11. OSTRACODES FROM DEEP SEA DRILLING PROJECT LEG 87[1]

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ABSTRACT

Twenty-two specimens of Ostracoda representing fifteen species of twelve genera were found in sediments from DSDP Leg 87. All specimens were collected from the Nankai Trough (Sites 582 and 583) in Pleistocene sediments from 21.56 to 110.38 m sub-bottom (4618 to 4879 m water depth). Ostracodes were not found at Site 584 (Japan Trench). All species are warm-temperate, shallow-water inhabitants, suggesting that the sediments containing them are slump deposits.

INTRODUCTION

Except for the study of Ostracoda from Leg 56 in the Japan Trench by Hanai and others (1980), there have been no investigations of the deep-sea Ostracoda from the Japan area. Among 654 samples from DSDP Sites 582, 583, and 584, we selected 99 samples near foraminifer-bearing horizons. Half of each sample (about 5 cm^3) was washed through a Taylor's #200 sieve. Ostracodes occur in coarse sand samples at Sites 582 and 583 in the Nankai Trough in water from 4618 to 4876 m deep. Samples at Site 584 in the Japan Trench contain no ostracodes. The occurrences of fossil ostracodes, including the sediment characteristics and associated fauna, are outlined below.

Sample 582B-7-3, 87–89 cm: water depth 4879 m, sample depth 110.38 m sub-bottom; muddy sand with pumice particles, radiolarians, planktonic and benthic foraminifers, and sponge spicules.

Xestoleberis sp., a broken right valve

Sample 583-3-5, 55–56 cm: water depth 4634 m, sample depth 21.56 m sub-bottom; sand with radiolarians, planktonic and benthic foraminifers, diatoms, sponge spicules, and plant fragments.

Loxoconcha japonica, a right valve

Cytheropteron miurense, an immature left valve

Cytherura? *miii*, a left valve and an immature right valve

Acanthocythereis? sp., an immature left valve and a very small immature right valve

Neomonoceratina microreticulate, a very small immature right valve

Sample 583-4-1, 46–47 cm: water depth 4634 m, sample depth 23.47 m sub-bottom; sand, with radiolarians, foraminifers, and shell fragments.

Cytherura? *miii*, a carapace

Cytheropteron miurense, a broken left valve

Pontocythere japonica, an immature right valve

Sample 583-8-1, 80–81 cm: water depth 4634 m, sample depth 56.21 m sub-bottom; sand, with planktonic foraminifers, radiolarians, and sponge spicules.

Cytheropteron eremitum, a broken left valve

Paracytheridea neolongicaudata?, a fragment

Sample 583-8-2, 80–81 cm: water depth 4634 m, sample depth 57.71 m sub-bottom; sand, with planktonic and benthic foraminifers.

Hemicytherura kajiyamai, a right valve

Pontocythere subjaponica, a right valve

Loxoconcha laeta, a broken left valve

L. japonica, a fragment

Sample 583-8-3, 80–81 cm: water depth 4634 m, sample depth 58.21 m sub-bottom; muddy sand, with planktonic foraminifers, radiolarians, and plant fragments.

Nipponocythere bicarinata, a female carapace

Sample 583A-11-1, 7–19 cm: water depth 4618 m, sample depth 49.13 m sub-bottom; sand with planktonic foraminifers, plant fragments, and radiolarians.

Robustaurila ishizakii, an immature right valve

Sample 583D-5-1, 14–16 cm: water depth 4759 m, sample depth 85.45 m sub-bottom; sand with foraminifers.

Amphileberis nipponica, a right broken valve

Samples that contained no ostracodes are listed in the appendix at the end of this chapter.

GENERAL FAUNAL ASPECTS

The Recent and known fossil occurrences of each species found in DSDP Leg 87 are as follows. For occurrences reported before 1975 see the checklist published by Hanai and others (1977). (All depths are sub-bottom depths.)

Pontocythere japonica. Recent: Enshu-nada (depth 5.9–13.6 m) (Ikeya and Hanai, 1982); Tateyama Bay (depth 3–10 m) (Frydl, 1982); Aburatsubo Cove (depth 2.7 m) (Abe, 1983). Holocene: Numa Formation, Tateyama (Frydl, 1982). Pleistocene: Kioroshi, Kamiiwahashi, Kiyokawa, and Yabu formations, Kisarazu and Ki-

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oroshi (Yajima, 1978; 1982). Pliocene: Ananai Formation, Shikoku (Ishizaki, 1983).

Pontocythere subjaponica. Recent: Setonaikai (Okubo, 1977); Enshu-nada (depth 5.6–13.6 m), Hamana-ko Bay (depth 2.1–4.8 m) (Ikeya and Hanai, 1982); Tateyama Bay (depth 3–30 m) (Frydl, 1982). Holocene: Numa Formation, Tateyama (Frydl, 1982). Pleistocene: Kioroshi, Kamiiwahashi, Kiyokawa, and Yabu formations, Kisarazu and Kioroshi (Yajima, 1978; 1982).

Neomonoceratina microreticulate. Pleistocene: Kioroshi, Kamiiwahashi, Kiyokawa, and Yabu formations, Kisarazu and Kioroshi (Yajima, 1978; 1982).

Robustaurila ishizakii. Recent: Setonaikai (Okubo, 1980).

Amphileberis nipponica. Recent: East China Sea (depth 76–114 m) (Ishizaki, 1981). Holocene: Numa Formation, Tateyama (Frydl, 1982). Pleistocene: Kioroshi and Kiyokawa formations, Kisarazu, Kamiiwahashi, and Yabu formations, Kioroshi (Yajima, 1978; 1982). Pliocene: Ananai Formation, Shikoku (Ishizaki, 1983).

Hemicytherura kajiyamai. Recent: off Oga Peninsula (depth 25 m) (Okada, 1979). Holocene: Numa Formation, Tateyama (Frydl, 1982). Pleistocene: Anden and Shibikawa formations, Oga Peninsula (Okada, 1979). Pliocene: Ananai Formation, Shikoku (Ishizaki, 1983).

Cytheropteron miurense. Recent: Tateyama Bay (depth 3–30 m) (Frydl, 1982). Pleistocene: Kioroshi, Kamiiwahashi, Kiyokawa, and Yabu formations, Kisarazu and Kioroshi (Yajima, 1978; 1982). Pliocene: Ananai Formation, Shikoku (Ishizaki, 1983).

Paracytheridea neolongicaudata. Holocene: Numa Formation, Tateyama (Frydl, 1982). Pleistocene: Kiyokawa and Yabu formations, Kioroshi (Yajima, 1982). Pliocene: Ananai Formation, Shikoku (Ishizaki, 1983).

Loxoconcha japonica. Recent: Setonaikai (intertidal zone) (Okubo, 1980); Hamana-ko Bay (depth 4.3 m) (Ikeya and Hanai, 1982); Tateyama Bay (depth 3–30 m) (Frydl, 1982); Aburatsubo Cove (depth 2–5 m) (Abe, 1983). Holocene: Numa Formation, Tateyama (Frydl, 1982). Pleistocene: Kiyokawa Formation, Kisarazu and Kioroshi (Yajima, 1978; 1982). Pliocene: Ananai Formation, Shikoku (Ishizaki, 1983).

Loxoconcha laeta. Recent: Tateyama Bay (depth 3–30 m) (Frydl, 1982). Holocene: Numa Formation, Tateyama (Frydl, 1982). Pleistocene: Kioroshi, Kamiiwahashi, Kiyokawa, and Yabu formations, Kisarazu and Kioroshi (Yajima, 1978; 1982).

Nipponocythere bicarinata. Recent: Tateyama Bay (depth 3–30 m) (Frydl, 1982), Aburatsubo Cove (depth 5 m) (Abe, 1983). Holocene: Numa Formation, Tateyama (Frydl, 1982). Pleistocene: Kioroshi, Kamiiwahashi, Kiyokawa, and Yabu formations, Kisarazu and Kioroshi (Yajima, 1978; 1982). Pliocene: Ananai Formation, Shikoku (Ishizaki, 1983).

Occurrences of Ostracoda at Sites 582 and 583 are restricted to sand turbidites in the upper Pleistocene beds. The species listed above are mainly dwellers on the shelf in the subtropical climatic zone and are found at depths ranging from the sea shore to approximately 200 m, but a few exceptions, such as *Acanthocythereis?* sp. (which is probably a slope form), prefer somewhat deeper water. There were no occurrences of the tropical-water species that dominate the Ryukyu Islands area or of the cold-water species characteristic of the area influenced by the Oyashio. This absence suggests that those ostracodes present in the cores were derived from the adjacent continental shelf, probably the northern slope of the Nankai Trough. Furthermore, the fine ornamental structure of these ostracode carapaces was quite well preserved as shown in Plate 1, Figs. 13 and 14. All these facts suggest that the ostracodes were transported by slumping from the adjacent shallow warm-water environments. The reason for the absence of deep-water species seems to be the absence or scarcity of oxygen in the deep water, as suggested by the presence of authigenic pyrite in the sediments, rather than a high sedimentation rate that would tend to mask the occurrence of deep-water Ostracoda.

TAXONOMIC NOTES

All specimens are deposited in the collection of the University Museum of the University of Tokyo (UMUT).

Family TRACHYLEBERIDIDAE Sylvester-Bradley, 1948
Subfamily TRACHYLEBERIDINAE Sylvester-Bradley, 1948
Tribe TRACHYLEBERIDINI Sylvester-Bradley, 1948
Genus *ACANTHOCYTHEREIS* R. C. Howe, 1963

***Acanthocythereis*? sp.**
(Plate 1, Figs. 1, 2, 4, 5, 7–15)

Illustrated specimen. An immature left valve, UMUT-CA 16643 (length 1.03 mm, height 0.663 mm), Sample 583-3-5, 55–56 cm (water depth 4634 m, sample depth 21.56 m sub-bottom, Pleistocene).

Remarks. We have only one immature left valve and a very small right valve; we will not give a detailed description because there is a possibility that the spines are broken (the top of the muri and the overall preservation is not good). This species is very large and has many muri with two or three smaller turretlike spines on their tips. It has no eye spot, which suggests a deep-sea habitat.

Subfamily PTERYGOCYTHEREIDINAE Puri, 1957
Genus *AMPHILEBERIS* Guan, 1978

***Amphileberis nipponica* (Yajima, 1978)**

Lixouria nipponica Yajima, 1978, p. 400, 401, pl. 50, figs. 7a–c, text-figs. 9-2a, b; Ishizaki, 1981, table. 2; Frydl, 1982, table 1; Ishizaki, 1983, table 2.
Yajimaina nipponica: Malz, 1981, p. 68, pl. 13, figs. 9-13.
Carinovalve nipponica: Yajima, 1982, p. 202.

Remarks. Through a personal communication with Dr. H. Malz (1983), Yajima learned that the Japanese species hitherto called *Lixouria* closely resembles the genus *Amphileberis* (type species *Amphileberis gibbera* Guan, 1978), which was proposed by Guan in 1978 (Guan et al., 1978). *Lixouria nipponica* closely resembles *A. gibbera* in lateral outline and carapace size, but *L. nipponica* has a holamphidont hinge.

Family HEMICYTHERIDAE Puri, 1953
Subfamily HEMICYTHERINAE Puri, 1953
Tribe AURILINI Pokorný, 1953
Genus *ROBUSTAURILA* Yajima, 1982

***Robustaurila ishizakii* (Okubo, 1980)**

Mutilus ishizakii Okubo, 1980, p. 405–408, figs. 6, 7c–g, 11e–g.

Remarks. The Japanese *Mutilus* differs significantly from the European *Mutilus*, especially in lateral ornamentation.

Family CYTHERURIDAE G. W. Müller, 1894
Genus *CYTHERURA* Sars, 1866

***Cytherura*? *miii* (Ishizaki, 1969)**
Pl. 1, Figs. 3, 6.

Tetracytherura miii Ishizaki, 1969, p. 216, 217, pl. 24, figs. 13, pl. 26, figs. 10, 11; Ishizaki, 1971, p. 79, pl. 2, fig. 17.

Cytherura? *miii:* Hanai et al., 1977, p. 54.

Illustrated specimen. A left valve, UMUT-CA 16644 (length 0.523 mm, height 0.245 mm) from Sample 583-3-5, 55–56 cm.

Remarks. *Cytherura*? *miii* has a prominent caudal process at the posterodorsal angle and resembles *Microcytherura negrescens* G. W. Müller, 1894 in lateral outline, but Wagner (1957) showed that *M. negrescens* has many large sieve-type pores, whereas this species has small simple normal pores and may represent a new genus.

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APPENDIX
Examined Samples That Contained No Ostracodes

582-1-1, 3–24	582B-8-1, 50–52	583B-3-1, 20–21
582-1-3, 42–44	582B-8-2, 50–52	583D-3-1, 28–30
582-1-4, 2–44	582B-8-3, 50–52	583D-4-1, 19–21
582-1-5, 2–44	582B-9-1, 48–50	583D-12-3, 58–60
582-1-6, 2–44	582B-9-2, 48–50	583D-13-1, 27–29
582-3-1, 56–58	582B-10-1, 61–63	583F-17-2, 37–38
582-3-6, 81–84	582B-10-2, 60–62	583G-4-3, 66–67
582A-1-2, 104–106	582B-10-3, 62–64	583G-8-2, 50–52
582A-1-3, 104–106	582B-10-4, 89–91	584-1-1, 80–82
582A-1-4, 104–106	582B-10-5, 63–65	584-1-2, 80–82
582A-2-1, 68–70	582B-10-6, 61–63	584-1-3, 80–82
582A-2-2, 68–70	582B-14-5, 74–76	584-1-4, 80–82
582A-2-3, 68–70	582B-18-1, 57–59	584-1-5, 80–82
582A-2-4, 68–70	582B-23-1, 73–75	584-1-6, 80–82
582A-2-5, 68–70	582B-23-6, 46–48	584-2-1, 24–26
582B-2-1, 124–126	582B-26-2, 82–84	584-2-2, 24–26
582B-2-2, 124–126	582B-29-1, 89–91	584-2-3, 24–26
582B-2-3, 124–126	582B-32-3, 20–21	584-2-4, 24–26
582B-2-4, 124–126	582B-64-4, 86–87	584-3-1, 51–53
582B-3-1, 64–66	582B-71-1, 89–90	584-3-2, 51–53
582B-3-2, 64–66	583-1-1, 54–55	584-3-3, 51–53
582B-3-3, 64–66	583-3-1, 38–39	584-3-4, 51–53
582B-5-1, 46–48	583-3-3, 63–64	584-4-1, 51–53
582B-5-2, 46–48	583-5-2, 75–76	584-4-2, 51–53
582B-5-3, 46–48	583-9-1, 106–108	584-4-3, 51–53
582B-7-1, 87–89	583-10-1, 114–115	584-4-4, 51–53
582B-7-2, 75–77	583-11-2, 49–50	584-4-5, 51–53
582B-7-4, 87–89	583A-11-2, 17–19	584-4-6, 51–53
582B-7-5, 87–89	583B-1-1, 57–58	584-5-1, 50–52
582B-7-6, 87–89	583B-1-2, 57–58	
582B-7-7, 87–89	583B-1-3, 57–58	

Note: Samples expressed as Hole-Core-Section, interval in cm.

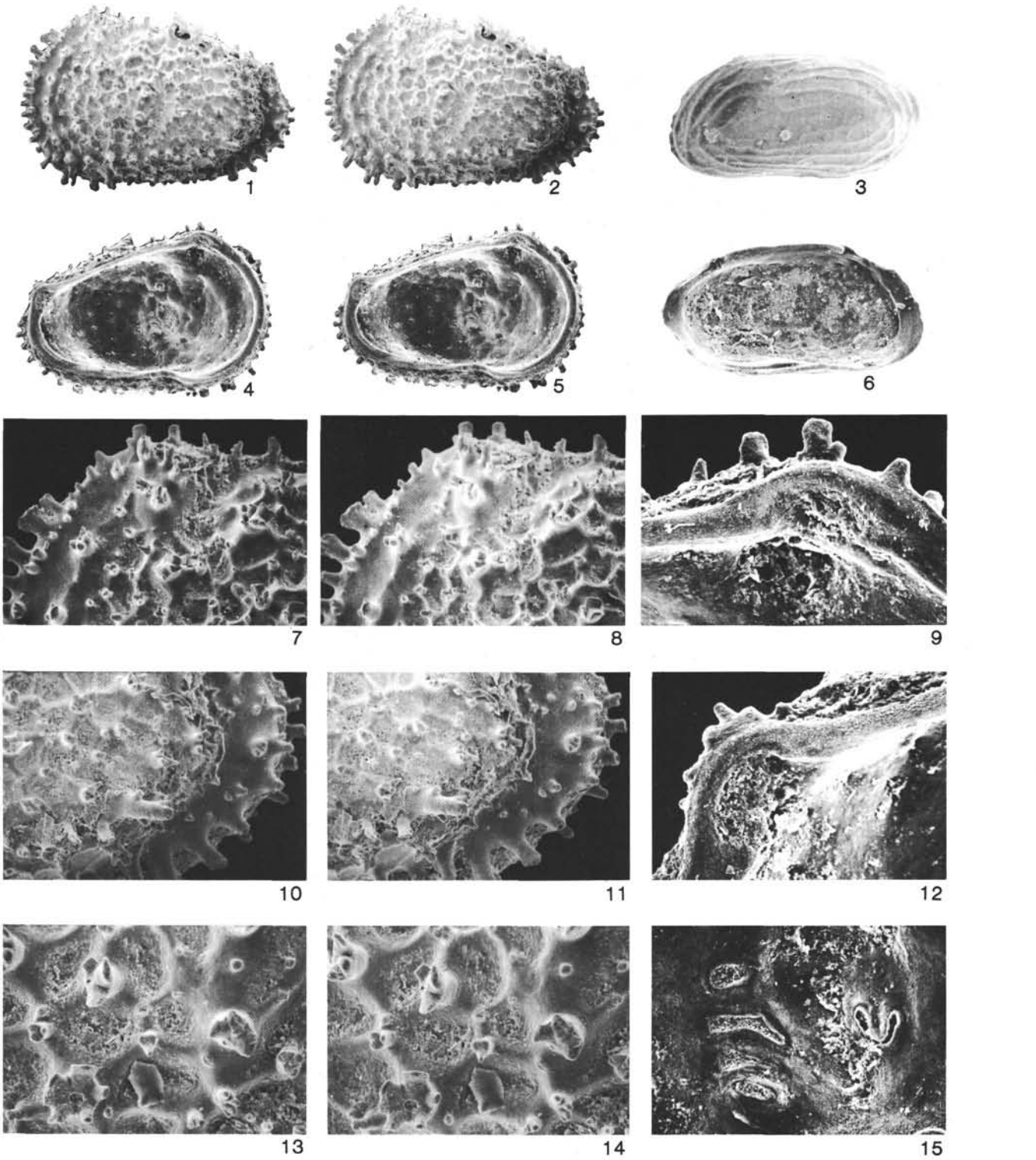

Plate 1. Ostracodes from DSDP Site 583. **1, 2, 4, 5, 7–15.** *Acanthocythereis*? sp. UMUT-CA 16643, Sample 583-3-5, 55–56 cm, an immature left valve; (1, 2) exterior lateral view, stereo pair, ×46; (4, 5) interior lateral view, stereo pair, ×41; (7, 8) exterior lateral view of anterior part, stereo pair, ×100; (9) anterior socket of hingement, ×209; (10, 11) exterior lateral view of posterior part, stereo pair, ×100; (12) posterior socket of hingement, ×209; (13, 14) spines on muri, just above muscle scar area, stereo pair, ×200; (15) adductor muscle scars and frontal scar, interior view, ×218. **3, 6.** *Cytherura*? *miii* (Ishizaki, 1969) UMUT-CA 16644, Sample 583-3-5, 55–56 cm, a left valve; (3) exterior lateral view, ×91; (6) interior lateral view, ×91.