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Note of Orbitolinid foraminifera from the Lower Aptian (Cretaceous) Shimanoshita Mudstoner, Lower Yezo Group, Hokkaido, Japan

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Abstract

Orbitolinid foraminiferal assemblages known from the Takisato *Orbitolina* Limestone, Shimanoshita Mudstone, Lower Yezo Group are described briefly, and the early Aptian is assigned for the assemblage.

Introduction and Acknowledgements

The Takisato *Orbitolina* Limestone, Shimanoshita Mudstone, Lower Yezo Group has been known as the occurrence of *Orbitolina,* and its related genera and species (Yabe and Hanzawa, 1926, Hashimoto, 1936, Matsumaru, 1971, 1973, 2005, Matsumaru and Furusawa, 2005). The *Orbitolina* is the diagnostic genus known from the Barremian to Cenomanian Stages in the Cretaceous Epoch in the Tethys to Indo-Pacific regions (Hofker, 1963, 1966; Schroeder, 1963, 1964; Zhang, 1986; Hashimoto and Matsumaru, 1974, 1977; Yabe and Hanzawa, 1926, Matsumaru, 1971, 1973, 2005, and others) and Carribbean region (Roemer, 1849, 1852; Douglass, 1960a, 1960b and others). The detailed age assignment for the Takisato *Orbitolina* Limestone has to be mentioned from the geological occurrence of *Orbitolina* and their related genera and species. The senior author (K.M.) has hitherto collected samples from the *Orbitolina* bearing sandstones and limestones from Japan, especially from the Takisato *Orbitolina* Limestone, Shimanoshita Mudstone, Lower Yezo Group, Ashibetsu City, Hokkaido; Tanohata and Hiraiga Formations, Miyako, Iwate Prefecture; Koma *Orbitolina* Sandstone, Saitama Prefecture; Ishido Formation, Sanchu Graben, Gunma Prefecture; and Hanoura Formation, Monobegawa Group, Tokushima Prefecture. The detailed species description has described as the manuscript by the senior author (K.M., 2005MS). Although all the samples in Japan yields *Orbitolina* and their related genera and species, only few specimens preserved embryonic chambers are occurred from the sandstones and limestones, except for the Takisato *Orbitolina* Limestone, and further research are needed for study to know all the faunal assemblages from the Cretaceous strata in Japan. However, in order to better understand the Japanese *Orbitolina* and related species, the authors have researched for the Takisato *Orbitolina* Limestone for four times from 2004 to the present. In order to study the

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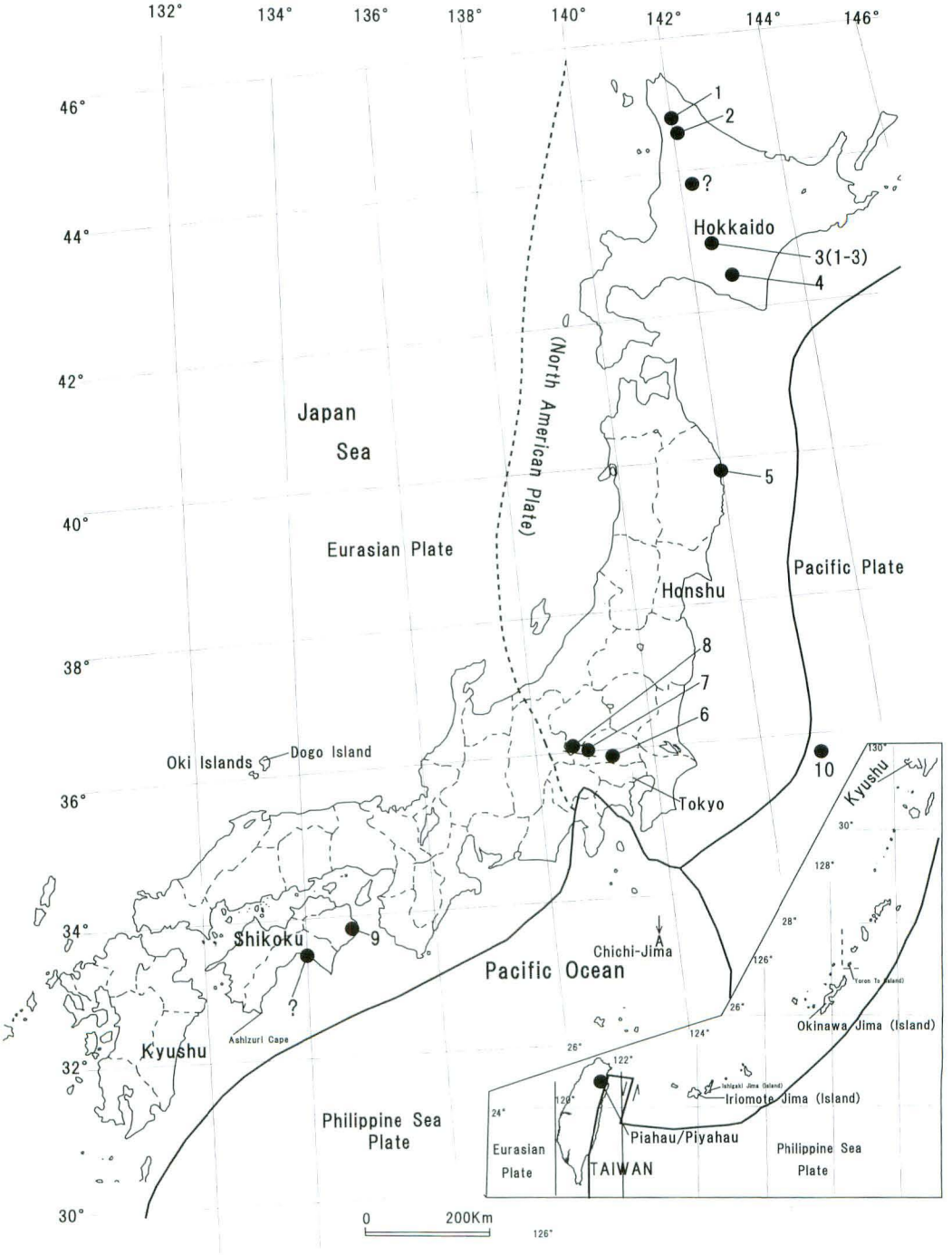

Fig. 1 Map showing the locality of *Orbitolina* in Japan and Taiwan.

Takisato *Orbitolina* Limestone, Ashibetsu City, the authors have to get the permission of the Sorachi Forest Administer Office, Iwamizawa City, for the field research. Moreover, the field condition in there has always to be checked, because of the natural disaster due to lacking the path. The aim of the short note describes the data known from the present status of researches. The authors express their cordial thanks to the officers of the Sorachi Forest Administer Office, for the permission of the research, Mrs. Watanabe Kazuhiro and Hidenari Inaoka, Students of Saitama University, for their kind help, and Mr. Shuji Shimozono, for his research assists. This work was supported partial by a Field Research Fund from the Saitama University.

Age of the *Orbitolina* assemblage

1. Shimanoshita location (Fig. 1- 3; Fig. 2)

The detailed sample location is explained in the present status as the exposure along the old Nemuro Line between the Shimanoshita Bridge and Takitomi Bridge, beside the left bank of the Sorachi River (Locality No. 3, Matsumaru, 2005, Text-figure 1). Two sample locations are missing,

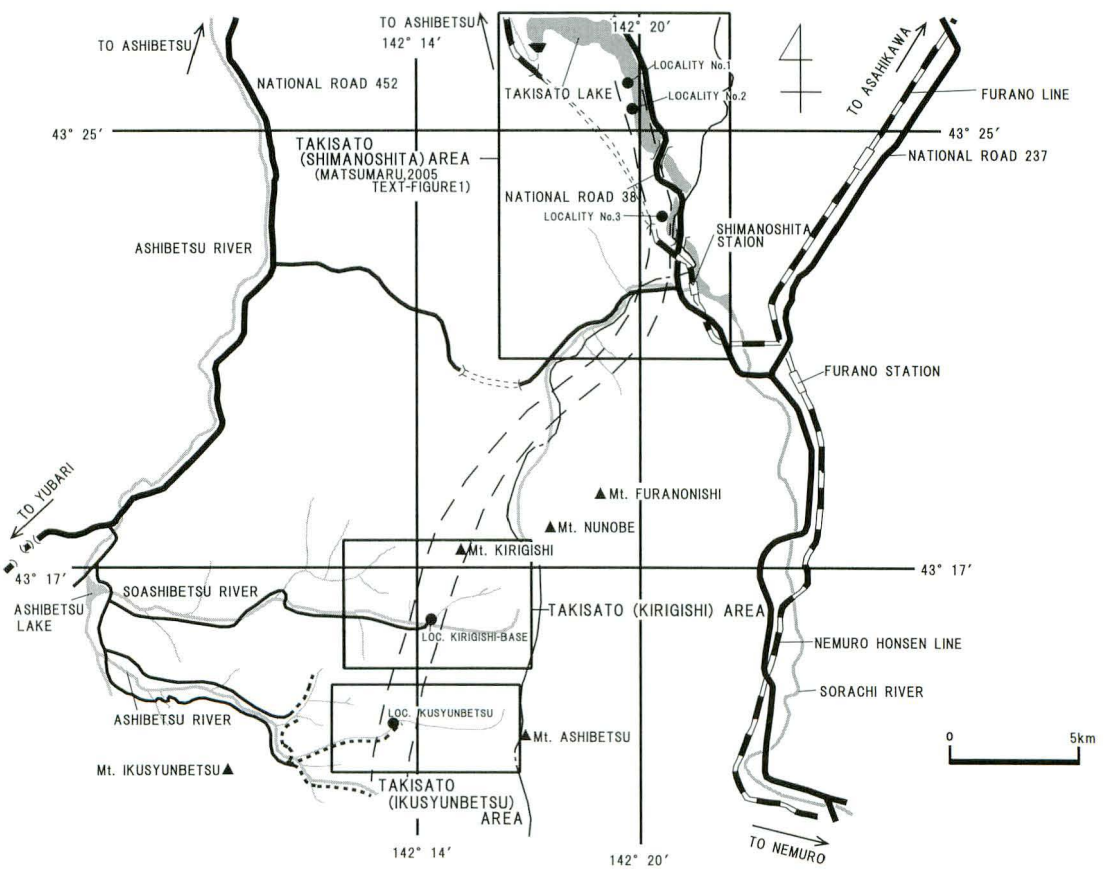

Fig. 2 Map showing the fossil localities of Shimanoshita, Kirigishi and Ikushunbetsu of the Takisato *Orbitolina* Limestone, Ashibetsu City, Hokkaido.

because of the construction of the Takisato Dam. The gray limestone pile (ca. 40 m thick) conformably covered the black slate, alternation of black slate and thin sandstone of the Shimanoshita Mudstone is composed of bedded black shale bearing impure limestone, bedded light gray medium sandstone bearing limestone, and massive, coral and algae bearing gray coloured limestone in ascending order. The top massive limestone (Wackstone to Packstone) yields fossil allochems mostly foraminifera, calcareous algae, mollusks, and echinoid spines, in addition to oolite, pellets, intraclasts and orthochemical constituents.

The Orbitolinid foraminifera such as *Palorbitolina lenticularis, Mesorbitolina parva, Praeorbitolina* sp., and *Praeorbitolinoides japonica,* in addition to smaller benthic foraminifera and very few planktic foraminifera are found from the top limestone. Then the early Aptian is assigned to the assemblages stated above, based on the joint occurrence of *Palorbitolina lenticularis* and *Mesorbitolina parva.*

2. Kirigishi location (Fig. 1, 3-2; Fig. 2)

The location of Mt. Kirigishi (1073m), which is composed of the "Takisato" *Orbitolina* Limestone is found in the geological map by Hashimoto (1936, pl. 22). This location is placed at the point of 17km SSW from the Shimanoshita locality, and is found at the gray limestone exposure along the Sou-Ashibetsu River, about 10km east from the Ashibetsu Lake. The total thickness of the limestone is estimated from 16 to 20m thick. The authors prepared about 200 thin sections from the coral, algae, and bryozoan bearing limestones (Wackestone and Packstone), but the observed *Orbitolina* under the microscope is few in occurrence. *Mesorbitolina parva* and *Palorbitolina lenticularis* can, however, be found. Moreover, this limestone yields *Iraqia simplex.* This species has a short range from the Late Bedoulian Stage (Early Aptian) by Moullade and others (1985). This *Iraqia simplex* bearing samples are found from the cobble sized rolling limestones, which are coming from the Mt. Kirigishi.

3. Ikushunbetsu location (Fig. 1, 3-3; Fig. 2)

The location of the "Takisato" *Orbitolina* Limestone is found from the geological map by Hashimoto (1936, pl. 22), and is placed at the point of 4km south from the Kirigishi locality. The exposure of the Takisato *Orbitolina* Limestone is situated about 15km southeast along the Ashibetsu River from the Ashibetsu Lake. The total thickness of the limestone is about 16m thick. The mollusk, coral, algae and echinoid spine bearing limestone (Packstone) yields *Mesorbitolina parva, Mesorbitolina minuta, Praeorbitolina* sp., and others. Then the Takisato *Orbitolina* Limestone at Ikushunbetsu locality seems to be younger horizon than other Takisato *Orbitolina* Limestone at the Shimanoshita and Kirigishi localities, judging from the Orbitolinid species. As a whole, the age of the Takisato *Orbitolina* Limestone is assigned to the early Aptian.

Geological and geographical significances of the Takisato *Orbitolina* Limestone

The Takisato *Orbitolina* Limestone can be seen as a series of the reefal limestone during the early Aptian Stage. The scope of the limestone is estimated as a reefal limestone about 30km length and 16 to 40m thick. Considering the present geographical situation from 43°14′ N. Lat. to 43°26′ N. Lat. of the Takisato *Orbitolina* Limestone, Ashibetsu City, Hokkaido, it is assumed that the tropical currents during the early Aptian has been more superiority than the present. The authors have to do the research of the sedimentology and Sr isotope of carbonates, in order to know the paleoenvironment, and as the results of the research, the authors will get the fruitful knowledge of the depositional environment of the Takisato *Orbitolina* Limestone, as a geological significance. This should be confirmed by the further study.

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