

Freshwater Harpacticoid Copepods of Hokkaido, Northern Japan

Teruo ISHIDA*

Until twenty years ago, the study of freshwater harpacticoid copepods in Japan had been mainly restricted to the subterranean species (e.g. Chappuis 1929, '55, '58 and Miura 1962, '64). Some of the common surface water species were described sporadically by Brehm (1927). Unfortunately as his description was inadequate, considerable confusion was introduced. During the past decade, some taxonomists have begun to pay attention to the surface water species. The occurrence of *Harpacticella paradoxa* (Brehm) in Nikko was reported by Itô and Kikuchi (1977), *Canthocamptus mirabilis* Štěrba from Sapporo by Itô and Takashio (1980), *Elaphoidella grandidieri* (Guerne et Richard) in Itako by Kikuchi (1985), and so on. I myself began a preliminary faunistic survey of the surface freshwater Harpacticoida in Japan (Ishida 1981, '82, '83, '84a and b). At the present stage of my study, I have identified specimens of harpacticoid fauna mostly in Hokkaido, northern Japan. In the present paper, I try to summarize the distribution of 29 species in Hokkaido, and offer some suitable illustrations for diagnosis.

Ninety samples from various parts of Hokkaido were collected and supplied by Dr. Tomiko Ito, Hokkaido Fish Hatchery, as a by product of her study of Trichoptera, and 130 samples came from my own collection.

My sampling method in the field followed a simple procedure. With the aid of a fine mesh (xx 13) hand net, I collected moss, leaf litter, mud and gravel from the water, and placed the material in a bucket already filled with water. Once the collected matter had been stirred and washed fully, it was passed through a coarse sieve to eliminate coarse matters, and sieved by the hand net. The material thus obtained, plus a small amount of water and formalin, was put into a polyethylen bag. In the laboratory, all suspensive fine detritus and sedimentary mineral granules were removed by the mining pan method from the animals in the water. The animals were then placed under a stereomicroscope, and collected by handsorting.

The following species were found in the samples examined: -

1. *Harpacticella paradoxa* (Brehm)
2. *Canthocamptus staphylinus* (Jurine)
3. *Canthocamptus mirabilis* Štěrba
4. *Canthocamptus* sp. II
5. *Mesochra rapiens* (Schmeil)
6. *Mesochra alaskana* Wilson
7. *Attheyella idahoensis* (Marsh)

北海道さけ・ますふ化場研究業績第304号

* Hokkaido Salmon Hatchery, Fisheries Agency of Japan, 2-2 Nakanoshima, Toyohira-ku, Sapporo 062
JAPAN (石田昭夫: 水産庁北海道さけ・ますふ化場)

8. *Attheyella nakaii* (Brehm)
9. *Attheyella crassa* (Sars)
10. *Attheyella orientalis* Chappuis
11. *Attheyella* sp. M
12. *Attheyella dentata* (Poggenpol)
13. *Attheyella nordenskjöldii* (Lilljeborg)
14. *Maraenobiotus vejdotskyi* Mrázek
15. *Maraenobiotus brucei* (Richard)
16. *Gulcamptus* sp. S
17. *Epactophanes richardi* Mrázek
18. *Moraria poppei* (Mrázek)
19. *Moraria duthiei* (T. & A. Scott)
20. *Moraria varica* (Graeter)
21. *Moraria* sp. B
22. *Bryocamptus zschokkei* (Schmeil)
23. *Bryocamptus vejdotskyi* (Mrázek)
24. *Bryocamptus laccophilus* (Kessler), female only
25. *Bryocamptus hiemalis* (Pearse)
26. *Bryocamptus calvus* (Brehm)
27. *Bryocamptus nivalis* (Willey)
28. *Elaphoidella bidens* (Schmeil), female only
29. *Paracamptus reductus* Wilson

In the present study, the peristomial character was minutely analysed, and following items were examined: 1) the distribution of spines and spinules as well as serrelation in each body segment; 2) the ornamental character of legs and anal operculum; 3) morphometrical differences of leg segments. The references in the synonymy list include an original description, the monographs easily available in Japan and other papers related to Asia and North America.

Abbreviations: The following abbreviations are used in plates; Cph=Cephalotholax, Md=mandible, P1-P6=legs 1-6, Exp=exopodite, Emp=endopodite, Abd=abdomen, Fu=caudal rami, and parts around them, f=female, m=male.

1. *Harpacticella paradoxa* (Brehm, 1924)

(Plate 1)

Handeliella paradoxa Brehm, 1924, p. 99 (not consulted).

Harpacticella paradoxa (Brehm). Lang, 1948, p. 343 ; Itô and Kikuchi, 1977, p. 70 ; Tai and Song, 1979, p. 180.

Materials illustrated: Nikko, Tochigi Pref., Honshû (36°44'N, 139°31'E), 24 Nov. 1979, male and female.

Remarks : Two females of this species were taken at a small stream in a forest of Tokachi Plane (42°47'N, 143°09'E), 5 July 1983.

2. *Canthocamptus staphylinus* (Jurine, 1820)

(Plate 2)

Monoculus staphylinus Jurine, 1820 p. 74 (not consulted).

Canthocamptus staphylinus (Jurine). Gurney, 1932, p. 94 ; Lang, 1948, p. 923 ; Borutskii, 1952, p. 156 ; Dussart, 1967, p. 246 ; Ishida, 1981, p. 36 ; Miura, 1984, p. 512.

Materials illustrated : Chitose, Hokkaido (42°49'N, 141°33'E), 8 May 1981, male and female ; Lake Takkobunuma (43°07'N, 144°30'E), 11 June 1984, female.

Remarks : This species is very common in the shallow lakes, ponds, ditches, and lowland rivers and streams in Hokkaido. As well known, the species has variable ornamental character of anal operculum and shape of caudal rami by individuals.

3. *Canthocamptus mirabilis* Štěrba, 1968

(Plate 3)

Canthocamptus mirabilis Štěrba, 1968, p. 52.

Canthocamptus mirabilis Štěrba. Tai and Song, 1979, p. 216 ; Itô and Takashio, 1980, p. 210 ; Kikuchi, 1982, p. 670 ; Miura, 1984, p. 515.

Materials illustrated : River Hirô, Hokkaido (42°15'N, 143°19'E), 2 July 1983, male and female.

Remarks : This species is very common in forest lentic and lotic waters, excluding lakes. The distribution seems to be restricted within a circle (r=ca 350km.) with a center at Wakkanai, northern most of Hokkaido (Fig. 1). The species shows allopatric distribution for *Canthocamptus* sp. II. Some females have narrow caudal rami which are similar to those of the males, and the occurrence in a population varies from zero to 100 percents, by districts.

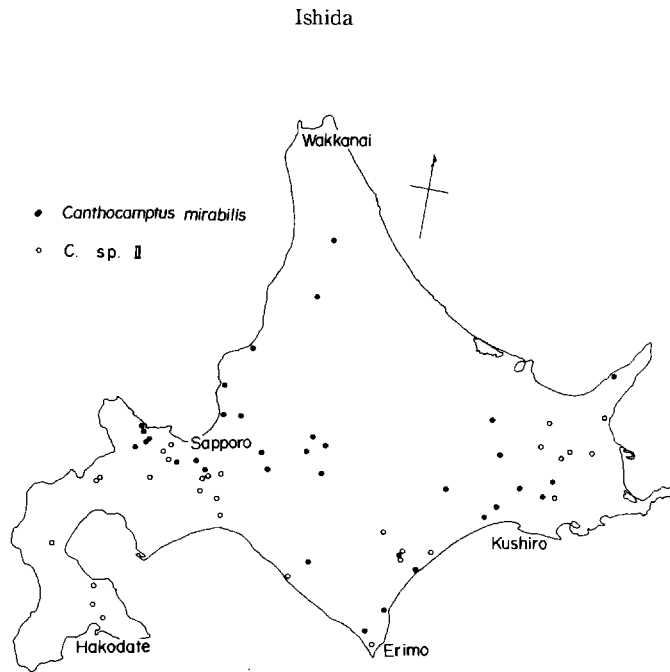


Fig. 1. Distribution map of *Canthocamptus mirabilis* and *C. sp. II* in Hokkaido.

4. *Canthocamptus* sp. II
(Plate 4)

Materials illustrated : Chitose, Hokkaido (42°49'N, 141°33'E), 23 Dec. 1983, male and female.

Remarks : This species is very common, except lakes, in the south of *C. mirabilis* districts as shown in Fig. 1. The species is closely related to *C. mirabilis*. In habitus, the species is easily distinguished from other on triangular anal operculum in both sexes, and fringed inner caudal setae in female.

5. *Mesochra rapiens* (Schmeil, 1894)
(Plate 5)

Aspteinia rapiens Schmeil, 1894, p. 348 (not consulted).

Mesochra rapiens (Schmeil). Gurney, 1932, p. 264 ; Lang, 1948, p. 947 ; Borutskii, 1952, p. 146 ; Wilson and Yeatman, 1959, p. 839 ; Dussart, 1967, p. 255.

Materials illustrated : Lake Utonai, Hokkaido (42°42'N, 141°43'E), 30 May 1976, female ; River Chitose, Hokkaido (42°49'N, 141°33'E), 15 July 1980, male.

Remarks : Besides illustrated materials, 3 females and 6 males were collected at Lake Tôro (43°09'N, 144°30'E), in 11 June 1984.

6. *Mesochra alaskana* Wilson 1958
(Plate 6)

Mesochra alaskana Wilson, 1958, p. 47.

Mesochra alaskana Wilson. Wilson and Yeatman, 1959, p. 840 ; Ishida, 1982, p. 49 ;
Miura, 1984, p. 519

Materials illustrated : Lake Akan, Hokkaido (43°27'N, 144°07'E), 27 May 1981, male and female.

Remarks : This species inhabits in high density in Lake Akan. One female was found at a small stream of the Cape Erimo (42°00'N, 143°13'E), 31 Dec. 1981.

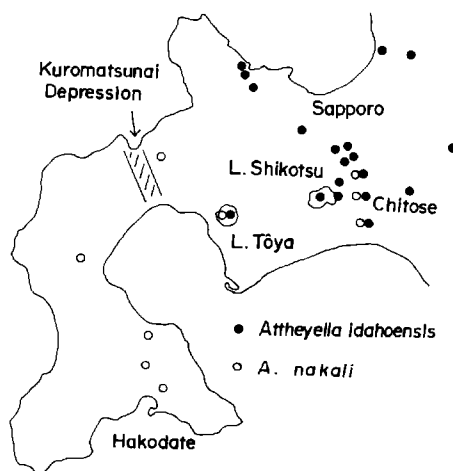


Fig. 2. Distribution map of *Attheyella idahoensis* and *A. nakaii* in Hokkaido (in part).

7. *Attheyella idahoensis* (Marsh, 1903)
(Plate 7)

Canthocamptus idahoensis Marsh, 1903, p. 112 (not consulted).

Attheyella idahoensis (Marsh). Coker, 1934, p. 123 ; Lang, 1948, p. 971 ; Borutskii, 1952,
p. 262 ; Wilson and Yeatman, 1959, p. 844.

Attheyella sp. A. Ishida, 1983, p. 45.

Materials illustrated : Biruwa, Hokkaido (43°34'N, 144°30'E, 25 Aug. 1983, male and female.

Remarks : This species occurs very commonly in the north of the Kuromatsunai Depression as shown in Fig. 2. The females from Lake Shikotsu (42°47'N, 141°23'E) have truncated cadual rami, which are similar to those of *A. nakaii* of Lake Aoki, central Japan, originally described by Brehm (1927).

Ishida

8. *Attheyella nakai* (Brehm, 1927)
(Plate 8)

Canthocamptus Nakaii Brehm, 1927, p. 138.

Attheyella nakaii (Brehm). Lang, 1948, p. 972 ; Borutskii, 1952, p. 260 ; Ishida, 1983, p. 45.

Attheyella morimotoi Miura, 1962, p. 271 ; Miura, 1984, p. 523.

Materials illustrated : Nikko, Tochigi Pref., Honshu (36°44'N, 139°31'E), 24 Nov. 1979, male and female.

Remarks : This species is very common in southern Hokkaido. Sympatric distribution of *A. idahoensis* with this species is seen in the areas as shown in Fig. 2. In the sympatric areas, all matured females of this species have caudal rami same to those of male (Ishida, 1983).

The author collected two females and four males from Lake Aoki (type locality), central Japan, 26 May 1986. The female specimens coincide with that of Brehm's description, especially in respect to truncated caudal rami, which are seemed to be lake abyssal form.

Miura (1962) reported *Attheyella morimotoi* from the subteranean waters of Shikoku, Japan. However, his *A. morimotoi* seems to be a junior synonym of *A. nakaii*.

9. *Attheyella crassa* (Sars, 1862)
(Plate 9)

Canthocamptus crassus Sars, 1862, p. 232 (not consulted).

Attheyella crassa (Sars). Lang, 1948, p.965 ; Borutskii, 1952, p. 257 ; Dussart, 1967, p. 263 ; Tai and Song, 1979, p. 232 ; Kikuchi, 1982, p. 670 ; Ishida, 1981, p. 39.

Materials illustrated : Erimo, Hokkaido (42°00'N, 143°13'E), 17 Sept. 1980, male and female.

Remarks : This species is common in Hokkaido.

10. *Attheyella orientalis* Chappuis, 1929
(Plate 10)

Attheyella orientalis Chappuis, 1929, p. 97 (not consulted).

Attheyella orientalis Chappuis. Lang, 1948, p. 970 ; Ishida, 1981, p. 39.

Materials illustrated : Obihiro, Hokkaido (42°47'N, 143°09'E), 5 July 1983, female ; Biruwa, Hokkaido (43°34'N, 144°30'E), 11 June 1984, male.

Remarks : This species is common in Hokkaido, especially in lakes, pools and ditches.

11. *Attheyella* sp. M
(Plate 11)

Materials illustrated : Mikazuki, Hyōgo Pref., Honshū (35°00'N, 134°27'E), 29 April 1980, male and female.

Remarks: One female and 2 males were obtained in a small ditch of Rankoshi (42°54'N, 140°

36'E), on 6 August and 30 September 1985.

12. *Attheyella dentata* (Poggenpol, 1874)
(Plate 12)

Canthocamptus dentatus Poggenpol, 1874, p. 43 (not consulted).

Canthocamptus dentatus Poggenpol. Gurney, 1932, p. 191.

Attheyella dentata (Poggenpol). Lang, 1948, p. 976 ; Wilson and Yeatman, 1959, p. 848 ;
Tai and Song, 1979, p. 236 ; Ishida, 1984, p. 51.

Materials illustrated : Makubetsu, Hokkaido (42°55'N, 143°20'E), 5 July 1983.

Remarks : This species is not rare in Hokkaido. The species seems to be the inhabitant of shallow lakes, and weed-filled ponds of open land.

13. *Attheyella nordenskjöldii* (Lilljeborg, 1902)
(Plate 13)

Canthocamptus Nordenskjöldii Lilljeborg, 1902, p. 8 (not consulted).

Canthocamptus hyperboreus Willey, 1925, p. 156.

Attheyella illinoisensis (Forbes). Lang, 1948, p. 978.

Attheyella nordenskjöldii nordenskjöldii (Lilljeborg). Borutskii, 1952, p. 276.

Attheyella nordenskjöldii (Lilljeborg). Wilson and Yeatman, 1959, p. 845 ; Ishida, 1981,
p. 39 ; Miura, 1984, p. 521.

Materials illustrated : Otoineppu, Hokkaido (44°43'N, 142°14'E), 14 Oct. 1983, male and female.

Remarks : The occurrence seems to be rather sporadic. Often, very high density is observed. Present known localities in Hokkaido are as follows ; Otoineppu, Lake Shiretoko (44°03'N, 145°03'E), Lake Shikotsu (42°47'N, 141°23'E), Lake Akan (43°27'N, 144°07'E), Honbetsu (43°09'E, 143°39'E) and Niikappu (42°24'N, 142°17'E).

14. *Maraenobiotus vej dovskyi* Mrázek, 1893
(Plate 14)

Maraenobiotus vej dovskyi Mrázek, 1893b, p. 103 (not consulted).

Maraenobiotus vej dovskyi Mrázek. Lang, 1948, p. 1017 ; Borutskii, 1952, p. 251 ; Dussart, 1967, p. 280 ; Ishida, 1981, p. 38 ; Miura, 1984, p. 526.

Materials illustrated : Yoichi, Hokkaido (43°13'N, 140°44'E), 29 Apr. 1980, female ; Horokanai, Hokkaido (44°00'N, 142°08'E), 28 Feb. 1981, male.

Remarks : This species is not rare, with low abundance, in the districts of the west coast of Hokkaido. Ornamental character of anal operculum and shape of cadal rami vary by individuals within a same place.

15. *Maraenobiotus brucei* (Richard, 1898)
(Plate 15)

Mesochra Brucei Richard, 1898, p. 334 (not consulted).

Maraenobiotus brucei (Richard). Lang, 1948, p. 1019 ; Borutskii, 1952, p. 245 ; Wilson and Yeatman, 1959, p. 833 ; Dussart, 1969, p. 287 ; Ishida, 1982, p. 51 ; Miura, 1984, p. 528.

Materials illustrated : Hirō, Hokkaido (42°15'N, 143°19'E), 2 July 1983.

Remarks : This species is common in the areas of the southern foot of the Hidaka Range.

16. *Gulcamptus* sp. S
(Plate 16)

gen. *Gulcamptus* Miura, 1969, p. 250

Materials illustrated : Shikotsu-kohan, Hokkaido (42°47'N, 141°23'E), 9 Sept. 1985.

Remarks : A dense population inhabits in a small inflow of Lake Shikotsu, near Shikotsu Salmon Hatchery.

17. *Epactophanes richardi* Mrázek, 1893
(Plate 17)

Epactophanes richardi Mrázek, 1893a, p. 108 (not consulted).

Epactophanes richardi Mrázek. Lang, 1948, p. 1026 ; Borutskii, 1952, p. 368 ; Wilson and Yeatman, 1959, p. 832 ; Dussart, 1967, p. 290 ; Tai and Song, 1979, p. 258 ; Ishida, 1982, p. 51.

Materials illustrated : Yoichi, Hokkaido (43°13'N, 140°44'E), 7 June 1981, female only.

Remarks : This cosmopolitan is common in Hokkaido, too.

18. *Moraria poppei* (Mrázek, 1893)
(Plate 18)

Ophiocamptus poppei Mrázek, 1893a, p. 114 (not consulted).

Moraria poppei (Mrázek). Gurney, 1932, p. 234 ; Lang, 1948, p. 1036 ; Borutskii, 1952, p. 335 ; Dussart, 1967, p. 298 ; Ishida, 1981, p. 40 ; Miura, 1984, p. 530.

Materials illustrated : Tsukigata, Hokkaido (43°22'N, 141°37'E), 3 Dec. 1980.

Remarks : This species is not rare with low abundance in Hokkaido.

19. *Moraria duthiei* (T. & A. Scott, 1896)

(Plate 19)

Attheyella Duthiei T. & A. Scott, 1896, p. 4 (not consulted).

Moraria duthiei (T. & A. Scott). Gurney, 1932, p. 227 ; Lang, p. 1037 ; Borutskii, 1952, p. 328 ; Wilson and Yeatman, 1959, p. 835 ; Dussart, 1967, p. 300 ; Kikuchi, 1982, p. 670 ; Ishida, 1981, p. 41 ; Miura, 1984, p. 532.

Materials illustrated : Erimo, Hokkaido (42°00'N, 143°13'E), 31 Dec. 1981.

Remarks : This species is common, especially in Kosen Genya, eastern Hokkaido.

20. *Moraria varica* (Graeter, 1911)

(Plate 20)

Canthocamptus varicus Graeter, 1911, p. 18 (not consulted).

Moraria varica (Graeter). Gurney, 1932, p. 243 ; Lang, 1948, p. 1042 ; Borutskii, 1952, p. 337 ; Dussart, 1967, p. 304 ; Ishida, 1982, p. 51 ; Miura, 1984, p. 533.

Materials illustrated : Tsukigata, Hokkaido (43°22'N, 141°37'E), 26 June 1982, female ; Kajikawa, Niigata Pref., Honshû (38°00'N, 139°24'E), 27 June 1981, male.

Remarks : Only a few specimens were caught at the west coast districts of Hokkaido.

21. *Moraria* sp. B

(Plate 21)

Moraria sp. B, Ishida, 1981, p. 41 ; Ishida, 1982, p. 52.

Moraria sp. 2, Kikuchi, 1984, p. 279.

Materials illustrated : Furano, Hokkaido (43°21'N, 142°23'E), 27 July 1982, female ; Otoi-neppu, Hokkaido (44°43'N, 142°14'E), 14 Oct. 1983, male.

Remarks : This species is not rare. The main distribution of the species seems to be confined to western Hokkaido (Kikuchi, 1984). Occasionally the species occurs densely at a small space.

22. *Bryocamptus zschokkei* (Schmeil, 1893)

(Plate 22)

Canthocamptus zschokkei Schmeil, 1893, p. 31 (not consulted).

Canthocamptus zschokkei Schmeil. Gurney, 1932, p. 144.

Bryocamptus zschokkei (Schmeil). Lang, 1948, p. 1066 ; Borutskii, 1952, p. 191 ; Wilson and Yeatman, 1959, p. 850 ; Dussart, 1967, p. 329 ; Ishida, 1981, p. 37 ; Kikuchi, 1982, p. 670.

Materials illustrated : Lake Akan, Hokkaido (43°27'N, 144°07'E), 27 May 1981.

Ishida

Remarks : This species is widespread and very common with high density, especially at spring seepage sites.

23. *Bryocamptus vej dovskyi* (Mrázek)
(Plate 23)

Canthocamptus vej dovskyi Mrázek, 1893b, p. 38 (not consulted).

Bryocamptus vej dovskyi (Mrázek). Lang, 1948, p. 1074 ; Borutskii, 1952, p. 178 ; Wilson and Yeatman, 1959, p. 856 ; Dussart, 1967, p. 332 ; Tai and Song, 1979, p. 218 ; Ishida, 1981, p. 37.

Materials illustrated : Lake Oikamanae, Hokkaido (42°36'N, 143°32'E), 2 July 1983.

Remarks : The species is common in shallow lakes and ponds.

24. *Bryocamptus laccophilus* (Kessler, 1914)
(Plate 24)

Canthocamptus laccophilus Kessler, 1914, p. 628 (not consulted).

Bryocamptus laccophilus (Kessler). Lang, 1948, p. 1098.

Arcticocamptus laccophilus (Kessler). Borutskii, 1952, p. 221.

Bryocamptus laccophilus (Kessler). Dussart, 1967, p. 354 ; Ishida, 1982, p. 50 ; Miura, 1984, p. 538.

Materials illustrated : Erimo, Hokkaido (42°00'N, 143°13'E), 17 Sept. 1980, female only.

Remarks : Only one female was obtained at a small stream near the Cape Erimo.

25. *Bryocamptus hiemalis* (Pearse, 1905)
(Plate 25)

Canthocamptus hiemalis Pearse, 1905, p. 153.

Bryocamptus hiemalis (Pearse). Lang, 1948, p. 1107.

Bryocamptus hiemalis hiemalis (Pearse). Borutskii, 1952, p. 235.

Bryocamptus hiemalis (Pearse). Wilson and Yeatman, 1959, p. 854 ; Kikuchi, 1982, p. 670 ; Ishida, 1984, p. 43.

Materials illustrated : Chitose, Hokkaido (42°49'N, 141°33'E), 8 Apr. 1982.

Remarks : This species is very common in cold waters, from seepage springs to large lakes and from trickles to rivers. In habitus, the species, *B. calvus* and *B. nivalis* are easily distinguished with the difference of the arrangement of the dorsal spinule rows on abdomen.

26. *Bryocamptus calvus* (Brehm, 1927)
(Plate 26)

Canthocamptus calvus Brehm, 1927, p. 143.

Bryocamptus hiemalis brevifurca Coker, 1934, p. 101.

Bryocamptus calvus (Brehm). Lang, 1948, p. 1111 ; Ishida, 1984, p. 43 ; Miura, 1984, p. 538.

Materials illustrated: Chitose, Hokkaido (42°49'N, 141°33'E), 8 Apr. 1982.

Remarks: This species is very common in cold waters, and sympatric with *B. hiemalis*. The description of the species was given briefly and fragmentary by Brehm for female specimen from Lake Aoki, central Japan. I tried a sampling at the type locality, on May in 1986, but failed to get the specimen in the lake. Two females were caught at a small inflow of the lake. Their morphological character does not conflict with the Brehm's description, and coincides with that of the specimens from Hokkaido.

27. *Bryocamptus nivalis* (Willey, 1925)
(Plate 27)

Attheyella nivalis Willey, 1925, p. 153.

Bryocamptus nivalis (Willey). Lang, 1948, p. p. 1110 ; Wilson and Yeatman, 1959, p. 854 ; Kikuchi, 1982, p. 670 ; Ishda, 1984, p. 43.

Materials illustrated: Yoichi, Hokkaido (43°13'N, 140°44'E), Sept. 1984.

Remarks: Sympatric distribution of the species with *B. hiemalis* and *B. calvus* occurs commonly, but the abundance is not so high.

28. *Elaphoidella bidens* (Schmeil, 1894)
(Plate 28)

Canthocamptus bidens Schmeil, 1894, p. 73 (not consulted).

Attheyella coronata Sars, 1904, p. 641 (not consulted).

Canthocamptus bidens Schmeil. Gurney, 1932, p. 184.

Attheyella bidens (Schmeil) *coronata* (Sars). Coker, 1934, p. 130.

Elaphoidella bidens (Schmeil). Lang, 1948, p. 1134.

Elaphoidella bidens bidens (Schmeil). Borutskii, 1952, p. 294.

Elaphoidella bidens coronata (Sars). Wilson and Yeatman, 1959, p. 849.

Elaphoidella bidens (Schmeil). Dussart, 1967, p. 374.

Elaphoidella coronata (Sars). Tai and Song 1979, p. 251.

Elaphoidella sp.. Ishda, 1981, p. 40.

Materials illustrated: Lake Mikazuki-numa, Hokkaido (42°40'N, 141°53'E), 12 Apr. 1981, female.

Remarks: Besides illustrated specimen, one female was caught at Lake Ô-numa (42°00'N, 140°43'E) and Lake Benten-numa (42°39'N, 141°46'E), respectively. Although the obtained specimens were only a few, it seems to be common in coastal shallow lakes along the coast of the Pacific.

29. *Paracamptus reductus* Wilson, 1956
(Plate 29)

Paracamptus reductus Wilson, 1956, p. 348.

Paracamptus reductus Wilson. Wilson and Yeatman, 1959, p. 833 ; Ishida, 1982, p. 51.

? *Paracamptus Nakamurai* Chappuis, 1958, p. 76.

? *Paracamptus nakamurai* Chappuis. Miura, 1984, p. 546.

Materials illustrated : Tsukigata, Hokkaido (43°22'N, 141°37'E), 3 Dec. 1980, female ;
Mikawa-mura, Niigata Pref., Honshū (37°45'N, 139°24'E), 28 Apr. 1981, male.

Remarks : Only a few individuals were caught from Hokkaido.

Acknowledgements

I would like to thank Dr. Tomiko Itō (Hokkaido Fish Hatchery) for the gift of valuable specimens. I am also obliged to Mr. Yoshifumi Miura, Hyōgo Prefecture, for his guidance and the gift of valuable references. My deep thanks are also due to Dr. Yoshiaki Kikuchi (Ibaraki University) for his useful advice and critical reading of the manuscript, and the gift of valuable references.

References

- Borutskii, E. V. (1952) : Fauna of U. S. S. R. Crustacea Vol. III No. 4 Freshwater Harpacticoida. 423 pp. Moscow-Leningrad.
- Brehm, V. (1924) : Diagnosen neuer Entomostraken. IV. *Akad. Anz. Wien*, 1924 (13), 99-100.
- Brehm, V. (1927) : Über die Tiefenfauna japanischer Seen. *Arch. f. Hydrobiol.* 18, 135-150.
- Chappuis, P. A. (1929) : Note sur le Copepods. *Bull. Soc. Stiinte Cluj.* 4, 97-99.
- Chappuis, P. A. (1955) : Harpacticoides troglobies du Japon. *Notes biospéol.* 10, 183-190.
- Chappuis, P. A. (1958) : Mission Franco-Japonaise dans les grottes du Japon. Harpacticoides de la grotte dite Akiyoshi-Do. *Notes Biospéol.* 13, 71-83.
- Coker, R. E. (1934) : Contribution to knowlege of North American freshwater harpacticoid copepod Crustacea. *Jour. Elisha Mitchell Sci. Soc.* 50, 75-141.
- Dussart, B. (1967) : Les Copépodes des eaux Continentals. Tome I : Calanoides et Harpactioides. 500 pp. Paris.
- Graeter, E. (1911) : Die Copepoden der unter irdischen Gewässer. *Arch. f. Hydrobiol.* 1, 111-152.
- Gurney, R. (1932) : British freshwater Copepoda. Vol. 2. (Harpacticoida). 336 pp. Ray Society, London.
- Ishida, T. (1981) : A preliminary account of the fresh-water harpacticoid copepods of Hokkaido, northern Japan. *Sci. Rep. Hokkaido Salmon Hatchery.* (35), 33-56. (in Japanese with English Summary)
- Ishida, T. (1982) : Futher notes of the fresh-water harpacticoid copepods of Hokkaido, northern Japan. *Sci. Rep. Hokkaido Salmon Hatchery.* (36), 49-61. (in Japanese with English Summary)
- Ishida, T. (1983) : On the distribution of the related three species and variety of genus *Attheyella* (Copepoda, Harpacticoida), in Hokkaido and Honshu, Japan. *Sci. Rep. Hokkaido Salmon Hatchery.*

- (37), 45-51. (in Japanese with English Summary)
- Ishida, T. (1984a): On the distribution of the related three species of genus *Bryocamptus* (Copepoda, Harpacticoida), in Hokkaido and Honshu, Japan. *Sci. Rep. Hokkaido Salmon Hatchery.* (38), 43-49. (in Japanese with English Summary)
- Ishida, T. (1984b): On the newly discovered three species of Copepoda *Halicyclops* sp., *Acanthocyclops venustoides bispinosus* (Yeatman) and *Attheyella dentata* (Poggenpol) of freshwaters of Hokkaido, Japan. *Sci. Rep. Hokkaido Salmon Hatchery.* (38), 51-56. (in Japanese with English Summary)
- Itô, T. and Y. Kikuchi (1977): On the occurrence of *Harpacticella paradoxa* (Brehm) in Japan; a freshwater Harpacticoid Copepod originally described from a Chinese lake. *Ann. Zool. Jap.* **50** (1), 40-56.
- Itô, T. and T. Takashio (1980): *Canthocamptus mirabilis* Štěrba (Copepoda, Harpacticoida) from Hokkaido, northern Japan. *Ann. Zool. Jap.* **53**(3), 210-219.
- Jurine, L. (1820): Histoire des *Monocles* qui se trouvent aux environs de Genève. 260 pp. Genève, Paris.
- Kessler, E. (1914): Zwei neue *Canthocamptus* Arten aus dem Riesengebirge. *Zool. Anz.* **43**, 626-630.
- Kikuchi, Y. (1982): On a faunistic survey of the freshwater harpacticoid copepods from the east of Hokkaido. *Zool. Sci.* **91** (4), 670. (in Japanese)
- Kikuchi, Y. (1984): Morphological comparison of two terrestrial species of *Moraria* (Canthocamptidae, Harpacticoida) from Japan, with the scanning electron microscope. *Crustaceana Supplement* **7**, 279-285.
- Kikuchi, Y. (1985): Redescription of a freshwater Harpacticoid copepod, *Elaphoidella grandidieri* (Guerne & Richard, 1893), from a swamp at Itako, central Japan. *Publ. Itako Hydrobiol. Stn.* **2** (1), 1-8.
- Lng, K. (1948): Monographie der Harpacticiden. 1683 pp. Hakan Ohlssons Boktryckeri, Lund.
- Lilljeborg, W. (1902): Tres species novae generis *Canthocampti* e Novaja Semlja et Sibiria boreali. Bihang Kungl. Sv. Vet.-Acad. Handl. **28**.
- Marsh, C. D. (1903): On a new species of *Canthocamptus* from Idaho. *Trans. Wis. Acad. Sci., Arts and Letters* **14**, 112-116.
- Miura, Y. (1984): Nippon no rikusuisan Harpacticoida. Nippon / Chugoku Tansuisan Kai-ashi rui, 500-563. (in Japanese)
- Miura, Y. (1962): Three new harpacticoid copepods from the subterranean waters of Shikoku in Japan. *Jap. J. Zool.* **13**, 267-274.
- Miura Y. (1964): Subterranean Harpacticoid Copepods from a driven well in Japan. *Jap. J. Zool.* **14** (2), 133-141.
- Miura Y. (1969): Results of the speleological survey in South Kora 1966 XIV. Subterranean Harpacticoid Copepods of South Korea. *Bull. Nat. Sci. Mus.* **12** (2), 241-254.
- Mrázek, A. (1893a): Beiträge zur Kenntnis der Harpacticiden Fauna des Süßwassers. *Zool. Jb., Syst.* **7**, 89-130.
- Mrázek, A. (1893b): Príspevky k Poznani Sladkovodnich Copepoda. *Böhmisch Ges. Wiss., Abh. - naturw. Kl.* **8:2** 1-74.
- Pearse, A. S. (1905): Contributions to the copepod fauna of Nebraska and other States. *Proc. Amer. Microscop. Soc.* **26**, 145-160.

- Poggenpol, M. J. (1874): Verzeichnis der Copepoden, Cladoceren und Ostracoden der Umgebung von Moscou. *Nov. Soc. impér. Amis Sci. nathop. Ethnogr. Univ. Moscow.* **10** (2), 69-81.
- Richard, J. (1898): Sur la faune des eaux douces explorés en 1898 pendant la campagne du yacht Princesse Alice. *Mém. Soc. Zool. Fr.* **11**, 326-338.
- Sars, G. O. (1862): Oversigt af de indenlandske Ferskvandscopepoder. *Forh. Videnskabs - Selsk. Christiania*, 212-262.
- Sars, G. O. (1904): Pacifische Plankton-Crustacean. *Zool. Jb. Syst.* **19**, 629-645.
- Schmeil, O. (1893a): Copepoden des Rhätikon-Gebirges. *Abh. naturforsch. Ges. Halle.* **19**, 1-40.
- Schmeil, O. (1893b): Deutschelands freilebende süßwasser Copepoden. II. Harpacticidae. *Bibl. Zool. Stutt.* **15**, 1-100.
- Schmeil, O. (1894): Additions to the fauna of the Firth of Forth. *12th Ann. Rep. Fish. Bd. Scotland*, Part III. 348 pp.
- Scott, T. & A. (1896): Some new or rare Crustacea from Scotland. *Ann. Mag. nat. Hist.* **6** (18), 1-8.
- Štěrba, O. (1968): Neue Harpacticoida (Crustacea, Copepoda) aus dem asiatischen Teil der Paläarktis. *Zool. Anz.* **180**, 50-68.
- Tai, A. and Y. Song (1979): Fauna Sinica. Crustacea, Freshwater Copepoda. 450 pp. Peking.
- Willey, A. (1925): Northern Cyclopodae and Canthocamptidae. *Trans. Royal Soc. Can.* 3rd Ser. **19**, 137-158.
- Wilson, M. S. (1956): North American harpacticoid copepods: 3 *Paracamptus reductus* n. sp., from Alaska. *J. Wash. Acad. Sci.* **46** (11), 348-351.
- Wilson, M. S. (1958): North American harpacticoid copepods. 4. Diagnoses of new species of fresh-water Canthocamptidae and Cletodidae (Genus *Huntemmania*). *Proc. Biol. Soc. Wash.* **71**, 43-48.
- Wilson, M. S. and H. C. Yeatman. (1959): Free - living Copepoda: Harpacticoida. in *Fresh - water Biology*, (ed.) W. T. Edmondson. 1248 pp. 815-861. John Willey, N. Y.

北海道の淡水ソコミジンコ

石田 昭夫

北海道の淡水域に生息するソコミジンコ（地下水種を除く）の種類相と分布の状態がほぼ明らかとなったので、種の同定に役立つ形に作製した図版をそえて報告する。

使用できた材料は全道各地から集められた220試料である。ソコミジンコの採集法は特異なので、著者の方法を紹介する。種類相は未記載種4種を含む29種である。シノニムリストには原記載、わが国で入手しやすいモノグラフ、および関係するわが国とアジア、北米の論文を取めてある。摘要にはその種の分布域、分布密度、生息場所等を記述する。図版は各葉とも全体図（一部を除き雌のみ）と口器を除く体の各部位の図を、同一の順序でほぼ同じ位置に配置して描いてある。

Freshwater Harpacticoid Copepods of Hokkaido, Northern Japan

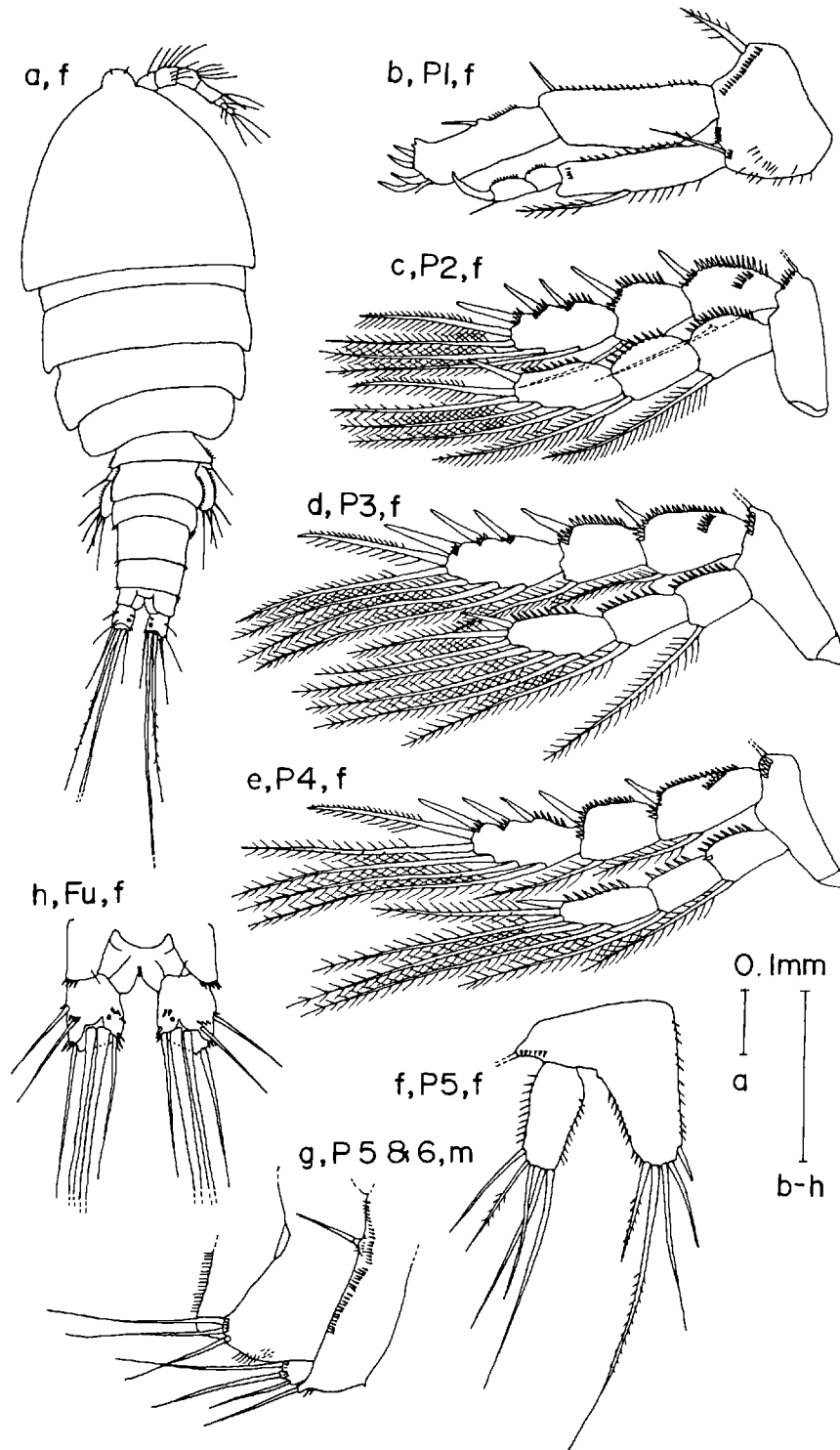


Plate 1. *Harpacticella paradoxa* (Brehm)

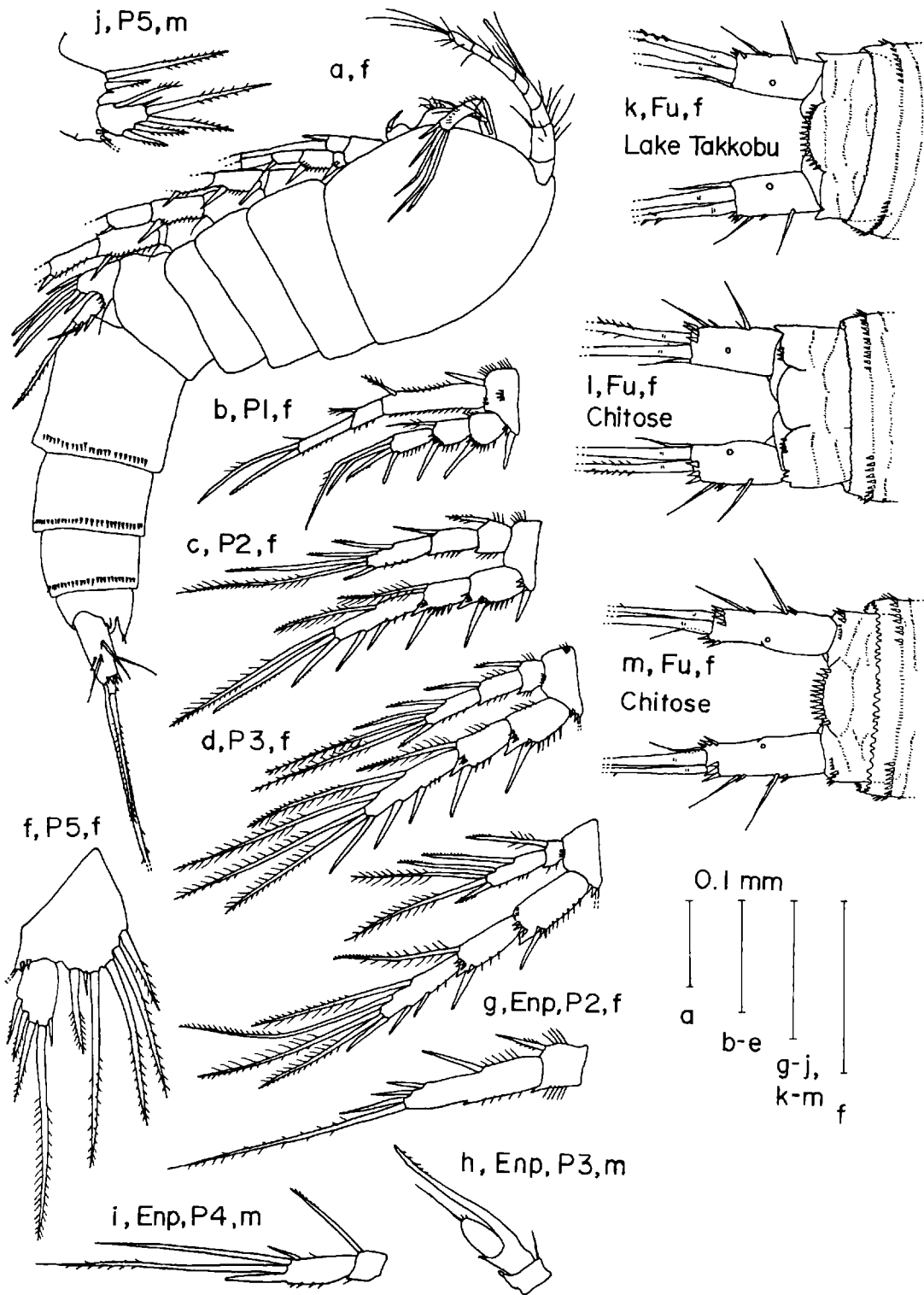


Plate 2. *Canthocamptus staphylinus* (Jurine)

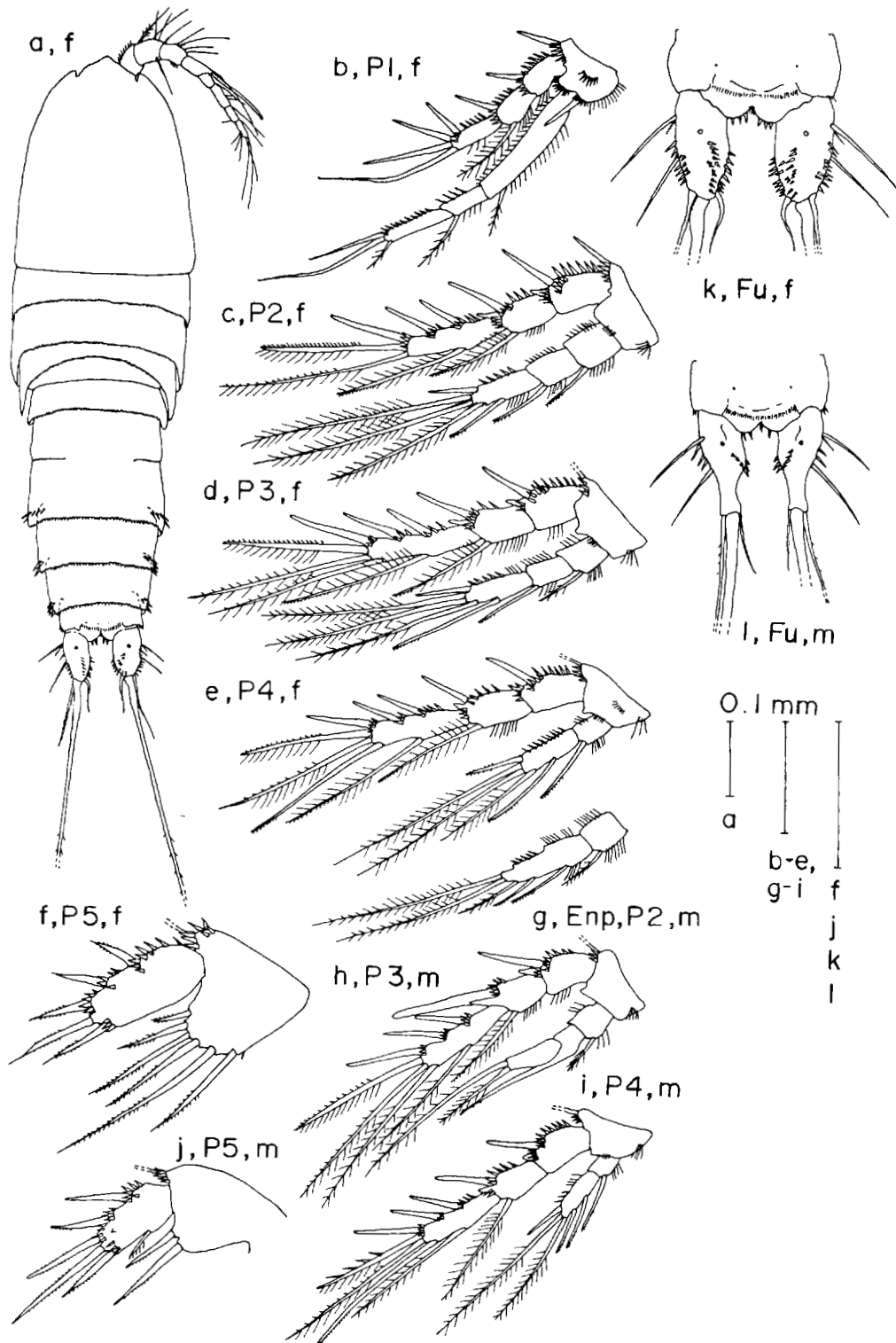


Plate 3. *Canthocamptus mirabilis* Štěrba

Ishida

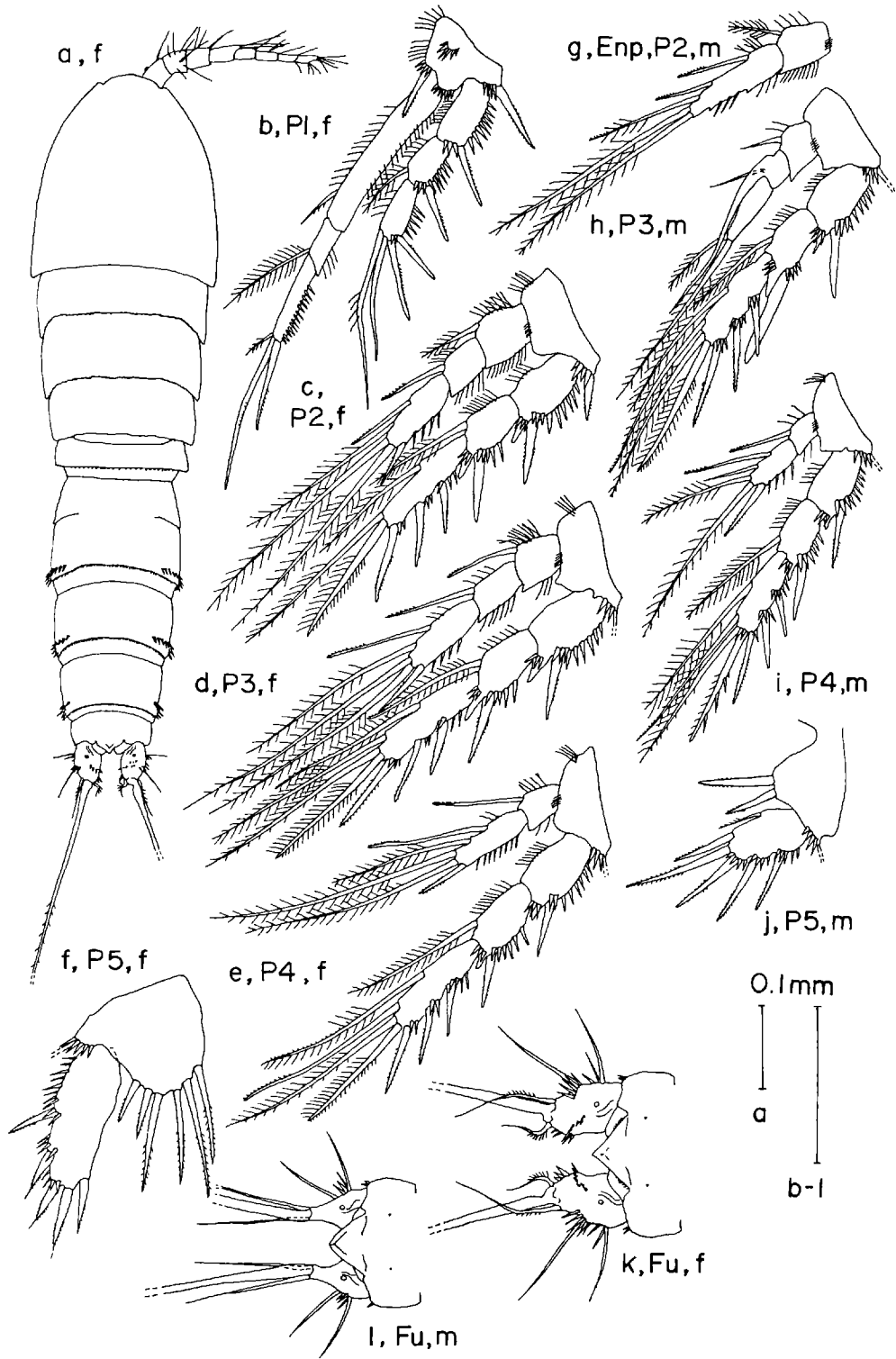


Plate 4. *Canthocamptus* sp. II

Freshwater Harpacticoid Copepods of Hokkaido, Northern Japan

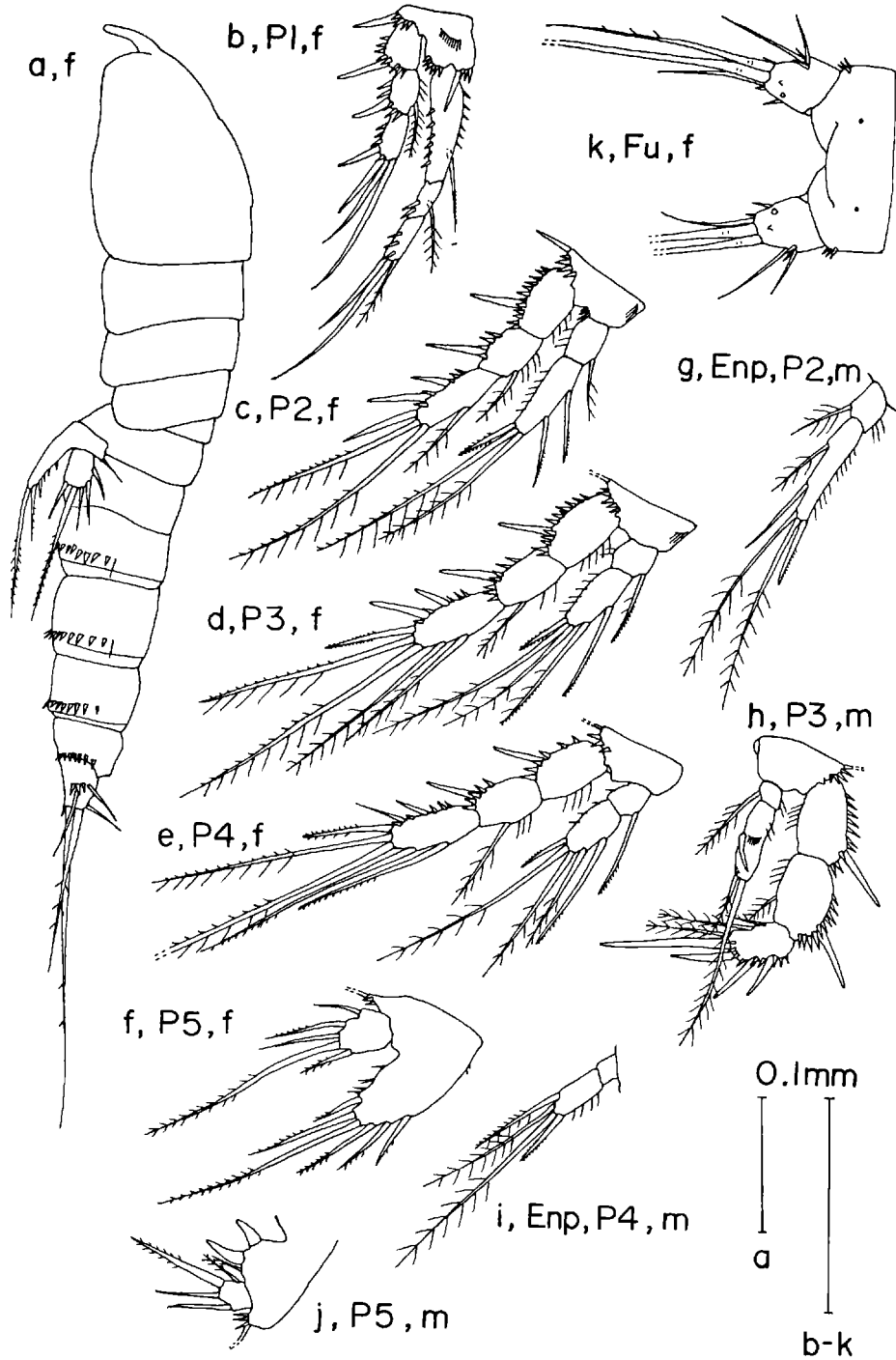


Plate 5. *Mesochra rapiens* (Schmeil)

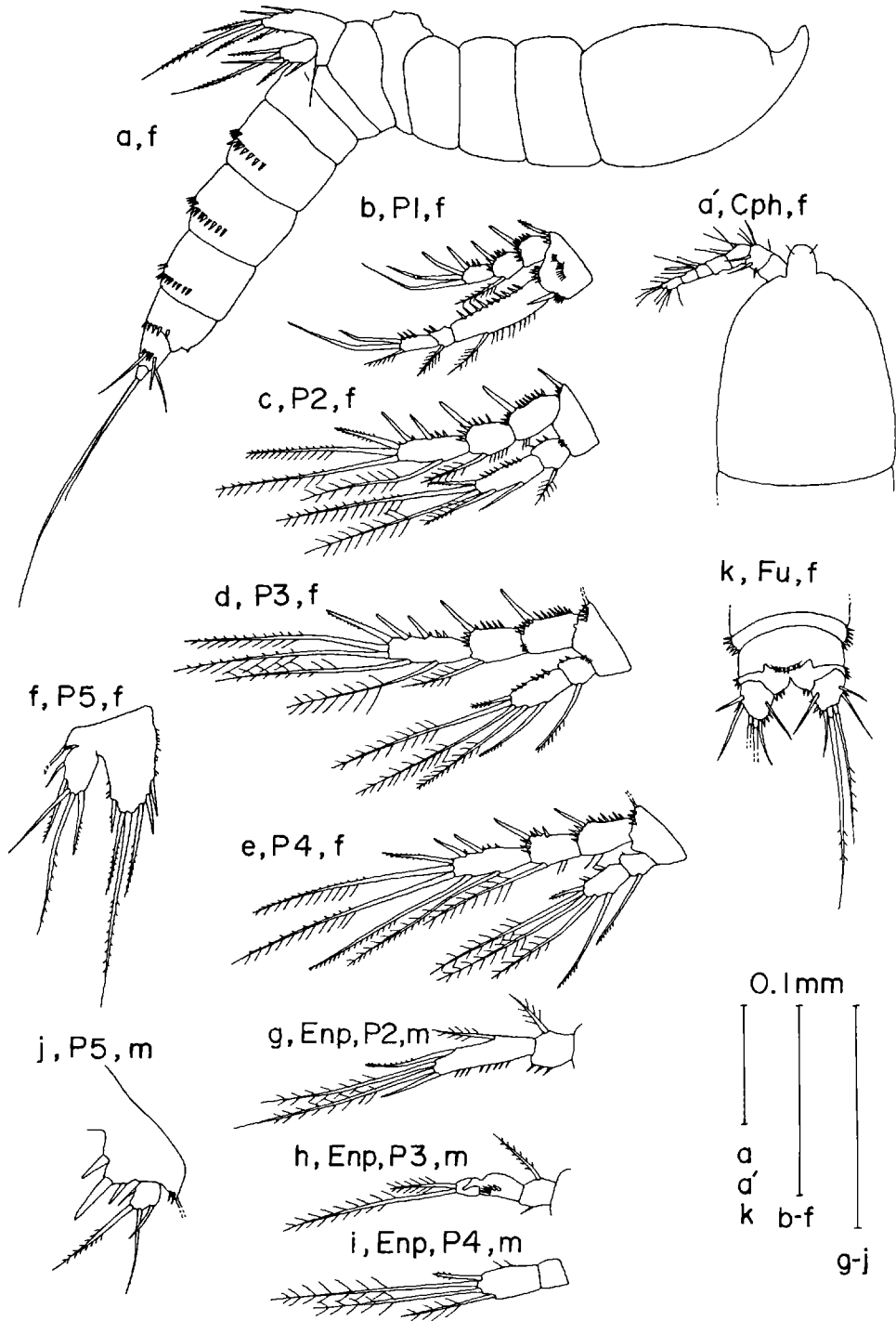


Plate 6. *Mesochra alaskana* Wilson

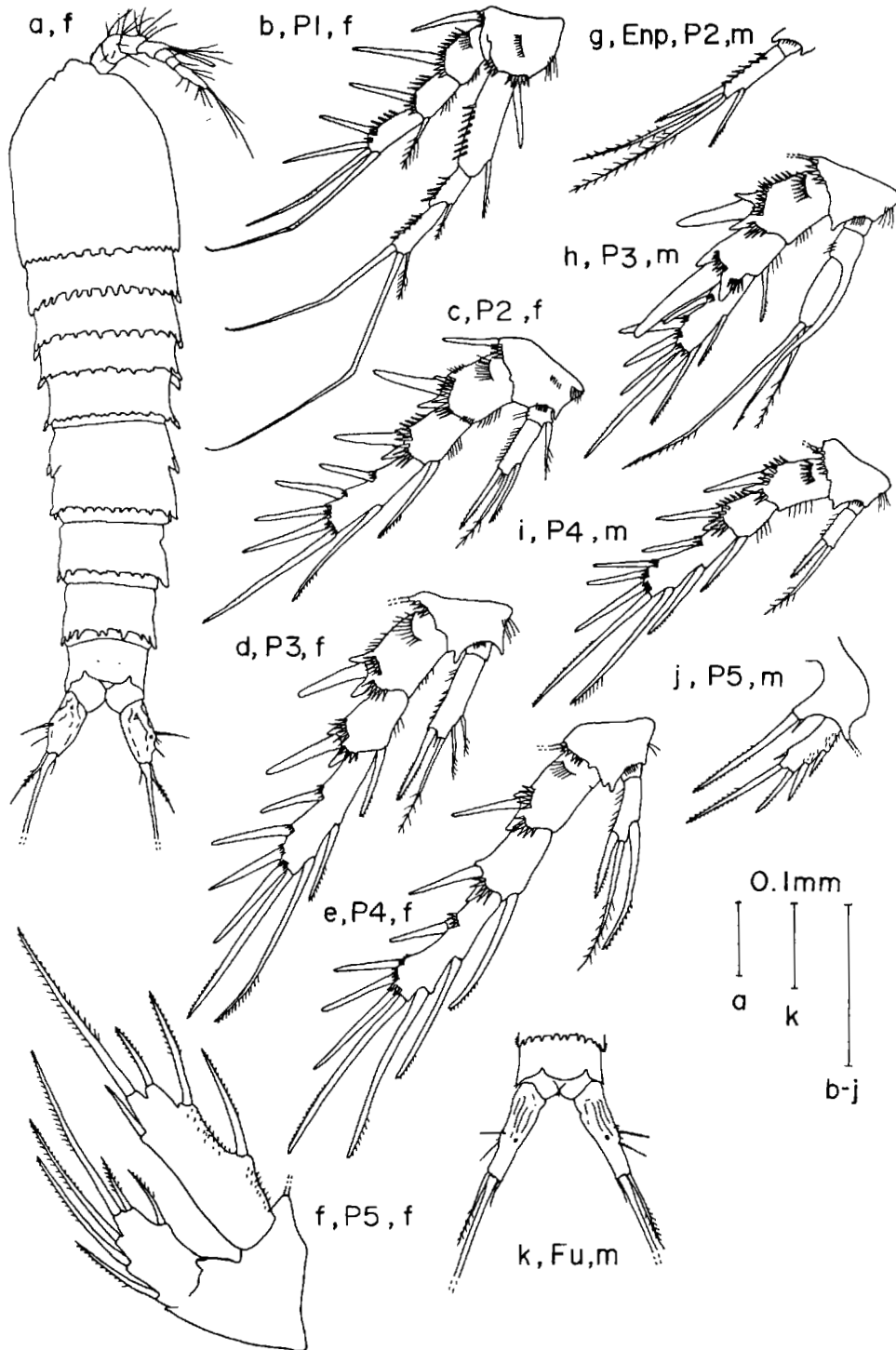


Plate 7. *Attheyella idahoensis* (Marsh)

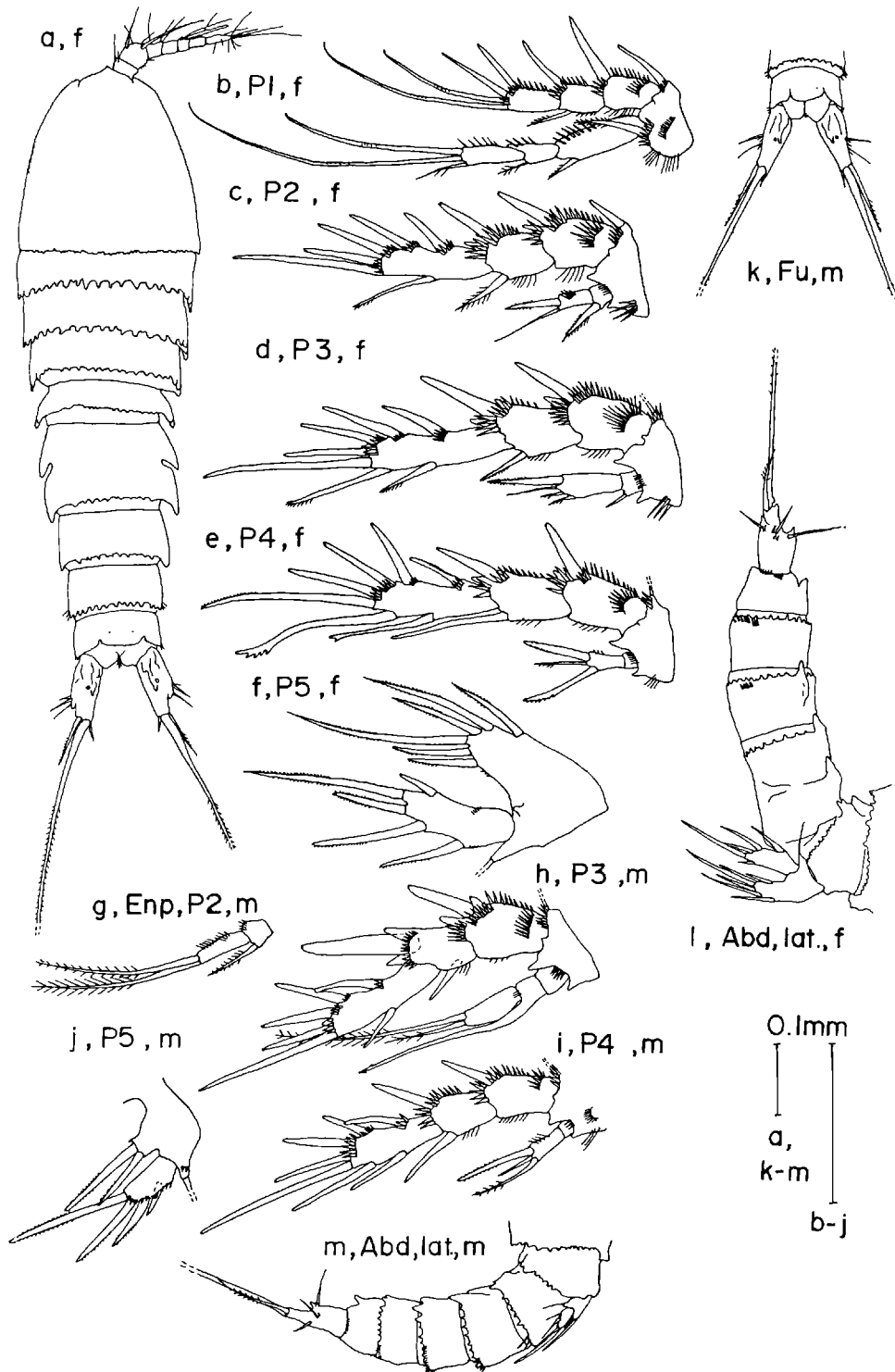


Plate 8. *Attheyella nakaii* (Brehm)

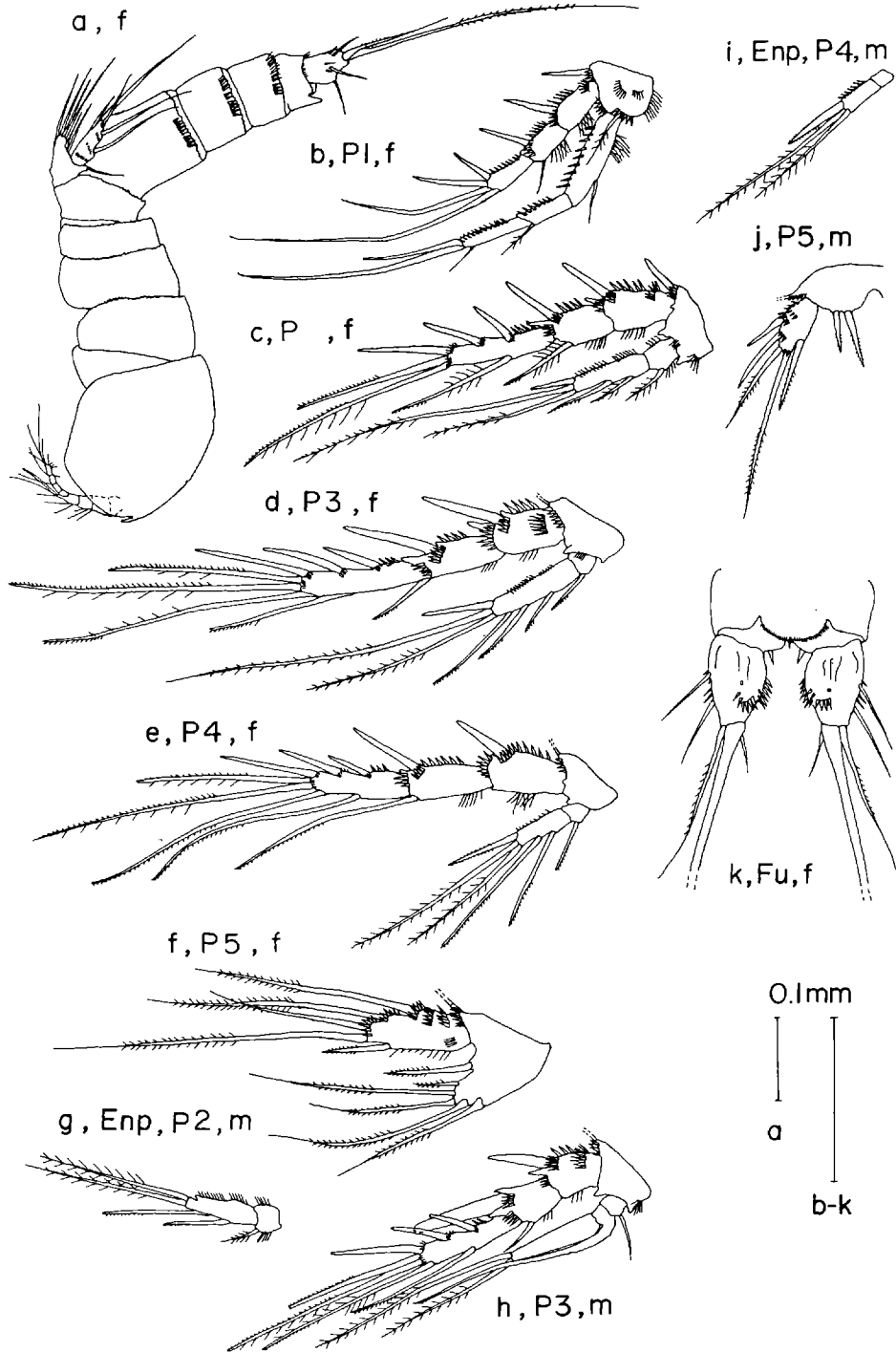


Plate 9. *Attheyella crassa* (Sars)

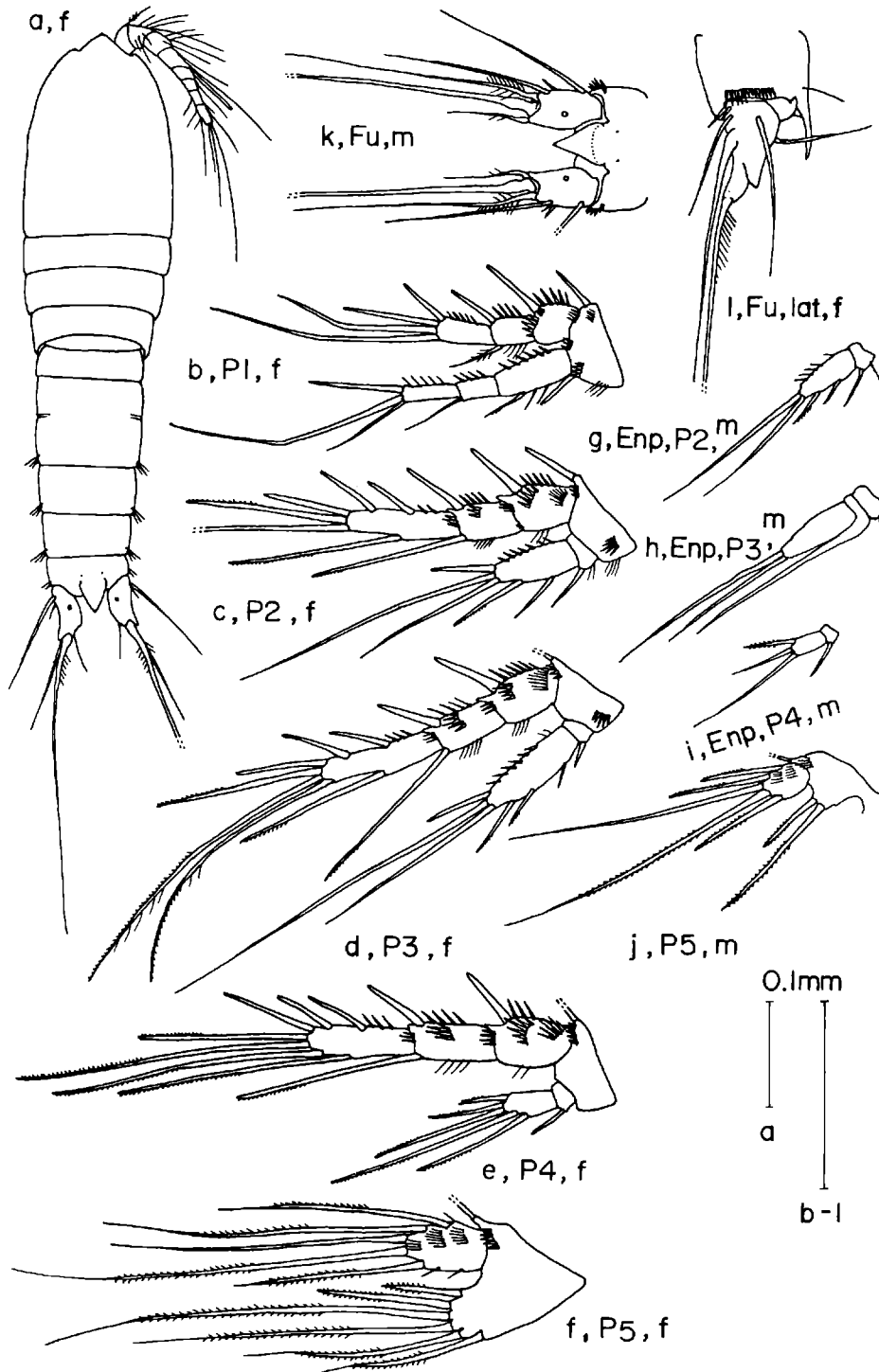


Plate 10. *Attheyella orientalis* Chappuis

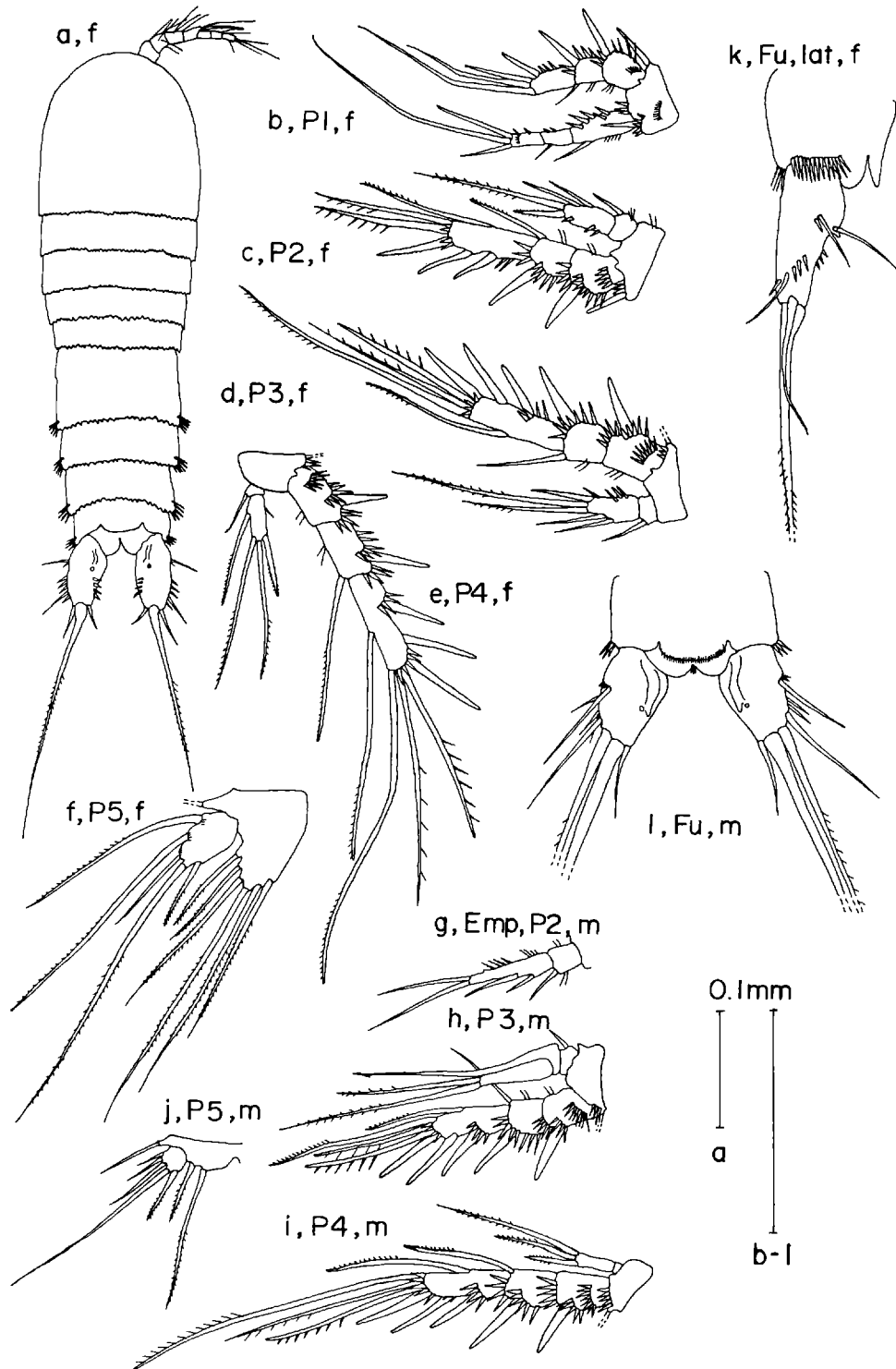


Plate 11. *Attheyella* sp. M

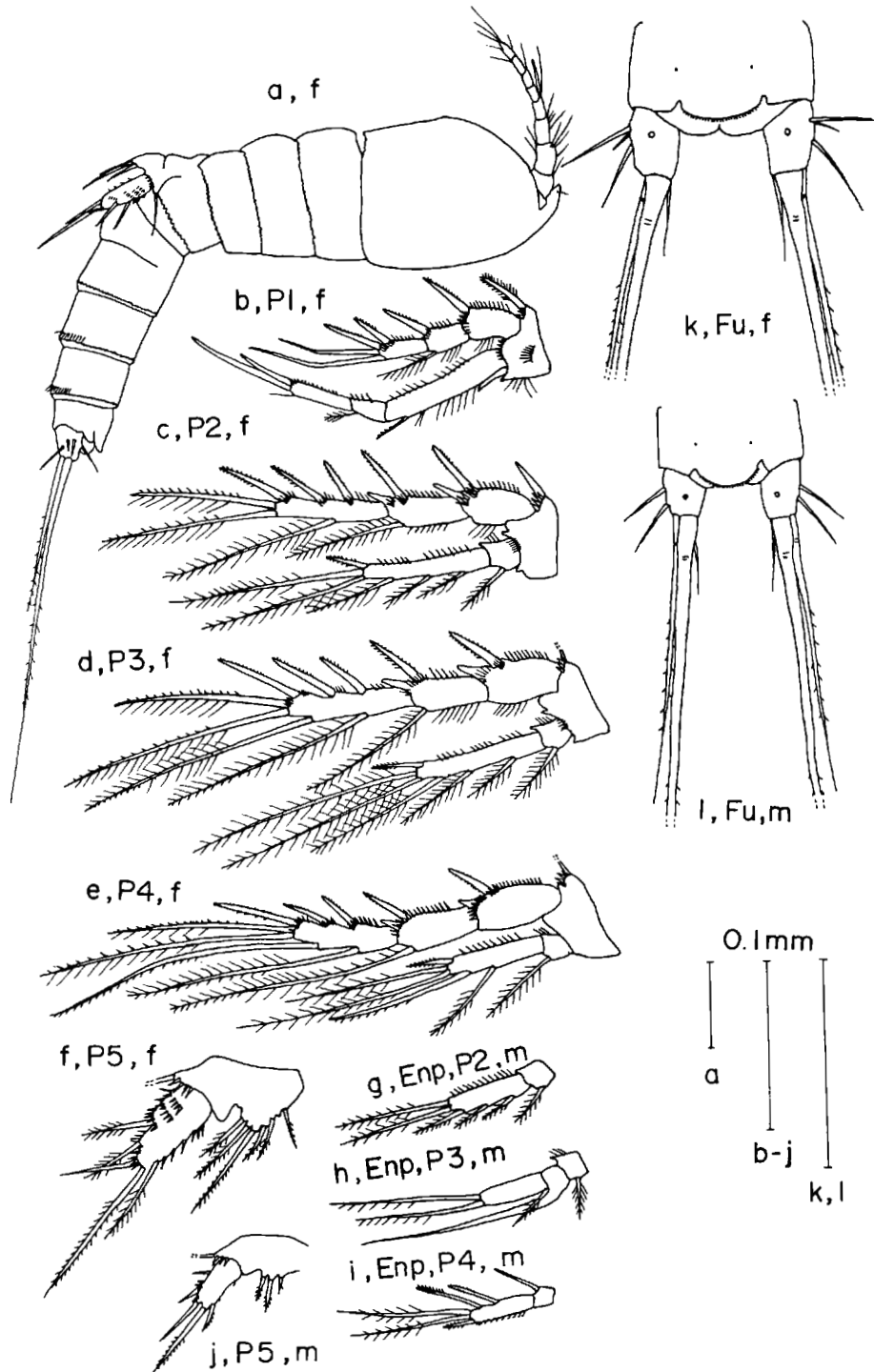


Plate 12. *Attheyela dentata* (Poggenpol)

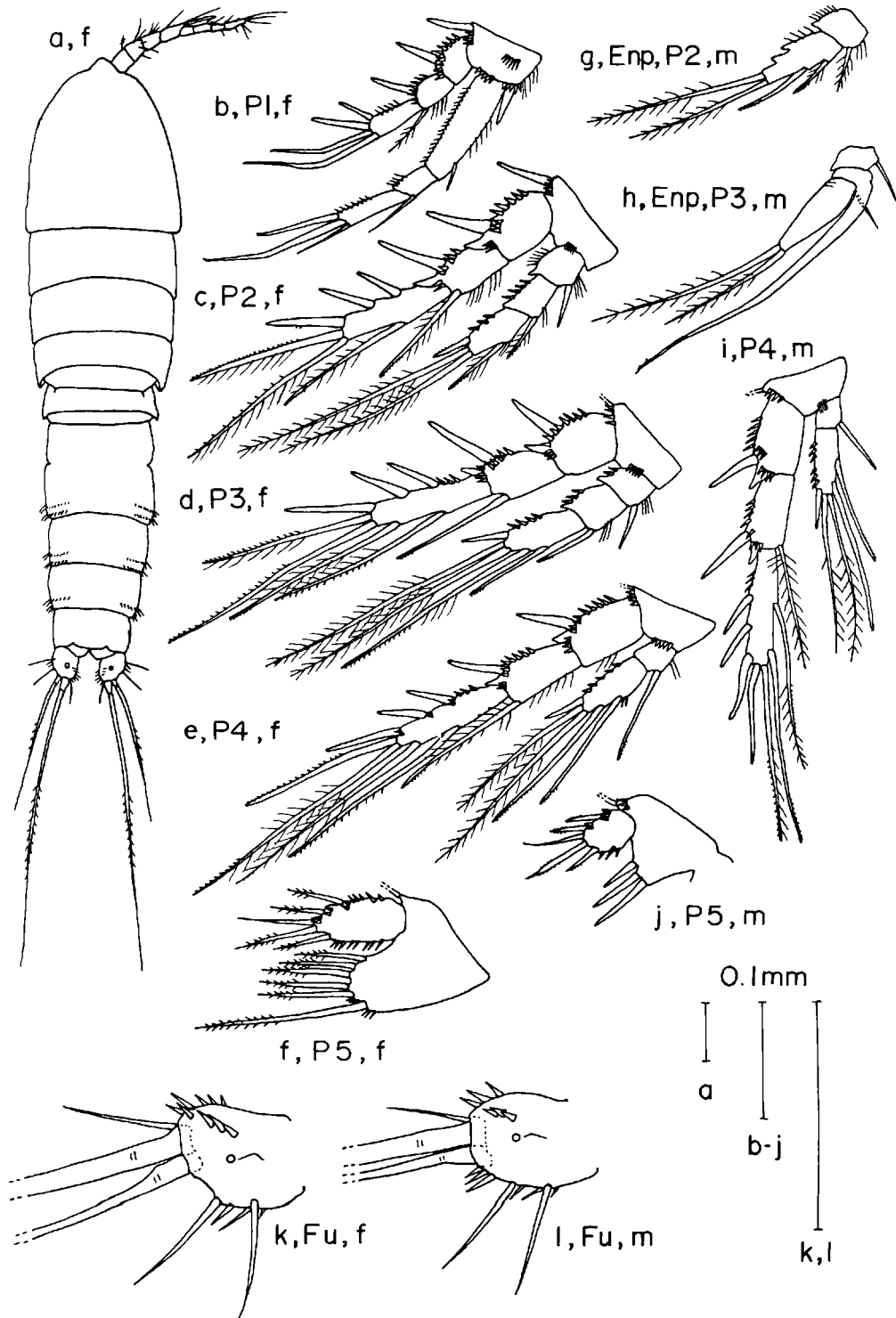


Plate 13. *Attheyella nordenskjöldii* (Lilljeborg)

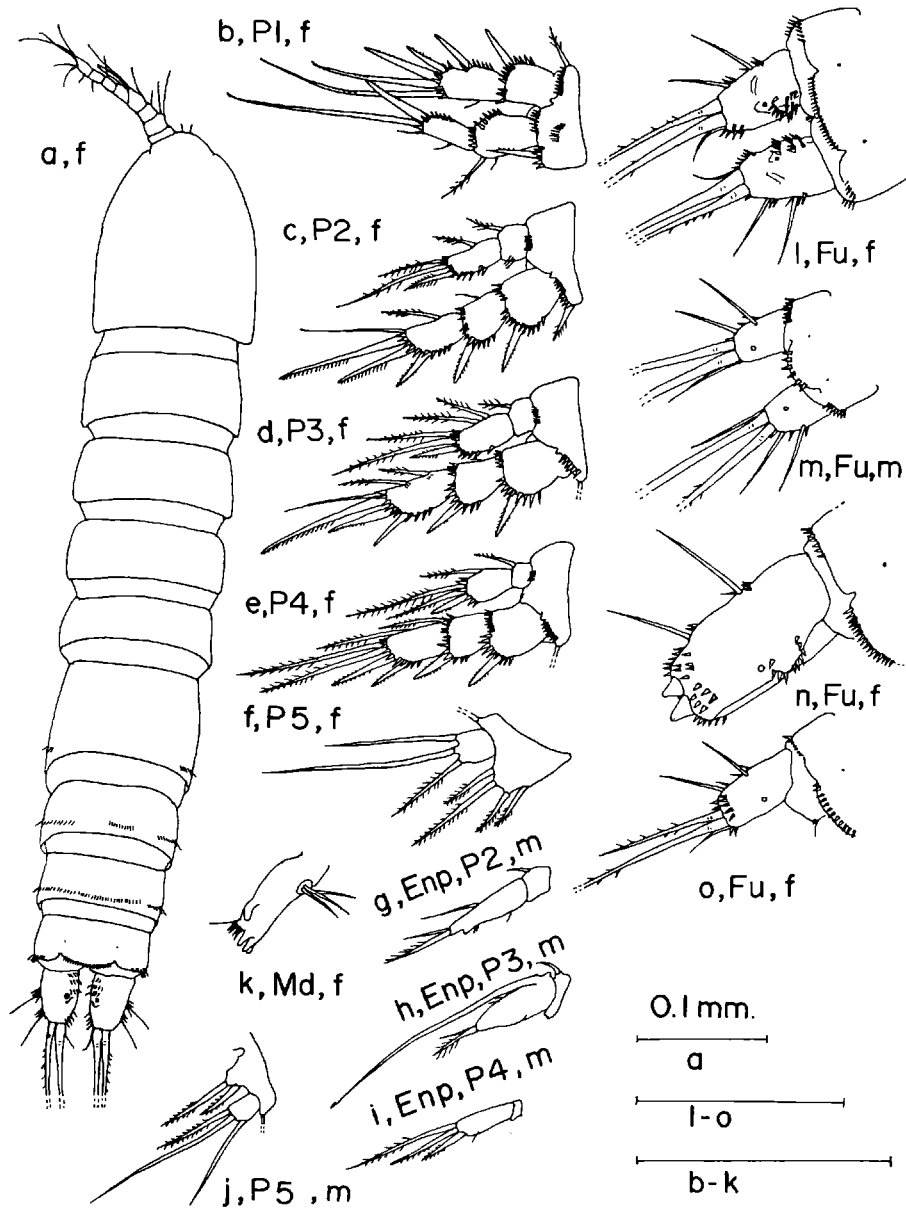


Plate 14. *Maraenobiotus vej dovski* Mrázek

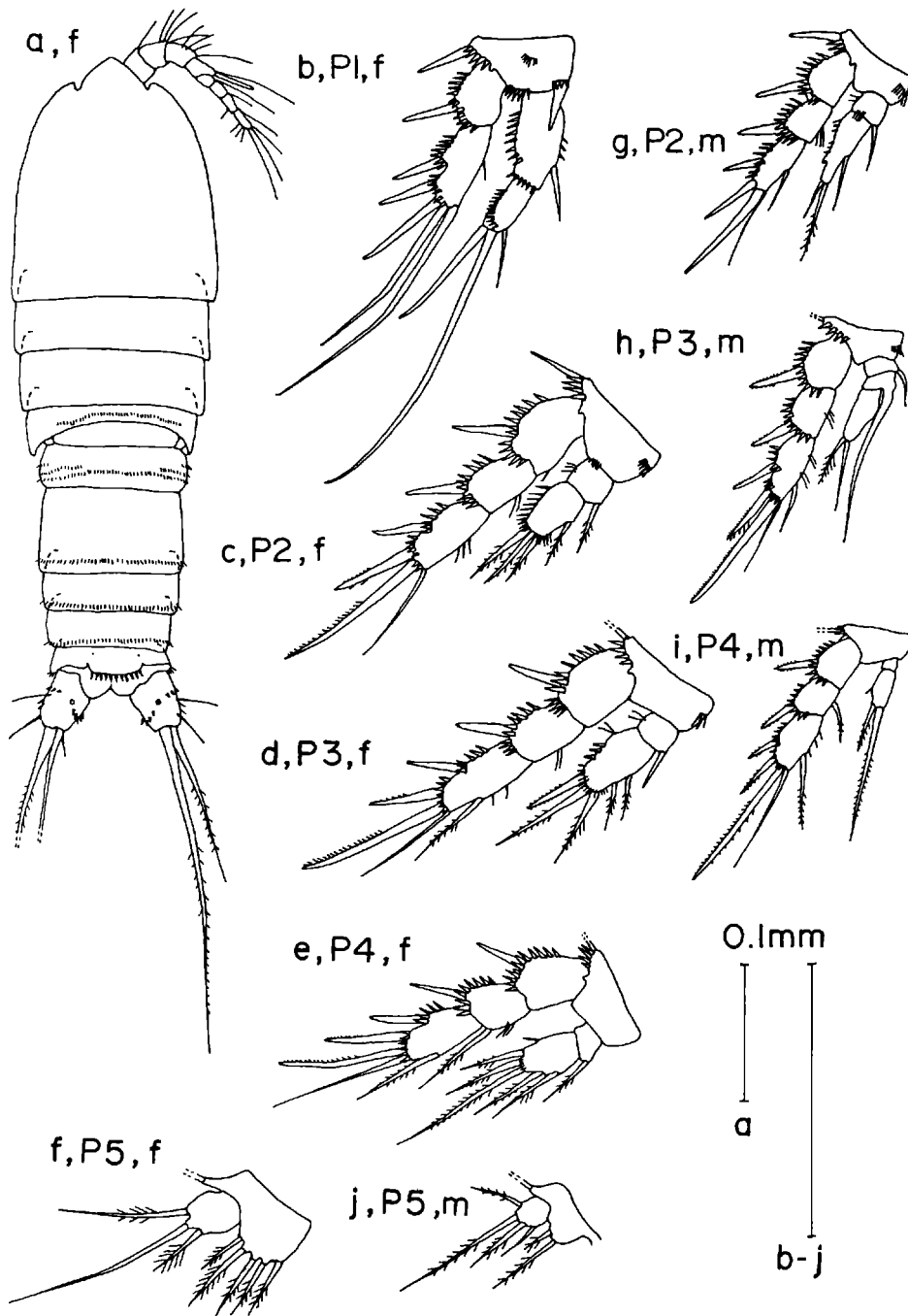


Plate 15. *Maraenobiotus brucei* (Richard)

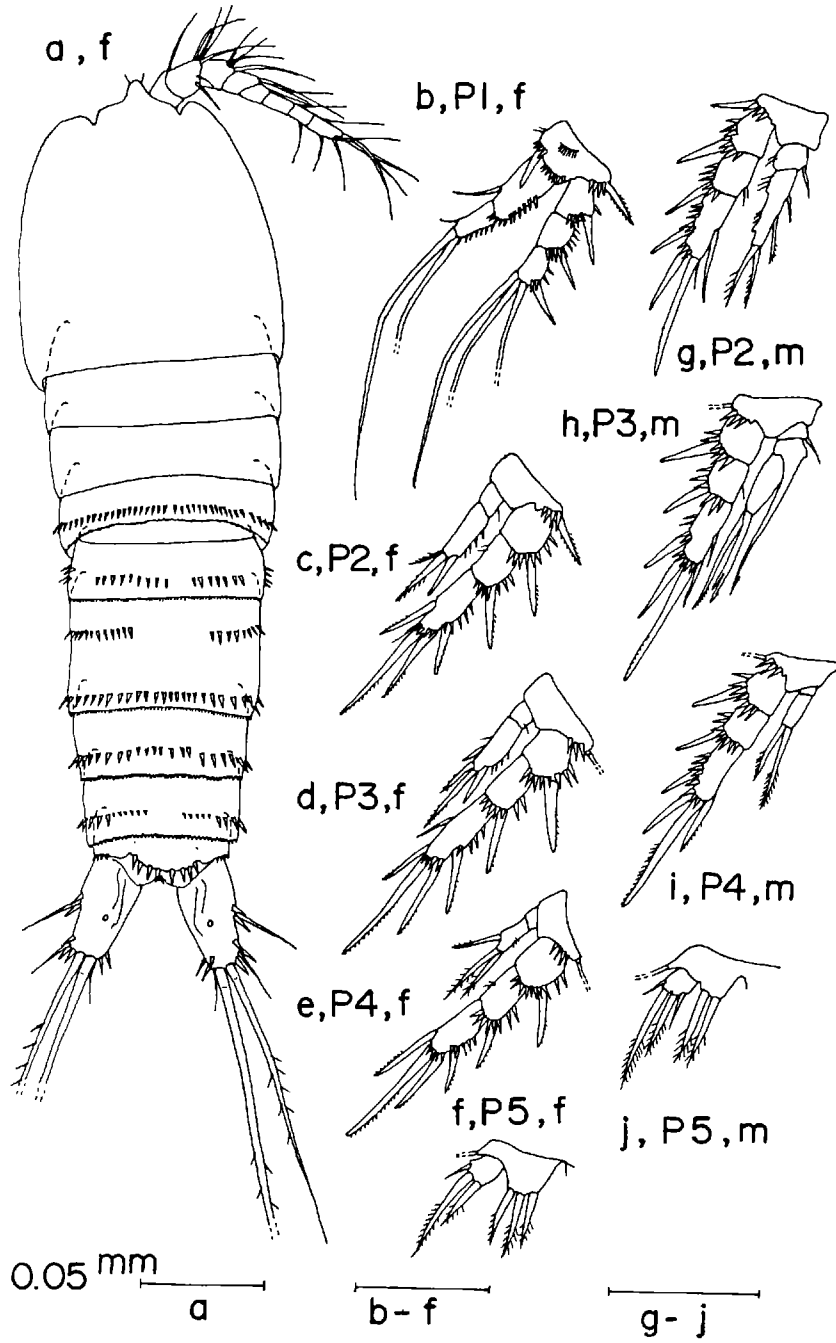


Plate 16. *Gulcamptus* sp. S

Freshwater Harpacticoid Copepods of Hokkaido, Northern Japan

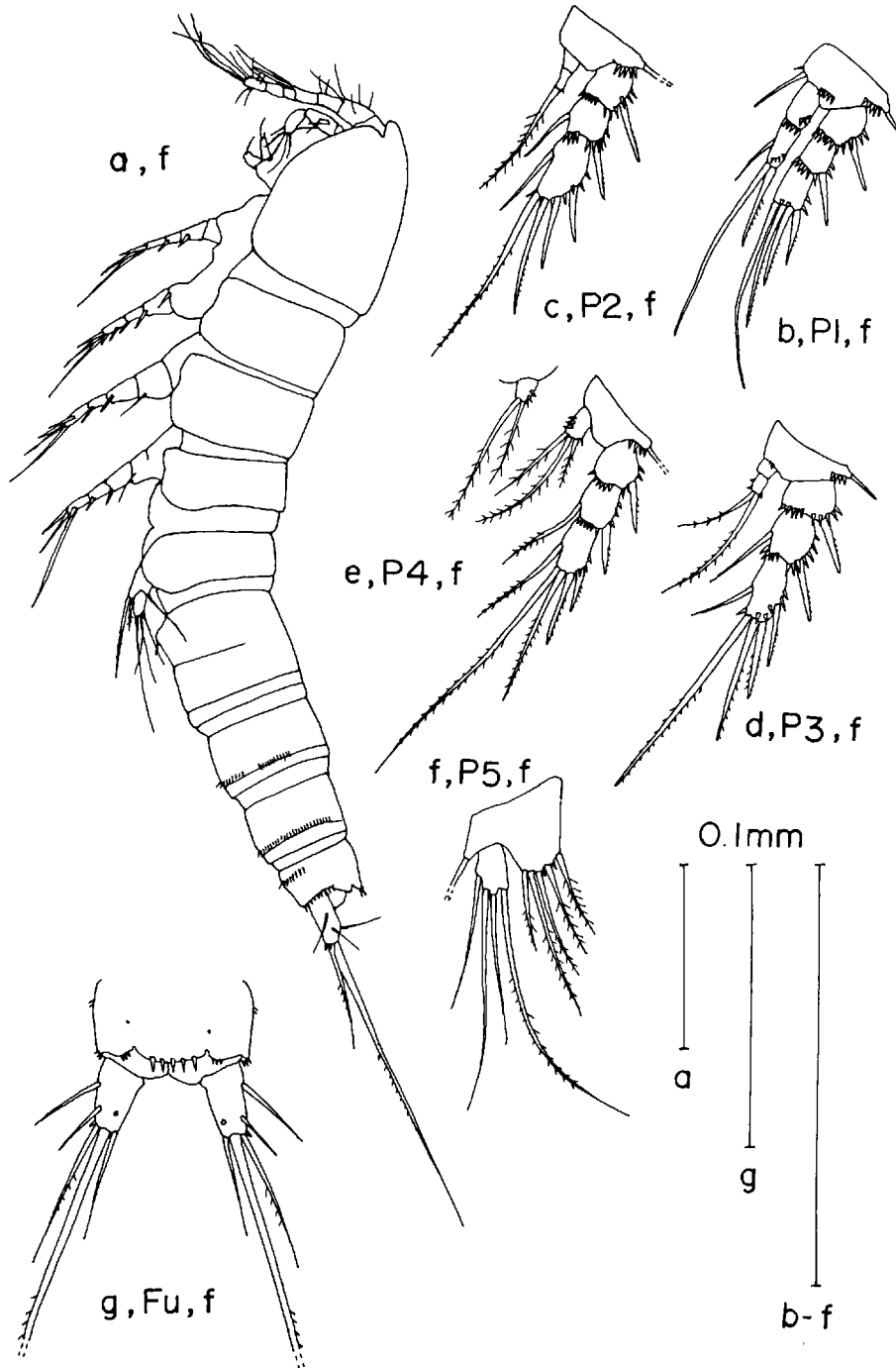


Plate 17. *Epactophanes richardi* Mrázek

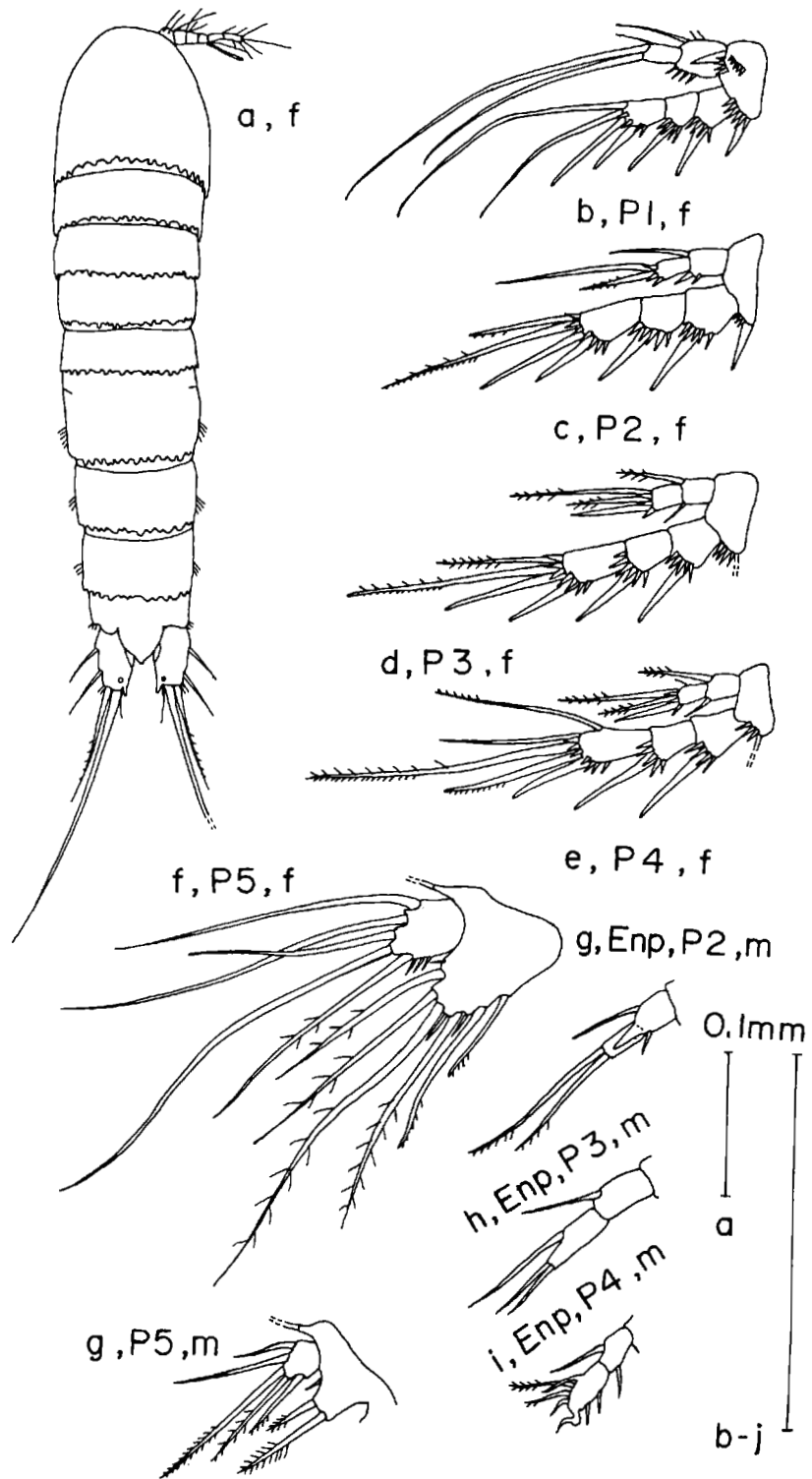


Plate 18. *Moraria poppei* (Mrázek)

Freshwater Harpacticoid Copepods of Hokkaido, Northern Japan

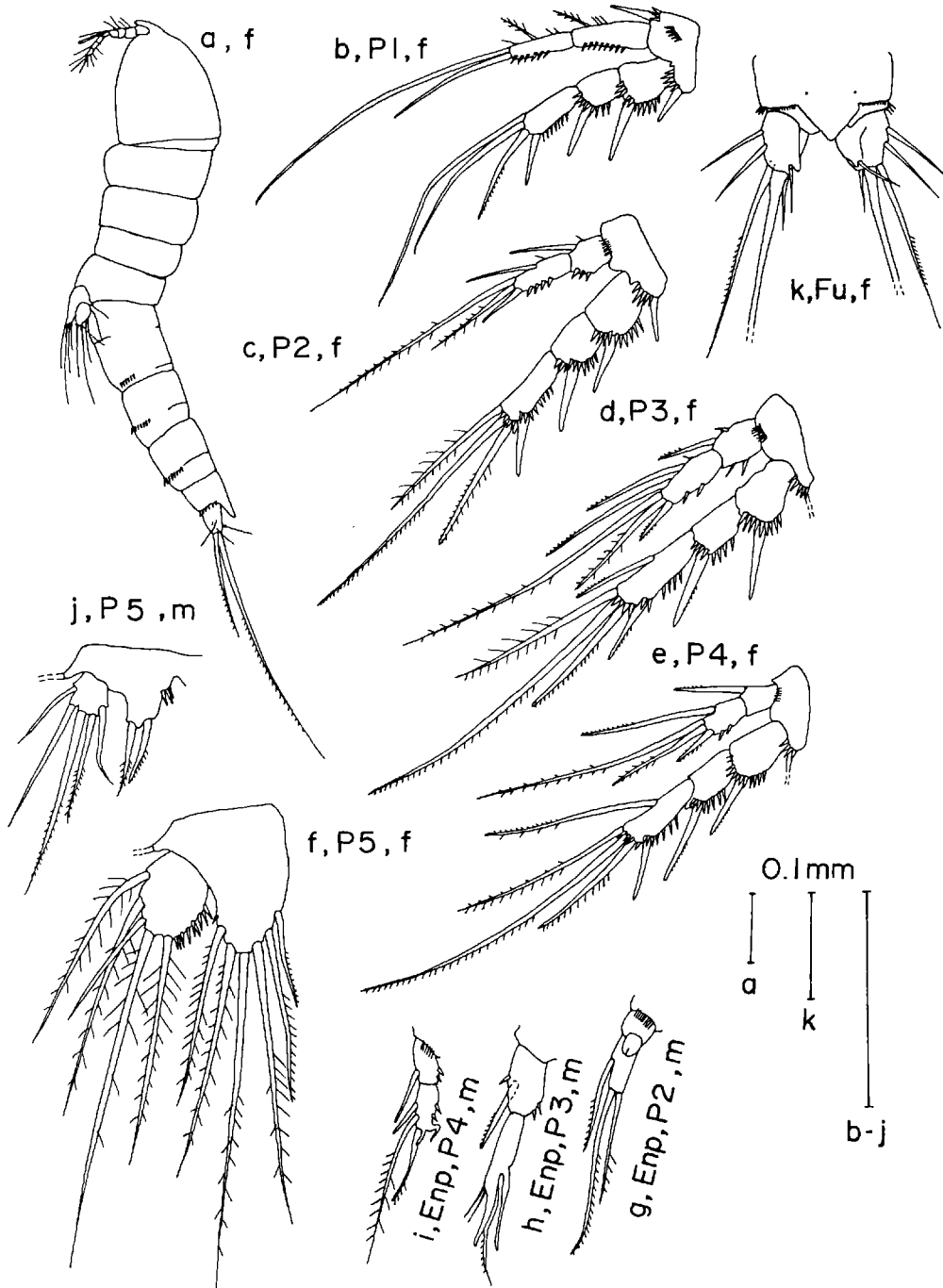


Plate 19. *Moraria duthiei* (T. & A. Scott)

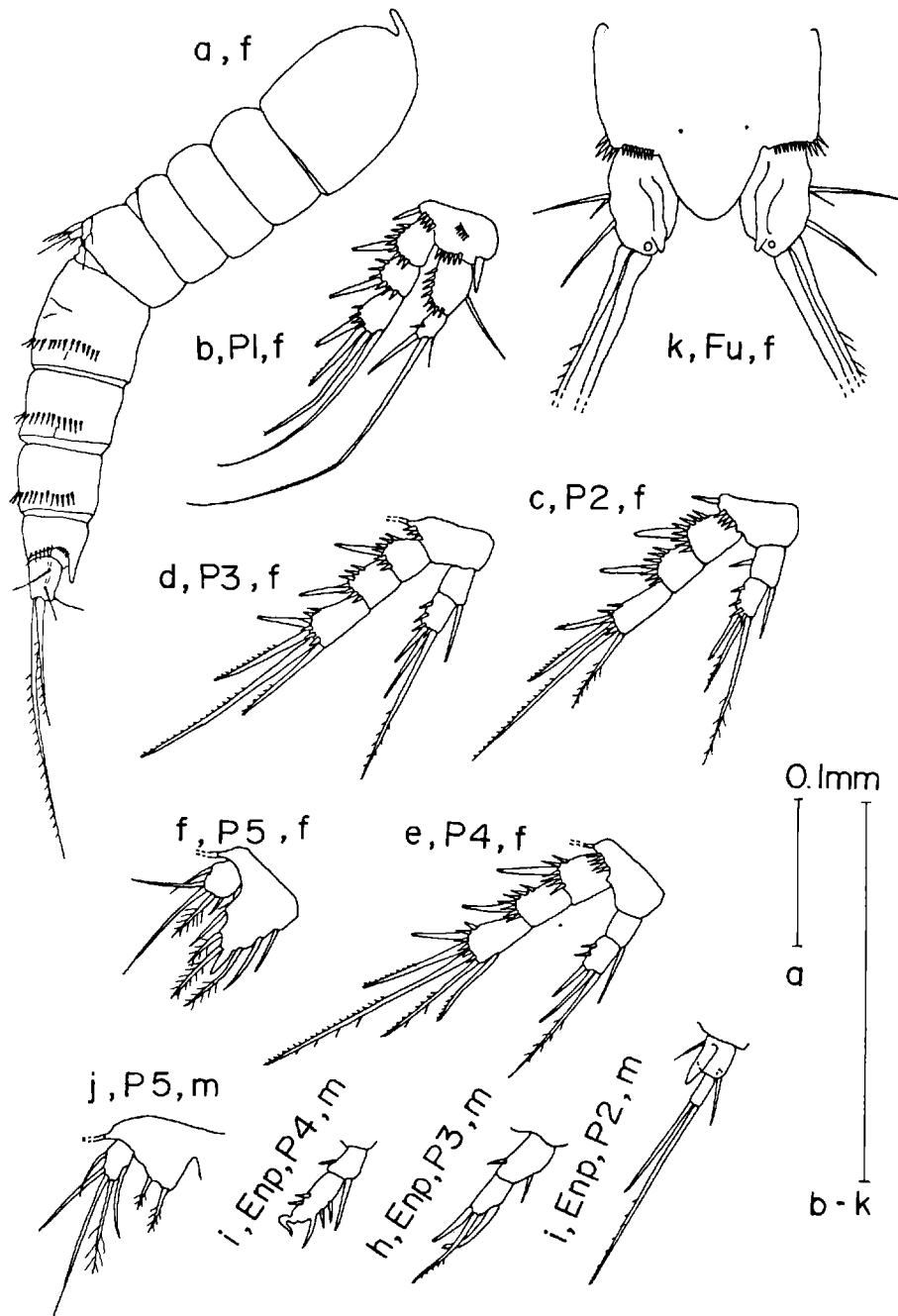


Plate 20. *Moraria varica* (Graeter)

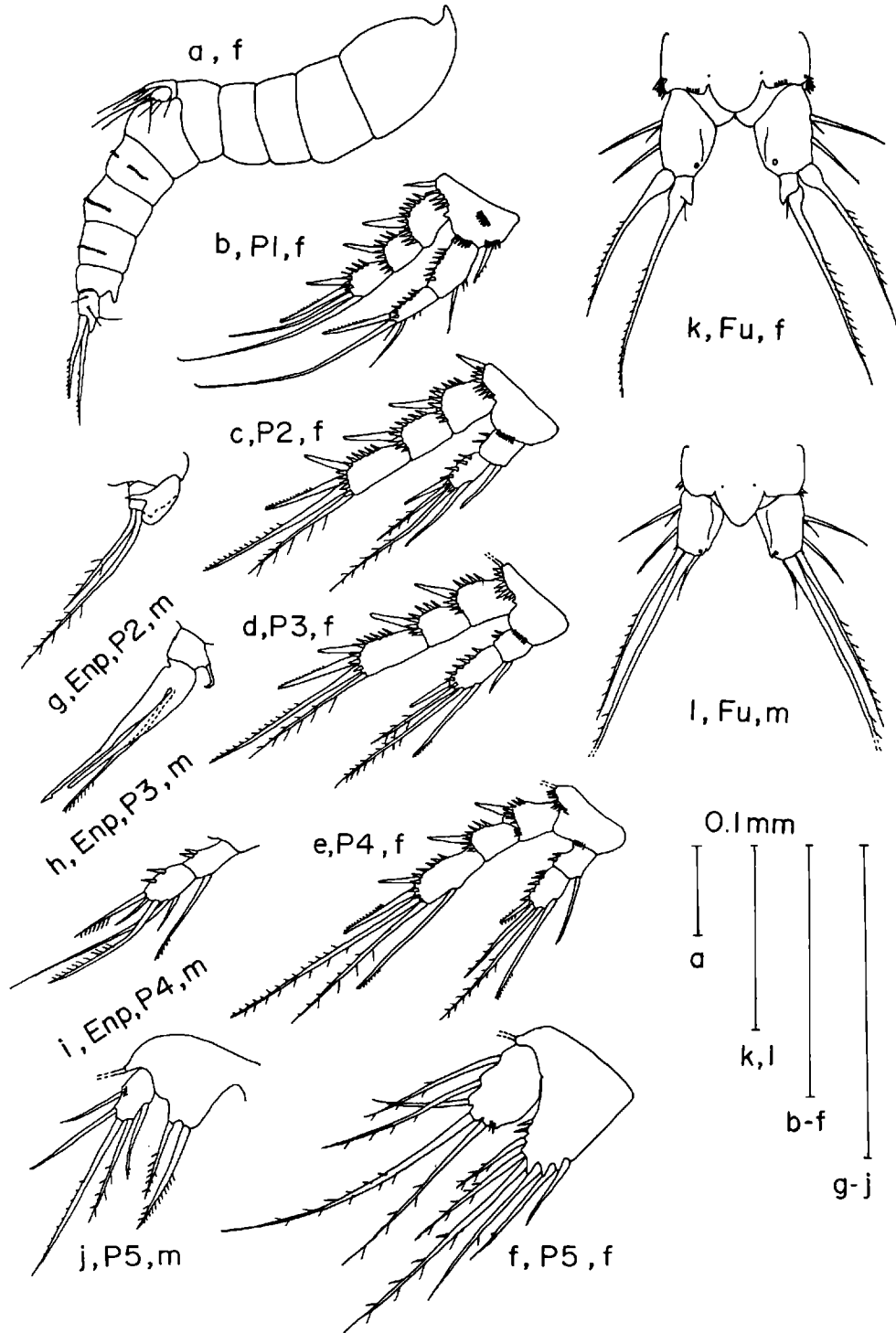


Plate 21. *Moraria* sp. B

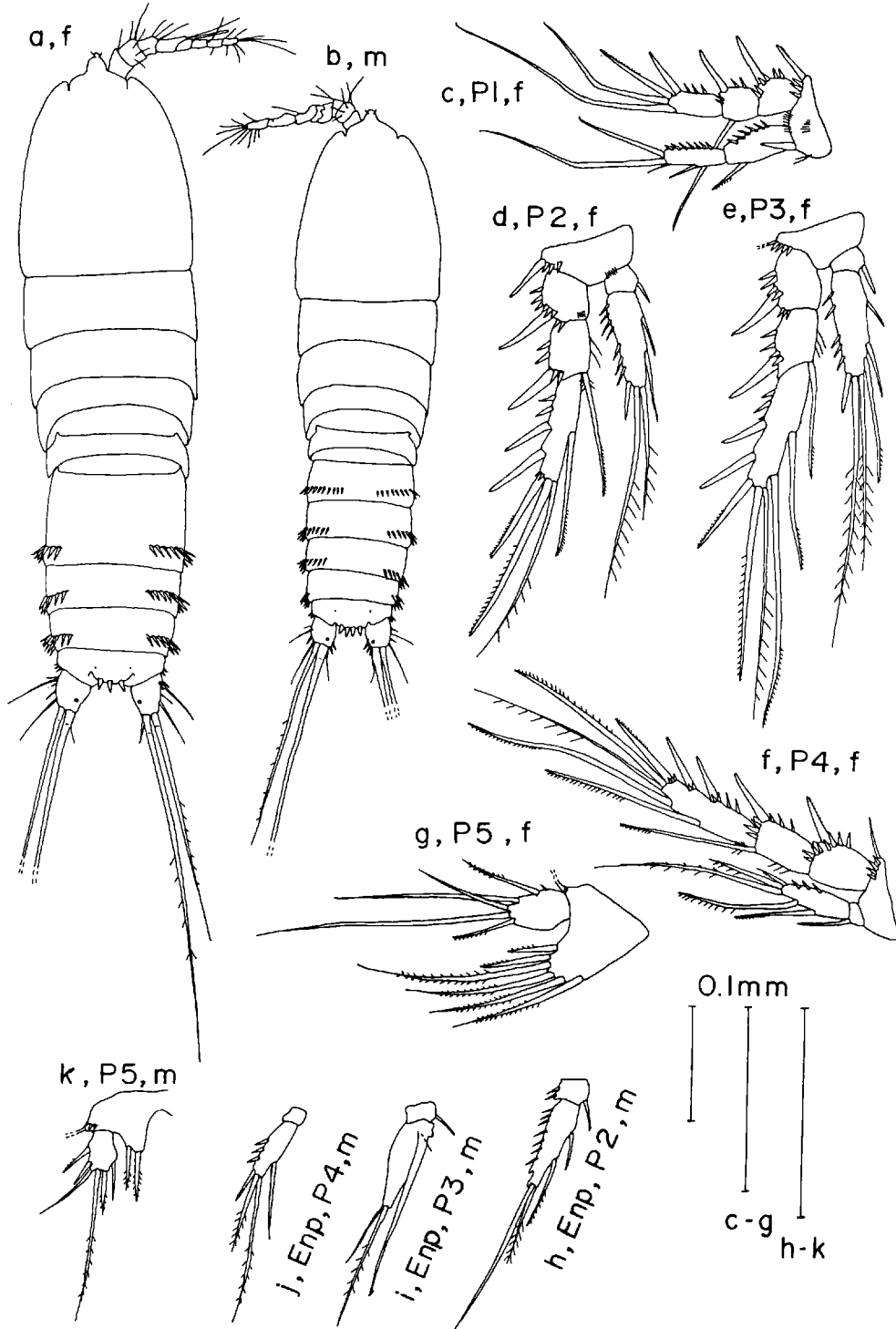


Plate 22. *Bryocnemtus zschokkei* (Schmeil)

Freshwater Harpacticoid Copepods of Hokkaido, Northern Japan

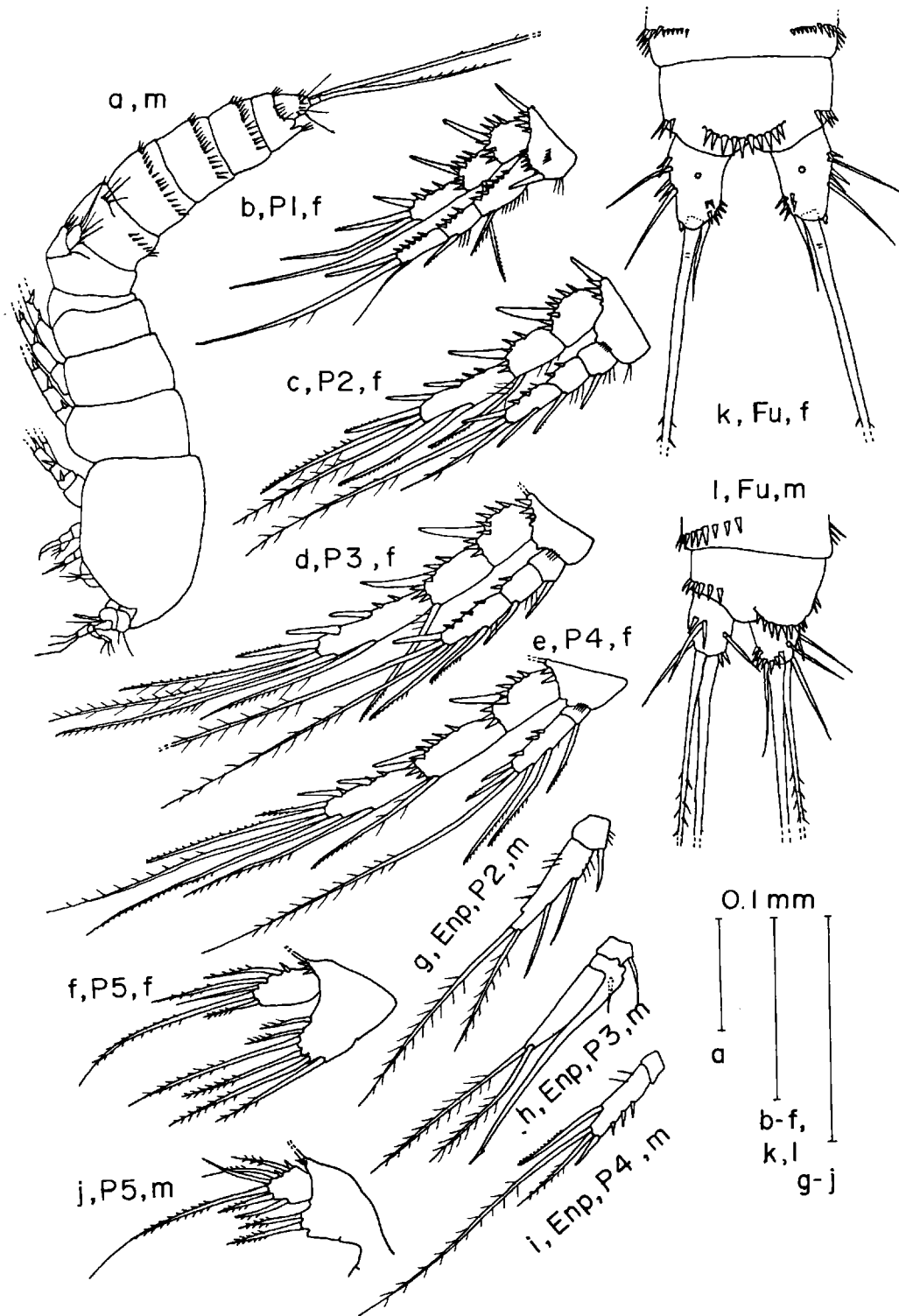


Plate 23. *Bryocamptus vejdotskyi* (Mrázek)

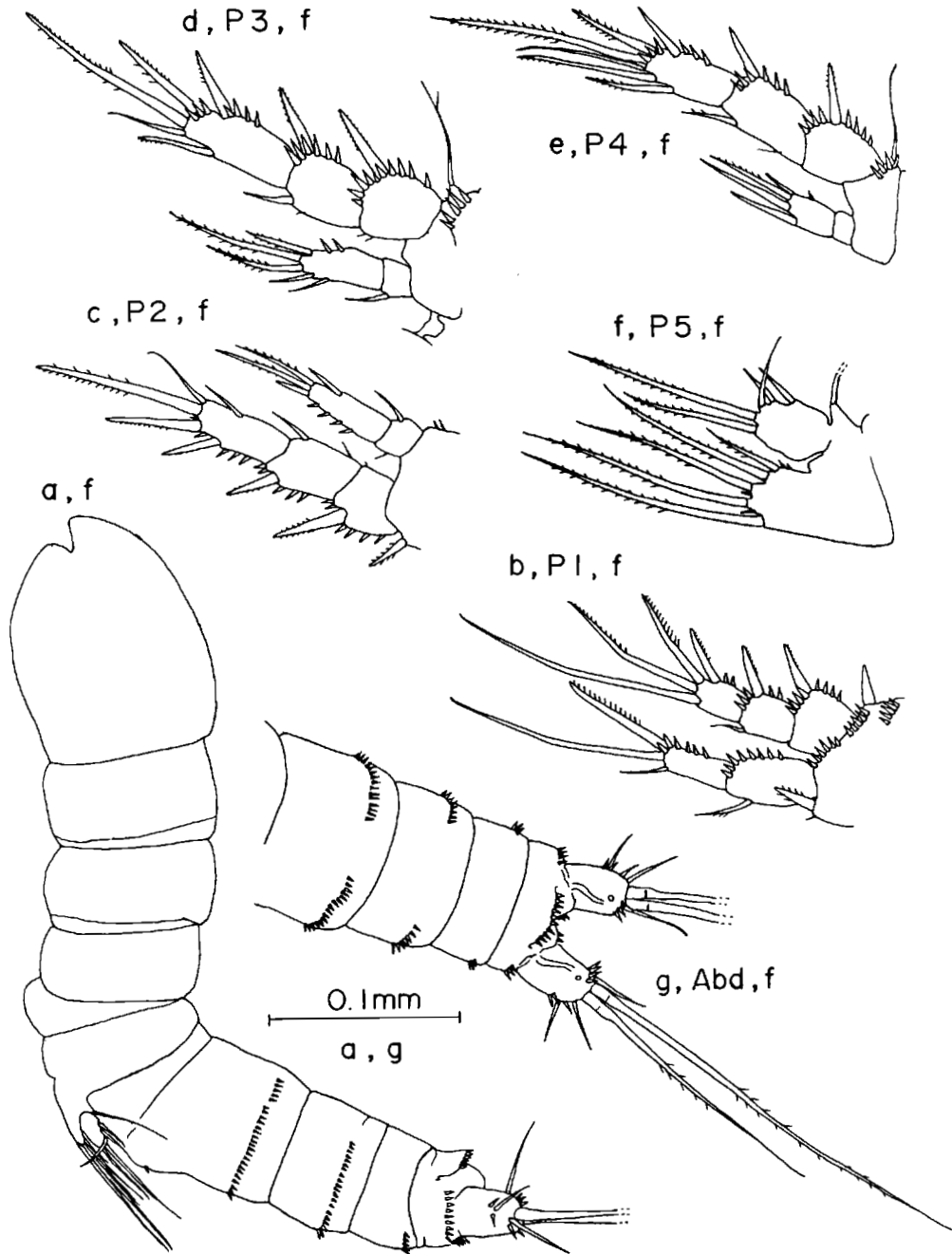


Plate 24. *Bryocamptus laccophilus* (Kessler), female only

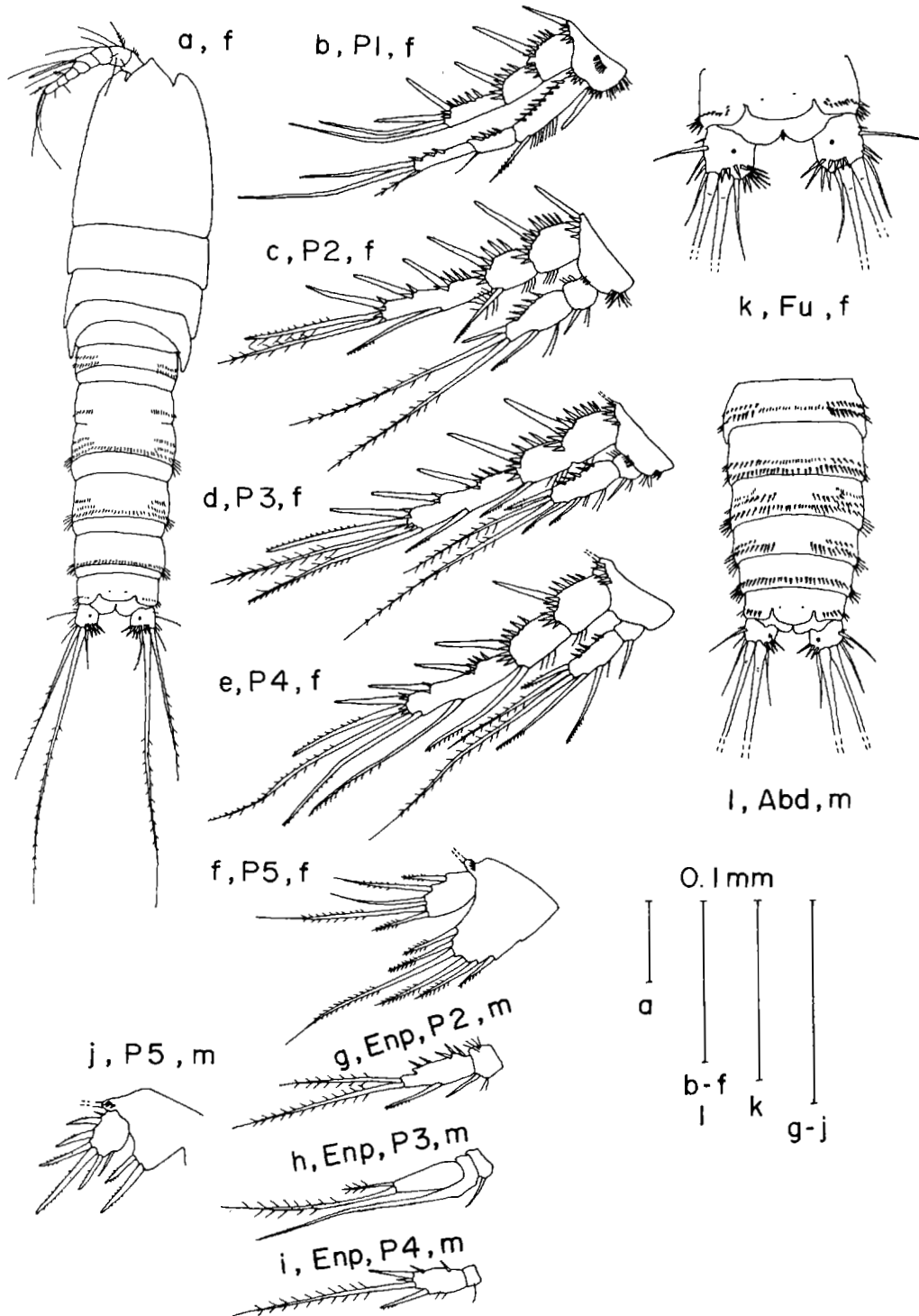


Plate 25. *Bryocamptus hiemalis* (Pearse)

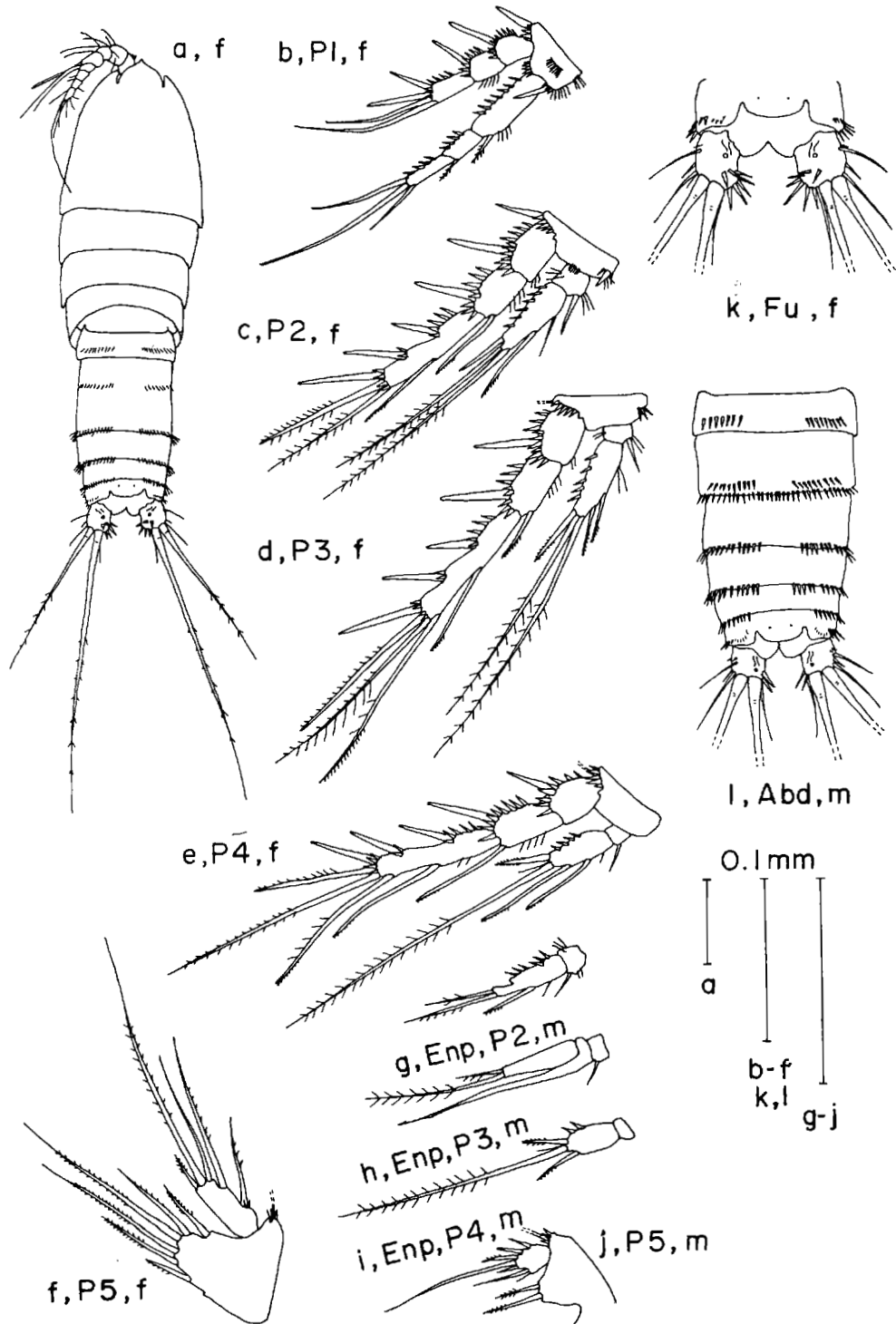


Plate 26. *Bryocamptus calvus* (Brehm)

Freshwater Harpacticoid Copepods of Hokkaido, Northern Japan

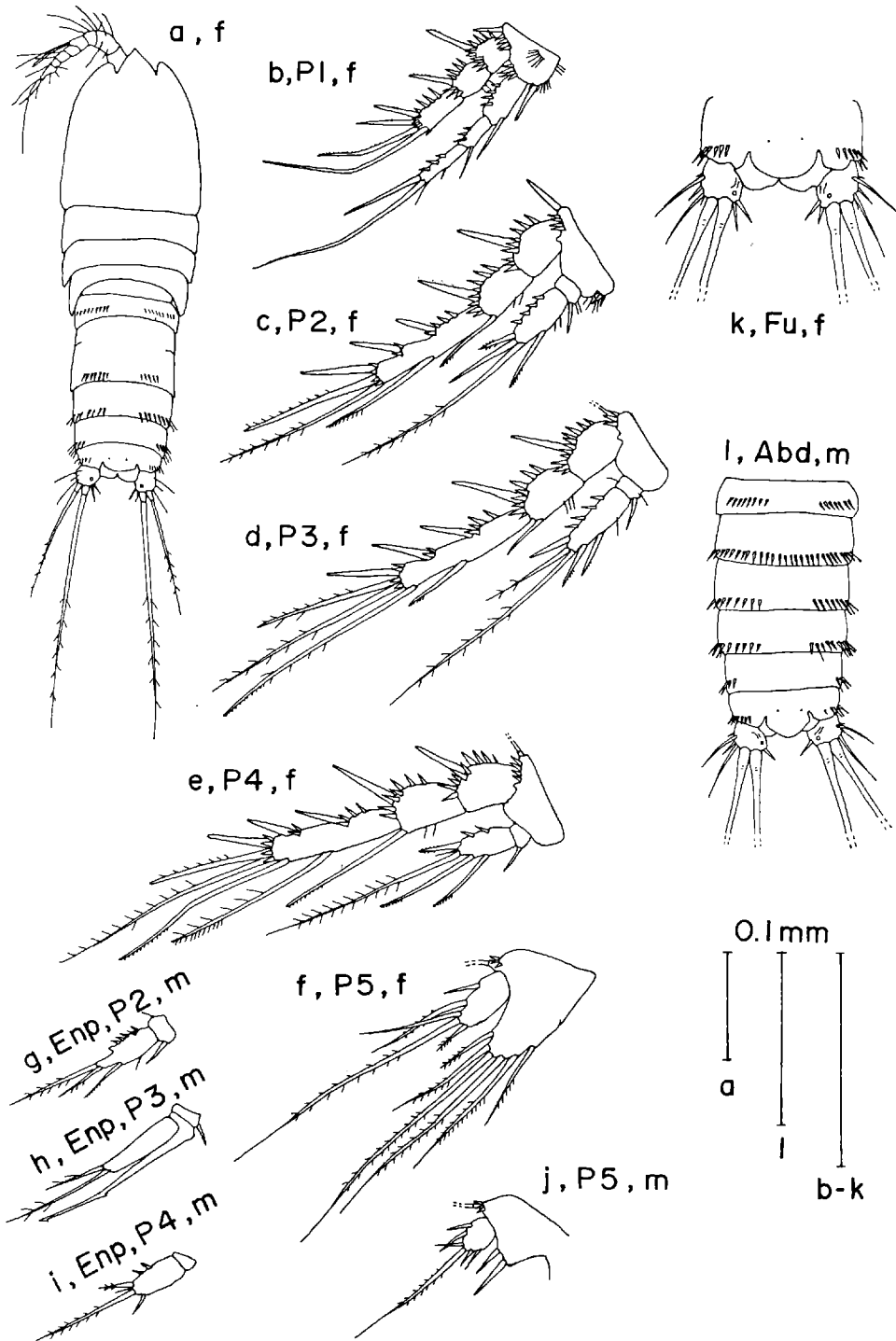


Plate 27. *Bryocamptus nivalis* (Willey)

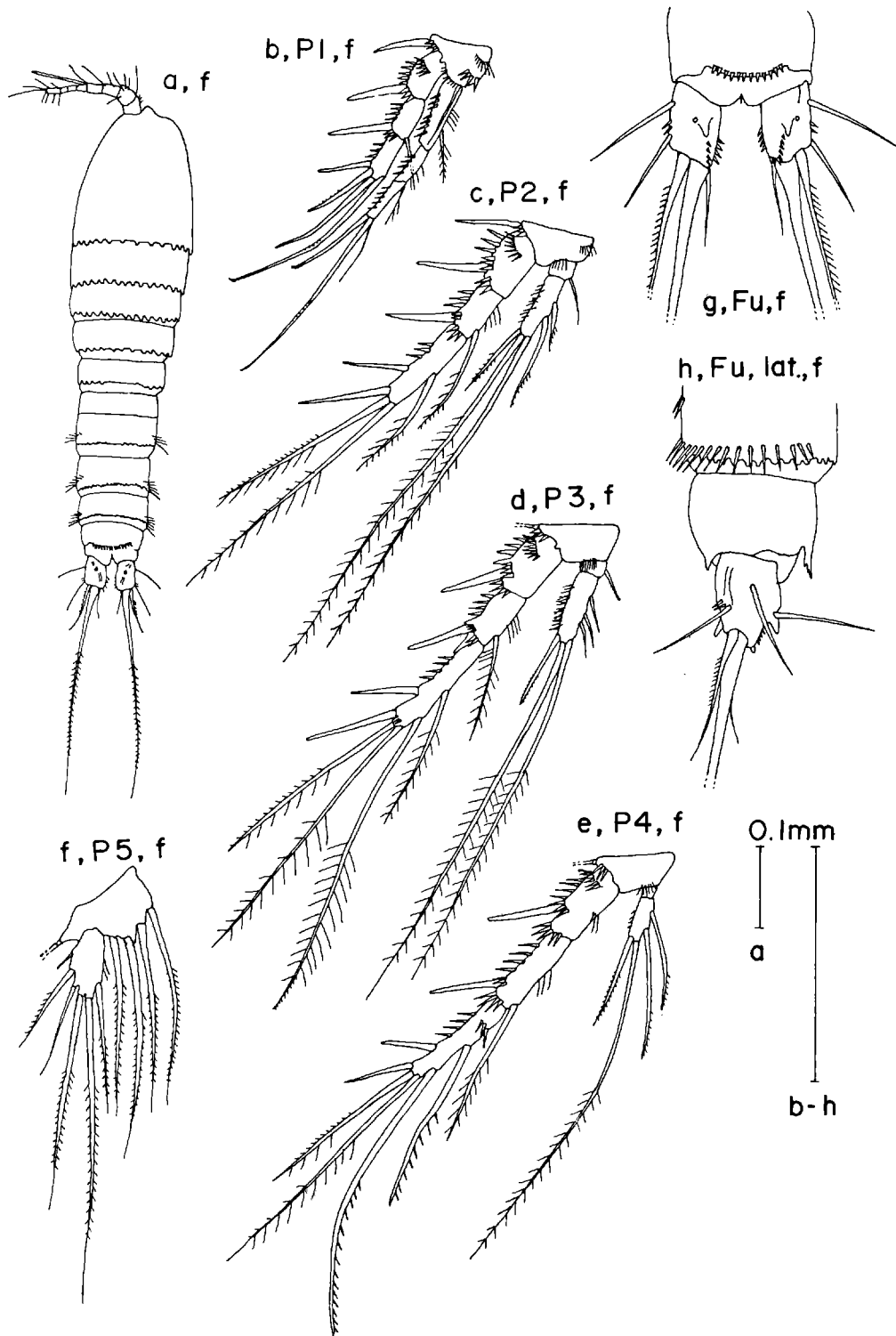


Plate 28. *Elaphoidella bidens* (Schmeil), female only

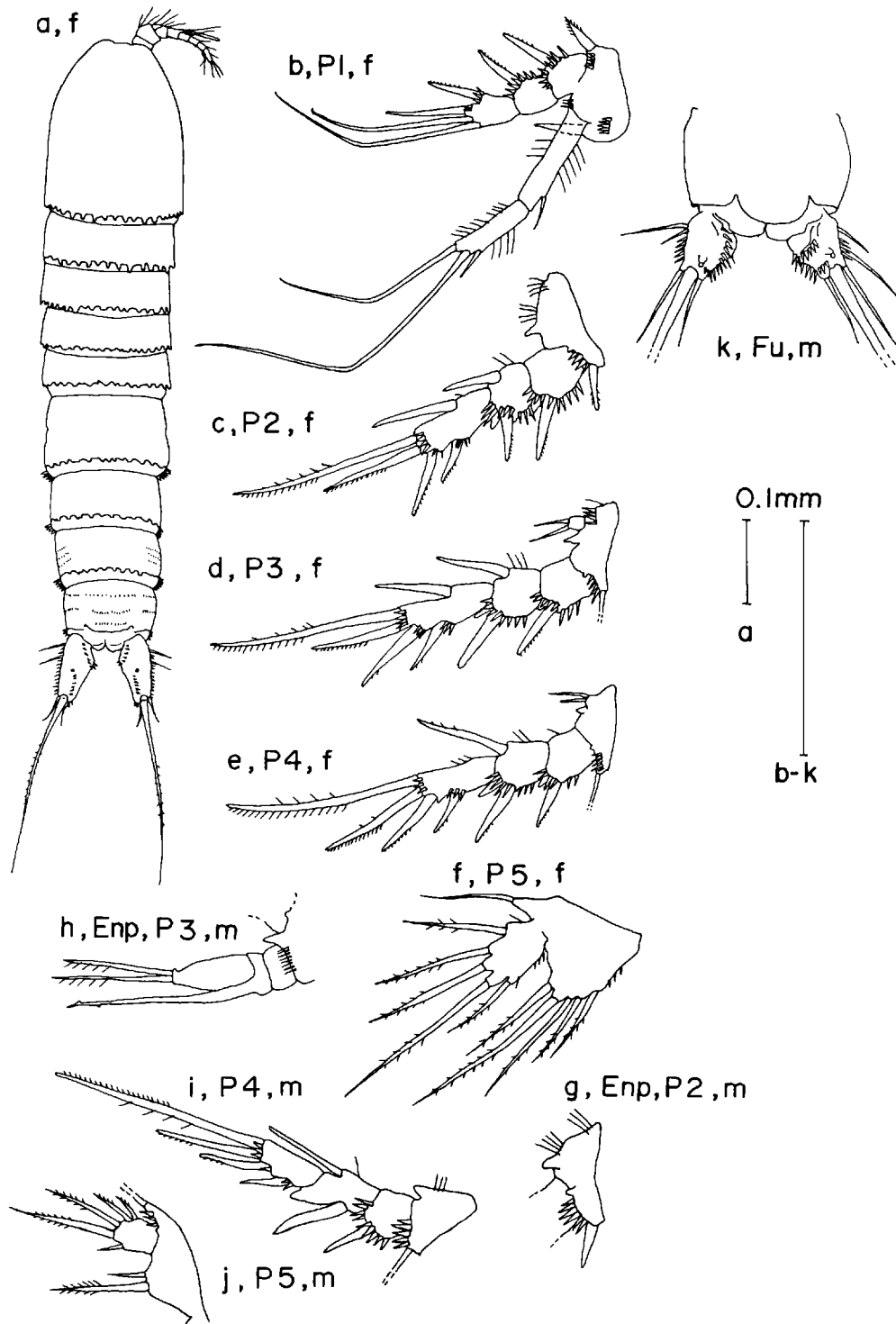


Plate 29. *Paracamptonus reductus* Wilson