

# A Checklist of Published Crustacean Species from Brackish Lakes, Shinjiko and Nakaumi, Japan

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**摘要**：2003 年末までに発表された文献記録に基づいて、宍道湖から中海に至る汽水域（境水道は含まない）に産する水生甲殻類のチェックリストを作成した。その結果、15 目 193 種の甲殻類が本水域から報告されていたことが明らかとなった（ミジンコ目 7 種、カイミジンコ目 54 種、カラヌス目 20 種、キクロプス目 8 種、ハルパクチクス目 5 種、ポエキロストム目 5 種、シフォノストム目 1 種、フジツボ目 4 種、アミ目 3 種、クーマ目 2 種、タナイス目 1 種、等脚目 15 種、端脚目 17 種、十脚目 50 種、シャコ目 1 種）。

本水域の甲殻類相には未解明な部分も多いため、甲殻類全体についての生物地理学的な考察を行うことは困難であるが、比較的解明度が高いと考えられる汽水性カラヌス目と内湾・沿岸性カイアシ亜綱について分布パターンの分析を試みた。その結果、本水域に産する種は複数の分布要素に分類され、その中でも古東シナ海や古日本海を起源とする「東亜初期固有要素」に分類される種の割合が特に高いことが明らかとなった。

等脚目のシンジコスナウミナナフシ *Cyathura shinjikoensis* Nunomura, 2001 は本水域以外からは記録がなく、現段階では本水域の固有種とみなされる。

**キーワード**：甲殻類，チェックリスト，宍道湖，中海，日本

## Introduction

Shinjiko (area: 79.2 km<sup>2</sup>, average depth: 4.5 m, salinity: 1-6 psu) and Nakaumi (area: 86.8 km<sup>2</sup>, average depth: 5.4m, salinity: 14-20 in the surface and 25-30 psu in the bottom layer), two coupled brackish lakes, make up the Hii River estuary system which opens to Miho Bay, the Sea of Japan. These two lakes and the Ohashi River, a short connecting river (length: 7.3 km) between the two lakes, are the largest brackish-water ecosystem remaining in Japan at present (Fig. 1). Freshwater from the Hii River and other small streams and salt water from the Sakai Channel (length: 7.5 km) meet and mix in this area, resulting in unique hydrographic and environmental conditions.

Both lakes have the same bathymetric character of a

large surface area and shallow depth. However, the ecosystems of the two lakes are very different. In Shinjiko, a small bivalve, *Corbicula japonica* dominates in the lake bottom and plays an important role in the nutrient cycle of the lake ecosystem. On the other hand, the hypolimnion of Nakaumi becomes anoxic from April to October. In addition, the formerly healthy and productive ecosystem of Nakaumi was severely damaged by the reclamation works of the last 40 years.

The hydrographic conditions and the distribution, abundance, and mode of life of organisms vary greatly among these water bodies and from season to season. This situation has interested researchers, and many ecological and faunal studies of brackish-water crustaceans from Shinjiko and Nakaumi have been published since the 1920s. However, with the exception

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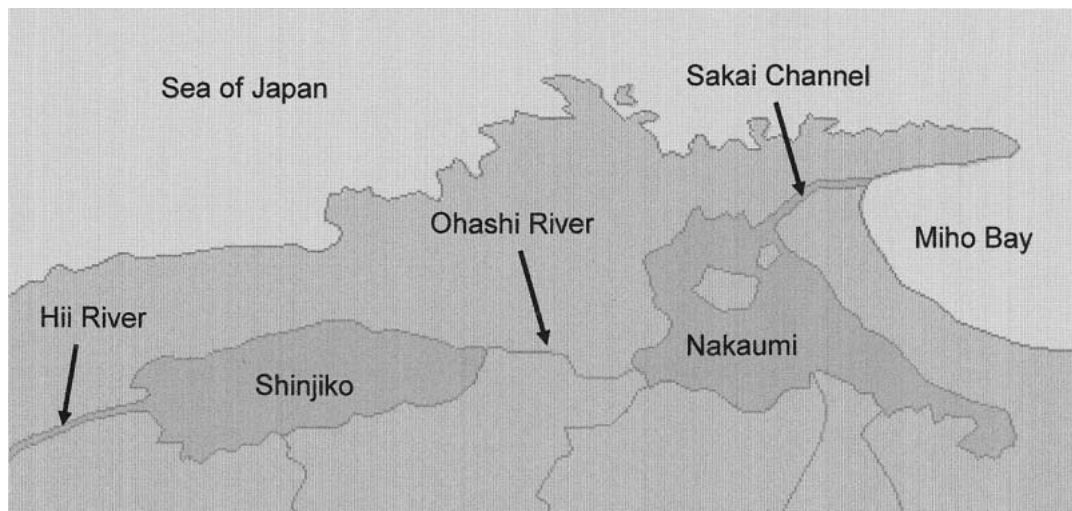


Fig. 1. Map of a coupled of brackish lakes, Shinjiko and Nakaumi.

of some studies of Ostracoda, Copepoda, Cumacea, and Decapoda, few investigations involved taxonomists. As a result, doubtful records and obvious misidentifications are present in many studies. The shortage of taxonomic information continues to be a problem, leading to misidentification of crustaceans in very recent papers. Hence, as a resource for future research in this area, it was felt that a list of all crustacean records for the region would be a useful tool, leading to this bibliographical survey of aquatic crustaceans from the Shinjiko-Nakaumi brackish lake system (until 2003). The area treated here is brackish water of Shinjiko and Nakaumi, and the Ohashi River, excluding the Sakai Channel.

The author hopes this list of valid names of crustaceans will be useful not only for taxonomists but also for researchers in other fields of science who use crustaceans in their research. Although I have tried to incorporate as many early records as possible, there must remain many which I was unable to find. These must be left to be added in future publications.

## Results and Discussion

From the bibliographical survey, I recognized 193 species (including doubtful records) of aquatic crustaceans belonging to 15 orders that have so far been recorded from the brackish lakes system: 7 species of Cladocera, 54 of Podocopida, 20 of Calanoida, 8 of Cyclopoida, 5 of Harpacticoida, 5 of Poecilostomatoida, 1 of Siphonostomatoida, 4 of Cirripedia, 3 of Mysidacea, 2 of Cumacea, 1 of Tanaidacea, 15 of Isopoda, 17 of Amphipoda, 50 of Decapoda, 1 of Stomatopoda (Table 1). In these waters, however, there are many doubtful records and taxonomic problems with respect to crustaceans as described below. Especially, the fauna of the following orders are very poorly known:

Harpacticoida, Poecilostomatoida, Siphonostomatoida, Tanaidacea, Isopoda, and Amphipoda.

Although it is difficult to discuss crustacean biogeography due to the insufficiency of the distributional records, brackish calanoid copepods and inlet and neritic copepods recorded from the lakes show an "East Asian initial endemic element". According to Ohtsuka *et al.* (1995), brackish calanoid copepods listed in the present paper are classified as three distributional types: Type Ic "East Asian initial endemic element" (*Acartia sinjiensis* Mori, 1940, *Sinocalanus tenellus* (Kikuchi, 1928), *Pseudodiaptomus inopinus* (Burckhardt, 1913), and *Eurytemora pacifica* Sato, 1913), Type II "Arctic-temperate cold-water element" (*Acartia hudsonica* Pinhey, 1926), and Type III "Indo-West Pacific warm-water element" (*Pseudodiaptomus marinus* Sato, 1913). Variable distributional types including "East Asian initial endemic element" are also recognized in inlet and neritic copepods (Ohtsuka and Ueda, 1999). Type Ic, distributed in both continental and island waters, belongs to an East Asian endemic element that could have originated on the coast of the ancient East China Sea or the Japan Sea (Nishimura, 1980; 1981). In addition, *Gnorimosphaeroma naktongense* Kim and Know, 1987 (Isopoda) has distributional pattern similar to Type Ic and is thought to originate along the coast of the ancient Japan Sea (Fukuhara *et al.*, 2001; Nunomura, 1996).

Although Shinjiko-Nakaumi is a young water body (10000-6000 years old), *Cyathura shinjikoensis* Nunomura, 2001 (Isopoda) is at present recognized as endemic species from this brackish water system.

## Format

Taxa which are higher ranks from order are arranged following Chihara and Murano (1997). Arrangements of

**Table 1.** Species numbers of aquatic crustaceans recorded from Shinjiko, Ohashi River, and Nakaumi (until 2003).

	Orders							
	Cladocera	Podocopida	Calanoida	Cyclopoida	Harpacticoi.	Poecilosto.	Siphonosto.	Cirripedia
Shinjiko	5	5	4	4	1	1	1	1
Ohashi River	5	4	5	2	0	0	0	0
Nakaumi	5	51	19	7	5	4	0	4
total	7	54	20	8	5	5	1	4

	Orders						
	Mysidacea	Cumacea	Tanaidacea	Isopoda	Amphipoda	Decapoda	Stomatopoda
Shinjiko	2	1	1	9	6	27	0
Ohashi River	1	0	0	2	3	2	0
Nakaumi	3	1	0	7	15	45	1
total	3	2	1	15	17	50	1

families within each order follow Onbé (1997) on Cladocera, Hanai *et al.* (1977) on Ostracoda, Ohtsuka and Ueda (1997) on Copepoda, Mizuno (1991) on Cyclopoida, Gamo (1995) on Harpacticoida, Ohtsuka (1997) on Poecilostomatoida, Gamo (1997) on Cumacea, Saito *et al.* (2000) on Isopoda, Ishimaru (1994) on Gammaridea of Amphipoda, and Konishi (1997) on Decapoda. Genera and species are arranged alphabetically within each family. Specific names are listed with Japanese common names, synonyms and distributional records within the area (each author in parentheses). Doubtful species are marked [?] in front of specific names in the checklist. Brief taxonomic notes are added below distributional records when necessary.

## Checklist

### Arthropoda 節足動物門

#### Crustacea 甲殻亜門

#### Branchiopoda 鰓脚綱

#### Cladocera ミジンコ目 (枝角類)

#### Sididae シダ科

- Penilia avirostris* Dana, 1849 ウスカワミジンコ  
= *Penilia schmackeri*: Chiba, 1950; Chiba and Kobayashi, 1959; Miyadi *et al.*, 1952; Suda *et al.*, 1931.  
Shinjiko (Chiba and Kobayashi, 1959; Harada *et al.*, 1985; Uye, 1997), Ohashi River (Uye, 1997; Uye *et al.*, 2000), Nakaumi (Chiba, 1950; Harada *et al.*, 1985; Miyadi *et al.*, 1952; Ohtsuka *et al.*, 1999a; Suda *et al.*, 1931; Uye, 1997; Uye *et al.*, 2000).
- Diaphanosoma brachyurum* (Liéve, 1848) オナガミジンコ

Shinjiko (Kawanabe *et al.*, 1968; Uye, 1997; Uye *et al.*, 2000), Ohashi River (Uye *et al.*, 2000).

#### Daphniidae ミジンコ科

- Daphnia longispina* O. F. Müller, 1785 ハリナガミジンコ

Shinjiko (Harada *et al.*, 1985).

#### Podonidae ウミオオメミジンコ科

- Evadne tergestina* (Claus, 1862) トゲナシエボシミジンコ

Shinjiko (Chiba and Kobayashi, 1959; Harada *et al.*, 1985; Uye, 1997), Ohashi River (Uye, 1997), Nakaumi (Chiba, 1950; Harada *et al.*, 1985; Miyadi *et al.*, 1952; Ohtsuka *et al.*, 1999a; Uye, 1997; Uye *et al.*, 2000).

- Podon leuckarti* G. O. Sars, 1862 オオウミオオメミジンコ

Ohashi River (Uye, 1997; Uye *et al.*, 2000), Nakaumi (Ohtsuka *et al.*, 1999a, Uye, 1997; Uye *et al.*, 2000).

- Podon polyphemoides* (Leuckart, 1859) コウミオオメミジンコ

Shinjiko (Uye, 1997), Ohashi River (Uye, 1997; Uye *et al.*, 2000), Nakaumi (Ohtsuka *et al.*, 1999a, Uye, 1997; Uye *et al.*, 2000).

- [?] *Podon schmackeri* Poppe, 1889 ウミオオメミジンコ  
Nakaumi (Chiba, 1950).

Remarks: This record is probably a misidentification of other species, because *P. schmackeri* is pelagic species and occurs only in oceanic waters (Onbé, personal communication).

**Ostracoda カイムシ亜綱****Podocopida 節柄目 (カイミジンコ目)****Pontocyprididae ウミヒラカイミジンコ科**

1. *Pontocypris?* sp. A  
Shinjiko (Ishizaki, 1969), Nakaumi (Ishizaki, 1969).
2. *Propontocypris?* sp.  
Ohashi River (Tanaka *et al.*, 1998), Nakaumi (Tanaka *et al.*, 1998).

**Candonidae カンドナ科**

3. *Dolerocypria mukaishimense* Okubo, 1980 スナカイミジンコ  
Shinjiko (Tanaka *et al.*, 1998), Ohashi River (Tanaka *et al.*, 1998), Nakaumi (Tanaka *et al.*, 1998).

**Cyprididae キプリス科**

4. *Candonocypris assimilis* Sars, 1894 ハイナガカイミジンコ  
Ohashi River (Tanaka *et al.*, 1998).

**Cytherideidae キテリデア科**

5. *Perissocytheridea japonica* Ishizaki, 1968  
Nakaumi (Takayasu *et al.*, 1990).
6. *Pontocythere miurensis* (Hanai, 1959)  
Nakaumi (Takayasu *et al.*, 1990).
7. *Pontocythere subjaponica* (Hanai, 1959)  
= *Cushmanidea subjaponica*: Ishizaki, 1969.  
Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990).
- . *Pontocythere* sp. A  
Nakaumi (Takayasu *et al.*, 1990).

**Leptocytheridae レプトキテレ科**

8. *Callistocythere alata* Hanai, 1957  
Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990).
9. *Callistocythere japonica uranipponica* Hanai, 1957  
Nakaumi (Takayasu *et al.*, 1990).
10. *Callistocythere rugosa* Hanai, 1957  
Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990).
11. *Callistocythere* aff. *reticulata* Hanai, 1957  
Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990).

12. *Callistocythere* cfr. *undulatifacialis* Hanai, 1957  
Nakaumi (Ishizaki, 1969).

- . *Callistocythere* sp. A  
Nakaumi (Takayasu *et al.*, 1990).

- . *Callistocythere* sp. B  
Nakaumi (Takayasu *et al.*, 1990).

**Cytheridae キテレ科 (ソコカイミジンコ科)**

13. *Cythere nishinipponica* Okubo, 1976  
Nakaumi (Takayasu *et al.*, 1990).
14. *Cythere lutea omotenipponica* Hanai, 1959  
Nakaumi (Ishizaki, 1969).
15. *Schizocythere kishinouyei* (Kajiyama, 1913)  
Nakaumi (Takayasu *et al.*, 1990).
16. *Spinileberis quadriaculeata* (Brady, 1880)  
Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990; Tanaka *et al.*, 1998).
17. *Spinileberis pulchra* Chen in Hou *et al.*, 1982  
Shinjiko (Tanaka *et al.*, 1998).
18. *Spinileberis furuyaensis* Ishizaki and Kato, 1976  
= *Spinileberis* sp. A: Ishizaki, 1969.  
Nakaumi (Ishizaki, 1969).

**Hemicytheridae ヘミキテレ科**

19. *Aurila cymba* (Brady, 1869)  
= *Aurila miii*: Ishizaki, 1969.  
Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990).
20. *Aurila* aff. *munechikai* Ishizaki, 1968  
Nakaumi (Takayasu *et al.*, 1990).
21. *Aurila* cfr. *hataii* Ishizaki, 1968  
Nakaumi (Takayasu *et al.*, 1990).
22. *Coquimba ishizakii* Yajima, 1978  
Nakaumi (Takayasu *et al.*, 1990).
23. *Finmarchinella uranipponica* Ishizaki, 1969  
Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990).  
Remarks: The type locality of the species is "St. 12 (Lat. 35°31'12"N, Long. 133°11'22"E), Nakanoumi Estuary" (Hanai, 1977).
24. *Finmarchinella japonica* (Ishizaki, 1966)  
Nakaumi (Takayasu *et al.*, 1990).

25. *Hemicythere? miii* (Ishizaki, 1969)  
= *Urocythereis miii*: Ishizaki, 1969.  
Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990).  
Remarks: The type locality of the species is “St. 12 (Lat. 35°31'12"N, Long. 133°11'22"E), Nakanoumi Estuary” (Hanai, 1977).

26. *Hermanites tosaensis* Ishizaki, 1968  
Nakaumi (Ishizaki, 1969).

27. *Robustaurila* sp.  
Nakaumi (Takayasu *et al.*, 1990).

### Trachyleberididae トラキレベリス科

28. *Acanthocythereis niitsumai* (Ishizaki, 1971)  
Nakaumi (Takayasu *et al.*, 1990).
29. *Bicornucythere bisanensis* (Okubo, 1975)  
= *Leguminocythereis hodgii*: Ishizaki, 1969.  
Shinjiko (Tanaka *et al.*, 1998), Ohashi River (Tanaka *et al.*, 1998), Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990; Tanaka *et al.*, 1998).
30. *Moosella tomokoae* (Ishizaki, 1968)  
Nakaumi (Takayasu *et al.*, 1990).
31. *Pistocythereis bradyformis* (Ishizaki, 1968)  
Nakaumi (Takayasu *et al.*, 1990).
32. *Pistocythereis bradyi* (Ishizaki, 1968)  
= *Echinocythereis bradyi*: Ishizaki, 1969.  
Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990).
33. *Trachyleberis scabrocuneata* (Brady, 1880)  
Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990).

### Bythocytheridae

34. *Bythoceratina hanaii* Ishizaki, 1968  
Nakaumi (Takayasu *et al.*, 1990).

### Cytheruridae キテルラ科

35. *Angulicytherura? miii* (Ishizaki, 1969)  
= *Tetracytherura miii* Ishizaki, 1969.  
= *Cytherura miii*: Takayasu *et al.*, 1990.  
Shinjiko (Ishizaki, 1969), Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990).  
Remarks: The type locality of the species is “St. 17 (Lat. 35°28'01"N, Long. 133°08'32"E) Nakanoumi Estuary” (Hanai, 1977).

36. *Hemicytherura cuneata* Hanai, 1957

Nakaumi (Takayasu *et al.*, 1990).

37. *Howeina camptocytheroidea* Hanai, 1957  
Nakaumi (Takayasu *et al.*, 1990).

38. *Semicytherura henryhowei* Hanai and Ikeya, 1977  
Nakaumi (Takayasu *et al.*, 1990).

39. *Semicytherura* cfr. *miurensis* (Hanai, 1957)  
Nakaumi (Takayasu *et al.*, 1990).

-. *Semicytherura* sp. A  
Nakaumi (Takayasu *et al.*, 1990).

-. *Semicytherura* sp. B  
Nakaumi (Takayasu *et al.*, 1990).

### Loxoconchidae ロクソコンカ科

40. *Cytheromorpha acupunctata* (Brady, 1880)  
= *Cytheromorpha japonica*: Ishizaki, 1969.  
Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990; Tanaka *et al.*, 1998).

41. *Loxoconcha hattorii* Ishizaki, 1971  
Nakaumi (Takayasu *et al.*, 1990).

42. *Loxoconcha japonica* Ishizaki, 1968  
Nakaumi (Takayasu *et al.*, 1990).

43. *Loxoconcha kattoi* Ishizaki, 1968  
Nakaumi (Takayasu *et al.*, 1990).

44. *Loxoconcha optima* Ishizaki, 1968  
Nakaumi (Takayasu *et al.*, 1990).

45. *Loxoconcha tosamodesta* Ishizaki, 1981  
= *Loxoconcha modesta*: Takayasu *et al.*, 1990.  
Nakaumi (Takayasu *et al.*, 1990).

46. *Loxoconcha tumulosa* (Hu, 1979)  
Nakaumi (Takayasu *et al.*, 1990).

47. *Loxoconcha uranouchiensis* Ishizaki, 1968  
Nakaumi (Ishizaki, 1969; Takayasu *et al.*, 1990).

-. *Loxoconcha* sp. A  
Nakaumi (Takayasu *et al.*, 1990).

-. *Loxoconcha* sp. B  
Nakaumi (Takayasu *et al.*, 1990).

**Xestoleberididae キセストレベリス科**

48. *Xestoleberis hanaii* Ishizaki, 1968  
Nakaumi (Takayasu *et al.*, 1990).

49. *Xestoleberis sagamiensis* Kajiyama, 1913  
Nakaumi (Takayasu *et al.*, 1990).

-. *Xestoleberis* sp.  
Nakaumi (Takayasu *et al.*, 1990).

**Paradoxostomatidae パラドクソストマ科**

50. *Cytherois nakanoumiensis* Ishizaki, 1969  
Nakaumi (Ishizaki, 1969).  
Remarks: The type locality of the species is  
"Nakanoumi" (Ishizaki, 1969).

51. *Cytherois uranouchiensis* Ishizaki, 1968  
Nakaumi (Ishizaki, 1969).

-. *Cytherois* sp.  
Nakaumi (Takayasu *et al.*, 1990).

52. *Paracytherois tosaensis* Ishizaki, 1968  
Nakaumi (Ishizaki, 1969).

53. *Paracytherois* cfr. *tosaensis* Ishizaki, 1968  
Nakaumi (Takayasu *et al.*, 1990).

-. *Paracytherois* sp.  
Nakaumi (Takayasu *et al.*, 1990).

54. *Paradoxostoma* sp.  
Nakaumi (Takayasu *et al.*, 1990).

**Copepoda カイアシ亜綱****Calanoida カラヌス目****Acartiidae アカルチア科**

1. [?] *Acartia bifilosa* (Giesbrecht, 1881)  
Nakaumi (Suda *et al.*, 1931).  
Remarks: This record is probably a misidentification.

2. *Acartia erythraea* Giesbrecht, 1889  
Nakaumi (Kawanabe *et al.*, 1968; Ohtsuka *et al.*,  
1999a; Uye *et al.*, 2000).

3. *Acartia hudsonica* Pinhey, 1926  
= *Acartia clausi*: Kawanabe *et al.*, 1968; Miyadi *et al.*,  
1952; 1954.  
Ohashi River (Uye, 1997; 2003; Uye *et al.*, 2000),

Nakaumi (Kawanabe *et al.*, 1968; Miyadi *et al.*, 1952;  
1954; Ohtsuka *et al.*, 1999a; 1999b; Uye, 1997; 2003;  
Uye *et al.*, 2000).

4. [?] *Acartia longiremis* (Lilljeborg, 1853)  
Nakaumi (Suda *et al.*, 1931).  
Remarks: This record is probably a misidentification.

5. *Acartia sinjiensis* Mori, 1940  
= *Acartia plumosa*: Harada *et al.* 1985.  
Shinjiko (Harada *et al.*, 1985; Mori, 1940; Uye, 1997),  
Ohashi River (Uye, 1997; 2003; Uye *et al.*, 2000),  
Nakaumi (Harada *et al.*, 1985; Mori, 1940; Ohtsuka *et al.*,  
1999a; 1999b; Uye, 1997; 2003; Uye *et al.*, 2000).  
Remarks: The type locality of *A. sinjiensis* is Nakaumi  
near Makata harbor, and Shinjiko (Mori, 1940).

**Calanidae カラヌス科**

6. *Calanus sinicus* Brodsky, 1965  
Nakaumi (Ohtsuka *et al.*, 1999a; Uye *et al.*, 2000).

7. *Undinula vulgaris* (Dana, 1849)  
= *Calanus vulgaris*: Chiba, 1950.  
Nakaumi (Chiba, 1950).

**Temoridae テモラ科**

8. *Eurytemora pacifica* Sato, 1913  
Ohashi River (Uye, 1997; 2003; Uye *et al.*, 2000),  
Nakaumi (Harada *et al.*, 1985; Ohtsuka *et al.*, 1999a;  
1999b; Uye, 1997; Uye *et al.*, 2000).

9. *Temora discaudata* Giesbrecht, 1892  
= *Temora stylifera*: Suda *et al.*, 1931.  
Nakaumi (Suda *et al.*, 1931).

**Paracalanidae パラカラヌス科**

10. *Paracalanus crassirostris* Dahl, 1894  
Nakaumi (Ohtsuka *et al.*, 1999a; Uye *et al.*, 2000).

11. *Paracalanus parvus* (Claus, 1863) s. l.  
Nakaumi (Chiba, 1950; Harada *et al.*, 1985; Miyadi *et al.*,  
1952; 1954; Ohtsuka *et al.*, 1999a; Uye *et al.*, 2000).

**Pseudodiaptomidae プセウドディアプトムス科 (ニセヒゲナガミジンコ科)**

12. *Pseudodiaptomus inopinus* (Burckhardt, 1913) ニセヒゲナガケンミジンコ  
Shinjiko (Harada *et al.*, 1985; Kawanabe *et al.*, 1968;  
Uye, 1997; Uye *et al.*, 2000), Ohashi River (Uye, 1997;  
Uye *et al.*, 2000), Nakaumi (Ohtsuka *et al.*, 1999a; Uye,

1997; Uye *et al.*, 2000).

13. *Pseudodiaptomus marinus* Sato, 1913  
Nakaumi (Ohtsuka *et al.*, 1999a; Suda *et al.*, 1931).

### Centropagidae ケントロパジェス科

14. *Centropages tenuiremis* Thompson and Scott, 1903  
Nakaumi (Uye *et al.*, 2000).
15. [?]*Centropages kroeyeri* Giesbrecht, 1892  
Nakaumi (Suda *et al.*, 1931).  
Remarks: This record is probably a misidentification.
16. [?]*Centropages hamatus* (Lilljeborg, 1853)  
Nakaumi (Suda *et al.*, 1931).  
Remarks: This record is probably a misidentification.
17. *Sinocalanus tenellus* (Kikuchi, 1928)キスイヒゲナ  
ガケンミジンコ  
= *Limnocalanus sinensis* var. *tenellus*: Kikuchi,  
1928.  
Shinjiko (Harada *et al.*, 1985; Kawanabe *et al.*, 1968;  
Kikuchi, 1928; Uye, 1997; 2003; Uye *et al.*, 2000),  
Ohashi River (Uye, 1997; Uye *et al.*, 2000), Nakaumi  
(Harada *et al.*, 1985; Lacuna *et al.*, 2000; Miyadi *et al.*,  
1952; 1954; Ohtsuka *et al.*, 1999a; 1999b; Uye, 1997;  
Uye *et al.*, 2000).

### Stephidae ステフォス科

18. *Stephos* sp.  
Nakaumi (Ohtsuka *et al.*, 1999a).

### Tortanidae トルタヌス科

19. *Tortanus (Tortanus) forcipatus* (Giesbrecht, 1889)  
Nakaumi (Ohtsuka *et al.*, 1999a; Suda *et al.*, 1931; Uye  
*et al.*, 2000).

### Diaptomidae ディアプトムス科 (ヒゲナガケンミジンコ科)

20. *Eodiaptomus japonicus* (Burckhardt, 1913)ヤマトヒ  
ゲナガケンミジンコ  
Shinjiko (Harada *et al.*, 1985).

### Cyclopoida キクロプス目

#### Oithonidae オイトナ科

1. [?]*Oithona aruensis* Fruchtl, 1923  
Nakaumi (Harada *et al.*, 1985).  
Remarks: *Oithona aruensis* reported by Harada *et al.*

(1985) may be identical with *Oithona davisae* because *O. aruensis* recorded only from Ryukyu in Japan, was previously confused with *O. davisae* (Ohtsuka, personal communication).

2. *Oithona brevicornis* Giesbrecht, 1891  
Nakaumi (Ohtsuka *et al.*, 1999a).
3. *Oithona davisae* Ferrari and Orsi, 1984  
Ohashi River (Uye, 1997; Uye *et al.*, 2000), Nakaumi  
(Ohtsuka *et al.*, 1999a; 1999b; Uye, 1997; 2003; Uye *et al.*, 2000).
4. [?]*Oithona nana* Giesbrecht, 1892  
Shinjiko (Chiba and Kobayashi, 1959), Nakaumi  
(Kawanabe *et al.*, 1968; Miyadi *et al.*, 1952; 1954; Suda  
*et al.*, 1931).  
Remarks: These early records of *O. nana* may be  
identical with *O. davisae* because *O. nana* was previ-  
ously confused with *O. davisae* (Ohtsuka, personal com-  
munication).
5. *Oithona similis* Claus, 1866  
Shinjiko (Chiba and Kobayashi, 1959), Nakaumi  
(Miyadi *et al.*, 1954; Ohtsuka *et al.*, 1999a; Suda *et al.*,  
1931).

### Cyclopinidae キクロピナ科

6. *Paracyclopinia nana* Smirnov, 1935  
Shinjiko (Uye, 1997), Ohashi River (Uye, 1997),  
Nakaumi (Ohtsuka *et al.*, 1999a).
7. *Cyclopina kiraensis* Hiromi, 1984  
Nakaumi (Ohtsuka *et al.*, 1999a; Ueda *et al.*, 2001).  
Remarks: *Cyclopina kiraensis* was known only from  
two brackish waters, Shinjiko and the mouth of the  
Yahagi-furukawa River, Aichi Prefecture (Ueda *et al.*,  
2001).

### Cyclopidae ケンミジンコ科

8. “*Mesocyclops leuckarti* (Claus, 1857)”アサガオケン  
ミジンコ  
Shinjiko (Mizuno, 1984).  
Remarks: Cyclopid species recorded as *M. leuckarti*  
from eastern Asia including Japan are not identical with  
*M. leuckarti* (Kiefer, 1981; Ohtsuka and Ueda, 1999).  
The identity of the species from these areas requires  
reassessment.

**Harpacticoida** ハルパクチクス目**Ectinosomatidae** フネガタソコミジンコ科

1. *Microsetella norvegica* (Boeck, 1864) オヨギソコミジンコ  
Nakaumi (Miyadi *et al.*, 1952; Ohtsuka *et al.*, 1999a; Suda *et al.*, 1931; Uye *et al.*, 2000).

**Tachidiidae** カワリコソミジンコ科

2. *Euterpina acutifrons* (Dana, 1847) ウカレソコミジンコ  
= *Eutерpe acutifrons*: Miyadi *et al.*, 1952; 1954.  
Nakaumi (Miyadi *et al.*, 1952; 1954).
3. *Tachidius* sp.  
Nakaumi (Ohtsuka *et al.*, 1999a).

**Harpacticidae** ソコミジンコ科  
(ハルパクチクス科)

4. *Harpacticus uniremis* Krøyer, 1842 ホツカイソコミジンコ  
Nakaumi (Chiba, 1950).

**Canthocamptidae** カントカンプトラス科

5. *Epactophanes richardi* Mrazek, 1894  
Shinjiko (Miura, 1984), Nakaumi (Miura, 1984).

**Poecilostomatoida** ポエキロストム目**Ergasilidae** ニセエラジラミ科

1. *Thersitina gasterostei* (Pagenstecher, 1861)  
= *Limnoncaea diuncata* Kokubo, 1914: Okano, 1974; 1985  
Shinjiko (Okano, 1974; 1987).  
Remarks: *Limnoncaea diuncata* was relegated as a junior synonym of *T. gasterostei* (Ohtsuka *et al.*, 2004).

**Oncaeidae** オンケア科

2. *Oncaea venusta* Philippi, 1843  
Nakaumi (Ohtsuka *et al.*, 1999a).

**Corycaeidae** コリケウス科

3. *Corycaeus affinis* McMurrich, 1916  
Nakaumi (Ohtsuka *et al.*, 1999a).
4. [?] *Corycaeus venustus* (Dana, 1849)  
Nakaumi (Suda *et al.*, 1931).  
Remarks: This record is probably a misidentification.

**Miraciidae** ミラシア科

5. *Macrosetella gracilis* Dana, 1852  
= *Setella gracilis*: Suda *et al.*, 1931.  
Nakaumi (Suda *et al.*, 1931).

**Family unknown** 科不明

- . *Saphirella*-like copepod spp. サフィレラ型カイアシ類  
Nakaumi (Ohtsuka *et al.*, 1999a).

**Siphonostomatoida** シフォノストム目**Caligidae** ウオジラミ科 (カリグス科)

1. *Caligus orientalis* Gussev, 1951  
Shinjiko (Suzumoto, 1974).  
Remarks: Suzumoto (1974) recorded *C. orientalis* on *Carassius auratus cuvieri* (Temminck and Schlegel, 1846) from Shinjiko.
- . *Caligus* sp.  
Shinjiko (Uéno, 1943).  
Remarks: Uéno (1943) found *Caligus* sp. on *Cyprinus carpio* Linnaeus, 1758 from Shinjiko.

**Family unknown** 科不明

- . Parasitic copepod juveniles  
Nakaumi (Ohtsuka *et al.*, 1999a).  
Remarks: Ohtsuka *et al.* (1999a) recorded parasitic copepod juveniles as zooplankters.

**Cirripedia** フジツボ目**Balanidae** フジツボ科

1. *Balanus amphitrite* Darwin, 1854 タテジマフジツボ  
Nakaumi (Kato, 2000).
2. *Balanus kondakovi* Tarasov and Zevina, 1957 ドロフジツボ  
Nakaumi (Iga, 1973; Kato, 2000).
3. *Balanus improvisus* Darwin, 1854 ヨーロッパフジツボ  
Shinjiko (Iga, 1973; Kato, 2000), Nakaumi (Iga, 1973; Kato, 2000; Shimamura and Nakamura, 2001).
4. *Balanus eburneus* Gould, 1841 アメリカフジツボ  
Nakaumi (Kato, 2000; Shimamura and Nakamura, 2001).



**Malacostraca 軟甲綱****Mysidacea アミ目****Mysidae アミ科**

1. *Neomysis awatschensis* (Brandt, 1851) クロイサザアミ  
Nakaumi (Ohtsuka *et al.*, 1999a).
2. *Neomysis intermedia* (Czerniavsky, 1882) イサザアミ  
Shinjiko (Ii, 1964; Kamita, 1967; Koshikawa, 2003;  
Sato and Kato, 1996), Nakaumi (Koshikawa, 2003; Sato  
and Kato, 1996).
3. *Neomysis japonica* Nakazawa, 1910 ニホンイサザアミ  
Shinjiko (Kamita, 1967; Kuwabara, 2000), Ohashi  
River (Kikuchi, 1964), Nakaumi (Kikuchi, 1964;  
Koshikawa, 1999; Kuwabara, 2000; Ohtsuka *et al.*,  
1999a).

**Cumacea クーマ目****Leuconidae シロクーマ科**

1. *Leucon simanensis* Gamô, 1962 シマネシロクーマ  
Shinjiko (Gamô, 1962; Kikuchi, 1964).  
Remarks: *Leucon simanensis* known only from two  
brackish lakes, Shinjiko and Kamoko of Sado Island  
(Gamô, 1997). The type locality of the species is "east  
part of Shinji Lake" (Gamô, 1962).

**Diastylidae クーマ科**

2. *Dimorphostylis asiatica* Zimmer, 1921 トウヨウサザ  
ナミクーマ  
Nakaumi (Gamô, 1968; Kikuchi, 1964).  
Remarks: Although Gamô (1968) reported *D. asiatica*  
from "Shinzi Lake (Tottori Prefecture)", Shinjiko is not  
in Tottori Prefecture but in Shimane Prefecture. Hence,  
the locality recorded by Gamô (1968) must be Nakaumi.

**Tanaidacea タナイス目****Tanaidae タナイス科**

1. *Tanais* sp.  
Shinjiko (Kikuchi, 1964).
- *Tanaidae* gen. sp.  
Shinjiko (Harada *et al.*, 1997).

**Isopoda 等脚目****Anthuridae スナウミナナフシ科**

1. *Cyathura shinjikoensis* Nunomura, 2001 シンジコス  
ナウミナナフシ  
= *Paranthura japonica* ヤマトウミナナフシ:  
Kikuchi, 1964.  
= *Paranthura* sp.: Kikuchi, 1964.  
= *Cyathura kikuchii* キクチスナウミナナフシ:  
Sakamoto *et al.*, 1994; Harada *et al.*, 1997.  
= *Cyathura* sp.: Miyadi, 1932; Ueno, 1943.  
Shinjiko (Harada *et al.*, 1997; Kikuchi, 1964; Miyadi,  
1932; Nunomura, 2001; Sakamoto *et al.*, 1994; Ueno,  
1943), Ohashi River (Kikuchi, 1964).  
Remarks: *Cyathura shinjikoensis* is known only from  
Shinjiko and Ohashi River. The type locality of the  
species is "off Kimachi, Shinjiko" (Nunomura, 2001).

**Paranthuridae ウミナナフシ科**

2. [?] *Paranthura japonica* Richardson, 1909 ヤマトウミ  
ナナフシ  
Nakaumi (Yasugi *et al.*, 1999).  
Remarks: This record is probably misidentification of  
*C. shinjikoensis*.

**Family unknown 科不明**

3. *Epicaridea* gen. sp. ヤドリムシ亜目の1種  
Nakaumi (Ohtsuka *et al.*, 1999a).  
Remarks: Ohtsuka *et al.* (1999a) recorded *Epicaridea*  
gen. sp. as zooplankters.

**Idoteidae ヘラムシ科**

4. *Cleantiella strasseni* (Thielemann, 1910) オヒラキヘ  
ラムシ  
Nakaumi (Fujimoto *et al.*, 1999).
5. *Idotea metallica* Bosc, 1801 ナガレモヘラムシ  
Nakaumi (Kikuchi, 1964).
6. [?] *Synidotea laevidorsalis* (Miers, 1883) ワラジヘラ  
ムシ  
Nakaumi (Kikuchi, 1964).  
Remarks: As far as I examined, all *Synidotea* collected  
from Nakaumi were not identical with *S. laevidorsalis*  
and probably an allied species of *S. laevidorsalis*  
(Yamauchi, unpublished data).

**Cirolanidae スナホリムシ科**

7. *Eurydice* sp. ナギサスナホリムシ属の1種

Shinjiko (Yamauchi, 2003).

Remarks: Although I examined only two individuals of *Eurydice* sp. collected from Shinjiko, they were obviously different from three *Eurydice* species previously recorded from Japan: *Eurydice akiyamai* Nunomura, 1981, *Eurydice longiantennata* Nunomura and Ikehara, 1985, and *Eurydice nipponica* Bruce and Jones, 1981 (Yamauchi, 2003).

8. *Excirrolana chiltoni* (Richardson, 1905) ヒメスナホリムシ  
= *Excirrolana (Pontogeroideis) japonica*: Harada *et al.*, 1997.  
Shinjiko (Harada *et al.*, 1997).

### Corallanidae ニセウオノエ科

9. *Tachaea chinensis* Thielemann, 1910 エビノコバン  
Shinjiko (Nunomura, 2000).

### Sphaeromatidae コツブムシ科

10. *Chitonosphaera lata* (Nishimura, 1968) ハバヒロコツブムシ  
Shinjiko (Fukuhara *et al.*, 2000).
11. *Gnorimosphaeroma chinense* (Tattersall, 1921) キスイソコツブムシ (シナコツブムシ)  
Shinjiko (Fukuhara *et al.*, 2000).
12. *Gnorimosphaeroma hoestlandti* Kim and Know, 1985 フタゲイソコツブムシ  
Nakaumi (Nunomura, 1998).
13. *Gnorimosphaeroma naktongense* Kim and Know, 1987 チョウセンイソコツブムシ  
Shinjiko (Fukuhara *et al.*, 2000).
14. *Gnorimosphaeroma rayi* Hoestlandt, 1969 イソコツブムシ  
= *Neosphaeroma oregonensis*: Kikuchi, 1964.  
= *Gnorimosphaeroma oregonensis*: Sakamoto, 1995; Yasugi *et al.*, 1999.  
Shinjiko (Kikuchi, 1964; Sakamoto, 1995), Ohashi River (Kikuchi, 1964), Nakaumi (Hoestlandt, 1975; Kikuchi, 1964; Nunomura, 1998; Shimamura and Nakamura, 2001; Yasugi *et al.*, 1999).
15. *Sphaeroma retrolaevis* Richardson, 1904 ヨツバコツブムシ  
Shinjiko (Sakamoto, 1995).

## Amphipoda 端脚目

### Gammaridea ヨコエビ亜目

#### Ampeliscidae スガメソコエビ科

1. *Ampelisca brevicornis* (A. Costa, 1853) クビナガスガメ  
Nakaumi (Kikuchi, 1964).
2. *Ampelisca miharaensis* Nagata, 1959 ヒゲナガスガメ  
Nakaumi (Kikuchi, 1964).

#### Ampithoidae ヒゲナガヨコエビ科

3. *Ampithoe valida* Smith, 1873 モズミヨコエビ  
Ohashi River (Kikuchi, 1964), Nakaumi (Kawanabe *et al.*, 1968; Kikuchi, 1964).

#### Aoridae ユンボソヨコエビ科

4. *Grandidierella japonica* Stephensen, 1938 ニホンドロソコエビ  
Shinjiko (Kikuchi, 1964), Ohashi River (Kikuchi, 1964), Nakaumi (Yasugi *et al.*, 1999).

#### Corophiidae ドロクダムシ科

5. *Crassikorophium crassicorne* (Bruzelius, 1859) トゲドロクダムシ  
= *Corophium crassicorne*: Sakamoto, 1995.  
Shinjiko (Sakamoto, 1995).
6. *Monocorophium uenoi* (Stephensen, 1932) ウエノドロクダムシ  
= *Corophium uenoi*: Yasugi *et al.*, 1999.  
Nakaumi (Yasugi *et al.*, 1999).

#### Pontogeneiidae アゴナガヨコエビ科

7. [?] *Tethygeneia pacifica* (Schellenberg, 1938)  
= *Pontogeneia pacifica*: Kawanabe *et al.*, 1968.  
Nakaumi (Kawanabe *et al.*, 1968).  
Remarks: Kawanabe *et al.* (1968) reported *P. pacifica* as a dominant species in the phytal animals of Nakaumi and Miho Bay. *Pontogeneia pacifica* was originally described from Hawaii, and Kawanabe *et al.* (1968) is the only record of *P. pacifica* from Japan (Ariyama, personal communication). The identity of this species from these areas requires reassessment.

#### Anisogammaridae キタヨコエビ科

8. [?] *Jesogammarus (Annanogammarus) annandalei* (Tattersall, 1922) アンナンデールヨコエビ

= *Annisogammarus annandalei*: Kikuchi (1964).

Shinjiko (Kikuchi, 1964), Ohashi River (Kikuchi, 1964), Nakaumi (Kikuchi, 1964).

Remarks: This record is probably a misidentification of other anisogammarid species, because *J. annandalei* is endemic to Lake Biwa, and was previously confused with other *Jesogammarus* species and *Eogammarus possjeticus* Tzvetkova, 1967 (Morino, 1985).

9. [?]*Spinulogammarus subcarinatus* (Bate, 1862)

= *Anisogammarus subcarinatus*: Kawanabe *et al.*, 1968.

Shinjiko (Kawanabe *et al.*, 1968), Nakaumi (Kawanabe *et al.*, 1968).

Remarks: Kawanabe *et al.* (1968) reported *A. subcarinatus* as a dominant species in the phytal animals of Shinjiko and Nakaumi. The species is distributed in Bering Sea, Kamchatka, Aleutian Islands, and British Columbia, and Kawanabe *et al.* (1968) is the only record of the species from Japan (Tomikawa, personal communication). The identity of the species from these areas requires reassessment.

### Melitidae メリタヨコエビ科

10. *Melita* sp. near *dentate*, Krøyer, 1842 トゲメリタヨコエビの近似種

Shinjiko (Sakamoto, 1995).

11. [?]*Melita koreana* Stephensen, 1944 カギメリタヨコエビ

Shinjiko (Kikuchi, 1964), Nakaumi (Kikuchi, 1964).

Remarks: The intertidal amphipods, which were previously regarded as single species *M. koreana*, consist of several species (Yamato, 1985; 1987; 1988; 1990). The identity of *Melita* species from these areas requires reassessment.

### Stenothoidae タテソコエビ科

12. *Stenothoe valida* Dana, 1853 タテソコエビ

Nakaumi (Kikuchi, 1964).

### Oedicerotidae クチバシソコエビ科

13. *Pontocrates altamarina* (Bate and Westwood, 1863) ホソハサミンソコエビ

Nakaumi (Kikuchi, 1964).

### Hyalidae モクスヨコエビ科

14. *Apohyale punctata* (Hiwatari and Kajihara, 1981) モクスヨコエビ

= *Hyale grandicornis*: Kikuchi, 1964.

Nakaumi (Kikuchi, 1964).

### Talitridae ハマトビムシ科

15. *Orchestia* sp.

Nakaumi (Yasugi *et al.*, 1999).

### Caprellidea ワレカラ亜目

#### Caprellidae ワレカラ科

16. [?]*Caprella penantis* Leach, 1814 マルエラワレカラ = *Caprella acutifrons*: Kikuchi, 1964.

Nakaumi (Kikuchi, 1964).

Remarks: Kikuchi (1964) reported *C. acutifrons* (junior synonym of *C. penantis*) attached on *Sargassum hemiphyllum* of Nakaumi, but this is probably a misidentification of other caprellid species (Mori, personal communication). The identity of this species form Nakaumi requires reassessment.

17. *Caprella scaura* Templeton, 1836 トゲワレカラ

Nakaumi (Kikuchi, 1964).

### Decapoda 十脚目

#### Penaeidae クルマエビ科

1. *Fenneropenaeus chinensis* (Osbeck, 1765) コウライエビ

= *Penaeus orientalis*: Harada, 1968.

Nakaumi (Harada, 1968).

2. *Marsupenaeus japonicus* (Bate, 1888) クルマエビ

= *Penaeus japonicus*: Chiba and Kobayashi, 1959; Harada, 1968; Ishitobi *et al.*, 2000; Koshikawa, 1999; 2003.

Shinjiko (Chiba and Kobayashi, 1959; Harada, 1968; Kuwabara, 2000), Nakaumi (Harada, 1968; Ishitobi *et al.*, 2000; Koshikawa, 1999; 2003; Kuwabara, 2000).

3. *Metapenaeopsis acclivis* (Rathbun, 1902) トラエビ

= *Metapenaeus acclivis*: Hiratsuka, 2001.

Nakaumi (Hiratsuka, 2001).

4. *Metapenaeopsis barbata* (De Haan, 1844) アカエビ

Nakaumi (Hiratsuka, 2001; Ishitobi *et al.*, 2000; Kuwabara, 2000).

5. *Metapenaeus ensis* (De Haan, 1844) ヨシエビ

= *Metapenaeus monoceros*: Ota, 1941; Harada, 1968.

Shinjiko (Harada, 1968; Hiratsuka, 2001; Ishitobi *et al.*, 2000; Kamita, 1964; 1967; Koshikawa, 2003;

Kuwabara, 2000; Ota, 1941), Nakaumi (Harada, 1968; Hiratsuka, 2001; Ishitobi *et al.*, 2000; Koshikawa, 1999; 2003; Kuwabara, 2000; Ota, 1941).

6. *Metapenaeus joyneri* (Miers, 1880) シバエビ  
Shinjiko (Chiba and Kobayashi, 1959), Nakaumi (Sato and Kato, 1996).

7. *Penaeus monodon* Fabricius, 1798 ウシエビ  
= *Penaeus bubulus*: Harada, 1968.  
Nakaumi (Harada, 1968).

8. *Penaeus semisulcatus* De Haan, 1844 クマエビ  
Nakaumi (Hiratsuka, 2001; Ishitobi *et al.*, 2000; Koshikawa, 1999; 2003; Kuwabara, 2000).

9. *Trachysalambria curvirostris* (Stimpson, 1860) サルエビ  
= *Trachypenaeus curvirostris*: Harada, 1968.  
Shinjiko (Harada, 1968), Nakaumi (Harada, 1968).

### Sergestidae サクラエビ科

10. *Acetes japonicus* Kishinouye, 1905 アキアミ  
Shinjiko (Harada, 1968), Nakaumi (Harada, 1968; Kikuchi, 1964; Koshikawa, 2003; Sato and Kato, 1996).

### Atyidae ヌマエビ科

11. *Caridina leucosticta* Stimpson, 1860 ミゾレヌマエビ  
Shinjiko (Sato and Kato, 1996; Kamita, 1967; 1970; Kuwabara, 2000).

12. *Neocaridina denticulata* (De Haan, 1849) ミナミヌマエビ  
Shinjiko (Anonymous, 2000).

13. *Paratya compressa compressa* (De Haan, 1844) ヌマエビ  
Shinjiko (Anonymous, 2000; Ishitobi *et al.*, 2000; Kamita, 1967; Kuwabara, 2000), Nakaumi (Anonymous, 2000).

### Palaemonidae テナガエビ科

14. *Exopalaemon orientis* Holthuis, 1950 シラタエビ  
= *Palaemon orientis*: Anonymous, 2000; Hiratsuka, 2001; Ishitobi *et al.*, 2000; Koshikawa, 1999; 2003.  
= *Palaemon (Exopalaemon) orientis*: Harada, 1968.  
Shinjiko (Anonymous, 2000; Harada, 1968; Hiratsuka, 2001; Ishitobi *et al.*, 2000; Kamita, 1964; 1967; Koshikawa, 2003; Kuwabara, 2000; Sato and Kato, 1996), Nakaumi (Anonymous, 2000; Harada, 1968; Hiratsuka, 2001; Ishitobi *et al.*, 2000; Koshikawa, 1999;

2003; Kuwabara, 2000; Sato and Kato, 1996).

15. *Macrobrachium australe* (Guerin-Meneville, 1838) ザラテテナガエビ  
Shinjiko (Harada, 1968).

16. *Macrobrachium nipponense* (De Haan, 1849) テナガエビ  
Shinjiko (Anonymous, 2000; Armada *et al.*, 1993; Chiba and Kobayashi, 1959; Harada, 1968; Hiratsuka, 2001; Ishitobi *et al.*, 2000; Kamita, 1964; 1967; 1970; Koshikawa, 2003; Kuwabara, 2000; Mashiko, 1990; 2000; Ohno and Armada, 1999; Sato and Kato, 1996; Udagawa and Sato, 1991), Ohashi River (Udagawa and Sato, 1991), Nakaumi (Anonymous, 2000; Harada, 1968; Hiratsuka, 2001; Ishitobi *et al.*, 2000; Koshikawa, 1999; 2003; Kuwabara, 2000; Udagawa and Sato, 1991).

Remarks: Populations of *M. nipponense* in Japan were divided into three groups based on genetic variations obtained by electrophoretic analyses of enzymes, egg and clutch sizes and salinity responses of unfed zoeas (Armada *et al.*, 1993; Ohno and Armada, 1999). According to Armada *et al.* (1993) and Ohno and Armada (1999), the Shinjiko's population is classified as brackish-water lagoon group which occurs in brackish-water lagoons and bears medium numbers of medium-sized eggs.

17. *Palaemon pacificus* (Stimpson, 1860) イソスジエビ  
Shinjiko (Sato and Kato, 1996), Nakaumi (Harada, 1968; Hiratsuka, 2001; Ishitobi *et al.*, 2000).

18. *Palaemon paucidens* De Haan, 1844 スジエビ  
Shinjiko (Anonymous, 2000; Harada, 1968; Hiratsuka, 2001; Ishitobi *et al.*, 2000; Kamita, 1967; 1970; Koshikawa, 2003; Kuwabara, 2000; Nishino, 1980; Sakamoto, 1995; Sato and Kato, 1996; Udagawa and Sato, 1991), Nakaumi (Anonymous, 2000; Harada, 1968; Koshikawa, 2003).

19. *Palaemon ortmanni* (Rathbun, 1902) アシナガスジエビ  
Nakaumi (Harada, 1968).

20. *Palaemon serrifer* (Stimpson, 1860) スジエビモドキ  
Shinjiko (Harada, 1968; Kamita, 1967; Koshikawa, 2003; Sato and Kato, 1996), Nakaumi (Anonymous, 2000; Harada, 1968; Hiratsuka, 2001; Ishitobi *et al.*, 2000; Koshikawa, 1999; 2003; Kuwabara, 2000; Shimamura and Nakamura, 2001).

### Alpheidae テッポウエビ科

21. *Alpheus bisincisus* De Haan, 1849 フタミゾテッポ

ウエビ

Nakaumi (Anonymous, 2000).

22. *Alpheus brevicristatus* De Haan, 1844 テツポウエビ  
Nakaumi (Anonymous, 2000; Harada, 1968;  
Kuwabara, 2000).

### Hippolytidae モエビ科

23. *Eualus leptognathus* (Stimpson, 1860) ヤマトモエビ  
Shinjiko (Hiratsuka, 2001; Ishitobi *et al.*, 2000;  
Kuwabara, 2000), Nakaumi (Hiratsuka, 2001; Ishitobi *et al.*, 2000; Kuwabara, 2000).

### Crangonidae エビジャコ科

24. [?] *Crangon affinis* De Haan, 1849 エビジャコ  
Shinjiko (Hiratsuka, 2001; Ishitobi *et al.*, 2000;  
Kuwabara, 2000; Sato and Kato, 1996), Nakaumi  
(Harada, 1968; Hiratsuka, 2001; Ishitobi *et al.*, 2000;  
Koshikawa, 2003; Kuwabara, 2000).

Remarks: *Crangon affinis* and its allies were revised by Hayashi and Kim (1999), and it is possible that several species are distributed in these lakes (Osawa, personal communication). The identity of *Crangon* from the lakes requires reassessment.

25. *Paracrangon echinata* Dana, 1852 カジワラエビ  
Shinjiko (Sato and Kato, 1996).

### Cambaridae アメリカザリガニ科

26. *Procambarus clarkii* (Girard, 1852) アメリカザリガニ  
Shinjiko (Anonymous, 2000; Ishitobi *et al.*, 2000;  
Koshikawa, 2003; Kuwabara, 2000), Nakaumi (Harada,  
1968; Hiratsuka, 2001; Ishitobi *et al.*, 2000; Koshikawa,  
2003).

Remarks: *Procambarus clarkii* was introduced to Shimane Prefecture immediately after end of the World War II (Kamita, 1964; 1967).

### Callianassidae スナモグリ科

27. [?] *Nihonotrypaea petalura* (Stimpson, 1860) スナモグリ  
Nakaumi (Kuwabara, 2000).

Remarks: Kuwabara (2000) reported *N. petalura* from sandy-muddy bottom of Nakaumi, but this is probably a misidentification of allied species, such as *Nihonotrypaea japonica* (Ortmann, 1891) or *Nihonotrypaea harmandi* (Bouvier, 1901), because *N. petalura* normally inhabits in intertidal zone with boulder stones, and *N. japonica* and *N. harmandi* inhabit in sandy tidal wetland (Osawa, personal communication). The identity of *Nihonotrypaea*

form Nakaumi requires reassessment.

### Upogebiidae アナジャコ科

28. *Upogebia major* (De Haan, 1841) アナジャコ  
Shinjiko (Kuwabara, 2000), Nakaumi (Kuwabara,  
2000).

### Paguridae ホンヤドカリ科

29. *Pagurus filholi* (De Man, 1887) ホンヤドカリ  
= *Pagurus geminus*: Anonymous, 2000; Ishitobi *et al.*, 2000.  
= *Pagurus samuelis*: Koshikawa, 1999.  
Nakaumi (Anonymous, 2000; Ishitobi *et al.*, 2000;  
Koshikawa, 1999).

30. *Pagurus minutus* Hess, 1865 ユビナガホンヤドカリ  
= *Pagurus dubius*: Anonymous, 2000; Hiratsuka,  
2001; Ishitobi *et al.*, 2000.  
Nakaumi (Anonymous, 2000; Hiratsuka, 2001;  
Ishitobi *et al.*, 2000; Kuwabara, 2000).

### Dromiidae カイカムリ科

31. *Dromia wilsoni* (Fulton and Grant, 1902) ワタゲカムリ  
Nakaumi (Koshikawa, 1999).

### Matutidae キンセンガニ科

32. *Matuta victor* (Fabricius, 1781) キンセンガニ  
Nakaumi (Kuwabara, 2000).

### Leucosiidae コブシガニ科

33. *Philyra pisum* De Haan, 1841 マメコブシガニ  
Shinjiko (Koshikawa, 2003; Kuwabara, 2000),  
Nakaumi (Harada, 1968; Hiratsuka, 2001; Fujimoto *et al.*, 1999; Ishitobi *et al.*, 2000; Koshikawa, 1999; 2003;  
Kuwabara, 2000; Yasugi *et al.*, 1999).

### Majidae クモガニ科

34. *Achaeus* sp. アケウス属の1種  
Nakaumi (Harada, 1968).

### Portunidae ワタリガニ科

35. *Charybdis (Charybdis) japonica* (A. Milne-Edwards, 1861) イシガニ  
Nakaumi (Harada, 1968; Ishitobi *et al.*, 2000;  
Koshikawa, 2003; Kuwabara, 2000).
36. *Charybdis (Gonioneptunus) bimaculata* (Miers,

1886)フタホシイシガニ  
Nakaumi (Harada, 1968).

37. *Portunus (Portunus) pelagicus* (Linnaeus, 1758)タイ  
ワンガザミ

Shinjiko (Harada, 1968; Kamita, 1967; Koshikawa,  
2003), Nakaumi (Harada, 1968; Hiratsuka, 2001; Ishitobi  
*et al.*, 2000; Koshikawa, 1999; 2003; Kuwabara, 2000).

38. *Portunus (Portunus) trituberculatus* (Miers, 1876)ガ  
ザミ

Nakaumi (Koshikawa, 1999; Kuwabara, 2000).

### Xanthidae オウギガニ科

39. *Liomera venosa* (H. Milne Edwards, 1834)ベニオウ  
ギガニ

Nakaumi (Anonymous, 2000; Ishitobi *et al.*, 2000).

### Pilumnidae ケブカガニ科

40. *Pilumnopus makiana* (Rathbun, 1931)マキトラノ  
オガニ

Nakaumi (Anonymous, 2000; Ishitobi *et al.*, 2000).

### Grapsidae イワガニ科

41. *Chiromantes dehaani* (H. Milne Edwards, 1853)クロ  
ベンケイガニ

Shinjiko (Anonymous, 2000; Kamita, 1967;  
Kuwabara, 2000), Nakaumi (Anonymous, 2000;  
Koshikawa, 1999; Kuwabara, 2000).

42. *Chiromantes haematocheir* (De Haan, 1833)アカテ  
ガニ

Shinjiko (Kamita, 1967; Kuwabara, 2000), Nakaumi  
(Kuwabara, 2000).

43. *Eriocheir japonica* De Haan, 1835 モクズガニ

Shinjiko (Anonymous, 2000; Harada, 1968; Ishitobi *et al.*,  
2000; Kamita, 1967; Koshikawa, 2003), Nakaumi  
(Harada, 1968; Hiratsuka, 2001; Ishitobi *et al.*, 2000;  
Koshikawa, 1999; 2003).

44. *Gaetice depressus* (De Haan, 1833)ヒライソガニ  
Nakaumi (Kuwabara, 2000).

45. *Hemigrapsus penicillatus* (De Haan, 1835)ケフサイ  
ソガニ

Shinjiko (Hiratsuka, 2001; Koshikawa, 2003;  
Kuwabara, 2000), Ohashi River (Kuwabara, 2000),  
Nakaumi (Anonymous, 2000; Harada, 1968; Hiratsuka,  
2001; Ishitobi *et al.*, 2000; Koshikawa, 1999; 2003;  
Kuwabara, 2000).

46. *Hemigrapsus sanguineus* (De Haan, 1835)イソガニ  
Nakaumi (Kuwabara, 2000).

47. *Helice tridens* De Haan, 1835 アシハラガニ  
Shinjiko (Sakamoto, 1995).

48. *Pachygrapsus crassipes* Randall, 1839 イワガニ  
Nakaumi (Kuwabara, 2000).

49. *Sesarmops intermedius* (De Haan, 1835)ベンケイガ  
ニ

Shinjiko (Kamita, 1967), Nakaumi (Kuwabara, 2000).

### Pinnotheridae カクレガニ科

50. *Pinnotheres* sp. シロピンノ属の1種  
Nakaumi (Harada, 1968).

### Stomatopoda シャコ目 (口脚目)

#### Squillidae シャコ科

1. *Oratosquilla oratoria* (De Haan, 1844)シャコ  
Nakaumi (Ishitobi *et al.*, 2000; Koshikawa, 2003;  
Kuwabara, 2000).

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### REFERENCES

- Anonymous (2000) Hiikawasukei no gyokairui. 183 pp. Izumo Work Office, Chugoku Regional Construction Bureau, Ministry of Construction, Izumo (in Japanese).
- Armada, N., Ohno, A. and Taki, Y. (1993) Differentiation of local populations in the palaemonid shrimp, *Macrobrachium nipponense*, in Japanese waters. *J. Tokyo Univ. Fish.*, 80: 139-153.

- Chiba, T. (1950) A limnological survey of Nakano-umi and Lake Sinji in the coast of the Japan Sea 2. On the plankton of Nakano-umi in summer (1949). *Bull. Jap. Soc. Fish.*, 16: 22-24 (in Japanese with English summary).
- Chiba, T. and Kobayashi, U. (1959) A limnological survey of Nakano-umi and Lake Shinji lying on the Japan Sea coast 3. On the plankton of Lake Shinji in summer. *J. Fish. Jap.*, 41: 9-14 (in Japanese with English summary).
- Chihara, M. and Murano, M. (eds.) (1997) An illustrated guide to marine plankton in Japan. xxxvi + 1574 pp. Tokai University Press, Tokyo (in Japanese with English title).
- Fujimoto, M., Takayasu, K., Yamaguchi, K. and Sonoda, T. (1999) Benthic fauna and environmental characteristics in Honjo-Area of Lake Nakaumi. *Laguna*, 6: 107-117 (in Japanese with English summary).
- Fukuhara, H., Okada, A. and Kimura, N. (2000) Distribution of the three species of Sphaeromatidae with reference to salinity in brackish Lake Shinji, Shimane Pref., Japan. *Jap. J. Limnol.*, 61: 155-160 (in Japanese with English abstract).
- Fukuhara, H., Furukawa, A. and Kimura, N. (2001) Distribution of *Gnorimosphaeroma* (Isopoda; Sphaeromatidae) at the lower reaches of the River Kitakami and the River Tone. *Mem. Fac. Educ. and Human Sci., Natul. Sci., Niigata Univ.*, 4(1): 1-7 (in Japanese with English abstract).
- Gamô, S. (1962) Two new species of Japanese cumacean Crustacea, *Leucon simanensis* sp. nov. and *L. varians* sp. nov. *Zool. Mag.*, 71: 256-261 (in Japanese with English abstract).
- Gamô, S. (1968) Studies on the Cumacea (Crustacea, Malacostraca) of Japan Part III. *Publ. Seto Mar. Biol. Lab.*, 16: 147-192, pl. 18.
- Gamô, S. (1995) Copepoda. In: Guide to seashore animals of Japan with color pictures and keys Vol. II. (ed.) Nishimura, S. pp. 56-112. Hoikusha, Osaka (in Japanese with English title).
- Gamô, S. (1997) Order Cumacea. In: An illustrated guide to marine plankton in Japan. (eds.) Chihara, M. and Murano, M. pp. 1085-1111. Tokai University Press, Tokyo (in Japanese with English title).
- Hanai, T., Ikeya, T., Ishizaki, K., Sekiguchi, Y. and Yajima, M. (1977) Checklist of Ostracoda from Japan and its adjacent seas. *Bull., Univ. Mus., Univ. Tokyo*, 12: 1-119.
- Harada, E. (1968) Ecology and biological production of Lake Naka-umi and adjacent regions, 5. Seasonal changes in distribution and abundance of some decapod Crustacea. *Spec. Publ. Seto Mar. Biol. Lab. Series II*, 2: 75-103.
- Harada, E., Nishino, M. and Narita, T. (1985) A partite plankton sampler and summer vertical structure of zooplankton revealed using in shallow brackish waters, Lake Shinji-ko and Lake Naka-umi. *Physiol. Ecol. Japan*, 22: 37-57.
- Harada, S., Nakamura, M. and Kunii, H. (1997) Seasonal changes of macrobenthic diversity in reed bed of Lake Shinji. *Laguna*, 4: 11-18 (in Japanese with English abstract).
- Hayashi, K.-I. and Kim, J. N. (1999) Revision of the East Asian species of Crangon (Decapoda: Caridea: Crangonidae). *Crust. Res.*, 28: 62-103.
- Hiratsuka, J. (2001) Influence of channeling by conduit pipes on the fish and crustacean assemblage in the enclosed Honjo Area of Lake Nakaumi. *Jap. J. Limnol.*, 62: 61-73 (in Japanese with English abstract).
- Hoestlandt, H. (1975) Occurrences of the Isopoda Flabellifera *Gnorimosphaeroma rayi* Hoestlandt on the coasts of Japan, Eastern Siberia and Hawaii, with a brief note on its genetic polychromatism. *Publ. Seto Mar. Biol. Lab.*, 22: 31-46.
- Iga, T. (1973) Barnacles of Lakes Shinji-ko, Naka-umi and Jinzai-ko. *Mem. Natul. and Cul. Res. San-in Region*, 13: 59-69 (in Japanese with English title).
- Ii, N. (1964) Fauna Japonica, Mysidae (Crustacea). x + 610 pp. Biogeograph. Soc. Japan. Tokyo.
- Ishimaru, S. (1994) A catalogue of gammaridean and ingolfiellidean Amphipoda recorded from the Vicinity of Japan. *Rept. Sado Mar. Biol. Stat., Niigata Univ.*, 24: 29-86.
- Ishitobi, Y., Hiratsuka, J., Kuwabara, H. and Yamamuro, M. (2000) Changes in fish and crustacean assemblage in connected coastal lagoons, Lake Nakaumi and Lake Shinji, Japan. *Jap. J. Limnol.*, 61: 129-146 (in Japanese with English abstract).
- Ishizaki, K. (1969) Ostracodes from Shinjiko and Nakanoumi, Shimane Prefecture, western Honshu, Japan. *Sci. Rep. Tohoku Univ.. 2nd Ser., Geol.*, 41: 197-224, pls. 1-9.
- Kamita, T. (1964) San'in no dôbutsu-shi. 157 pp. Imai Shoten, Matsue (in Japanese).
- Kamita, T. (1967) Shinjiko no dôbutsu-tachi. 192 pp., Hirata (in Japanese).
- Kamita, T. (1970) Studies on the freshwater shrimps, prawns and crawfishes of Japan, revised ed. 213 pp. Sonoyama Shoten Press, Matsue (in Japanese with English summary).
- Kato, T. (2000) Fujitsubo no nakama (Arthropoda: Crustacea: Cirripedia). pp. 72-73. In: Hiikawasuikei no teiseidôbutsu. 170 pp. Izumo Work Office, Chugoku Regional Construction Bureau, Ministry of Construction, Izumo (in Japanese).
- Kawanabe, H., Tezuka-Saito, Y., Sunaga, T., Maki, I. and Azuma, M. (1968) Ecology and biological

- production of Lake Naka-umi and adjacent regions. *Spec. Publ. Seto Mar. Biol. Lab. Series II*, 2: 45-73.
- \*Kiefer, F. (1981) Beitrag zur Kenntnis von Morphologie, Taxonomie und geographischer Verbreitung von *Mesocyclops leuckarti* auctorum. *Arch. Hydrobiol.*, Suppl. 62: 148-190.
- Kikuchi, K. (1928) Freshwater Calanoida of middle and southwestern Japan. *Mem. Coll. of Sci., Kyoto Imp. Univ.*, Ser. B, 4(1): 65-79, pls. 18-22.
- Kikuchi, T. (1964) Ecology and biological production of Lake Naka-umi and adjacent regions. 3. Macrobenthic communities of Lake Shinji-ko and Lake Naka-umi. *Spec. Publ. Seto Mar. Biol. Lab. Series II*, 1: 21-44.
- Konishi, K. (1997) Order Decapoda. In: An illustrated guide to marine plankton in Japan. (eds.) Chihara, M. and Murano, M. pp. 1439-1479. Tokai University Press, Tokyo (in Japanese with English title).
- Koshikawa, T. (1999) A study of fish of Honjou area in Lake Nakaumi -data analysis of wholesale of fish-. *Laguna*, 6: 157-164 (in Japanese with English summary).
- Koshikawa, T. (2003) Shinjiko Nakaumi-suiiki no gyokairui no genkyô. *Kisui-kenkyû*, 13: 80-95 (in Japanese).
- Kuwabara, H. (2000) Ebi no nakama (Arthropoda: Crustacea: Decapoda), Kani no nakama (Arthropoda: Crustacea: Decapoda), Sonota no kôkakurui. pp. 76-85. In: Hiikawasuikei no teiseidôbutsu. 170 pp. Izumo Work Office, Chugoku Regional Construction Bureau, Ministry of Construction, Izumo (in Japanese).
- Lacuna, D. G. and Uye, S. (2000) Effect of UVB radiation on the survival, feeding, and egg production of the brackish-water copepod, *Sinocalanus tenellus*, with notes on photoreactivation. *Hydrobiologia*, 434: 73-79.
- Mashiko, K. (1990) Diversified egg and clutch sizes among local populations of the fresh-water prawn *Macrobrachium nipponense* (de Haan). *J. Crust. Biol.*, 10: 306-314.
- Mashiko, K. (2000) Variations in body size of individuals at sexual maturity among local populations of the freshwater prawn *Macrobrachium nipponense* (de Haan), with special reference to freshwater colonization. *Crust. Res.*, 29: 20-26.
- Miura, Y. (1984) Nihon no tansuisan Harpacticoida (Sokomijinko-rui). In: Chugoku/Nihon Tansuisan Kaiashirui (Freshwater Copepoda of China and Japan). (eds.) Shen, C.-J. and Mizuno, T., pp. 500-563. Tatarashobo, Tottori (in Japanese).
- Miyadi, D. (1932) Studies on the bottom fauna of Japanese lakes. IV. Lakes of the Japan Sea coast of southern Honshu. *Jap. Jour. Zool.*, 4: 41-79.
- Miyadi, D., Habe, T. and Yamazi, I. (1952) [Hydrography and biotic communities of Miho Bay and Lake Naka-umi. I]. *Contr. Physiol. Ecol. Kyoto Univ.*, 76: 1-29 (in Japanese).
- Miyadi, D., Habe, T., Yamazi, I. and Fuse, S. (1954) [Hydrography and biotic communities of Miho Bay and Lake Naka-umi. II]. *Contr. Physiol. Ecol. Kyoto Univ.*, 78: 1-43 (in Japanese).
- Mizuno, T. (1984) Nihon no rikusuisan Cyclopoida. In: Chugoku/Nihon Tansuisan Kaiashirui (Freshwater Copepoda of China and Japan). (eds.) Shen, C.-J. and Mizuno, T., pp. 564-620. Tatarashobo, Tottori (in Japanese).
- Mizuno, T. (1991) Order Cyclopoida. In: An illustrated guide to freshwater zooplankton in Japan. (eds.) Mizuno, T. and Takahashi, E. pp. 17-50. Tokai University Press, Tokyo (in Japanese with English title).
- Mori, T. (1940) Two new copepods from Japanese waters. *Zool. Mag.*, 52: 328-330.
- Morino, H. (1985) Revisional studies on *Jesogammarus-Annanogammarus* group (Amphipoda: Gammaroidea) with descriptions of four new species from Japan. *Publ. Itako Hydrobiol. Stn.*, 2(1): 9-55.
- Nishimura, S. (1980) Nihonkai no seiritsu (The origin of the Sea of Japan), 2nd ed. Chikuji-shokan, Tokyo, 228 pp (in Japanese).
- Nishimura, S. (1981) Chikyu no umi to seimei (Sea and organisms of the earth: an introduction to marine zoogeography). Kaimei-sha, Tokyo, 284 pp (in Japanese).
- Nishino, M. (1980) Geographical variations in body size, brood size and egg size of a freshwater shrimp, *Palaemon paucidens* de Haan, with some discussion on brood habit. *Jap. J. Limnol.*, 41: 185-202.
- Nunomura, N. (1996) Specimens of the genus *Gnorimosphaeroma* from Takaoka City. *Toyama no seibutsu*, 35: 13-16 (in Japanese with English summary).
- Nunomura, N. (1998) On the genus *Gnorimosphaeroma* (Crustacea, Isopoda, Sphaeromatidae) in Japan with descriptions of six new species. *Bull. Toyama Sci. Mus.*, 21: 23-54.
- Nunomura, N. (2000) Warajimushi no nakama (Arthropoda: Crustacea: Isopoda). In: Hiikawasuikei no teiseidobutsu. 170 pp. Izumo Work Office, Chugoku Regional Construction Bureau, Ministry of Construction, Izumo (in Japanese).
- Nunomura, N. (2001) A new species of the genus *Cyathura* (Crustacea: Isopoda) from the Lake Shinji-ko, Shimane Prefecture, western Japan. *Bull. Toyama Sci. Mus.*, 24: 19-23.
- Ohno, A. and Armada, N. (1999) Differentiation of the palaemonid shrimp, *Macrobrachium*, in Japanese islands. *Aquabiology*, (123): 319-329 (in Japanese)



- with English abstract).
- Ohtsuka, S. (1997) Order Poecilostomatoida. In: An illustrated guide to marine plankton in Japan. (eds.) Chihara, M. and Murano, M. pp. 961-1001. Tokai University Press, Tokyo (in Japanese with English title).
- Ohtsuka, S. and Ueda, H. (1997) Order Calanoida. In: An illustrated guide to marine plankton in Japan. (eds.) Chihara, M. and Murano, M. pp. 660-931. Tokai University Press, Tokyo (in Japanese with English title).
- Ohtsuka, S. and Ueda, H. (1999) Zoogeography of pelagic copepods in Japan and its adjacent waters. *Bull. Plankton Soc. Japan*, 46: 1-20 (in Japanese with English abstract).
- Ohtsuka, S., Ueda, H. and Lian, G.-S. (1995) *Tortanus derjugini* Smirnov (Copepoda: Calanoida) from the Ariake Sea, western Japan, with notes on the zoogeography of brackish-water calanoid copepods in East Asia. *Bull. Plankton Soc. Japan*, 42: 147-162.
- Ohtsuka, S., Hoshina, T., Seike, Y., Ohtani, S. and Kunii, H. (1999a) Seasonal changes of zooplankton community in Honjo area and its neighboring waters of Lake Naka-umi. *Laguna*, 6: 73-87 (in Japanese with English abstract).
- Ohtsuka, S., Ohtani, S., Seike, Y., Kunii, H. and Nishida, S. (1999b) Feeding habits of zooplankton, in particular, copepods in Lake Naka-umi. *Laguna*, 6: 89-105 (in Japanese with English abstract).
- Ohtsuka, S., Ho, J.-S., Nagasawa, K., Morozinska-Gogol, J. and Piasecki, W. (2004) The identify of *Limnoncaea diuncata* Kokubo, 1914 (Copepoda: Poecilostomatoida) from Hokkaido, Japan, with the relegation of *Diergasilus* Do, 1981 to a junior synonym of *Thersitina* Norman, 1905. *Syst. Parasit.*, 57: 35-44.
- \*Okano, I. (1974) Biwako no dôbutsu-plankton. In: Shiga no Seibutsu. (ed.) Shiga no seibutsu henshû-iinkai, pp. 137-153. Shiga-ken-rikakyôiku-kenkyûbukai, Ôtsu (in Japanese).
- Okano, I. (1987) Tansuisan-kenmijinko no tokusyuna suurei ni tsuite - *Limnoncaea* zoku ni kansuru chicken-. In: Okano, I. (ed.) Tansui no plankton, pp. 51-58. Takatsuki (in Japanese).
- Onbé, T. (1997) Class Branchiopoda. In: An illustrated guide to marine plankton in Japan. (eds.) Chihara, M. and Murano, M. pp. 609-624. Tokai University Press, Tokyo (in Japanese with English title).
- \*Ota, S. (1941) Ecological research on a shrimp, *Metapenaeus monoceros*, in Lake Shinji-ko and Nakaumi. *Res. Note Fish. Agency*, 28: 1-18 (in Japanese).
- Saito, N., Itani, G. and Nunomura, N. (2000) A preliminary check list of isopod crustaceans in Japan. *Bull. Toyama Sci. Mus.*, (23): 11-107 (in Japanese with English abstract).
- Sakamoto, I. (1995) Shinjiko no yoshi-ikada no suiseiseibutsu. *Kisuiikokenkyû*, 5: 7-13 (in Japanese).
- Sakamoto, Y., Kunii, H. and Nakamura, M. (1994) Shinjiko no yoshitai to macrobenthos. *Kisuiiko-kenkyû*, 4: 68-72 (in Japanese).
- Sato, H. and Kato, T. (1996) Catalogue of the animal specimens of Kamita collection in the Sanbe Shizenkan Open Field Museum -Crustaceans-. *Catalogue of the Collection in the Shimane Prefectural Sanbe Shizenkan Open Field Museum*, 1: 1-138 (in Japanese with English introduction).
- Shimamura, K. and Nakamura, M. (2001) Succession of biotic community on an artificial reef in the coast of Lake Nakaumi, brackish water, Shimane, Japan. *Suisanzoshoku*, 49: 299-304 (in Japanese with English abstract).
- Suda, K., Matsudaira, Y., Takabatake, T. and Mizuuchi, M. (1931) Nakaumi kaiyo kansoku chosa hokoku. *Kaiyô Jihô*, 3: 120-153 (in Japanese).
- Suzumoto, H. (1974) On a caligid parasite found on injured crasian carp, *Carassius auratus* C., in Lake Shinji. *Fish Pathol.*, 9: 23-27 (in Japanese with English abstract).
- Takayasu, K., Ueda, K. and Ohta, H. (1990) Natural history of the Nakano-umi and Shinji Lakes XII. Ostracode thanatocoenoses from the bottom deposits of Lake Nakano-umi and their historical distribution. *Geo. Rept. Shimane Univ.*, 9: 129-144 (in Japanese with English title).
- Tanaka, G., Seto, K. and Takayasu, K. (1998) The relationship between environments and ostracode assemblages from Miho Bay to Lake Shinji. *Laguna*, (5): 81-91 (in Japanese with English abstract).
- Udagawa, H. and Sato, H. (1991) San'inchihô ni okeru tansuiebi no bunpu ni tsuite. *Shimane-yaseiseibutsu-kenkyukai-kaihô*, (7): 19-21 (in Japanese).
- Ueda, H., Ohtsuka, S., Seike, Y. and Ohtani, S. (2001) Second Record of *Cyclopina kiraensis*, a small, brackish-water cyclopoid copepod, in Japan. *Limnology*, 2: 49-50.
- Uéno, M. (1943) Ecological studies on Japanese brackish waters, with special reference to brackish lakes. I. Benthic fauna of brackish lakes along the Japan Sea coast. *Sci. Rep. Hattori Hokokai*, (10): 409-425.
- Uye, S. (1997) Ecological characteristics of brackish-water zooplankton. *Bulletin on Coastal Oceanography*, 35: 49-55 (in Japanese with English abstract).
- Uye, S. (2003) Ecosystem and material cycling in enclosed costal seas (6). Geographical and seasonal variations in mesozooplankton in Lake Shinji-Ohashi River-Lake Nakaumi brackish-water system and their ecological roles. *Aquabiology*, 147: 277-282 (in Japanese with English abstract).

- Uye, S., Shimazu, T., Yamamuro, M., Ishitobi, Y. and Kamiya, H. (2000) Geographical and seasonal variations in mesozooplankton abundance and biomass in relation to environmental parameters in Lake Shinji-Ohashi River-Lake Nakaumi brackish-water system, Japan. *J. Mar. Systems*, 26: 193-207.
- Yamato, S. (1985) Discrimination of four intertidal melitid species (Amphipoda: Melitidae) in the Inland Sea of Japan, and evidence of their reproductive isolation. Preliminary report. *Benthos Res.*, 28: 36-41 (in Japanese with English abstract).
- Yamato, S. (1987) Four intertidal species of the genus *Melita* (Crustacea: Amphipoda) from Japanese waters, including descriptions of two new species. *Publ. Seto Mar. Biol. Lab.*, 32: 275-302.
- Yamato, S. (1988) Two species of the genus *Melita* (Crustacea: Amphipoda) from brackish waters in Japan. *Publ. Seto Mar. Biol. Lab.*, 33: 79-95.
- Yamato, S. (1990) Two new species of the genus *Melita* (Crustacea: Amphipoda) from shallow waters of the Seto Inland Sea of Japan. *Publ. Seto Mar. Biol. Lab.*, 34: 149-165.
- Yamauchi, T. (2003) *Eurydice* from Shinji-ko (Isopoda: Cirolanidae). *Bull. Hoshizaki Green Found.*, (6): 172 (in Japanese with English abstract).
- Yasugi, S., Nakamura, M., Miura, S. and Nakao, S. (1999) Successional changes of macro benthos community on the artificial bottom in Lake Nakaumi. *Suisanzoshoku*, 47: 181-190 (in Japanese with English abstract).
- [\*Not seen directly]