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The Family Cerviniidae Sars, Lang

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## MEIOBENTHIC HARPACTICOIDA (CRUSTACEA, COPEPODA) FROM THE DEEP SEA OFF NORTH CAROLINA II. THE FAMILY CERVINIIDAE SARS, LANG<sup>1</sup>

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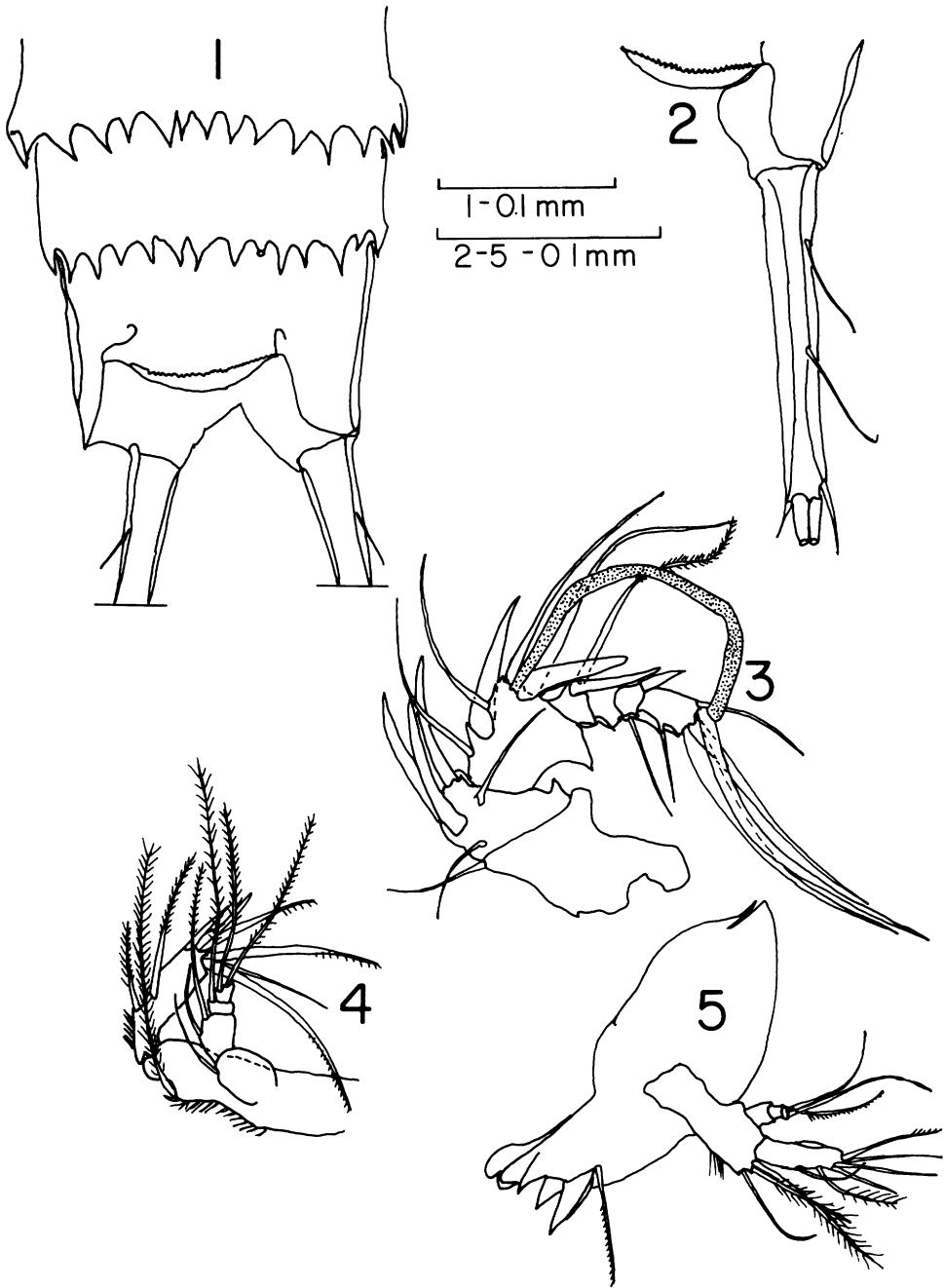
COULL, B. C. 1973. Meiobenthic Harpacticoida (Crustacea, Copepoda) from the deep sea off North Carolina II. The family Cerviniidae Sars, Lang. *Trans. Amer. Micros. Soc.*, 92: 198–208. This second paper on the deep-sea harpacticoids off North Carolina deals exclusively with the family Cerviniidae. Seven species, including two new to science, were collected. The new species, *Cerviniella hamata* n. sp. and *Cerviniella bodini* n. sp., differ from the known species primarily in mouthpart setation and swimming leg segmentation and setation. Both new species possess a P<sub>4</sub> endopodite and along with *C. brodaskayae* Por are the only known species to do so. A table with salient morphological features and a key to the genus is given. A brief description of *Eucanuella* aff. *reticulata* Soyer is also given.

As part of my continuing study of North Carolinian deep-sea harpacticoids, this paper deals exclusively with the family Cerviniidae. Present knowledge of deep-sea harpacticoids is restricted to a few geographically isolated examples and except for Part I of this series, there is nothing known of the deep (>100 m) fauna off the United States east coast. The cerviniids have long been recognized as an exclusively deep-sea group, and their occurrence on the Carolinian slope and Hatteras abyssal plain was to be expected. Their squat body shape, characteristic spade-shaped appendages, and spiny processes make them ideally suited for a burrowing life in abyssal muds (see Figs. 9–12 and 21–24 of swimming legs).

I collected seven species of Cerviniidae, two of which are new and described below. Table I lists the North Carolinian cerviniids. The station locations, collecting methods, preparation, and terminology used throughout are the same as in Part I of this series (Coull, 1973).

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FIGS. 1-5. *Cerviniella hamata* n. sp. ♀. Fig. 1. Last three abdominal somites and caudal rami. Fig. 2. Caudal ramus. Fig. 3. A<sub>1</sub>. Fig. 4. A<sub>2</sub>. Fig. 5. Md.

TABLE I  
Species list

	Station <sup>1</sup>	Total no. specimens
<i>Cerviniella mirabilipes</i> Smirnov	21	1 ♀
<i>C. hamata</i> n. sp.	14, 16	2 ♀ ♀
<i>C. bodini</i> n. sp.	5, 6	4 ♀ ♀
<i>Cerviniopsis longicaudata</i> Sars	10, 12	4 ♀ ♀
<i>C. gubernovi</i> Smirnov	4, 16, 17	4 ♀ ♀
<i>Eucanuella</i> aff. <i>reticulata</i> Soyev	5, 17, 18	3 ♂ ♂
<i>Pseudocervinia magna</i> (Smirnov)	13	1 ♀

<sup>1</sup> The stations are the same as those in Part I of this series (Coull, 1973).

*Description of Species*  
Genus *Cerviniella* Smirnov, 1946

Since Bodin's (1967, 1971) listing of the species in the genus, no species have been added.

*Cerviniella hamata* n. sp.

Material: 2 ♀ ♀ (1 ♀ station 14; 1 ♀ station 16). Holotype dissected ♀ on slides, USNM No. 140855.

Type locality: EASTWARD Station 11826 (No. 14); 34° 06.5' N, 75° 46.8' W, depth 1,000 m.

*Description*

Female: Based on a non-ovigerous female, 0.95 mm. First thoracic segment fused to the cephalon. Rostrum bluntly triangular. Abdominal somites dentate dorsally and ventrally. Genital somite divided dorsally, with two strong lateral spines. Last two abdominal somites and anal operculum as in Figure 1. Caudal rami (Fig. 2) divergent distally, 6.2 times as long as wide at the widest portion, with two dorsal and two terminal setae.

A<sub>1</sub> (Fig. 3), 7-segmented, third segment with dentiform projection on outer margin, aesthetasc on segment three.

A<sub>2</sub> (Fig. 4), 2-segmented endopod, 4-segmented exopod. Exopod with total of six setae; terminally with two.

Md. (Fig. 5), praecoxa with bidentate pars incisiva, three dentate lacinia and a seta. Palp with three setae, uniaarticulate endopod with six setae and small triarticulated exopod with three terminal setae.

Mxl. (Fig. 6), arthrite of praecoxa with three surface and six terminal setae. Coxa basis and endopod indistinctly separated with seven setae. Exopod reduced to small knob with three setae.

Mx. (Fig. 7), syncoxa with four endites. Basis terminally with a claw, endopod 2-segmented with five setae, exopod reduced to a single seta.

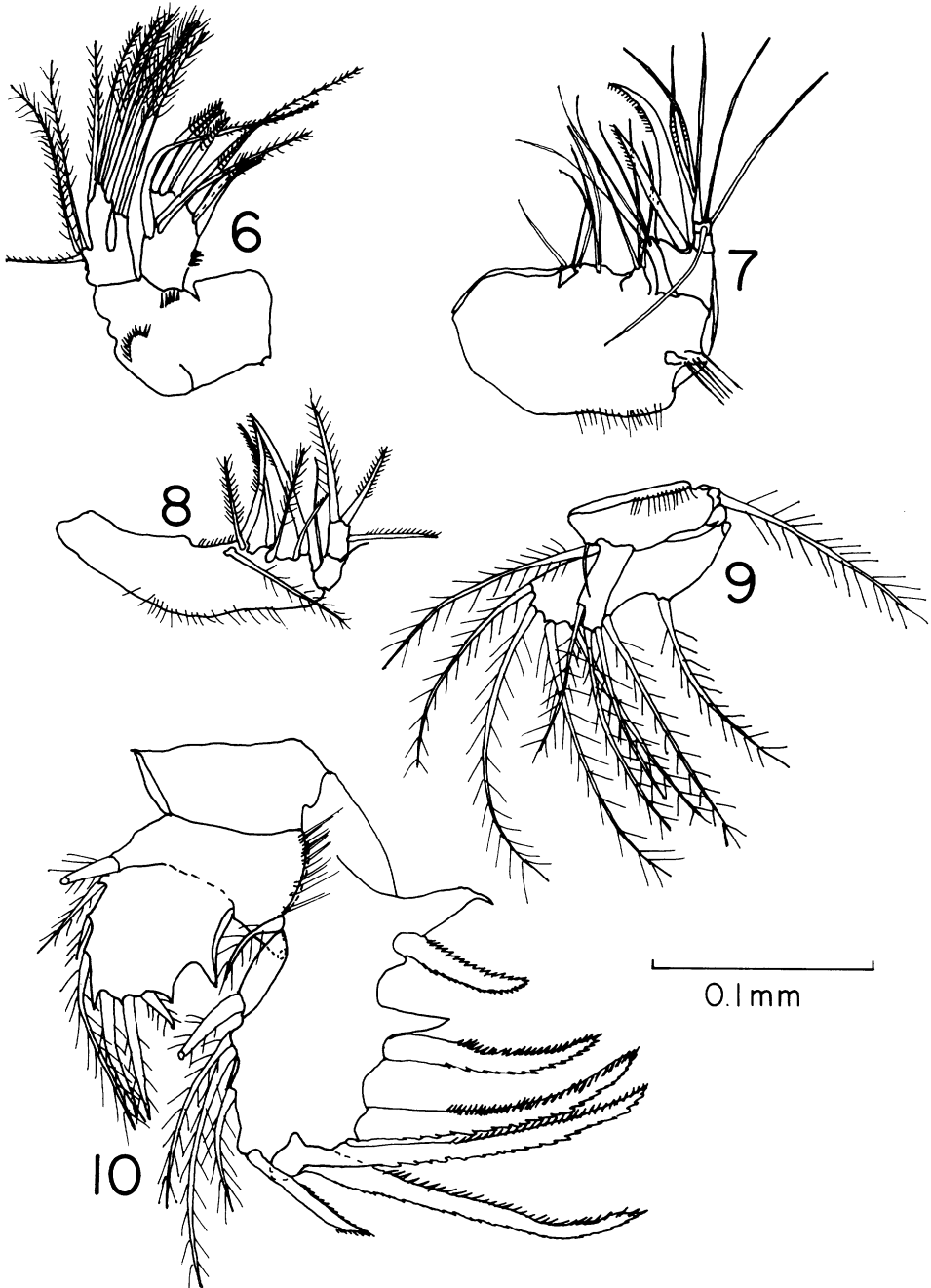
Mxp. (Fig. 8), not prehensile. Coxa long, with haired margins and six setae. Endopod 2-segmented. First segment with one seta, second segment with three.

P<sub>1</sub> (Fig. 9), exopod and endopod 1-segmented and overlapping. Exopod much larger than endopod. Setation as figured and listed below.

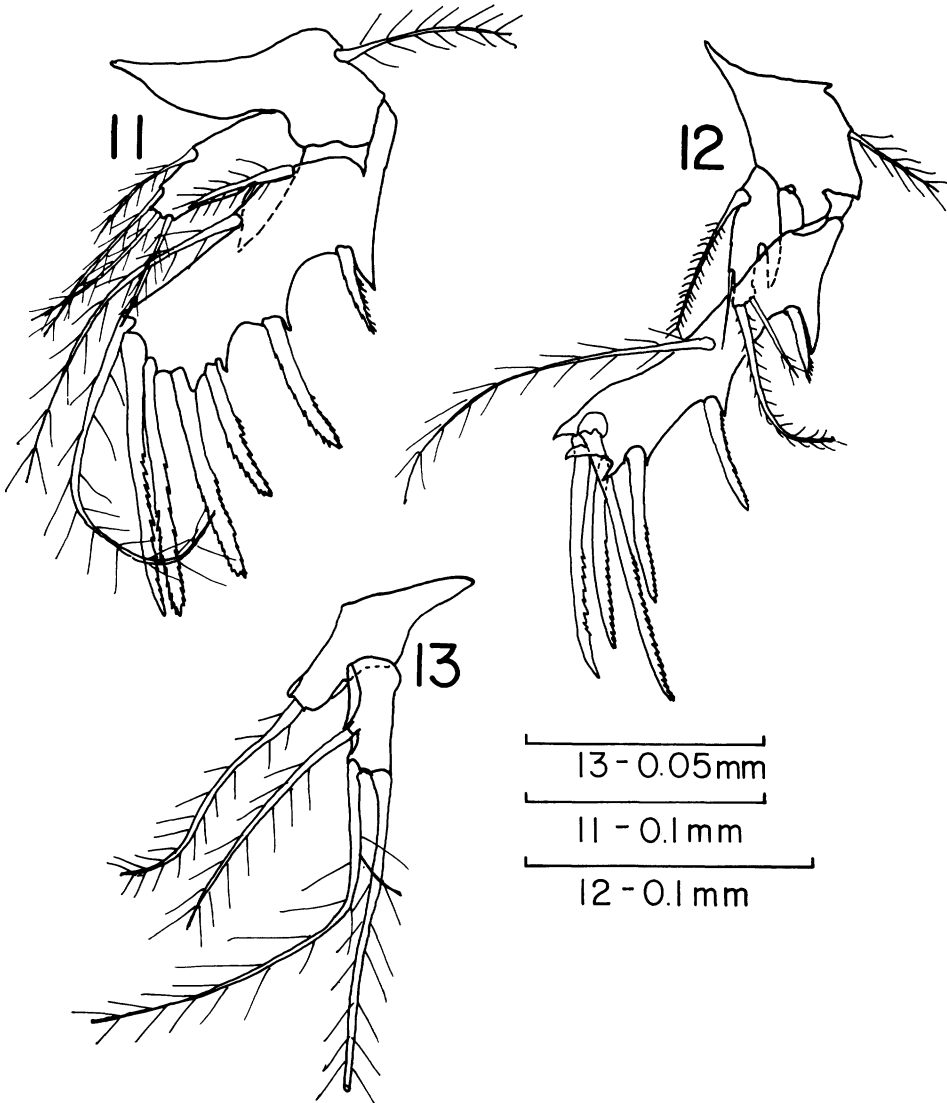
P<sub>2</sub> (Fig. 10), with strong uniaarticulated exopod and indistinctly 2-segmented endopod. Setation as figured and listed.

P<sub>3</sub> (Fig. 11), both rami uniaarticulate. Exopod strong. Endopod bifurcate. Setation as figured and listed.

P<sub>4</sub> (Fig. 12), both rami uniaarticulate. Exopod slender. Endopod with two inner and two terminal setae. Outer margin modified as hook, "bottle opener"-like. Setation as figured and listed.



FIGS. 6-10. *Cerviniella hamata* n. sp. ♀. Fig. 6. Mxl. Fig. 7. Mx. Fig. 8. Mxp. Fig. 9. P<sub>1</sub>. Fig. 10. P<sub>2</sub>.

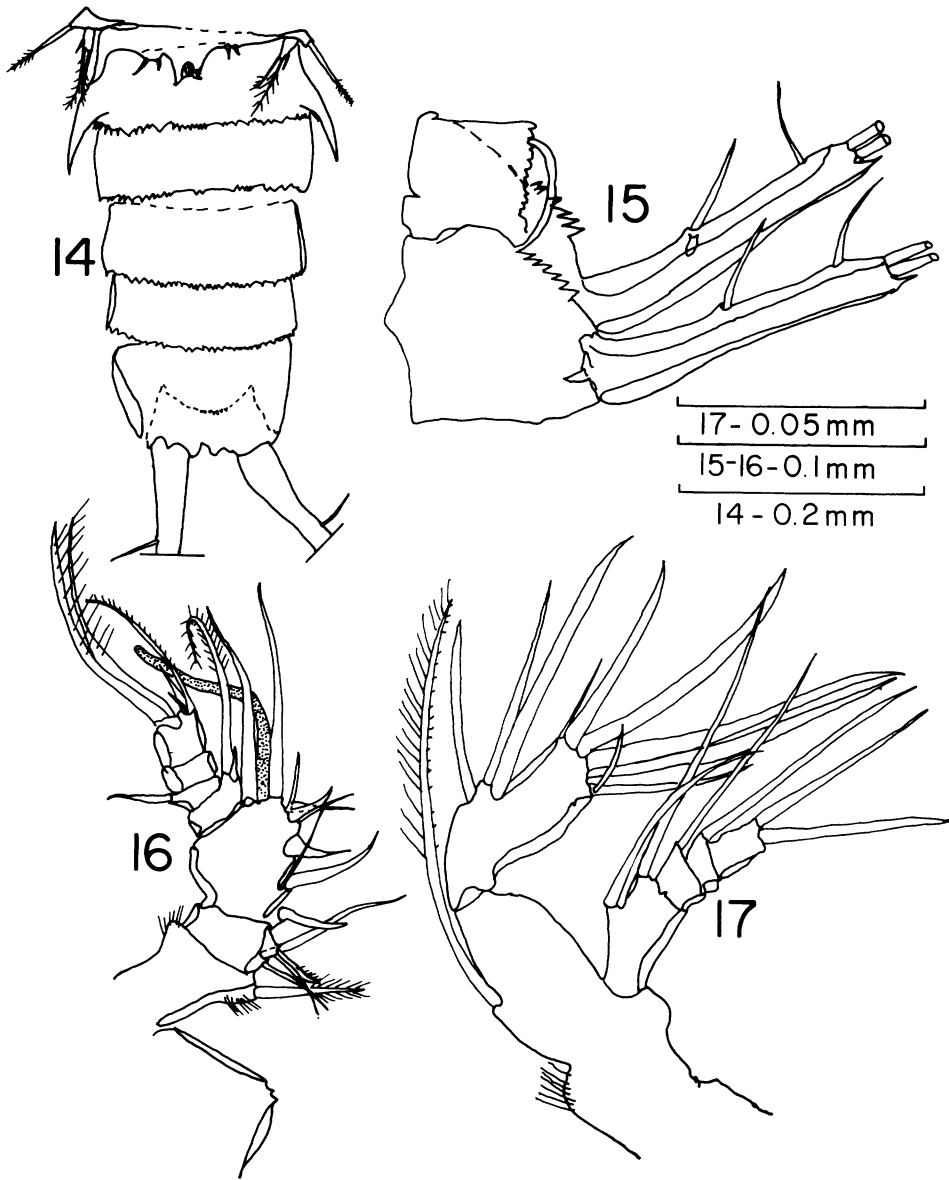


FIGS. 11-13. *Cerviniella hamata* n. sp. ♀. Fig. 11. P<sub>3</sub>. Fig. 12. P<sub>4</sub>. Fig. 13. P<sub>5</sub>.

Setal formula—*Cerviniella hamata* n. sp.

	Exp.	End.
P <sub>1</sub>	124	120
P <sub>2</sub>	524	1,321
P <sub>3</sub>	234	220
P <sub>4</sub>	133	220

P<sub>5</sub> (Fig. 13), reduced and fused to body. Inner expansion baseopodite absent, outer portion present with one seta. Exopod two times as long as wide with one outer and two terminal setae.



FIGS. 14-17. *Cerviniella bodini* n. sp. ♀. Fig. 14. Abdomen. Fig. 15. Caudal rami. Fig. 16. A<sub>1</sub>. Fig. 17. A<sub>2</sub>.

Male: Unknown.

Etymology: The specific name is from the latin *hamatus* ("hook") to indicate the unique structure of the P<sub>4</sub> endopodite.

*Discussion*

Within the genus only three species (*C. brodskayae*, *C. hamata* n. sp., and *C. bodini* n. sp.) possess a P<sub>4</sub> endopodite. In the other four known species it is absent (Table II gives the swimming leg segmentation of all the known species). *C.*

TABLE II  
Swimming leg morphology of *Cerviniella*

Species	No. seg. Exp. P <sub>1</sub>	No. setae Exp. P <sub>1</sub>	No. seg. Exp. P <sub>2</sub>	No. seg. Exp. P <sub>3</sub>	No. seg. Exp. P <sub>4</sub>	No. seg. Exp. P <sub>4</sub>
<i>mirabilipes</i> Smirnov	1	3	2	2	0	1
<i>talpa</i> (Por)	1	6	2	2	0	1
<i>langi</i> Bodin	1	7	2	2	0	1
<i>lagarderei</i> Bodin	1	6	2	1	0	2
<i>brodskayae</i> Por	2	4	1	1	1	1
<i>bodini</i> n. sp.	2	5	2	2	1	1
<i>hamata</i> n. sp.	1	3	2	1	1	1

*hamata* is separated from *C. brodskayae* and *C. bodini* by the unique hooked-shaped P<sub>4</sub> endopod, its uniarticulated P<sub>1</sub> endopod, and the presence of but three setae on the P<sub>1</sub> endopod (*C. brodskayae* has four, *C. bodini* five). A key to the species and more complete discussion of the genus follows the description of *C. bodini* n. sp.

*Cerviniella bodini* n. sp.

(Figs. 14–26)

Material: 4 ♀♀ (3 ♀♀ station 5; 1 ♀ station 6). Holotype dissected ♀ on slides, USNM No. 140856; paratype 1 ♀, USNM No. 140857.

Type locality: EASTWARD Station 12001 (No. 5); 34° 20.5' N, 75° 45.8' W, depth 500 m.

*Description*

Female: Based on a non-ovigerous female, 1.04 mm. First thoracic segment fused to cephalon. Rostrum bluntly triangular (Fig. 16). Abdominal somites dentate. Genital somite divided dorsally, indistinctly divided ventrally, with two strong lateral processes (Fig. 14). Anal operculum finely dentate (Fig. 15). Caudal rami (Fig. 15) 5–6 times as long as wide, slightly divergent with two dorsal and two terminal setae.

A<sub>1</sub> (Fig. 16), 7-segmented, aesthetasc on segment 3.

A<sub>2</sub> (Fig. 17), with 2-segmented endopod, terminally with seven setae. Exopod 4-segmented; first segment with two, second with one, third with one, fourth with two setae, respectively.

Md. (Fig. 18), praecoxa with bidentate pars incisiva, four lacinia and one seta. Palp with four setae, uniarticulate exopod and endopod. Exopod with four and endopod with nine setae.

Mxl. (Fig. 19), arthrite of praecoxa with two surface and five terminal setae. Coxabasis and endopod separate. Exopod broken off specimen examined.

Mx. (Fig. 20), syncoxa with four endites. Basis terminally with a claw. Endopod 1 indistinctly 2-segmented with three setae. Exopod represented by two setae.

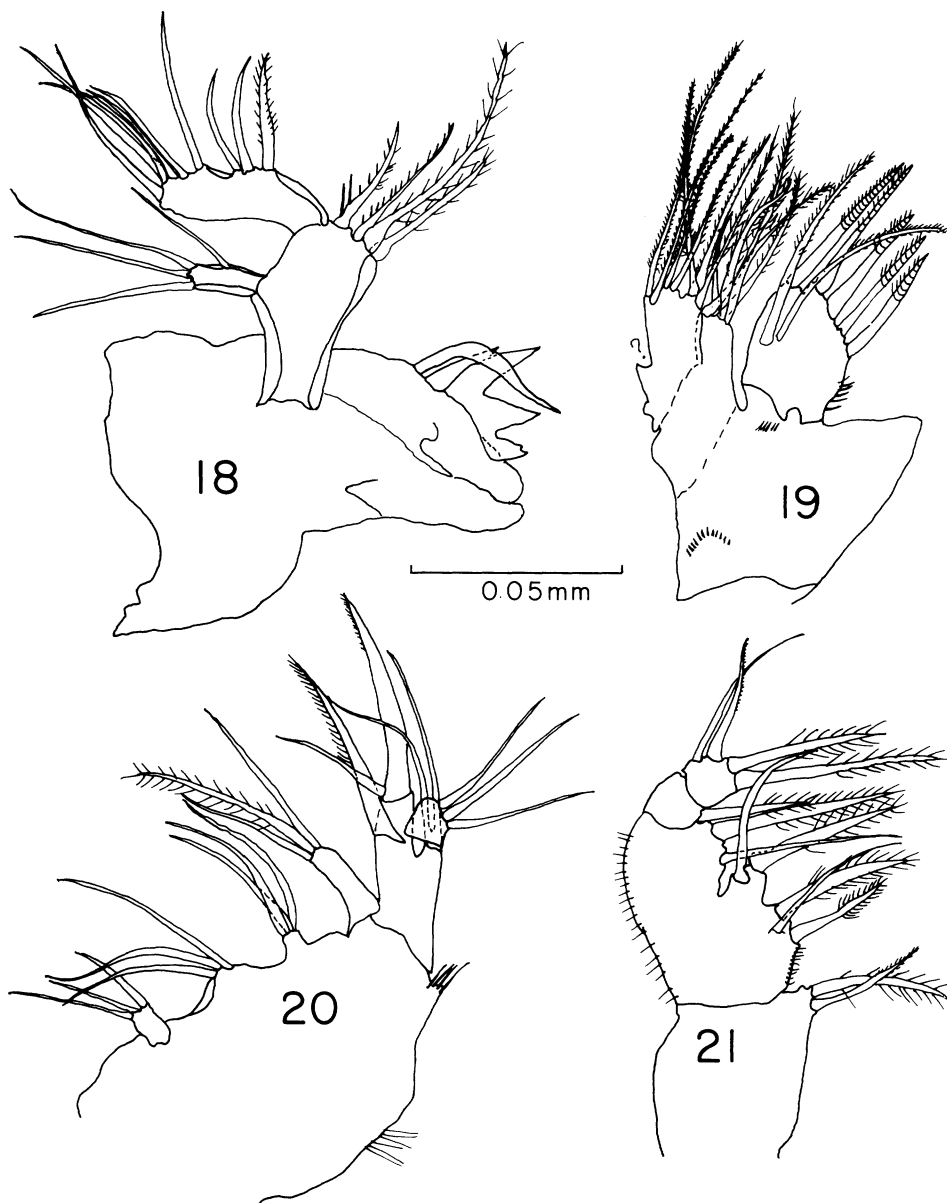
Mxp. (Fig. 21), not prehensile. Coxa-basis not fused. Coxa with two setae, basis with eight. Endopod 2-segmented. First segment with one inner seta; second segment with two outer and two terminal setae.

P<sub>1</sub> (Fig. 22), exopod 1-segmented, endopod 2-segmented, rami overlapping. First segment endopod with one inner seta and small dentiform projection laterally. Setation as figured and listed below.

P<sub>2</sub> (Fig. 23) and P<sub>3</sub> (Fig. 24), both very strong with 1-segmented exopods, 2-segmented endopods. Setation as figured and listed.

P<sub>4</sub> (Fig. 25), both rami 1-segmented. Exopod much larger than endopod. Endopod reduced to small knob with one seta. Setation as figured and listed.

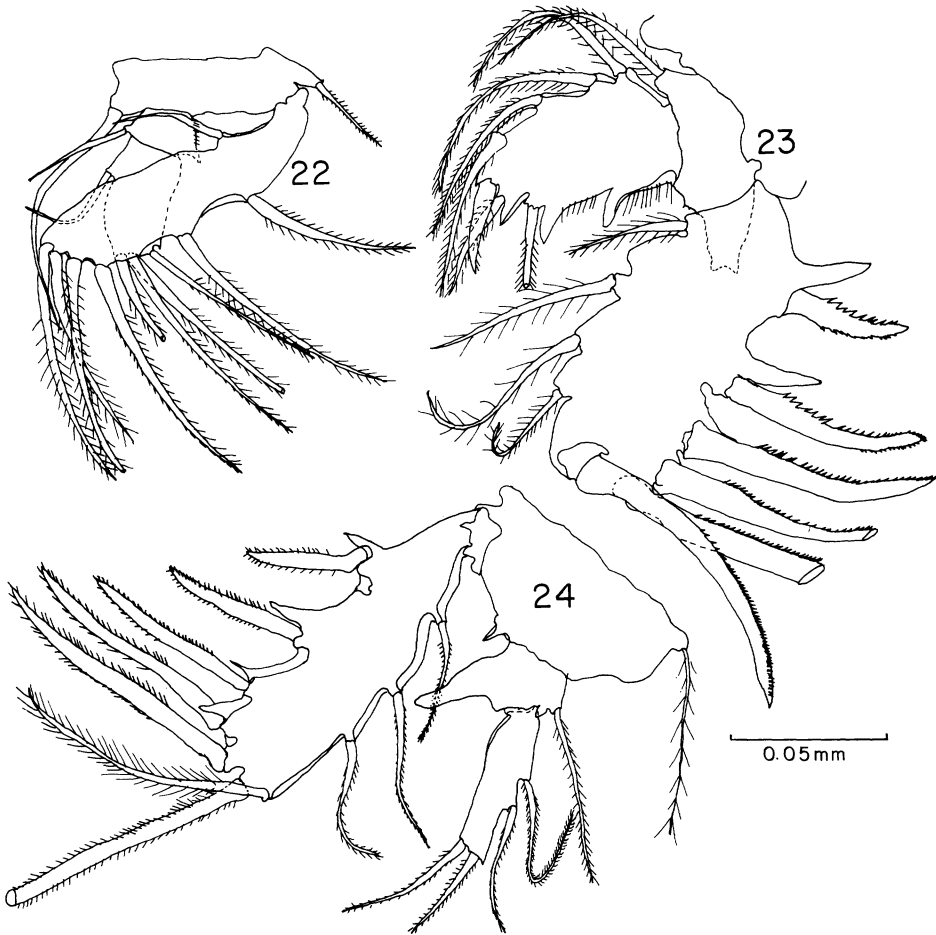




FIGS. 18–21. *Cerviniella bodini* n. sp. ♀. Fig. 18. Md. Fig. 19. Mxl. Fig. 20. Mx. Fig. 21. Mxp.

Setal formula—*Cerviniella bodini* n. sp.

	Exp.	Enp.
P <sub>1</sub>	134	1.130
P <sub>2</sub>	424	1.322
P <sub>3</sub>	334	1.220
P <sub>4</sub>	023	010



FIGS. 22-24. *Cerviniella bodini* n. sp. ♀. Fig. 22. P<sub>1</sub>. Fig. 23. P<sub>2</sub>. Fig. 24. P<sub>3</sub>.

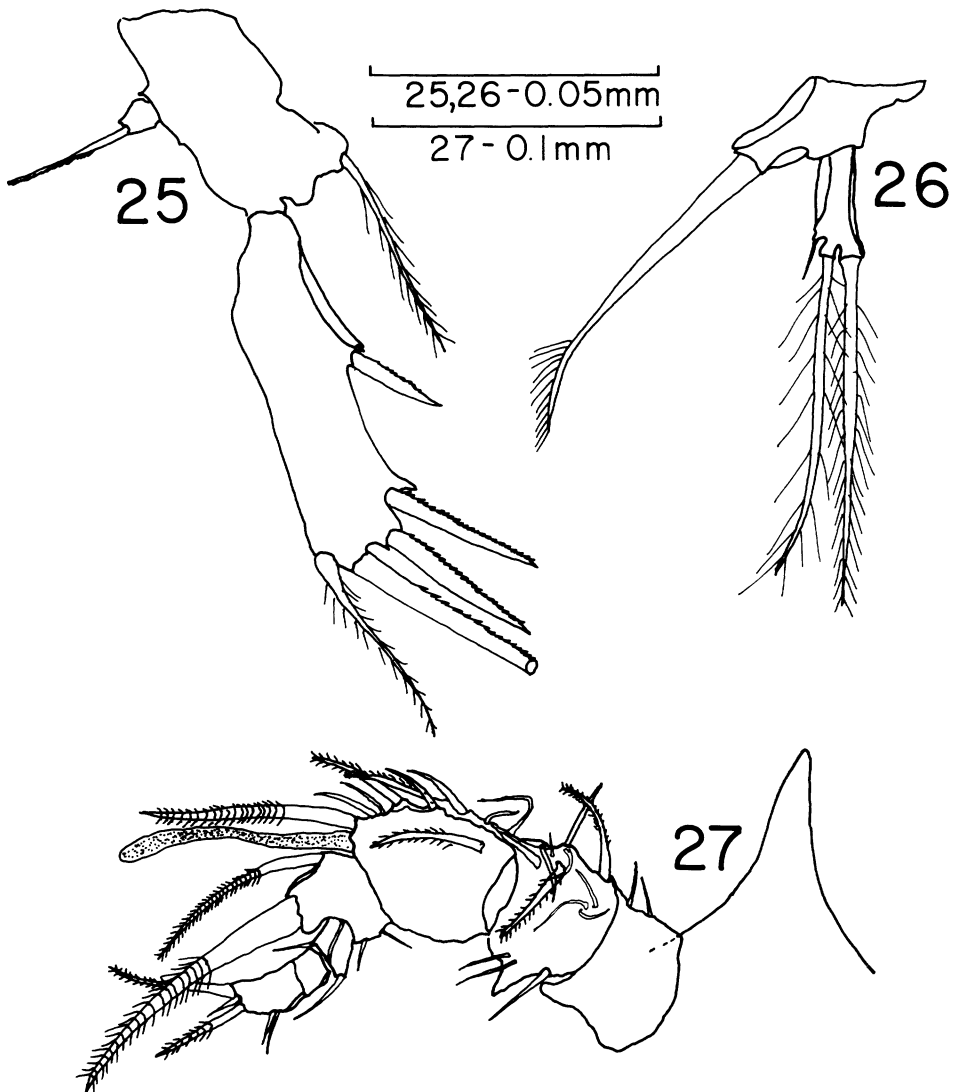
P<sub>5</sub> (Fig. 26), reduced and fused to body. Inner expansion baseoendopodite absent. Exopod two times as long as wide with one very short distal seta and two long terminal setae.

Male: Unknown.

Etymology: The trivial name is in honor of Dr. Phillippe Bodin, La Rochelle, France.

*Discussion*

As previously mentioned, only *C. hamata* n. sp., *C. bodini* n. sp., and *C. brodskayae* Por possess a P<sub>4</sub> endopod. In both *C. brodskayae* and *C. bodini* the P<sub>1</sub> and P<sub>4</sub> endopods are very similar; that is, only in these two species is the P<sub>1</sub> endopod biarticulate and the P<sub>4</sub> endopod small with one terminal seta. *C. bodini* is easily separated from *C. brodskayae* by comparing the segmentation of the P<sub>2</sub> and P<sub>3</sub> endopodites (1-segmented in *C. brodskayae*, 2-segmented in *C. bodini*) and the number of setae on the P<sub>1</sub> endopod (four in *C. brodskayae*, five in *C. bodini*). See Table II.



FIGS. 25, 26. *Cerviniella bodini* n. sp. ♀. Fig. 25. P<sub>4</sub>. Fig. 26. P<sub>5</sub>.  
 FIG. 27. *Eucanuella* aff. *reticulata* Soyev ♂—A<sub>1</sub>.

The genus may be divided into those species with a P<sub>4</sub> endopod and those without (Table II). I am not sure of what phylogenetic importance the presence or absence of a P<sub>4</sub> endopod plays. Its presence should infer an advanced state; however, several species lacking the P<sub>4</sub> endopod appear to be more advanced in segmentation of the other swimming legs and thus the absence of the endopod may be secondarily derived, by loss of the ramus. Perhaps with continued sampling of deep-sea environments more *Cerviniella* will be found and speculation on the intrageneric relationships elucidated.

With the description of Por's (1969) *C. brodskayae* and the two new species described here, Bodin's (1968, p. 21) generic diagnosis must be changed as follows: endopodite P<sub>1</sub>, uni- or biarticulate; endopodite P<sub>4</sub> absent or 1-segmented.

Key to species of *Cerviniella*: based on females

- |   |                               |
|---|-------------------------------|
| 1. Enp. P <sub>4</sub> present .....  | 2                             |
| Enp. P <sub>4</sub> absent .....  | 4                             |
| 2. Enp. P <sub>4</sub> reduced to a knob with one seta; Enp. P <sub>1</sub> 2-segmented .....                                   | 3                             |
| Enp. P <sub>4</sub> with four setae and with outer edge hooked (like a bottle opener,<br>see Fig. 12); Enp. P 1-segmented ..... | <i>C. hamata</i> n. sp.       |
| 3. Enp. P <sub>2</sub> -P <sub>3</sub> 2-segmented .....  | <i>C. bodini</i> n. sp.       |
| Enp. P <sub>2</sub> -P <sub>3</sub> 1-segmented .....   | <i>C. brodskayae</i> Por      |
| 4. Exp. P <sub>4</sub> 1-segmented .....  | 5                             |
| Exp. P <sub>4</sub> 2-segmented .....   | <i>C. lagarderei</i> Bodin    |
| 5. Enp. P <sub>1</sub> with three setae .....   | <i>C. mirabilipes</i> Smirnov |
| Enp. P <sub>1</sub> with six setae .....  | <i>C. talpa</i> (Por)         |
| Enp. P <sub>1</sub> with seven setae .....  | <i>C. langi</i> Bodin         |

Genus *Eucanuella* T. Scott, 1900  
*Eucanuella* aff. *reticulata* Soyer, 1969  
 (Fig. 27)

As indicated in Table I, three males of this species were collected. I thought at first that my specimens were females, especially since the A<sub>1</sub> (Fig. 27) is 7-segmented and very much like that figured by Sars (1911) for the females of *E. spinifera* T. Scott. Furthermore, Soyer (1969) gives no figure of either the male or female A<sub>1</sub> of *E. reticulata*, but states, "L'antennules de huit articles comme chez la femelle est préhensile." However, in every other detail, including (a) the presence of two inner setae on the second segment of the P<sub>4</sub> endopod, (b) a modified hook-like seta on the Mxl., (c) a 3-segmented P<sub>5</sub>, (d) elongated (7 × 8 times as long as wide) caudal rami, and (e) setal formula have convinced me that the North Carolinian form is *E. reticulata* or very close to it.

Since only the A<sub>1</sub> is in question, I see no need to designate the North Carolinian forms as new and suspect that it is indeed the male of *E. reticulata* Soyer. Soyer (1969, p. 373) gives a key to the genus.

The lack of a sexually dimorphic A<sub>1</sub> in deep-sea harpacticoids has been discussed elsewhere (Coull, 1973).

One male of *E. aff. reticulata* has been deposited at the United States National Museum, USNM No. 140858.

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