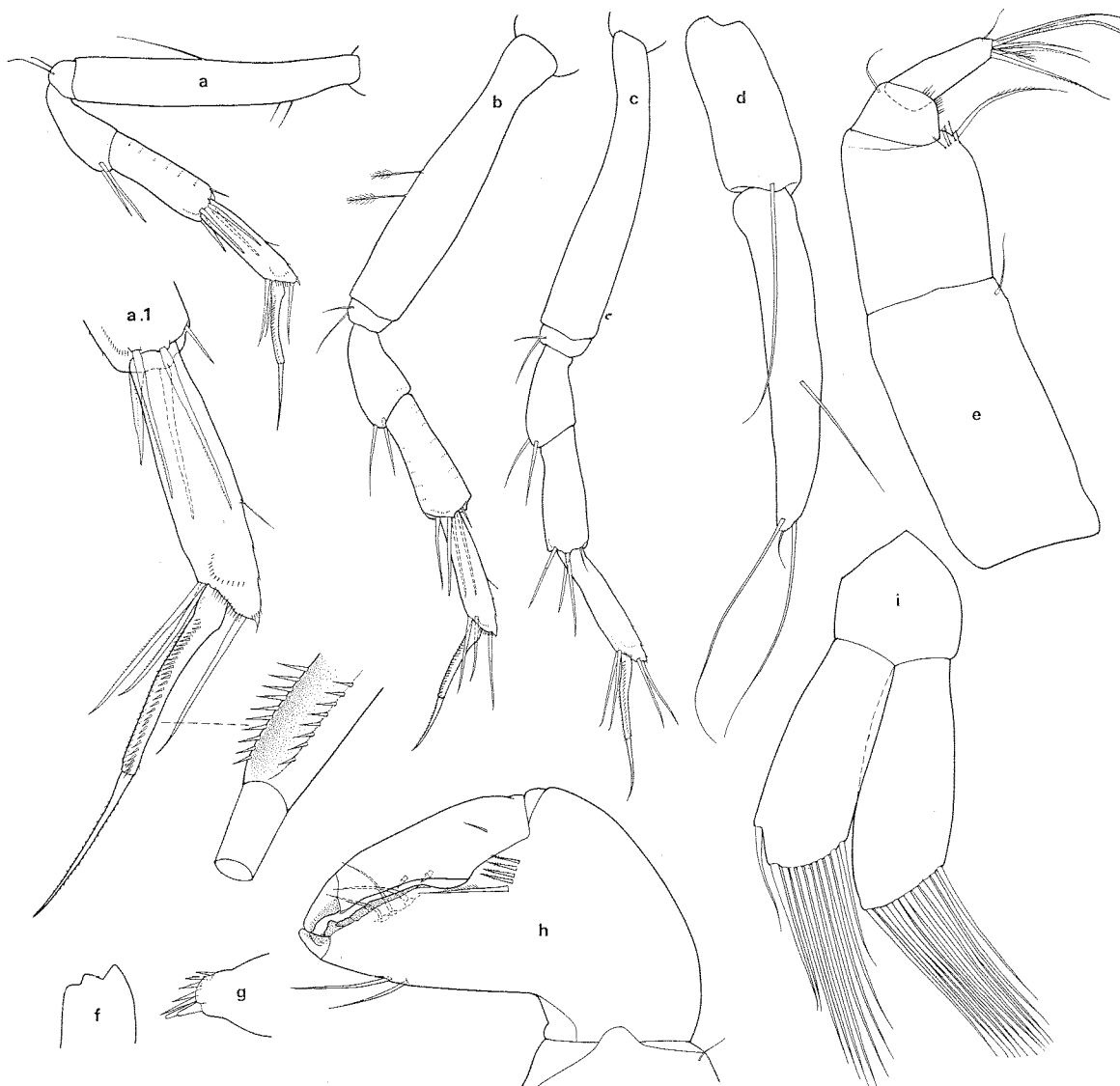


Fig. 110. *Leptognathia paraforcifera* n.sp.; a-d, ♀; a-c, peraeopods V-VII, rostral view ($\times 130$); a.1, distal part of peraeopod V, rostral view ($\times 320$), detail ($\times 585$); d, uropod, dorsal view ($\times 200$); e-i, subad. ♂; e, antennula, ventral view ($\times 130$); f, pars incisiva of right mandible, internal view ($\times 425$); g, distal end of processus molaris of left mandible, caudal view ($\times 320$); h, propus and dactylus of cheliped, rostral view – the dotted parts are orange-coloured ($\times 130$); i, pleopod I, rostral view ($\times 205$).

about 6 times longer than the greatest width. The endopodites together form a somewhat forceps-like formation.

Description of subadult male:

The subadult male differs from the female only in the following respects.

Body. Length about 2.3 mm.

Pleon. Pleonites somewhat longer.

Antennula (Fig. 110e). First two joints much thicker and somewhat shorter than those in the female.

Mandibles (Fig. 110f-g) almost as in the female.

Cheliped (Fig. 110h). The tergal surface of the finger is not crenate along the proximal part.

Pleopods (Fig. 110i). Basis short and broad. Exopodite somewhat longer than endopodite, about 4 times longer than broad at the base, and furnished with twelve bare terminal setae. Endopodite furnished with one bare seta near the end of the inner margin and with ten bare terminal setae.

Remarks:

In the absence of female pleopods the species agrees with *L. manca* G. O. Sars (1882a, p. 4; 1896, p. 31, pl. XIV, fig. 3), *L. unguicillata* (Norman & Stebbing) (NORMAN & STEBBING, 1886, p. 118, pl. XXIV, fig. IV), *L. indivisa* (Hansen) (HANSEN, 1913, p. 120, pl. XII, figs. 2a-e), and *L. paramanca* Lang (1958a, p. 431, figs. A-C). From *L. manca* it differs

materially in the uropods, from *L. indivisa* and *L. paramanca* in the pleon and the uropods. It is, no doubt, very closely related to *L. unguicillata*, but it differs from this species in the more slender pleon and in the chelipeds. (I have made a direct comparison between the two species).

***Paranarthrura* Hansen, 1913**

Paranarthrura Hansen, 1913, p. 121 (partim).
Leptognathia Kudinova-Pasternak, 1965, pp. 82-88 (partim).
 Nec. *Paranarthrura* Hansen, VANHÖFFEN, 1914, p. 478.
 Generotype: *Paranarthrura insignis* Hansen, 1913, p. 122, pl. XII, fig. 3a-m.

Diagnosis:

Pleonites five in number, very short, narrower than the last peraeonite and the

pleotelson. Both separated ocular lobes and visual elements lacking. Antennula four-jointed. Antennae five-jointed, last joint very small. Mandibles with processus molaris which in some species is very thin and membranous; lacinia mobilis more or less reduced. Endite of maxillulae long with one dwarfed and ten longer spines around the distal end. Epignath falciform. Coxa of cheliped situated directly behind the basis. Propus of peraeopods II-IV with normal spines. Female without pleopods. The marsupium is formed by four pairs of oostegites.

Remarks:

As has already been pointed out, (see p. 161) the genus contains, in my opinion, with certainty only the three species mentioned in the key below.

The genus is known only from the deep-sea.

Key to the species

- | | | |
|--|---------------------------|---|
| 1. Endopodite of uropod two-jointed; labrum obtuse-angled in front | <i>P. insignis</i> Hansen | |
| Endopodite of uropod one-jointed; labrum broad in front | | 2 |
| 2. Endopodite of uropod about as long as the peduncle | <i>L. subtilis</i> Hansen | |
| Endopodite of uropod more than twice as long as the peduncle | <i>L. undulata</i> n.sp. | |

***Paranarthrura undulata* n.sp.**

Material:

St. 723, Gulf of Panama (5°38'N, 79°30'W), 3230 m, 12 May 1952. Gear: Petersen-Grab 0.2 sq. m. Bottom: dark clay. Bottom temp.: c. 2.0°C. - 2 adult females, 1 subadult male.

Description of female type:

Body (Pl. VIIIb) moderately slender, about 5 times longer than broad, irregularly undulated in outline (the name of the species alludes to this very conspicuous appearance). Length about 3.7 mm. Integument rather strongly calcified and somewhat fragile.

Carapace (Fig. 111a) about as long as peraeonites 2-3 and half of peraeonite 4 together, broadest across the middle of the respiratory chambers. Front end not fully half as long as the greatest width, rostral process moderately long and rounded at the tip (Fig. 111b). Lateral surfaces with three convexities; antero-lateral corners slightly extended outwards.

Peraeonites (Fig. 111a) increase in length from 2

to 6 while peraeonite 7 is about 1.4 times longer than 2. Peraeonites 2 and 3 broadest in front, and seen from above somewhat bowl-shaped, peraeonite 4 broadest somewhat behind the front margin, peraeonite 5 in the middle, peraeonite 6 somewhat behind the middle, and peraeonite 7 at the back. The peraeopods are attached to the broadest part of the peraeonites. Hyposphenians are present on all peraeonites and situated just behind the anterior margin, the one on peraeonite 7 being much longer than the others and strongly backwards curved (Fig. 111c-d). The basal part of each hyposphenic is set with very tiny spinules.

Pleon (Fig. 111e) nearly as long as the last two peraeonites together. Pleonites 1 and 5 of about the same length and a little longer than any of the others. Last pleonite with a small lateral seta in about the middle. Pleotelson seen from above somewhat shorter than the last three pleonites together, much broader than long and widened towards the end; posterior end with a small triangular process in the middle, furnished with two short setae at the tip, and with two longer setae on each side about halfway between the tip and the uropods.

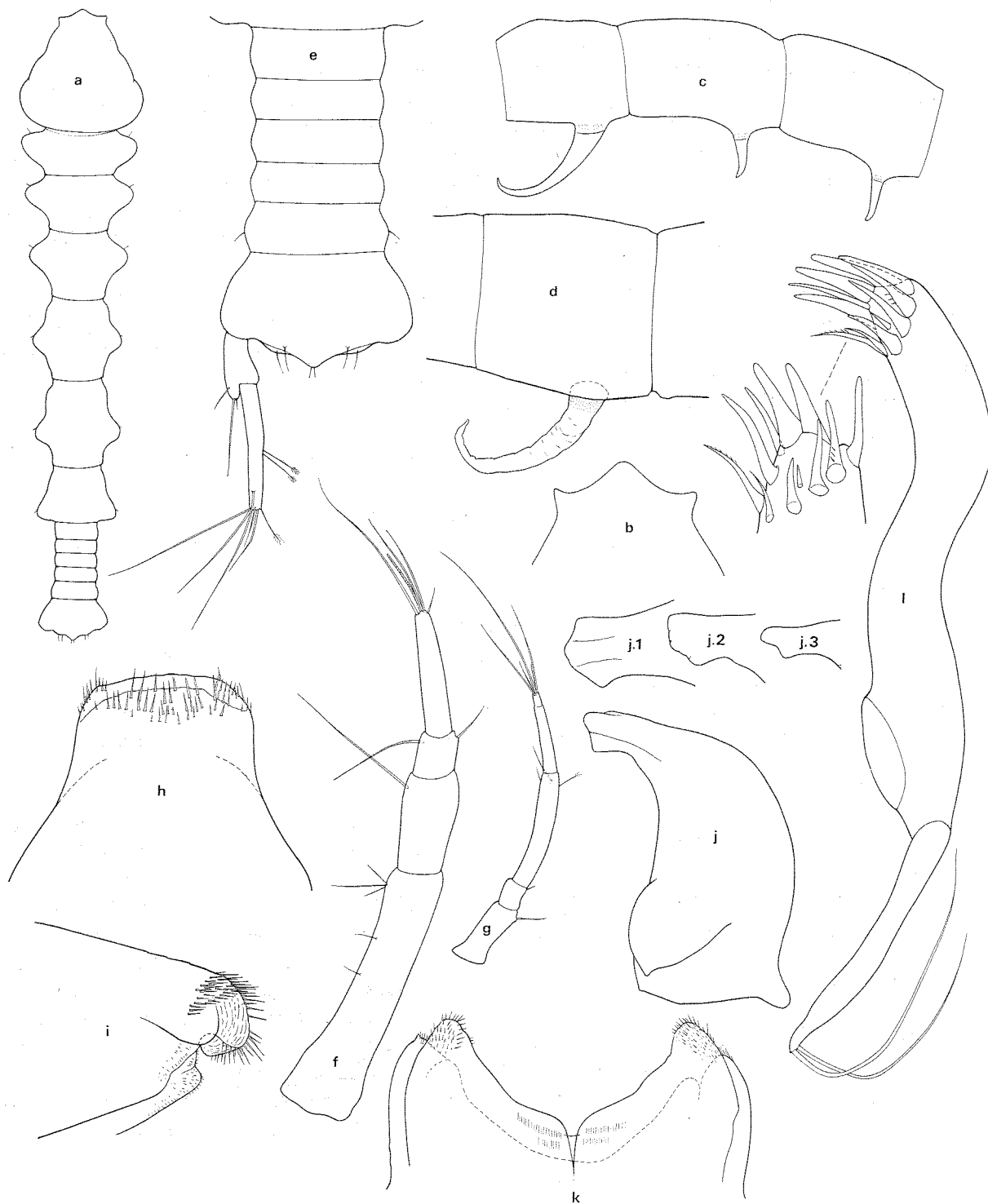


Fig. 111. *Paranarthrura undulata* n.sp., ♀; a, dorsal view ($\times 28$); b, anterior part of carapace, dorsal view ($\times 80$); c, last three peraeonites, lateral view ($\times 50$); d, last peraeonite, lateral view ($\times 80$); e, pleon, dorsal view ($\times 80$); f, antennula, dorsal view ($\times 100$); g, antenna, lateral view ($\times 100$); h-i, labrum, caudal and lateral views ($\times 320$); j, right mandible, rostral view ($\times 320$); j.1-j.3, pars incisiva of same in different positions ($\times 320$); k, distal part of labium, caudal view ($\times 320$).

Antennula (Fig. 111f). First joint as long as the other joints combined, nearly 2.7 times longer than the second, and fully six times longer than the third. Last joint nearly as long as the two preceding joints together, with short terminal aesthetasc.

Antenna (Fig. 111g) five-jointed. First joint fully twice as long as the second, each joint with one fine dorsal seta. Third joint very long, nearly 1.8 times longer than the fourth, with no trace of coalescence. Fifth joint very short.

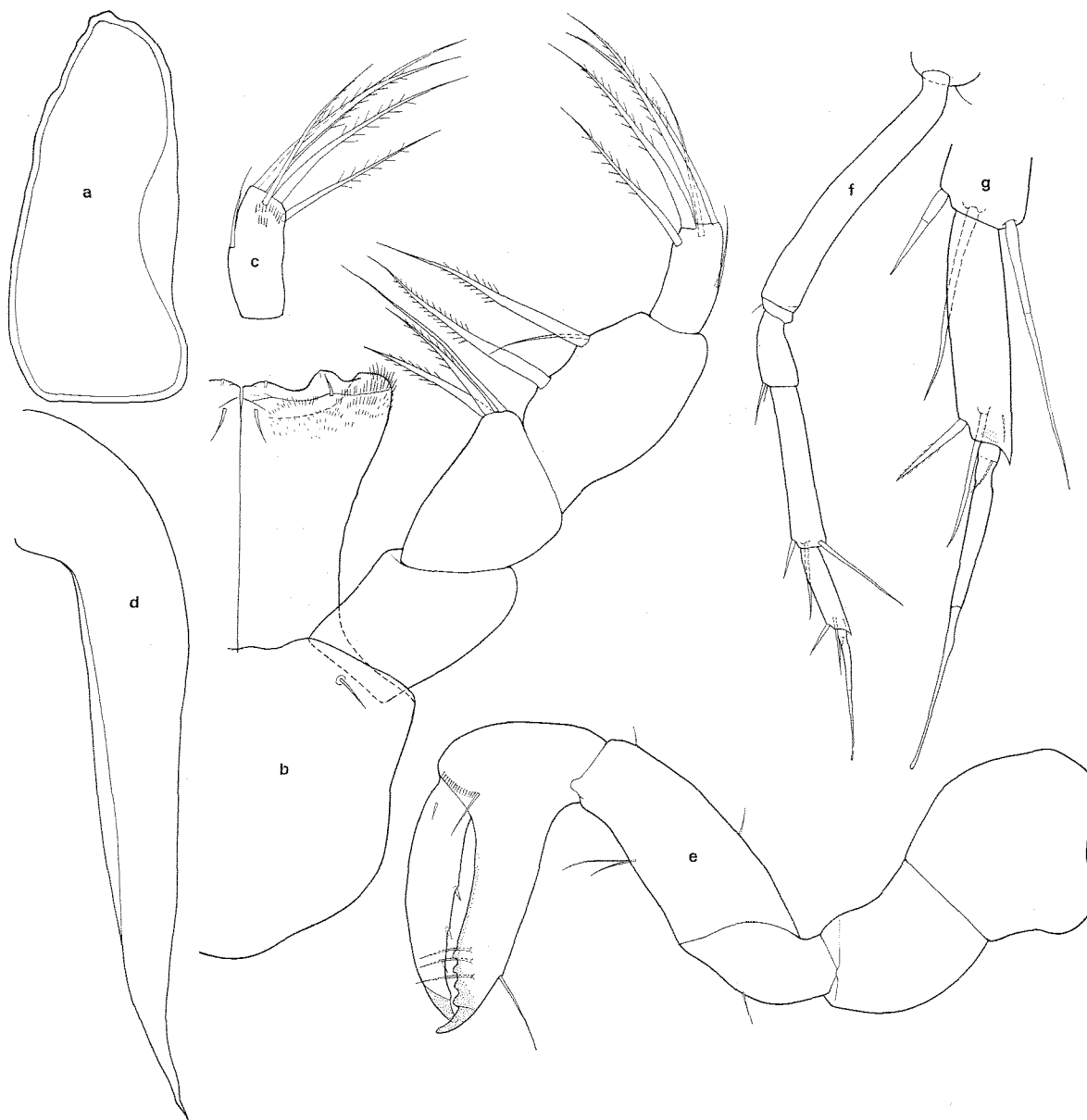


Fig. 112. *Paranarthrura undulata* n. sp., ♀; a, maxilla, rostral view ($\times 520$); b, maxilliped, caudal view ($\times 320$); c, last palpal joint of same, rostral view ($\times 320$); d, epignath ($\times 320$); e, cheliped, rostral view – the dotted parts are orange-coloured ($\times 80$); f, peraeopod II, caudal view ($\times 80$); g, distal part of same ($\times 205$).

Labrum (Fig. 111 h-i) in rostral view very broad in front and richly set with spinules, in lateral view labiate.

Mandibles (Fig. 111 j-j.3; Pl. VIII c-d). Processus molaris backwards directed, unarmed. Pars incisiva of either mandible tri-dentate, somewhat undulated between the teeth, lacinia mobilis only represented by a small spinule (Pl. VIII d).

Labium (Fig. 111 k) running out into two broad lobes, set with hairs in the distal part.

Maxillula (Fig. 111 l). Endite slightly S-shaped, with the terminal spines shaped as in the figure. Palp about half as long as the endite.

Maxilla (Fig. 112 a) a slightly vaulted plate, fully twice as long as the greatest width, broadest behind; outside irregularly convex.

Maxilliped (Fig. 112 b-d). Basis completely fused with the corresponding joint of the other maxilliped, set with one caudal seta just behind the middle of the first joint of the palp. Endite strongly undulated in front; most distal part of caudal surface hairy and furnished with one short seta near the inner margin, and with one somewhat outside the middle. Joints of palp with zero, three, three, and six setae, respectively, counting distad, most of them being strong and plumose; last joint (Fig. 112 c) with two

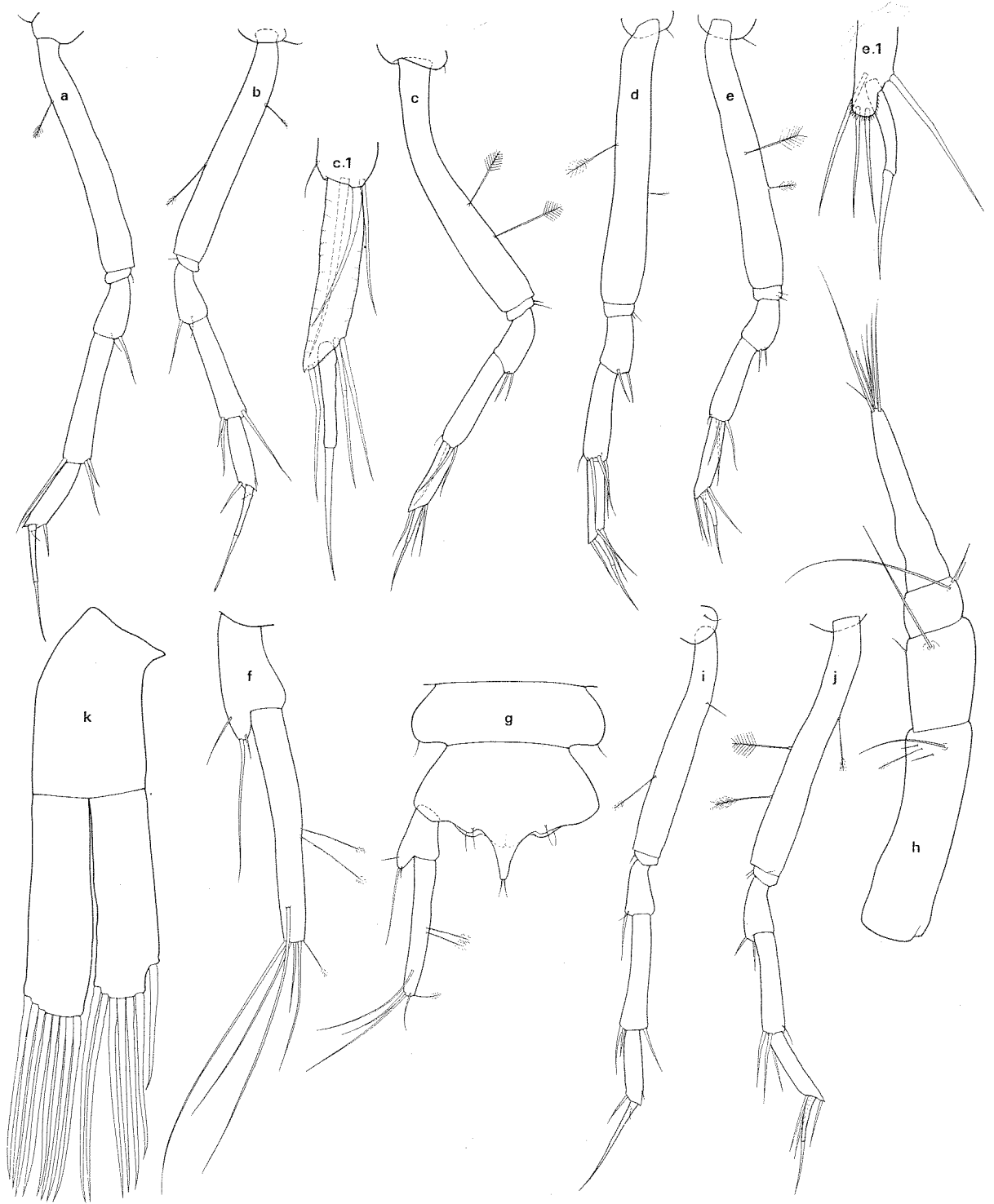


Fig. 113. *Paranarthrura undulata* n.sp.; a-f, ♀; a, peraeopod III, rostral view ($\times 80$); b, peraeopod IV, caudal view ($\times 80$); c-e, peraeopods V-VII, rostral view ($\times 80$); c.1, distal part of peraeopod V, rostral view ($\times 205$); e.1, distal part of peraeopod VII, rostral view ($\times 205$); f, uropod, dorsal view ($\times 150$); g-k, subad. ♂; g, posterior part of pleon, dorsal view ($\times 80$); h, antennula, oblique ventral view ($\times 600$); i-j, peraeopods IV and V, caudal and rostral views ($\times 80$); k, pleopod I, caudal view ($\times 265$).

transverse rostral rows of spinules in the distal part. Epignath (Fig. 112d) bare.

Cheliped (Fig. 112e). Coxa somewhat larger than basis, reaching to the front margin of peraeonite 2, as outstanding as in *Anarthrura* (see Pl. VIIIb). Basis nearly as long as coxa and about as long as merus. Carpus shorter than propus. Propus furnished with a row of tiny spinules and one seta on the rostral surface just behind the dactylus; finger with one sternal seta near the end, with four tergal teeth just behind the terminal claw, and with three caudal setae at some distance from the terminal claw. Dactylus with one rostral spinule near the base, and with three sternal spinules. Claws and tergal part of fixed finger with a faint touch of orange colour (in the figures the coloured parts are dotted).

Peraeopods II-IV (Figs. 112f-g, 113a-b) decrease somewhat in length from II to IV. Coxa defined but invisible from above, with a short fine rostral seta. Basis of peraeopods II and III shorter than the four succeeding joints together, basis of peraeopod IV about as long as these joints. Ischium short, furnished with one very short sternal seta. Merus with one very short sternal seta and one sternal spine, which does not reach to the middle of the carpus. Carpus of peraeopods II and III about 2.3 times longer than merus, carpus of peraeopod IV a little shorter, each of them furnished with two sternal spines of different lengths, and with one tergal spine which reaches to or a little beyond the end of the propus. The latter has a well-defined rostral lobule at the end, furnished with one very short seta and one sternal spine, propus of peraeopod II moreover with one long rostral spine near the end. Dactylus with claw much longer than propus; claw about as long as dactylus.

Peraeopods V-VII (Fig. 113c-e.1). Peraeopod VII somewhat shorter than the other two. Coxa not marked off, furnished with one short fine rostral seta. Basis longer than the four succeeding joints together. Ischium very short, set with two short sternal setae. Merus with two short sternal spines. Carpus about twice as long as merus, furnished with one tiny tergal seta and with three long spines around the distal end, the longest one reaching to about the end of the propus. Propus of peraeopods V and VI about 0.8 times as long as carpus, furnished with three distal spines, which reach far beyond the end of the proper dactylus. Propus of peraeopod VII about as long as carpus, set with four distal spines of the same lengths as those of the

two preceding peraeopods. Dactylus slightly curved and a little shorter than the claw.

Uropod (Fig. 113f). Exopodite not marked off, very short and straight backwards directed, furnished with one moderately long dorsal seta in the proximal part and with one long seta and one very short seta at the tip. Endopodite one-jointed, long and slender, about 7.5 times longer than broad at the base and about 3 times longer than basis.

Description of subadult male:

The subadult male differs from the female only in the following respects.

Body. Length about 3.3 mm.

Pleon (Fig. 113g). Pleonites somewhat longer, of equal length, and furnished with one small postero-lateral seta. Pleotelson not broader than the pleonites; posterior process much longer, truncated at the tip.

Antennula (Fig. 113h) with the first joint much shorter than the succeeding joints together. Last joint about 1.3 times longer than the two preceding joints together.

Peraeopods IV-VII (Fig. 113i-j) with longer carpus.

Pleopods (Fig. 113k) present on all pleonites. Basis large. Exopodite a little longer than the endopodite. The rami are distally set with eight and seven stiff spiniform setae, respectively.

Remark:

The species differs markedly from the other species of the genus in the general shape of the body.

Anarthruopsis n. gen.

Diagnosis:

Pleonites five in number, neither very short nor narrower than the last peraeonite and the pleotelson. Both separated ocular lobes and visual elements lacking. Antennulae four-jointed. Antennae six-jointed, last joint small. Mandibles very small with unarmed membranous processus molaris and untoothed pars incisiva; lacinia mobilis absent. Endite of maxillulae short, with five short spines around the distal end. Epignath falciform. Coxa of cheliped situated directly behind the basis. Propus of peraeopod II distally provided with one or two long sternal spines, that of peraeopod III with one long sternal spine, the spines being bifid at the tip. Pleopods in fe-

male very small and rudimentary, exo- and endopodites forming small lamellae, completely without setae. The marsupium is formed by four pairs of oostegites.

Remarks:

Anarthruopsis is closely related to *Anarthrura* G. O. Sars and *Paranarthrura* Hansen, the chelipeds of which are essentially shaped in the same manner. However, the three genera differ materially from one another in the female pleon which in *Anarthrura* is unsegmented, but in *Anarthruopsis* it is five-segmented and well developed, and in *Paranarthrura* five-segmented but dwarfed and narrower than the last peraeonite and than the pleotelson. In *Paranarthrura* the mandibles have – contrary to the statement of HANSEN (*loc. cit.*) – a small processus molaris, which is membranous and downwards directed. In this character *Anarthruopsis* agrees almost perfectly with *Paranarthrura* but differs from *Anarthrura*, the mandibles of which completely lack the processus molaris. In *Paranarthrura* the left mandible has a lacinia which is rather well-developed in *P. insignis* Hansen, rudimentary and only represented by a spine or spinule in other species. In *Anarthruopsis* and *Anarthrura* the lacinia is lacking. The distal end of the maxillula is in *Paranarthrura* surrounded with eleven spines, in *Anarthruopsis* and *Anarthrura* with five. From the other two genera, *Anarthruopsis* differs moreover in the unique armament of the propus of peraeopods II and III, and in the peculiarly shaped propus of the cheliped. The presence or absence of female pleopods is not of generic value.

Anarthruopsis galathea n.sp.

Material:

St. 716, Acapulco-Panama (9°23'N, 89°32'W), 3570 m, 6 May 1952. Gear: herring otter trawl. Bottom: dark, muddy clay. Bottom temp.: c. 1.9°C. – 1 female (with rudimentary oostegites), 1 subadult male, 1 manca.

Description of female type:

Body (Fig. 114a; Pl. VIIIe) moderately robust, about 5.6 times longer than broad, sublinear. Length about 2.6 mm. Integument rather strongly calcified and somewhat fragile.

Carapace as long as its greatest width and about as long as peraeonites 2 and 3 and half of peraeonite 4 together, narrowed in the anterior third, in front

about half as long as the greatest width; anterolateral corners somewhat extended; rostral process moderately long, narrowly rounded at the tip (Fig. 114b).

Peraeonites (Fig. 114a and c; Pl. VIIIe) broader than long, increasing in length from 2 to 5 and 6 which are equally long while 7 is as long as 2. They are connected by a short, narrowed neck-like part and they have a tiny dorso-lateral seta near the anterior margin (Fig. 114c). Sternites strongly bulged.

Pleon (Fig. 114d-e; Pl. VIIIe) about as long as the last three peraeonites together. Pleonites well defined, as broad as the last peraeonite and much broader than long. First and last pleonites a little longer than any of the others. Last pleonite with a tiny dorso-lateral seta just behind the anterior margin and with one somewhat longer lateral seta near the middle. Epimera folded inwards and set with a tiny seta near the posterior end. Sternites strongly bulged. Pleotelson about as long as the last two pleonites together, semicircular in outline and dorsally set with six tiny setae, arranged as in Fig. 114d.

Antennula (Fig. 114f). First joint fully 0.7 times as long as the succeeding joints together and about twice as long as the second which is about 1.4 times longer than the third, while the last joint is about 1.6 times longer than the third. First and second joints with particular setae. Last joint with slender aesthetasc.

Antenna (Fig. 114g). First three joints subequally long, second and third joints with a dorsal seta at the end. Fourth joint somewhat curved, nearly 1.25 times longer than the preceding joints together and fully 1.5 times longer than the fifth, set with at least five long particular setae.

Labrum (Fig. 114h-i) set with diminutive hairs in the anterior part, in caudal view it is narrowly rounded in front, in lateral view labiate.

Mandibles (Fig. 114j-l) only slightly calcified, almost completely identical.

Labium (Fig. 114m). Front margin of the lobes set with a sparse row of tiny hairs.

Maxillula (Fig. 114n) with four transverse rows of tiny spinules on the surface of the short and almost straight endite and with tiny spinules and blunt spines at the end. Palp about as long as the endite, with two terminal setae.

Maxilla (Fig. 115a) a somewhat vaulted irregular plate, broadly rounded in front and with an outer bulge behind the middle.

Maxilliped (Fig. 115b-c) with the basis completely

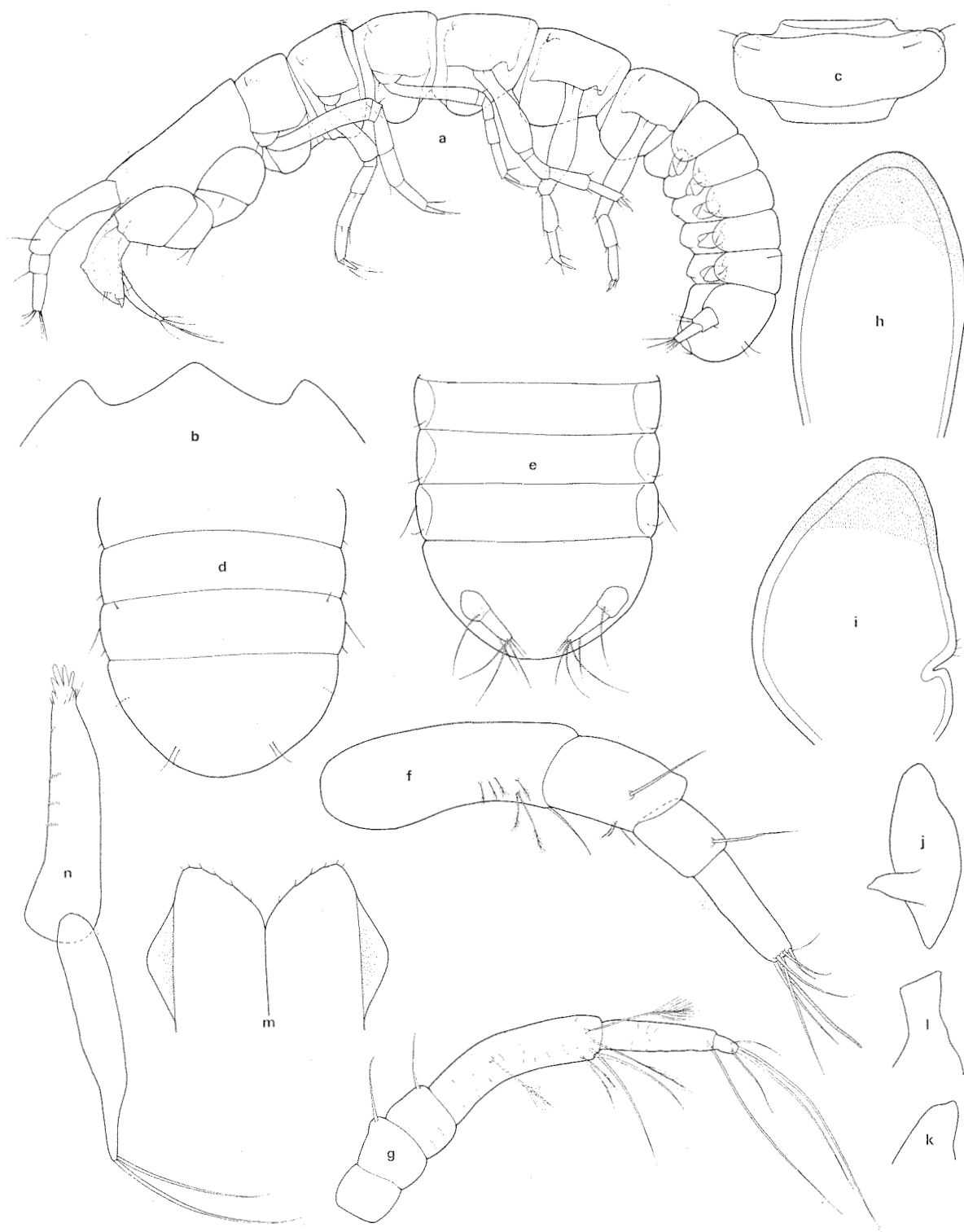


Fig. 114. *Anarthruopsis galathea* n.gen., n.sp., ♀; a, lateral view ($\times 50$); b, front end of carapace, dorsal view ($\times 175$); c, pereopod II, dorsal view ($\times 80$); d-e, last three pleonites and pleotelson, dorsal and ventral views ($\times 80$); f, antennula, ventral view ($\times 160$); g, antenna lateral view ($\times 160$); h-i, labrum, caudal and lateral views ($\times 320$); j, right mandible, internal view ($\times 420$); k-l, pars incisiva of right and left mandibles, internal view ($\times 420$); m, distal part of labium, caudal view ($\times 320$); n, maxillula, oblique internal view ($\times 320$).

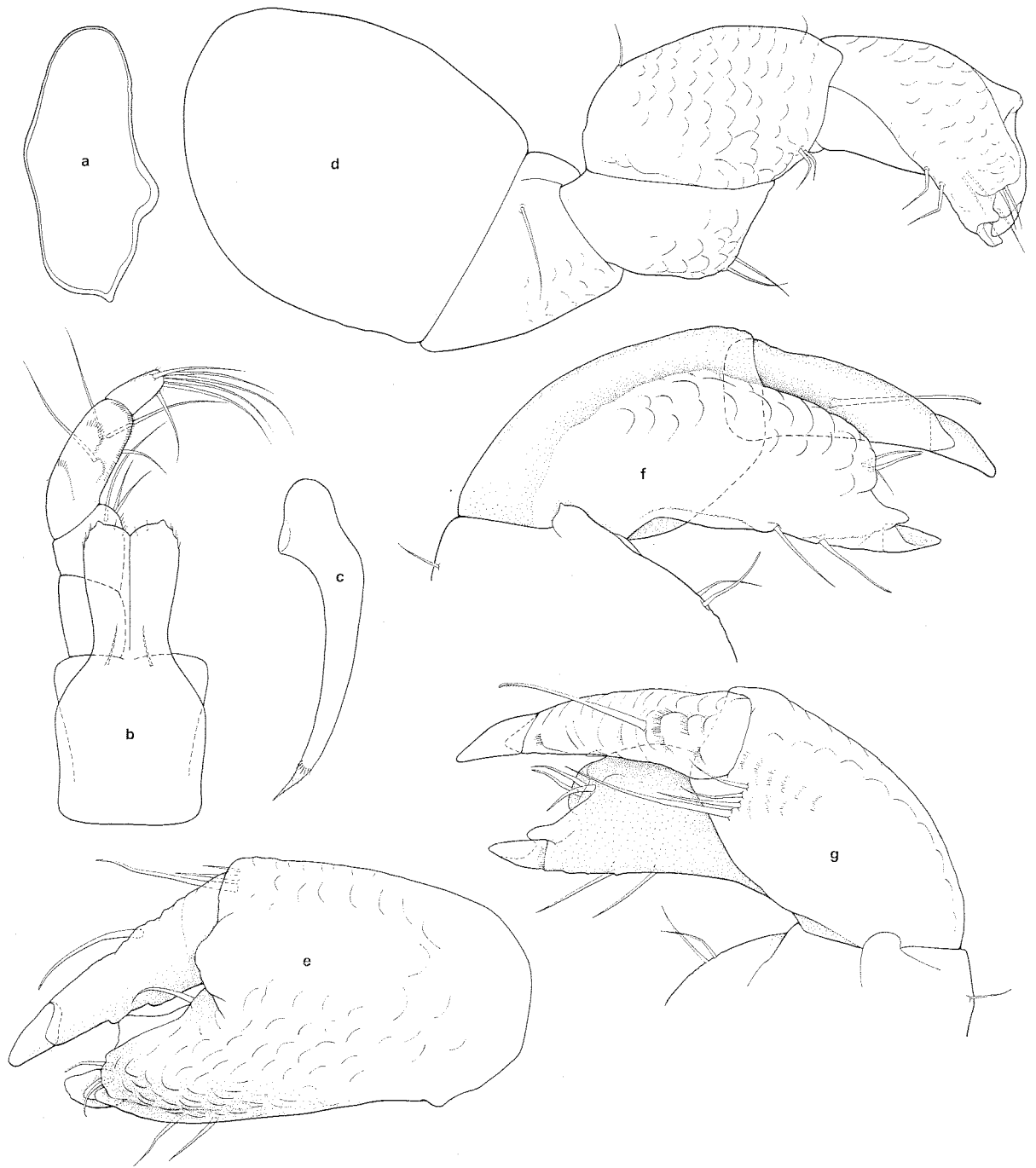


Fig. 115. *Anarthruopsis galatheae* n.gen., n.sp., ♀; a, left maxilla, caudal view ($\times 420$); b, maxilliped, rostral view ($\times 205$); c, epignath ($\times 205$); d, cheliped, caudal view ($\times 150$); e, propus and dactylus of same, quite horizontal caudal view ($\times 230$); f-g, the same, somewhat oblique caudal and rostral views ($\times 320$).

fused with the corresponding joint of the other maxilliped, set with one caudal seta just behind the palp. Endite with some tiny hairs in the most distal part of the outer margin and with two tiny dorsal spinules just inside the distal margin; outer distal corner extended as a bulge. Joints of the palp with zero, three, four and six setae, respectively, counting distad; second and third joints without seta at the

outer distal end; third joint with rows of tiny hairs on the rostral surface; last joint with a row of tiny lateral hairs along the distal part. Most distal part of epignath (Fig. 115c) with a ring of tiny spinules and with diminutive hairs.

Cheliped (Fig. 115d-g). Coxa very large, rounded at the base, reaching nearly to the posterior end of carapace. Basis much shorter than coxa and about

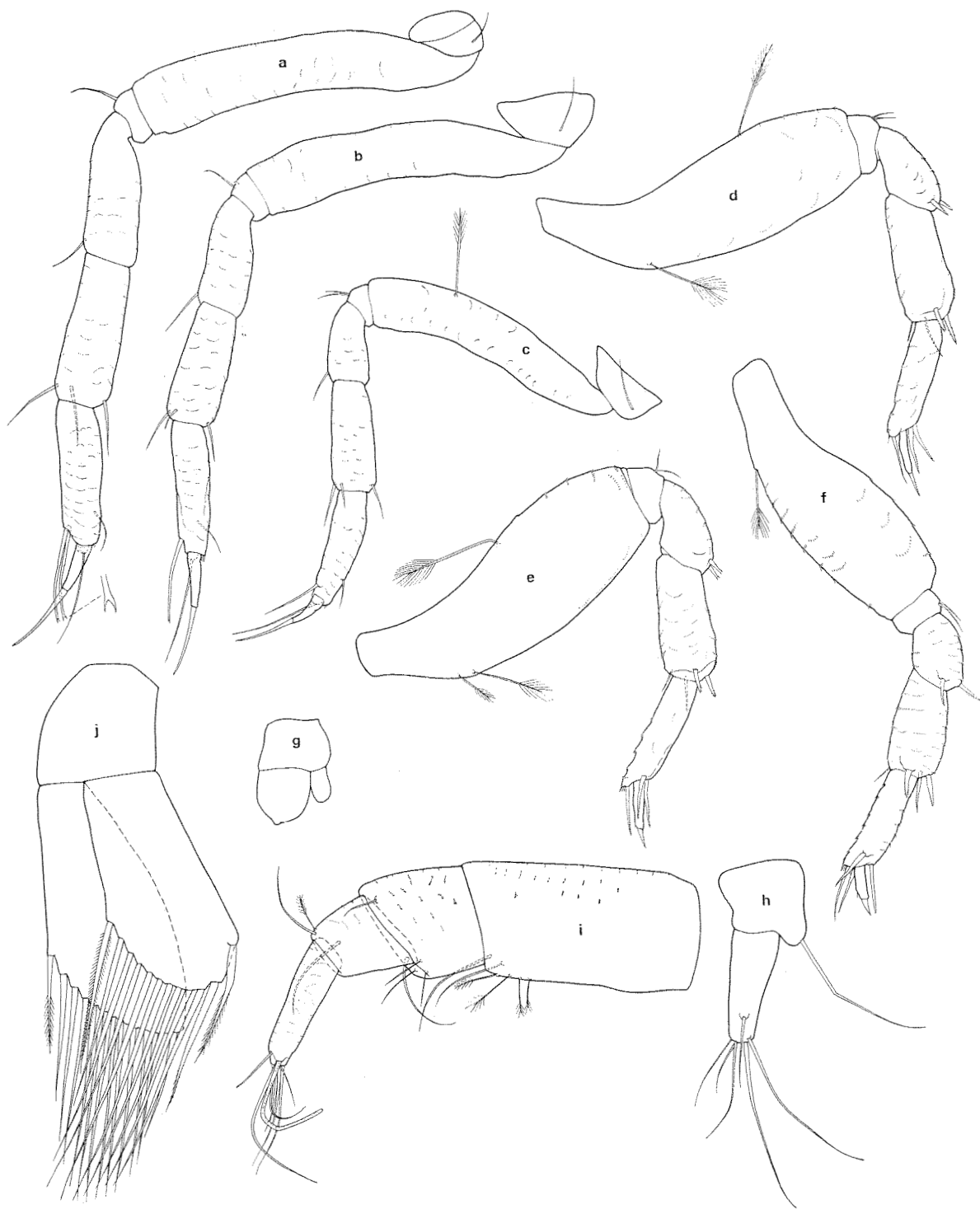


Fig. 116. *Anarthruopsis galatheae* n. gen., n. sp.; a-h, ♀; a-c, pereopods II-IV, caudal view ($\times 150$); d-f, pereopods V-VII, rostral view ($\times 150$); g, pleopod I, caudal view ($\times 320$); h, uropod, dorsal view ($\times 205$); i-j, subad. ♂; i, antennula, ventral view ($\times 150$); j, pleopod I, rostral view - all setae are plumose ($\times 205$).

as long as merus, with a long caudal seta. Merus with two sternal setae near the middle. Carpus somewhat longer than propus with two widely separated tergal setae and with two juxtaposed sternal setae just behind the propus. The greater

part of the tergal surface of the propus forms a long broad precipitous ridge resulting in that the finger and the dactylus form a pair of scissors; rostral surface with a transverse row of one long and three shorter setae just behind the dactylus

and with some arched rows of tiny hairs; finger shaped in a very peculiar manner (see the figures). Rostral surface of dactylus set with one strong seta near the middle and with numerous scale-like formations, at least some of which are set with tiny hairs. Basis, merus, carpus and propus more or less set with scale-like formations.

Peraeopods II-IV (Fig. 116a-c) long and slender. Peraeopod II longest, IV shortest. Coxa well defined, set with a seta. Basis of peraeopod II slightly longer than the three succeeding joints combined and about twice as long as ischium and merus together; basis of peraeopods III and IV about 2.4 and 3.0 times longer, respectively, than the two last-mentioned joints together; basis of peraeopod IV set with at least one particular seta. Ischium very short; peraeopods II and III with one sternal seta, peraeopod IV with two. Merus of peraeopod II longest, of peraeopod IV shortest, set with one sternal seta. Carpus about as long as propus, longest in peraeopod II, shortest in peraeopod IV, set with one tergal and two sternal spines which do not reach to the middle of the propus. The last-mentioned joint has a well-defined rostral lobule at the end, furnished with a long thin seta, and it has a short distal seta near the end; near the distal sternal end there is on peraeopod II one (left peraeopod) or two (right peraeopod) long spines, on peraeopod III one somewhat shorter spine, the spines – as already mentioned in the diagnosis of the genus – being bifid at the tip while the corresponding spine on peraeopod IV is unforked. (It may be noted that in the other two specimens there is only one sternal spine in peraeopods II.) Dactylus with claw nearly as long as propus; claw longer than dactylus. Except for ischium and dactylus the joints are adorned with tiny scale-like formations or ridges which are set with diminutive hairs.

Peraeopods V-VII (Fig. 116d-f) more robust than the preceding peraeopods, somewhat longer than peraeopod IV but shorter than peraeopod III. Coxa not defined. Basis tumefied, about as long as the four succeeding joints together and set with one or more long particular setae. Ischium short, with two sternal setae. Merus much shorter than carpus, with two sternal spines. Carpus as long as propus, at the end surrounded with four short spines. Propus of peraeopods V and VI with three distal spines, propus of peraeopod VII with four. Dactylus with claw much shorter than propus; claw shorter than dactylus. The joints are for the rest adorned in the same way as those of the preceding peraeopods.

Pleopods (Fig. 116g) already mentioned in the diagnosis of the genus.

Uropod (Fig. 116h) very short. Exopodite represented only by a small knob-like process of the basis, set with a single long seta. Endopodite one-jointed, furnished with one dorsal seta in the distal part and with five terminal setae.

Description of subadult male:

The subadult male differs from the female only in the antennula, which is much thicker (Fig. 116i), and in the presence of five pairs of well-developed pleopods (Fig. 116j), the exo- and endopodites of which are set with long plumose setae in the distal part; the exopodite is somewhat longer than the endopodite.

Manca stage:

In the manca stage found the last pair of peraeopods is not fully developed. In all other respects (also in the presence of rudimentary pleopods!) it agrees perfectly with the female.

Exspina n. gen.

Diagnosis:

Five pleonites. Both separated ocular lobes and visual elements lacking. Antennulae four-jointed, first joint very large. Antennae six-jointed, last joint very small. Mandibles with small, bare, membranous processus molaris; lacinia mobilis well-developed. Maxillulae with remarkably short endite, the tip of which has one or two diminutive verruciform spinules but no spines (the generic name alludes to this character). Epignath falciform. Coxa of cheliped situated above the posterior process of basis. Propus of peraeopods II-IV with normal spines. Claw of peraeopods V-VII with a sternal spiniform process near the tip. Female without pleopods. Marsupium formed by four pairs of oostegites.

Remarks:

The genus differs from all other genera in the lack of terminal spines on the maxillular endite.

Exspina typica n. sp.

Material:

St. 663, Kermadec Trench (36° 31'S, 178° 38'W), 4410 m, 24 Febr. 1952. Gear: herring otter trawl. Bottom: brown sandy clay with pumice. Bottom



Fig. 117. *Exspina typica* n.gen., n.sp., ♀; a, anterior part of carapace, dorsal view ($\times 80$); b, pleon, dorsal view ($\times 35$); c, antennula, dorsal view ($\times 80$); d, antenna, lateral view ($\times 80$); e-f, labrum, caudal and lateral views ($\times 205$); g-h, right and left mandibles, caudal and rostral views ($\times 205$); i, pars incisiva of right mandible ($\times 320$); j, pars incisiva and lacinia mobilis of left mandible, somewhat oblique caudal view ($\times 320$); k, labium, caudal view ($\times 205$); l, uropods, ventral view ($\times 55$).

temp.: 1.2°C . – 2 adult females, 1 subadult male. St. 664, Kermadec Trench ($36^{\circ}34'\text{S}$, $178^{\circ}57'\text{W}$), 4540 m, 24 Febr. 1952. Gear: herring otter trawl. Bottom: brown sandy clay with pumice. Bottom temp.: 1.1°C . – 3 adult females (one with emptied marsupium), 3 subadult males.

St. 668, Kermadec Trench ($36^{\circ}23'\text{S}$, $177^{\circ}41'\text{E}$), 2640 m, 29 Febr. 1952. Gear: herring otter trawl. Bottom: clay. Bottom temp.: 2.0°C . – 2 adult females.

St. 716, Acapulco-Panama ($9^{\circ}23'\text{N}$, $89^{\circ}32'\text{W}$), 3570 m, 6 May 1952. Gear: herring otter trawl. Bottom: dark muddy clay. Bottom temp.: c. 1.9°C . – 7 adult females (one with emptied marsupium), 2 incomplete adult females, 1 subadult male, 2 manca stages.

St. 726, Gulf of Panama ($5^{\circ}49'\text{N}$, $78^{\circ}52'\text{W}$) 3670-3270 m, 13 May 1952. Gear: herring otter trawl. Bottom: clay. Bottom temp.: c. 2.0°C . – 1 subadult male.

Description of female type (with emptied marsupium from St. 664):

Body (Pl. VIII f-g) short about 3 times longer than the greatest width in dorsal view almost oval in outline and somewhat resembling *Cryptocope abbreviata* (G. O. Sars) (G. O. Sars 1866, p. 122; 1896, p. 34, pl. XV, fig. 1). Length about 4.7 mm. Integument moderately strongly calcified somewhat fragile.

Carapace (Fig. 117a) about as long as the first two pereaeonites together about twice as broad behind as in front, laterally convex. Antero-lateral corners somewhat extended forwards and set with a tiny dorsal seta near the base; rostral process very short, acute.

Pereaeonites increasing in length from 2 to 5 and 6 which are of about the same length, while pereaeonite 7 is about 0.7 times as long as 6 and fully twice as long as 2. No hyposphenians (these are lacking also in females without oostegites).

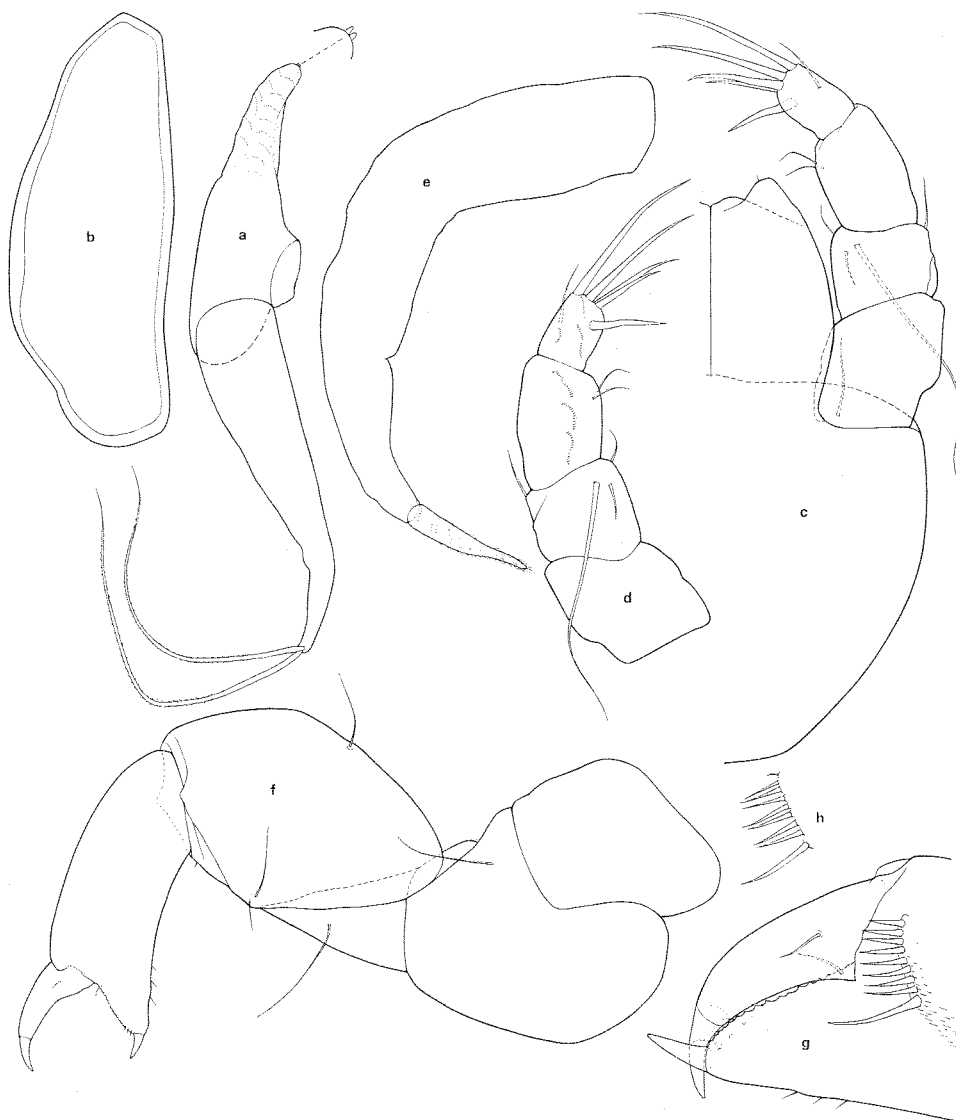


Fig. 118. *Exspina typica* n.gen., n.sp.; a-g, ♀; a, maxillula, rostral view ($\times 284$), detail ($\times 480$); b, maxilla, caudal view ($\times 164$); c, maxilliped, rostral view ($\times 164$); d, palp of same, caudal view ($\times 164$); e, epignath ($\times 164$); f, left cheliped, caudal view ($\times 164$); g, distal part of right cheliped, rostral view ($\times 164$); h, ♂; rostral spine-row on propus of cheliped ($\times 164$).

Pleonites (Fig. 117b) very short, strongly swollen, the first one distinctly longer than any of the others. Last pleonite with a tiny lateral seta (not visible in the figure). Pleotelson laterally convex, about as long as the last three pleonites together, posteriorly curved, with one tiny seta outside the uropods.

Antennula (Fig. 117c) scarcely longer than carapace. First two joints very thick. First joint about as long as the succeeding joints together and about 3 times longer than the second. Third joint shortest. Fourth joint about half as long as the first. Each joint is furnished with setae, the last one moreover with a short slender aesthetasc; the short thin setae on the first joint arise from a small socle.

Antenna (Fig. 117d). First joint short, bare. Second joint about twice as long as the first and about 1.3 times longer than the third, each of them furnished with one dorsal seta at the distal end. Fourth joint as long as the two preceding joints together

and about 1.6 times longer than the fifth. Last joint very short.

Labrum (Fig. 117e-f) bare, in rostral view broad in front; in lateral view the distal part looks like the head of a seal.

Mandibles (Fig. 117g-j). Pars incisiva of right mandible for the greater part finely crenate along the convex margin, that of the left mandible relatively smooth, with some fine striations. Lacinia mobilis of left mandible large, finely crenate along the inner half of the distal margin.

Labium (Fig. 117k) with naked lobes.

Maxillula (Fig. 118a). Endite very broad in the proximal part; in the distal part set with numerous rows of exceedingly tiny hairs, at the end with two verruciform spinules. Palp very large, longer than the endite, with two plumose terminal setae.

Maxilla (Fig. 118b) about 2.7 times longer than the greatest width, anteriorly obtuse-angled, and

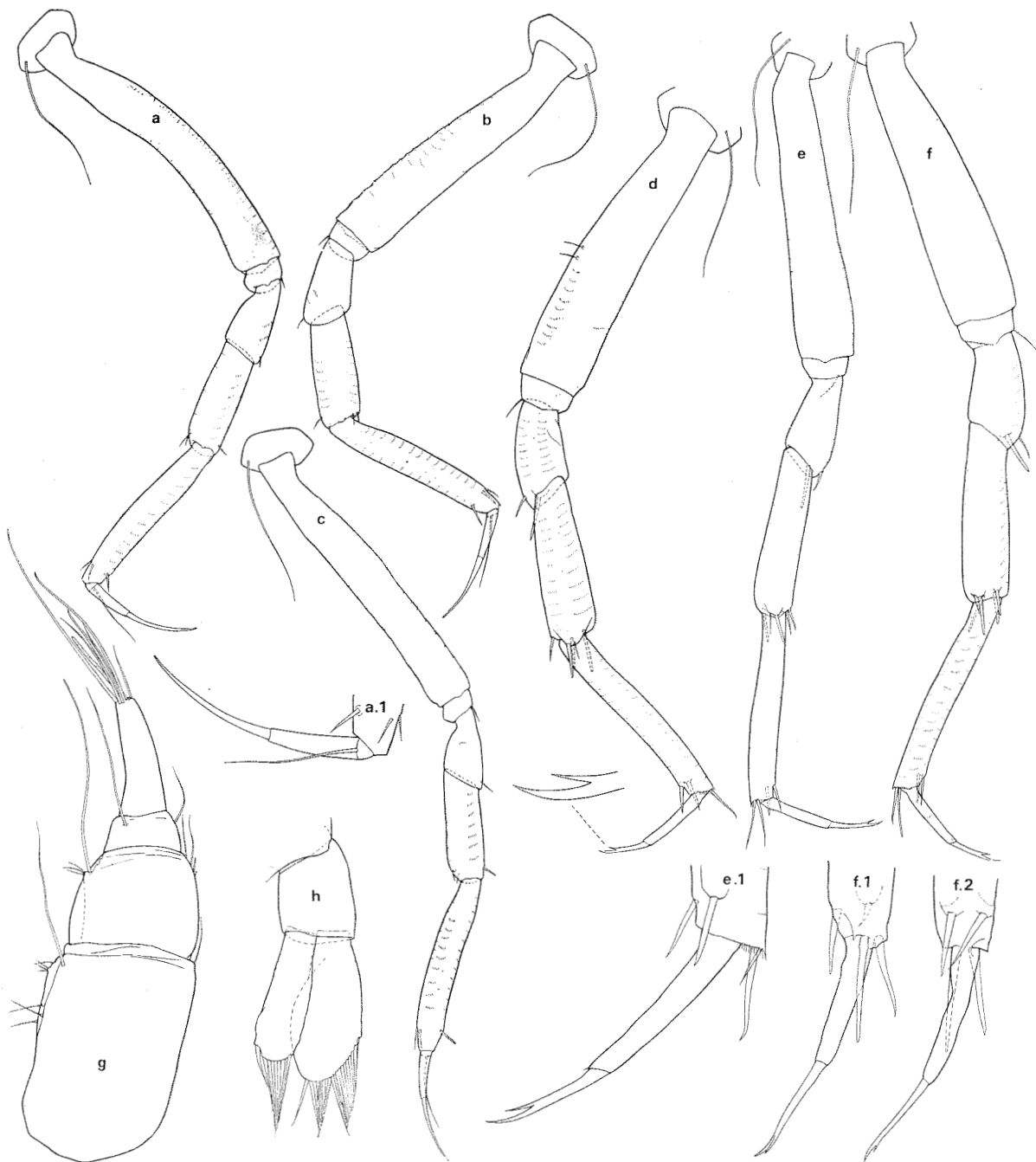


Fig. 119. *Exspina typica* n. gen., n. sp.; a-f, ♀; a-c, peraeopods II-IV, caudal view ($\times 80$); a.1, distal end of propus, and dactylus of peraeopod II, rostral view ($\times 160$); d-f, peraeopods V-VII, rostral view ($\times 80$), detail ($\times 320$); e.1, distal end of propus, and dactylus of left peraeopod VI of another female, caudal view ($\times 205$); f.1-f.2, distal end of propus, and dactylus of left and right peraeopods VII of a female from St. 716, caudal and rostral views ($\times 205$); g-h, subad. ♂; g, antennula, ventral view ($\times 80$); h, pleopod I, caudal view ($\times 80$).

with the greater part of the outside somewhat ex-curved.

Maxilliped (Fig. 118c-e). Basis completely fused with the corresponding joint of the other maxilliped, the two joints together forming a broadly cordiform and somewhat vaulted plate which bears one caudal seta just outside the endites. Antero-lateral corners of endites somewhat extended forwards and set with

a very tiny setula. First joint of palp unarmed; second joint with one seta at the outer and inner distal ends, and with two caudal setae, one of which is very long; third and fourth joints with some few rows of tiny hairs on the caudal surface, and with two and six setae, respectively, five of the setae of the last joint being strong and spiniform.

Cheliped (Fig. 118f-g). Coxa large, well marked

off. Basis about as long as carpus; the posterior process is rounded behind and it reaches to about the front lower angle of the second peraeonite. Merus short, triangular. Carpus much broader than propus. Rostral surface of propus set with a transverse row of one long and eight shorter spiniform setae at some distance from the dactylus and the finger; sternal surface slightly incurved, with three tiny setulae; finger with three caudal setulae inside the terminal claw, and with one caudal setula at the base of the convex and serrate tergal surface. Dactylus with one setula in the proximal part of the rostral surface; terminal claw somewhat longer than that of the finger.

Peraeopods II-IV (Fig. 119a-c) long and slender. Coxa well defined, furnished with a long slender rostral seta. Basis about 0.8 times as long as the four succeeding joints together, basis of peraeopod III shorter than any of the others. Ischium short. The three succeeding joints increase successively in length. Ischium, merus, carpus and propus with one sternal spinule, carpus and propus moreover with two tergal spinules near the end. Propus with a well defined rostral lobule furnished with a distal seta reaching far beyond the end of the proper dactylus but not to the end of the terminal claw. Dactylus with terminal claw much shorter than propus; claw about 1.4 times longer than dactylus, acute at the tip. Except for ischium and dactylus, the joints are adorned with rows of tiny hairs on the caudal surface, arranged as in the figures.

Peraeopods V-VII (Fig. 119d-f) very similar to the preceding ones, but differing in the following respects. The coxa is not or very indistinctly defined. The basis is only about 0.6 times as long as the four succeeding joints together owing to the fact that merus, carpus and propus are longer than the corresponding joints of the preceding peraeopods. The merus has two distal sternal spines of very different lengths, and the distal end of the carpus is surrounded by one setula and four short spines. The propus has two short distal sternal spines, and the distal end of peraeopod V has one spine, that of

peraeopods VI and VII two. The propus has no rostral lobule at the end, and the terminal claw of the dactylus is shorter than the proper dactylus, and it has a sternal spiniform process near the tip.

Uropod (Fig. 117b) very short. Basis nearly as long as broad, unarmed. Exopodite one-jointed and a little shorter than the two-jointed endopodite, the first joint of which is about twice as long as the second.

Description of subadult male (from St. 664):

The subadult male differs from the female only in the much thicker and longer antennulae (Fig. 119g) and in the presence of five pairs of two-branched pleopods, which distally are set with short, stiff setae (Fig. 119h). There is also an unimportant difference in the armament of the rostral surface of the propus of the cheliped (cp. Fig. 118g and h).

Notes on the manca stages:

Two manca stages 3.0 mm long have been found. They lack the last pair of peraeopods and pleopods, and the terminal claw of peraeopod V has a sternal spiniform process in both of them, that of peraeopod VI not.

Variation:

Besides the specimens described, one female and one subadult male from each of the Sts. 663 and 664, one female from St. 668, and two females from St. 716 have been dissected.

In all of them the endite of the maxillula has only one verruciform spinule at the tip. The number of spines on the rostral surface of the propus of the cheliped ranges from seven to ten. In the female from St. 663 and in the subadult male from St. 664 one of the tergal distal spines of the propus of the left peraeopod VI is dwarfed (Fig. 119e.1), and in one of the females from St. 716 one of the sternal spines of the propus of the left peraeopod VII is dwarfed (Fig. 119f.1), on the right peraeopod not (Fig. 119f.2).

B. Supplementary description of some deep-sea species collected by other expeditions

Leiopus leptodactylus Beddard, 1886

Leiopus leptodactylus Beddard, 1886a, p. 116.

Leiopus leptodactylus Beddard, BEDDARD, 1886b, p. 115, pl. XII, fig. 1; pl. XV, figs. 5-12.

Apseudes leptodactylus (Beddard), LANG, 1949, p. 4.

Apseudes leptodactylus (Beddard), WOLFF, 1956b, p. 200.

Material:

Siboga Expedition, St. 78, North Atlantic, 1830 m.

— 1 female, determined by BEDDARD.

Female (with no trace of oostegites):

Body (Pl. IXa) about 8 times longer than broad. Integument rather strongly calcified.

Carapace about 0.7 times as long as broad. Respiratory chambers strongly swollen. In front of these chambers there is a process shaped like the ocular lobes but smaller. Ocular lobes extended obliquely forwards and outwards, and excavated in front. Rostrum expanded at the base into a pair of moderately large lobes, and terminating in a long acute point. Epistome with a short spiniform process, directed obliquely forwards and downwards.

Peraeonites increase in length from 2 to 5 and 6 which are equally long while 7 is as long as 4. Coxa of pereopod II extended as a moderately long spiniform process. Coxa of succeeding pereopods small and rounded. Peraeonite 2 with short spiniform process at the anterior corners, the succeeding pereonites with longer spiniform process at some distance from these corners. Hyposphenians are present on all pereonites.

Pleon very slender, a little shorter than the last three pereonites together. Pleonites somewhat longer than the greatest width, evenly rounded ventrally; posterior corners extended as a short spiniform process. Pleotelson longer than the last three pleonites together.

Labrum (Fig. 120a) with a blunt median process in front; anterior margin strongly excavated, very finely crenated and laterally set with diminutive hairs.

Mandibles. Distal end of processus molaris bent somewhat backwards and outwards, set with some few spinules. Pars incisiva of right mandible six-dentate, that of left mandible eight-dentate. Lacinia mobilis six-dentate.

Labium. Basal part as in *L. wolffi*. Lobes for the

greater part margined with long hairs and with three finely plumose terminal setae or spines.

Maxillula. Outer endite distally surrounded with one dwarfed and eleven long spines. Inner endite with four finely ciliated setae. Setae of palpus as in Fig. 120c.

Maxilla (Fig. 120b). Caudal and rostral surfaces partly adorned with fine spinules or hairs. Setae of inner row bare, those of outer row five in number and very finely plumose along the distal part. Fixed endite with one spiniform caudal seta which is finely plumose along the distal half, and with one broad caudal spine which is strongly serrate in the distal part; the rostral surface bears a subterminal row of five simple setae; the distal end is set with four one-sidedly ciliate setae and with three strong spines, serrated in the distal part. Outer and inner lobes of movable endite with six setae each.

Maxilliped (Fig. 120d). Coxa with rows of diminutive hairs on the caudal surface. Basis with a few rows of diminutive hairs on the innermost part of the caudal surface, and finely crenate below the outer distal end. First palpar joint with one short outer seta and one long inner; second joint with three long setae near the outer distal end, and with numerous inner setae, most of them being plumose or finely serrate near the tip; third joint with five inner bare setae, and last joint with eight bare setae.

Cheliped (Fig. 120e). Basis with sternal spiniform process. Exopodite with four plumose setae. Merus with two tergal and three sternal setae. Carpus long and slender, armed as shown in the figure. Finger of propus much longer than the rest of the joint. Dactylus longer than the finger, owing to the very long terminal claw.

Peraeopod II (Fig. 120f). Basis somewhat shorter than merus and carpus together, with a strong spiniform process at the distal sternal end, and with one remarkably long tergal seta near the middle. Exopodite with three plumose setae. Ischium short, with one sternal seta. Merus much longer than carpus and propus together, with one sternal spine, and with many setae. Carpus shorter than propus, with one tergal spine, and two sternal spines. Propus with one tergal spine, with two distal spines and eight sternal spines, and with one short subterminal rostral spine, shaped as in *L. conspicuus*. Dactylus with claw as long as propus; dactylus with three spiniform sternal processes; claw very short.

Peraeopod V (Fig. 120g). Carpus with two sternal



Fig. 120. *Leiopus leptodactylus* Beddard, ♀; a, labrum, rostral view ($\times 100$); b, fixed maxillar endite, caudal view ($\times 325$); c, distal part of seta on maxillular palp ($\times 500$); d, maxilliped, caudal view ($\times 120$); e, cheliped, caudal view ($\times 45$); f, peracopod II, caudal view ($\times 45$); g, peracopod V, caudal view ($\times 45$); h, pleopod I, caudal view ($\times 110$).

spines and with the end surmounted with eight strong spines. Propus with tergal particular seta in the proximal part. Dactylus with claw longer than propus; claw shorter than dactylus, without sternal processes.

Pleopods (Fig. 120h) with the rami set with very few setae.

Remarks:

The pleopods seem to indicate that the specimen described represents a youth stage.

The species differs materially from *L. aberrans* in the carapace, from *L. sibogae* in the peraeonites, and from *L. weberi* and *L. gracilis* in the cheliped. From the other species it differs among other things in the terminal claw on peraeopod V.

L. leptodactylus is probably closest to *L. gracilis*.

Leiopus gracilis (Norman & Stebbing, 1886)

Apseudes gracilis Norman & Stebbing, 1886, p. 95, pl. XX.

Nec. *Apseudes gracilis* Norman & Stebbing, HANSEN, 1913, pl. I, fig. 3a-d.

Material:

Valorous Exped., St. 12, North Atlantic (56°11'N, 37°41'W), 2653 m. – 1 incomplete female, and 1 incomplete male (the specimens are determined by NORMAN & STEBBING).

Female:

Body about 9 times longer than broad. Integument moderately strongly calcified. Length about 11 mm.

Carapace with a distinct transverse furrow near the posterior end.

Peraeonites increase in length from 2 to 5 and 6 which are equally long while 7 is as long as 4. Peraeonites 4-7 longer than broad. Coxa of peraeopods III-VII small. Hyposphenians are present on all peraeonites. Peraeonites 3-7 with a pair of well-developed lateral spiniform processes which on peraeonite 3 are situated at the anterior corners, on the succeeding peraeonites at some distance from these corners.

Pleon longer than last three peraeonites together. Pleonites with a transverse row of small tubercles near the anterior dorsal margin; epimera spiniformly extended (they are not provided with a spine, as figured by STEBBING); ventral surface with strong spiniform process. Pleotelson about as long as last

three pleonites together, dorso-laterally set with two longitudinal rows of small tubercles, laterally for the greater part sparsely serrate, posteriorly slightly emarginate with a small, rounded process in the middle which bears two small setae.

Labium with three terminal forked spiniform setae on the lobes.

Maxillula. Outer endite terminally surmounted with one dwarfed spine and ten long spines. Inner endite with five terminal plumose setae.

Maxilla very similar to that in *L. shiinoi*.

Maxilliped with most of the setae on second palpar joint marginated with fine spinules along the distal part.

Cheliped as in the male (see Fig. 121b-c).

Peraeopod II (Fig. 121d). Basis about as long as merus and carpus together, with spiniform process at the distal sternal corner. Ischium very short, with two sternal setae. Merus as long as carpus and propus together, with one sternal spine. Carpus with two sternal spines and one tergal spine. Propus with one tergal spine, two distal spines, eight (left peraeopod) or five (right peraeopod) sternal spines, and with one subterminal rostral spine, shaped as in *L. conspicuus*. Dactylus with claw as long as propus; dactylus with four sternal spiniform processes; claw very short.

Peraeopod V as in *L. leptodactylus*.

Pleopods (Fig. 121f) present.

Male:

Body (Pl. IXb-d) as in the female.

Peraeonites as in the female but the lateral spiniform processes are much shorter.

Pleon. The pleonites differ from those of the female inasmuch as the spiniform process on the epimera is very small, as is also the case with the ventral process. Pleotelson almost exactly as in *L. shiinoi* (the peculiar shape of pleotelson in Pl. IXb-c is because it is somewhat damaged).

Antennula. Outer flagellum twenty-two-jointed; all joints, the last one excepted, with aesthetascs. Inner flagellum three-jointed, without aesthetascs.

Antenna (Fig. 121a). Squama somewhat shorter than in the female, reaching a little beyond the end of the second flagellar joint. Flagellum nine-jointed as in the female; second and third joints with particular setae.

Mandibles. Spiniferous lobe of either mandible with five stileto-shaped spines.

Peraeopod V as in the female.

Peraeopod VII (Fig. 121e) as in the figure.

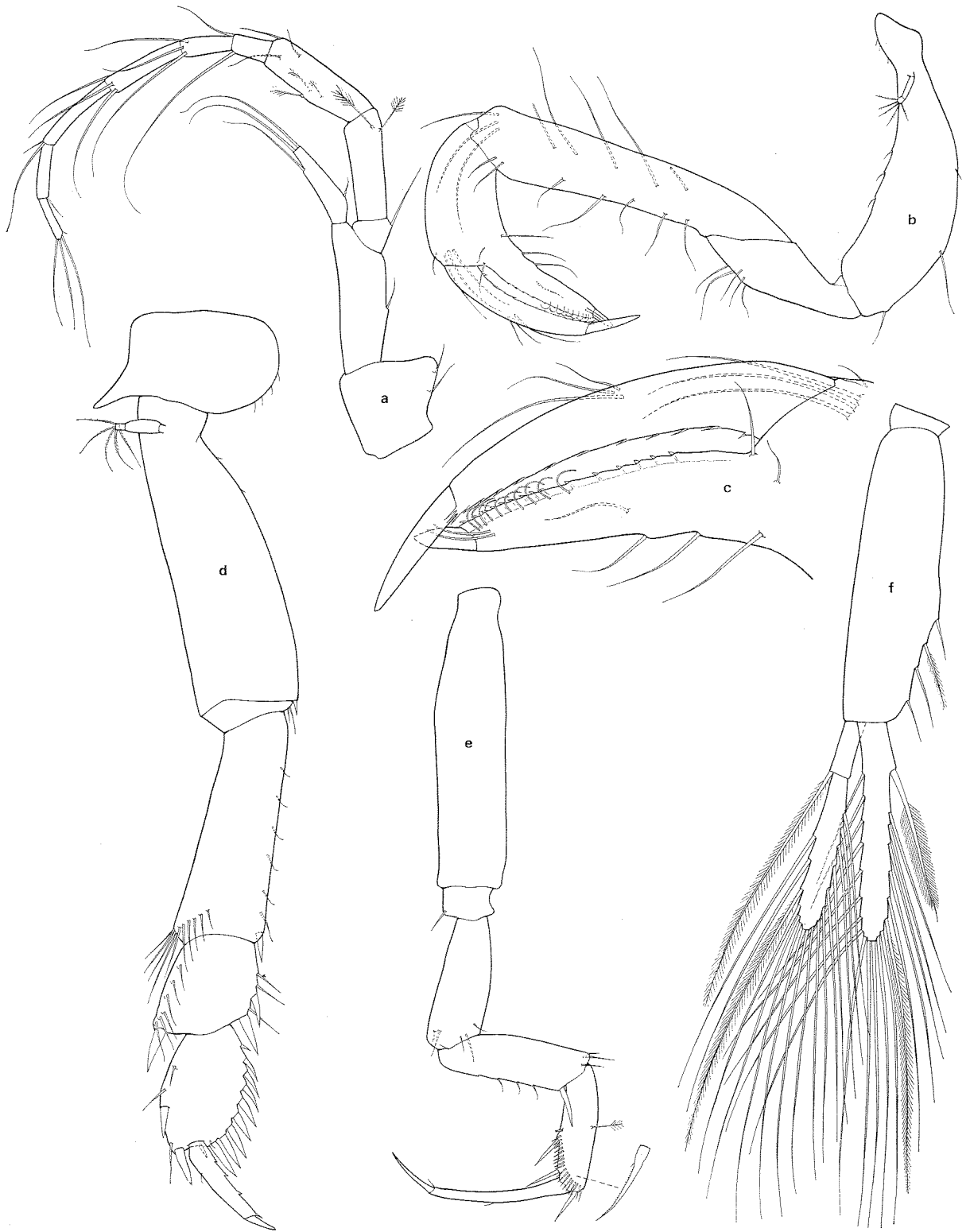


Fig. 121. *Leiopus gracilis* (Norman & Stebbing); a, antenna, ♂, lateral view ($\times 100$); b, cheliped, ♂, caudal view ($\times 60$); c, distal part of propus, and dactylus of same, rostral view ($\times 140$); d, peraeopod II, ♀, caudal view ($\times 45$); e, pleopod I, ♀, rostral view ($\times 65$); f, peraeopod VII, ♂, rostral view ($\times 45$), spine ($\times 270$).

Remarks:

Among other things, *L. gracilis* differs from *L. sibogae* in the presence of lateral spiniform processes on the peraeonites; from *L. aberrans* in the presence of a spiniform process in front of the respiratory chambers; from *L. leptodactylus*, *L. weberi*, and *L. shiinoi* in the absence of a sternal spiniform process on the basis of the cheliped; and from the other species in the claw on peraeopod V. It seems to be most closely related to *L. leptodactylus*.

Leiopus sibogae (Nierstrasz, 1913)

Apseudes sibogae Nierstrasz, 1913, p. 3, pl. I, figs. 1-18.

Apseudes sibogae Nierstrasz, WOLFF, 1956b, pp. 200 and 236.

Material:

Siboga Exped., St. 223 (5°44'7''S, 126°27'3''E), 4391 m. - 1 incomplete adult female with rudimentary oostegites, 1 incomplete subadult female, 1 incomplete subadult male, fragments of two specimens.

Female (with rudimentary oostegites):

Body (Pl. IXe-f) 9.4-9.5 times longer than broad. Integument strongly calcified and fragile. Length about 18 mm.

Peraeonites, *pleonites* and *pleotelson* agree exactly with NIERSTRASZ's description.

The oral parts are as in the subadult male described below, except that the spiniferous lobe of either mandible bears one simple spine and five many-forked spines.

Subadult female:

Body (Pl. Xa) much more slender than in the adult female, being about 11 times longer than broad. Length about 11 mm.

Cheliped (Fig. 122a). Basis without spiniform processes, with one sternal spinula, two sternal setae, and one caudal spinula near the base. Exopodite with four plumose setae. Ischium with one tergal setula, two juxtaposed sternal setae, and one sternal setula. Carpus about as long as propus, set with many setae. Propus about 1.4 times longer than broad, with five long rostral setae behind the dactylus, with one rostral seta just behind the finger, with one caudal seta behind the dactylus and one behind the finger; in the gap between the dactylus and the finger there are three setae. Finger about as long as

the rest of the joint, with one strong tergal process at the base; it bears four sternal setae and seven caudal setae which are curved and cylindrical, and a tergal row of long lamellae. Dactylus with three juxtaposed long rostral setae near the middle, and with a sternal row of setiform lamellae behind the claw.

Peraeopod II (Fig. 122b). Basis about as long as merus and carpus together. Exopodite with four plumose setae. Ischium short, with two sternal setulae. Merus somewhat longer than carpus and propus together, with one sternal spine. Carpus about 1.25 times longer than propus, with one tergal spine and one sternal. Propus with six sternal spines and two distal spines. Merus, carpus and propus set with many setae. Dactylus with one tergal setula and four sternal spiniform processes; claw very short.

Peraeopod III (Fig. 122c). Basis somewhat shorter than merus, carpus and propus together. Carpus 1.4-1.5 times longer than merus. Propus somewhat shorter than merus. Dactylus with claw fully as long as propus; claw about 0.3 times as long as the proper dactylus.

Peraeopods V-VII (Figs. 122d-g, and 123a) very alike, but with the following differences. Basis of peraeopod V about as long as merus, carpus, and propus together, basis of peraeopods VI and VII shorter than these joints. Propus of peraeopods V and VI with one tergal particular seta, on peraeopod V situated near the base, on peraeopod VI near the middle. There are also some differences in the armament of the joints, as is clear from the figures.

Pleopods (Fig. 123b). Basis with nine inner setae. First joint of exopodite very short, with one outer seta; second joint marginated with numerous setae. Endopodite somewhat longer than exopodite, with numerous marginal setae. All setae are plumose.

Subadult male:

Antennula as in the female, i.e., the flagella have no aesthetascs.

Mandibles (Fig. 123c-d). Processus molaris very long, at the end bent somewhat backwards and outwards and set with some few spinuliform processes. Pars incisiva of either mandible six-dentate; lacinia mobilis eight-dentate. Spiniferous lobe armed as shown in the figures, the spines being shorter and much less forked than in the female.

Labium (Fig. 123e-e.1). Lobes very slender; right lobe with two terminal setae, left lobe with one seta (in the female examined each lobe bears two setae).

Maxillula (Fig. 123f-h). Distal end of outer endite

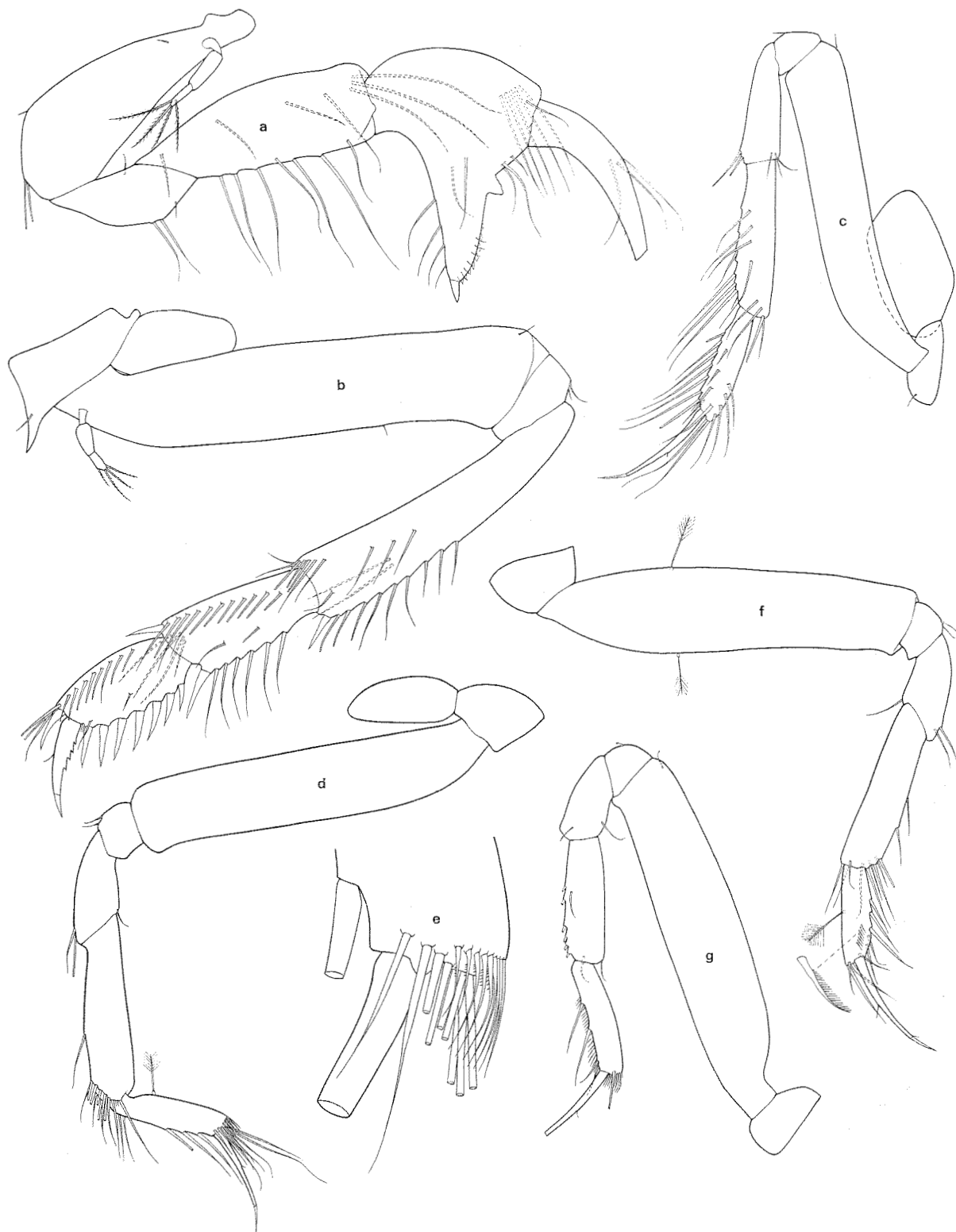


Fig. 122. *Leiopus sibogae* (Nierstrasz), ♀; a, cheliped, caudal view ($\times 30$); b-c, pereopods II and III, caudal view ($\times 30$); d, pereopod V, caudal view ($\times 30$); e, distal end of propus of same, caudal view ($\times 160$); f-g, pereopods VI-VII, rostral and caudal views ($\times 30$).



Fig. 123. *Leiopus sibogae* (Nierstrasz); a-b, ♀; a, distal part of propus of peraeopod VII, caudal view ($\times 160$); b, pleopod I, caudal view ($\times 47$); c-l, subadult ♂; c-d, distal part of left and right mandibles, internal view ($\times 320$); e-e.1, labium, caudal view ($\times 205$); f, distal part of outer maxillular endite, caudal view ($\times 320$); g-h, inner endite of right and left maxillulae, caudal view ($\times 320$); i, distal part of fixed maxillar endite, caudal view ($\times 363$); j, cheliped, caudal view ($\times 40$); k-l, part of finger and dactylus of the same, caudal view ($\times 205$).

surmounted with one dwarfed spine and eleven long spines, shaped as in Fig. 123f. Left inner endite with four plumose terminal setae, right inner endite with three (in the female examined each endite bears four setae).

Maxilla (Fig. 123i). Setae of inner row bare. The outer row numbers five spiniform setae which are finely ciliated along the distal part. Fixed endite armed as in the figure. Outer lobe of movable endite with nine setae, inner lobe with eleven (or twelve?) setae.

Cheliped (Fig. 123j-l) very similar to that of the female.

Peraeopod V as in the female.

Remarks

L. sibogae differs from the other species of the genus in the absence of lateral spiniform processes on the peraeonites.

Leiopus weberi (Nierstrasz, 1913)

Apseudes weberi Nierstrasz, 1913, p. 7, pl. II, figs. 19-29.

Apseudes weberi, WOLFF, 1956b, p. 200.

Material:

Siboga Exped., St. 223 (5°44'7"S, 126°27'3"E), 4391 m. – 4 fragments of females (one of them with fully developed marsupium), 1 incomplete subadult male.

Siboga Exped., St. 241 (4°24'3"S, 126°49'3"E), 1570 m. – 2 fragments of female, 1 somewhat incomplete adult male, 1 somewhat incomplete subadult male.

Female (from St. 223):

Peraeonites (Pl. Xb) much broader than those of the males.

Pleonites evenly rounded ventrally.

Antennula. First joint about 2.8 times longer than second joint which is 1.6-1.7 times longer than the third. First and second joints with particular setae.

Antenna. The first joint is extended inwards as a triangular process. The squama reaches somewhat beyond the middle of the second flagellar joint and it bears four setae. Flagellum ten-jointed; second, third, and fourth joints with particular setae.

Labrum as in *L. wolffi*.

Mandibles crenate on the outer side just below and above the palp, and set with long, fine hairs in front of the crenation. Processus molaris strong, some-

what upward-curved, with the distal end bent somewhat backward and outward and set with tiny hairs. Pars incisiva of either mandible seven-dentate. Lacinia mobilis five-dentate. Spiniferous lobe of either mandible with one simple spine, and five forked spines.

Labium (Fig. 124a-b) with three terminal setae on the lobes.

Maxillula (Fig. 124c-d). Outer endite with two caudal spiniform setae near the end, and with the distal end surmounted by one dwarfed spine, and ten long spines. Inner endite with four terminal setae, shaped as in Fig. 124d.

Maxilla (Fig. 124e). Setae of inner row bare. The outer row numbers five spiniform setae which are finely plumose along the distal part. Fixed endite armed as in the figure. Outer lobe of movable endite with seven plumose setae, inner lobe with eight, five of which are plumose.

Maxilliped (Fig. 124f). Coxa with some rows of diminutive hairs in the outer part. Basis bare. Endite with three couplers, and with six plumose setae on the free margin of the median vertical surface. First joint of the palp with one short outer seta, and with one long caudal seta near the inner end; second joint with two outer setae near the distal end, and with numerous inner setae, shaped as in the figure; third joint with six inner setae, two of which are shorter than the others and one-sidedly finely ciliate; fourth joint with seven bare setae.

Cheliped (Fig. 124g). Basis about twice as long as broad, and as long as carpus, with sternal spiniform process, and with two sternal setae near the distal end. Exopodite with four plumose setae. Merus with three sternal setae, the distal of which is very short, and with one caudal seta near the distal sternal end. Carpus with many long setae. Propus somewhat longer than carpus, and about twice as long as broad; it bears one caudal seta and five sternal setae just behind the dactylus, and it has one seta in the gap between the dactylus and the finger, and one rostral seta at the base of the finger. The latter is somewhat longer than the rest of the joint; it bears one rostral seta, three sternal setae, a caudal row of six fine setae inside the tergal end, and a tergal row of eight lamellae. Dactylus longer than finger owing to the much longer terminal claw; it bears three rostral setae, one of which is very short and spiniform, near the middle, and a sternal row of eight spiniform processes.

Peraeopod II (Fig. 124h). Basis as long as merus and carpus together, without spiniform processes.



Fig. 124. *Leiopus weberi* (Nierstrasz), ♀; a, right side of labium, caudal view ($\times 160$); b, distal part of lobe of same, caudal view ($\times 425$); c-d, distal part of maxillular endites, caudal view ($\times 338$); e, distal part of fixed maxillar endite, rostral view ($\times 385$); f, maxilliped, caudal view ($\times 118$), spine ($\times 385$); g, cheliped, rostral view ($\times 47$), details ($\times 205$); h, peraeopod II, caudal view ($\times 47$); i, peraeopod V, rostral view ($\times 47$).

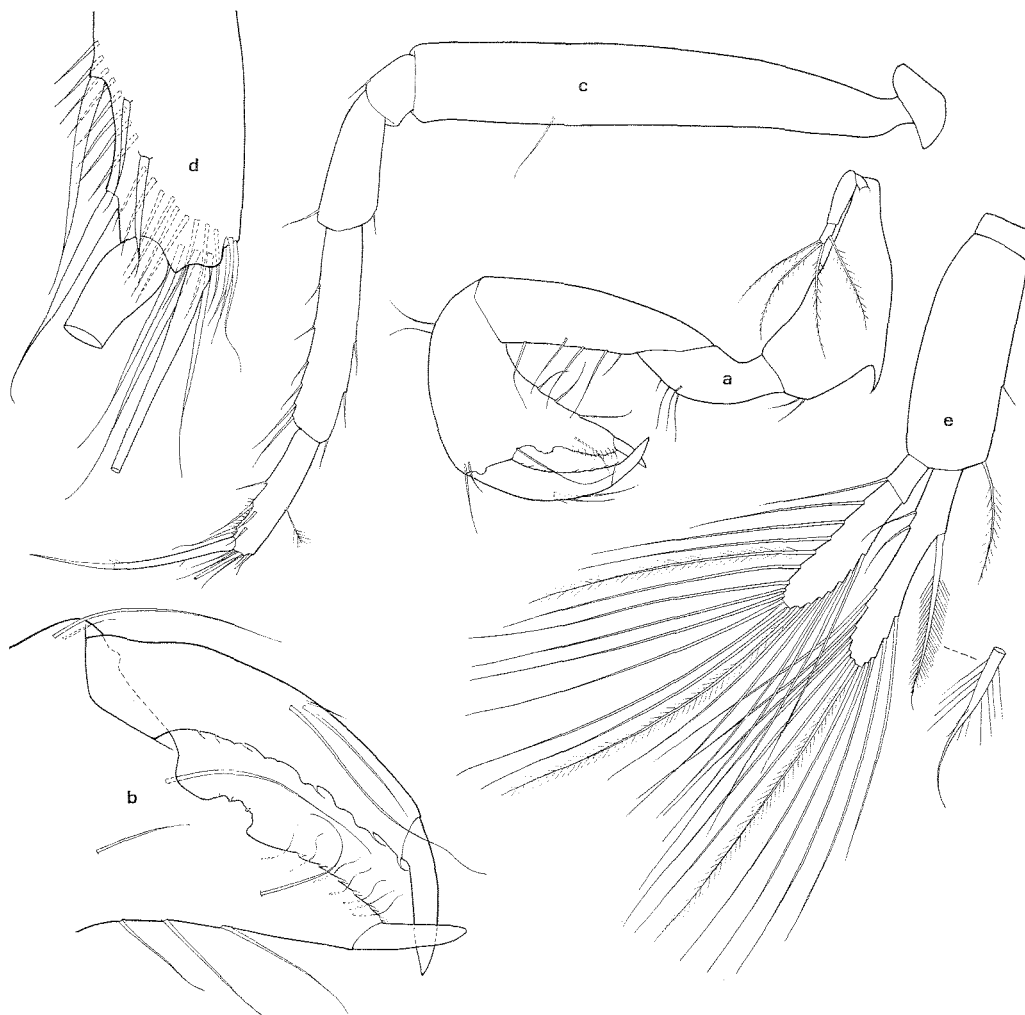


Fig. 125. *Leiopus weberi* (Nierstrasz), ♂; a, cheliped, caudal view ($\times 47$); b, distal part of propus, and dactylus of same, rostral view ($\times 118$); c, pereopod VII, rostral view ($\times 47$); d, distal part of propus of same, rostral view ($\times 205$); e, pleopod I, caudal view ($\times 65$).

Exopodite with five plumose setae. Ischium with two sternal setae. Merus somewhat shorter than carpus and propus together, with one sternal spine. Carpus about 1.4 times longer than propus, with two sternal spines. Propus with one tergal spine, two distal spines, and five sternal. Dactylus with claw as long as propus; dactylus with three sternal spiniform processes; claw much shorter than dactylus.

Pereopod V (Fig. 124i). Basis somewhat shorter than merus, carpus, and propus together, with particular setae. Carpus about 1.6 times longer than merus, and about 1.5 times longer than propus. Propus with tergal particular seta above the middle. Dactylus with claw much shorter than propus; claw short and without sternal processes.

Adult male:

Body (Pl. Xc) much more slender than in the female. Pleotelson as in *L. conspicuus*.

Pleonites with a ventral median spiniform process which is long on pleonites 1 and 5, very short on pleonites 2-4.

Antennula. Outer flagellum eighteen-jointed, all joints with aesthetascs.

Antenna. Second and third flagellar joints with particular setae and with the succeeding joints set with aesthetascs (the flagellum is fifteen-jointed).

Mandibles differing from those of the female in the following respects: pars incisiva of either mandible four-dentate; lacinia mobilis three-dentate; spiniferous lobe with three short, stiletto-shaped spines.

Cheliped (Fig. 125a-b). Finger with an irregular tergal process near the base, the process being set with three spinules; the claw is longer than that of the female.

Pereopods V and VII (Fig. 125c-d) as in the female.

Pleopods (Fig. 125e). Coxa very short, bare. Basis



Fig. 126. *Leiopus gracillimus* (Hansen); a-c, ♀ L; a-a.1, lobes of labium, rostral view ($\times 175$), spines ($\times 450$); b, distal part of endite of maxilliped, caudal view ($\times 320$); c, distal end of propus, and dactylus of peraeopod II, rostral view ($\times 145$), spine ($\times 320$); d-e, ♀ P; d, distal end of propus of peraeopod III, rostral view ($\times 320$); e, dactylus with claw of peraeopod V, rostral view ($\times 205$); f-g, ♂; f, distal part of peraeopod II, rostral view ($\times 145$), spine ($\times 320$); g, dactylus of peraeopod V, caudal view ($\times 205$).

with one inner setula near the middle, and with one plumose seta at the inner distal corner. First joint of exopodite with one outer seta; second joint four times as long as the first, with numerous marginal setae. Endopodite somewhat longer than exopodite, armed as in the figure. All setae are plumose.

Remarks:

The species differs from *L. aberrans* in the presence of spiniform process in front of the respiratory chambers, from *L. sibogae* in the presence of lateral spiniform processes on the peraeonites, from *L. gracilis* in the presence of sternal spiniform process on the basis of the cheliped, and from *L. leptodactylus* and *L. shiinoi* among other things in the propus of the cheliped. From the other species it differs in the claw on peraeopod 5. It differs also from all other species of the genus inasmuch as the caudal surface of the endite of the maxillipeds is

devoid of an outer seta and that the inner seta is not transformed into a leaf-like spine.

Leiopus gracillimus (Hansen, 1913)

Apseudes gracillimus Hansen, 1913, p. 15, pl. I, fig. 4a-e.

Apseudes gracillimus Hansen, WOLFF, 1956b, p. 200, figs. 12-18.

Material:

Taken by the *Thor*: St. 166, South of Iceland ($62^{\circ}57'N$, $19^{\circ}58'W$), 957 m, 14 July 1903. Gear: dredge. Bottom temp.: $4.9^{\circ}C$. – 8 adult females, 4 adult males, 3 preadult specimens, some rather damaged.

Taken by the *Ingolf*: St. 22, South of Greenland ($58^{\circ}10'N$, $48^{\circ}25'W$), 3474 m, 22 June 1895. Gear:

dredge. Bottom: soft grey ooze, without any sand. Bottom temp.: 1.4°C. – 1 preadult specimen. Taken by the *Galathea*: St. 193, off Southeast Africa (32°34'S, 31°52'E), 3680 m, 6 Feb. 1951. Gear: shrimp otter trawl. Bottom: globigerina ooze. Bottom temp.: 1.1°C. – 2 adult males.

Female (two females have been dissected):

Labium (Fig. 126a-a.1). The terminal armament of the lobes is somewhat variable. In one of the females (by WOLFF labelled ♀ P) either lobe has three terminal spiniform setae while in another female (by WOLFF labelled ♀ L) the right lobe is as in the preceding specimen, the left lobe, however, being set with only two spiniform setae, the inner of which is bifid at the tip (Fig. 126a).

Maxillula. Outer endite set with hairs in the distal part and provided with two outer setae which are one-sidedly ciliate; the distal end is surmounted by one dwarfed and ten strong spines. Inner endite with five plumose terminal setae.

Maxilla armed exactly as in *A. conspicuus*.

Maxilliped (Fig. 126b). Coxa, basis and palp armed as in the species just mentioned except that the second palpal joint has four distal setae, the third joint only five inner setae, and the last joint six setae, one of which is very short. Endite armed as in the figure.

Peraeopod II (Fig. 126c). Propus with one one-sidedly ciliate subterminal rostral seta. Dactylus of female P with three sternal processes, that of female L with four.

Peraeopods III-IV (Fig. 126d). Propus with subterminal rostral spine, shaped as shown in the figure.

Peraeopod V (Fig. 126e). Dactylus with two tergal setae, and with four sternal setae, two of which are situated near the middle and two at the end; claw with four sternal processes.

Male:

Peraeopod II (Fig. 126f). Propus with one one-sidedly ciliate subterminal rostral seta which is shorter than that in the female. Dactylus with one tergal seta, and with five sternal processes.

Peraeopods III-IV as in the female.

Peraeopod V (Fig. 126g). Dactylus with three juxtaposed setae near the middle, with one rostral spine at about the distal third, and with two terminal rostral setae.

Remarks:

In the shape of the claw on peraeopod V the fe-

male approaches *L. galathea* and *L. conspicuus*. From the former it differs materially in the shape of the rostrum, from the latter, among other things in the shape of the carapace and in the presence of pleopods in the female.

Leiopus hansen n. nom.

Apseudes gracilis Norman & Stebbing, HANSEN, 1913, p. 13, pl. I, fig. 3a-d.

Apseudes gracilis Norman & Stebbing, 1886, WOLFF, 1956b, p. 202, fig. 14c, and p. 206.

Nec. *Apseudes gracilis* Norman & Stebbing, 1886, p. 95, pl. XX.

Material:

Ingolf Exped., St. 10 (64°24'N, 28°50'W), 1484 m, bottom temp.: 3.5°C. – 1 subadult female, 1 manca stage, determined by HANSEN.

A comparison between NORMAN & STEBBING'S *A. gracilis* and HANSEN'S specimens has proved that HANSEN'S identification is wrong. In the true *gracilis* the terminal claw on peraeopod V is shaped as in peraeopods VI and VII while in HANSEN'S specimens it is much shorter, broader and provided with two strong sternal processes, the distal process on the left peraeopod being bifid at the tip (Fig. 127d), on the right peraeopod not. Thus, *hansen* belongs to the same group as *gracillimus*, *galathea*, *zenkevitchi*, *conspicuus*, and *wolffi*, while *gracilis* belongs to the same group as *leptodactylus*, *sibogae*, *weberi* and *aberrans*.

In the shape of the terminal claw on peraeopod V, *hansen* agrees with *zenkevitchi* and *wolffi*, from both of which, however, it differs materially in the shape of the rostrum.

Female:

Body (Pl. Xd) 9.3-9.4 times longer than broad. Integument strongly calcified. Length about 13 mm.

Carapace (Pl. Xe) shorter than the two succeeding peraeonites together, without transverse furrows. Rostrum expanded at the base into a pair moderately large lobes.

Peraeonites increase in length from 2 to 5 and 6 which are equally long while 7 is a little shorter than 4.

Pleon nearly as long as the last four peraeonites together. Pleotelson somewhat longer than the three last pleonites together.

Mandibles. The end of the processus molaris is tongue-shaped, bent somewhat backwards and out-



Fig. 127. *Leiopus hanseni* n. nom., ♀; a, right lobe of labium, caudal view ($\times 205$); b, terminal spines of same ($\times 450$); c, maxilliped, caudal view ($\times 118$); d, dactylus of left peraeopod V ($\times 205$).

wards, finely crenate and set with fine hairs. Pars incisiva of right mandible six-dentate, of left mandible eight-dentate. Lacinia mobilis eight-dentate. Spiniferous lobe of either mandible with one simple spine and five forked spines.

Labium (Fig. 127a-b) with the lobes for the greater part margined with long hairs and set with three terminal forked spines.

Maxillula as in *L. gracillimus*.

Maxilla. Setae of inner row bare, bifid at the tip. The outer row numbers seven spiniform setae which are finely ciliated along the distal half. The fixed endite is on the caudal surface armed as in *L. bacescui*; rostral surface with seven subterminal spines some of which are one-sidedly ciliate along the distal part, others again two-sidedly ciliated; distally there are two somewhat curved cylindrical setae and three forked spines. Outer lobe of movable endite with seven setae which are finely two-sidedly ciliate along the distal part; inner lobe with eight long-

plumose setae, and with one strong, curved spiniform seta which is one-sidedly ciliate along the distal part.

Maxilliped (Fig. 127c). Coxa bare. Basis with three small caudal setae near the inner surface and with a row of tiny hairs on the outer surface. First joint of the palp with one short outer seta, and with one long, bare seta near the inner distal end; second joint with six bare distal setae and with numerous inner setae, the longest of which are bare, the others armed as shown in the figure. The endite is armed as in *L. wolffi*, except that there are three couplers, and that the free margin of the median vertical surface bears six plumose setae.

Peraeopod V (Fig. 127d). Claw on dactylus with two sternal processes, the distal of which is bifid on the left peraeopod, on the right not.

Leiopus galathea (Wolff, 1956)

Apseudes galathea Wolff, 1956b, p. 191, figs. 2-11.

Material:

Galathea Exped., St. 658, Kermadec Trench ($35^{\circ}51'S$, $178^{\circ}31'W$), 6660-6770 m, 20 Feb. 1952. Gear: 6 m sledge trawl. Bottom: brown sand with clay and stones. Bottom temp.: $1.3^{\circ}C$. – 5 adult females (one with rudimentary oostegites); 2 adult males; 2 preadult specimens.

Galathea Exped., St. 664, Kermadec Trench ($36^{\circ}34'S$, $178^{\circ}57'W$), 4540 m, 24 Feb. 1952. Gear: herring otter trawl. Bottom: brown sandy clay with pumice. Bottom temp.: $1.1^{\circ}C$. – 3 adult females.

Female:

Labium (Fig. 128a). In the two females examined (by WOLFF labelled ♀ G and ♀ H) the lobes have three terminal forked spines, not two simple spines as figured by WOLFF (*op. cit.*, p. 193, fig. 5e).

Maxillula (Fig. 128b-b.1, and c). In the females mentioned the inner endite has not six simple setae as figured by WOLFF (*op. cit.*, p. 193, fig. 5a) but five plumose setae, the middle of which is spiniform. The outer endite bears two outer finely plumose setae at some distance from the end; the distal end of this is in female G surmounted by one dwarfed and ten strong spines, this being the case also with the right endite in female H, while the left endite in the last-mentioned female has one more dwarfed spine (Fig. 128b).

Maxilla (Fig. 128d). Setae of inner row bare. The



Fig. 128. *Leiopus galathea* (Wolff); a, ♀ G; left half of labium, caudal view ($\times 118$), spines ($\times 320$); b-h, ♀ H; b-b.1, distal end of left maxillular endites, caudal view ($\times 205$); c, distal end of right outer maxillular endite, caudal view ($\times 205$); d, distal part of fixed maxillular endite, and two outer spines, caudal view ($\times 320$); e, inner part of second palpar joint of maxilliped, caudal view ($\times 130$), setae ($\times 320$); f, distal part of endite of right maxilliped, caudal view ($\times 270$); f.1, inner caudal spine on endite of left maxilliped ($\times 270$); g, distal part of peraeopod V, rostral view ($\times 320$); h, distal part of one of the long setae on propus of peraeopod V ($\times 1250$); i, ♂; distal half of dactylus, and claw of peraeopod V ($\times 205$).

outer row numbers seven spiniform setae which are ciliated along the distal part; they increase successively in length, counting towards the fixed endite. The latter is armed as in the figure.

Maxilliped (Fig. 128e-f). Inner setae of second palpar joint shaped as in Fig. 128e. The median vertical surface of the endite bears six plumose setae

on the free margin; the distal end is armed as in Fig. 128f.

Peraeopods II-IV. Propus with subterminal rostral spine, shaped as in *L. conspicuus*.

Peraeopod V (Fig. 128g-i). Claw on dactylus with six spiniform sternal processes, not with six spines as figured by WOLFF (*op. cit.*, p. 194, fig. 6d).

V. SUMMARY

1. For the body segments and the legs the terminology of WOLFF (1956b) has been used. The anterior prolongation of the propus of the cheliped has been called "the finger", and "the movable" finger has been replaced by "the dactylus".

For Sars's (1886) "auditory bristles" the neutral term "particular setae" has been used.

In all Apseudidae and in the females of the Neotanaidae the inner part of the distal margin of the maxilla is set with two subterminal rows of setae. In the descriptions these rows have been designated as the caudal and the rostral row, respectively.

The oral parts and the legs have been oriented as proposed by RACOVITZA (1923).

2. Notes on the postmarsupial development and on the sexual dimorphism have been given. The transformation of the mandibles and of the pleotelson in the males of *Leiopus* takes place gradually during the last moultings.

3. In the taxonomic part four new genera and twenty-four new species have been established.

4. In the discussion of the family Apseudidae, the following facts have been pointed out:

Hodometrica Miller does not lack pleopods. The genus has five pairs of very small pleopods.

Apseudomorpha Miller has not one pair of pleopods but five pairs.

Imitapseudes Menzies is synonymous with *Apseudomorpha*.

Apseudes avicularia Barnard belongs to *Apseudomorpha*.

The pleon of *Synapseudes* Miller does not consist of two pleonites but of three, the last one of which is very small.

Sphyrapus stebbingi Richardson cannot be referred to *Sphyrapus*.

5. A partial revision of the genus *Apseudes* Leach has been given.

6. The genus *Leiopus* Beddard has been reinstated, and the following species have been transferred to this genus: *Apseudes galathea* Wolff, *A. gracilis* Norman & Stebbing, *A. gracillimus* Hansen, *A. sibogae* Nierstrasz, *A. weberi* Nierstrasz, and *A. zenkevitchi* Kudinova-Pasternak.

Apseudes gracilis Norman & Stebbing in HANSEN (1913, p. 13) and in WOLFF (1956b, p. 202) has been renamed *Leiopus hanseni* n. nom.

7. In *Neotanais* the palp of the maxilliped is not five-jointed but four-jointed, as in other tanaids. The number and the shape of the forked spines on the fixed maxillar endite and the number of terminal setae or spines on the inner maxillular endite are of no specific value.

8. *Haplocope* G. O. Sars, *Tanaella* Norman & Stebbing, *Leptognathiella* Hansen, and *Strongylur-ella* Hansen have been incorporated with *Leptognathia* G. O. Sars.

9. HANSEN's (1913, p. 121) statement that in *Paranarthrura* Hansen the labrum "is produced in a somewhat long, distally obtuse triangle" holds good for the generotype but not for the other species he establishes. In these species the labrum is broad in front. His statement that the mandibles in this genus lack the processus molaris is incorrect.

10. *Paranarthrura clavipes* Hansen and *Paranarthrura monacanthus* Vanhöffen do not belong to *Paranarthrura*.

Leptognathia caudata Kudinova-Pasternak does not belong to *Leptognathia*.

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PLATE I

a-b. *Apseudes lagenirostris* n.sp., female. a ($\times 8.8$); b, carapace ($\times 31$). c-d. *Apseudes setosus* n.sp., female. c ($\times 7.9$); d, carapace and pereaeonites 2-4 ($\times 22$). e-f. *Apseudes tuberculatus* n.sp., male. e ($\times 10.5$); f, carapace and pereaeonites 2-3 ($\times 25$).