Hamond, R., 1973. The harpacticoid copepods (Crustacea) of the saline lakes in southeast Australia, with special reference to the Laophontidae. *Records of the Australian Museum* 28(17): 393–420. [20 July 1973].

doi:10.3853/j.0067-1975.28.1973.406

ISSN 0067-1975

Published by the Australian Museum, Sydney

The Harpacticoid Copepods (Crustacea) of the Saline Lakes in Southeast Australia, with Special Reference to the Laophontidae

By R. HAMOND

CSIRO, Division of Fisheries and Oceanography, Cronulla, N.S.W., Australia

Figures 1–81. Manuscript received, 28th March, 1972

SUMMARY

The bottom-living copepods collected by Dr I. A. E. Bayly in the saline lakes include the cyclopoid *Halicyclops ambiguus* Kiefer and six species of harpacticoid, namely *Mesochra baylyi* Hamond, *Onychocamptus bengalensis* (Sewell), *Cletocamptus deitersi* (Richard), *Heterolaophonte wellsi* sp. nov., *Robertsonia propinqua* (Scott), and an undescribed species of *Amphiascoides*. *M. baylyi* was by far the most widespread and numerous harpacticoid, and in many of the samples it was the only harpacticoid present. *O. bengalensis* was the second most numerous and widespread harpacticoid, the other harpacticoids all being scarce; *H. ambiguus* was about as common as *O. bengalensis*, and had a substantially similar distribution. *R. propinqua*, *O. bengalensis*, and *C. deitersi* are new records for Australia. *H. wellsi* has been found only in high-salinity localities lacking weeds, and therefore appears to favour the bottom sediments; none of the other species showed any distinct preference for localities with or without weeds. The present paper also contains the description of *H. wellsi*, a redescription of *O. bengalensis*, and notes on *C. deitersi*.

INTRODUCTION

As has been shown by Bayly (1970) and by Bayly and Williams (1966), the saline lakes in question contain an interesting fauna, characterised by the widespread occurrence throughout the lake system of a limited number of species, most of which are of marine origin; this is clearly true of the bottom-living copepods (Table 2), which consisted of the cyclopoid *Halicyclops ambiguus* Kiefer (1967) and of a mere six species of harpacticoid. The synonymy of previous records is as follows:

Bayly and Williams (1966), Table 14	Bayly (1970), pp. 124–125	Present name and reference
Mesochra sp.	*Mesochra* sp. nov.	*Mesochra baylyi* Hamond (1971)
Onychocamptus sp.	*O. bengalensis* (Sewell)	*O. bengalensis* (Sewell), redescribed below
Robertsonia cf. *R. knoxi*	*Robertsonia* sp. nov.	*R. propinqua* (T. Scott), see Hamond (in press)
Halicyclops, sp. nov.	*H. ambiguus*	*H. ambiguus*, see Table 2 of present paper
....	*Heterolaophonte* sp. nov.	*H. wellsi* sp. nov., described below
....	....	*Amphiascoides* sp. nov., to be described elsewhere
....	....	*Cletocamptus deitersi* (Richard), partly redescribed below

MATERIAL AND METHODS

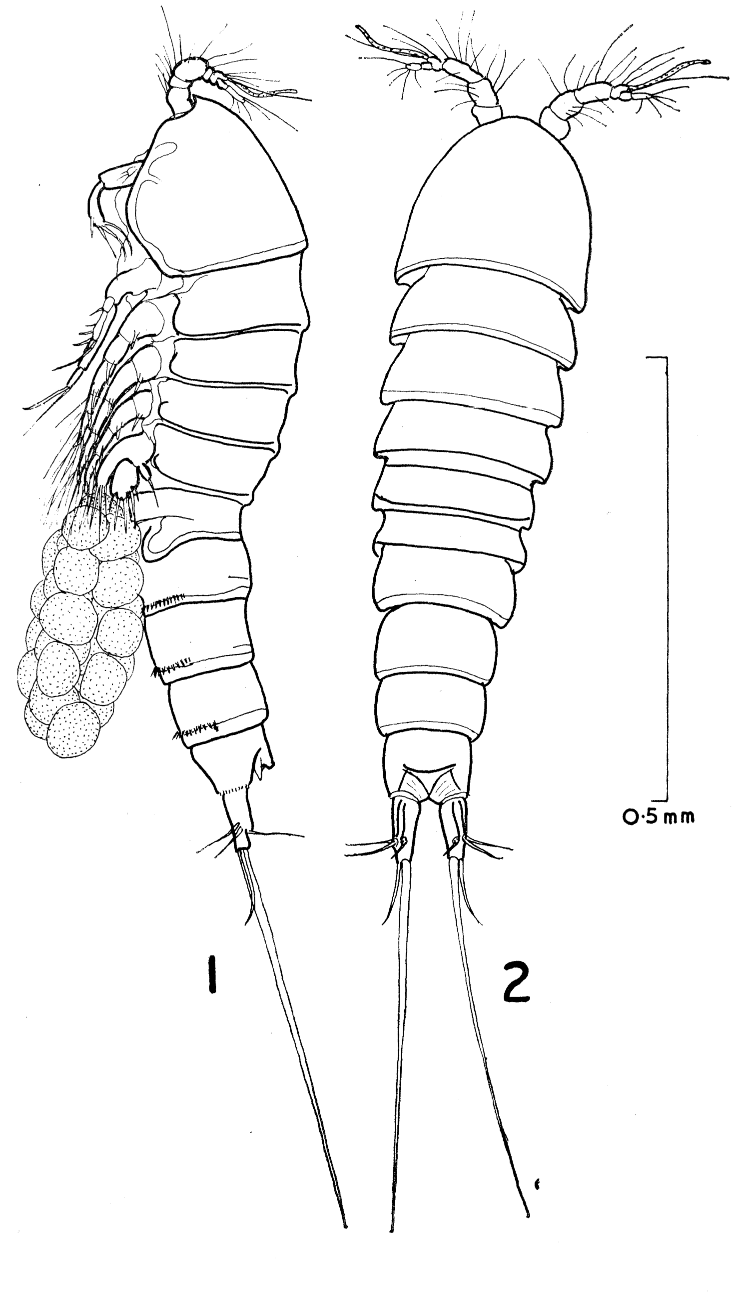
Each sample listed in Table 2 consisted of a single tube, in which the cleaned copepods were preserved in dilute formalin; the standard of preservation was generally high. The samples were not quantitative in any ecological sense; repeat samples were taken in some localities (e.g. locality 13) on different dates. Not included in Table 2 is a lagoon (near the head of The Coorong, some 46 miles north of Kingston in South Australia), a sample from which on 22.5.1968 (salinity 16.2‰) yielded nineteen females (of which eight were ovigerous), no males, and no copepodites of *Mesochra baylyi;* in Table 2 this would have been expressed as $\genfrac{}{}{0pt}{}{19,8,}{0,0.}$ The asterisks in Table 2 (*M. baylyi* at 10B; *O. bengalensis* at 12) indicate that the number for each sample includes a pair in precopula. The copepods were studied as in Hamond (1969, 1971); holotype material has been deposited in the Australian Museum; other material is being retained in my own collection, for comparison with material to be studied in the future.

TAXONOMY

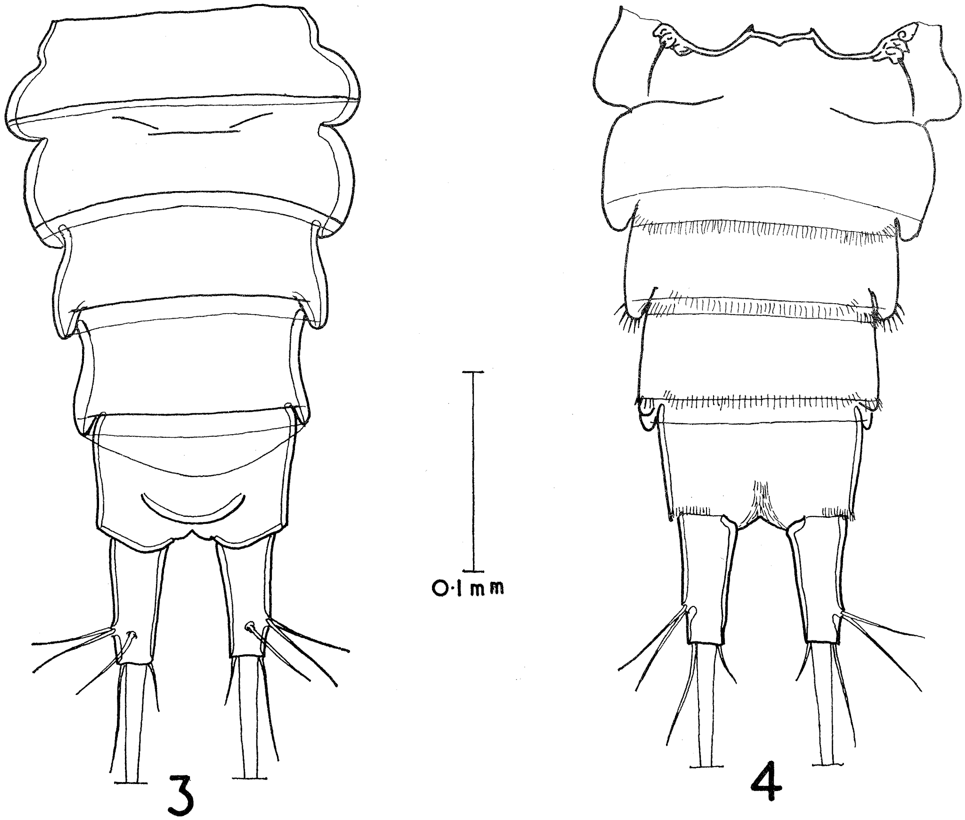
Description of **Heterolaophonte wellsi** sp. nov.

(Figs 1–26).

Female (*holotype*). General appearance very much like that of most other laophontids, without compression, flattening, or unusual protuberances. Each abdominal somite (fig. 4) has a ventrally complete row of very delicate teeth, and a lateral comb of small spinules. Dorsal sensillae not noticed in spite of searching under high power.



Figs 1, 2. *Heterolaophonte wellsi*, ♀. Fig. 1, side view; fig. 2, dorsal view.



Figs 3, 4. *Heterolaophonte wellsi*, ♀, abdomen. Fig. 3, dorsal view; fig. 4, ventral view.

Operculum smooth-edged and curved (figs 3, 5); the ridges, running from each end of the operculum to the base of each furcal ramus, have a pattern of minute chitinous roughnesses along their crests. Furcal ramus tapering slightly (ratio of length to greatest breadth about 8:3 in dorsal view), and with a pronounced dorsal carina from the base of the ramus to the insertion of the dorsal seta. There are two outer lateral setae arising together, a dorsal seta arising level with them, and three terminal setae of which only the middle one is substantially longer than the furcal ramus; this large seta is not modified in any way.

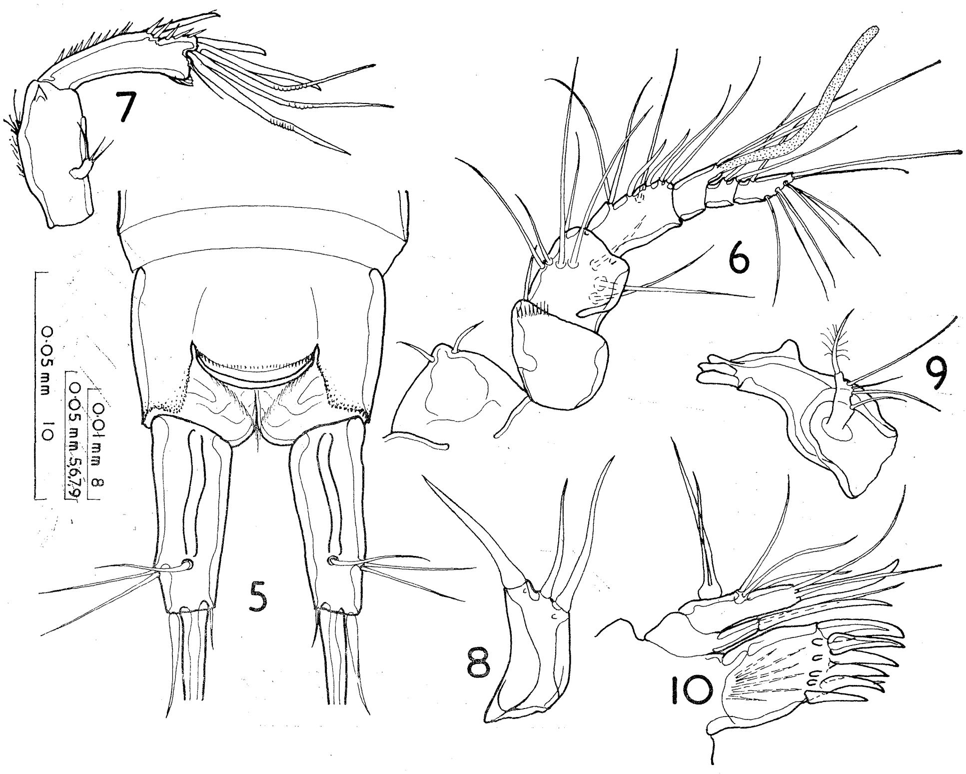
Antennule (fig. 6) with six segments, of which the fourth bears the aesthetasc; all antennular setae are smooth and simple. Antenna (fig. 7) with a single-segmented exopod (magnified in fig. 8), and with a terminal group of appendices comprising a simple seta, three kinked setae, and two hooked spines; a third hooked spine arises subterminally. Mandible (Fig. 9) with a single-segmented exopod bearing five setae, of which only the terminal is plumose. Maxillules (fig. 10), maxillae (fig. 11), and maxillipedes (fig. 12) not remarkable.

P1 (fig. 13) with a two-segmented exopod, the second segment being much the longer. The endopod is much longer than the exopod, and bears terminally a very slender and almost entirely straight claw, adaxially to which is a long slim seta and a minute terminal setule (present in all three dissected females) which may or may not represent the small seta (of which there is otherwise no trace) found in this position in many laophontids.

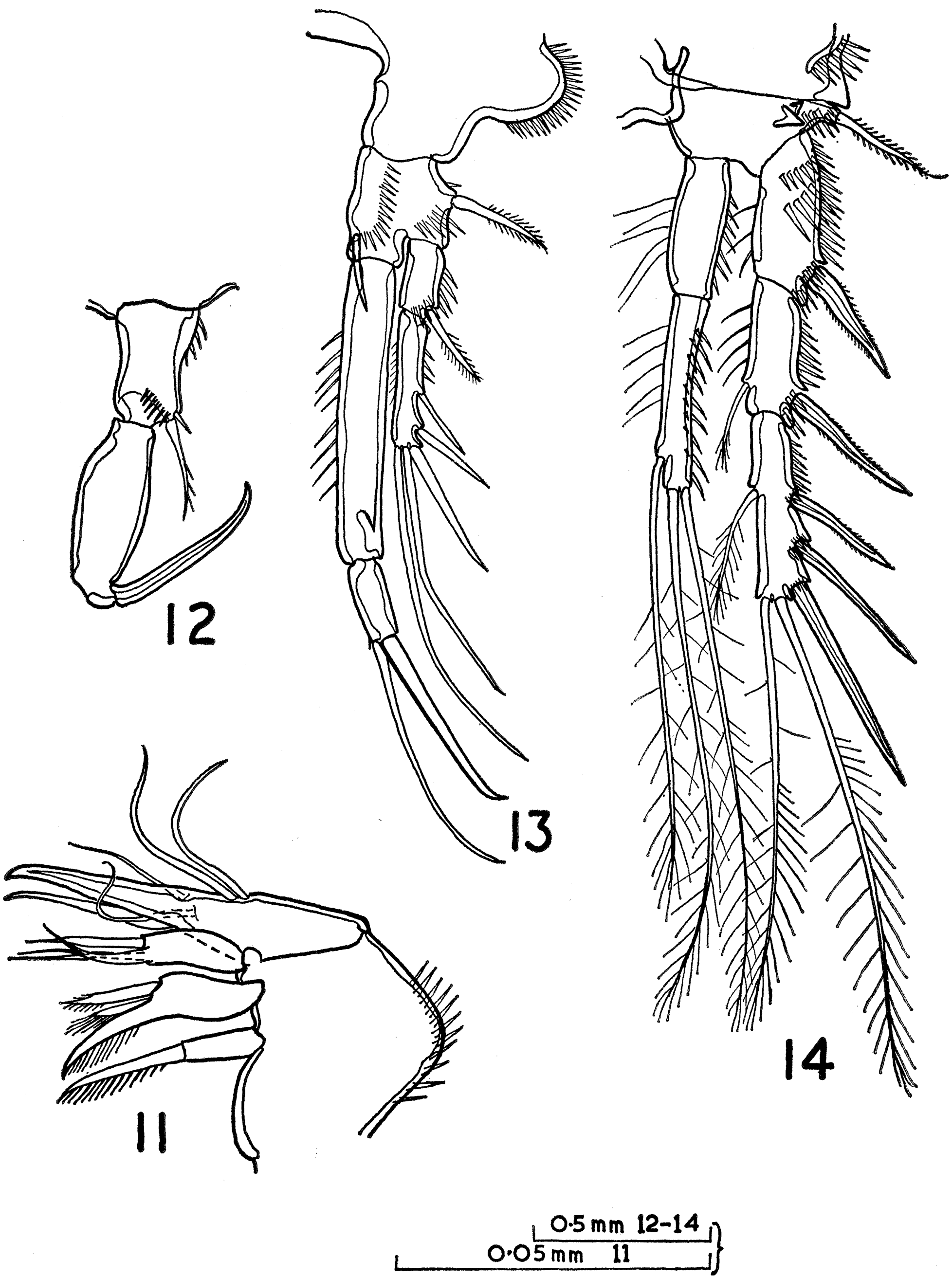
Swimming legs with three-segmented exopods and two-segmented endopods; setal formula:

P2(fig. 14)		P3(fig. 15)		P4(fig. 16)	
exp	enp	exp	enp	exp	enp
0.1.123	0.120	0.1.223	0.221	0.1.123	0.120

P5 (fig. 17) with discrete rami, the exopod not quite as long as the basiendopod; the latter bears two stout unilaterally pinnate setae on its inner margin and three plumose setae terminally, whereas the six exopodal setae are all plumose, the indentations between their bases being deeply marked.

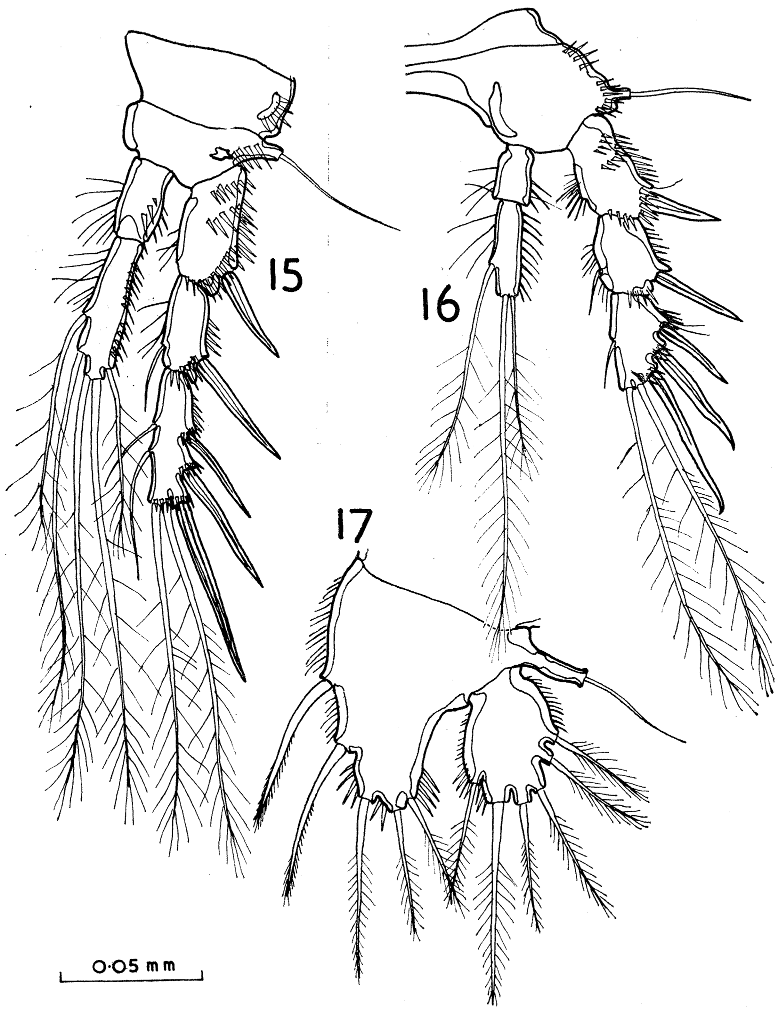


Figs 5–10. *Heterolaophonte wellsi*, ♀. Fig. 5, operculum and furca; fig. 6, R + A1; fig. 7, A2; fig. 8, A2exp; fig. 9, Md; fig. 10, Mxl.

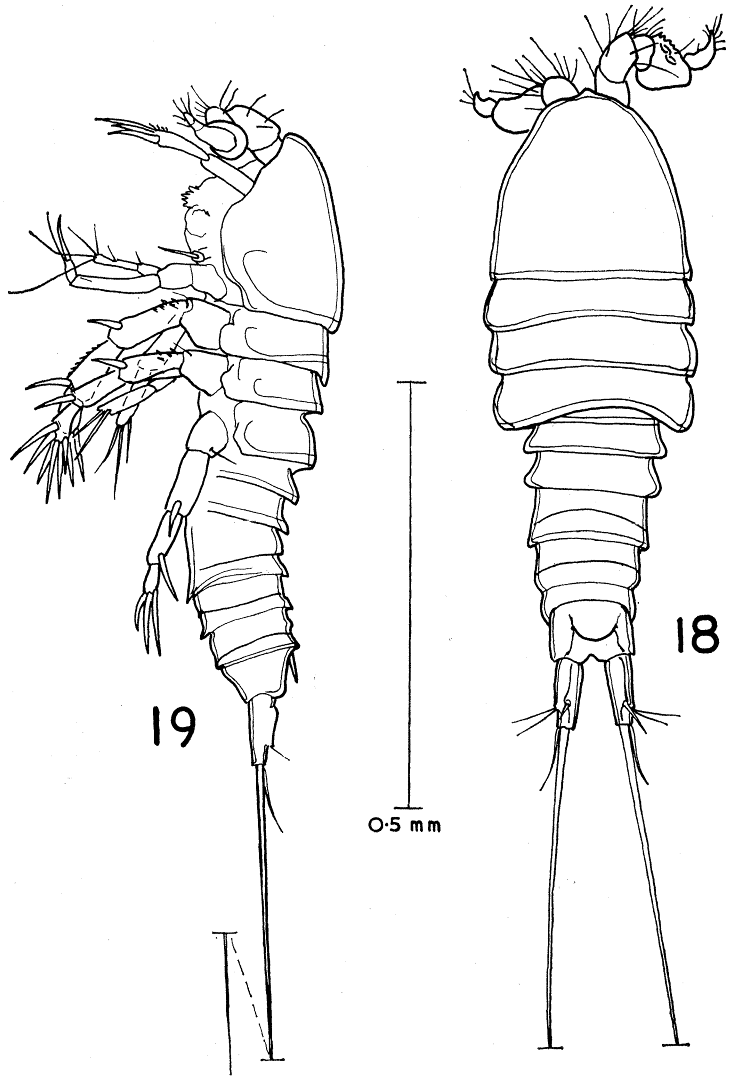


Figs 11–14. *Heterolaophonte wellsi*, ♀. Fig. 11, Mx; fig. 12, Mxp; fig. 13, P1; fig. 14, P2.

Male allotype (figs 18–26). Abdomen ornamented as in the female, but decidedly slimmer in proportion to the rest of the body (figs 18, 19). Antennule (fig. 20) with about six very indistinct segments, of which the fourth bears the aesthetasc. Antenna (fig. 21) as in the female, but bearing two subterminal hooked spines, instead of only one such spine as in all four females examined. Swimming legs showing the usual sexual dimorphism; endopods decreasing in length progressively from P2 to P4, but each of them with two segments. Setal formula as in the female, except that, on one side, P2exp3 has four outer spines (fig. 24; abnormal), and P3exp3 has a possible second inner seta (below that shown in Figure 25, but on the other leg of this pair).



Figs 15–17. *Heterolaophonte wellsi*, ♀. Fig. 15, P3; fig. 16, P4; fig. 17, P5.



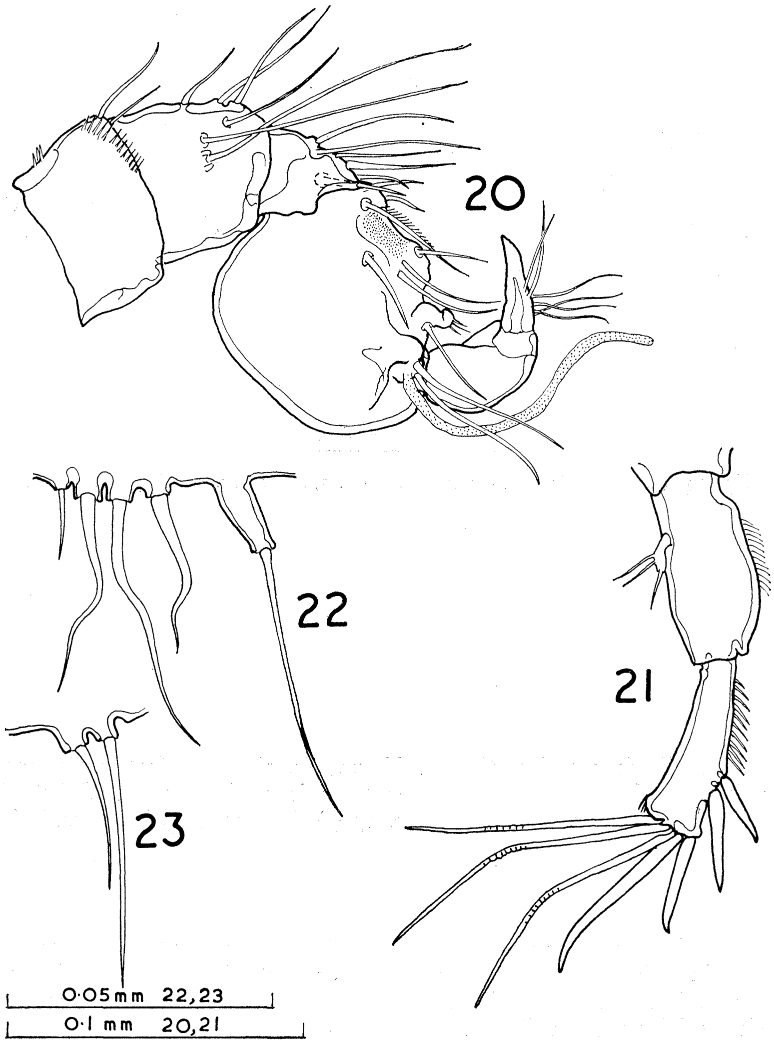
Figs 18, 19. *Heterolaophonte wellsi*, ♂. Fig. 18, dorsal view; fig. 19, side view.

This possible second inner seta is concealed behind the inner margin of the segment bearing it, but there is a distinct break in the chitin exactly where it appears to originate. The formula for P3enp2 might equally well be 320 or 221; having only one other male, I am unwilling to dissect it until more males have been found.

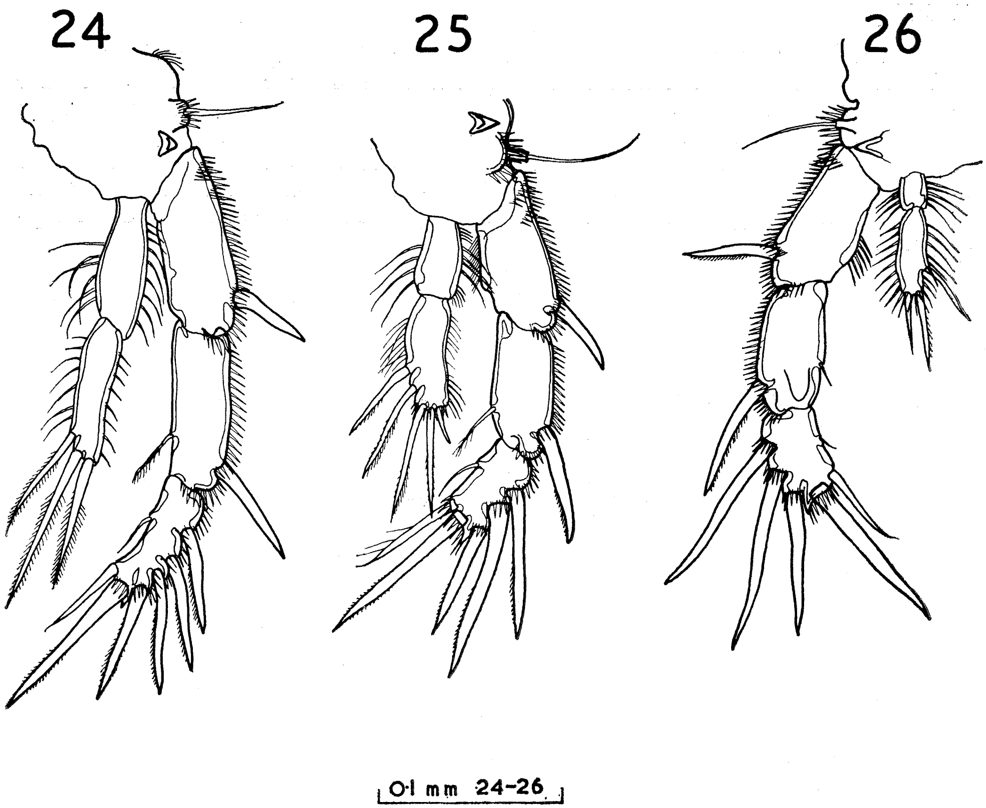
P5 (fig. 22) with four setae, all of which are smooth and rather limp; P6 (fig. 23) with two smooth setae, the outer being the longer.

Variability

The following specimens have been dissected; the holotype, a female paratype, and a copepodite, all from locality 10, and the male allotype and a second female paratype from locality 16B. The only variations found were, that in the first paratype the lefthand endopod of P4 had the formula 0.220, and that in the second paratype both exopods of P4 had the formula 0.0.123. Paratype 2 was 0.82 mm long, the other females (including those not dissected) ranging from 0.7 to 0.8 mm in length, and the copepodites from 0.45 to 0.6 mm in length. Length of holotype 0.82 mm, of allotype 0.67 mm.



Figs 20–23. *Heterolaophonte wellsi*, ♂. Fig. 20, A1; fig. 21, A2; fig. 22, P5; fig. 23, P6.



Figs 24–26. *Heterolaophonte wellsi*, ♂. Fig. 24, P2; fig. 25, P3; fig. 26, P4.

Remarks

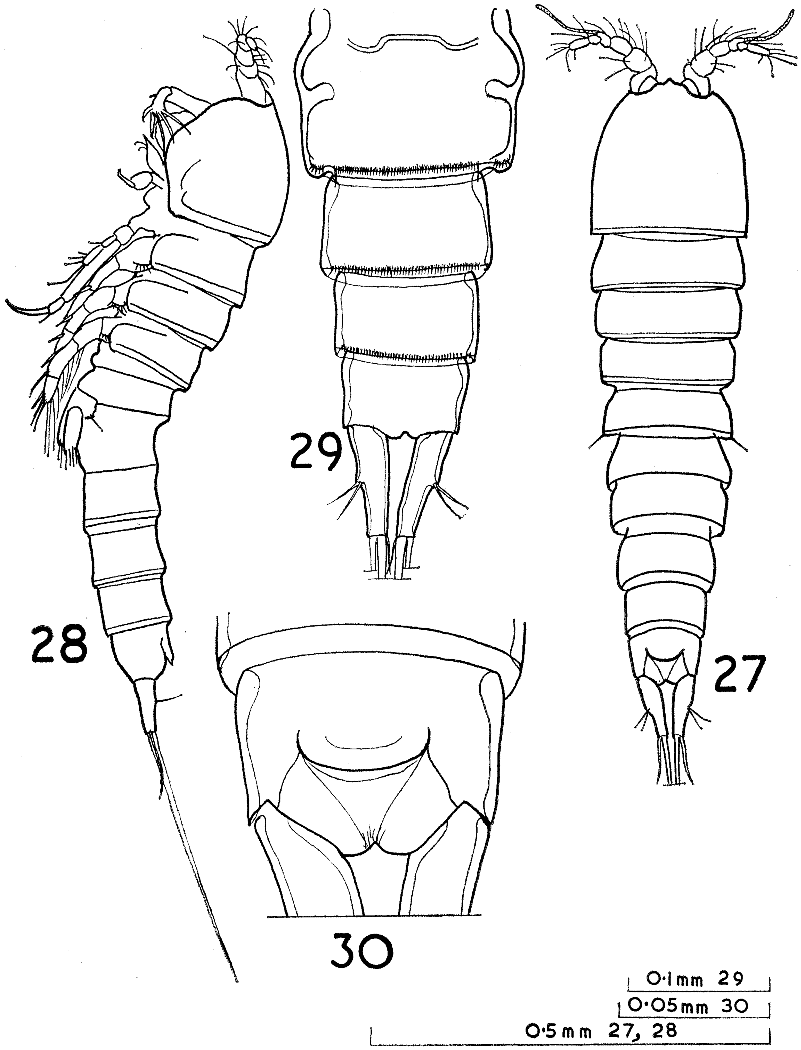
Although P1 is very like that of *Normanella*, all other features of the present species combine to place it unequivocally in the *quinquespinosa*-group of *Heterolaophonte*; the diagnosis of this group (Lang, 1948, p. 1365) does not require emendation, but a revised key to it is given below.

Ecology

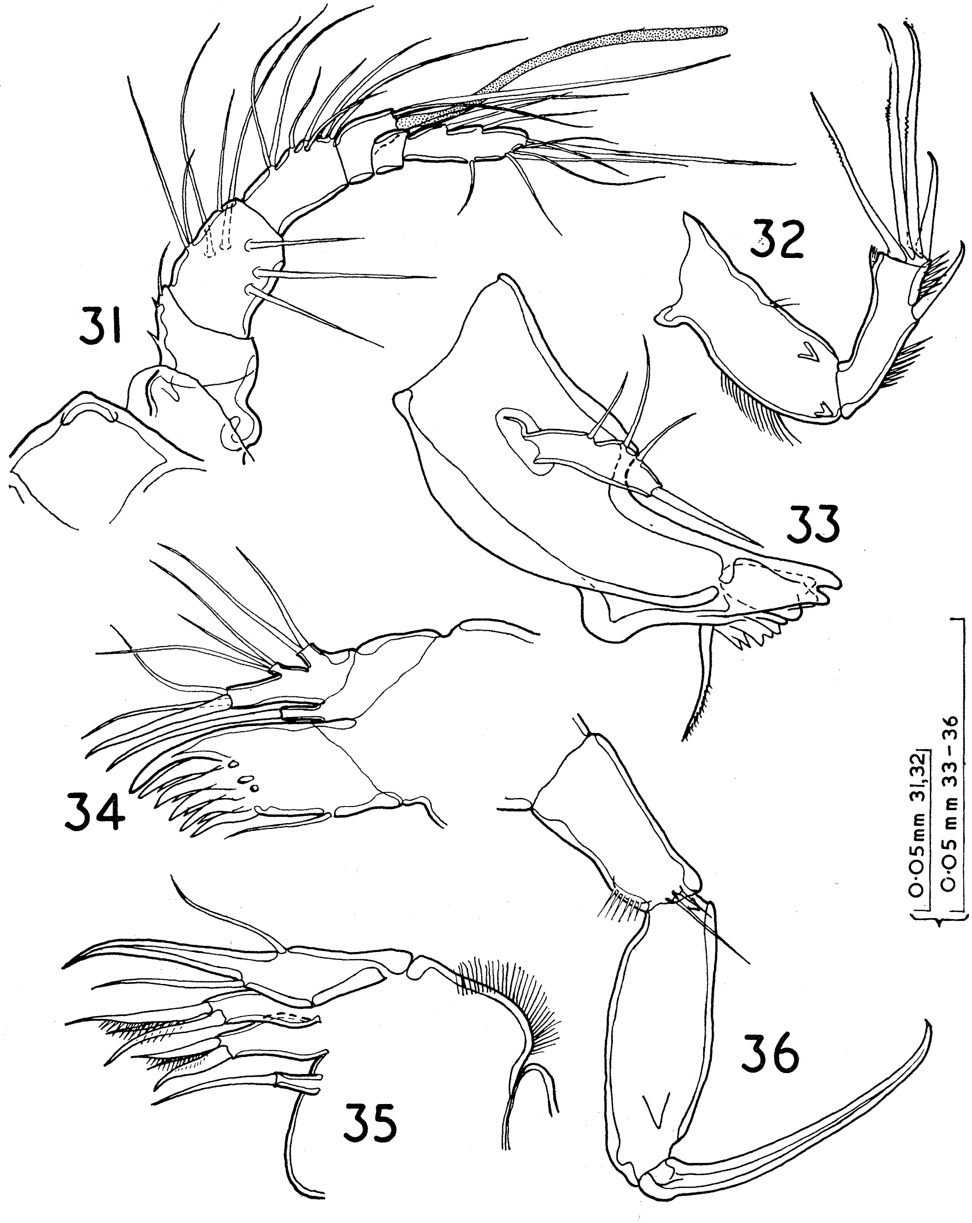
This species appears to prefer bottom sediments rather than algae (see ecology section, below); it is most unusual for a species of *Heterolaophonte* to be found in saline lakes that have been separated from the sea for perhaps centuries, although several other species which are basically marine can stand short periods of lowered or variable salinity in estuaries or tidepools (Lang, 1948).

Heterolaophonte quinquespinosa (Sewell)

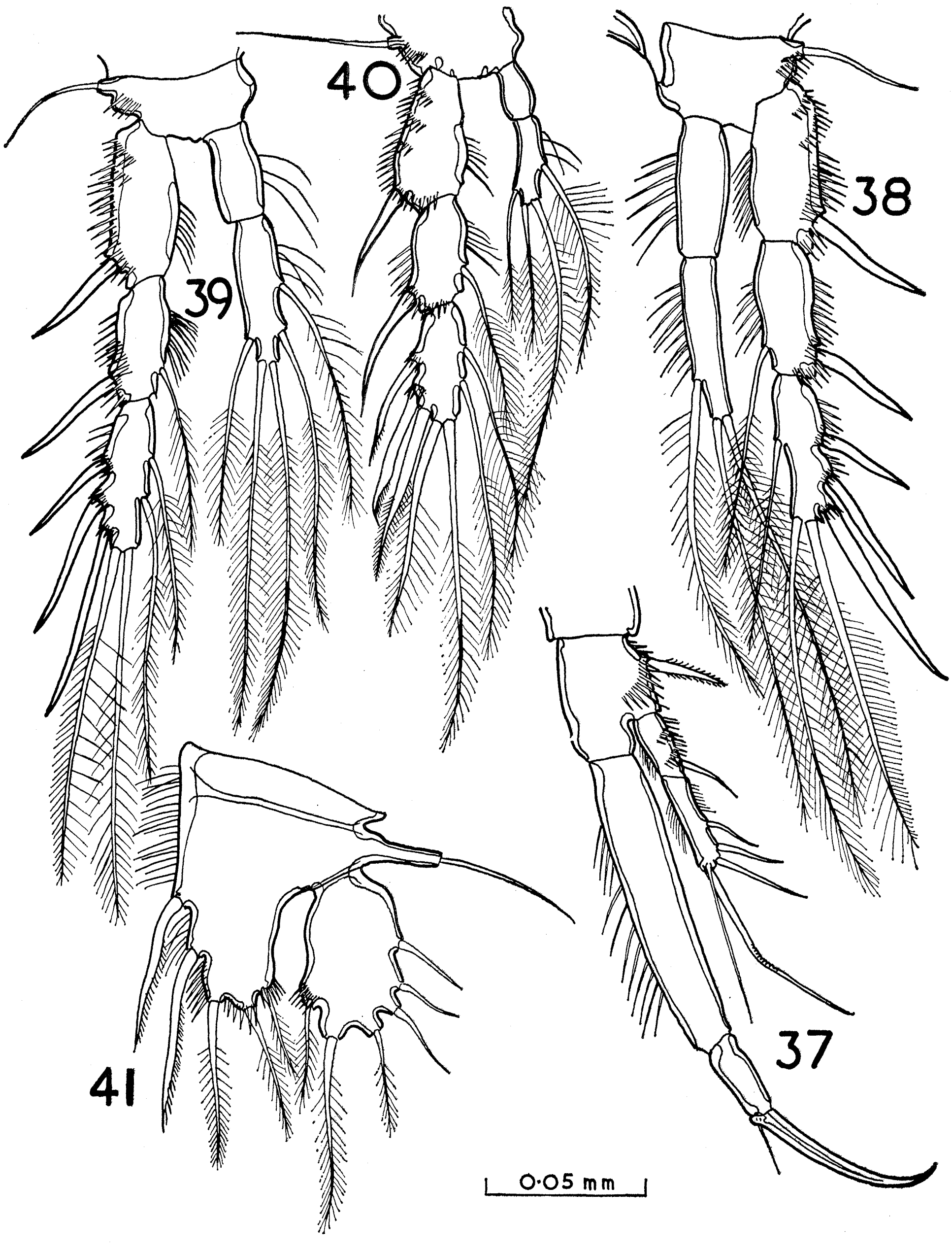
Dr J. B. J. Wells (unpublished) has come to the conclusion that this is a senior synonym of *H. sigmoides* (Willey); he kindly sent me the female studied here (figs 27–41), which was sent to him by Dr Bodin from Marseilles (Bodin, 1964, p. 151, as *H. sigmoides*). He also sent me two specimens of his own (Wells, 1963, p.24, as *H. sigmoides*), but unfortunately these were both mounted whole on slides, and the overlapping of the limbs made it impossible to see the setal formula and associated details; however, in general appearance these specimens closely resembled the Marseilles specimen. It should be noted that the citation by Wells of this species from Réunion Island (1963, p. 24) is more likely to apply to *H. parasigmoides* Bozic (1969) (=*H. sigmoides* in Bozic 1964).



Figs 27–30, *Heterolaophonte sigmoides*, ♀. Fig. 27, dorsal view; fig. 28, side view; fig. 29, ventral view of abdomen; fig. 30, operculum.



Figs 31–36. *Heterolaophonte sigmoides*, ♀. Fig. 31, R + 1A; fig. 32, A2; fig. 33, Md; fig. 34, Mxl; fig. 35, Mx; fig. 36, Mxp.



Figs 37–41. *Heterolaophonte sigmoides*, ♀. Fig. 37, P1; fig. 38, P2; fig. 39, P3; fig. 40, P4; fig. 41, P5.

The main differences between the Marseilles female and that of *H. wellsi* are shown in Table 1. Other noteworthy features in the former are: (1) the single posteroventral row of small needle-like spinules on each abdominal segment (fig. 29); (2) the richly developed combs of spinules on the exopods of P1 to P4 inclusive (figs 37–40); and (3) the shape of the rami of P5 (fig. 41). The remaining figures are presented here as a matter of record, against the day when a thorough knowledge of the range of variation in each sex, over as wide a geographical range as possible, will permit a deeper revision of the *quinquespinosa*-group. At present, the males are too poorly known to make them worth incorporating in a key; the following key refers only to females, and, if the Marseilles population should be found to have a spine on the basis of P1, then the difference between it and the Bermudan population disappears.

Of the three species of *Heterolaophonte* published since the most recent key (Lang, 1965, p. 468), *H. norvegica* Drzycimski (1968) leads to couplet 13 in Lang's key, whereas *H. parasigmoides* Bozic and *H. wellsi* nov. sp. both lead to couplet 26. However, because of the changes in synonymy discussed above, the following key is intended to replace couplets 25 to 27 inclusive of Lang's key.

Key to the **quinquespinosa** group of **Heterolaophonte** Lang (females only)

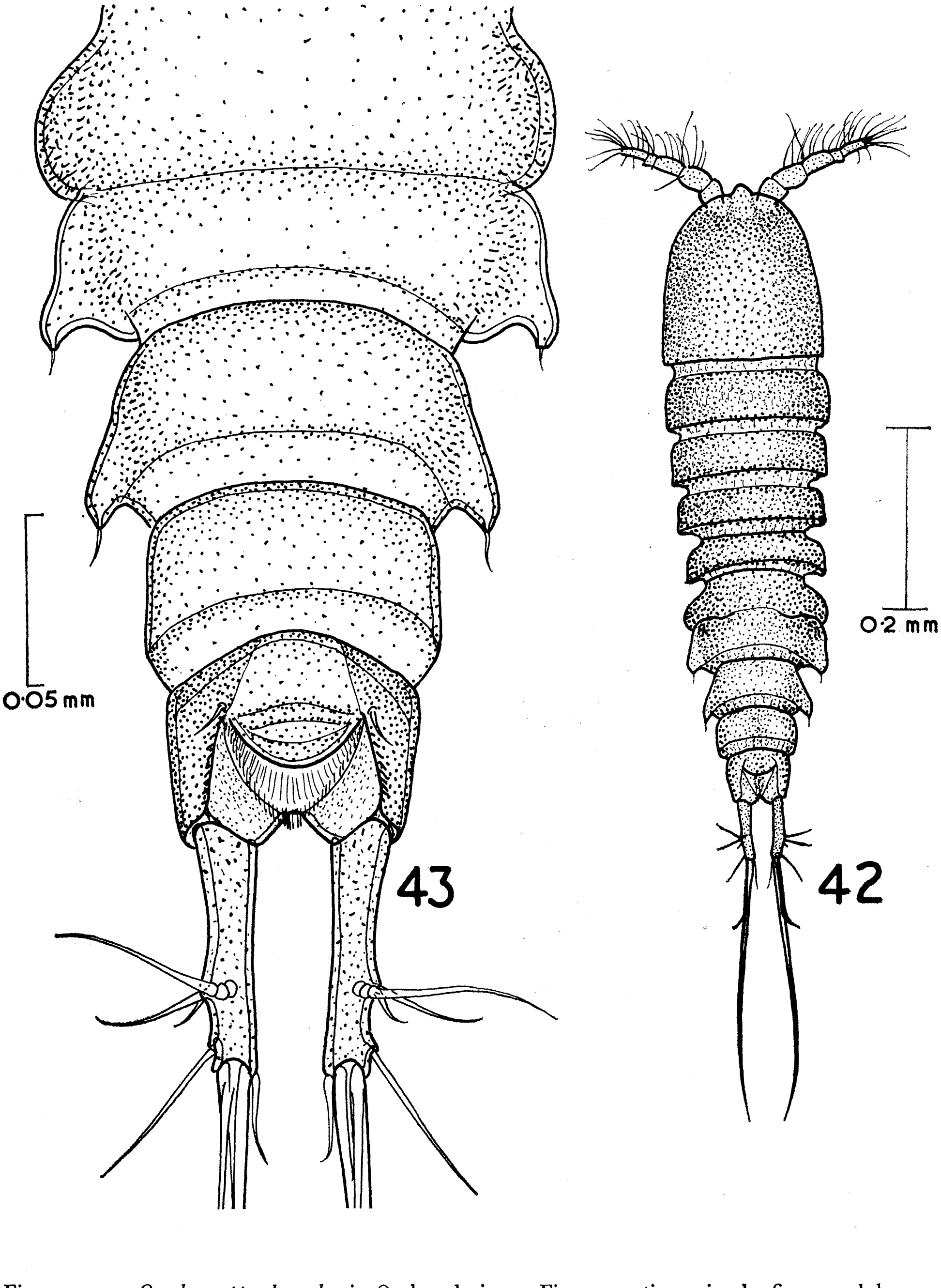
1. P1enp2, accessory seta longer than terminal claw .... *H. wellsi*
   P1enp2, accessory seta shorter than terminal claw 2
2. P1enp2 more than half as long as terminal claw .... *H. longifurcata*
   P1enp2 less than half as long as terminal claw 3
3. P1basis without a spine .... *H. quinquespinosa*—Marseilles
   P1basis with a spine 4
4. P3exp3 with one inner seta; P3,enp1 with an inner seta and enp2 with three inner setae; P4exp3 with a total of 6 spines and setae .... *parasigmoides*
   P3exp3 with two inner setae; P3, enp1 with no inner setae and enp2 with two inner setae; P4exp3 with a total of 7 spines and setae .... *H. quinquespinosa*—Bermudan

Redescription of **Onychocamptus bengalensis** (Sewell)
(Figs 42–65)

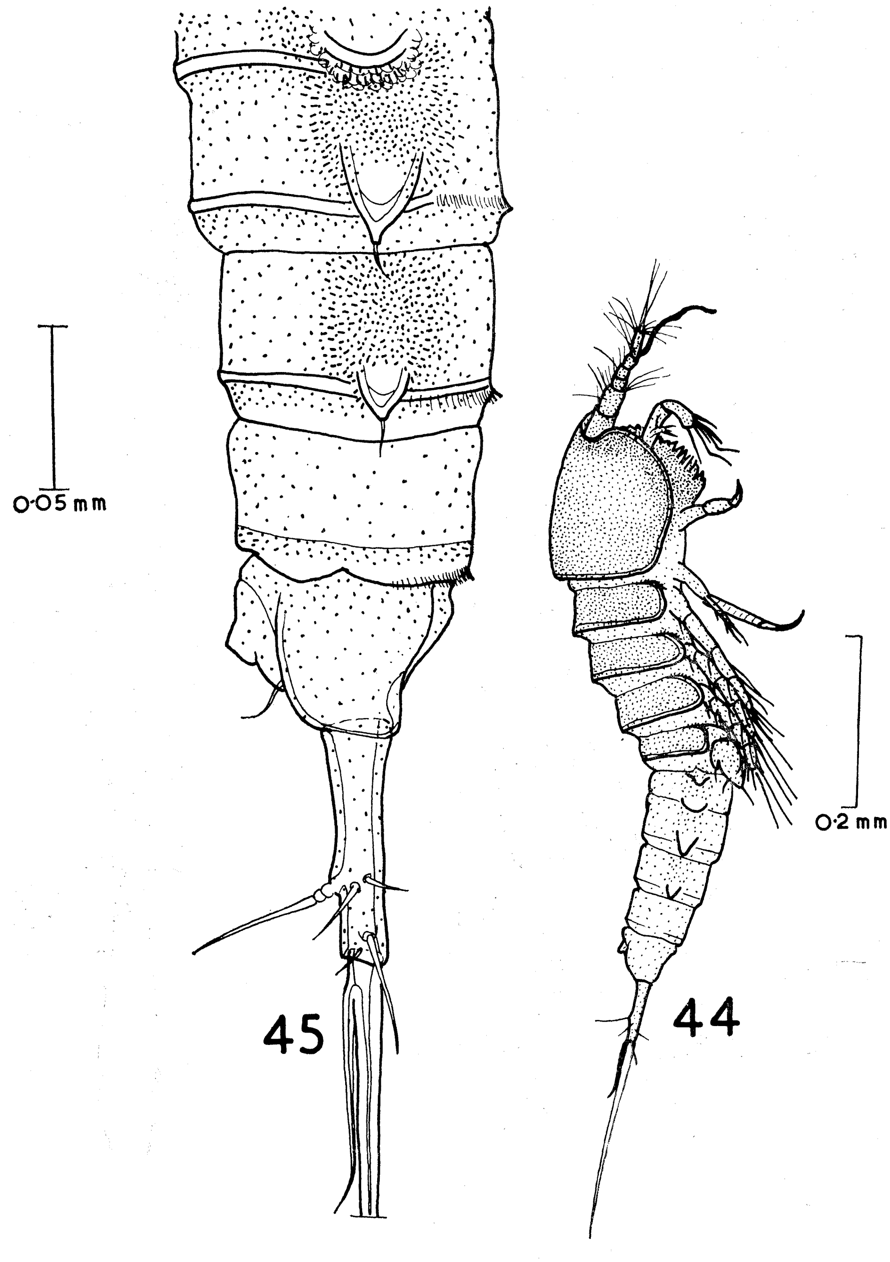
This species was well represented in the present series of samples (Table 2), and I have also found it in moderate numbers in brackish lagoons (Narrabeen, Manly, and Dee Why) in the northern coastal suburbs of Sydney. The original description (Sewell, 1934, from near Calcutta) is very incomplete, but fortunately includes one highly diagnostic character, the fused rami of the female P5 (remarked upon also by Bayly and Williams, 1966, p. 217, as *Onychocamptus* sp.), which appears to be unknown in any other laophontid. Although I have been unable to obtain any specimens from India, I can find no reason to doubt the specific identity of the Indian and Australian animals.

Description

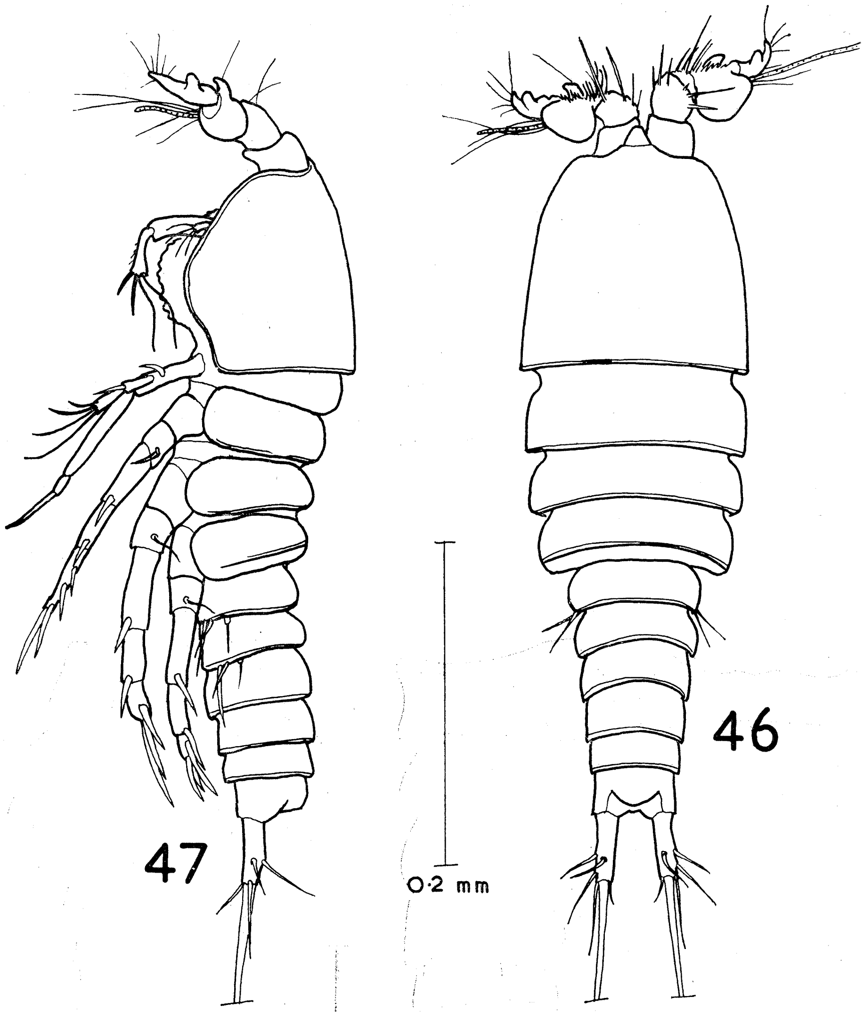
Adult female (figs 42–45, 51–61). Length 0.74 mm (in the female figured, from Narrabeen Lagoon, but most females are about 0.6 to 0.7 mm long). Body of the standard laophontid form, not compressed or flattened, the somites clearly demarcated; prosome only slightly wider than the rest of the body, and carrying an



Figs 42, 43. *Onychocamptus bengalensis*, ♀, dorsal view. Fig. 42, entire animal; fig. 43, abdomen with operculum and furca.



Figs 44, 45. *Onychocamptus bengalensis*, ♀, side view. Fig. 44, entire animal; fig. 45, abdomen and furca.



Figs 46, 47. *Onychocamptus bengalensis*, ♂. Fig. 46, dorsal view; fig. 47, side view.

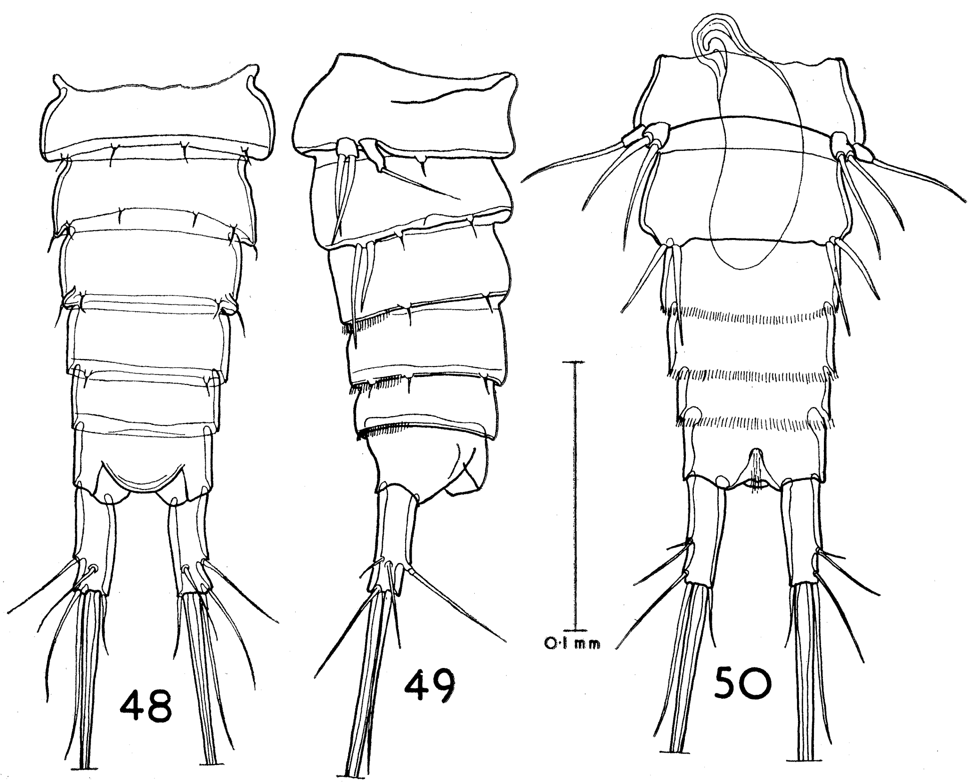
inconspicuous triangular rostrum. Genital double-somite broader than long, clearly divided, the rear half with a marked lateral keeltooth ending in a sensilla (as on the somite behind it; figs 42, 43). The rear half of the double-somite, and each of the somites behind it, bears a ventrally complete comb of spinules on the rear margin (fig. 45, ♀; Figs 49, 50, ♂). Operculum (unknown to Lang, 1948) deeply curved, with a smooth edge (fig. 43). Caudal rami about six times as long as broad in dorsal view; the middle terminal furcal seta in the present female is about as long as the abdomen and furca combined (much more than this, in other females), the other furcal setae all being short. The short uppermost terminal furcal seta appears to be fused at its base with the large furcal seta (Figs 43, 45); otherwise, none of the furcal setae present any unusual features.

Antennule (fig. 51) with five segments, of which the third bears the aesthetasc. Antenna (fig. 52) with a terminal group of setae of which one (kinked in other females) is straight, two are kinked, and two are hooked at the tip; one of these last two is much longer than the other. Subterminally, there are two more short hooked setae and a simple seta. The allobasis bears a single-segmented exopod with two lateral and two terminal setae, all four setae being coarsely plumose. Mandible (fig. 53) with a small single-segmented exopod bearing five setae; maxillules (fig. 54) not remarkable; maxillae (fig. 55) with an area on the precoxa covered with irregular rows of small spinules; maxillipede (fig. 56) with a strong claw, as long as the palm.

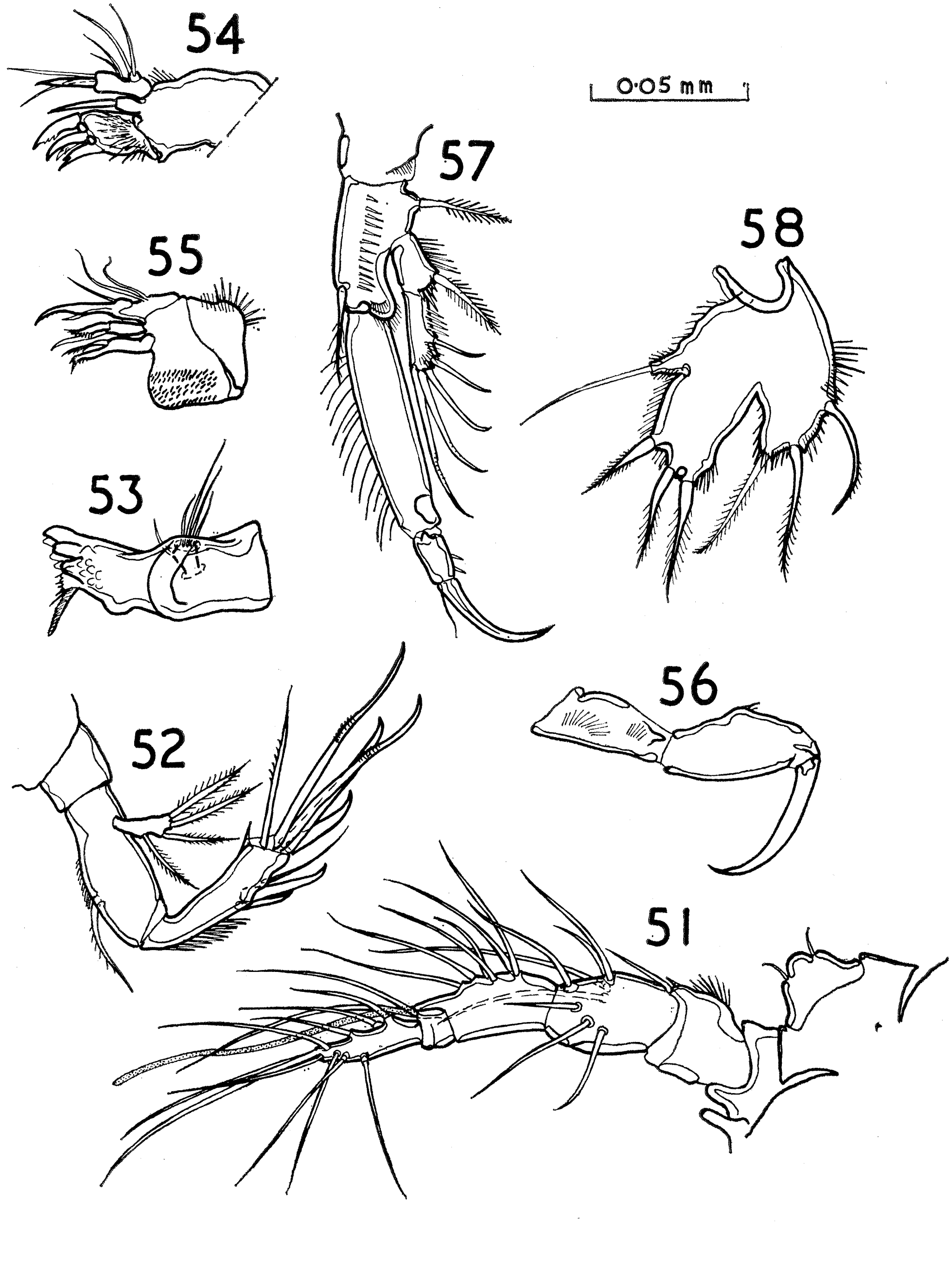
P1 (fig. 57) with a two-segmented exopod whose distal segment bears three spines and two terminal kinked setae, all five appendices being smooth; the strongly built two-segmented endopod bears a heavy claw and a very slender accessory setae, both terminally.

Swimming legs with three-segmented exopods and two-segmented endopods, the latter being much shorter than the exopod on each leg. Setal formula:

P2 (fig. 59)		P3 (fig. 60)		P4 (fig. 61)	
exp	enp	exp	enp	exp	enp
0.1.123	0.220	0.1.123	0.321	0.1.123	0.120 or 0.111



Figs 48, 50. *Onychocamptus bengalensis*, ♂, abdomen. Fig. 48, dorsal view; fig. 49, side view; fig. 50, ventral view.



Figs 51–58. *Onychocamptus bengalensis*, ♀. Fig. 51, R + A1; fig. 52, A2; fig. 53, Md; fig. 54, Mxl; fig. 55, Mx; fig. 56, Mxp; fig. 57, P1; fig. 58, P5.

I am unable to decide the true arrangement of the terminal endopod setae of P4, and therefore alternatives are given.

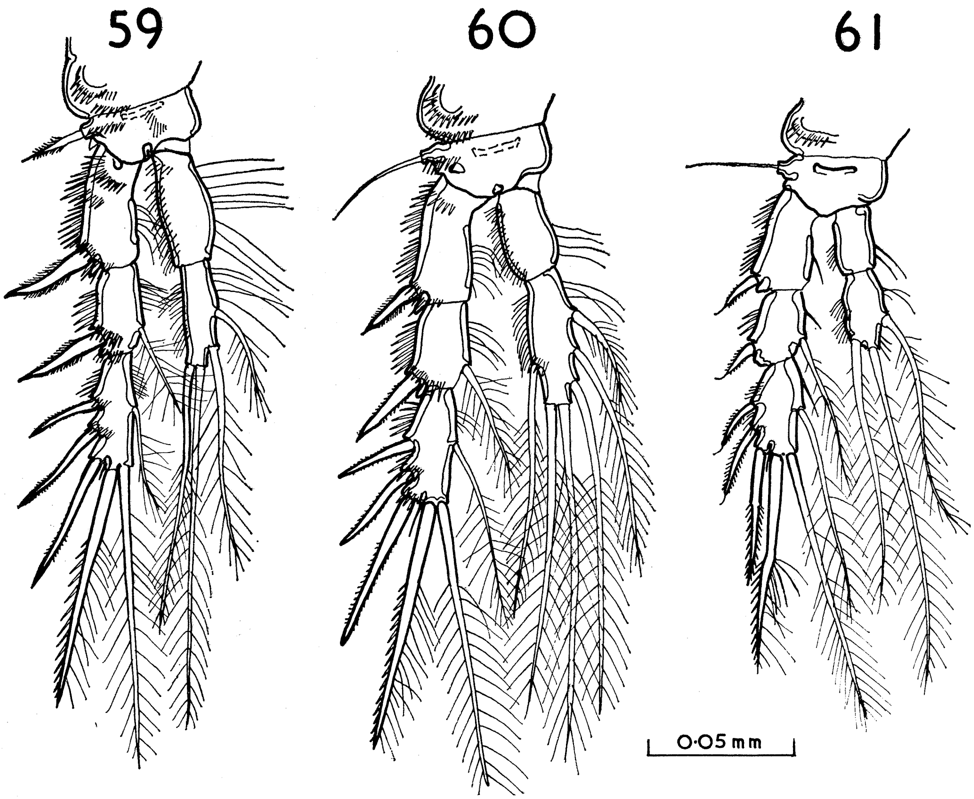
P5 (fig. 58) with fused rami; each ramus bears three coarsely plumose setae.

Adult male (figs 46–50, 62–65). Length 0.46 mm (Table 2, locality 12); abdomen much slenderer, compared with the rest of the body, than in the female. Antennule (fig. 62) indistinctly six- or seven-segmented, the fourth segment inflated and bearing the aesthetasc.

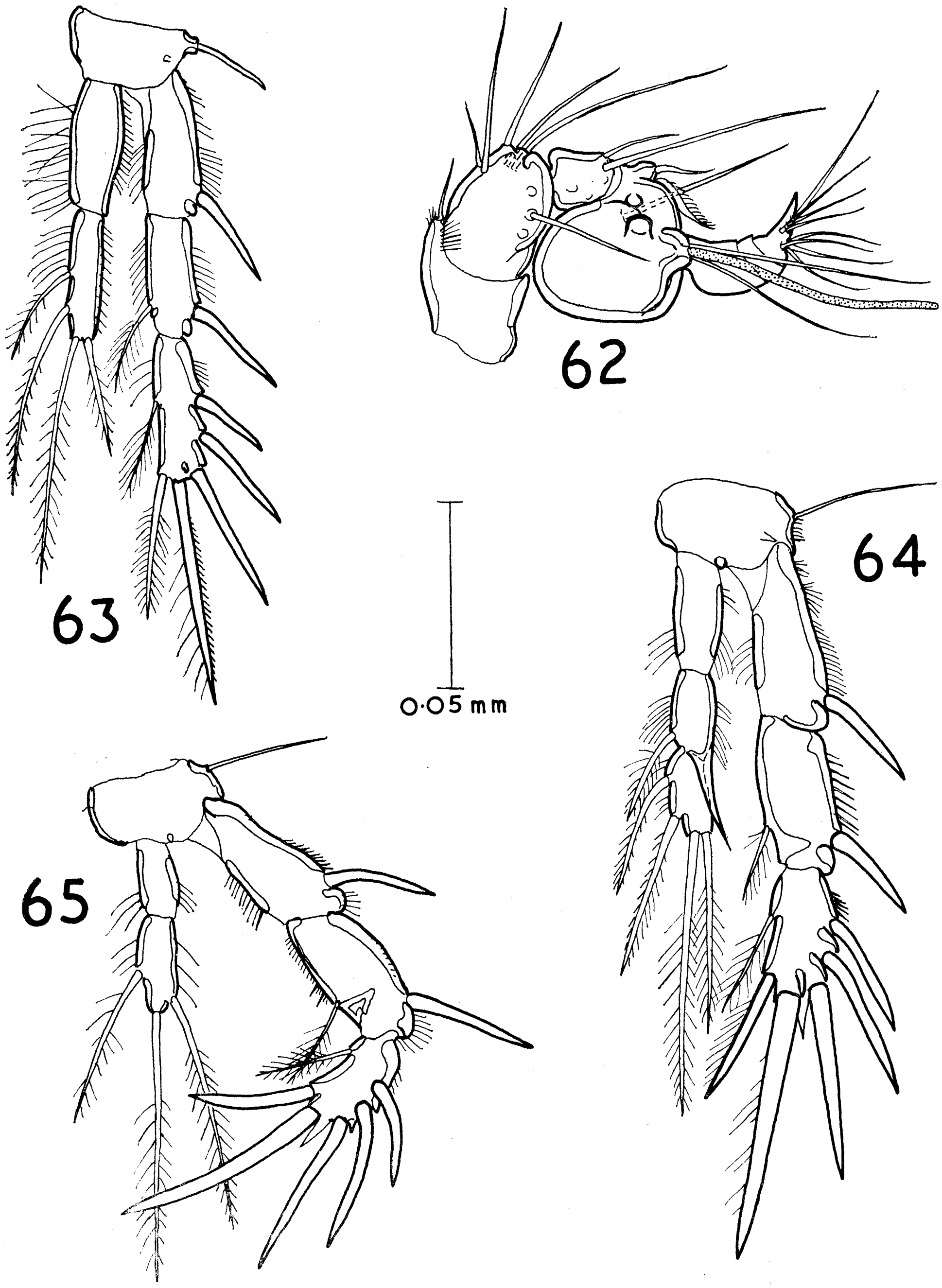
In both sexes from the samples listed in Table 2, the P1 was much slenderer (fig. 47) than in the female described above from Narrabeen Lagoon; unfortunately, no males from the Sydney area are yet available for comparison.

P2 (fig. 63) very much as in the female; P3 (fig. 64) and P4 (fig. 65) with heavily built exopods, that of P4 being strongly incurved. Setal formula as in the female, except that the two distal endopod segments of P3 are discrete, the formula for this endopod in the male thus being 0.1.220; the middle segment of this endopod has a tapering adaxial thorn reaching to slightly beyond the end of the distal segment.

P5 and P6 (figs 49, 50) each with two simple setae.



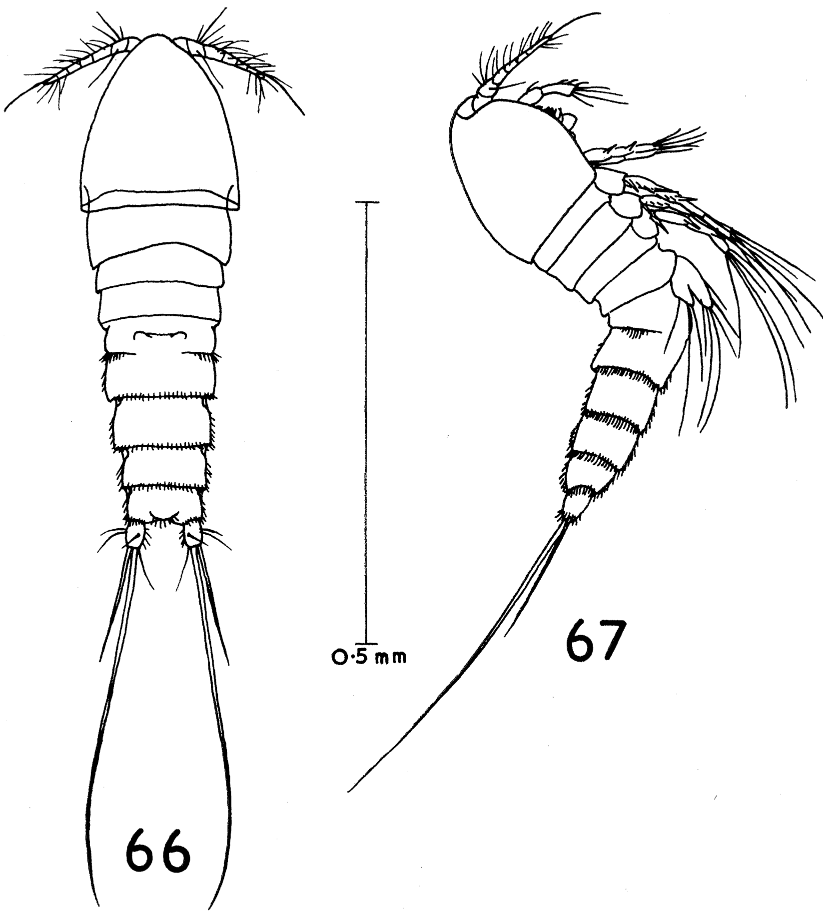
Figs 59–61. *Onychocamptus bengalensis*, ♀. Fig. 59, P2; fig. 60, P3; fig. 61, P4.



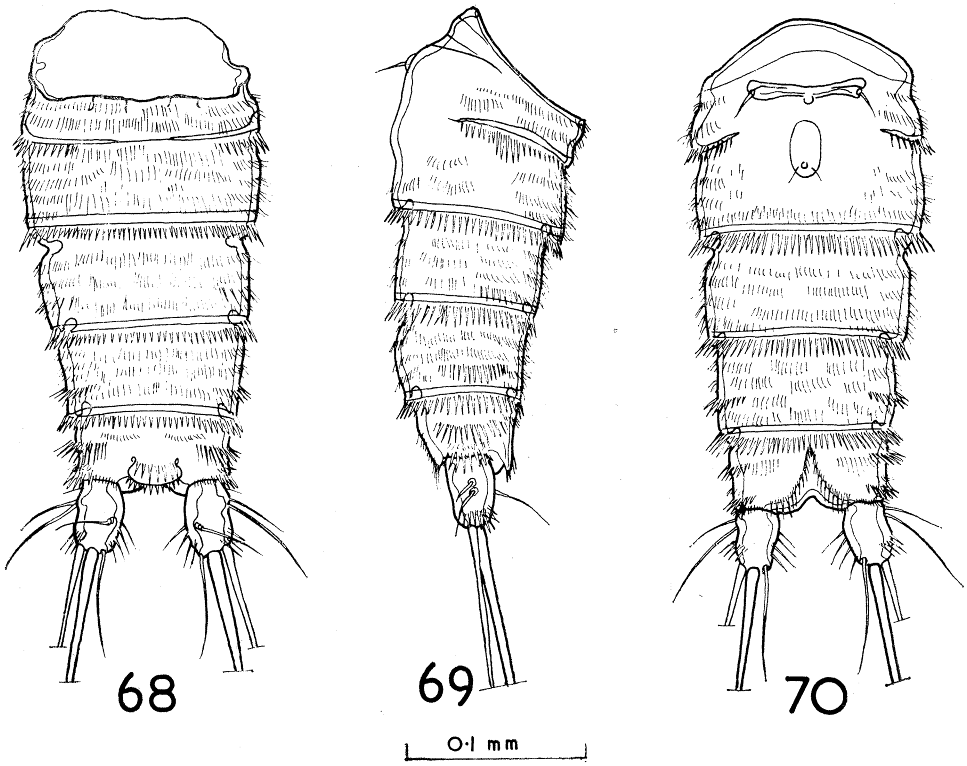
Figs 62–65. *Onychocamptus bengalensis*, ♂. Fig. 62, A1; fig. 63, P2; fig. 64, P3; fig. 65, P4.

Cletocamptus deitersi (Richard) (Figs 66–81)

The figures are presented merely as proof of the presence of this South American species in Australia, where it has not previously been recorded; the single female, from locality 10E, was indistinguishable from Jamaican specimens (now in the United States National Museum) which I have recently examined, and all agreed so closely with the descriptions in Lang (1948) and Yeatman (1963) as to make a detailed description unnecessary. The only species of this genus not in Lang's monograph is *C. xenuus* Por (1958), which is very different in many ways from *C. deitersi*.



Figs 66, 67. *Cletocamptus deitersi*, ♀. Fig. 66, dorsal view; fig. 67, side view.



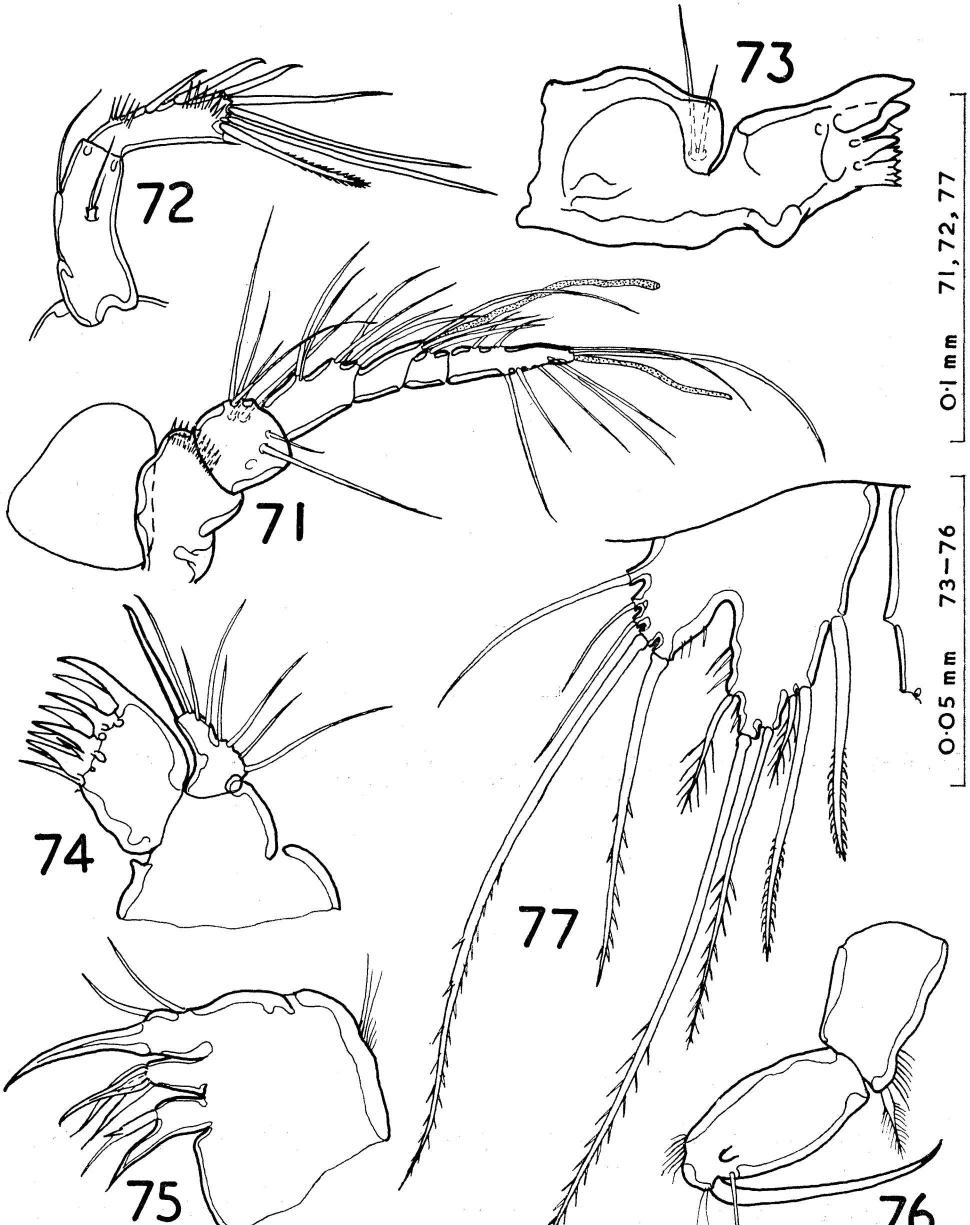
Figs 68–70. *Cletocamptus deitersi*, ♀, abdomen. Fig. 68, dorsal view; fig. 69, side view; fig. 70, ventral view with genital area.

The female from 10E showed the following states of characters, which in this species are notoriously variable:

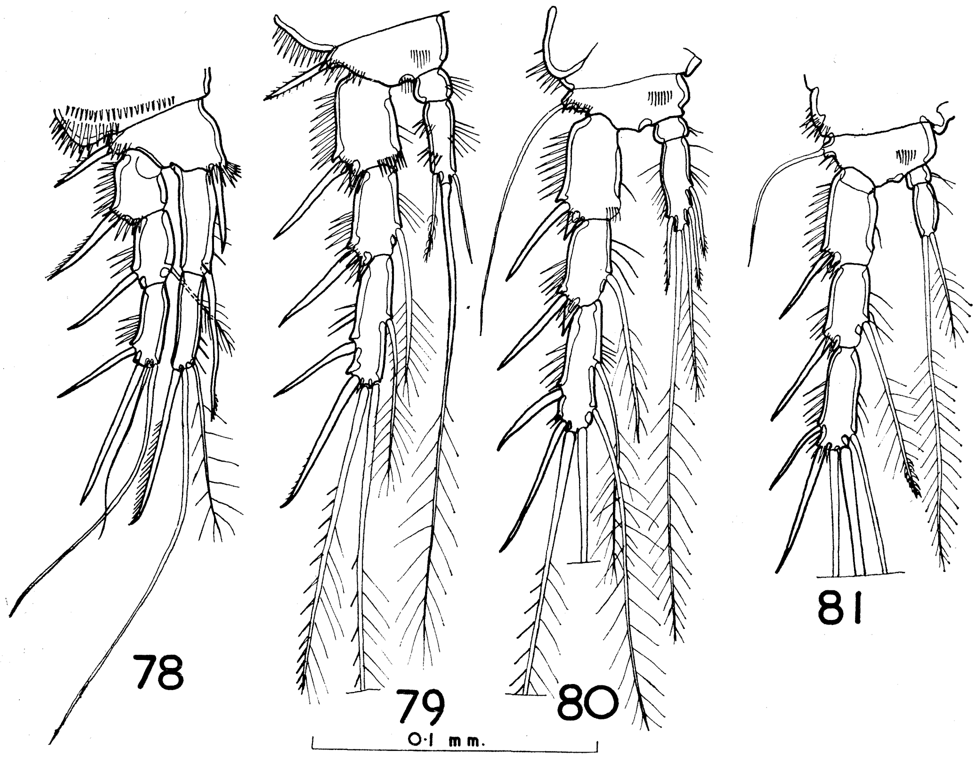
(1) The antennal exopod (fig. 72) on one side of the animal is of a single segment, bearing two simple terminal setae of which the adaxial is the shorter; the exopod of the other antenna could not be seen clearly;

(2) The site of the mandibular palp (fig. 73) gives rise to two simple setae; and

(3) P5 (fig. 77) has five exopod setae and six basiendopod setae.



Figs 71–77. *Cletocamptus deitersi*, ♀. Fig. 71, R + A1; fig. 72, A2; fig. 73, Md; fig. 74, Mxl; fig. 75, Mx; fig. 76, Mxp; fig. 77, P5.



Figs 78–81. *Cletocamptus deitersi*, ♀. Fig. 78, P1; fig. 79, P2; fig. 80, P3; fig. 81, P4.

ECOLOGY

In a letter dated 14.4.1970, Dr Bayly states, "Locality 10E is the only one that is not 'athalassic' in the sense that I defined it in 1966 (Bayly and Williams, 1966, p. 178) and 1967 (chapter 3 in Weatherly, 1967). . . . It is an 'open' locality connected with the sea by a stream; the salinity was 15.8‰."

In a letter dated 11.5.1970, he gives the following ecological details: "All collections were made by casting a net from the lake shore or by wading about in shallow water with the net held just above the bottom, so that they are 'littoral' collections in the normal sense of the word. However, you must realise that, in more highly saline lakes, there is frequently no littoral vegetation, and conditions are very uniform in a horizontal direction from one extreme shoreline to that opposite. In other words, it is most unlikely that a collection taken from the middle of a highly saline lake would differ very significantly from a 'littoral' collection. It should also be borne in mind that all of the Beachport-Robe lakes are very shallow, and if weed occurs near the shore it also occurs all over the lake. All collections in December 1969, except those from localities 10 and 12, were from highly weedy localities. Localities 10 and 12 were not weedy, and harpacticoids would have been caught because the net was just above the bottom, and walking in front of it would have disturbed the bottom sediments. With respect to September 1966, locality 16B was definitely without any weeds (you never find any filamentous algae or higher plants in the large localities 10A and 16B). A significant fact now emerges, namely that *Heterolaophonte wellsi* has been collected only from high-salinity localities lacking weeds; it therefore appears to be a bottom-sediment-dweller, rather than a weed-dweller. In March 1964, locality 12 (which yielded quite large numbers of *M. baylyi* and *O. bengalensis*, and small numbers of *R. propinqua*) had a thick growth of filamentous algae".

ACKNOWLEDGEMENTS

I am most grateful to Dr I. A. E. Bayly (Monash University) for sending me the samples and all necessary ecological information, for his help during the course of the work, and for his constructive criticisms of the completed typescript. Thanks are also due to the Chief of the Division of Fisheries and Oceanography, CSIRO, for the loan of phase-contrast equipment.

REFERENCES

Bayly, I. A. E., 1970. Further studies on some saline lakes of south-east Australia. *Aust. J. mar. Freshwat. Res.* 21: 117–129.

Bayly, I. A. E. and Williams, W. D., 1966. Chemical and biological studies on some saline lakes of south-east Australia. *Aust. J. mar. Freshwat. Res.* 17: 177–228.

Bodin, P., 1964. Recherches sur la systématique et la distribution des copépodes harpacticoides des substrats meubles des environs de Marseille. *Rec. Trav. Stn mar. Endoume* 51 (Bull. 35): 107–183.

Bozic, B., 1964. Copépodes harpacticoides et cyclopoides de La Réunion, II. Plage Saint-Pierre. *Bull. Mus. natn Hist. nat. Paris* (2), 36: 481–499.

Bozic, B., 1969. Copépodes harpacticoides de La Réunion, VI. *Bull. Mus. natn Hist. nat. Paris* (2) 41: 867–882.

Drzycimski, I., 1968. Neue Harpacticoida (Copepoda) aus dem west-norwegischen Küstengebiet. *Sarsia* 31: 15–24.

Hamond, R., 1969. Methods of studying the copepods. *J. Quekett microsc. Club* 31: 137–149.

Hamond, R., 1971. The Australian species of *Mesochra* (Crustacea: Harpacticoida), with a comprehensive key to the genus. *Aus. J. Zool.* (Suppl. 7): 1–32.

Hamond, R., (in press). The Australian species of *Robertsonia* (Crustacea, Harpacticoida). *Rec. Aust. Mus.*

Kiefer, F., 1967. Cyclopiden aus salzhaltigen Binnengewässern Australiens (Copepoda). *Crustaceana* 12: 292–302.

Lang, K., 1948. *Monographie der Harpacticiden.* Nordiska Bokhandeln, Stockholm.

Lang, K., 1965. Copepoda Harpacticoidea from the Californian Pacific coast. *K. svenska Vetensk Akad. Handl.* (4), 10 (2): 1–560.

Por, F. D., 1968. Copepods of some land-locked basins in the islands of Entedebir and Nocra (Dahlak Archipelago, Red Sea). *Bull. Sea Fish. Res. Stn Israel* 49: 32–50.

Sewell, R. B. S., 1934. A study of the fauna of the salt lakes, Calcutta. *Rec. Ind. Mus.* 36: 45–121.

Weatherley, A. H., 1967. *Australian inland waters and their fauna; eleven studies.* A.N.U. Press, Canberra.

Wells, J. B. J., 1963. Copepoda from the littoral region of the estuary of the River Exe (Devon, England). *Crustaceana* 5: 10–26.

Yeatman, H. C., 1963. Some redescriptions and new records of littoral copepods for the Woods Hole, Massachusetts region. *Trans. Am. microsc. Soc.* 82: 197–209.

TABLE 1

Differences between the females of *Heterolaophonte sigmoides* (from Marseilles) and *H. wellsi*

Character	*sigmoides*	*wellsi*
A2exp	absent; site indicated only by two setae	present, with 3 setae
P1basis, inner spine	absent	present
P1exp2, inner terminal seta	straight, and shorter than outer terminal seta	curving outwards, longer than outer terminal seta
P1enp2, terminal claw	stout, curved along whole length	slender, straight for most of length but with curved tip
P1enp2, seta next to claw	much shorter than claw	longer than claw
P2–P4, inner setae of exopods	long and pinnate	short and bare
P4exp3, inner setae	2	1
P4,enp2 reaches as far as	end of exp1	end of exp2
P4enp2, outer seta	present	absent (but present on one side of female paratype 1)
P5,benp reaches	not quite to end of exp	level with end of exp, or even slightly beyond it

TABLE 2

Copepods in the saline lake samples, collected by Dr Bayly

Locality number	2	4	6	10	10A	10B	10C	10E	12	12	13	13	13	13	14	15	15A	15B	16	16B
Date	March 1964			29.12. 1969	3.9. 1966	as 10	27.12. 1969	2.1. 1970	as 2	as 10	as 2	1.3. 1964	as 10A	as 10	as 2	as 10	31.12. 1969	as 10	as 2	as 10A
Halicyclops ambiguus Kiefer	2 juv.					3,1, 0,1.	34,14, 0,0.	few	7,0, 1,0.		2,1, 0,0.	1 juv.				19,7, 0,0.	many			
Amphiascoides nov. sp.								1,0. 1,0.												
Robertsonia propinqua (T. Scott)						4,2, 2,0.			7,0, 0,0.	1,0, 1,0.	5,0, 3,0.	0,0. 0,1.	0,0. 1,1.							
Mesochra baylyi Hamond	14,5, 0,0.	28,9, 0,0.	9,8, 0,0.	1,0, 0,0.	7,1, 0,0.	6*,3, 2,2.		6,5, 0,0.	11,4, 1,0.	2,2, 0,0.	4,2, 0,0.			2,1, 0,0.		17,3, 1,2.	1,0, 0,0.	1,0, 0,0.	7,0, 0,0.	30,4, 6,3.
Cletocamptus deitersi (Richard)								1,0, 0,0.												
Heterolaophonte wellsi nov. sp.				3,1, 0,18.																8,1, 2,1.
Onychocamptus bengalensis (Sewell)				1,0, 0,0.		1,0, 0,0.	5,1, 1,0.	1,0, 0,0.	18*,0, 8,2.	4,0, 3,3.	12,0, 4,0.	2,0, 5,0.	4,0, 0,0.		1,0, 5,2.					
Total species 7	2	1	1	3	1	4	2	5	4	3	4	3	2	1	1	2	2	1	1	2

48686 3.73 V. C. N.BLIGHT, GOVERNMENT PRINTER

THE HARPACTICOID COPEPODS (CRUSTACEA) OF THE SALINE LAKES IN SOUTHEAST AUSTRALIA, WITH SPECIAL REFERENCE TO THE LAOPHONTIDAE

by

R. HAMOND

RECORDS OF

THE AUSTRALIAN MUSEUM

Vol. 28, No. 17. Pages 393-420.

Figures 1-81.

SYDNEY

20 JULY, 1973

Price, $1.50

Printed by Order of the Trustees