

# Checklist and bibliography of the Caprellidea (Crustacea: Amphipoda) from Japanese waters

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Until 1998, 115 species of the Caprellidea (Crustacea: Amphipoda) have so far been reported from Japanese waters. Of these, the infraorder Caprellida contains 105 species which is dominated by the family Caprellidae, 88 species, followed by the Phtisicidae, 8 species. This indicates the number of recorded species of the Caprellida has increased 50% (35 species) from over the past 20 years from the 70 species recorded in Arimoto (1976d). The infraorder Cyamida, composed of the monotypic family Cyamidae, has 10 species. Synonyms of each species are completed based on the taxonomic descriptions dealing with Japanese specimens. A bibliography of studies, except for taxonomy, dealing with the Japanese caprellids is also given.

**Key words:** Amphipoda, bibliography, Caprellidea, checklist, Japan

## INTRODUCTION

Japanese waters have been shown to possess one of the most rich species diversities of the Caprellidea (Crustacea, Amphipoda) (e.g., McCain and Steinberg 1970). In 1976, the late Dr. Ishitaro Arimoto compiled all the taxonomic information on the Caprellidea, except for the infraorder Cyamida which are parasites on cetaceans, from Japan into a monograph (Arimoto 1976d). The ease of identification of caprellids in ecological studies using the monograph has led to the accumulation of ecological information on caprellids by the species level at several localities along the Japanese coast since the 1980s; Amakusa, western Kyushu (Imada et al. 1981, Imada and Kikuchi, 1984a, b, Aoki 1988, 1996a, b, 1997, Aoki and Kikuchi 1990a, 1991, 1995, Edgar 1991, Edgar and Aoki 1993), the Pacific coast of Boso Peninsula, central Japan (Takeuchi et al. 1987, 1990a, b, Takeuchi and Hirano 1988, 1991, 1992a, b, 1995, Takeuchi 1992, 1996), and the Pacific coast of the Tohoku District, northern Japan (Hirayama and Kikuchi 1980, Takeuchi 1996, 1998, Takeuchi and Hino 1997). Besides ecological studies, the monograph stimulated further research in the taxonomic study of the Caprellidea. The late Dr. I. Arimoto described 24 new species and 7 species that were new to Japan of caprellids until 1982 after 1976 (Arimoto 1976a, 1977a, b, 1978b–e, 1979a, b, 1980a–c, e, 1981a, c, 1982, Arimoto and Hirayama 1979). Five new species and three new species to Japan have been also described by the other scientists (Takeuchi 1986, 1993a, Takeuchi et al. 1989, Takeuchi and Ishimaru 1991, Aoki 1991b, Aoki and Kikuchi 1995, Mori 1995, 1996).

In order to take an extensive view of the present status of caprellid studies in Japan, I present here a compilation of the checklist and bibliography on the Caprellidea from the Japanese waters. The geographical area examined is the Japanese Archipelago composed of the main four islands and surrounding smaller islands and Ryukyu Islands and Bonin Islands.

## CHECKLIST

In this section, a checklist on 105 species of the infraorder Caprellida and 10 species of the infraorder Cyamida amphipods recorded from Japanese waters until 1998 is given. The number of species of the Caprellida has increased by 35 species (50%) since the publication of Arimoto (1976d). Of these species, 88 species belong to the Family Caprellidae followed by 8 species in the Phtisicidae. Only one species is recorded in the families Caprogammaridae and Paracercopidae, respectively.

The synonyms are restricted to the taxonomic descriptions which are considered to deal with Japanese specimens, except for six species. The occurrences of the two species of caprellids, *Perotripus* sp. and *Caprella astericola* Jankowski and Vassilenko, 1973, in Japanese waters have been reported only in ecological and parasitological papers (Takeuchi et al. 1987, Takeuchi and Hirano 1995, Goggin and Bouland 1997). Four species of *Cyamus* which are parasites on Cetaceans near Japanese waters were only noted in tables in a world review on the Cyamidae (Berzin and Vlasova 1982), and a collection list of the University of Southern California, respectively.

I refrained from adding the following five species of the caprellids, which were included in the list of the Japanese caprellids in Mayer (1903) and Arimoto (1976d); *Caprella affinis* Brandt, 1851 from the Sea of Okhotsk, *C. algaceus* Vassilenko, 1967 from Possjet Bay, Siberian coast of the Sea of Japan, *C. simplex* Mayer, 1890 from the eastern coast of the Korean Peninsula, *C. sp.* in Mayer (1903) from Sakhalin Island, and *C. nichtensis* Brandt, 1851 from the Sea of Okhotsk. Their distributions fall outside of the geographic area defined in this paper. I also excluded unpublished personal opinions on synonyms of the checklist. Names given in parentheses indicate the common Japanese names.

Infraorder Caprellida

I. Family Caprogammaridae

Genus *Caprogammarus*

1. *Caprogammarus gurjanovae* Kudrjaschov and Vassilenko, 1966 (Yokoebi-warekara)  
*Caprogammarus gurjanovae* — Takeuchi and Ishimaru, 1991, 284–290, figs. 1–5. — Takeuchi, 1995, 194, fig. 21–173.

II. Family Paracercopidae

Genus *Cercops*

2. *Cercops holboelli* Kröyer, 1843 (Haranaga-warekara)  
*Cercops holboelli* — Arimoto, 1976d, 25–27, fig. 9. — Takeuchi, 1995, 194–195, fig. 21–174.  
*Cercops holbölli* — Arimoto, 1970c, 23–25, 31, figs. 1, 5.

III. Family Phtisicidae

Genus *Protomima*

3. *Protomima imitatrix* Mayer, 1903 (Mukashi-warekara)  
*Protomima imitatrix* Mayer, 1903, 22, pl. 6 figs. 10–11, pl. 9 fig. 56. — Arimoto, 1929, 120–121, 126, pl. 1 figs. 1–2, 4–6. — Utinomi, 1965, 578 with figs. — Utinomi, 1968, 282–284, figs. 1–2. — Arimoto, 1970c, 25–27, 31, figs. 2, 5. — Arimoto, 1976d, 31–33, figs. 11–12. — ? Arimoto and Murano, 1981, 65–66, fig. 1. — Takeuchi, 1995, 195, fig. 21–175.
4. *Protomima* sp. in Mayer (1903)  
*Protomima* sp. Mayer, 1903, 22–23. — Arimoto, 1976d, 34.

Genus *Phtisica*

5. *Phtisica marina* Slabber, 1769 (Umi-warekara)  
*Phtisica marina* — Arimoto, 1980c, 96–101, fig. 2.

Genus *Pseudoproto*

6. *Pseudoproto fallax* Mayer, 1903 (Chibihige-warekara)  
*Pseudoproto fallax* Mayer, 1903, 27–28, pl. 6 fig. 22, pl. 9 figs. 5, 52. — Arimoto, 1970c, 27–29, 31, figs. 3, 5. — Arimoto, 1976d, 34–35, fig. 13. — Arimoto and Kikuchi, 1977, 97, fig. 5.

Genus *Protogeton*

7. *Protogeton incertus* Mayer, 1903 (Nagatenohira-warekara)  
*Protogeton incertus* — Arimoto, 1980c, 101–102, fig. 3.
8. *Protogeton inflatus* Mayer, 1903 (Itoashi-warekara)  
*Protogeton inflatus* — Hiro, 1937, 310–311, fig. 1, pl. 22 figs. 1–2. — Arimoto, 1970c, 29–31, figs. 4–5. — Arimoto, 1976d, 29–31, Fig. 10. — Arimoto, 1981a, 49–50, fig. 2.

Genus *Prellicana*

9. *Prellicana minima* Mayer, 1903 (Ashinaga-chibi-warekara)  
*Prellicana minima* — Utinomi, 1968, 284–285, fig. 3. — Arimoto, 1976d, 36–38, fig. 14.

Genus *Perotripus*

10. *Perotripus* sp. in Takeuchi et al. (1987) and Takeuchi and Hirano (1995)

IV. family Caprellidae

Genus *Paraprotella*

11. *Paraprotella prima* Mayer, 1903 (Mifushi-eraashi-warekara)  
*Paraprotella prima* Mayer, 1903, 38–39, pl. 1 figs. 27–29, pl. 6 figs. 50–55, pl. 9 figs. 10, 34, 64–65. — Arimoto, 1971c, 39–41, figs. 6–7. — Arimoto, 1976d, 33, 40–41, figs. 12, 16. — Arimoto and Murano, 1981, 66–68, fig. 2.
12. *Paraprotella secunda* Mayer, 1903 (Daini-mifushi-eraashi-warekara)  
*Paraprotella secunda* Mayer, 1903, 71. — Arimoto, 1971c, 41–42, fig. 7. — Arimoto, 1976d, 41–42.

Genus *Protella*

13. *Protella gracilis* Dana, 1853 (Warekaramodoki)  
*Protella gracilis* — Mayer, 1903, 33–34. — Arimoto, 1929, 123–126, pl. 1 figs. 7–15. — Hiro, 1937, 311, pl. 22 figs. 3–4. — Utinomi, 1965, 578 with figs. — Arimoto, 1976d, 50–53, figs. 21–22. — Arimoto and Kikuchi, 1977, 96–97, fig. 4K.

Genus *Monoliropus*

14. *Monoliropus tener* Arimoto, 1968 (Yasashinote-warekara)  
*Monoliropus tener* Arimoto, 1968, 59–61, fig. 1. — Arimoto, 1976d, 46–47, fig. 19. — Arimoto and Kikuchi, 1977, 96, fig. 4J.

Genus *Orthoprotella*

15. *Orthoprotella hamata* Arimoto, 1981 (Kagiude-warekara)  
*Orthoprotella hamata* Arimoto, 1981a, 50–54, figs. 3–4.
16. *Orthoprotella spinigera* Mori, 1996  
*Orthoprotella spinigera* Mori, 1996, 319–326, figs. 1–5.

Genus *Metaprotella*

17. *Metaprotella sandalensis* Mayer, 1898 (Hitofushi-eraashi-warekara)  
*Metaprotella sandalensis* — Utinomi, 1973, 29–31, fig. 1. — Arimoto, 1976d, 48–49, fig. 20.

Genus *Prototritella*

18. *Prototritella ishigakensis* Arimoto, 1977 (Ishigaki-warekara)  
*Prototritella ishigakensis* Arimoto, 1977a, 1–4, figs. 1–2.

Genus *Pedotrina*

19. *Pedotrina globosa* Arimoto, 1978 (Marugata-warekara)  
*Pedotrina globosa* Arimoto, 1978d, 22–24, fig. 3.

Genus *Heterocaprella*

20. *Heterocaprella clavigera* Arimoto, 1976 (Soko-warekara)  
*Heterocaprella clavigera* Arimoto, 1976a, 44–47, figs. 1–2.

Genus *Liropus*

21. *Liropus japonicus* Mori, 1995  
*Liropus japonicus* Mori, 1995, 329–336, figs. 1–5.

Genus *Paracaprella*

22. *Paracaprella crassa* Mayer, 1903 (Ikubi-warekara)  
*Paracaprella crassa* Mayer, 1903, 66–67, pl. 2 figs. 32–33, pl. 7 figs. 48–50. — Arimoto, 1929, 122–123, 126, pl. 1 fig. 3. — Utinomi, 1965, 578 with figs. — Utinomi, 1968, 285–286, fig. 4. — Arimoto, 1971e, 59–62, figs. 10, 12. — Arimoto, 1976d, 53–56, figs. 23–24. — Takeuchi, 1995, 196, fig. 21–176.
23. *Paracaprella insolita* Arimoto, 1980 (Ijho-warekara)  
*Paracaprella insolita* Arimoto, 1980c, 105–106, fig. 6.
24. *Paracaprella tenuis* Mayer, 1903 (Togenashi-ikubi-warekara)  
*Paracaprella tenuis* — Arimoto, 1971e, 61–63, figs. 11–12. — Arimoto, 1976d, 55–58, figs. 24–25.

Genus *Hemiaegina*

25. *Hemiaegina minuta* Mayer, 1890 (Hime-warekara)  
*Hemiaegina minuta* — Arimoto, 1930, 13–15, fig. 2. — Utinomi, 1969, 297–299, fig. 2. — Arimoto, 1976d, 58–60, 62, figs. 26, 28. — Arimoto and Kikuchi, 1977, 95–96, fig. 4I. — Takeuchi, 1995, 196–197, fig. 21–177.

Genus *Premohemiaegina*

26. *Premohemiaegina sola* Arimoto, 1978 (Kodoku-warekara)  
*Premohemiaegina sola* Arimoto, 1978e, 26, fig. 1.

Genus *Metacaprella*

27. *Metacaprella anomala* (Mayer, 1903) (California-warekara)  
*Caprella anomala* — Arimoto, 1934, 494–496, 509, pl. 1 figs. 1–2, pl. 3 figs. 1, 7, 16, 26.  
*Metacaprella anomala* — Arimoto, 1976d, 60–63, figs. 27–28.

Genus *Caprella*

28. *Caprella acanthogaster* Mayer, 1890 (Ibara-warekara)  
*Caprella acanthogaster* — Mayer, 1903, 78–79, pl. 3 fig. 3. — Utinomi, 1943a, 271–273, fig. 1. — Utinomi, 1943b, 281–282, fig. 1. — Utinomi, 1965, 579 with figs. — Takeuchi, 1995, 201, fig. 21–185.  
? *Caprella (Spinicephala) acanthogaster* — Arimoto, 1976d, 169–175, figs. 91–93.
29. *Caprella aino* Utinomi, 1943 (Ezo-warekara)  
*Caprella aino* Utinomi, 1943c, 284–286, fig. 2.  
*Caprella (Caprella) aino* — Arimoto, 1976d, 114–116, figs. 61–62.
30. *Caprella andreae* Mayer, 1890  
*Caprella andreae* — Aoki and Kikuchi, 1995, 54–60, figs. 1–6.
31. *Caprella astericola* Jankowski and Vassilenko, 1973 in Goggin and Bouland (1997)
32. *Caprella arimotoi* Takeuchi, 1993 (Hosokobu-warekara)  
*Caprella arimotoi* Takeuchi, 1993a, 115–120, figs. 1–3. — Takeuchi, 1995, 203, fig. 21–191.  
*Caprella (Spinicephala) verrucosa* — Arimoto, 1976d, 122–126, figs. 67–68. (in part).
33. *Caprella bathyalis* Vassilenko, 1972 (Utsukushi-warekara)  
*Caprella (Caprella) bathyalis* — Arimoto, 1980c, 107–109, fig. 8.
34. *Caprella bispinosa* Mayer, 1890 (Kita-warekara)  
*Caprella bispinosa* — Utinomi, 1943b, 283–284, fig. 3. — Utinomi, 1943c, 286–287, fig. 3.  
*Caprella (Caprella) bispinosa* — Arimoto, 1976d, 106–110, figs. 56–58.
35. *Caprella borealis* Mayer, 1903 (Igakobu-warekara)  
*Caprella aff. borealis* — Utinomi, 1943c, 287–289, fig. 4.  
*Caprella (Spinicephala) borealis* — Arimoto, 1976d, 134–137, figs. 72–73.
36. *Caprella brachiata* Arimoto, 1978 (Era-warekara)  
*Caprella (Rostrhicephala) brachiata* Arimoto, 1978d, 21–22, fig. 2.
37. *Caprella branchella* Arimoto, 1978 (Eranaga-warekara)  
*Caprella (Caprella) branchella* Arimoto, 1978d, 19–20, fig. 1.
38. *Caprella brevirostris* Mayer, 1903 (Semushi-warekara)  
*Caprella brevirostris* Mayer, 1903, 95–96, pl. 3 fig. 45, pl. 7 figs. 74–76. — Takeuchi, 1995, 198, fig. 21–178.  
*Caprella (Rostrhicephala) brevirostris* — Arimoto, 1976d, 206–209, figs. 111–112.  
? *Caprella drepanochir* — Utinomi, 1969, 300–302, fig. 4.
39. *Caprella californica* Stimpson, 1856 (Toge-warekara-modoki)  
*Caprella californica* — Arimoto and Kikuchi, 1977, 91–92, fig. 1B. — Takeuchi, 1995, 199, fig. 21–181.  
*Caprella (Spinicephala) californica* — Arimoto, 1976d, 139–146, figs. 75–77.  
? *Caprella gracilis* Stimpson, 1855, 384.  
*Caprella scaura f. scauroides* Mayer, 1903, 118–119, pl. 5 figs. 16–18.
40. *Caprella carinata* Arimoto, 1934 (Baratoge-warekara)  
*Caprella carinata* Arimoto, 1934, 496–501, 509, fig. 1, pl. 1 figs. 3–11, pl. 2 figs. 3–5. pl. 3 figs. 2, 8, 17, 21–22, 27.  
*Caprella (Caprella) carinata* — Arimoto, 1976d, 97–102, figs. 51–53.
41. *Caprella chelimana* Mayer, 1903 (Tsubamenote-warekara)

- Caprella chelimana* Mayer, 1903, 96–97, pl. 3 figs. 43–44, pl. 8 figs. 1–2.  
*Caprella (Spinicephala) chelimana* — Arimoto, 1976d, 138–139, fig. 74.
42. *Caprella ciliata* G. O. Sars, 1883 (Togete-warekara)  
*Caprella (Caprella) ciliata* — Arimoto and Hirayama, 1979, 45–46, fig. 2.
43. *Caprella cilluroantennata* Arimoto, 1934 (Himetogewarekara)  
*Caprella cilluroantennata* Arimoto, 1934, 501–503, 509, pl. 1 fig. 12, pl. 2 figs. 12–13, pl. 3 figs. 3–4, 9, 14, 20, 23, 30–31. — Arimoto, 1961, 81–83, figs. 1–7.  
*Caprella (Spinicephala) cilluroantennata* — Arimoto, 1976d, 167–169, fig. 90.
44. *Caprella corallina* Arimoto, 1980 (Sango-warekara)  
*Caprella (Caprella) corallina* Arimoto, 1980a, 55–56, fig. 1
45. *Caprella cristibrachium* Mayer, 1903 (Tosakaera-warekara)  
*Caprella (Spinicephala) cristibrachium* — Arimoto, 1976d, 121–122, fig. 66.
46. *Caprella danilevskii* Czerniavki, 1868 (Hosowarekara)  
*Caprella Danilevskii* — Arimoto, 1930, 18–19, fig. 5.  
*Caprella danilevskii* — Hiro, 1937, 312–313, pl. 22 fig. 6. — Utinomi, 1943b, 284, fig. 4. — Utinomi, 1965, 579 with figs. — Takeuchi, 1995, 203–204, fig. 21–192.  
*Caprella (Rostrhicephala) danilevskii* — Arimoto, 1976d, 183–189, fig. 99–101.
47. *Caprella decipiens* Mayer, 1890 (Magire-warekara)  
*Caprella decipiens* Mayer, 1890, 86–87, pl. 7 figs. 37–40. — Arimoto, 1930, 19–20, fig. 6. — Hiro, 1937, 313, pl. 22 fig. 7. — Utinomi, 1969, 299–300, fig. 3. — Arimoto and Kikuchi, 1977, 92–93, fig. 2C.  
*Caprella (Caprella) decipiens* — Arimoto, 1976d, 72–76, figs. 33–35.
48. *Caprella dissona* Arimoto, 1979 (Futsuriai-warekara)  
*Caprella (Rostrhicephala) dissona* Arimoto, 1979b, 33–34, fig. 1
49. *Caprella drepanochir* Mayer, 1890 (Togeshi-warekara)  
*Caprella drepanochir* — Utinomi, 1943c, 289–291, figs. 5–6.  
*Caprella (Rostrhicephala) drepanochir* — Arimoto, 1976d, 179–181, fig. 97.
50. *Caprella equilibra* Say, 1818 (Kubinaga-warekara)  
*Caprella aequilibrata* — Mayer, 1903, 89–92, pl. 3 figs. 29–34, pl. 7 figs. 66–69. — Utinomi, 1965, 579 with figs.  
*Caprella equilibra* — Arimoto, 1971b, 30–35, figs. 1–4. — Arimoto and Kikuchi, 1977, 93, fig. 2D. — Takeuchi, 1995, 202, fig. 21–188.  
*Caprella (Rostrhicephala) equilibra* — Arimoto, 1976d, 195–205, figs. 106–109.
51. *Caprella equina* Arimoto, 1978 (Umatsura-warekara)  
*Caprella (Rostrhicephala) equina* Arimoto, 1978b, 33–35, fig. 1.
52. *Caprella eximia* Mayer, 1890 (Tsumebuto-warekara)  
*Caprella eximia* Mayer, 1890, 79, pl. 2 figs. 10–11.  
*Caprella (Caprella) eximia* — Arimoto, 1976d, 88–90, fig. 45.
53. *Caprella generosa* Arimoto, 1977 (Kizoku-warekara)  
*Caprella generosa* — Takeuchi, 1995, 198, fig. 21–179.  
*Caprella (Rostrhicephala) generosa* Arimoto, 1977b, 12–14, figs. 1–2.
54. *Caprella gigantochir* Mayer, 1903 (Tenaga-warekara)  
*Caprella gigantochir* Mayer, 1903, 103, pl. 4 fig. 14, pl. 8 figs. 7–9. — Arimoto, 1931, 10–11, fig. 7. — Hiro, 1937, 314, pl. 22 figs. 9–10. — Utinomi, 1968, 287, fig. 5. — Takeuchi, 1995, 199–200, fig. 21–182.  
*Caprella (Spinicephala) gigantochir* — Arimoto, 1976d, 156–159, figs. 83–84. — Arimoto, 1980c, 110–111, fig. 11.
55. *Caprella glabra* Aoki, 1991 (Subesube-warekara)  
*Caprella glabra* Aoki, 1991b, 91–95, figs. 1–3.
56. *Caprella grahami* Wigley and Shave, 1966 (Misaki-warekara)  
*Caprella (Caprella) grahami* — Arimoto, 1980b, 33–34, fig. 2.
57. *Caprella gracilior* Mayer, 1903 (Yase-warekara)  
*Caprella (Caprella) gracilior* — Arimoto and Hirayama, 1979, 47–48, fig. 3.
58. *Caprella gracillima* Mayer, 1890 (Higehosonagawarekara)  
*Caprella gracillima* Mayer, 1890, 83, pl. 2 fig. 25. — Mayer, 1903, 103–104.  
*Caprella (Caprella) gracillima* — Arimoto, 1976d, 78–81, figs. 38, 40.
59. *Caprella imaii* Utinomi, 1943 (Imai-warekara)  
*Caprella imaii* Utinomi, 1943a, 276–277, figs. 4–5.  
*Caprella (Caprella) imaii* — Arimoto, 1976d, 96–97, fig. 50.
60. *Caprella iniqua* Arimoto, 1980 (Fudo-warekara)  
*Caprella (Caprella) iniqua* Arimoto, 1980e, 27–29, figs. 1–2.
61. *Caprella iniquilibra* Mayer, 1903 (Onaga-warekara)  
*Caprella iniquilibra* Mayer, 1903, 105, pl. 4 figs. 17–19.  
*Caprella (Caprella) iniquilibra* — Arimoto, 1976d, 82–84, figs. 41–42.
62. *Caprella irregularis* Mayer, 1890 (Midare-warekara)  
*Caprella irregularis* Mayer, 1890, 84, pl. 2 figs. 16–18, pl. 4 fig. 32.  
*Caprella (Caprella) irregularis* — Arimoto, 1976d, 116–118, fig. 63.
63. *Caprella japonica* (Schurin, 1935) (Nippon-warekara)  
*Eugastraulax japonicus* — Utinomi, 1947, 70–71, figs. 1–2.  
*Caprella (Caprella) japonica* — Arimoto, 1976d, 66–68, figs. 29–30.
64. *Caprella kominatoensis* Takeuchi, 1986 (Kominato-warekara)  
*Caprella kominatoensis* Takeuchi, 1986, 67–73, figs. 1–4.

65. *Caprella kroeyeri* de Haan, 1849 (Oh-warekara)  
*Caprella kroeyeri* — Yamaguchi and Baba, 1993, 189–190, fig. 17.  
*Caprella Kröyer*[sic.] — Arimoto, 1931, 11–13, fig. 8.  
*Caprella kroeyeri* — Takeuchi, 1995, 201–202, fig. 21–186.  
*Caprella (Caprella) kroeyeri* — Arimoto, 1976d, 90–94, figs. 46–48.  
*Caprella Kröyeri* de Haan, 1849, 228–229, pl. 50 fig. 8. — Mayer, 1890, 74–75, pl. 2 figs. 20–23, pl. 4 fig. 30, pl. 5 fig. 47, pl. 7 figs. 3, 8. — Mayer, 1903, 107–108, pl. 5 fig. 1, pl. 8 fig. 13.  
*Caprella kröyeri* — Utinomi, 1943a, 277–279, fig. 6. — Utinomi, 1965, 580 with figs.  
*Caprella spinosa* Lokington, 1874, 405–406.
66. *Caprella laevis* (Schurin, 1935) (Sunachi-warekara)  
*Caprella laevis* — Arimoto, 1976c, 51–55, figs. 1–2.  
*Caprella (Caprella) laevis* — Arimoto, 1976d, 76–77, fig. 36.
67. *Caprella laeviuscula* Mayer, 1903 (Hutohanote-warekara)  
*Caprella laeviuscula* — Utinomi, 1943c, 291–292, fig. 7. — Takeuchi, 1995, 202, fig. 21–187.  
*Caprella (Caprella) laeviuscula* — Arimoto, 1976d, 94–96, fig. 49.
68. *Caprella liliata* Arimoto, 1979 (Yuri-warekara)  
*Caprella (Caprella) liliata* Arimoto, 1979a, 1–2, fig. 1.
69. *Caprella longidentata* Arimoto, 1934 (Nagahanote-warekara)  
*Caprella longidentata* Arimoto, 1934, 503–505, 509, pl. 1 figs. 13–16, pl. 2 figs. 6–8, pl. 3 figs. 5, 10, 12, 15, 24, 29.  
*Caprella (Caprella) longidentata* — Arimoto, 1976d, 102–104, figs. 53–54.
70. *Caprella lukini* Vassilenko, 1974 (Rukini-warekara)  
*Caprella (Spinicephala) lukini* — Arimoto and Hirayama, 1979, 49, fig. 4.
71. *Caprella luctator* Stimpson, 1855  
*Caprella luctator* Stimpson, 1855, 383–384.
72. *Caprella minima* Arimoto, 1980 (Kogata-warekara)  
*Caprella (Spinicephala) minima* Arimoto, 1980c, 112–113, fig. 12.
73. *Caprella minuscula* Arimoto, 1980 (Ko-warekara)  
*Caprella (Spinicephala) minuscula* Arimoto, 1980c, 109, fig. 9.
74. *Caprella mixta* Mayer, 1903 (Mazari-warekara)  
*Caprella (Caprella) mixta* — Arimoto, 1976d, 77–78, fig. 37.
75. *Caprella monoceros* Mayer, 1890 (Mono-warekara)  
*Caprella bidentata* Utinomi, 1947, 72–73, fig. 3. — Arimoto and Kikuchi, 1977, 91–92, fig. 1A.  
*Caprella (Caprella) bidentata* — Arimoto, 1976d, 112–114, figs. 60–61.  
*Caprella monoceros* Mayer, 1890, 87, pl. 7 fig. 32. — Arimoto, 1931, 14–16, fig. 10. — Aoki and Kikuchi, 1990b, 538–543, figs. 3–5. — Takeuchi, 1995, 199–200, fig. 21–183.  
*Caprella (Caprella) monoceros* — Arimoto, 1976d, 84, 86–88, figs. 42, 44.
76. *Caprella mutica* Schurin, 1935 (Koshitoge-warekara)  
*Caprella mutica* — Takeuchi, 1995, 200–201, fig. 21–184.  
? *Caprella (Caprella) mutica* — Arimoto, 1976d, 111–112, fig. 59.
77. *Caprella nagaoi* Arimoto, 1970 (Nagao-warekara)  
*Caprella nagaoi* Arimoto, 1970, 676–677, fig. 1.  
*Caprella (Caprella) nagaoi* — Arimoto, 1976d, 118–119, fig. 64.
78. *Caprella obtusifrons* Utinomi, 1943 (Kakuhana-warekara)  
*Caprella obtusifrons* Utinomi, 1943c, 292–294, fig. 8.  
*Caprella (Rostrhicephala) obtusifrons* — Arimoto, 1976d, 205–206, fig. 110.
79. *Caprella okadai* Arimoto, 1930 (Okada-warekara)  
*Caprella Okadai* Arimoto, 1930, 20–22, 24–25, pl. 2 figs. 1–11.  
*Caprella okadai* — Takeuchi, 1995, 204–205, fig. 21–194.  
*Caprella (Caprella) okadai* — Arimoto, 1976d, 70–72, fig. 32.
80. *Caprella paulina* Mayer, 1903 (Kobukabotya-warekara)  
*Caprella paulina* — Utinomi, 1943c, 295–296, fig. 9.  
*Caprella (Spinicephala) paulina* — Arimoto, 1976d, 175–177, fig. 94.
81. *Caprella penantis* Leach, 1814 (Maruera-warekara)  
*Caprella acutifrons* — Utinomi, 1965, 578 with figs.  
*Caprella acutifrons* f. *natalensis* — Arimoto, 1930, 16–17, fig. 3. — Hiro 1937, 312, pl. 22 fig. 5.  
*Caprella acutifrons* f. *neglecta* Mayer, 1903, 80. — Utinomi, 1943a, 273–275, figs. 2A, 3A. — Utinomi, 1943b, 282–283, fig. 2. — Utinomi, 1943c, 284, fig. 1.  
*Caprella neglecta* — Arimoto, 1971b, 36–41, figs. 5–9.  
*Caprella neglecta barbigra* Arimoto, 1971c, 19–20.  
*Caprella penantis* — Arimoto and Kikuchi, 1977, 93–95, fig. 2E. — Takeuchi, 1995, 202–203, fig. 21–189.  
*Caprella (Rostrhicephala) penantis* — Arimoto, 1976d, 209–220, figs. 113–115.
82. *Caprella pinnigera* Arimoto, 1980 (Tsubasa-warekara)  
*Caprella (Caprella) pinnigera* Arimoto, 1980b, 35–36, fig. 3.
83. *Caprella polyacantha* Utinomi, 1947 (Iga-warekara)  
*Caprella polyacantha* Utinomi, 1947, 75–76, figs. 4–5. — Utinomi, 1969, 302–304, fig. 5.  
*Caprella (Spinicephala) polyacantha* — Arimoto, 1976d, 177–179, figs. 95–96.
84. *Caprella rhopalochir* Mayer, 1890 (Osate-warekara)  
*Caprella rhopalochir* — Utinomi, 1947, 76–77, fig. 6.

- Caprella (Spinicephala) rhopalochir* — Arimoto, 1976d, 159–161, fig. 85.
85. *Caprella scitula* Arimoto and Hirayama, 1979 (Aijowarekara)  
*Caprella (Rostrhicephala) scitula* Arimoto and Hirayama, 1979, 52–53, fig. 5
86. *Caprella scaura* Templeton, 1836 (Toge-warekara)  
*Caprella scaura* — Arimoto, 1931, 16–18, 20, pl. 3 figs. 1–6. — Hiro 1937, 314–315, fig. 3, pl. 22 figs. 11–12. — Utinomi, 1965, 579 with figs. — Arimoto and Kikuchi, 1977, 94–95, fig. 3F. — Takeuchi, 1995, 198–199, fig. 21–180.  
*Caprella scaura diceros* — Arimoto, 1971b, 42–48, figs. 10–14. — Arimoto and Kikuchi, 1977, 94–95, fig. 3G.  
*Caprella (Spinicephala) scaura diceros* — Arimoto, 1976d, 148–155, figs. 79–81.  
*Caprella scaura* f. *diceros* Mayer, 1890, 71, pl. 4 figs. 40, 42, pl. 7 figs. 35–36. — Mayer, 1903, 118. — Utinomi, 1943b, 285, fig. 5.  
*Caprella scaura hamata* — Arimoto and Kikuchi, 1977, 94–95, fig. 3G.  
*Caprella (Spinicephala) scaura hamata* — Arimoto, 1976d, 155–156, fig. 82.  
*Caprella scaura* f. *hamata* Utinomi, 1947, 77–78, fig. 7.  
*Caprella (Spinicephala) scaura typica* — Arimoto, 1976d, 147–148, fig. 78. — Arimoto, 1980c, 109–110, fig. 10.
87. *Caprella septentrionalis* Kröyer, 1838 (Hokkai-warekara)  
*Caprella septentrionalis* — Utinomi, 1943c, 296–297, fig. 10.  
*Caprella (Spinicephala) septentrionalis* — Arimoto, 1976d, 126–135, figs. 69–72.  
*Caprella septentrionalis* f. *parva* Mayer, 1890, 66, pl. 2 figs. 28–31.
88. *Caprella simia* Mayer, 1903 (Kamate-warekara)  
? *Caprella scaura* — Arimoto and Kikuchi, 1977, 94–95, fig. 3F.  
*Caprella simia* Mayer 1903, 123–124, pl. 5 fig. 31, pl. 8 fig. 25. — Hiro, 1937, 315–136, pl. 22 fig. 13. — Utinomi, 1965, 580 with figs. — Mori and Yamato, 1993, 41–45, figs. 1–3.  
*Caprella (Spinicephala) simia* — Arimoto, 1976d, 161–165, figs. 86–88.  
*Caprella Tateyamaensis* Arimoto, 1930, 22–25, pl. 2 figs. 12–20.
89. *Caprella soyo* Arimoto, 1934 (Soyo-warekara)  
*Caprella Sôyô* Arimoto, 1934, 505–507, 509, pl. 2 figs. 1, 9–11, pl. 3 figs. 6, 11, 13, 18–19, 25, 28, 32.  
*Caprella (Caprella) soyo* — Arimoto, 1976d, 104–107, figs. 55–56.
90. *Caprella* sp. in Arimoto (1934)  
*Caprella* sp. Arimoto, 1934, 508–509, pl. 2 figs. 2, 14–15.
91. *Caprella subinermis* Mayer, 1890 (Kaginote-warekara)  
*Caprella fretensis* — Hiro, 1937, 313–314, fig. 2, pl. 22 fig. 8.
- Caprella subinermis* Mayer, 1890, 85–86, pl. 5 fig. 45, pl. 7 figs. 18, 44. — Arimoto, 1931, 18–20, pl. 3 fig. 7. — Arimoto and Kikuchi 1977, 94–95, fig. 3H.
- Caprella (Rostrhicephala) subinermis* — Arimoto, 1976d, 192–195, figs. 104–105.
92. *Caprella subtilis* Mayer, 1903 (Hosonaga-warekara)  
*Caprella (Caprella) subtilis* — Arimoto, 1976d, 80–82, figs. 39–40.
93. *Caprella temperativa* Arimoto, 1982 (Yawara-warekara)  
*Caprella (Caprella) temperativa* Arimoto, 1982, 21–23, fig. 1.
94. *Caprella tsugarensis* Utinomi, 1947 (Tsugaru-warekara)  
*Caprella linearis* — Arimoto, 1931, 13–14, fig. 9.  
*Caprella tsugarensis* Utinomi, 1947, 78–79, fig. 8. — Takeuchi, 1995, 204, fig. 21–193.  
*Caprella (Rostrhicephala) tsugarensis* — Arimoto, 1976d, 189–192, figs. 102–103.
95. *Caprella unguina* Mayer, 1903  
*Caprella unguina* — Takeuchi et al., 1989, 20–27, figs. 1–4.
96. *Caprella venusta* Utinomi, 1943 (Asamushi-warekara)  
*Caprella venusta* Utinomi, 1943b, 285–287, fig. 6. — Utinomi, 1943c, 297–298, fig. 11.  
*Caprella (Caprella) venusta* — Arimoto, 1976d, 68–70, fig. 31.
97. *Caprella verrucosa* Boeck, 1872 (Kobu-warekara)  
*Caprella acutifrons* f. *verrucosa* Mayer, 1903, 83. — Arimoto, 1930, 17–18, fig. 4. — Utinomi, 1943a, 274–275, figs. 2B, 3B.  
*Caprella verrucosa* — Utinomi, 1969, 304–305. — Takeuchi, 1995, 203, fig. 21–190.  
*Caprella (Spinicephala) verrucosa* — Arimoto, 1976d, 122–126, figs. 67–68. (in part)
98. *Caprella vidua* Mayer, 1903 (Goke-warekara)  
*Caprella vidua* Mayer, 1903, 128, pl. 5 figs. 37–38, pl. 8 figs. 32–34.  
*Caprella (Spinicephala) vidua* — Arimoto, 1976d, 165–167, fig. 89.

## IV. Incertae sedis

Genus *Liriopes*

99. *Liriopes lunaticus* Arimoto, 1978 (Gekko-warekara)  
*Liriopes lunaticus* Arimoto, 1978c, 21–23, fig. 1.

Genus *Aciconula*

100. *Aciconula miranda* Mayer, 1903 (Higeashi-warekara)  
*Aciconula miranda* — Utinomi, 1969, 296–297, fig. 1. — Arimoto, 1971c, 42–44, fig. 8. — Arimoto, 1976d, 42–44, fig. 17.

Genus *Noculacia*

101. *Noculacia bogisa* Mayer, 1903 (Senaka-futatoge-warekara)  
*Noculacia bogis* [sic.] — Arimoto, 1971e, 63–65, fig. 13.  
*Noculacia bogisa* — Arimoto, 1976d, 44–45, fig. 18. — Arimoto, 1980c, 102–104, fig. 4.

Genus *Pretritella*

102. *Pretritella divina* Arimoto, 1980 (Kami-warekara)  
*Pretritella divina* Arimoto, 1980c, 104–105,  
fig. 5.

Genus *Postoparacaprella*

103. *Postoparacaprella marcida* Arimoto, 1981  
(Muryoku-warekara)  
*Postoparacaprella marcida* Arimoto, 1981c, 21–  
22, fig. 1.

Genus *Propodalirius*

104. *Propodalirius insolitus* Mayer, 1903 (Ijhogata-  
warekara)  
*Propodalirius insolitus* — Arimoto, 1980c, 106–  
107, fig. 7.

Genus *Triperopus*

105. *Triperopus mirus* Mayer, 1903 (Kawari-warekara)  
*Triperopus mirus* — Arimoto, 1971c, 44–46, fig.  
9. — Arimoto, 1976d, 38–39, fig. 15.

## Infraorder Cyamida

## IV. Family Cyamidae

Genus *Platycyamus*

106. *Platycyamus flaviscutatus* Waller, 1989  
*Platycyamus flaviscutatus* Waller, 1989, 292–293,  
fig. 1.

Genus *Isocyamus*

107. *Isocyamus deltobranchium* Sedlak-Weinstein, 1992  
*Isocyamus deltobranchium* Sedlak-Weinstein, 1992,  
938–945, figs. 1–12.

Genus *Cyamus*

108. *Cyamus bahamondei* Buzeta, 1963 in Berzin and  
Vlasova (1982)
109. *Cyamus boopis* Lütken, 1870  
*Cyamus elogatus* Hiro, 1938, 71–77, figs. 1–6.  
*Paracyamus boopis* — Ishi, 1915, 157–159.
110. *Cyamus ceti* (Linnaeus, 1758) in Berzin and  
Vlasova (1982)
111. *Cyamus erraticus* Roussel de Vauzème, 1834  
*Cyamus erraticus* — Iwasa, 1934, 37–39, pls. 5,  
7. — Utinomi, 1965, 581 with fig.
112. *Cyamus gracilis* Roussel de Vauzème, 1834 in  
Berzin and Vlasova (1982)
113. *Cyamus orubraedon* Waller, 1989  
*Cyamus orubraedon* Waller, 1989, 293–295, figs.  
2–4.
114. *Cyamus ovalis* Roussel de Vauzème, 1834  
*Cyamus ovalis* — Iwasa, 1934, 33–37, pls. 4, 6.—  
Utinomi, 1965, 581 with fig.
115. *Cyamus* sp. in Lueng (1965)

tions of each species listed in the above section are excluded.

Behavior — Aoki (1996a–b, 1997), Aoki and Kikuchi (1990a, 1991), Takeuchi and Hirano (1995).

Biogeography — Arimoto (1973), Takeuchi and Sawamoto (1998).

Checklist — Berzin and Vlasova (1982), Gruner (1975), McCain and Steinberg (1970).

Community structure — Edgar (1991), Edgar and Aoki (1993), Fuse (1962), Hirata (1986), Hirata et al. (1988), Hirayama and Kikuchi (1980), Ito et al. (1988b), Kikuchi (1966), Miyadi and Masui (1942a–b), Sakaguchi (1979), Takeda et al. (1990), Takeuchi (1992), Takeuchi and Hino (1997), Takeuchi et al. (1987, 1990b), Yasuhara et al. (1981), Yokoyama et al. (1997).

Distribution — Arimoto (1976b), Irie (1957, 1958a–b).

Dry weight, carbon and nitrogen contents — Takeuchi (1998).

Faunal list — Aoki and Asakura (1995), Arimoto (1970a, 1971d–f, 1974, 1975, 1978e, 1979c–d, 1980b–d, 1981b, 1982), Arimoto and Hirayama (1979), Arimoto and Kikuchi (1977), Hirosaki (1964), Honma et al. (1974), Horikoshi et al. (1979), Irie (1955), Ito (1970), Ito et al. (1972, 1982, 1988a), Kikuchi (1968, 1985), Kuramochi (1997), Nishi et al. (1998), Saito (1997), Sandô (1964), Takeuchi and Hirano (1987), Uchida et al. (1970), Utinomi (1947, 1964, 1968, 1969, 1973), Yamaguchi (1993), Yamashita (1979).

Fish predation — Baba and Sano (1987), Edgar and Aoki (1993), Fukuhara (1991), Hirayama (1978), Hong et al. (1998), Horinouchi et al. (1998), Kiso (1980, 1981, 1982), Omori (1980), Oshiro and Nishihira (1994), Tanaka (1977), Terazaki and Iwata (1983), Yamazaki and Tanaka (1994), Yokogawa and Iguchi (1992).

Grazing — Achiha et al. (1995).

Gut contents — Nagasawa and Nemoto (1988).

Histology — Yamashita (1995).

Life history — Sakaguchi (1990), Takeuchi and Hirano (1988, 1991, 1992a, b).

List of type specimens — Harada (1991).

Methodology — Aoki (1991a).

Microdistribution — Imada et al. (1981), Kita and Harada (1962).

Morphology — Arimoto (1962, 1971a), Ito (1974, 1982), Sakaguchi (1988, 1989), Takeuchi (1990).

Parasitology — Araki et al. (1997), Goggin and Bouland (1997), Hoshide (1969), Yasumoto and Nagasawa (1996).

Phylogeny — Laubitz (1993), Takeuchi (1993b).

Population fluctuation — Aoki (1988), Iikura (1985), Iikura et al. (1984), Imada and Kikuchi (1984a–b), Kito (1975), Mukai (1971), Omori et al. (1992), Takama (1980), Takeuchi et al. (1990a).

Review — Aoki (1998), Arimoto (1978a), Hashizume (1998), Iikura (1987), Irie (1959), Matsumasa and Mukai (1996), Mukai (1996), Takeuchi (1996).

Toxicology — Hayakawa (1976).

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**BIBLIOGRAPHY**

An attempt in the present section is made to allow easy access to key literature dealing with phylogeny, biology and ecology of caprellid amphipods, although this is not a comprehensive bibliography of the all the scientific literature on Japanese caprellids. The literature concerned with descrip-

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## 日本近海産のワレカラ亜目（甲殻綱：端脚目）の チェックリスト及び文献リスト

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1998年までに出版された研究を集計すると、日本近海から115種のワレカラ亜目（甲殻綱：端脚目）の分布が確認された。このうち、ワレカラ下目は105種であり、なかでもワレカラ科が88種と最も多く、ムカシワレカラ科の8種が次ぐ。ワレカラ下目の種数は、この20年間でArimoto (1976d) で記録された70種より50% (35種) 増加した。クジラジラミ下目はクジラジラミ科からのみなり、10種が分布する。各種毎に日本産の標本を基にした分類学的記載のシノニムリストを作成したほか、分類以外の分野に関しても、日本のワレカラ亜目に関する文献リストを付け加えた。

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