
634. MIOCENE MOLLUSCS FROM THE BIHOKU GROUP AT MIYAUCHI-CHO, SHOBARA CITY, SOUTHWEST JAPAN*

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Introduction and Acknowledgements

Miyauchi-cho (formerly shinchiku-chô) of Shôbara City, Southwest Japan has been well known as a locality of the Miocene fossil molluscs, since OTUKA (1938) reported Ostrea, Soletellina, Cyclina, Batillaria, and other well preserved shells. OYAMA (1967) mentioned that the fossil molluscs from the locality may be regarded as one of the typical examples of the tidal zone communities in the inner bay facies of the transgressive phase. We have restudied the Miocene molluscs occurred in the Shôbara area from the paleoecological point of view, and as a result of our research, we will report here on the fossil molluscan assemblages of the Lower Sandstone member of the Bihoku group (IMAMURA, 1953) at Miyauchi-cho. Two types of combination of molluscan species, i.e. Batillaria-Crassostrea and Crassostrea-Cyclina-Geloina assemblages are recognized in this member. The former is found in the most part of the member, and the latter is restricted in its distribution within a part of the basal horizon. The Crassostrea-Cyclina-Geloina assemblage is comparable with the Telescopium-Geloina assemblage of the Miocene Kadonosawa-type fauna found in the other areas of Japan, and is very interesting to us because of its peculiar combination of species.

We wish to express our sincere thanks to Dr. Katura OYAMA of the Geological Survey of Japan at Kawasaki for help to discriminate some fossils and Dr. Tadashige HABE of the National Science Museum at Tokyo for suggestion on the taxonomy of Recent geloinas. We are indebted to Associate Professor Kiyotaka CHINZEI of the University of Tokyo for reading the manuscript. Acknowledgements are due to Dr. Yasuhide IWASAKI of the University of Tokyo for suggestion and permission to study the specimens stored at the

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University Museum. Thanks are also due to Professor C.C. RIN of the National Taiwan University at Taipei and Dr. Tunyow HUANG of the Chinese Petroleum Corporation at Miaoli for information about the formations yielding geloinas. Appreciation is expressed to Mr. Shige- haru IRISAWA at Miyauchi-chô, Shôbara City and Mr. Osamu IRISÉ of the Hakushima Primary School of Hiroshima City for collecting and supply of specimens. This study was supported in part by the Grant in Aid for Science Researches from the Ministry of Education.

and the Bihoku group in the upper, and their stratigraphic relation is recognized as a parallel unconformity. The non-marine Shiomachi formation, 10–45 m thick, is composed of conglomerate, sandstone, shale, and tuff. It yields fossil plants, such as Trapa yokoyamae NATHORST, T. cf. borealis HEER, and Liquidamber formosana HANCE.

The marine Bihoku group is subdivided into the Lower Sandstone and Upper Shale members (IMAMURA, 1953). The Lower Sandstone member, 15–45 m thick, is made up of conglomerate, sandstone, and alternation of sandstone and shale. It contains larger foraminifera and various molluscs. The characteristic fossils are as follows:

Larger foraminifera: Miogypsina "kotai HANZAWA", Operculina complanata japonica HANZAWA.

Molluscs: Anadara daitokudoensis (MAKIYAMA), Vepricardium ogurai (OTUKA), Dosinia suketoensis OTUKA, Tapes siratoriensis (OTUKA), Vicarya callosa japonica YABE and HATAI, Batillaria yamanarii MAKIYAMA.

The Upper Shale member, about 50 m thick, is composed of shale containing a small number of molluscs, such as Acila submirabilis MAKIYAMA, Propeamussium cf. tateiwa KANEHARA, Fissidentalium sp., etc. The study of smaller foraminifera from this group was carried out by TAI (1953). The geologic age of the Lower Sandstone member of the Bihoku group is assigned to the Early to Middle Miocene, or in other words to the Zones N. 8 to N. 9 of BLOW’s planktonic foraminiferal zonation (IKEBE et al., 1972).

The geologic columns of the Lower Sandstone member of the Bihoku group shown in Text-fig. 2 is observed at a small valley of Miyauchi-chô (Loc. 2 of OTUKA, p. 23, text-fig. 1, 1938) in Text-fig. 1. The Lower Sandstone member

Notes on Geology

According to IMAMURA (1953), the Miocene formations distributed in the Shôbara, Miyoshi, and Mirasaka areas of Hiroshima Prefecture are divided into the Shiomachi formation in the lower

Text-fig. 1. Locality map.
covers unconformably the undulated surface of the basement rock, i.e. tuff of rhyolite or rhyodacite of Late Cretaceous. This member, approximately 23 m thick, is made up of angular pebble to cobble conglomerate, gray mudstone with thin coal layers, medium-to coarse-grained sandstone, gray mudstone to fine-grained sandstone, and bluish gray fine- to medium-grained

Text-fig. 2. Geologic columns of the Miocene Bihoku group in Miyauci-chô, Shôbara City.
sandstone in upward succession. The lithofacies of the member seems to be variable laterally, and the member contains coaly laminae and drifts of plant fragments besides molluscs.

Molluscan Assemblages

The fossil molluscs were collected from the 7 horizons of different localities in the Lower Sandstone member of the Bihoku group at Miyauchi-chô (Text-figs. 1, 2 and Table 1). The shells are abundantly found at Horizons 2, 4, 5, 6, and 7, but rare at Horizons 1 and 3. Accordingly, the relative abundance of each species at each of the former horizons is noted in Table 1, whereas that of the latter ones is not shown. The molluscs reported by OTUKA (1938) might be obtained from the middle part of the columns (Horizons 5 and 6 in Text-fig. 2). The brief description of lithology, modes of molluscan occurrence, and species composition of molluscs at each horizon are as follows:

Hor. 1:—Light brown mudstone to medium-grained sandstone. A few fragmental molluscs are found with plant remains. They are Crassostrea sp., Cyclina sp., Batillaria tateiwa, B. yamanarii, etc.

Hor. 2:—Purplish gray mudstone to fine-grained sandstone with coaly laminae. Shells are clustered or sporadic. The shells of oysters are not articulated. A large number of specimens of Crassostrea sp. were collected with a few individuals of Cyclina takeyamai.

Hor. 3:—Light to moderate brown fine-grained sandstone. A few fragments of molluscs occur sporadically. Among them, Batillaria yamanarii is noticeable.

Hor. 4:—Yellowish brown, muddy, medium- to coarse-grained sandstone. Most shells are obtained from a discontinuous fossil layer, and crassostreas occur as the nodules of fossil clusters. Some geloinas are articulated, but the other bivalves are scarcely jointed. Cyclina takeyamai is very abundant. Crassostrea gravitesta, Geloina yamanei, and Anadara daitokudoensis are common. Few or rare species are Saxolucina k-hataii, Soletellina minoensis, Vicarya callosa japonica, Batillaria tateiwa, etc. The species association is peculiar to this horizon.

Hor. 5 and 6:—Dark gray mudstone to fine-grained sandstone. Most molluscs are scattered, but the lens at Hor. 6 is made up of densely aggregated oyster shells. Batillaria tateiwa, B. yamanarii and Crassostrea gravitesta are the dominant species, and Cyclina takeyamai and Vicarya callosa japonica are commonly found. The rare forms are Anadara daitokudoensis, Lunatia meisen-sis, etc.

Hor. 7:—Medium gray mudstone to fine-grained sandstone. Molluscs occur sporadically or clusteringly, and some nodules are composed of clustered shells. Some bivalves remain intact. Batillaria yamanarii and Crassostrea gravitesta are abundant as well as at Hors. 5 and 6. Cyclina takeyamai and Vicarya callosa japonica are associated commonly. The rare species are Anadara daitokudoensis, Saxolucina k-hataii, Meretrix sp., Trapezium sp., Carditia cf. toyamaensis, Soletellina minoensis, etc. The number of rare species are more than those of Hors. 5 and 6.

The molluscan species listed in Table 1 are all common constituents of the Early to Middle Miocene Kadosawa (Kurosedani)-type fauna (CHINZEI and IWASAKI, 1967; IWASAKI, 1970; TSUDA, 1960) which was distributed widely in Japan and Korea at that time. Judging
Table 1. Fossil molluscs from the Miocene Bihoku group at Miyauchi-chō, Shōbara City (Loc. 2 of OTUKA, 1938).

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<td>Vicarya callosa japonica Yabe and</td>
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<td>Vicaryella bacula (Yokoyama)</td>
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<td>Cerithidea tokunagai Otuka*</td>
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R <5%, F 5-10, C 10-20, A 20-30, VA >30. 1, 3, 5, 6, 7: Batillaria-Grassostrea assemblage, 2, 4: Grassostrea-Cyclina-Geloina assemblage.

* OTUKA (1938) indicated that the type locality of Cerithidea tokunagai is Loc. 1 (at Suketo) of Text-fig. 1 on p. 40 of his article. On the other hand he marked the occurrence of C. tokunagai only at Loc. 2 (in Shinchiku-chō) in his Table 1, and he also noted that the locality is Shinchiku-chō (Loc. 2) on the label of the type specimen stored in the University Museum, University of Tokyo. Accordingly, the type locality of C. tokunagai seems to be OTUKA's Loc. 2 at Miyauchi-chō (formerly Shinchiku-chō).
from the species composition at each horizon, the molluscan fauna found in the Lower Sandstone member can be divided into the following two assemblages, namely *Batillaria-Crassostrea* assemblage (Hors. 1, 3, 5, 6 and 7) and *Crassostrea-Cyclina-Geloina* assemblage (Hors. 2 and 4).

The former assemblage is distributed in most parts of the member, but the occurrence of the latter is restricted within a part of the basal horizon of the member. The idealized relationship of both assemblages to the other Kadonosawan assemblages is shown in Table 2. These molluscan habitats might not be so far from the place of burial, judging from the observation of modes of fossil occurrence and sediments enclosing fossils.

OTUKA (1938) concluded that the marine fauna of the Lower Sandstone member of the Bihoku group is rich in genera that are common with the inhabitants of estuaries or shallow inland seas. In addition to OTUKA's conclusion, the mangrove coast (SHEPARD, 1963) or the estuarine mangrove swamp (EMERY et al., 1957) of tropical or subtropical regions is possibly inferred as a depositional environment of the Lower Sandstone member of the group, judging from the generic composition of the *Crassostrea-Cyclina-Geloina* assemblage and lithofacies as OYAMA (1950) inferred on the Kurosedani fauna of the Toyama basin.

Table 2. Correlation table of the bay head assemblages in the Kadonosawa-type fauna.

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<tr>
<td>Batillaria-Crassostrea</td>
<td>Crassostrea-Batillaria</td>
<td>Arcid-Potamid fauna</td>
<td>Ostrea</td>
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<td>Crassostrea-Cyclina-Geloina</td>
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<td>Batillaria</td>
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<td>Telescopium-Geloina</td>
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Remarks on the Molluscan Assemblages

The *Batillaria-Crassostrea* assemblage at Miyauichi-chō is equivalent with *Crassostrea-Batillaria* assemblage which is commonly found at the basal part of the Bihoku group distributed in the eastern Setouchi region (ITOGAWA, 1971). It also corresponds to the *Batillaria* and *Ostrea* assemblages of the Kadonosawa area in Northeast Japan where the typical Kadonosawa fauna is developed (CHINZEI and IWASAKI, 1967). At Miyauichi-chō, it is impossible to divide the *Batillaria-Crassostrea* assemblage into two assemblages, since batillarias are usually associated with crassostreas at the basal part of the Bihoku group, as pointed by ITOIGAWA (1971). The *Batillaria* and *Ostrea* assemblages, however, were separated from each other in the Kadonosawa area (CHINZEI and IWASAKI, 1967).

The combination of *Crassostrea-*
Cyclina-Geloina is new to science and much interesting to us. Up to now, geloinas have been reported from the Eocene of Hokkaido (NAGAO and ŌTATUME, 1943; MINATO, 1950), and from the Early to Middle Miocene of the area near Toyama City (OYAMA, 1950) and two other areas in Japan. The Early to Middle Miocene geloinas were found in the Arcid-potamid fauna (TSUDA, 1965) of the Kurosedani fauna (TSUDA, 1960). The Arcid-potamid fauna, also belonging to the Kadonosawa-type fauna, was collected from the lower part of the Kurosedani formation of the Yatsuo group near Toyama City of the Hokuriku district. According to TSUDA (1965), the characteristic and abundant species of the fauna are as follows: Anadara hakehataensis, A. kurosedaniensis, Striarca uetsukiensis, Cuculaea toyamaensis, Ostrea gravitesta, Geloina stachi, G. yamanai, Cyclina mitsuchii, Phaxas izumoensis, Protorotella yuantiensi, Cerithidea hanapokuensis, C. yatsuoensis, Vicarya yokoyamai, Vicaryella notoensis, Chicoreus asanoi, and C. notoensis.

Judging from the constituents mentioned above as well as from the species list of the Kurosedani fauna (TSUDA, 1960), the Arcid-potamid fauna is considered to be the mixture of the Ostrea, Batillaria, and Telescopium-Geloina assemblages in the idealized Kadonosawa-type fauna (IWASAKI, 1970), or of the Batillaria-Crassostrea and Crassostrea-Cyclina-Geloina assemblages at Miyauchi-chō. The Telescopium-Geloina assemblage was named at first as the Telescopium-Geloina biocoenosis by OYAMA (1950), and was regarded as the fauna proper to mangrove swamps of tropical and subtropical regions. In this assemblage (Assemblage I of the Kurosedani fauna by TSUDA, 1960), the forms of mangrove swamps proper, such as Geloina and Telescopium, are associated with Anadara, Ostrea, Vicarya, Vicaryella, Cerithidea, etc., which are the constituents of the Batillaria and Ostrea assemblages of the Kadonosawa-type fauna.

Comparing the Crassostrea-Cyclina-Geloina assemblage with the Telescopium-Geloina assemblage, Crassostrea, Cyclina, Geloina, and Anadara are common in both assemblages, but the former lacks the other characteristic elements of mangrove swamps, such as Littorinopsis mioidelicatula and Telescopium schencki of the latter assemblage. However, the Crassostrea-Cyclina-Geloina assemblage is certainly comparable with the Telescopium-Geloina assemblage in the Kadonosawa-type fauna, since the principal constituents are common with each other.

TSUDA (1965) reported Geloina yamanei, Littorinopsis mioidelicatula, and Terebratula spp. from the Miocene Iwafune formation near Murakami of Niigata Prefecture, Northeast Japan. NISHIDA and CHIHARA (1966) listed the following molluscs from the Miocene Ōyama formation of the Kamigō group in the Nishitagawa coal-field area of Yamagata Prefecture, Northeast Japan, besides the molluscus reported by TANAI (1951): Anadara hakehataensis, Arca spp., Clementia papyracea, Cutellus sp., Geloina yamanei, Joannisella takeyamai, and Vicarya yokoyamai (discriminated by TSUDA).

Of the other characteristic form of Telescopium from the Miocene formations in Japan, SHUTO (1963) reported Telescopium sp. with Anadara? daitokuodenisi and Trachycardium shiobaraensis from the Miocene Ōyatori formation of the Sakatani subgroup of the Nichinan group in the Nichinan area, Miyazaki Prefecture, Kyushu. IWASAKI (1970)
found *Telescopium telescopium* along with *Anadara "kakehataensis"*, *Ostrea gravitesta*, *Batillaria yamanarii*, *Joannisella cumingii*, *Cyclina japonica*, *Clementia papyracea*, *Polinices meisensis*, etc. in the Miocene Sakai formation of Tanega-shima Island, Kagoshima Prefecture, Kyushu. OKAMOTO, TAKAHASHI and TERACHI (1971) also found a specimen of *Telescopium schencki* in the *Modiolus-Cyclina-Turritella-Patinopecten* assemblage from the Miocene Kawaii formation of Nima-chô, Shimane Prefecture, Sanin district.

These Miocene assemblages containing *Geloina* and *Telescopium*, except the *Modiolus-Cyclina-Turritella-Patinopecten* assemblage in Nima-chô, can be compared with the *Telescopium-Geloina* assemblage. Accordingly, it is concluded that *Telescopium*, *Geloina*, and the other elements of mangrove swamps proper are usually associated with the constituents of the *Batillaria* and *Ostrea* assemblages or the Arcid-potamid fauna in the Kadonosawa-type fauna. The occurrence of the *Telescopium-Geloina* assemblage may be expected from the Early to Middle Miocene formations containing the Arcid-potamid fauna in Japan when the collection of fossils is made carefully.

TAN (1938) studied the *Telescopium-Geloina* fossil biocoenosis from the T'ouk'oshan (Tôkazan) group in Taiwan. The association of his Loc. B in the Upper Pliocene to Lower Pleistocene "Konglin (Kyûrin)" formation at Sao-keng, Kuanhsi-chen, Hsinchu-Ilsien (Sôko, Kansai-syô, Sintiku Prefecture) is characterized by the occurrence of following common or abundant species: *Cyclina sinensis*, *Assiminea kansaiensis*, *Melanooides subscabroides*, *Cerithidea ornata*, C. cingulata, *Telescopium telescopium*, and *Ellubium aurisjudaee*.

In this association *Ostrea gigas*, *Polymesoda (Geloina) luchuana*, and *Cyclina sinensis* are more or less rare constituents. Comparing this with the *Crassostrea-Cyclina-Geloina* assemblage from Miyauchi-chô, however, *Crassostrea gravitesta*, *Geloina yamanei*, and *Cyclina takeyamai* are rather abundant and main constituents at Miyauchi-chô. MARTENS (1897) listed the recent brackish water molluscs from Indonesia. In generic level, the molluscs of Miyauchi-chô are in some common with those of Indonesia.

**Description of Geloina Species**

**Family Corbiculidae GRAY, 1847**

**Genus Geloina GRAY, 1842**

**Geloina yamanei** OYAMA, 1950

Pl. 47, figs. 1, 2, 3, and 4


**Material:**—Twenty five specimens of *Geloina* were collected; most of them are ill-preserved. A few specimens (GSEH-OK-H001—H003) are fairly well-preserved and enough to identify with *G. yamanei*. The specimens are kept at the Geological Laboratory, Shinonome School, Faculty of Education, Hiroshima University.

**Description:**—Shell medium to large in size for the genus, quadrangularly or subtrigonally oval, inequilateral and moderately thick; umbo at about a third from the anterior end, blunt, prosogyrous, and somewhat below the summit of valve; antero-dorsal margin straight and steeply sloped; anterior end roundly angulated; postero-dorsal margin almost straight or slightly convex, posterior margin slightly convex, subvertical; posterior end subtruncated,
making blunt angles with the postero-dorsal and ventral margins; antero- to postero-ventral margin forms a large arc. Surface ornamented with concentric fine growth-lines and low wrinkles; and with weak furrows running from the umbo to the postero-ventral extremity. Internal margin smooth; ligamental suture distinct; ligamental groove long and excavated; nymph also long; post-ligamental cutting deeply V-shaped; hinge broad and solid; dentition of left valve three cardinal and an anterolateral and a postero-lateral teeth; anterior cardinal tooth short and subvertical, middle one medium and oblique, and posterior one long and very oblique; bifurcation observable only on the middle cardinal; anterior lateral tooth short and very strong like cuspid, posterior one long and weak.

**Measurements (in mm):**

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Length</th>
<th>Height</th>
<th>Depth</th>
<th>H/L</th>
<th>D/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shōbara Pl. 47, fig. 1</td>
<td>73.0</td>
<td>65.4</td>
<td>(1/2)19.3</td>
<td>0.90</td>
<td>0.53</td>
</tr>
<tr>
<td>Shōbara Pl. 47, fig. 3</td>
<td>57.2</td>
<td>50.5</td>
<td>(1/2)12.8</td>
<td>0.88+</td>
<td>0.45</td>
</tr>
<tr>
<td>Topotype Pl. 47, fig. 4</td>
<td>60.2</td>
<td>53.4</td>
<td>34.8</td>
<td>0.89</td>
<td>0.58</td>
</tr>
<tr>
<td>Holotype OYAMA (1950)</td>
<td>57.5</td>
<td>52</td>
<td>(1/2)14</td>
<td>0.90</td>
<td>0.49</td>
</tr>
</tbody>
</table>

**Remarks:**—The present specimens are morphologically quite similar to the holotype of Geloina yamanei (OYAMA, pl. 3, figs. 3a, b, 1950) and the topotype (pl. 47, fig. 4), which were collected from the Kurosedani formation of the Yatsuo group in the Hokuriku district. The topotype is more or less trigonal than the holotype and the present specimens, and has furrows running from the umbo to the postero-ventral end. The length-height proportion among the specimens of *yamanei* is fairly constant, i.e. 0.88+ to 0.90, but the length-depth proportion of them is more variable, i.e. 0.45 to 0.58 as seen on the table of measurements.

*Geloina stachi* (OYAMA, pl. 3, figs. 1-2a, b, 1950) is found in association with *G. yamanei* from the Kurosedani formation, but *G. stachi* is discriminated from the latter in having laterally elongated and more oval shell form (Length-height proportion is 0.80 to 0.85).

*Geloina yamanei* differs from *Geloina hokkaidoensis* (NAGAO and ÔTATUME, pl. 1, figs. 1-4; pl. 2, figs. 1-7, 1943; MINATO, fig. 10, 1950), which occurred in the Eocene of Hokkaido, in having larger and lower shell form. The present specimens are distinctive from *Geloina bibaiensis* (NAGAO and ÔTATUME, pl. 1, fig. 5, 1943; MINATO, fig. 11, 1950), which was collected also from the Eocene of Hokkaido, in having not protruded umbo and truncated posterior end.

The present species has a close resemblance in the shell form to the recent *Geloina sinuosa* (DESHAYES)* (CLESSIN, pl. 45, fig. 1, 1879; OYAMA and ISHIYAMA, in fig. 6, 1963; SHIKAMA, pl. 40, fig. 6, 1964), which includes *Geloina fissidens*.
(PILSBRY, pl. 8, figs. 5-6, 1895) as the synonym, distributed in the southwestern Pacific region and Okinawa, but it has rather angulated and trapezoidal outline and weaker furrows on the posterior surface than those of *G. sinuosa*.

The present form is less similar to the recent *Geloina papua* (LESSON) (CLESSIN, pl. 14, figs. 7-8, 1879; KURODA and HABE, fig. 943, 1965), which includes *Geloina luchuana* (PILSBRY, pl. 9, figs. 4-5, 1895; HABE, fig. 233, 1951-53; HABE, pl. 55, fig. 5, 1961) and *Geloina yaeyamaensis* (PILSBRY, pl. 8, fig. 7; pl. 9, fig. 6, 1895) as the synonym, found in Okinawa and the southwestern Pacific region. It is distinguished from *G. papua* in having more rounded and higher shell outline and furrows on the posterior area.

*Locality:*—Miyauchi-chô, Shôbara City, Hiroshima Prefecture (Loc. 4 in Text-fig. 1).

*Lithology:*—Yellowish brown (or medium gray) medium- to coarse-grained sandstone.

References


EMERY, K.O., STEVENSON, R.E. and HEDGEPETH, J.W. (1957): Estuaries and in-...* The name of *Geloina sinuosa* is generally used for the geolinas having furrows on the posterior area, but *G. sinuosa* (DESHAYES) 1854 is regarded as a synonym of *Geloina coaxans* (Gmelin) 1791 according to Dr. HABE (personal communication).


text-fig. 1, pls. 1-3.


Biboku
Kadonosawa
Kurosedani
Miyauuchi
Murakami
Nichinan
Nima
Nishitagawa

Setouchi
Shinchiku
Shiomachi
Shôbara
Suketo
Tanegashima
Toyama
Yatsuo

備北
門ノ沢
黒瀬谷
宮内
村上
日南
仁摩
西田川

瀬戸内
新築
塩町
庄原
助藤
種子島
富山
八尾

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Explanation of Plate 47

(All figures in about natural size, unless otherwise stated)


Figs. 5a, b–7a, b. Anadara (Hataiarca) daitokudoensis (MAKIYAMA). 5a, b. Reg. No. GSEH-OK-H004; Loc. No. 4. 6a, b. Reg. No. GSEH-OK-H005; 7a, b. Reg. No. GSEH-OK-H006; Loc. No. 7.

Figs. 8a, b. Cardilia cf. toyamaensis TSUDA. Reg. No. GSEH-OK-H007; Loc. No. 7.

Fig. 9. Solatellina minoensis YOKOYAMA. Reg. No. GSEH-OK-H008; Loc. No. 7.

Fig. 10. Vicaryella bacula (YOKOYAMA). Reg. No. GSEH-OK-H009; Loc. No. 6.

Fig. 11. Vicarya callosa japonica YABE and HATAI. Reg. No. GSEH-OK-H010; Loc. No. 7.

Fig. 12. Batillaria (Tateiwaia) yamanarii MAKIYAMA. Reg. No. GSEH-OK-H011; Loc. No. 6.