

Early Cretaceous Hexacorals from the Western Part of the Sanchu Area, Kanto Mountains

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Abstract Twelve hexacoral species including two new species are described in this article. They were collected from the Sanchu Cretaceous in the western part of the Sanchu area, Kanto Mountains, central Japan. Judging from the paleontological data, the age of the hexacoral assemblage indicates Early Cretaceous (probably Barremian to Early Aptian).

Key words: Hexacorals, Sanchu Cretaceous, Kanto Mountains.

Introduction and Acknowledgements

Recently, many hexacorals were collected by the writers from limestone lenses of the Torinosu type in the Unit 1 (Hisada *et al.*, 1992) of the Sanchu Cretaceous which is exposed in the western part of the Kanto Mountains, central Japan. In this article, these hexacorals are described, and the age of the assemblage is discussed.

Figured specimens are deposited in the National Science Museum, Tokyo (NSM).

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Geologic Setting

The Sanchu Cretaceous is composed of interbedded fine- to medium-grained sandstone, sandy shale, coarse-grained sandstone, conglomerate, light gray tuffaceous siltstone and fossiliferous limestone of the Torinosu type. The stratigraphy of the Sanchu Cretaceous has been summarized in several papers since Harada (1890). According to recent studies of the Sanchu Cretaceous in the whole distributional area, the lithostratigraphic three-fold or four-fold divisions have been generally accepted. Namely, Takei (1985) mentioned that the Sanchu Cretaceous consists of the Ishido, Sebayashi and Sanyama Formations in ascending order. Matsukawa (1983) separated the lower non-marine Shiroi Formation from his marine Ishido Formation on the basis of his paleontological study and established the stratigraphy of the Sanchu Cre-

taceous such as the Shiroi, Ishido, Sebayashi and Sanyama Formations in ascending order. Hisada *et al.* (1992) proposed tentatively three-fold divisions, Units 1 to 3 in ascending order, which are observable along the Mamnozawa, about 30 km to east of Jukkoku pass. However concerning the distributional area of each division, there are slight differences and confusion in some places among several authors.

The Torinosu type limestones yielding coral fossils were collected at five localities; Loc. 1 Naranokidaira (Fujimoto, 1939, 1958), Loc. 2 Shinzaburozawa (Fujimoto, 1939, 1958), Loc. 3 SW of Jukkoku pass, Loc. 4 SE of Mt. Yomoppara, and Loc. 5 Higashinagayasawa (Fujimoto, 1958) (Fig. 1). All of these limestones belong to the Ishido Formation (Takei, 1985), Unit 1 (Hisada *et al.*, 1992), and Shiroi and Ishido Formations (Matsukawa, 1983).

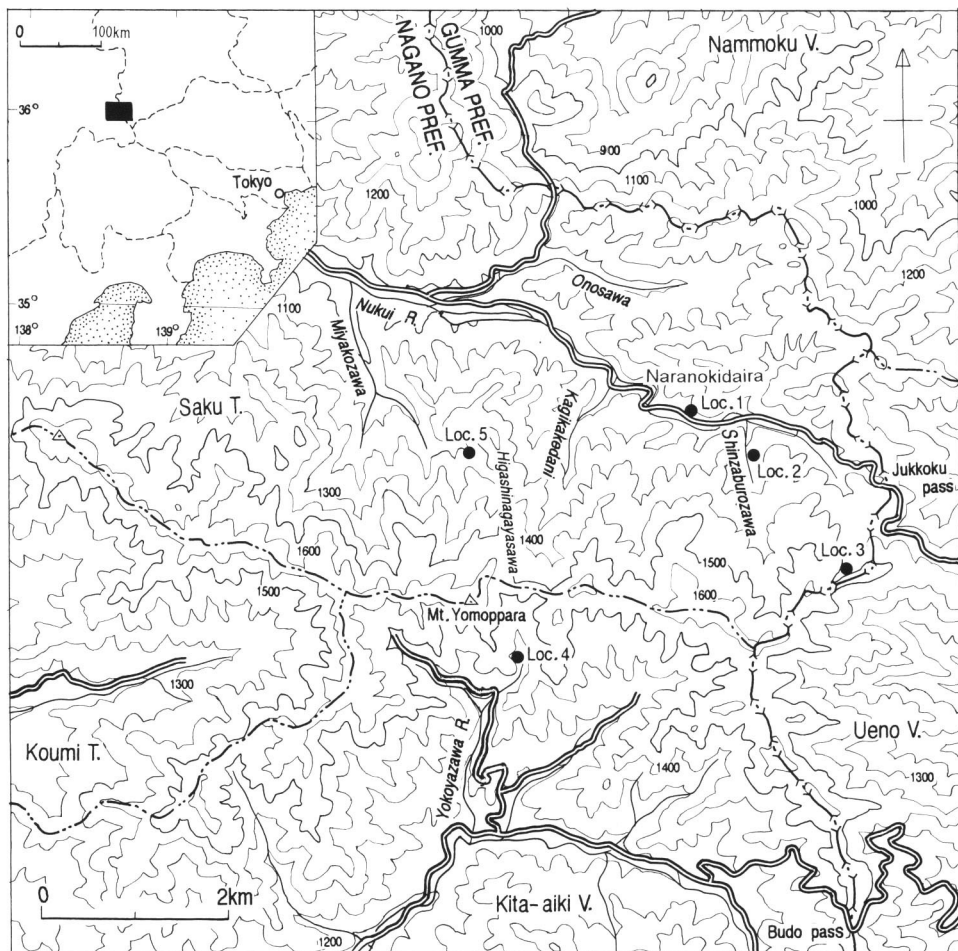


Fig. 1. Location of hexacorals from the Sanchu area.

According to Hisada *et al.* (1992), Unit 1 consists of conglomerate, massive muddy fine-grained sandstone and thin-bedded fine- to medium-grained sandstone, being accompanied with limestone of the Torinosu type. Parallel and low-angled cross laminations and bioturbation and trace fossils such as burrows and trails are frequently present in muddy sandstone and thin-bedded fine-grained sandstone. Conglomerate is sandy matrix-supported, and clasts, which are mainly sedimentary rocks, are commonly pebble or cobble sized.

The occurrence of ammonites correlatable to the Late Hauterivian to Late Barremian fauna has been known from the Ishido Formation (Obata *et al.*, 1976, 1984). Matsukawa (1988) reported that the Ishido fauna (=the ammonite fauna of the Ishido Formation) is assignable to Early to Late Barremian. It is noteworthy that SA-632 and SA-621 (in Figure 1, Matsukawa, 1988) are comparatively closed to Loc. 5 and Loc. 1 in the present paper, respectively. Sashida *et al.* (1989) recovered a foraminiferal fauna of benthonic and planktonic species and unidentified radiolarian species belonging to the genera *Holocryptocanium* and *Hemicryptocapsa* from the Torinosu type limestone, which is inferred to be an inclusion of the Ishido Formation. These microfossils obtained from the limestone reveal an Early Aptian age. Therefore, the age of the Ishido Formation ranges from Barremian probably to Early Aptian judging from the above-mentioned reliable index fossils.

Fauna and Correlation

The following hexacorals were previously found by Eguchi (1951) from limestone lenses of the Torinosu type in the western part of the Sanchu area, Kanto Mountains.

Eohydnophora? sp.

Placocoenia? *ohinataensis* Eguchi

Eugyra sugiyamai Eguchi

Microsolenia sp.

Of them *Eugyra sugiyamai* and *Placocoenia?* *ohinataensis* were described. From the data of these hexacorals, he considered that the age of the Torinosu type limestone lenses indicates probably Cretaceous.

In the present work, the following hexacorals are found and described from five limestone lenses of the Torinosu type in the Unit 1 of the Sanchu Cretaceous which is exposed in the western part of the Sanchu area.

Naranokidaira (Loc. 1 in Fig. 1)

Eohydnophora sanchuensis n. sp.

Placocoenia ohinataensis Eguchi

Shinzaburozawa (Loc. 2 in Fig. 1)

Eohydnophora sanchuensis n. sp.

Eugyra digitata Koby

E. sp. A

Cyathophora sp. aff. C. steinmanni Fritzsche

Isastrea sp. B

Montlivaltia sp. cfr. M. xainzaensis Liao

Trochoidomeandra sp. indet.

SW of Jukkoku pass (Loc. 3 in Fig. 1)

Eugyra sp. cfr. E. neocomiensis Fromentel

Montlivaltia sp. cfr. M. xainzaensis Liao

SE of Mt. Yomoppara (Loc. 4 in Fig. 1)

Eugyra sp. B

Higashinagayasawa (Loc. 5 in Fig. 1)

Stylosmilia shirakurai n. sp.

Isastrea sp. A

Eugyra digitata has been found from the Urgonian in Switzerland and Poland and the Barremian-Lower Aptian in Serbia (Koby, 1896; Morycowa, 1964; Turnšek & Mihajlović, 1981).

Eugyra sp. cfr. E. neocomiensis is closely allied to *E. neocomiensis* from the Neocomian in France, the Urgonian in Switzerland and the Barremian-Lower Aptian in Serbia (Fromentel, 1857, 1861–1887; Koby, 1896; Turnšek & Mihajlović, 1981).

Eugyra sp. A is similar to *E. cotteai* from the Neocomian in France, the Urgonian in Switzerland, the Hauterivian in Poland, the Barremian-Aptian in Slovenia and the Barremian-Lower Aptian in Serbia (Fromentel, 1857, 1861–1887; Koby, 1896; Morycowa, 1964; Turnšek & Buser, 1974; Turnšek & Mihajlović, 1981). It also resembles *Eugyra oshimaensis* from the Lower Cretaceous Oshima Formation in Northeast Japan (Eguchi, 1951).

Eugyra sp. B resembles *E. lanchoronensis*. The latter occurs in the Barremian-Lower Aptian in Poland and Serbia and the Lower Aptian in Rumania (Morycowa, 1964, 1971; Turnšek & Mihajlović, 1981).

Eohydnothora sanchuensis n. sp. is allied to *E. incerta* from the Lower Aptian in Rumania (Morycowa, 1971).

Cyathophora sp. aff. C. steinmanni is very similar to *C. steinmanni*. The latter was reported from the Hauterivian-Barremian in Chile and Poland and the Barremian-Lower Aptian in Serbia (Fritzsche, 1924; Morycowa, 1964; Turnšek & Mihajlović, 1981).

Isastrea sp. A. is related to *I. carpathica* from the Lower Aptian in Rumania and the Barremian-Lower Aptian in Serbia (Morycowa, 1971; Turnšek & Mihajlović, 1981).

Montlivaltia sp. cf. M. xainzaensis much resembles *M. xainzaensis*. The latter has been found from the Hauterivian to Lower Aptian in Xizang (Liao, 1982; Liao & Xia, 1994).

Up to the present, only two species belonging to *Trochoidomeandra* were de-

scribed. Of them *Trochoidomeandra ovalis* occurs in the Barremian-Lower Aptian in Serbia (Turnšek & Mihajlović, 1981), and *T. problematica* in the Lower Aptian in Rumania and the Cretaceous of Xizang (Morycowa, 1971; Liao & Xia, 1994).

Judging from the paleontological evidence mentioned above, the age of this hexacoral assemblage indicates Early Cretaceous (probably Barremian to Early Aptian).

Systematic Description

Family Stylinidae d'Orbigny, 1851

Genus *Eohydnophora* Yabe and Eguchi, 1936

***Eohydnophora sanchuensis* n. sp.**

(Figs. 2-1~2 a, b)

Diagnosis: *Eohydnophora* with septa of two cycles (usually alternating in size). In longitudinal section, relatively crowded dissepiments (5 to 7 per 2 mm) usually complete and loosely dome-like or horizontal in shape.

Description: Corallum massive and hydnophoroid with subseries.

In transverse section, thin and discontinuous wall forming collines short (about 1.3 mm in length) to long (4–6 mm in length), curve or straight. Septa of two cycles, usually alternating in size. They laterally dentate. Those of the first cycle thick and long, numbering 3 to 4 per 2 mm. They reach near the centre of the series. Those of the second is very short and usually present, but sometimes absent. Width of series 1.0 to 2.0 mm. Collumella absent.

In longitudinal section, dissepiments crowded, 5 to 7 per 2 mm. They complete and loosely dome-like or horizontal in shape, but sometimes incomplete and vesicles.

Comparison: The present form resembles *Eohydnophora incerta* (Morycowa, 1971, p. 91–92, pl. 21, fig. 1; Turnšek & Buser, 1976, p. 49–50, 75, pl. 4, figs. 1–2) in having septa of two cycles forming laterally dentate, almost same width of series and crowded septa, but differs from the latter in having more crowded dissepiments in longitudinal section. It is distinguished from *Eohydnophora* cf. *picteti* (Koby) described by Eguchi (1951, p. 45–46, pl. 15, figs. 2–4) in having septa of two cycles. It also differs from *Eohydnophora tosaensis* Yabe & Eguchi (1936, p. 142, 143) and *E. aff. picteti* (Koby) described by Eguchi, (1951, p. 14, pl. 2 figs. 7–8) in having septa of two cycles and more crowded dissepiments in longitudinal section.

Occurrence: Limestone lenses of the Torinosu type in the Unit 1 of the Sanchu Cretaceous at Naranokidaira (Loc. 1) and Shinzaburozawa (Loc. 2), Saku town, Minamisaku-gun, Nagano Pref.

Repository: Reg. nos. NSM PA14252 (Holotype) (Loc. 2), NSM PA14251 (Paratype) (Loc. 1).

Genus *Eugyra* Fromentel, 1857***Eugyra digitata* Koby, 1896**

(Figs. 2–3 a, b)

Eugyra digitata Koby, 1896, p. 21–22, pl. 18, figs. 4–7.*Eugyra digitata* Koby: Morycowa, 1964, p. 47–48, pl. 5, fig. 9, pl. 9, figs. 2 a, b.*Eugyra digitata* Koby: Turnšek & Mihajlović, 1981, p. 16–17, pl. 11, figs. 1–2.*Description:* Corallum massive with meandroid series.

In transverse section, corallites bounded by usually continuous wall forming very long collines. Wall somewhat sinuous. Septa relatively thick, subequal in size, numbering 4 to 5 per 2 mm. Distance between centres of corallites 1, 2 to 2.0 mm. Columella absent.

In longitudinal section, dissepiments 4 to 5 per 2 mm. They complete and dome-like in shape, but rarely horizontal.

Comparison: It is identical with *Eugyra digitata* Koby in having septa of the same size, almost same spaced septa and dissepiments and other common morphological characters.

Occurrence: A limestone lens of the Torinosu type in the Unit 1 of the Sanchu Cretaceous at Shinzaburozawa (Loc. 1), Saku town, Minamisaku-gun, Nagano Pref.

Repository: Reg. no. NSM PA14253.

***Eugyra* sp. cf. *E. neocomiensis* Fromentel, 1857**

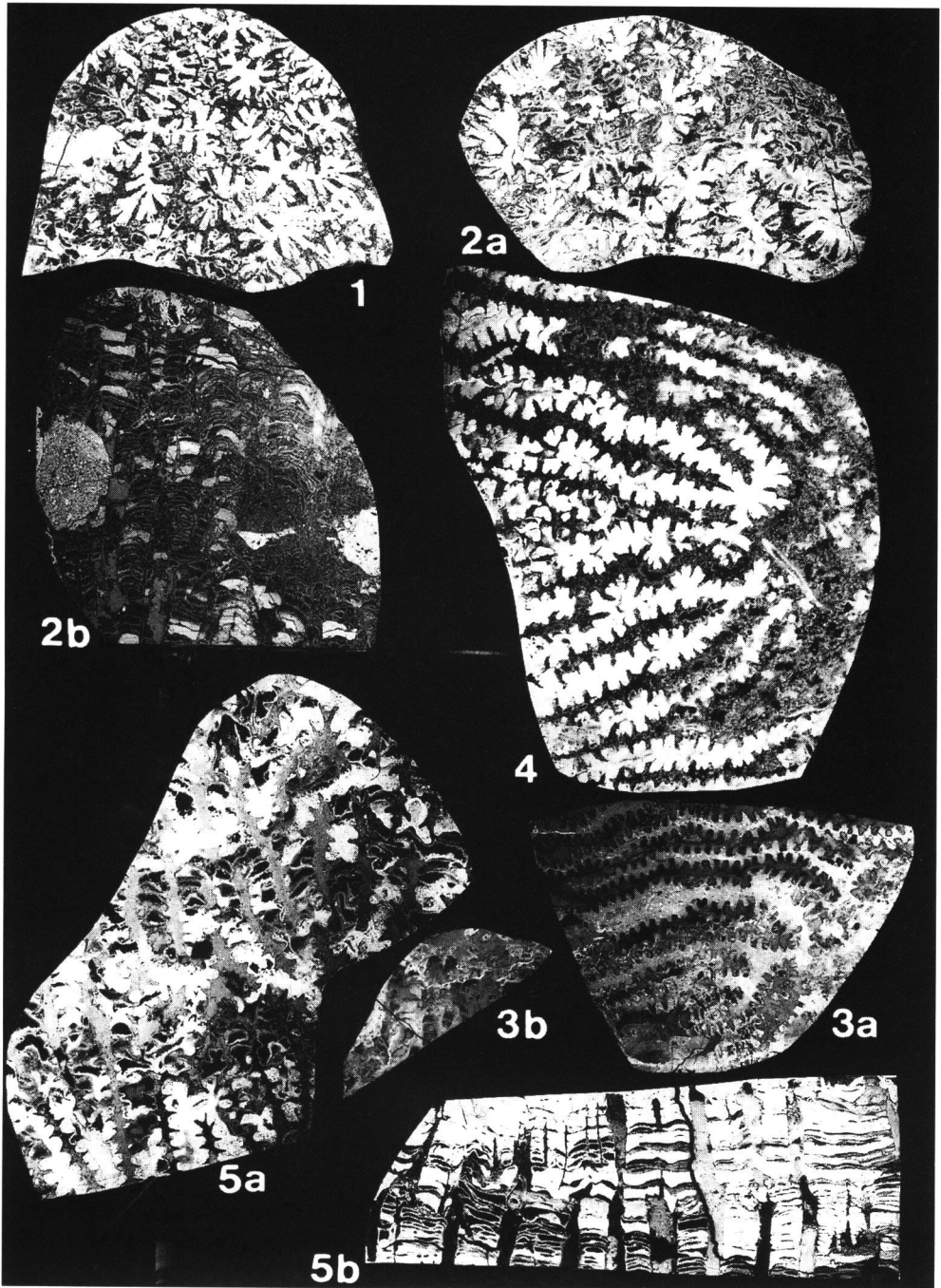
(Fig. 2–4)

*Compare**Eugyra neocomiensis* Fromentel, 1857, p. 31, pl. 3, figs. 6–7.*Eugyra neocomiensis* Fromentel: Fromentel, 1861–1887, p. 442–443, pl. 103, fig. 1.*Eugyra neocomiensis* Fromentel: Koby, 1896, p. 19–20, pl. 5, fig. 1.*Eugyra neocomiensis* Fromentel: Turnšek & Mihajlović, 1981, p. 17–18, pl. 11, figs. 5–6.*Description:* Corallum massive and meandroid with series.

In transverse section, continuous wall forming very long collines present. It relatively thick and sinuous, but sometimes straight. Septa thick. They alternating in size. Those of the first cycle 3 to 4 in number per 2 mm. Those of the second very short. Distance between centres of the corallites about 2.0 mm. Columella absent.

Longitudinal section missing.

Fig. 2. 1–2, *Eohydnohora sanchuensis* Yamagiwa, Hisada and Tamura n. sp. 1. Transverse section, X3.0 (NSM PA14251); 2a. Transverse section, X3.0, 2b. Longitudinal section, X3.0 (NSM PA14252). 3, *Eugyra digitata* Koby. 3a. Transverse section, X3.0, 3b. Longitudinal section, X3.0 (NSM PA14253). 4, *Eugyra* sp. cf. *E. neocomiensis* Fromentel. Transverse section, X3.0 (NSM PA14254). 5, *Eugyra* sp. A. 5a. Transverse section, X3.0, 5b. Longitudinal section, X3.0 (NSM PA14255).



Comparison: The present form is characterized by its crowded septa, long and sinuous wall and almost same distance (about 2 mm) between centres of corallites. Besides, its septa are alternating in size. It much resembles *Eugyra neocomienseis* Fromental in having the features mentioned above. Although the longitudinal section is missing, the former may referable to the latter.

Occurrence: A limestone lens of the Torinosu type in the Unit 1 of the Sanchu Cretaceous at SW of Jukkoku pass (Loc. 3), Saku town, Minamisaku-gun, Nagano Pref.

Repository: Reg. no. NSM PA14254.

***Eugyra* sp. A**

(Figs. 2-5a, b)

Remarks: The present form resembles *Eugyra cotteaui* Fromental (1857, p. 30–31, pl. 3, figs. 4–5; Fromental, 1861–1887, p. 443–444, pl. 103, fig. 2; Koby, 1896, p. 20–21, pl. 5, fig. 2; Morycowa, 1964, p. 48–49, pl. 11, fig. 4; Turnšek & Buser, 1974, p. 94, 113, pl. 4, fig. 4; 1976, p. 48–49, 75, pl. 2, figs. 3–6; Turnšek & Mihajlović, 1981, p. 17, pl. 11, figs. 3–4) and *E. oshimaensis* Eguchi (1951, p. 45, pl. 15, fig. 5), but differs from the latter two in having more crowded dissepiments (7 to 10 per 2 mm) in longitudinal section.

Occurrence: A limestone lens of the Torinosu type in the Unit 1 of the Sanchu Cretaceous at Shinzaburozawa (Loc. 2), Saku town, Minamisaku-gun, Nagano Pref.

Repository: Reg. no. NSM PA14255.

***Eugyra* sp. B**

(Fig. 3-1 a, b)

Remarks: The present form is related to *Eugyra lanckoronensis* (Morycowa, 1964, p. 50–51, pl. 9, fig. 3, pl. 10, figs. 2–3; Morycowa, 1971, p. 58–60, pl. 9, fig. 1; Turnšek & Buser, 1976, p. 49, 75, pl. 3, figs. 1–4; Turnšek & Mihajlović, 1981, p. 18, pl. 12, figs. 1–3). However, the former is separable from the latter in having dome-like dissepiments in longitudinal section.

Occurrence: A limestone lens of the Torinosu type in the Unit 1 of the Sanchu Cretaceous at SE of Mt. Yomoppara (Loc. 4), Kita-aiki village, Minamisaku-gun, Nagano Pref.

Repository: Reg. no. NSM PA14256.

Genus *Stylosmilia* Milne-Edwards & Haime, 1848

***Stylosmilia shirakurai* n. sp.**

(Fig. 3-2 a–c)

Diagnosis: Small *Stylosmilia* with 10 (occasionally 11 or 12) septa of the first

two cycles.

Description: Corallum fasciculate. Corallites probably subcylindrical.

Corallites subcircular in transverse section; usually 1.0 to 1.6 mm in diameter in mature stage. Corallite wall thick, mostly 0.2 to 0.3 mm in thickness. Septa rather thick. They straight or slightly sinuous. 10 (occasionally 11 or 12) septa of the first and second cycles long, usually contact with a columella. The third's ones very short and rudimentary. Columella distinct and styliform showing slightly compressed type.

Comparison: It differs from *Stylosmilia alpina* Koby (1896, p. 36–37, pl. 7, figs. 6–7; Turnšek & Mihajlović 1981, p. 15. pl. 9, figs. 1–3) in having smaller corallites and less numerous septa.

Derivation of the specific name: After Late Mr. Morio Shirakura, who greatly contributed to the research of geology in Saku area, Nagano Pref.

Occurrence: A limestone lens of the Torinosu type in the Unit 1 of the Sanchu Cretaceous at Higashinagayasawa (Loc. 5), Saku town, Minamisaku-gun, Nagano Pref.

Repository: Reg. nos. NSM PA14258 (Holotype), NSM PA14257, 14259 (Paratypes).

Genus *Cyathophora* Michelin, 1843

Cyathophora sp. aff. *C. steinmanni* Fritzsche, 1924

(Figs. 3-3 a, b)

Compare:

Cyathophora steinmanni Fritzsche, 1924, p. 316–317, pl. 3, fig. 8, pl. 4, fig. 3.

Cyathophora steinmanni Fritzsche: Morycowa, 1964, p. 24–25, pl. 3, fig. 2, pl. 5, figs. 2–3.

Non *Cyathophora steinmanni* Fritzsche: Turnšek & Buser, 1976, p. 48, 75, pl. 2, figs. 1–2.

Cyathophora steinmanni Fritzsche: Turnšek & Mihajlović, 1981, p. 18, pl. 13, figs. 3–4.

Description: Corallum massive and plocoid.

In transverse section, corallites round or subround in mature stage. They 2.0 to 2.4 mm in diameter. Central distance 3.0 to 4.0 mm. Corallite wall distinct. Septa of three cycles, numbering 24. Six septa of the first cycle reaching about 1/3 the radius in length. Six ones of the second about 1/2 the length of the first. Twelve ones of the third very short. Corallites united by costae. Costae about 24 in number. Columella absent.

In longitudinal section, endothecal dissepiments 2 to 3 per 2 mm. They complete and usually horizontal, but sometimes dome-like or irregular in shape.

Comparison: In longitudinal section, the present form is somewhat widely spaced endothecal dissepiments than *Cyathophora steinmanni* Fritzsche. However, the former much resembles the latter in many other important morphological characters.

Occurrence: A limestone lens of the Torinosu type in the Unit 1 of the Sanchu

Cretaceous at Shinzabrozawa (Loc. 2), Saku town, Minamisaku-gun, Nagano Pref.

Repository: Reg. no. NSM PA14260.

Family Calamophyllidae Vaughan & Wells, 1943

Genus *Isastrea* Milde-Edwards & Haime, 1851

***Isastrea* sp. A**

(Fig. 3-4)

Description: Corallum massive and cerioid.

In transverse section, corallites polygonal. They generally 2.5 to 3.5 mm in diameter. Central distance 2.0 to 4.0 mm. Corallite wall present, but partly absent with septa confluent. Corallites monocentric. Septa relatively thick, straight or slightly sinuous. They about 24 in number, the lateral surface spinose. Twelve septa of the first two cycles extending centre. The third ones slightly shorter those of the first two. Columella papillar or quite rudimentary.

Longitudinal section missing.

Comparison: It is similar to *Isastrea carpathica* (Morycowa, 1971, p. 106–108, pl. 28, fig. 1; Turnšek & Mihajvolić, 1981, p. 29–30, pl. 31, figs. 4–5) in its size of corallites and form of the corallite wall. However, the former has less numerous septa. It is somewhat related to *Isastrea matumotoi* Eguchi (1944, p. 70, pl. 2, figs. 1–3; 1951, p. 53–54, pl. 18, figs. 1–2). However, the former's corallite wall is partly absent with septa confluent. Besides, the former has less numerous septa.

Occurrence: A limestone lens of the Torinosu type in the Unit 1 of the Sanchu Cretaceous at Higashinagayasawa (Loc. 5), Saku town, Minamisaku-gun, Nagano Pref.

Repository: Reg. no. NSM PA14261.

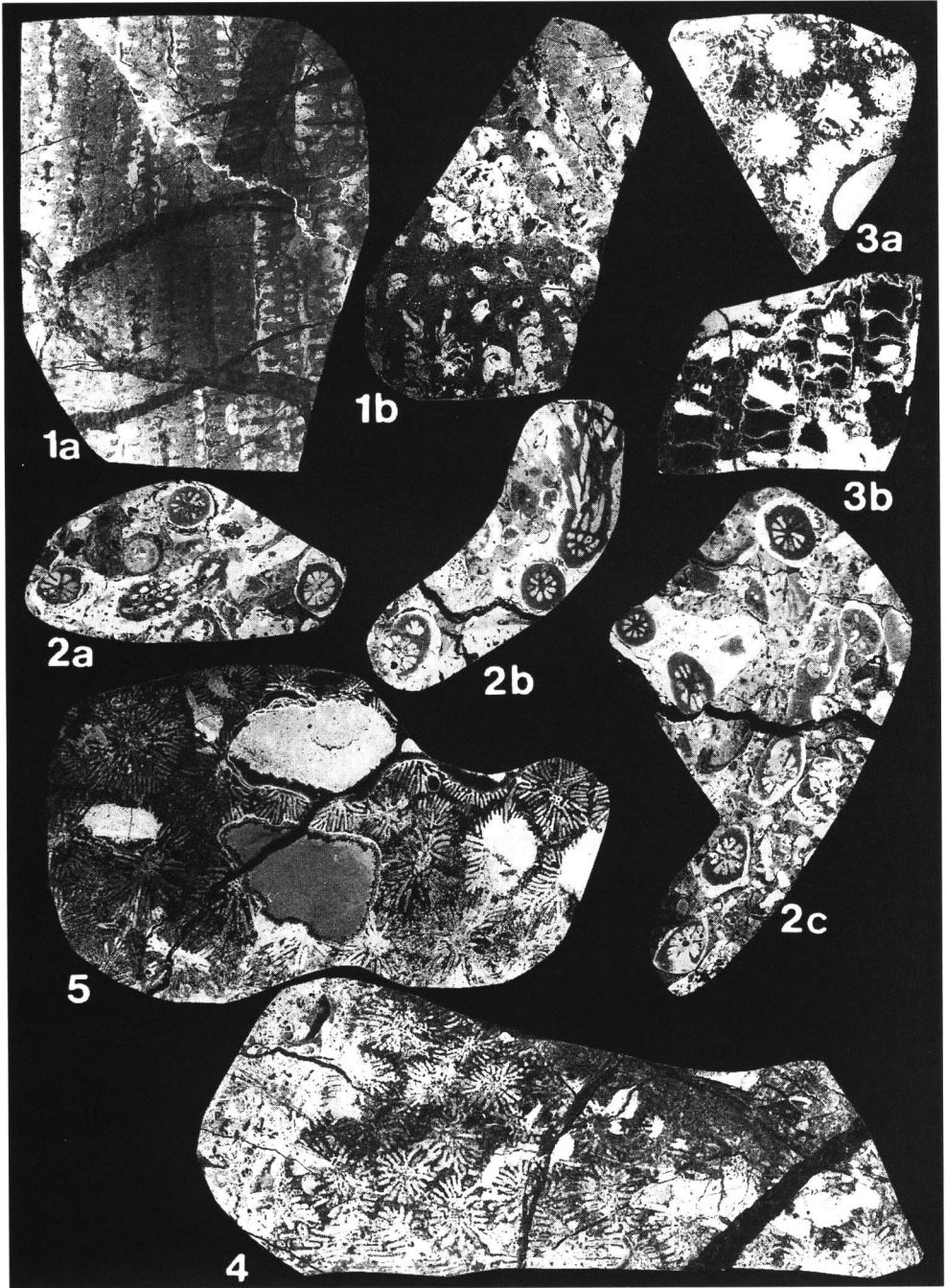
***Isastrea* sp. B**

(Fig. 3-5)

Description: Corallum massive and cerioid.

In transverse section, corallites polygonal and monocentric; usually 2.4 to 6.0 mm in diameter. Central distance 2.8 to 5.6 mm. Corallite wall generally present, but occasionally indistinct. Septa straight or slightly sinuous. They 32 to 50 in number. Their lateral surface usually smooth. Columella spongy or rudimentary.

Fig. 3. 1, *Eugyra* sp. B. 1a. Transverse section, $\times 3.0$, 1b. Longitudinal section, $\times 3.0$ (NSM PA14256). 2, *Stylosmilia shirakurai* Yamagiwa, Hisada and Tamura, n. sp. 2a. Transverse section, $\times 3.0$, 2b. Transverse and Longitudinal sections, $\times 3.0$, 2c. Transverse section, $\times 3.0$ (NSM PA14257–14259). 3, *Cyathophora* sp. aff. *C. steinmanni* Fritzsche. 3a. Transverse section, $\times 3.0$, 3b. Longitudinal section, $\times 3.0$ (NSM PA14260). 4, *Isastrea* sp. A. Transverse section, $\times 3.0$ (NSM PA14261). 5, *Isastrea* sp. B. Transverse section, $\times 3.0$ (NSM PA14262).



No longitudinal section.

Comparison: The present form somewhat resembles *Latimeandra kaufmanni* (Koby, 1896, p. 45–46, pl. 11, figs. 1–2; Sučić, 1953, p. 104, pl. 5, fig. 4; Turnšek & Mihajlović, 1981, p. 30, pl. 30, figs. 1–5, pl. 31, figs. 1–3). The former, however, differs from the latter in the following characters, 1) corallites only monocentric, 2) Septa's lateral surface generally smooth.

Occurrence: A limestone lens of the Torinosu type in the Unit 1 of the Sanchu Cretaceous at Shinzaburozawa (Loc. 2), Saku town, Minamisaku-gun, Nagano Pref.

Repository: Reg. no. NSM PA14262.

Family Montlivaltiidae Dietrich, 1926

Genus *Montlivaltia* Lamouroux, 1821

***Montlivaltia* sp. cf. *M. xainzaensis* Liao, 1982**

(Figs. 4-1 a, b~2)

Compare:

Montlivaltia xainzaensis Liao, 1982, p. 170, pl. 15, fig. 6, pl. 16, figs. 6–9, pl. 17, fig. 1.

Montlivaltia xainzaensis Liao: Liao & Xia, 1994, p. 160, 232–233, pl. 45, figs. 1–6.

Description: Corallum solitary.

In transverse section, corallites subround in outline; 11.0 to 20.0 mm in diameter. Corallite wall relatively thin. Septa about 65 to 80+ in number. They straight or slightly sinuous. Synapticulae and dissepiments observed. No columella. There is an oblong shaped axial opening (fossula) in axial part.

Longitudinal section missing.

Comparison: The present form much resembles *Montlivaltia xainzaensis* Liao in its important morphological characters. However, the former are somewhat smaller than the latter in its size.

Occurrence: Limestone lenses of the Torinosu type in the Unit 1 of the Sanchu Cretaceous at Shinzaburozawa (Loc. 2) and SW of Jukkoku pass (Loc. 3); Saku town, Minamisaku-gun, Nagano Pref.

Repository: Reg. nos. NSM PA14263 (Loc. 2), NSM PA14264 (Loc. 3).

Family Trochoidomeandridae Turnšek & Mihajlović, 1981

Genus *Trochoidomeandra* Morycowa, 1971

***Trochoidomeandra* sp. indet.**

(Fig. 4-3)

Description: Corallum solitary.

In transverse section, corallite subellipsoidal in outline; about 24.0 mm in longest diameter. Corallite wall locally missing. About ten septa of the first two cycles very thick and long. They reach axial part. About 10 septa of the third somewhat

shorter and thinner than those of the first two. Those of the fourth incompletely developed. They about 1/2 the length of the third. Those of the fifth occasionally observed. They very thin and short. Septa contain along the entire length long greatly towards the interior directed and curved outgrowth. Density of outgrowth about 3 per 2 mm. Fossula elongate and narrow. Columella absent.

Longitudinal section missing.

Comparison: The present form is somewhat similar to *Trochoidomeandra ovalis* Turnšek & Mihajlović (1981, p. 26–27, pl. 25, figs. 1–5, pl. 26, figs. 1–2), but differs from the latter in having the following characters. (1) Septa contain along the entire length long greatly towards the interior directed and curved outgrowth. (2) Smaller corallite. If better preserved material is obtained in future, it will be able to be proposed as a new species of *Trochoidomeandra*.

Occurrence: A limestone lens of the Torinosu type in the Unit 1 of the Sanchu Cretaceous at Shinzaburozawa (Loc. 2), Saku town, Minamisaku-gun, Nagano Pref.

Repository: Reg. no. NSM PA14265.

Family Faviidae Gregory, 1900
Genus *Placocoenia* d'Orbigny, 1849
Placocoenia ohinataensis Eguchi, 1951

(Fig. 4-4)

Placocoenia? ohinataensis Eguchi, 1951, p. 55, pl. 19, fig. 9.

Description: Corallum massive and plocoid.

In transverse section, corallites subcircular and suboval in outline, usually 5.0 to 7.0 mm in inside diameter. Coenosteum composed of costae and exothecal dissepiments. Central distance 7.0 to 11.0 mm. Corallite wall shows synapticulothecal type. Septa thick and straight or slightly sinuous. Twelve septa of the first two cycles extending to central part. Twelve ones of the third somewhat shorter and thinner than those of the first two. The fourth's ones short and rudimentary. Synapticulae distinct. A stout and lamellar type columella observed.

Longitudinal section missing.

Comparison: The present form is characterized by its plocoid type corallum and a stout and lamellar type columella. These features show the species of *Placocoenia*. It is very similar to *Placocoenia ohinataensis* Eguchi in having a stout and lamellar type columella, almost same corallite size, almost same length of the central distance, almost same septal number and other common morphological characters. Therefore, the writers suggest that the former belongs to the latter. It can be distinguished from *Silingastraea xainzaensis* by Liao (1982, p. 173, pl. 21, figs. 1–2, pl. 22, fig. 1; Liao & Xia, 1994, p. 170, 234, 235, pl. 49, figs. 1–2, pl. 50, figs. 6–7) in having shorter septa of the third cycle than those of the first two ones.

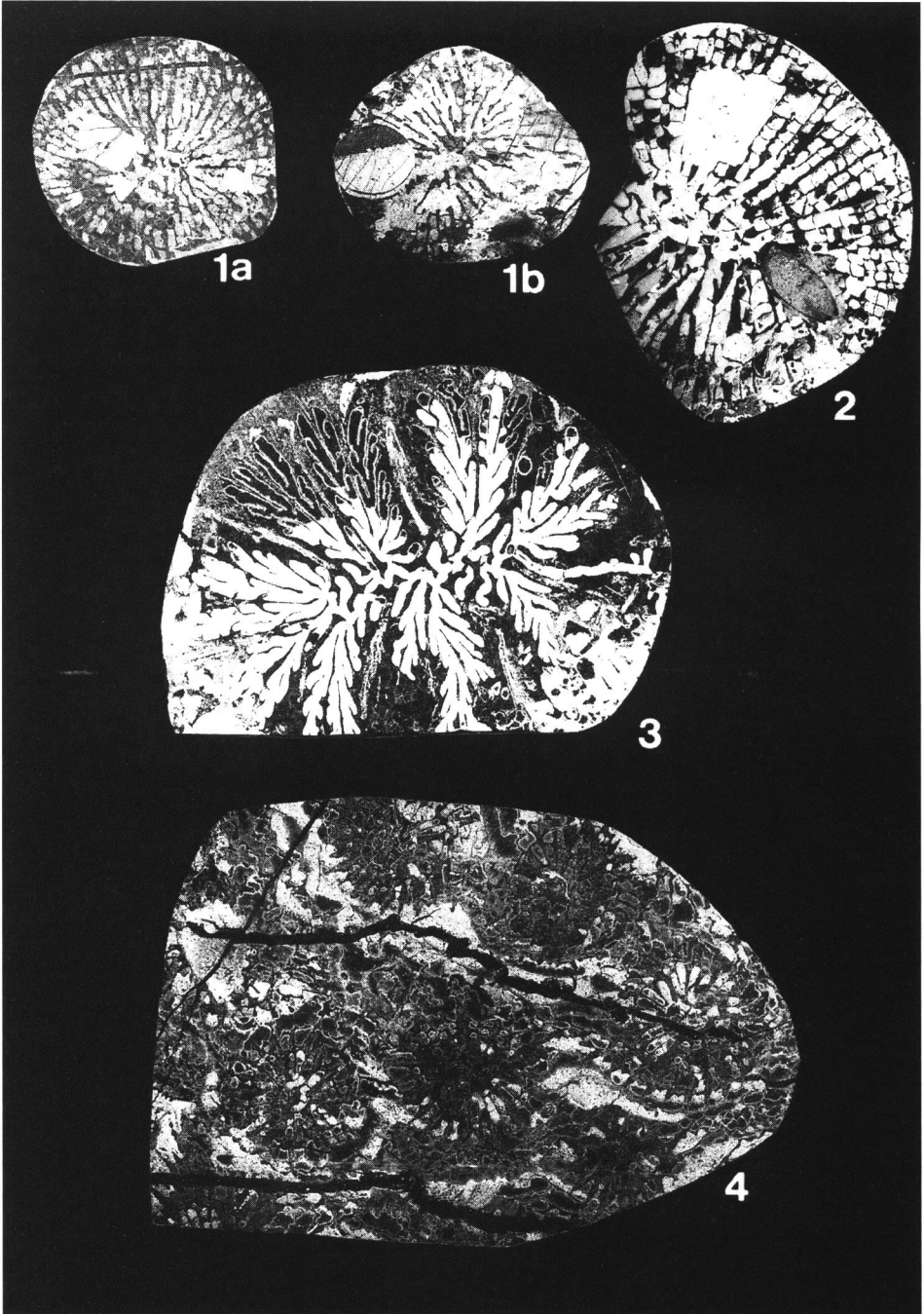


Fig. 4. 1–2, *Montlivaltia* sp. cff. *M. Xainzaens* Liau. 1a–b. Transverse sections, $\times 3.0$ (NSM PA14263); 2. Transverse section, $\times 3.0$ (NSM PA14264). 3, *Trochoidomeandra* sp. indet. Transverse section, $\times 3.0$ (NSM PA14265). 4, *Placocoenia ohinataensis* Eguchi. Transverse section, $\times 3.0$ (NSM PA14266).

Occurrence: A limestone lens of the Torinosu type in the Unit 1 of the Sanchu Cretaceous at Naranokidaira (Loc. 1), Saku town, Minamisaku-gun, Nagano Pref.

Repository: Reg. no. NSM PA14266.

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