Studies on the New Zealand Amphipodan Fauna
No. 9. The Families Acanthonotozomatidae, Pardaliscidae and Liljeborgiidae *

By D. E. Hurley,
Portobello Marine Biological Station, Port Chalmers.

[Read by title and abstract before Otago Branch on April 13, 1954; received by the Editor, April 26, 1954.]

Summary

Two species of Acanthonotozomatidae, Iphonmedia kaurai n.sp. and Maotiphimedia kinema n.g., n.sp. are described from Hauraki Gulf, a third, Panoploco spinosus G. M. Thomson, is re-described from Otago Harbour. One species of Pardaliscidae, Synoploides macronyx Stebbing, is listed. The Family Liljeborgiidae is represented by Liljeborgia aequabula Stebbing; L. dubia (Haswell); L. hansom n.sp. from Otago; L. barhami n.sp. from Torrent Bay, Nelson; L. akarua n.sp. from Akaroa and L. akaroica var. maria n.var. from Cape Maria van Diemen. Keys to genera and species are given.

Introduction and Acknowledgments

The material described represents in part new material collected in or immediately outside the Otago Harbour and new material from the Chilton Collection encountered whilst working up the local species. This material proved also to contain specimens of Acanthonotozomatidae for which I find it necessary to construct a new genus. I have taken this opportunity to list the species of Pardaliscidae recorded by the Terra Nova Expedition from New Zealand.

I wish to thank Messrs. H. V. and J. A. Hanson of the fishing vessel "Grace" from Portobello for their kindness in collecting material for me, and Dr. E. J. Batham of Portobello Marine Biological Station for assistance with this work. I am extremely grateful to Professor E. Percival and the Canterbury University College Council and Library for allowing me the use of the Chilton Collection of material and literature.

Family Acanthonotozomatidae

Barnard, 1930: 345 (references).
Barnard, 1932: 115–117.

"Integument more or less indurated, proessiferous. Head rostrate. Sideplates well developed, 1st-4th usually acuminate. Eyes well developed. Antennae 1 and 2 seldom elongate or very different in length, accessory flagellum absent or rudimentary. Mouthparts projecting downward, and drawn out as if for piercing rather than biting. Gnathopod 1 very slender and feeble, simple or chelate; gnathopod 2 seldom strong, Peraeopods 3–5, 2nd joint expanded, usually acute at one or more points of hind margin. Uropod 3, rami lanceolate. Telson unarmmed, apically emarginate"—Stebbing.

* This study is part of a programme being carried out at Portobello Marine Biological Station, University of Otago, under a Nuffield Grant

Transactions of the Royal Society of New Zealand 763
A considerable number of new genera have been added to this family since Stebbing's definition of 1906, and a further one is added in this paper. By far the greater number are southern in distribution.

**KEY TO GENERA OF ACANTHONOTOZOMATIDAE**

| 1. Maxilla 1 palp of 1 segment | 2. Gnathopod 2 slender and chelate | 3. Maxilla 1 palp falling greatly short of outer plate apex | 4. Gnathopods 1 and 2 simple | 5. Gnathopod 2 subchelate; maxilliped, 2nd segment of palp not produced along inside 3rd; lower lip incised | 6. Mandible tapering to smooth symmetrical spoon-shaped apex | 7. Upper lip rounded, not incised; lower lip incised | 8. Gnathopod 1 simple | 9. Telson entire, rounded; upper lip incised; gnathopods both well developed; body very strongly processiferous | 10. Gnathopod 1 feeble, very slender; gnathopod 2 shorter and stouter | 11. Body not strongly processiferous, lateral processes negligible; upper lip asymmetrically lobed; maxilliped palp shorter than outer plate; mandible pointed | 12. Mandible cutting edge drawn out in long needle-like apex; maxilliped palp has small 4th segment; upper and lower lips not incised | 13. Maxilla 1 palp enormously expanded into ovate lamina; upper lip asymmetrically incised; lower lip not incised; mandible short and broad but thin |
|-----------------------------|----------------------------------|---------------------|-----------------|----------------------|-----------------------|-----------------|-----------------|-------------------|------------------|---------------------|-------------------|-----------------------|----------------------|
| Maxilla 1 palp of 2 segments | Gnathopod 2 subchelate and robust | Maxilla 1 palp reaching apex of outer plate | Gnathopod 1 minutely chelate, gnathopod 2 not simple | Gnathopod 2 subchelate; maxilliped, 2nd segment of palp produced along inside 3rd; lower lip not incised | Mandible not as above | Upper lip squarish, incised, lower lip incised | Gnathopod 1 chelate | Telson distally notched or emarginate | Gnathopod 1 and 2 alike, well developed | Body very strongly processiferous, strongly developed lateral processes; maxilliped palp longer than outer plate; mandible distally broad | Mandible not as above | Mandible not as above | Maxilliped palp has small 4th segment; upper and lower lips not incised | Not as above |
| Paraphimedia Chevreux, 1906 | Ostlus Lilljeborg, 1885 | Panoploepsis Kunkel, 1910 | Anchiphimedia Barnard, 1930 | Labaphimedia Barnard, 1932 | Morphimedia n.g | Acanthonotozomoides Schellenberg, 1931 | Acanthonotozoma Boeck, 1876 | Iphimediopsis* Schellenberg, 1931 | Acanthonotozomella Schellenberg, 1926 | Parapanoploca Nicholls, 1938 | Maxillaphimedia Barnard, 1930 | * Nicholls (1938) has pointed out that this name is preoccupied and will have to be replaced.
14. Upper and lower lips not incised; maxilliped palp 1st and 2nd segments not broadened, 2nd segment not produced along inside 3rd; mandible cutting edge not broad, not strongly toothed... \[Iphimediella\] Chevreux, 1913
Not as above

15. Upper lip emarginate; lower lip incised; maxilliped palp not particularly broadened, 2nd segment produced along inside 3rd though somewhat obtusely
Not as above... \[Iphimeda\] Rathke, 1843

16. Upper lip strongly incised; maxilliped palp 1st and 2nd segments broadened
Upper lip entire; maxilliped palp 1st and 2nd segments not broadened
\[Pseudiphimediella\] Schellenberg, 1931

17. Mandibles short and stout with apices transformed in adult into broad oval grinding surfaces; epistome wide and very short
Not as above... \[Gnathiphimeda\] Barnard, 1930

18. Cutting edge of mandible entire
Cutting edge of mandible toothed... \[Echiniphimeda\] Barnard, 1930
\[Paraphimediella\] Schellenberg, 1931

Although only three species are here recorded from New Zealand, it is extremely probable, if the Discovery and Terra Nova Reports are any indication, that any sustained dredging programme in New Zealand waters will add a considerable number of species.

**Genus Panoploea** G. M. Thomson

1881: 212.
Stebbing, 1906: 211-212

"Back broadly rounded, some segments produced into teeth. Rostrum acute. Sideplates 1-3 more or less acutely tapering, 4th with projecting point of hind margin. Upper lip somewhat narrowed distally. Lower lip without inner lobes, outer incised on inner margin near apex. Mandible narrowly tapering to cutting edge, accessory plate narrow, no spine row, molar exceedingly feeble, 3rd joint of palp not very long. Maxilla 1, inner plate with several setae, outer with 10 (?) spines, palp 2-jointed, not reaching extremity of outer plate. Maxilla 2, outer plate the longer, rather the narrower, obliquely truncate, inner still more so and fringed for half its length. Maxillipeds, inner and outer plates long and narrow, outer fringed on distal part of outer margin, 1st joint of palp not as long as 2nd and 3rd combined, 2nd much produced along inner margin of 3rd, finger wanting. Gnathopods 1 and 2 very slender, gnathopod 1 with very small chela, gnathopod 2 more or less chelate. Peraeopods 3-5, 2nd joint well expanded. Uropod 3, rami narrowly lanceolate. Telson broadly incised at apex."—Stebbing.

The only species so far known from New Zealand is the genotype, *Panoploea spinosa* G. M. Thomson, which has not been completely described although Stephensen’s figures (1927) go a long way towards this aim.

**Key to Species of Panoploea**

1. Pr. 4 & 5, basos lower hind corner rounded; Pr. 3-5, posterior margin of basos finely but strongly serrated like circular saw-blade
Pr. 5, basos lower hind corner acutely toothed; posterior margin not serrated as above... \[P spinosa\] G. M. Thomson, 1880.
2. Pr. 3 sideplate produced posteriorly in long sharp tooth; basos produced in 2 strong teeth; 3 pairs of dorsal processes to pereon and pleon, the third pleon segment having single median tooth only . . . . . . 
These characteristics not combined .

3. Pr. 3 & 4, basos alike, bidentate; carina on pleon segment 3 ending anterior to hind margin of segment which sweeps in regular curve between the two laterodorsal spines Pr. 4 & 5, basos alike, unidontate; small obtuse tooth on pleon segment 3 either side between carina and laterodorsal spines .

4. Sideplate 4 has acute postero-distal angle; body has 3 pairs of dorsal processes; epimeral plate 3 has 2 teeth, the superior one upturned; Pr. 5 basos has 3 teeth .
These characteristics not combined .

5. Pr. 5 basos with 3 distinct teeth; pleon segment 3 with dorsal teeth strongly hooked.
These characteristics not combined .

6. Pr. 5 basos strongly excised distally; epimeral plate 3 with produced serrate postero-distal angle, superior 2nd tooth lacking .
Pr. 5 basos not strongly excised distally; epimeral plate 3 with 2 sharp teeth posteriorly .

7. Epimeral plate 3, superior tooth strongly upturned and inferiorly serrate; epimeral plates 1 and 2 also have medial tooth posteriorly; sideplates of Pr. 3–5 produced postero-distally on strong tooth.
Epimeral plate 3 not so noticeably upturned and serrate; epimeral plates 1 and 2 with medial tooth; sideplates of Pr. 3–5 not produced posteriorly into strong tooth .

P. joubini var. bidentata Nicholls, 1938
P. joubini var. joubini Chevreux, 1913
P. macrocystidus Barnard, 1932
P. eblanee (Bate), 1857
P. excisa Barnard, 1932
P. nickettsi Shoemaker, 1931
P. minuta (Sars) 1882

If Chevreux’s statements about the pereopods of his P. joubini are accurate, and I see no reason to doubt them, then it would seem reasonable to grant Nicholls’ var. bidentata specific rank. The other differences which Nicholls mentions support this view, particularly those in the pleon segments.

Panoploea spinosa G. M. Thomson (Figs. 1–35).
Panoploea spinosa G. M. Thomson, 1880: 3, pl. 1, fig. 2, 2a-c
Stebbing, 1906: 212.
Stephenson, 1927: 313–314, fig. 9.

Colour greyish-brown to blackish because of many small black stellate chromatophores; eyes reniform, not coalesceent, ruby-red; antennae and legs from ischiun segment distally a whitish-yellow.

Rostrum as long as 1st peduncle segment of antenna 1; pereopod 5 slightly the longest; dorsum has a pair of spine prolongations on pereon segment 7, also on pleon segments 1 to 3, those on pleon segment 3 comparatively short. Eyecubes have two small acute teeth. Length 5 mm.

Antennae. First: Peduncle short, 1st segment width ⅓ length, a few fine bristle-setae distally; 2nd little more than ½ length 1st but superodistally produced in sharp slender tooth ⅓ along 3rd, which is ⅓ length 1st, like flagellar seg-
TEXT-FIG 1.—Panoploca spinosa G. M. Thomson. Male. 1—Adult. 2—Rostum and eyelohe. 3—Dorsal view of pereon segment 7, pleon segments 1–3 and urosome. 4—Gnathopod 1; inset shows lip-scale flecking. 5—Gnathopod 1 propod and dactylos. 6—Gnathopod 2. 7—Gnathopod 2, propod and dactylos. 8—Peraeopod 1. 9—Peraeopod 2 sideplate and gill. 10—Dorsal spines of pereon segment 7. 11—Dorsal spines of pleon segment 3. 12—Conical spine-teeth from margins of pleon dorsal spines. 13—Uropod 3.
ments in appearance except for lack of flaccid sensory setae; 2nd has sharply produced inferodistal angle also, 4 spines above it on end margin, 1 spine and setae near superodistal angle, 2 spines and setae 1/2 along superior margin. Flagellum of 18–22 segments, the last somewhat truncate, each with 2 slender setae and 4 long flaccid sensory setae superodistally. Second: Peduncle shorter than flagellum, 2nd segment subtriangular, with superodistal angle produced in sharp tooth 1/2 along 3rd; 3rd as long, inferodistal angle a short produced sharp tooth; 2 or 3 spines on superodistal; 4th as wide, slightly more than twice as long, superodistal angle produced 1/2 along 5th in sharp tooth, inferodistal less sharply produced, 4 pairs of spines and a few bristle setae on superior margin, 4 spines on end margin medially and inferiorly; 5th narrowed, almost as long, 2 pairs of spines superiorly, 1 on superodistal angle simulating tooth, 4 on end margin. Flagellum of 30–44 segments, 1st twice as long as others, small tuft of bristle-setae on superodistal angle of each.

MOUTHPARTS. Upper Lip: Longer than wide, ovate, distally notched. Lower Lip: Outer lobes have quite acutely pointed apex; inner margin deeply notched and finely bristled. First Maxillae: Inner plate short (not figured) with 7 or 8 plumose setae distally on inner margin; outer has 10 finely-toothed spines on end; palp 2nd segment slightly the longer, has 8–10 spine-setae terminally Mandibles: Molar process a small basal projection with toothed margin; mandible long and slender, cutting plate of left has about 5 coarse teeth, accessory plate a long blunt finger; right lacks accessory, has only small tooth on inner margin; palp of 3 more or less subequal segments, 2 or 3 setae on end of 2nd, 3rd bluntly tapering with convex outer margin, straight inner with 10–12 toothed spines on distal 1/2, very finely bristled surface. Maxillipeds: Basos and ischium have pair of setae on outer distal angle, 4 longer setae on basos inner plate insertion. Inner plate reaching not much more than 1/2 along outer, slightly jagged end margin has 10 or so plumose setae, left margin finely setose; outer plate lanceolate, rounded end and distal portions of lateral margins strongly fringed with short plumose setae. Merus quite wide, width nearly 1/4 length, 5 or so fine setae on inner margin, 3 or 4 long fine setae on outer distal angle. Carpus as long when including blunt inner distal angle process which extends 1/4 along propod; setae on outer distal angle and thickly on end of process; propod 3/4 merus length, narrower than carpus and blunt ended, strongly setose on end and less so down inner margin, suggestion of fine comb of teeth on inner margin distally.

GNATHOPADS. First: Sideplate ovate-triangular, with anterior margin rounding broadly to ventral, posterior straight, posterodistal angle slightly rounded with small setal notch, the anterior surface finely flecked with lip-like scales; width 1/2 length. Basos slightly longer, curved, width less than 1/2 length, naked like all other segments except propod. Isthum 3/4 basos, width not 1/2 length, merus as long, subtriangular and produced in sharp process about 1/2 along carpus; carpus narrower, arising from narrow stem early on merus, not quite 1/2 basos length; propod very slender, not quite as long as carpus, produced inferodistally in narrow process with 4 thick plumose setae basally, 1 on end, 2 or 3 very poorly defined teeth on inner margin forming palm for dactylos, which is barely longer, has similar defined teeth, 2 thick plumose setae, a distinct cap overlying dactylos tip. Second: Ovate-arcuate, anterior margin convex and surface with lip-scales; ventrally rounded with single setal notch; posteriorly concave, width 1/2 length. Basos as long, width 1/2 length, a few bristle-setae on anterior margin. Isthum
as wide, $\frac{1}{2}$ as long; merus ovately-triangular, $\frac{1}{2}$ basos length, as wide, single bristle-seta posteriorly; carpus $\frac{2}{3}$ basos length, subtriangular, 2 setae on posterodistal angle, greatest width $\frac{3}{4}$ length; propod as long as ischiun, widening a little distally, convex anterior margin has 5 or 6 setae at dactylos base; distal $\frac{1}{2}$ of concave posterior has 7 or 8 sets of 1–3 setae, more down distal $\frac{1}{4}$ of inner margin of blunt process which forms oblique palm for dactylos, has small single spines at apex; dactylos short, slightly curved, naked except for seta on outer margin near base, 1 or 2 near tip; blunt propod process has finely striated surface.

**Peraeopods. First:** Width nearly $\frac{1}{4}$ length, lip-scales across anteroventral portion; otherwise as in Gn. 2. Basos width $\frac{1}{2}$ length, not quite sideplate length, single spine on each distal angle; ischiun slightly narrower, $\frac{3}{4}$ basos length, naked. Merus piriform, $\frac{1}{2}$ basos length, width $\frac{3}{4}$ length, 3 single spines on anterior margin, 2 single and pair on distal angle posteriorly. Carpus $\frac{3}{4}$ basos length, widening distally to $\frac{3}{4}$ length, 2 or 3 spines on anterodistal angle, group of 3 spines $\frac{1}{4}$ along posterior margin, 5 on angle; propod margins parallel, anterior with 2 pairs of spines plus bristle-setae, latter also on distal angle; posterior with 5 groups of 3–5 spines, width $\frac{3}{4}$ length, length $\frac{3}{4}$ basos; dactylos stout, curved, $\frac{3}{4}$ propod length, 2 or 3 minute setae on margins. **Second:** Sideplate width about $\frac{3}{4}$ length, lateral margins approaching to parallel although anterior broadly rounding ventrally; posterior shallowly excavate for proximal $\frac{1}{3}$. Otherwise like Pr. 1. Gill simple, pendulous, basos length. **Third:** Sideplate posterior lobe larger and deeper than anterior, 4 or 5 minute setae on posterior margin, also set with triangular scale-teeth. Basos ovate, as wide as long and slightly longer than sideplate posterior lobe; anterior margin straight except for convex distal portion which has 5 strong short spines; posteriorly basos expanded to a wide slightly convex flange with posterior margin deeply serrate by about 17 deep sharp teeth, a seta between each. Otherwise like Pr. 4. **Fourth:** Sideplate trapezoid, wider than deep, depth about $\frac{3}{4}$ basos; anterodistal angle rounded, posterodistal a sharp point with secondary serration below; posterior surface and margin triangularly scaled. Basos as before, anterior margin more convex, with as many as 9 or so spines commencing midway. Ischiun nearly $\frac{3}{4}$ basos length, subsquare, 3 or 4 spines anteriorly; merus piriform, anterior length $\frac{3}{4}$ basos, width $\frac{3}{4}$ length, straight margin has 5 sets of 1–3 spines, distal angle a short sharp tooth; posterior convex and proximally constricted with 4 or 5 single spines, 4 more on angle which is produced sharply nearly $\frac{1}{2}$ down carpus; carpus as long, width $\frac{3}{4}$ length, slightly convex posterior margin has distal groups of 2–5 spines; anterior has 3 groups of 3–7. Propod as long as basos, linear, width $\frac{3}{4}$ length, 4 groups of 2 or 3 small spines posteriorly, 5 of 4 or 5 spines anteriorly, dactylos $\frac{1}{2}$ as long. **Fifth:** Sideplate ovately rectangular, posterodistally rounded with triangular scale-teeth, 3 or 4 small serrations and minute setae. Basos slightly longer than wide, anterior margin strongly convex with 8–10 spines; posteriorly expanded to great convex flange reaching $\frac{3}{4}$ down merus, 4 or so small serrations on proximal $\frac{1}{3}$, about 20 deep serrations distally.

**Pleon.** In flattened dorsal view the pleon spines show a few minute setae marginally, also fine conical spine-teeth and triangular scale-teeth.

**Epimeral Plates. First:** Ovate with 2–5 spines on anterior margin, slight tooth marking posterodistal angle. **Second:** Anterodistal angle rounded, 3 spines ventrally, posterodistal angle a small posteriorly directed tooth; posterior margin sigmoid. **Third:** Wider than deep, subrectangular, anterodistal angle rounded, 3
spines ventrally, postero-distal angle a sharp tooth; a second slightly upturned sharp tooth on posterior margin medially, the margin between these teeth oblique with 6 or 7 distinct serrations, each with a seta; margin above superior tooth shallowly and obliquely excavate.

Uroponds. First: Rami subequal, shorter than peduncle, 4–5 spines on inner dorsal margin of peduncle, 6–8 on outer, margins minutely toothed; inner ramus has 6 and 3 spines, notch either side of ramus near tip; outer has 4 spines dorsally and single notch; margins of both finely pectinate. Second: Outer ramus slightly shorter, inner slightly longer than peduncle, which has 1 spine on inner distal angle, 2–4 on outer margin and angle, is a little scaled and pectinate; inner ramus has 3 and 5 marginal spines, 2 notches near tip, outer similar but with 3 spines, 1 notch; both have pectinate margins. Third: Rami longer than peduncle, outer the shorter, canoe-shaped with 7 and 6 spines, margins of both pectinate; peduncle distal angles sharply produced. Telson: Margins slightly convex, apically pointed each side of shallow notch, a small secondary serration with seta outside each apex.

Hypotypes Slides P.106, male; additional details slides P.107, and P.110, females.


Distribution. Auckland Islands (Stephensen, 1927); New Zealand.

Discussion

This is the first full description of a very distinctive species. It may be identified especially by the marked serration of the posterior margin of the basos in the 3rd to 5th pereaeopods as well as by the general body shape and spination and colouring.

The tube of specimens noted above as containing P. spinosa from “off Kawau Island, Hauraki Gulf” also held two specimens each of Maoriphimedia kimemoa and Iphimedia haurakiensis; that labelled simply “New Zealand” contained 2 specimens of I. haurakiensis as well as 8 of P. spinosa. Whilst there is a general superficial resemblance between the three species, it does not stand up to any reasonably attentive examination.

Genus Maoriphimedia n.g.

“Upper lip squarish, distally incised. Lower lip without inner lobes, outer lobes apically incised. Mandible stout, apex a bluntly rounded shallow spoon-like process, marked off from rest of mandible by distinct suture; without spine row; secondary plate when present a slender blunt finger. Maxilla 1 palp of 2 segments, extending beyond apex of outer plate Maxilliped palp 2nd segment not apically produced.”

This genus is very close to Labriphi media Barnard (1930) in the shape of the mandibles, although even here it shows some differences. It is clearly defined from Labriphi media and, as far as I know, from all other genera of Acantho- tozomatidae by the distinctive squarish upper lip.
The species described below, *Maoriphimedia hinemoa*, is designated genotype.

*Maoriphimedia hinemoa* n.sp. (Figs. 36–68)

Colour in spirit white. Eyes small, ovate. Eyelobe has strong distal tooth, smaller tooth above on anterior margin. Antennae and peraeopods incomplete. Body segments 5, 6 and 7 each have posterodistal angle produced in acute tooth. Segment 7 and pleon segments 1–3 have paired dorsal tooth-flanges, epimeral plates each have mediolateral tooth as well as posterodistal tooth in 2nd and 3rd; sideplates of peraeopod 3–5 have posterodistal angle produced in acute tooth, especially in peraeopod 3; a median raised tooth also on the surface of peraeopod 4 sideplate, a less strongly raised tooth on peraeopod 3 sideplate. Rostrum well developed. Length 8 mm.

**Antennae.** First: Peduncle 1st segment stout, width about ⅝ length of superior margin, ⅜ total length, the superodistal angle produced in short acute tooth, the outer lateral margin in very strong tooth more than ⅜ along 2nd segment; 2nd produced in hooded spur ⅜ along 3rd, width ⅜ total length, total length not quite ⅘ that of 1st; 3rd ⅗ total length 2nd, width ⅕ length, angles not produced, a few bristle-setae on segments. Flagellum 1st segment twice length 2nd, noticeably longer than 3rd; flagellar segments with 1 or 2 spines, 2 flaccid sensory setae on inferodistal angles. Second: Peduncle 1st segment as wide as long, as long as 2nd excluding superodistal angle which is produced in strong spur ¼ along 2nd; 2nd, width about ⅜ length, 1 or 2 bristle-setae distally; 3rd not quite twice length 2nd, width ⅕ length, distal angles a little produced, very minute pectinations and a few bristle-setae on margins.

**Mouthparts.** Upper Lip: Subrectangular, wider than long, small distinct notch on distal margin. Lower Lip: Outer lobes bristled outside apical incision. First Maxillae: Inner plate short, 8 plumose setae on inner distal margin; outer plate has 11 toothed spines distally, some of these saw-toothed on both margins, bristled about spine-bases. Palp 1st segment about ⅘ length 2nd, spine on inner distal angle; 2nd has 6 finely toothed spines on end margin, a few fine spine-setae. Mandibles: Inner margin strongly and smoothly convex medially above palp base; above this convexity a distinct transverse suture, then distally narrowing to blunt spoon-shaped apex, blunt medially crooked finger-like accessory plate in left arising from suture level and not quite reaching apex. Palp of 3 segments. 1st ⅘ length 2nd; 2nd linear, width ⅕ length, has 2 or 3 setae on inner distal angle; 3rd has convex outer margin, inner straight, inner surface strongly bristled, 1 strong toothed spine, 2 or 3 equally long plumose setae on blunt end. smaller plumose setae and spine-setae down inner margin. Maxilliped: Inner plate reaching about ⅔ along outer; subrectangular, about 8 long plumose setae down cleft margin which is also bristled; 2 stout serrated spines outside sharp inner distal angle, about 8 plumose setae across rest of end margin and a little down outer distally. Outer plate broadly lanceolate, distal ⅘ of inner and outer margins straight and meeting in quite sharp point, strongly fringed with plumose setae. Merus width ⅔ length, strong setae on outer distal angle, 9 or 10 shorter setae along inner margin. Carpus distally as wide, ⅘ as long, straight outer margin has tuft of long setae on distal angle, inner slightly widened and convex distally, the convex ⅘ fringed with long setae; propod as long, ⅘ as wide, 2 setae on outer margin, distal ⅔ of inner which rounds to blunt apex strongly setose; dactylos absent.
Text-fig. 4.—Maoriphimedia hinemoa n. sp. Female. 43—Maxilliped, right half. 44—Maxilliped, right inner plate. 45—Maxilla 1 outer plate and spines. 46—Upper lip. 47—Pereopod 1. 48—Pereopod 2 sideplate. 49—Pereopod 3 sideplate and basos. 50—Pereopod 4 sideplate, basos and posterodistal angle of pereon segment 6. 51—Pereopod 5 sideplate and basos. 52-55—Dorsal spines of pereon segment 7, pleon segments 1-3. 56—Epimeral plates.
Text-fig. 5.—Maozphimedia hinemoa n.sp. Female. 57—Antenna 1 peduncle. 58—Antenna 2 peduncle. 59—Lower lip. 60—Left mandible. 61—Left mandible, end of palp. 62—Right mandible. 63—Maxilla 1 outer plate and palp. 64—Maxilla 1 inner plate. 65—Uropod 1. 66—Uropod 2. 67-68—Tips of uropod 2 ram. Iphimedia hawakensis n.sp. Female. 69—Pereopod 1. 70—Pereopod 3 sideplate and basos. 71—Pereopod 5 sideplate and basos.
GNATHOPODS. First: Sideplate ovate-rectangular, width \( \frac{1}{2} \) length, setal notch posteriorly on rounded ventral margin. Basos slightly longer, arcuate, width about \( \frac{1}{4} \) length, numerous long fine plumose setae on proximal \( \frac{3}{4} \) of anterior margin, otherwise naked. Ischium as wide, \( \frac{3}{4} \) as long, naked like merus and carpus. Merus subtriangular, \( \frac{3}{4} \) basos length, as wide, reaching \( \frac{3}{4} \) down carpus which is 6/11ths basos length, arises from narrow stem early on merus. Propod as wide, as long as ischium, the posterodistal angle produced in sharp slender palm so gnathopod chelate, process and dactylos alike with 2 strong plumose setae on each, inner margin slightly toothed distally, differing only in very slender cap on dactylos, and 3 setae at process base. Second: Sideplate ovate-arcuate, width \( \frac{1}{2} \) length, 3 or 4 minute setae and serrations on distal portion of lower anterior margin, 2 setal notches on rounded apex. Basos as long, width about \( \frac{3}{4} \) length, setae on margins; ischium \( \frac{3}{4} \) as long, 2 or 3 bristle-setae on each margin; merus ovately triangular, as wide as ischium, posterior margin \( \frac{3}{4} \) its length, anterior \( \frac{4}{5} \) length posterior, bristle-setae on anterodistal angle and posterior margin. Carpus and propod subequal, almost ischium length, bristle-setae anterodistally on carpus; propod has 3 long setae on anterior surface, 2 about outer margin of dactylos which has bristle-setae on surface near tip, inner tip has 4–5 small teeth, slender cap; propod posterior margin has about 8 sets of 1–3 or so split-tipped long setae on distal \( \frac{1}{2} \), the last groups on produced posterodistal angle of chelate gnathopod, the narrow blunt process has short stout spine at tip, slender spine-setae on inner margin.

PERAEPODS. First: Sideplate like Gn. 2, but width \( \frac{1}{2} \) length, 1 setal notch. Basos width \( \frac{1}{2} \) length, length \( \frac{1}{2} \) sideplate, 2 or 3 spines on margins distally, setae on posterior margin proximally. Ischium \( \frac{3}{4} \) basos length, 2 spines on posterior margin, width \( \frac{3}{4} \) length. Merus piriform, distal width \( \frac{3}{4} \) length, 3 sets of 2–4 spines on each margin. Rest missing. Second: Sideplate anterior margin strongly convex, 4 or 5 minute setae and serrations distally, also on posterior margin; posterior produced in quite strong tooth about \( \frac{1}{2} \), shallowly excavate above, concave below. Third: Sideplate anterior lobe rounded, posterior basically subrectangular but produced posterodistally to long acute process. Basos subrectangular, slightly longer than wide, 5 or so stout spines on anterodistal angle which is produced a little down ischium: posteriorly expanded in squarish flange, posterior margin concave, has a few minute setae; ischium subsquare, about \( \frac{3}{4} \) basos length, about 5 spines on anterior margin, merus piriform, \( \frac{3}{4} \) basos length, distally as wide as long, straight anterior margin has 4 sets of 1–4 spines, is in parts minutely toothed; convex posterior has 4 sets of 1–3 spines, is also minutely pectinate, posterodistal angle produced strongly downwards. Other segments missing. Fourth: Peraeon segment acutely produced posterodistally; sideplate more or less subsquare, posterior margin somewhat sigmoid, posterodistal angle a sharp tooth, smaller raised tooth on posterodistal surface. Basos about as long as wide, straight anterior margin has 14 or so spines, long plumose setae distally; posterior margin has appearance of being convex with shallow concavity punched out of posterior margin, the posterodistal angle a little produced, minute setae along margins, long setae on surface mediiodistally. Fifth: Sideplate subrectangular, wider than deep, posterodistal angle produced in sharp tooth. Basos twice as long as sideplate, barely wider than long; about 12 strong single spines on slightly convex anterior margin, posteriorly expanded in ovate flange, a sharp tooth posterodistally, margin has minute setae and serrations.
PLEON. Spine flanges well developed on peraeon segment 7, pleon segments 1 and 2, their margins minutely spined and very minutely toothed; pleon segment 3 less strongly developed.

EPIMERAL PLATES. First: Ovate, ventrally rounded with 3 spines anterodistally, a single acute tooth midposteriorly. Second: Subrectangular, anterior angle rounded, 3 or 4 spines on ventral margin, posterodistal angle acute, second acute tooth midposteriorly. Third: Subrectangular, wider than deep, anterodistal angle rounded, 4–5 spines ventrally; posterodistal angle an acute tooth, strong 2nd tooth about 3 down posterior margin, strong concavity between teeth, excavate above superior tooth; margin has minute setae, is minutely pectinate.

UROPODS. First: Rami as long as peduncle, 6 or 7 long spines on each dorsal margin, stronger spine on each angle; 5 spines on outer ramus, 4 on each margin of inner; both probably notched near tip (this uropod damaged), margins minutely pectinate. Second: Inner ramus longer and outer shorter than peduncle, probably 1 notch on inner ramus which has 4 spines on each margin; 4 spines on outer ramus which has single notch near tip. Peduncle has 4 spines each dorsal margin. Third: Ramus much longer than peduncle, more or less lanceolate, 6 and 7 spines on ramus margins; posterodistal angles of peduncle a little produced. Telson: Longer than wide, quite deeply notched medially, each distal angle a small acute tooth, seta inside angle.

TYPE. Slides C. 112. 9. 1 Paratype in Chilton Collection.

LOCALITY. "Off Kawau Island, Hauraki Gulf, "Hinemoa", 19. XII. 14".

DISCUSSION

This species is distinguished especially by those characteristics which set off the genus from the other members of the family.

Genus Iphimedia Rathke
Stebbing, 1906: 214.
1910: 584.
Barnard, 1930: 346.
1932: 116.

"Body broadly rounded, some segments produced into teeth. Rostrum acute. Sideplates 1–3, at apex simply acute or bidentate, 4th with projecting tooth between 2 emarginations. Eyes well developed. Antennae 1 and 2 not greatly differing in length. Upper lip little or not emarginate. Lower lip having outer lobes incised on inner margin, forming an inner process, which may or may not represent the inner lobe. Mandible rather broadly tapering to blunt obscurely dentate cutting apex, accessory plate rather long, spine-row wanting, molar feeble (or sometimes wanting ?), palp rather strong. Maxilla 1, inner plate with several setae, outer with (always ?) 11 spines, palp 2-jointed, reaching beyond apex of outer plate. Maxilla 2 and maxillipeds as in Panoploea. Gnathopods 1 and 2 very slender, delicately chelate, 3rd joint not very short, 2nd joint in gnathopod 1 sinuous. Peraeopods 3–5, 2nd joint well expanded. Uropod 3, rami narrowly lanceolate. Telson broadly incised at apex." —Stebbing.

It would seem that the erection of new genera since Stebbing's diagnosis has removed from this genus all of the species which he placed in it except the genotype, Iphimedia obesa. However, several other species have since been added. One or two, admittedly, do not agree with the generic diagnosis in all points,
but the solution to this may be a slight emendation of the diagnosis rather than a different interpretation of their generic affinities.

**Key to Species of Iphimedia**

1. Telson entire; scale-like, rounded ... ... I. ambigua Haswell, 1880
   Telson emarginate, or distally incised

2. Peraeon segment 7 and pleon segments 1–3 each with pair of dorsal teeth and a medio-dorsal keel; epimeral segments 1 and 2 with median tooth on posterior margin ... I. gladiolus Barnard, 1937
   Peraeon segment 7 and pleon segments 1–3 lack medio-dorsal keel

3. Gnathopod 2 propod widening slightly to rounded palm; lateral tooth of epimeral plate 3 well above postero-distal angle; telson apex incised, small denticle on outer margin near apex; uropods 1 and 2 unarmed
   Not as above ... ... ... ... ... I. capicola Barnard, 1932

4. Pleon segment 3 lateral tooth near postero-distal tooth; gnathopod 1, 3rd and 5th segments as long as 6th, sideplates of Pt. 3–5 lack tooth-like postero-distal angle
   Not as above ... ... ... ... ... I. discreta Stebbing, 1910

5. No pronounced teeth on pleon segment 3; epimeral plate 3 lateral tooth well above postero-distal tooth, margin between serrate; gnathopod 1, 3rd and 5th segments subequal
   Very pronounced pair of teeth on pleon segment 3; epimeral plate 3 lateral tooth near postero-distal tooth; gnathopod 1, 3rd segment much shorter than 6th
   Not as above ... ... ... ... ... I. haurakensis n.sp.

Iphimedia haurakensis, n.sp. (Figs. 69–104)

Length about 7½ mm. ovigerous female with 26 ova. Colour in spirit white, eyes yellowish-brown, suggestion of green (perhaps originally black) about body segments. Peraeon segment 7 and pleon segments 1 and 2 have strong paired dorsal flange-spines, a small hump preceding spines on pleon segments 1 and 2, also in middle of pleon segment 3, which has slight suggestion of rounded keel, splits dorsally either side of 1st urosole segment. Rostrum not quite reaching end of 1st segment of antenna 1 peduncle; eye-lobes have 2 separated teeth, the lower acutely produced (the 1st not shown in Fig. 73). Mouthparts well produced downwards.

**Antennae. First**: Peduncle. 1st segment width ⅔ length, a few fine bristle-setae about distal angles, 4 strong spines ⅓ along superior margin; 2nd ⅕ 1st, width about ⅓ length, fine bristle-setae and spine superodistally, 2 spines inferodistally, spine and setae ⅓ along superior margin; 3rd shorter and narrower, 1 or 2 end setae; minute 2-segmented accessory flagellum. Flagellum of more than 17 segments, 1st longer than 3rd peduncle segment, narrower; others ¼ length 1st, each with fine bristle-setae and 2 flaccid sensory setae superodistally. **Second**: Peduncle, 3rd segment as long as 4th, wider. both superodistally produced in short sharp tooth, setae about tooth base, spine also on 4th; about 4 spines mediodistally; 5th as long as 3rd and 4th together; 3 sets of small spines and several bristle-setae superiorly. Flagellum of more than 28 segments, 1st about ⅓ as long as 5th peduncle segment and narrower, twice as long as succeeding segments, which have tuft of bristle-setae each on superodistal angle.
TEXT-FIG. 6.—Iphimeidea haurakiensis n sp. Female 72—Adult. 73—Eyelobe. 74—Gnathopod 1. 75—Gnathopod 1 sideplate, posterodistal setation 76—Gnathopod 1 propod and dactylos 77—Gnathopod 2. 78—Gnathopod 2 propod and dactylos. 79—Peraeopod 2 sideplate. 80—Peraeopod 4 sideplate and basos. 81—Telson.
TEXT-FIG. 7.—Iphimedia haurakensis n.sp. Female. 82—Antenna 1, fragmentary. 83—Accessory flagellum of antenna 1. 84—Antenna 2, fragmentary. 85—Lower lip. 86—Left mandible, palp missing. 87—Right mandible, palp missing. 88—Maxilliped, left half. 89—Maxilliped, left inner plate. 90—Upper lip. 91—Maxilla 1 with broken palp. 92—Maxilla 1 palp 93-96—Dorsal spine of peraeon segment 7, pleon segments 1-3. 97—Conical teeth from dorsal spine margins. 98—Epimeral plates. 99—Epimeral plate 3, posterior margin. 100—Uropod 1. 101—Uropod 2. 102—Uropod 2, tip of inner ramus. 103—Uropod 3 peduncle and one ramus. 104—Uropod 3, other ramus.
MOUTHPARTS. Upper Lip: Longer than wide, distally rounded with slight median notch. Lower Lip: Outer lobes long and apically acute, end and inner margins bristled, inner margins somewhat incised but this masked by fusion with quite large inner lobes. First Maxillae: Inner plate short, 5 plumose setae on inner distal margin; bristled especially on margins below the 11 finely-toothed end spines of outer plate. Palp reaching as far, 1st segment ⅓ length 2nd which is distally spine-setose. Mandibles. Long and slender, no spine row, molar process a small condyle on inner margin near base; left has long slender blunt accessory plate, right has none; palp of 3 slender segments, 2nd twice length 1st with 4 spine-setae distally; 3rd shorter than 2nd, about 10 spine-setae on inner margin, narrowing to blunt tip. Maxilliped: Basos and ischiun have a few fine setae on outer margins. Inner plate little more than ⅓ length outer, subrectangular, width less than ⅔ length, outer margin has fine bristles distally, then 8–10 long plumose setae; tip bluntly rounded with jagged inner edge until straight inner margin is reached; this end portion also has about 8 shorter plumose setae, cleft margin has long fine setae. Outer plate somewhat lanceolate; distal ⅓ of outer margin, rounded end and distal ⅓ of inner all strongly fringed with short finely-plumose setae. Palp as long, merus width not quite ⅓ length, outer distal angle has strong tuft of long setae, inner margin several short single setae; carpus nearly as long, not nearly as wide; naked except for tuft of long setae on outer distal angle and on end margin of inner angle which is produced ⅓ along propod; propod slender, about ⅖ carpus length, end and inner distal margins strongly setose, a few long fine setae on outer margin.

GNATHOPODS. First: Sideplate subrectangular, width ⅔ length, angles rounded, anterior almost absent, posterior with 2 distinct serrations each with seta. Basos as long, width ⅓ length, long and short fine setae on anterior margin; ischiun length ⅓ basos, width nearly ⅔ length, naked. Merus about as long and wide; carpus longer and proximally narrowed, arising proximally from merus; both naked. Propod about ⅔ basos length, width about ⅔ length; naked except for distal chelate portion; posterodistally produced in narrow knife-like process so slightly and coarsely toothed inner margin forms palm; about 5 strong plumose setae on process. Daetnylos short, reaching as far as process, indication of 2 or 3 teeth on inner margin, small cap above tip; 2 very thick long plumose setae on daetnylos. Second: Sideplate ovate-rectangular; width less than ⅓ length, anterodistally arcuate to posterodistal 2 serrations; basos as long, width less than ⅔ length, margins have fine bristle-setae. Ischiun nearly ⅓ basos length, fine bristle-setae on distal ⅓ of anterior margin. Merus somewhat subtriangular, ⅔ basos length, width ⅔ length; fine bristle-setae anterodistally and on posterior margin. Carpus nearly ⅓ basos length, width ⅔ length, a few fine bristle-setae posteriorly. Propod as long, width ⅔ length, widening slightly distally, minutely subchelate—almost chelate—with oblique palm, 3 small teeth on outer tip of posterodistal angle; slender curved daetnylos not over-reaching palm; a few setae on anterior margin and especially distally around daetnylos base, on palm and posterior margin especially, in sets of 2 and 3 along most of posterior margin; surface in parts very finely striated.

PERAEOPDS. First: Sideplate subrectangular, width about ⅔ length, anterodistal angle broadly rounded and exceedingly minutely toothed, anterior margin convex, posterior concave, posterodistal angle has 2 distinct serrations each with seta. Basos slightly shorter, width about ⅔ length, spine or 2 on distal angles,
a few fine marginal setae. Ischium subrectangular, \( \frac{3}{4} \) basos length, more or less naked. Merus piriform, \( \frac{1}{4} \) basos length, anterior margin convex, proximally constricted, pair of spines medially and distally on posterior margin; groups of 2, 1 and 3 spines anteriorly. Other segments missing. Simple pendulous gill about basos size; very large ovate seta-fringed broodplate. Second: Much the same but sideplate widens slightly coneavely posteriorly to about \( \frac{3}{4} \) width, is excave above that; distal portion has a few minute setae. Third: Sideplate anterior lobe rounded, almost as deep as subrectangular posterior lobe, distal margin of which has several minute setae, posterodistal angle 2 small spines. Basos ovate, nearly as long as sideplate posterior lobe, not quite as wide as long, straight anterior margin has about 7 stout spines, a few setae; posterior mostly straight but rounding evenly distally, several minute setae and serrations proximally and distally. Ischium and merus like pereaeopod 1 in reverse, but with 3 and 4 sets of spines anteriorly, 5 sets posteriorly on merus. Fourth: Sideplate trapezoid, wider than deep, posteroproximal angle rounded, posterodistal produced a little to acute point; about 3 stout spines on distal margin proximally, 2 minute setae and serrations near distal angle; posterior margin has triangular scale-teeth as in \textit{Maoriphimedia hinemoa}. Basos ovate, slightly longer than wide and much longer than sideplate; convex anterior margin has a few setae, 7 or so stout spines, single except on angle; convex posterior margin has number of fine setae and serrations in opposing directions either side of small acute projection about \( \frac{3}{4} \) down margin. Merus and ischium as in Pr. 4, other segments missing. Fifth: Sideplate small, subrectangular, wider than deep, posterodistal angle a little produced in acute point. Basos at least twice as deep as sideplate, as wide as deep; about 10 strong spines on convex anterior margin, coneave posterior has numerous small serrations with fine setae, a little produced to small acute posterodistal tooth. Ischium and merus as before, more strongly spined, other segments missing.

Epimeral Plates. First: Ovate, distally rounded; 4 strong spines anterodistally. Second: Subrectangular, deeper than wide, anterodistally more or less rounded with 3 strong spines ventrally; posterodistal angle produced to short acute tooth. Third: Subrectangular, wider than deep, anterodistal angle rounded, straight ventral margin has 3 strong spines anteriorly, posterodistal angle has small sharp produced tooth, a second stronger upturned tooth \( \frac{3}{7} \) along posterior margin, margin above this tooth coneave and also between it and posterodistal angle, the latter portion of margin finely serrate with small setae. The dorsal spine-flanges, illustrated as viewed from above (Figs. 93–96) when flattened, have finely toothed margins. The marginal surfaces and the dorsal surfaces corresponding to the humps between the flanges previously mentioned have minute conical teeth as figured and in places triangular scale-setae.

Uropods. First: Biramous, rami subequal, a little shorter than the peduncle, peduncle outer distal angle sharply produced, inner also acute but not as strong, about 5 strong spines on inner dorsal margin, 8 on outer. Rami slender, distally notched either side of tip of inner ramus, one notch only near tip of outer ramus, 6 spines on inner margin of inner ramus, 3 on outer margin; none on inner margin of outer ramus and 4 on outer. Second: Inner ramus as long as peduncle, outer shorter, tips of both notched as above, inner has 4 spines either margin, outer margin is also minutely toothed, outer ramus has 3 spines on outer margin; peduncle has 1 spine mid-ventrally, 4 dorsally. Third: Damaged. Peduncle \( \frac{3}{4} \)
rami length, produced ventrally in acute tooth, margin minutely toothed dorsally; one ramus canoe-shaped, slender, with 7 and 4 spines on dorsal margins; other lanceolate, broad, with 7 and 10 spines. Telson. Slightly deeper than wide, distal angles are acute with perhaps small serration outside, fine seta inside each tip and each extra serration; end margin concavely notched

**Type.** Slide C. 113, female, Chilton Collection. Hauraki material

**Paratypes.** C. 114, ♀ (Hauraki); C. 115 (New Zealand).

**Localities.** “Off Kawau Island, Hauraki Gulf, ‘ Hinemoa’, 29.XII 14 ″, 2 specimens, one badly damaged; “New Zealand ″, 2 specimens labelled “_Panoploea spinosa_ G.M.T. ″ and in company with _P. spinosa_; the Kawan material in company with both species already described.

**Discussion**

This species is distinguished from others of the genus by the telson, dorsal spination of the pleon, and the shape of the epimeral plates, especially the third. It can be easily distinguished from the other two species described in this paper by the lack of regular saw-tooth serration to the basos of Pr 3–5 as in _P. spinosa_; the general dorsal spination of the pleon; and the lack of mediolateral teeth to the posterior margin of the 1st and 2nd epimeral plates as in _Maritigmidea hinemoa._

**Family PARDALISCIDAE**

Stebbing, 1906: 220.
Schellenberg, 1920: 334

“Body not indurated  Head, rostrum usually small. Sideplates small, 4th like 3rd, 5th with front lobe the deeper. Eyes present or obsolete, never (?) coalescent. Antenna 1 usually with accessory flagellum, which is unlike in male and female. Mouthparts projecting, strongly developed. Mandible without molar. Maxillipeds, inner plates small. Gnathopods 1 and 2 subequal, either small and simple, or powerful and imperfectly subchelate. Peraeopods 1 and 2 unlike peraeopods 3–5, which are rather long, with 2nd joint little expanded. Uropod 3 rather large, rami foliaceous. Telson deeply cleft” —Stebbing

**Genus SYNOPIOIDES** Stebbing

Stebbing, 1906: 226
Schellenberg, 1926: 336.
1926a: 224
Pirlot, 1934: 172.

“Sideplates very shallow. Antenna 1, peduncle short, flagellum long, accessory flagellum rather long. Antenna 2 longer than antenna 1. Mandibles, cutting edge broad, denticulate, accessory plate on both mandibles, spine-row of 2 spines, palp very long, 3rd joint linear, much shorter than 2nd. Maxilla 1, outer plate with 8 long spines, palp with 7 spine-teeth on distally widened 2nd joint Maxilla 2, inner plate fringed on inner margin, rather shorter than outer. Maxillipeds, inner plates small, conical, setiferous, outer small on a large base, with few fringing spines, palp long. Gnathopods 1 and 2 simple, 5th and 6th joints long, narrow. Peraeopods 1 and 2 as in _Pardalisca_, but rather more slender Peraeopods 3–5 elongate, finger stiliform  Uropod 1, rami equal; uropod 2, outer ramus much the shorter; uropod 3, rami subequal, foliaceous. Telson deeply cleft.”

—Stebbing.
One genus and species has been recorded from New Zealand by Barnard (1930).

**Synopioides macronux** Stebbing, 1888.

1926a: 225, fig. 17.
Barnard, 1930: 363, fig. 34.
1932: 134.
Pirot, 1934: 173-175, figs. 64-66.

I have no material of this species, nor is there any in the Chilton Collection. However, I take this opportunity of listing it as a member of the New Zealand fauna. Barnard (1930) records 2 females from "Terra Nova" Station 130 (off Three Kings Islands, 27.viii.11, surface, night).

**DISTRIBUTION.** Atlantic Ocean 43° N. to 31° S.; Pacific and Indian Oceans.

**Family Liljeborgiidae**

Stebbing, 1899: 211.
1906: 229.

"Pleon with one or more of the segments dorsally dentate. Head, rostrum seldom large. Sideplate 1 produced forward, 4th emarginate behind. Antenna 1 usually shorter than antenna 2, accessory flagellum well developed. Upper lip slightly or not bilobed. Lower lip without inner lobes. Mandible, molar feeble. Maxillipeds, inner and outer plates rather small, palp elongate. Gnathopods 1 and 2 strong, subchelate, gnathopod 2 the larger, often with sexual variation. Peraeopods 1 and 2 very slender. Peraeopods 3-5, 2nd joint expanded, 5th pair the longest. Uropod 3, rami subequal in length. Telson eleft."—Stebbing.

The first sentence of this diagnosis should probably be altered to read "Pleon usually with one or more of the segments dorsally dentate".

One genus only is known from New Zealand.

**Genus Liljeborgia** Bate, 1862.

Barnard, 1932: 142.

"Pleon segment 4 dorsally dentate. Antenna 1 the shorter, accessory flagellum strongly developed. Mandible, cutting edge dentate, accessory plate on both mandibles, spines of spine-row short, palp slender with less difference in length than usual between the joints. Maxilla 1, inner plate small, with 1 or 2 setae, outer plate with 10 spines, palp large. Maxilla 2, inner plate the wider. Maxillipeds, outer plates narrow, reaching little beyond 1st joint of elongate palp. Gnathopods 1 and 2, 5th joint produced into a considerable lobe, 6th joint large, oval, finger long, more or less serrate on inner margin. Uropod 3, rami 1-jointed."—Stebbing.

A similar correction has to be made here to the remarks about pleon dentation; "pleon segment 4 often dorsally dentate" would probably meet the need, although "pleon segments usually dorsally dentate" might be a further improvement.

Barnard has spoken of the unsatisfactory state of this genus, and Stebbing (1888) equally as candidly of its " soporific effect". Both statements are very true. I have not been able to elucidate the confusion very much, and because
of the limited nature of the material, I have not been able to follow up Barnard's suggestions (1932) about the shape of the epistome. I have sorted out the New Zealand material available and find myself with what I consider four distinct species, one of these occurring in two forms. There are two difficulties which occur with this material. The first is in deciding which characteristics are of specific value within the genus; and the second is in establishing the precise relationships of the New Zealand material with previously described species. Generally speaking, I have accepted the same criteria as Schellenberg (1931). In particular, I have accepted the stability of the epimal plates despite suggestions to the contrary by Barnard (1930: 365) and others because it has not yet been proved that their shape is variable in this genus although there are a number of records of differences. I do not discount these records, but the general similarity of species suggests the possibility of different species being confused in these particular instances. The remarkable stability of the 3rd epimal plate throughout the order as a specific criterion makes me hesitate to accept variability without very good reason. The dorsal spination is more open to criticism, but it does seem to have some considerable specific value, although it is a characteristic to be used with caution. The number of setae on the inner plate of the first maxilla used by Piriot (1939) seems to me, after reviewing my material, to have also a limited application. However, some other characteristics appear to have value, and to have been overlooked previously.

The serration or otherwise of the second peraeopod sideplate posterior margin appears constant as does the spination or setation of the propod. The number of teeth on the dactyl of the gnathopods varies slightly but does seem to be of some specific value. I do not think the number of teeth on the outer plate of the first maxilla is sufficiently constant to be used as a specific criterion.

Certain information which I would like for the older established species is not available from the literature; consequently I cannot be completely happy about the following identifications but, if my assumptions as to the stability of the epimal plates are correct, most of the difficulties disappear.

### Key to New Zealand Species of Liljeborgia

1. Epimal plate 3 has no posterodistal incision
   - Epimal plate 3 has posterodistal incision or notch
   2

2. Pleon segments 1 and 2 usually weakly tridentate; gnathopod 2 broadly convex with small median concavity on palm; sideplate of peraeopod 2 has smooth posterior margin; peraeopod 5 basos anterior margin not strongly lobed in adult male, posterior margin minutely serrate
   - Pleon segments 1 and 2 usually strongly quinquedentate; gnathopod 2 in adult male distally narrow, strongly concave palm; sideplate of peraeopod 2 has notch in middle of posterior margin; peraeopod 5 basos anterior margin strongly lobed proximally in adult males, posterior margin deeply serrate
   3

3. Epimal plate 3 has 2 teeth posterodistally
   - Epimal plate 3 has simple notch posterodistally
   4

L. aequabilis Stebbing, 1888

L. dubia (Haswell), 1880

L. hansoni n.sp.
4. Urosome segments 1 and 2 have strong tooth dorsally; peraeopod 2 propod posterior margin has fine setae, no comb-pectination; gnathopods 1 and 2 have 0 and 5 teeth respectively on dactylos
Not combined as above

5 Pr. 1 and 2, propod has about 11 strong spines on otherwise naked posterior margin
Pr. 1 and 2, propod posterior margin has about 7 fine setae, margin between them finely-combed

L. barchami n.sp.

L. akaroica var. akaroica, n.sp. et n.var.

L. akaroica var. maria n.var.

Liljeborgia aequabilis Stebbing, 1888. (Figs. 105–138)
Liljeborgia aequabilis Stebbing, 1888: 988.
Stebbing, 1906: 741
Stebbing, 1910: 588.
Barnard, 1930: 364.
Pridot, 1936: 301, Fig. 125

Colour a bright cherry red, especially head and 1st 4 peraeon segments; eyes chocolate-brown, large and uneven, almost coalescent. Pleon and urosome show no obvious dorsal spines in side view, but pleon segments 1 and 2 may have 0 to 3 small adpressed teeth seen from dorsal aspect, urosome segments 1 and 2 may have 1 small tooth. Length, 11 mm.; depth, 2\(\frac{1}{2}\) mm.

Antennae. First. Reaches \(\frac{1}{3}\) along 5th segment of antenna 2 peduncle; length 3 mm. Peduncle, 1st segment about 3 times and 2nd twice as long as 3rd, a few fine setae on inferodistal angle of 1st, on superodistal angles of 2nd and 3rd: peduncle about \(\frac{3}{4}\) length of flagellum. Flagellum of 23 segments, 1 or 2 small setae on inferodistal angles, tuft of fine setae on superodistal angles, also \(\frac{1}{2}\) along superior margin of 1st 10 or so segments; accessory flagellum of 15 segments, a little more than \(\frac{1}{3}\) length primary; antennae somewhat flattened in vertical plane.

Second: Length 5 mm. Peduncle, 3rd segment as wide as long, \(\frac{3}{4}\) length 4th, 2 spine-setae on inferodistal angle; 4th about 8/9ths length 5th, 4 groups of setae and spine-setae on inferior margin and 5 on superior, tuft of fine setae superodistally, 3 spine-setae inferodistally; 5th has 6 sets of spine-setae and fine setae on inferior margin, about 15 tufts of short fine setae on superior margin; flagellum somewhat lanceolate, downwardly curved, as long as peduncle 5th segment, of 21 segments, mostly wider than long, setae as before, 1st segment about as long as next 6 with about 7 tufts of setae superiorly, 3 or 4 inferiorly.

Mouthparts Upper Lip: Rounded, slightly bilobed. Lower: Damaged First Maxillae: Inner plate has 2 long setae; outer reaches only \(\frac{1}{3}\) along palp; palp of 2 segments, 1st wider than long, less than \(\frac{3}{4}\) length 2nd which is distally rounded, has 3 setae along outer margin, row of about 9 spines down inner margin. row of spine-setae on inner surface parallel to margin and extending farther down than spines; maxilla produced in small rounded lobe or wing outside palp base Second Maxillae: Inner lobe slightly the shorter, both have inner and end margins strongly spine-setose. Mandible: Left has strong toothed accessory plate, right has feeble finely-serrated accessory plate; spine-row of 9 or 10 short spine-setae, proximal to them tuft of 5 or 6 long setae. Molar absent. Palp 1st segment barely longer than 2nd, 2nd has 3 long setae distally; 3rd barely more than \(\frac{3}{4}\) length 1st, 3 long setae on end, one \(\frac{3}{4}\) along outer margin. Maxilliped: Inner plate subtriangular, barely reaching past merus base; 3 long setae on inner margin,
about 5 on end outside the 1 or 2 spines on tip. Outer plate subtriangular, convex outer margin naked, straight inner has row of about 7 increasingly longer spines extending ½ down margin, row of setae between spines almost to base. Ischium subrectangular, width nearly twice length; merus subtriangular, as long as wide, basally as wide as ischium. Carpus as wide, inner margin 3 times and outer twice as long as merus; 3 long setae on outer distal angle; inner margin strongly setose throughout length, parallel row of setae on inner surface down to about ¾ from base. Propod margins more or less parallel, barely shorter than carpus, width not ¾ length, 3 long setae on outer margin proximally, long setae on inner margin, 2nd row of setae from about ¾ along inner margin obliquely across surface to inner base of daactylos, across daactylos base. Strong slender daactylos nearly propod length, distal surface of propod and inner of daactylos very finely bristled.

**GNATHOPODS. First:** Subsquare except that anterior margin narrows somewhat proximally, 4 fine setae anterodistally. Basos proximally constricted, width ⅓ length, anterior margin duplicated, one of the margins with 8 or 9 long setae, the other naked; posterior has long setae proximally, tufts of short fine setae distally. Ischium subsquare, 4 basos length, one of 2 anterior margins produced distally to flanged lobe. Merus sublanceolate, posterodistal angle produced downwards with a blunt spine, 3 groups of setae on distal ⅓ of posterior margin, width ⅓ length, length not quite ¾ basos, anterior margin contiguous with carpus proximal margin. Carpus a little shorter than merus, anterior margin convex and naked, distal sinuous, posteriorly produced in spoon-shaped lobe between merus and propod down latter almost as far as palm-defining spine; outer distal and end margins of lobe strongly setose; 3 parallel rows of setae on outer surface. Propod ovate, as long as basos, width ⅓ length, anterior margin naked, row of about 6 setae on anterior surface, slightly convex; posterior strongly convex, interrupted about ¼ by defining spine, palmar margin has profuse row of alternately long and short spine-setae on outer margin, short spines on inner, spine-setae very finely plumose distally and with 2 or 3 fine teeth on one margin; sparser parallel row of simple setae on surface, small projection with 2 spines at level of other palmar spine; long slender convex daactylos as long as palm, 8 inset teeth on inner margin proximally. Second: Essentially similar; sideplate ovately subtriangular, barely longer than wide, distally narrowing and rounded with 2 or 3 fine setae. Basos as before, anterior margin naked; ischium posterodistally setose, longer than wide, ⅓ basos length. Merus ⅓ basos length, nearly twice carpus length; carpus has 5 rows of setae on outer margin; propod a little longer than basos, width more than ⅓ length, palm medially emarginate, the 6 or 7 small spines on inner margin of distal section of palm set in pockets (Fig. 116). Daactylos inner margin has 16–17 teeth. Gills large, simple.

**PERAEOPODS. First:** Sideplate comparatively long and narrow, subtriangular, proximal width ⅓ length, rounded distal margin has 3 fine setae. Basos slender. Margins parallel, width about ⅔ length, a few fine setae on anterior margin. Ischium about ⅔ basos length, barely longer than wide, rounded lobe-flange anterodistally. Merus as wide as basos, ⅔ its length, anterior margin only slightly convex and constricted proximally, a few very minute setae on posterior margin. Carpus slightly narrower and shorter, fine spine-setae posterodistally, a few minute setae posteriorly. Propod linear, ⅔ as long again as carpus, narrow, 14 slender spines on posterior margin; slightly curved short slender daactylos less
than ¼ propod length. Second: Sideplate subrectangular, angles rounded, posteriorly excavate so width of proximal portion ½ length, of distal ⅔ length; fine setae ventrally; otherwise like Pr. 1. Third: Sideplate barely wider than deep, depth barely more than ½ basos length, posterior lobe subsquare, a small slightly produced postero-distal angle. Basos ovate, rectangular, width more than ⅔ length, posteriorly flanged, 9 small stout spines along anterior margin, 2 or 3 spine-setae on angle, posterior margin has about 16 serrations, each with quite fine long setae. Ischiun sub-rectangular, barely longer than wide, width about ¼ basos, 2 or 3 spine-setae antero-distally. Merus width about ¾ length, length ⅔ basos, about 6 paired slender spines on anterior of subparallel margins, 5 single spines on posterior, 2 or 3 on each distal angle. Carpus linear, narrower, little more than ½ basos length, 4 or 5 sets of long fine setae on anterior surface, a few spines on distal angles. Propod narrower, almost as long as merus, short transverse rows of long fine setae form continuous tract down one margin, single row of 10 or so spines down opposite; very short spike-like dactylos. Fourth: Sideplate small, sub-rectangular, wider than deep. Longer than Pr. 3, about 15 spines down posterior margin of propod, otherwise much the same. Fifth: Much the longest, sideplate small and ovate. Fewer spines and serrations on basos than in Pr. 3, carpus has 3 groups of spines on anterior margin, spines on distal angles; 4 groups of 2 or 3 fine setae and a spine-seta on posterior; propod margin has about 12 pairs of spines; other margin has an equal number of rows of spine-setae and setae; dactylos a long slender spike about ¾ propod length.

Epimeral Plates. First ovately sub-triangular, with ventral angle slightly produced; 2nd and 3rd sub-rectangular with antero-distal angle rounded, postero-distal slightly produced backwards; 2nd deeper than wide, 3rd wider than deep.

Pleopods. Normal, rami longer than peduncles, of about 15 or so plumose segments; 2 coupling spines on peduncle, inner ramus the longer.

Uropods. Tips reaching same distance. First: Inner ramus slightly the longer, a little more than ¾ peduncle length; peduncle has stout spine on each supero-distal angle, 1 or 2 spines and 2 or 3 long spine-setae on outer dorsal margin. Small spine and several minute setae on dorsal margin of inner ramus, up to 7 and 9 small spines on each dorsal margin of canoe-shaped outer ramus; integral end spine on each ramus. Second: Inner ramus as long as peduncle, outer slightly shorter, 2 stout spines on inner distal angle, 1 on outer; rami have 5 and 7 (outer) and 4 and 7 (inner) spines on dorsal margins; integral end spines. Third: Inner ramus barely longer than the outer; peduncle about ¾ length inner, 2 spines on inner supero-distal angle, 1 on outer, 1 on infero-distal angle; rami lanceolate, the narrower outer has 4 spines on outer margin; inner has 3 on outer margin, 5 on inner, minute terminal seta on prolonged tips of rami. Telson: Cleft almost to base, narrow lobes each about 4 times as long as wide, end acute with quite deep notch just outside and below tip, long strong spine in notch, 1 or 2 minute setae inside spine, sharp tooth outside.

Hypotypes. Slides P.84, male.

Distribution. Australia, New Zealand, Sulu Sea.

Discussion

Apart from the New Zealand localities listed above, the Chilton material contains a specimen from Bass Strait, Australia, which agrees with the New Zealand specimens in all details, including the depression in the gnathopod palm (Tray 117/9–13, Chilton Collection).

The species is known from only a few specimens and has never been fully described or figured. Chilton placed it into the synonymy of *L. brevicornis* but Pirlot does not consider this justified. However, Pirlot's reasons for this seem to centre around the number of setae on the inner lobe of the first maxilla. The difficulty about this is that most of my specimens have two setae, sometimes one, but never four as Pirlot himself shows. The lack also of a palm concavity in the gnathopods in Pirlot's figures suggest that his specimens belonged to a different species from those with which I am dealing. There is, of course, the possibility that Pirlot's specimens are *L. aequabilis* and these are not, but Stebbing's description is rather lacking in positive points which would settle this. Nevertheless, I think it is permissible to hold the view that Stebbing would have noticed the four setae on the first maxilla, had they been in fact present. In the meantime, the only sensible course is to describe the New Zealand specimens as *L. aequabilis*.

The species falls into the group lacking any sort of incision to the postero-distal angle of the third epimeral plate; *L. dubia, L. brevicornis* (= *L. pallida*), *L. macrornyx, L. fissicornis, L. della-vallei,* and *L. consanguinea.* *L. chevreuxi* has a quite distinctive 3rd epimeral plate. The second gnathopod palm concavity is the most obvious distinguishing mark from these species. The urosome and pleon spination of *L. dubia* is very different as shown by Haswell's original (1880) figures and description. *L. fissicornis* has strong spines on the urosome dorsally and the gnathopod is distinctive; the 1st urosome segment of *L. della-vallei* has 2 teeth; *L. consanguinea* differs in all 3 epimeral plates; *L. kinahani* slightly in the 3rd epimeral plate and also in urosome spination (Sars' figures, 1895). The epimeral plates of *L. quadridentata* and *L. octodentata* are also slightly different.

*Liljeborgia hansonii* n.sp. (Figs. 139–159).

Description of Ovigerous Female

Length 6 mm. Reddish tinge to body segments; eyes reddish-brown (in formalin). Eyebrows more or less rounded. Pleon segments 1 and 2 with small tooth dorsally, 2nd with very small secondary tooth either side; 1st and 2nd urosome segments with stronger tooth each. Rostrum reaching as far forward as eyebases, slender and conical.

Like *L. aequabilis* except for following details.

Antennae. First: Almost reaching end of antenna 2 peduncle. Accessory flagellum of 8 segments, primary of 14; flagellum supernodistal angles have setae, and flaccid sensory seta. Second: Peduncle 3rd segment a little wider than long, inferodistal angle produced in short sharp tooth; about 3 length 4th; 4th has 4 sets of 2 or 3 spines and 1 or 2 setae superiorly, 2 pairs of spines on inferior
TEXT-FIG. 10.—*Liljeborgia hansoni* n.sp. Female 139—Rostum 140—Antenna 2. 141—Antenna 1, superodistal angles of some flagellar segments. 142—Maxilla 1. 143—Mandible palp. 144—Maxilliped, right half 145—Maxilliped dactylos 146—Gnathopod 2. 147—Peraeopod 1. 148—Peraeopod 1, propod postero margin. 149—Peraeopod 2 side plate. 150—Pleon and urosome segments. 151—Uropod 3. 152—Telson
margin, row of small spines on inferodistal angle; 5th segment as long, slightly narrower, 7 groups of setae or spine plus setae superiorly; 3 sets of setae inferiorly. Flagellum as long as 5th segment, of 11 segments, not noticeably lanceolate.

**Mouthparts. First Maxillae:** Inner plate has simple plumose terminal seta, palp has about 7 short stout spines on end and inner distal margin, about 4 setae. **Mandible:** Pulp 1st segment about \( \frac{3}{4} \) length 2nd; 3rd about \( \frac{3}{4} \) length 2nd; 2 setae on end of 2nd, 4 on end of 3rd and 1 half along inner margin. **Maxilliped:** Inner plate reaches \( \frac{1}{3} \) along merus, has 3 spines and several setae distally. Outer reaches \( \frac{1}{3} \) along carpus, has 6 short spines and about 6 setae on inner margin. Fewer setae down carpus surface, 1 on carpus outer margin at \( \frac{2}{3} \), 7 or 8 short setae near propod outer margin; dactylos finely combed on inner margin; setation otherwise as in *L. aequabilis*; carpus inner margin twice length merus outer, carpus width \( \frac{1}{2} \) length; propod almost as long as merus, width \( \frac{3}{4} \) length, dactylos about \( \frac{3}{4} \) propod length, small terminal nail.

**Gnathopods. First:** Small but hardly significant differences from *L. aequabilis* in proportion; longer setae distally on basos posterior margin, no setae on propod anterior surface but number across posterior surface in palmar spine region; 2 palmar spines, 3 across inner knob; 4 teeth on dactylos inner margin; propod anterior margin is proximally trenched with double margin where it bends back on basos. This is also present in Gn. 2, absent in Gn. 1 in *L. aequabilis* and barely indicated in Gn. 2 in *L. aequabilis*. Sideplate has seta and more pronounced posterodistal notch than in *L. aequabilis*. **Second:** Sideplate posterodistally notched, the slight proportional differences from *L. aequabilis* of no great significance. Palm evenly convex throughout, palmar spines as in Gn. 1; anteroproximal trench in propod as in Gn. 1; 6 small setae on dactylos surface above the 7 teeth of inner margin. Gills simple, single, as long as basos.

**Peraeopods. First:** Sideplate ovate, convexly rounded ventrally and not narrowed much. Basos margins quite strongly setose, width \( \frac{1}{4} \) length, ischium \( \frac{1}{4} \) basos length, merus \( \frac{1}{4} \) basos length, a few fine setae posteriorly; propod slightly more than \( \frac{1}{4} \) basos length, about 6 sets of 1 long and 1 short fine seta posteriorly; dactylos about \( \frac{2}{3} \) propod length. **Second:** Sideplate subrectangular, distal width about \( \frac{1}{4} \) length, 5 or so fine serrations and setae on posterior margin. **Third:** Small ovate sideplate has a small posterodistal notch and seta. Basos ovate, margins both convex, distinctly narrowing proximally, 8 spines along anterior margin, 2 or 3 on angle; posterior margin has about 11 serrations each with small seta; merus has groups of 2 or 3 spines on anterior margin; other slighter differences from *L. aequabilis* **Fourth:** Sideplate subrectangular, small posterodistal notch and seta. Basos proximally narrowing, margins convex; anterior has 7 spines on distal portion, 2 or 3 on angle; posterior has about 21 serrations with seta each, most of serrations quite pronounced and as in Pr. 5; other segments as much as in Pr. 5. **Fifth:** Sideplate subrectangular, notch and seta posteroproximally; depth about \( \frac{1}{4} \) basos length. Basos ovate, not greatly narrowing proximally and with flange posterodistally, width about \( \frac{1}{4} \) length; otherwise as in Pr. 4 but serrations much stronger, as shown in Fig. 156. Merus about \( \frac{1}{4} \) basos length, width not \( \frac{1}{4} \) length, margins almost parallel, distal angles strongly spined; 4 sets of 3 or 4 spines along anterior, 5 sets of 1 to 3 along posterior. Carpus as long, narrower, 3 sets of
2 to 4 spines on each margin, distal angles spined. Propod linear, about 1/3 longer than basos, 7 sets of spine and 1 or 2 fine long setae on one margin; 7 sets of single or paired spines on other, spine or 2 and long setae distally; short spike dactyls about 1/3 propod length.

PLEPODS. Normal.

EPIMERAL PLATES. First: Subsquare, anterodistal angle rounded, posterodistal a little produced, posterior margin convex, anterior and ventral margin finely setose. Second: Basically similar, anterodistally a little more angular, without setae. Third: Subrectangular, much wider than deep, slightly convex ventrally, anterodistal angle rounded, posterodistal produced to distinct tooth, strong concavity between it and secondary tooth immediately above, seta in concavity. posterior margin otherwise straight, oblique, narrowing proximally.

UROPODS. First: Rami and peduncle subequal, peduncle dorsal margins with 5 spines each, last on inner side very strong, an almost equally long and narrow prolongation of angle beside it. Rami sublanseolate, with narrow tips, integral end spines; 5 spines along each dorsal margin of outer ramus, 6 or 7 on margins of inner. Second: Similar, shorter, fewer spines; peduncle outer dorsal margin has 4, inner has 2; 5 on outer ramus outer margin, 3 on inner; 2 on inner ramus outer margin, 4 on inner. Rami canoe-shaped. Third: Rami lanceolate, inner the wider, subequal and nearly twice length of peduncle which has 2 spines near inferior acutely produced inner angle, 1 or 2 on superior, 1 on outer. Inner ramus has 4 and 5 spines on margins; outer has 2 pairs of spines on outer margin. Telson: Lobes long and narrow, eleft about 3, single very strong spine set in deep notch in each apex, the angles of the notch acutely produced, outer nearly twice length of inner.


TYPE. Slides P.100 φ.

DISCUSSION

I thought at first that this specimen was L. dubia but after noting the importance which Schellenberg (1931) places on the epimeral plates, the question did not seem so simple. I have therefore described it as a new species with the epimeral plate as the most distinctive characteristic. The species can be distinguished from L. aequabilis by this feature, by the different urosome and pleon dorsal spination; the second gnathopod, the maxilliped, second antenna, peraeopod shape and spination especially in the basos, also the propod spination and sideplate posterior serration of the second peraeopod; the uropod spination and telson shape.

The only similar accounts of a double toothed 3rd epimeral plate in the genus occur in references to L. dubia. Barnard (1930) says “there is often a second tooth, either strong or a mere denticle, on the hind margin of pleon segment 3 above the acutely produced postero-inferior angle.” He also mentions that some of the specimens were tridentate on pleon segments 1 and 2 although most were quinque dentate. Could there be any connection here? Be that as it may, this specimen does not show anything approaching the pleon spination figured by both Haswell (1880) and Stebbing (1888).
Liljeborgia dubia (Haswell).

_Eusirus dubius_ Haswell, 1880: 331, pl. 20, fig. 3.
_Liljeborgia haswelli_ Stebbing, 1888: 985, pl. XCI.
_Liljeborgia dubia_ Stebbing, 1906: 233.

Barnard, 1930: 365, fig. 35.
Pirlot, 1936: 300, fig. 125.

Barnard’s records are the only satisfactory ones of this species from New Zealand. Chilton’s specimen from the Snares is not in good condition, the epimeral plates being masked and peraeopods absent. The gnathopod dactyls have 0 (probably) and 5 teeth; the pleon segments have 1 reasonably large and possibly 2 smaller teeth each and the uroscope segments have 1 large spine each. I doubt very much whether it is _L. dubia_.

Chilton’s Scotia specimens cannot be considered _L. dubia_ (Chilton, 1912: 485). In the gnathopods and 5th peraeopods there are no differences from Schellenberg’s figures (1931) of _L. georgiana_ and it is to this species they must be attributed.

_Liljeborgia akaroica_ n.sp. (Figs. 160–160).

This species is like _L. aequabilis_ except where otherwise stated.

Pleon segments 1 and 2 have 3 small teeth on each margin dorsally; the 3rd segment has a slight incision; the 1st and 2nd uroscope segments have each a very small tooth.

**Antennae. First**: Pair of flaccid sensory setae superodistally on each flagellum segment. _Second_: Flagellum of 19 segments; 5th peduncle segment has 12 sets of setae on superior margin.

**Mouthparts. First Maxillae** (C.103): Palp longer than inner plate, 2nd segment width ½ length, 4 spine-setae on outer margin, 8 small stout spines on end and distal inner margin, about as many long setae. Inner plate has single long end seta. _Maxilliped_ (C.102): Dactylus finely toothed, tip has stout nail-spine.

**Gnathopods. First**: Propod slightly wider distally than proximally; dactylus has 5 or more usually 6 teeth; otherwise much like that of _L. aequabilis_. _Second_: Dactylus has 10–13 teeth, otherwise like that of _L. hanssoni_.

**Peraeopods. First**: Like _L. hanssoni_; 2 long setae ventrally on sideplate; propod has 11 quite strong spines evenly along posterior margin, the margin itself otherwise quite naked. _Second_: Sideplate posterior margin has about 4 small serrations each with a seta; propod as in Pr. 1; otherwise like _L. hanssoni_. _Third_. Much as in _L. aequabilis_; basos posterior serration a little deeper but not as deep as in _L. hanssoni_; merus posterior margin naked except for a short and a very long spine on distal angle; about 3 pairs of short spines on anterior margin, 1 long and 3 or 4 short spines on distal angle; carpus has 6 increasingly longer spines anteriorly, each with very long fine setae, several long spines on posterodistal angle; propod has about 9 short spines along posterior margin. _Fourth and Fifth_: As in _L. aequabilis_ except where differing as above.

**Epimeral Plates.** The third has distinct notch in margin posterodistally, the margin each side of notch being more or less continuous in straight line.

**Uropods. First**: Peduncle has 5 and 1 spines on dorsal margins, the spines on the distal angles being especially strong; inner ramus has 5 and 6 spines
on dorsal margins, outer has 5 spines on outer margin and 3 small ones distally on inner. **Second**: Peduncle margins naked except for strong spine on each distal angle; inner ramus has 6 and 3 spines dorsally, outer has 5 and 3. **Third**: Peduncle has 1, 2 and 1 spines dorsally; inner ramus has 4 and 5 spines, outer has 6 on outer margin only; inner margin minutely pectinate. **Telson**: Apices acute.

**Types.** Slides C.102. **Paratypes**: C.103. **Allotype**: C.105.

**Localities.** Akaroa, 4. x 13, Chilton Collection (C.102, an ovigerous female, of $8^{1}/2$ mm. length; C.105, male); "Lyttelton-Dunedin" (C.103, female), an ambiguously labelled specimen from the Chilton Collection. "Off West King, 'Hinemoa,' 5.1.15," 60–65 fathoms, Chilton Collection (Slides C.109, male).

**Discussion**

This species has a similar third epimeral plate to that found in *L. georgiana*, *L. macrodon*, *L. longicornis*, *L. barhami*, and *L. quinquedentata*. It is distinguished from the first four of these amongst other things by its lack of strong urosome spines. There are also differences in gnathopod and pereopod basos shape. Maxilla 1 inner plate in *L. quinquedentata* has 4 setae (could this be Pirlot's *L. aequabilis* [1936] ?), and the 1st pleon segment does not have 3 teeth. The telson and serration of the basos in Pr 3–5 separate *L. macrodon* from *L. akaroica*.

Some of the differences between these species may not be great but in the present state of the genus, I consider them sufficiently distinct to warrant granting *L. akaroica* specific rank in its own right.

**Liljeborgia akaroica** var. **maria** n.var. (Figs. 181–183).

This is like *L. akaroica akaroica* but the first antenna has 10 and 15 segments; the second has 9 setal groups on the 5th peduncle segment, the flagellum has 14 segments. The gnathopods have 6 and 9–10 dactylar teeth. Peraeopods 1 and 2 propods have 7 short spine-setae, the margin between them finely combed, the pereaeopods otherwise like those in *L. akaroica akaroica*. The serrations of the posterior margin of pereaeopod 3 basos are more distinct, the merus posterior margin has 3 long spines, the anterior has 3 pairs of spines. The second uropod has 2 and 3 spines on dorsal margins of peduncle, 6 and 2 spines on one ramus, 4 on the other. The third has 3 spines on the peduncle, 3 and 2 on inner ramus, 4 on the outer ramus margin, naked inner margin finely pectinate-combed.

**Type.** Slides P.106, male.

**Locality.** "10 miles NW of Cape Maria, 80 fathoms, 'Hinemoa,' 5.1.15," Chilton Collection, 3 specimens.

**Discussion**

Whilst these differences are not sufficient in my opinion to warrant a separate species, particularly on such scanty material, the differences in the propods of pereaeopods 1 and 2 cannot be completely disregarded. Granting varietal rank seems the most satisfactory course until further material is available.

**Liljeborgia barhami** n.sp. (Figs. 184–201)

Pleon segment 1 has 1 very small tooth dorsally, 1 strong dorsal spine on each of urosome segments 1 and 2.
This species is like *L. aequabilis* except in the above and in the following details.

**Antennae.** *First*: Flagellum of 15 segments, accessory of 8, superodistal angles of segments a little produced as in *L. hansi*oni. *Second*: Flagellum of 14 segments, peduncle somewhat like *L. hansi*oni; superior margin of 4th peduncle segment has 4 groups of 3 or so strong spines, inferior similar; 5th has about 7 groups of 2 or 3 spines and several long fine setae superiorly, 4 similar groups inferiorly.

**Mouthparts.** *First Maxillae*: Palp a little ovate, 2 setae on outside margin, 5 strong short end spines, several setae on end and inner distal margin. *Maxilliped*: At least 9 spines down inner margin of outer plate; palm a little less strongly setose than in *L. aequabilis* especially on propod inner margin; segments comparatively wider and more ovate; propod distally fringed around dactylos base.

**Gnathopods.** *First*: Like *L. aequabilis* but dactylos lacking teeth entirely; 2 defining spines at end of palm where dactylos impinges, row of 4 spines and several setae transversely $\frac{1}{2}$ across propod at slightly lower level; basos posterior margin nearly naked, anterior margin has about 8 long spine-setae. *Second*: Like Gn. 2 in *L. hansi*oni but dactylos has only 5 teeth; fine setae on outer margin; basos has long fine setae on distal $\frac{1}{2}$ of inner margin, right along posterior; 1 defining spine to palm, 3 spines on surface and fine setae in row from them up propod parallel to palm.

**Peraeopods.** *First and Second*: Like those of *L. hansi*oni; long setae on anterior margin of carpus and merus. *Third to Fifth*: Like *L. hansi*oni but basos not quite so narrowed proximally, posterior excavations not so marked; a few less spines on other segments especially posteriorly.

**Epimeral Plates.** More or less like *L. akaroica*; the 2nd has several long setae ventrally.
UROPods. First: Peduncle has 4 and 5 spines on dorsal margins, those on distal angles very strong; rami have 4 and 5 spines dorsally. Second: Peduncle has 2 spines on each dorsal margin, 5 and 3 on rami. Third: Peduncle has 3 spines distally, 1 proximally; one ramus has 4 and 5 spines, other is naked. Telson: Like L. aequabilis.

Type. P.107, female.

Locality. "Torrent Bay, No. 5, C. Barham Morris, XII.20", Chilton Collection. This is in the Nelson region, between Golden and Tasman Bays.

Discussion

This species is distinguished by the 3rd epimeral plate, peraeopod 2 sideplate and propod spination and serration, and uroscope spination, the uroscope spines being of the carinate and not the adpressed kind. The number of dactylar teeth is also distinctive.

The species differs from L. consanguinea (Stebbing, 1888) in the shape of the 3 epimeral plates and from L. akaroica as already stated in the uroscope teeth, as also from L. octodentata. L. macrodon differs in Pr. 3–5 basos serration and telson and in gnathopod dactylar teeth; L. georgiana in Pr. 3–5 basos shape; L. longicornis in the male second gnathopod and in Pr. 5 basos shape, also Pr. 5 dactylus; L. quinquedentata in gnathopod dactylar teeth and the inner plate of the first maxilla.

Literature Cited


Bate, C. Spence, 1857. On a New Amphipod. Iphimedia eblanae Proc. Dublin Natural History Society, pp. 58–59, Pl. XVI, Fig. 1–7; The Natural History Review. Vol. IV: 229–230, Pl. 16, Fig. 1.


