

Some New Species of Bivalves from the Oligocene Poronai Formation

By

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In some districts of northern Japan, the upper Oligocene series comprise the molluscan fauna called Poronaian fauna in the lump. It is found in the Poronai group of Ishikari coal field, the Tappu group of Rumoi coal field, the Ombetsu group of Kushiro coal field and the Asagai formation of Joban coal field. The fauna is represented by about 150 molluscan species in total (MIZUNO, 1964).

The majority of the species had been clarified by YOKOYAMA (1890), YOKOYAMA (1924), MAKIYAMA (1934), TAKEDA (1953), HIRAYAMA (1955) and other authors. Through the writers' studies, however, some undescribed forms and those to be revised were found. They occur abundantly through the series or characteristically in a certain horizon. In this article, the following new bivalve species from the Poronai formation are described and illustrated.

Nucula hokkaidoensis MIZUNO et INOUE, sp. nov.

Crassatellites teshimai INOUE et MIZUNO, sp. nov.

Venericardia satisparva MIZUNO et INOUE, sp. nov.

Merisca onishii INOUE et MIZUNO, sp. nov.

Periploma ezoense MIZUNO et INOUE, sp. nov.

The Poronai formation developed mainly in the Yubari district of Ishikari coal field was biostratigraphically investigated by TESHIMA (1955, 1958) in Shimizusawa area, by ONISHI *et al.* (1963) in Oyubari area and by MATSUNO *et al.* (1964) in the type Poronai (= Horonai) area. According to these contributions, the formation is vertically divided into ten zonules, Ao, A, B, —I in every area, based upon successively divergent megafaunal assemblages, as shown in Table 1.

Among the five new species, *Nucula hokkaidoensis* occurs rarely through the formation, but is rather often found in the E zonule. This species is also the constituent member of the Poronaian fauna in the Kushiro coal field.

Crassatellites teshimai is fairly restricted to and but rather commonly found in the upper half of the formation, namely the zonules upper than E. It represents a form belonging to the particular type of the genera without internal crenulation of shell margin, as well as many other species of *Crassatellites* in the Japanese Paleogene.

Venericardia satisparva tends to be restricted to the lower part of the formation, occurring in the A and B zonules, and is characterized by very small shell sculptured with many (more than thirty-two) radial ribs.

Much occurrence of *Merisca onishii* is restricted to the upper part of the formation like as *Crassatellites teshimai*. It tends to be rather commonly found in the E, F and G zonules, and is characterized by the shape somewhat similar to *Macoma sejugata* YOKOYAMA, a member of the Poronaian fauna of northern Japan.

Periploma ezoense is one of more or less ubiquitous form among the Poronaian molluscs. The

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species, clearly distinguishable from *P. besshoense* in outline, is commonly found through the whole column of the Poronai and also in the Oligocene series of Kushiro coal field. It is not associated with *P. besshoense* in a outcrop in general.

Description of new species

Family Nuculidae

Genus *Nucula* LAMARCK, 1799

***Nucula hokkaidoensis* MIZUNO et INOUE, sp. nov.**

Pl. 30, figs. 4, 5

Description: Shell moderately large for the genus, oval-trigonal, strongly inequilateral and anteriorly somewhat produced, compressed. Antero-dorsal margin obliquely arched, continuing to anterior and broadly rounded ventral margin; posterior margin narrowly convex. Umbo small, pointed and opistogyrous. Surface ornamented with irregularly arranged concentric striae, partly passing to fine riblets. Inner margin of shell smooth. *Dimensions of the holotype*: length 20.0 mm; height, 15.7 mm.

Comparison: The new species is easily distinguished from *Nucula milnei* YOKOYAMA (YOKOYAMA, 1890, p. 195, pl. 22, figs. 2a-c, 3), known species of the genus from the Poronai formation, in more rounded shell having no radial striae.

Type locality: The vicinity of Mitsubishi-Oyubari Coal-mine, Poronai formation.

Remarks: Through the Poronai formation, *Nucula hokkaidoensis* occurs poorly in general, but is rather often comprised in its E zonule. This species is also found in the upper Oligocene Ombetsu group in the Kushiro coal field.

Family Crassatellitidae

Genus *Crassatellites* KRÜGER, 1823

***Crassatellites teshimai* INOUE et MIZUNO, sp. nov.**

Pl. 30, figs. 6-10

Description: Shell rather small, compressed, longer than high, ovately subquadrate, inequilateral; from umbonal area obsolete ridge obliquely running to postero-ventral corner. Anterior margin rather narrowly rounded than the posterior; posterior margin slightly convex and sub-truncated vertically; ventral margin broadly rounded or slightly waved, obliquely ascending forwards to the anterior extremity. Umbo not so prominent, situated at anterior 2/5 to 1/3. Surface of shell ornamented with distinct coarse concentric ribs and numerous fine concentric striae. Inner margin of shell smooth, not crenulated. *Dimensions of the holotype*: length, 31.1 mm; height, 21.2 mm.

Comparison: The most similar species to the new species is *Crassatella pauxilla* YOKOYAMA (= *Crassatellites pauxillus*) (YOKOYAMA, 1925, p. 122, pl. 14, figs. 8-11), in having coarse ribs, but the latter is higher in shape and has internal fine crenulations. *Crassatellites inconspicuus* is another allied form, but it is characterized by not quadrate shell with many fine concentric ribs.

Type locality: The vicinity of Mitsubishi-Oyubari Coal-mine; Poronai formation.

Remarks: *Crassatellites teshimai* exhibits a slight variation in shape of shell as shown in the figures of Pl. 1, namely, its ventral margin becomes to convex, nearly straight, or slightly concave, though

its quadrate form, subtruncated in posterior end, is common to all specimens. Also, its concentric coarse ribs number fifteen to more than twenty and the number seems to be independent to a growth stage of shell, but is peculiar in a individual. The species represents one of the species group which is characterized by having smooth internal margin of shell, commonly found through the Paleogene and a part of lower Miocene in Japan and disappeared from the area around Japan since middle Miocene time.

C. teshimai is not comprised in the lower half of the Poronai formation, but is found only in its upper half, at the horizon upper than the E zonule.

Family Carditidae

Genus *Venericardia* LAMARCK, 1801

Venericardia satisparva MIZUNO et INOUE, sp. nov.

Pl. 30, fig. 11

Description: Shell very small, subcircular, subequilateral, longer than high. Surface of shell ornamented with thirty-two to thirty-four radial ribs, faintly concave forwards. *Dimensions of the holotype*: length 7.5 mm; height, 5.5 mm.

Comparison: The rare form of *Venericardia*, having shell with the radial ribs more than thirty is represented by *Venericardia orbica* YOKOYAMA (YOKOYAMA, 1925, p. 7, pl. 1, fig. 10) and *Venericardia abeshinaiensis* OTUKA, (OTUKA, 1940, p. 94, pl. 11, fig. 10). This new species is distinguished from the other species of *Venericardia* from Japan including those from the Poronai formation and its correlatives in having very many radial ribs. From *V. orbica* it is distinguished in being smaller and higher, and from *V. abeshinaiensis* in having narrower ribs.

Type locality: The river cliff along the river Ikushumbetsu-gawa, Mikasa City; B zonule of Poronai formation.

Remarks: *Venericardia* is one of abundant form through the whole Poronai formation, but the present species is not so common, and tends to be restricted to the lower horizon of the formation, A and B.

Family Tellinidae

Genus *Merisca* Dall, 1900

Merisca onishii INOUE et MIZUNO, sp. nov.

Pl. 30, figs. 1a-c

Description: Shell moderately large, transversely oval, inequivalve, subequilateral, with apical angle of about 140°. Postero-dorsal margin slightly convex, obliquely running to somewhat subtruncated posterior margin; ventral margin very broadly convex; anterior margin largely rounded. Umbo slightly prominent, situated about at posterior 3/7 of whole length. Pallial sinus deep, finger-shaped, rounded at end, and situated at not higher portion of height of shell. Surface of shell sculptured with very regular numerous fine concentric riblets. Posterior folding of shell very weak. *Dimensions of the holotype*: length, 38.8 mm; height, 28.4 mm.

Comparison: In outline, the present new species resembles *Tellina sejugata* YOKOYAMA (= *Macoma sejugata*) (YOKOYAMA, 1924, p. 14, pl. 2, figs. 9-11), but differs from the latter in having the

regular concentric sculpture of surface of shell.

Type locality: Lower stream of the Nanajūgō-no-sawa, tributary of the river Poronai-gawa (= Horonai-gawa), Mikasa City; E zonule of Poronai formation.

Remarks: *Merisca onishii* is much found in the upper part, E, F and G zonules, though is rarely comprised also in B and D zonules.

Family Periplomatidae

Genus *Periploma* SCHUMACHER, 1817

Periploma ezoense MIZUNO et INOUE, sp. nov.

Pl. 30, fig. 3

Description: Shell moderate in size, transversely oval, compressed, strongly inequilateral, somewhat quadrate in posterior corner. Anterior margin excellently convex, rounded, smoothly continuing to broadly arched ventral margin; postero-dorsal margin short, oblique, rather abruptly turned to subtruncated posterior margin. Umbo situated posteriorly, slightly prominent, opistogyrous. Surface sculptured with concentric fine growth-lines and with irregularly arranged concentric rugose riblets. *Dimensions of the holotype*: length, 34.3 mm; height, 24.3 mm.

Comparison: *Periploma ezoense* is very similar to *Periploma iesakai* OYAMA et MIZUNO (OYAMA and MIZUNO, 1958, p. 16, pl. 1, fig. 13) especially in outline, but is higher than the latter in general. The latter has strongly wrinkled fine ribs of posterior corner which are very obscure in the former, and also the latter has no concentric rugose riblets that characterize the former. The new species is clearly distinguished from *Tellina besshoensis* YOKOYAMA (= *Periploma besshoense*) (YOKOYAMA, 1924, p. 14, pl. 2, figs. 1-5) in having subtruncated posterior margin and having no regular concentric rises. For the convenience of comparison, *P. besshoense* from the Poronai formation is illustrated in Pl. 1, fig. 2.

Type locality: The vicinity of Mitsubishi-Oyubari Coal-mine; Poronai formation.

Remarks: *Periploma ezoense* occurs sporadically throughout the large part of Poronai formation and usually is not associated with *P. besshoense* in a outcrop. *P. ezoense* also occurs in the Poronaian fauna in the Kushiro coal field.

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漸新統幌内層産の二枚貝新種の若干について

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要 旨

北日本地域の漸新世後期貝類群は約 150種の二枚貝・巻貝類からなる。これらについては従来多くの研究があるが、筆者らの研究によれば、かなりの未記載種、あるいは再検討を要する種が含まれている。ここでは、未記載種のうち、次の幌内層のもの 5種の記載をおこなった。

Nucula hokkaidoensis MIZUNO et INOUE, sp. nov.

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Merisca onishii INOUE et MIZUNO, sp. nov.

Periploma ezoense MIZUNO et INOUE, sp. nov.

Table 1 Division of the Poronai formation and occurrences of main molluscan fossils

(after MIZUNO, 1964)

Division	Thickness (m)		Main molluscs * relatively abundant **relatively common × relatively poor	Remarks
	Shimizu-sawa	Poronai		
I	100+	Lack	* <i>Neilonella</i> , <i>Venericardia</i> spp. ** <i>Acila</i> , <i>Portlandia</i> , <i>Thyasira</i> , <i>Crassatellites</i> , <i>Orectospira</i> × <i>Hubertschenckia</i> , <i>Lima</i>	Fossils abundant. (after Teshima, 1955)
H	300	Lack	* <i>Portlandia</i> , <i>Neilonella</i> , <i>Venericardia</i> spp. ** <i>Acila</i> , <i>Yoldia nagaoui</i> , <i>Periploma bes-</i> <i>shoense</i> , <i>Venericardia yokoyamai</i> , <i>Nemo-</i> <i>cardium</i> , <i>Crassatellites</i> , <i>Orectospira</i> × <i>Thyasira</i> , <i>Crenella</i> ?, <i>Psephaea</i>	Fossils abundant; with thick tuffaceous sandstone bed in the middle; <i>Callianassa</i> and <i>Linthia</i> are found. (after Teshima, 1955)
G	300	Lack?	** <i>Portlandia</i> , <i>Neilonella</i> , <i>Nemocardium</i> , <i>Crassatellites</i> , <i>Orectospira</i> , <i>Turritella</i> × <i>Acila</i> , <i>Yoldia nagaoui</i> , " <i>Propeamusium</i> " sp., <i>Tudicla japonica</i>	Fossils rather poor; <i>Linthia</i> is included. (after Teshima, 1955)
F	80~130	200~300+	** <i>Portlandia</i> , <i>Neilonella</i> , <i>Merisca</i> , <i>Lima</i> × <i>Crassatellites</i> , <i>Crenella</i> , <i>Orectospira</i>	Fossils rather poor; tuffaceo- us, with glauconitic fine sand- stone bed in the middle at the type Poronai area; <i>Callianassa</i> , <i>Bathyactis</i> ? and <i>Linthia</i> are found; characterized by <i>Lima</i>
E	30~77	130~300	* <i>Merisca</i> , <i>Periploma besshoense</i> , <i>Denta-</i> <i>lium</i> ** <i>Portlandia</i> , <i>Neilonella</i> , <i>Orectospira</i> , <i>Venericardia yokoyamai</i> × <i>Lima</i> , <i>Acila</i> , <i>Saccella</i> sp., <i>Yoldia nagaoui</i> , <i>Crassatellites</i> , <i>Venericardia akagii</i>	Fossils rather abundant; tuffaceous; <i>Bathyactis</i> ? is found; characterized by <i>Merisca</i>
D	10~150	70~180	* <i>Portlandia</i> , <i>Neilonella</i> ** <i>Yoldia nagaoui</i> , <i>Venericardia yokoyama</i> <i>V. akagii</i> , <i>Dentalium</i> , <i>Orectospira</i> × <i>Macoma</i> , <i>Merisca</i> , <i>Periploma ezoense</i>	Fossils abundant; <i>Callianassa</i> is found; characterized by <i>Portlandia</i>
C	20~150	100	* <i>Acila</i> , <i>Neilonella</i> , <i>Venericardia yokoyamai</i> , <i>Venericardia akagii</i> , <i>Orectospira</i> ** <i>Periploma besshoense</i> , <i>Portlandia</i> × <i>Dentalium</i>	Fossils abundant; character- ized by <i>Callianassa</i> at Shimi- zusawa and Oyubari; <i>Acila</i> nearly exclusively re- stricted to the lower part.
B	100~145	200~450	* <i>Acila</i> , <i>Neilonella</i> , <i>Venericardia yoko-</i> <i>yamai</i> , <i>Orectospira</i> ** <i>Venericardia akagii</i> , <i>V. tokudai</i> , <i>Siphono-</i> <i>dentalium</i> , <i>Yoldia saitoi</i> , <i>Y. nagaoui</i> , <i>Macoma</i> × <i>Periploma ezoense</i> , <i>P. besshoense</i> , <i>reneri-</i> <i>cardia satisparva</i> , <i>Portlandia</i>	Fossils abundant; the upper part characterized by <i>Acila</i> , <i>Neilonella</i> , <i>Orectospira</i> and <i>Venericardia</i> , the lower part characterized by <i>Yoldia</i> <i>saitoi</i> , <i>Venericardia yokoyamai</i> and <i>Macoma</i> .
A	60~0	250~600	** <i>Yoldia sobrina</i> , <i>Macoma</i> × <i>Venericardia yokoyamai</i> , <i>Yoldia laudabilis</i> , <i>Riuguhdrillia rugosa</i> , <i>Siphonodentalium</i>	Fossils very poor; composed of hard fine-grained siltstone
A ₀		70~35	* <i>Palliolium</i> ** <i>Periploma besshoense</i> × <i>Macoma</i> , <i>Neilonella</i> , <i>Siphonodentalium</i> , <i>Isognomon</i> , <i>Portlandia</i>	Fossils rather abundant; basal part composed of sand- stone and conglomerate of about 1 m in thickness, the remaining composed of silty very fine-grained sandstone, reducing the grain size up- wards to sandy siltstone, whol- ly with glauconitic grains.

PLATE
AND
EXPLANATION

(with 1 Plate)

Plate 30

- Figs. 1a-c. *Merisca onishii* sp. nov. Holotype, $\times 1.1$; lower stream of the Nanajūgō-no-sawa, tributary of the river Poronai-gawa (= Horonai-gawa), Mikasa City; E zonule of Poronai formation.
- Fig. 2. *Periploma besshoense* (YOKOYAMA) $\times 1$; Ban-no-sawa, tributary of upper stream of the river Ikushumbetsu-gawa, Mikasa City; A₀ zonule of Poronai formation.
- Fig. 3. *Periploma ezoense* sp. nov. Holotype, $\times 1.1$; the vicinity of Mitsubishi-Oyubari Coal-mine, Poronai formation.
- Figs. 4, 5. *Nucula hokkaidoensis* sp. nov. Holotype, fig. 5 ; figs. 4, 5, $\times 1$; fig. 4, Horonai (= Poronai), Mikasa City, C zonule of Poronai formation; fig. 5, the vicinity of Mitsubishi-Oyubari Coal-mine, Poronai formation.
- Figs. 6-10. *Crassatellites teshimai* sp. nov. Holotype, fig. 6; figs. 6-10, $\times 1$; the vicinity of Mitsubishi-Oyubari Coal-mine, Poronai formation.
- Fig. 11. *Venericardia satisparva* sp. nov. Holotype, $\times 2$; river cliff along the river Ikushumbetsu-gawa, Mikasa City, B zonule of Poronai formation.

