A new record of *Ellucana longicauda* Sewell, with the description of the male  
(Copepoda: Harpacticoida: Canuellidae)*

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**ABSTRACT:** In this paper the male of *Ellucana longicauda* (Sewell, 1940) is described for the first time and a full discussion of the species is given.

**RESUME:** Dans cette publication le mâle de *Ellucana longicauda* (Sewell, 1940) est décrit pour la première fois et la position systématique de l'espèce est discutée.

1 **INTRODUCTION**

In a previous paper (Fiers 1982) the female of *Ellucana longicauda* (Sewell) was recorded from a locality off the northern coast of Papua New Guinea. At that time only two female specimens were available, so that the description was fairly concise. The discovery of the male of this species allows a detailed redescription. Some appendages however, such as the maxilliped, the fifth leg and the rostrum are not redrawn because they have been figured previously.

2 **MATERIAL**

The samples were collected by Dr J. Van Goethem, in the vicinity of Laing Island (Hansa Bay, Madang Province) in Papua New Guinea. In the following list the first number refers to the year of collection and the second one to the sample number.  
PNG 77/120: north-west side of the island, outer reef; coral sand at $-20$ m; $1 \varphi$ (preparation P 2119).  
PNG 77/411b: lagoon; fine coral sand with detritus at $-6$ m; $1 \varphi$ preserved in alcohol.  
PNG 78/15: lagoon; coral debris with mud at $-6$ m; $1 \varphi$ (preparation P 2144) and $1 \delta$ (preparation P 2427).  
PNG 78/16: lagoon; infested wood covered with mud at $-6$ m; $1 \varphi$ and $1 \delta$ preserved in alcohol.

* Leopold III Biological Station, Laing Island, Contribution no. 63.

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3 DESCRIPTION

*Ellucana longicauda* (Sewell, 1940)

**Female**

The body (Fig. 1a) is spool-shaped with a conspicuous abdomen. The whole integument is smooth. The thoracal and genital segments have almost parallel margins. The post-genital segments are tapering towards the end. The length, measured including the rostrum, varies from 11.50 to 13.40 μm. The greatest width, occurring at the height of the posterior ridge of the cephalothorax, is 270 μm (210 μm in the second specimen). The ratio of the abdomen (Fig. 2d and e) to the length is 1:2.1. The first leg-bearing segment is totally fused with the cephalosome. The rostrum is bell-shaped and bears two sensorial setae. The genital segment, 250 × 255 μm, shows in dorsal view and on each side an internal thickened band. The genital field consists of two areas situated along the lateral edge. Both structures bear a long smooth seta, and are connected with a chitinous band curved in anterior direction. The dimensions of the post-genital segments are (width X length) 200 × 100, 180 × 75 and 165 × 70 (in μm). The anal segment has a small operculum. The anal groove is deep. The furcal rami are about 4.5 times as long as broad. The outer margin is straight. The inner margin is curved towards the anal groove and is extended in a blunt posterior process. Two inner setae (ventro-lateral), one dorsal and three terminal setae are implanted on the furcal rami. The principal terminal setae measure 130 μm (the inner one) and 260 μm (the external one).

The antennule (Fig. 3a) is indistinctly five-segmented. Especially the suture between the first and second segment is very indistinct. The setae and spines are strongly armed along their proximal stem. The distal half of them seems to be more flexible and in some cases feathered; in other cases this part is smooth. Both aesthetascs are implanted on the distal half of the third segment. They measure 100 μm each. The penultimate segment is the shortest of all, while the ultimate segment is rather long and cylindrical. Several rows of thin hairs occur on the first and second segment.

The antenna (Fig. 3b and f) has a three-segmented endopodite and a seven-segmented exopodite. The basis is strong and bears one feathered seta. The first endopodital segment has a small row of slender hairs and a strong seta. The second segment is furnished with two median setae and two distal ones. The setae on the ultimate segment are implanted on the apical ridge. All these setae are more or less densely feathered. Each preultimate segment of the exopodite bears a seta. The ultimate segment bears five setae, implanted on the distal margin. The setae are ornamented with several kinds of setules.

The mandible (Fig. 1c and d) shows a well-developed corpus mandibularis. The teeth seem to be unmovable, except for four setae-like sensorials. The coxa-basis is furnished with two short setae and two rows of spinules. The two-segmented endopodite bears three setae on the proximal segment and eight setae on the dis-
The exopodite consists of three segments with the following formula: 2, 1 and 3. The exopodal setae are very densely feathered.

The arthrite of the maxillule (Fig. 1e and f) is fused with the precoxa. The inner margin has nine strong spines, arranged in groups (3 - 3 - 2 - 1) while the surface bears two slender setae. The coxal endite bears three strong setae. The vestigial epipodite is represented as three long feathered setae. Eight pinnate setae are implanted along the inner margin of the basis. The endopodite is three-segmented with setal formula: 3 - 4 - 4. The exopodite bears 11 setae. The four inner ones are feathered with short setules, the five median ones are densely feathered. The most external setae of the exopodite is furnished with strong teeth.

In the maxilla (Fig. 1g) the pre-coxa and coxa are separated. Both appendages bear two endites. The number of setae on each endite is: 6 (proximal endite), 2, 3 and 3 (distal endite). The basis is extended in a hook-shaped process with two rows of small teeth on its surface. The prolongement bears three strong pinnate setae. The endopodite is a well distinguished cylindrical appendage with ten setae. The shape of the setal ornamentation is not very clear because of the small size.

The pre-coxa and the coxa of the maxilliped are fused. The basis and the endopodite are well distinguished. The pre-coxa bears nine strong setae and the basis three. The endopodite is short and thick and has ten setae.

The rami of the legs P1 to P4 are three-segmented except for the endopodite of the P4 having only two segments. The pre-coxa is represented in all the legs as a thin integumental fold. On the inner distal edge of the coxae, a strong spine (in P2 and P3) or a seta (in P1 and P4) is implanted. Some rami are covered with strong spines along their anterior surface. In Table 1 the ornamentation (+) and the lack of ornamentation (−) is given. The rami of P3 are strong. The external edge of each segment is extended in a strong process. The inner spines of the last endopodal segment are very strong and smooth. The rami of the P3 are also strong but less than those of the P2. The P4 bears four spiniform setae on the last exopodal segment, all implanted on the almost straight distal margin. The anterior margin of

Table 1. Cuticular ornamentation of the segments of the legs.

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<thead>
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<th></th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
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<tbody>
<tr>
<td>Exopodite</td>
<td>−−−</td>
<td>+ ++</td>
<td>+ ++</td>
<td>+ ++</td>
</tr>
<tr>
<td>Endopodite</td>
<td>−−−</td>
<td>−−−</td>
<td>−−−</td>
<td>+ ++</td>
</tr>
</tbody>
</table>

Table 2. Setal formula of the legs.

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coxa</td>
<td>0 - 1</td>
<td>0 - 1</td>
<td>0 - 1</td>
<td>0 - 1</td>
</tr>
<tr>
<td>Basis</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
<td>1 - 0</td>
</tr>
<tr>
<td>Exopodite</td>
<td>10 - 11 - 11</td>
<td>10 - 11 - 11</td>
<td>10 - 11 - 11</td>
<td>10 - 10 - 10</td>
</tr>
<tr>
<td>Endopodite</td>
<td>01 - 01 - 01</td>
<td>01 - 01 - 01</td>
<td>01 - 01 - 01</td>
<td>01 - 01</td>
</tr>
</tbody>
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Figure 2. Ellucana longiculata: a) ventral view of the male abdomen; b) lateral view of the male abdomen; c) dorsal view of the male abdomen; d) lateral view of the female abdomen; e) dorsal view of the female abdomen.
this segment has two extensions. The endopodital setae are spiniform. The setal formula of the legs is given in Table 2, the roman numerals indicating spines, the arabic numerals indicating setae.

The segments of both fifth legs are fused along their inner side. There are four setae implanted, the external being the longest.

**Male**

The description of the male deals with those structures which differ from the female.

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The body (Fig.1b) measures 1010 µm and the ratio of the abdomen to the length is 1:1.9. The genital segment (Figs.2a, b and c) is divided in two segments. The petasma is composed of two sub-divided triangular plates. The posterior angle of each plate has a long smooth seta and a hook-shaped one. The genital groove bears two setae, the largest one being bident.

In the antennule (Figs.3c, d and e) the first and second segments are fused, resulting in a four-segmented antennule.

The aesthetascs are short and broad, and are implanted on the second segment (the proximal aesthetasc is 45 µm, the distal one is 65 µm long). The third and fourth segments form a haplocer apparatus. The inner margin of this structure is rather complex and has two cushion-like structures, entirely covered with small teeth.

In the legs P₃ and P₄, sexual dimorphism occur. The third endopodital segment of the P₂ has a much stronger apical spine. The inner margin is not so strongly armed. The P₄ bears three setae-like appendages and a strong smooth spine. The distal margin of this segment is more curved than in the female. The legs P₂ to P₄ of the male are figured in Figures 4c, d and e, respectively.

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4 DISCUSSION

The original description of *Ellucana longicauda* by Sewell (1940) shows some regrettable shortcomings. Drawings of the entire animal or at least of the furcal rami, of great interest in canellid systematics, are lacking. These gaps, together with Sewell’s mis-interpretation of the so-called *Camuella*-like body shape and the subsequent erroneous designation to the *Camuella*-group, has caused some confusion about the systematic position of the genus *Ellucana*.

When describing *Ellucana secunda*, and revising the genus, Coull (1971) pointed out that the body shape of *Ellucana* is *Camuella*-like and not *Camuella*-like. Furthermore, the critical examination of the original drawings of the legs, and comparison of the Papua New Guinean specimen with other *Camuella* species, confirm that *E.longicauda* as described by Sewell from the Nicobars must have had the typical *Camuella* body shape.

The ratio of the rami to the length of the anal segment as given by Sewell (1940) agrees with these observed in our specimens. The divergence of the furcal rami stressed by Sewell were observed in alcohol, but when the animals were brought in a lactophenol medium, the furcal rami became parallel to each other.

The setation of the mouthparts is not the same as in Sewell’s specimen, especially the ornamentation of the endopodital palp of the antenna and the exobasis of the mandible being different.

The strongly marked teeth on the external margin of the third endopodital segment of the P₂ is less conspicuous in the Papua New Guinea specimens. In the latter, only a slight milled edge could be observed.

The fourth legs corresponds to the description of Sewell: the spine-like setae...
on the distal segment of the exopodite and the endopodite seem to be equal.

Notwithstanding these marked differences between the Nicobar specimen and
the specimens from Papua New Guinea, it seems to be irrelevant to consider them
as different species.

Comparison with *Ellucana secunda* Coull, 1971.

At present the genus *Ellucana* comprises only two species. In the discussion
about *E. secunda* Coull suggested the possibility that both species are conspecific.
The redescriptions of *Ellucana longicauda* in this paper clearly demonstrates that
two species are involved. The differences between *E. secunda* and *E. longicauda*
are:

- two internal setae on the furcal rami (*E. secunda* has only one)
- two aesthetascs on the female antennule (*E. secunda* has one)
- a striking difference in the setation of the mouthparts
- the setal formula of the endopodite of the P2
- the shape of the first endopodal segment of the P2
- the length and the ratio of the setae of the P3
- the shape of the male genital field.

ACKNOWLEDGEMENTS

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REFERENCES

Coull, B.C. 1971. Melobestic Harpacticoids (Crustacea, Copepoda) from the North Carolina
Fiers, F. 1982. New Calanoida from the northern coast of Papua New Guinea (Copepoda,
382, 1 map.
Planche 1. *Iconaster corindonensis* sp. nov.: 1, 2. Vues générales aborale et orale; 3. Détail des squelettes abactinal et superomarginal; 4. Détail d’un internradius, vue orale.

Planche 2. *Hymenaster acutus* sp.nov.: 1, 2. Vues générales aborale et orale; 3. Détail de l'armature adambulacraire (la flèche indique la base de l'écaille adambulacraire); 4. Détail de l'armature des pièces buccales. Figs.1-4 = holotype.

Planche 3. *Caymanostella hispida* sp.nov.: 1, 2. Vues générales aborale et orale; 3. Aspect des plaques et des piquants aborinaux; 4. Plaque terminale (plaque perforée entourée de piquants sessués) et piquants marginaux externes (flèche). La barre horizontale des Figs.3 à 5 représente 1 mm. Figs.1, 2, 4, 5 = holotype; Fig.3 = paratype.
Planche 4. *Myxoderma acutibrachia* sp. nov.: 1, 2. Vues générales aborale et orale; 3, 4. Détail des squelettes abactinal et superomarginal; 5, 6. Profil d'un bras montrant les plaques actinolatérales; 7. Vue interne du squelette axial montrant les plaques superambulacraires (Cônes); 8, 9. Détails du squelette axial d'un bras, vue externe. La barre horizontale des Figs. 3 à 9 représente 3 mm. Figs. 1, 2, 3, 5, 9 = holotype; Figs. 4, 6, 7, 8 = paratype disséqué.