

**ON THE NEW FORMS OF PALEOGENE MOLLUSCS  
FROM JAPAN**

By

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**Introduction**

During this half century, our informations on the paleontology of Paleogene system in Japan have been piled up in voluminous amount through the efforts of many authors. However, there remain yet many new forms of molluscs to be clarified for the progress of this science.

Here, the writers will describe among them the following twenty-one new Oligocene forms discovered from the various areas of Japan.

**New genus**

*Trominina* OYAMA et MIZUNO, gen. nov. (in Buccinidae).

**New species and subspecies** (The names of systems show those from which the holotype occurred)

*Minolia tsuchii* OYAMA et MIZUNO, sp. nov. (Setogawa group)

*Calyptraea sorachiensis* OYAMA et MIZUNO, sp. nov. (Wakkanabe formation, Ishikari group)

*Siphonalia ishikariana* OYAMA et MIZUNO, sp. nov. (Akabira formation, Ishikari group)

*Siphonalia?* *nipponica* OYAMA et MIZUNO, sp. nov. (Maze formation, Nishisonoki group)

*Pseudoperissolax iesakai* OYAMA et MIZUNO, sp. nov. (Shioda formation, Nishisonoki group)

*Saccella hokkaidoensis* OYAMA et MIZUNO, sp. nov. (Hiragishi formation, Ishikari group)

*Acila* (*Truncacila*) *nagaoi* OYAMA et MIZUNO, sp. nov. (Kishima formation, Kishima group)

*Acila* (*Acila*) *shimoyamai* OYAMA et MIZUNO, sp. nov. (Akabira formation, Ishikari group)

*Mytilus mabuchii* OYAMA et MIZUNO, sp. nov. (Omagari formation, Ombetsu group)

*Lima* (*Acesta*) *sameshimai* OYAMA et MIZUNO, sp. nov. (Setogawa group)

*Ostrea eorivularis* OYAMA et MIZUNO, sp. nov. (Shitakara formation, Urahoro group)

*Crassatellites* (*Crassatellites*) *komodai* OYAMA et MIZUNO, sp. nov. (Maze formation, Nishisonoki group)

*Venericardia (Cyclocardia) harukii* OYAMA et MIZUNO, sp. nov. (Higire formation, Nishisonoki group)

*Lucinoma nagaoi* OYAMA et MIZUNO, sp. nov. (Yamaga formation, Ashiya group)

*Thyasira (Conchocele) bisecta omarui* OYAMA et MIZUNO, subsp. nov. (Akabira formation, Ishikari group)

*Pitar sorachiensis* OYAMA et MIZUNO, sp. nov. (Wakkanabe formation, Ishikari group)

*Periploma iesakai* OYAMA et MIZUNO, sp. nov. (Tokuman formation, Nishisonoki group)

#### New names

*Cirsotrema (Cirsotremopsis?) nagaoi* OYAMA et MIZUNO, nom. nov. (for *Epitonium* sp. indet. NAGAO, 1928)

*Venericardia (Cyclocardia) yokoyamai* OYAMA et MIZUNO, nom. nov. (for *Venericardia compressa* YOKOYAMA, 1890)

*Mya grewingki nagaoi* OYAMA et MIZUNO, nom. nov. (for *Mya grewingki* MAKIYAMA, var. *elongata* NAGAO et INOUE, 1941)

Materials of new species and subspecies are all kept in the Geological Department, Geological Survey of Japan, except those of *Cirsotrema (Cirsotremopsis?) nagaoi* OYAMA et MIZUNO and *Saccella hokkaidoensis* OYAMA et MIZUNO; the former is preserved in the Geological and Paleontological Institute, Tōhoku University, and the latter is in the collection of the Geological and Mineralogical Institute, Hokkaidō University.

### Systematic Description

#### GASTROPODA

##### Family Trochidae

Genus *Minolia* A. ADAMS, 1860

*Minolia tsuchii* OYAMA et MIZUNO, sp. nov.

(Plate I, figs. 1a~c)

Holotype: GSJ. Reg. No. 5008 (Internal mould, somewhat broken at the apical and apertural parts)

Type locality: In the vicinity of Ashikubo, Miwa-mura, Abe-gun, Shizuoka-ken. (Setogawa group)

Description: Shell small, turbinate with four whorls, suture distinct. Body whorl large, inflated, sculptured with about nine spiral ribs and wider interspaces with one weak stria on every one; whorls of spire sculptured with about eight spiral ribs; aperture subcircular, columella thickened.

Dimensions of the holotype: Height ca. 0.85 mm; diameter of the last whorl 0.84 mm

Comparison: This new species somewhat resembles *Minolia funiculata*

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YOKOYAMA, 1890, upper Oligocene species from Central Hokkaidō, but differs from the latter in having more slender whorls and fewer spiral ribs on body whorl. Further, it differs from *Minolia subangulata* KURODA et HABE, 1952 in having fewer whorls.

Geologic range: (Lower?) Oligocene

Geographic distribution: Central Honshū

Family Epitoniidae

Genus *Cirsotrema* MÜRCH, 1852

Subgenus *Cirsotremopsis* THIELE, 1928

*Cirsotrema* (*Cirsotremopsis*?) *nagaii* OYAMA et MIZUNO, nom. nov.

(Plate I, figs. 18 a~c)

1928, *Epitonium* sp. indet. NAGAO, Sci. Rep., Tōhoku Imp. Univ., Ser. 2, Vol. 12, No. 1, p. 93(83), pl. 15, fig. 7.

Description and locality are given originally by NAGAO (1928).

Holotype: IGPS. Reg. No. 36183 (broken in the apical part of shell)

Type locality: "Beach rocks, west of Hachiman-zaki, Wakita, Wakamatsu-shi, Fukuoka-ken" (after NAGAO, 1928).

Description: "Shell rather small; probably high-turreted, penultimate whorl being slightly narrower than the body whorl and slowly increasing in diameter downward; suture distinct and deep. Each whorl convex, longitudinally ribbed and spirally striated; ribs 9-10 in number, rather narrow, slightly oblique, sharp, prominent and discontinuous from one whorl to the next, with the interspaces flat and almost thrice as broad as the ribs; two or three ribs very broad, thick, and roundly flat on top, growing to smooth varices spiral striae fine, and crowded, each alternated with one or two finer striae. Body whorl rather small; base smooth and provided with a bounding keel; aperture small, subcircular, and surrounded by discontinuous thickened lips; no defined umbilicus." (after NAGAO)

Geologic range: *Venericardia vestitoides* zone (upper Oligocene)

Geographic distribution: Northern Kyūshū

Family Calyptraeidae

Genus *Calyptraea* LAMARCK, 1799

*Calyptraea sorachiensis* OYAMA et MIZUNO, sp. nov.

(Plate I, figs. 6 a, b)

Holotype: GSJ. Reg. No. 5030

Type locality: Naié-machi, Sorachi-gun, Hokkaidō (exactly unknown). (Wakkanabe formation, Ishikari group)

Description: Shell large, with three whorls; sutures obscure. Spire high, more or less oblique; apex blunt. Aperture large, very oblique, nearly circular. Surface of the shell ornamented by many fine growth-lines.

Dimensions of the holotype: Height ca. 10 mm; major diameter of body whorl 29.5 mm

Comparison: This new species is characterized by its high and oblique spire, and is easily distinguished from the known species of other forms.

Geologic range: Lower Oligocene

Geographic distribution: Central Hokkaido

Buccinidae

Genus **Trominina** OYAMA et MIZUNO, 1958, gen. nov.

Type species: *Ancistrolepis japonicus* TAKEDA, 1953

Shell comparatively large, rather thin, fusiform, with high spire. Whorls rather high, not very numerous in number with two prominent keels, one of which is situated almost on the lower suture. Body whorl generally with two keels as in *Trichotropis*, but the lower one rarely obsolete. Spiral sculpture except keels and axials not prominent. Aperture oval, with short canal.

This new genus differs from *Neptunea* RÖDING, 1798, with high spire and two (or one) keels. *Clinopegma* GRANT et GALE, 1931 has two keels, but both of them are situated on the subsutural part of whorls.

This genus contains following species:

*Ancistrolepis japonicus* TAKEDA, 1953

*Ancistrolepis hokkaidoensis* HAYASAKA et UOZUMI, 1951

*Ancistrolepis ishikariensis* HAYASAKA et MATSUI, 1951

*Ancistrolepis bicordata* HATAI et KOIKE, 1957

*Melongena angasiana* YOKOYAMA, var. *yubariensis* HAYASAKA et MATSUI, 1951

*Melongena angasiana* YOKOYAMA, 1932

*Neptunea umbelliformis* HAYASAKA et UOZUMI, 1954

*Neptunea onnaica* YOKOYAMA, 1932

? *Neptunea ezoana* TAKEDA, 1953

Genus **Siphonalia** A. ADAMS, 1863

*Siphonalia ishikariana* OYAMA et MIZUNO, sp. nov.

(Plate I, figs. 7a, b, 8, 9a, b, 10a, b)

Holotype: GSJ. Reg. No. 5031

Type locality: Upstream of the Tanzan river, Ashibetsu-shi, Hokkaido. (Akabira formation, Ishikari group)

Description: Shell, small to medium in size, with four or five whorls; spire low, slightly concave-conical, each whorl shouldered and strongly nodose; apical angle about seventy degrees. Body whorl large, with thirteen sharp nodes on its upper portion; whorl inflated below the nodes, abruptly decreasing the inflation about at anterior one-third of the whorl, making very weak ridge between. Whorl of spire angulated with about thirteen nodes at about its middle. Spiral cords regularly arranged in alternation of

the strong and weak, undulated, crossing with very weak axial ribs; sculpture from the middle to posterior one-fourth of body whorl being very weak. Aperture obliquely oval, angulated on the upper part. Canal short, nearly straight, but the detail is unknown due to the ill-preservation of shell.

Dimensions of the holotype: Height ca. 19.7 mm; width of body whorl ca. 11.9 mm; height of body whorl ca. 15 mm.

Comparison: *Siphonalia ishikariana* n. sp. differs from *S. sakakurai* MIZUNO, 1954, in having many smaller nodes on each whorl and peculiar ornamentation of body whorl. It somewhat resembles *S. asakuraensis* (NAGAO), 1928, but the latter has few nodes on the whorls and higher shell. Also, it resembles American *S. bicarinata* DICKERSON, 1915 and its allies, but it differs from the American forms in having much inflated body whorl and well defined nodes on each whorl.

Remark: The new species are sometimes found in the Akabira and Wakkanabe formations of Ishikari group on the northern part of the Ishikari coal field, in Central Hokkaidō, together with such brackish molluscan fossils, as *Ostrea*, *Corbicula* and another allied species, *Siphonalia sakakurai* MIZUNO. This new species may be classed in a new subgenus of *Siphonalia* associated with *S. sakakurai*: their morphologic characteristics, namely, the short and nearly straight canal, and low spire, suggest, as pointed out by MIZUNO (1954), their similarity to the species of *Eosiphonalia*, but our materials can be apparently distinguished from the species of the subgenus in having no distinct biangulation of body whorl; they differ from those of *Nassicola* in having nearly straight and hardly bent canal.

Geologic range: Lower Oligocene

Geographic distribution: Central Hokkaidō

*Siphonalia? nipponica* OYAMA et MIZUNO, sp. nov.

(Plate I, figs. 2, 3)

1928, *Cancellaria?* sp. indet. d. NAGAO, Sci. Rep. Tōhoku Imp. Univ., Ser. 2, Vol. 12, No. 1, p. 122 (112), pl. 15, figs. 42~44.

Holotype: GSJ. Reg. No. 5035

Type locality: In the sample of "Kita-tatekō" at the Sakito coal mine, Sakito-machi, Nishi-sonogi-gun, Nagasaki-ken. (Maze formation, Nishi-sonoki group)

Description: Shell small, with five or six whorls; spire high, each whorl strongly shouldered and nodose; apical angle about forty-five degrees. Body whorl large, occupying more than a half of the whole shell, two rows of nodes, distinctly biangulated, showing a inconspicuous third angle below the other two nodes, on each row being arranged about ten nodes; body whorl sculptured with spiral cords in alternation of the strong and weak, becoming very weak on the biangulated part of whorl. Whorls on spire

ornamented with fine spiral cords, with about nine or ten nodes on the middle of each whorl. Aperture obliquely oval with angulation. Canal rather short, slightly twisted to the left.

Dimensions of the holotype: Height  $16.4\text{ mm} + 1.5\text{ mm} \pm$  (broken); width of body whorl ca.  $0.9\text{ mm}$ ; height of body whorl  $0.9\text{ mm} + 1.5\text{ mm} \pm$

Comparison: This new species somewhat resembles *Siphonalia bicarinata packi* (DICKERSON), 1917 and *S. sopenahensis* (WEAVER), 1912 in outline of shell, but apparently differs from them in having more prominent nodes and distinctly biangulated body whorl. Also, the new species shows the strong similarity to the species of *Eosiphonalia* in the morphologic characteristics of the shell, but it is easily distinguished from them in having higher shell.

Remark: The several specimens shown by NAGAO (1928) under the name of *Cancellaria?* sp. are referable to this new species. This new species is commonly yielded in the *Venericardia yoshidai* zone in Northwestern Kyūshū.

Geologic range: *Venericardia yoshidai* zone (lower Oligocene)

Geographic distribution: Northern Kyūshū

Family. Vasidae

Genus *Pseudoperissolax* CLARK, 1918

*Pseudoperissolax iesakai* OYAMA et MIZUNO, sp. nov.

(Plate I, figs. 4, 5)

Holotype: GSJ. Reg. No. 5037 (internal mould; broken in apex and aperture)

Type locality: Near Shirahama, about 700 m north to Nakado, Oshimamachi, Nishi-sonogi-gun, Nagasaki-ken. (Shioda formation, Nishisonoki group)

Description: Shell small, fusiform, smooth, bicarinated with probably five or six whorls. Body whorl more than half of the whole shell, fairly bicarinated, with fine tubercles on the posterior keel. Whorls of spire shouldered about at the middle. Aperture elongated, ovate-trigonal.

Dimensions of the holotype: Height  $14\text{ mm} +$ ; width  $10\text{ mm}$

Comparison: The new species differs from *Pseudoperissolax blakei* (CONRAD), 1855 in having smaller shell with smaller apical angle. Also, it is distinguished from *P. trophonoides* TEGLAND, 1933 in having tubercles on the posterior keel of body whorl.

Geologic range: *Venericardia vestitoides* zone (upper Oligocene)

Geographic distribution: Northern Kyūshū

PELECYPODA

Family Nuculanidae

Genus *Saccella* WOODRING, 1925

*Saccella hokkaidoensis* OYAMA et MIZUNO, sp. nov.

1953, *Nuculana* sp. form *Hokkaidoensis* TAKEDA, Studies on Coal Geology, No. 3, p. 66, pl. 6, figs. 10, 12.

1955, *Nuculana Hokkaidoensis* TAKEDA (MS) — OGASAWARA, Hok. Chish. Yōhō, No. 29, p. 28, text-fig. 2 (no description).

Holotype: UH. Reg. No. unknown (right, internal mould)

Type locality: In the boring core at the upper stream of Ichinosawa, west of Mt. Kamui, Utashinai-machi, Sorachi-gun, Hokkaidō. (Hiragishi formation, Ishikari group)

This new species was first cited as *Nuculana* sp. form *Hokkaidoensis* by TAKEDA (1953), who illustrated his destroyed holotype. Then, OGASAWARA (1955) has shown the specimen identifiable to the TAKEDA's species as *Nuculana hokkaidoensis* TAKEDA (MS). The writers' observations on some specimens made it sure that the unrecorded species of TAKEDA is widely found in the Paleogene of Hokkaidō, and here the writers establish a new specific name with the specimen shown by OGASAWARA (1955) as the type.

According to TAKEDA, characteristics of this species are as follows: "Shell moderately large, inequilateral; posterior elongated end rostrate and pointed, rostrum slightly recurved; beaks not prominent, low; anterior dorsal shoulder sometimes one-half the length of the posterior dorsal shoulder, rounded, and passing gradually to ventral; escutcheon distinct, with radial striation (?), extending to the end; pallial sinus very small, rounded in front. Surface ornamented with close, fine concentric lines, but nearly straight on ventral portion, and nearer to posterior dorsal margin suddenly running upward, where an obscure, blunt, depressed narrow area runs from umbone to the middle part of the posterior ventral margin. This species resembles *N. nagaoi*, but the former is much longer and the pallial sinus is smaller."

Comparison: This species is very similar to *Saccella nagaoi* TAKEDA, as pointed out by TAKEDA, but it is distinguishable from the latter in having larger shell with lower beak and wider anterior part. Also, it differs from *S. pseudoscissurata* TAKEDA, in having widely rounded anterior border.

Geologic range: Oligocene

Geographic distribution: Central Hokkaidō and eastern Hokkaidō

Family Nuculidae

Genus *Acila* H. et A. ADAMS, 1858

Subgenus *Truncacila* GRANT et GALE, 1931

*Acila (Truncacila) nagaoi* OYAMA et MIZUNO, sp. nov.

(Plate I, figs. 14, 15)

1928, *Nucula (Acila) mirabilis* var. *ashiyaensis* NAGAO, Sci. Rep., Tōhoku Imp. Univ., Ser. 2, Vol. 12, No. 1, p. 21, pl. 7, figs. 8, 9 (in part).

1956, *Acila nagaoui* MIZUNO (MS) — MIZUNO, Bull. Geol. Surv. Japan, Vol. 7, No. 6, p. 28, pl. 2, fig. 1 (no description).

Holotype: GSJ. Reg. No. 5019 (left valve; somewhat defaced)

Type locality: Obō, Arita-machi, Nishi-matsura-gun, Saga-ken. (Kishima formation, Kishima group)

Description: Shell small, obliquely oval, somewhat compressed; antero-dorsal border faintly arcuated; the postero-dorsal nearly straight, abruptly turning to broadly arcuated ventral border with angle of about 120~125°. Surface of shell ornamented with flat-topped, diverging radial ribs; primary bifurcation line situated somewhat posteriorly on shell; ribs on anterior half side coarse and platy, but those on posterior half side somewhat fine; obsolete radial ribbing area indistinct. Lunule narrow, small; escutcheon cordate, short. Inner margin of shell smooth.

Dimensions:	Length	Height
	(mm)	(mm)
Holotype	16.4	13.0
Paratype	13.2	9.5

Comparison: The new species somewhat resembles *Acila shumardi* (DALL), 1909 in its outline, but differs from the latter in having smaller shell with coarser radial ribs. Further, the former lacks rostral sinus, but the latter has weak rostral sinus.

Remark: NAGAO (1928) established *Nucula (Acila) mirabilis* var. *ashiyaensis* based on several specimens, but the specimens shown in his figures 8 and 9 may belong to the present new species from their characteristics.

Geologic range: *Venericardia yoshidai* zone (lower Oligocene)

Geographic distribution: Northwestern Kyūshū

Subgenus *Acila* s. str.

*Acila (Acila) shimoyamai* OYAMA et MIZUNO, sp. nov.

(Plate I, figs. 16, 17)

Holotype: GSJ. Reg. No. 5017 (internal mould of right valve)

Type locality: A branch of Kakino-sawa, the Penke-poronai river, Penke, Ashibetsu-shi, Sorachi-gun, Hokkaidō. (Akabira formation, Ishikari group)

Description: Shell small for the subgenus, moderately inflated, obliquely oval, with apical angle of 100~110°, antero-dorsal border long, slightly arched; postero-dorsal border short, nearly straight or faintly concave, abruptly turned to ventral border with nearly right angle. Rostral sinus distinct. Surface of shell ornamented with diverging radial ribs, being very fine, crowded; primary bifurcation line situated somewhat posteriorly or about at the middle of shell; angle of bifurcation about 70°. Obsolete radial ribbing area indistinct.



Dimensions :	Length (mm)	Height (mm)	Angle of bifurcation(°)
Holotype	18.1	14.8	ca. 70°
Paratype	21.0	17.0	ca. 70°

Comparison: *Acila shimoyamai* is very similar to *Acila praedivaricata* NAGAO et HUZIOKA, 1941, but distinguished from the latter by the smaller apical angle of bifurcation. Also, it resembles *Acila ashiyaensis* (NAGAO), 1928 and *Acila brevis* (NAGAO et HUZIOKA), 1941, but the new species differs from the former in having finer radial ribs and from the latter in having less inflated, smaller shell.

Remark: This new species is commonly found in the so-called marine zone of the Akabira formation of Ishikari group on the northeastern area of the Sorachi coal field and also rarely found in the Hiragishi formation near Sunagawa coal mine.

Geologic range: Lower Oligocene

Geographic distribution: Central Hokkaidō

#### Family Mytilidae

#### Genus *Mytilus* LINNÉ, 1758

*Mytilus mabuchii* OYAMA et MIZUNO, sp. nov.

(Plate III, figs. 8a, b, 9a, b)

Holotype: GSJ. Reg. No. 5015 (right, internal mould)

Type locality: Chambetsu-gawa, Ombetsu-mura, Shiranuka-gun, Hokkaidō. (Omagari formation, Ombetsu group)

Description: Shell large, elongated, moderately inflated. Dorsal border broadly arcuated, sometimes making very obtuse angle at about middle; ventral border slightly concave; the posterior regularly arched. Surface ornamented with fine concentric growth-lines. Beak small, terminal.

Dimensions :	Length (mm)	Greatest width (mm)
Holotype	ca. 62.0	34.1
Paratype	80.1	39.0
—	70.0	39.3

Comparison: This new species somewhat resembles a living *Mytilus edulis* LINNÉ, 1758, but differs from it in having larger apical angle. From *Mytilus luciferus* YOKOYAMA, 1924, the present species is easily distinguished in having a shorter form.

Remark: This species commonly occurs in the shallow sea deposits of Paleogene of Kushiro coal field, accompanied by *Ostrea eorivularis* OYAMA et MIZUNO, sp. nov. Also, it is rarely yielded in the Wakkanabe group of Ishikari coal field.

Geologic range: Oligocene

Geographic distribution: Central and eastern Hokkaidō

Family Limidae

Genus *Lima* BRUGUIÈRE, 1797

Subgenus *Acesta* H. et A. ADAMS, 1858

*Lima (Acesta) sameshimai* OYAMA et MIZUNO, sp. nov.

(Plate I, figs. 11, 12)

Holotype: GSJ. Reg. No. 5006 (internal mould of left valve, somewhat broken at ventral part)

Type locality: Vicinity of Ashikubo, Miwa-mura, Abe-gun, Shizuoka-ken. (Setogawa group)

Description: Shell large, strongly inequilateral, rather compressed, elongated to antero-ventral side; antero-dorsal border very long, somewhat concave, the postero-dorsal one short, convex, passing gradually into long, arcuated postero-ventral border; anterior ear very small, posterior ear large, not separated distinctly from postero-dorsal part of shell. Surface of shell sculptured by very fine concentric growth-lines and radial ribs, the latter being strong, not squamated, somewhat round-topped, separated by wider interspaces, sixteen to twenty-one in number, of which few being on anterior ear.

Dimensions of the holotype specimen: Length ca. 67 mm; height ca. 82 mm; thickness ca. 7 mm (left valve)

Comparison: *Lima sameshimai* sp. nov. is somewhat similar to *L. smithi* SOWERBY, 1888 and *L. protosquamosa* NOETLING, 1901, but is clearly distinguished from them in having less numbered radial ribs and longer antero-dorsal border of shell.

Remark: The writers examined ten specimens referred to this new species. These specimens show a slight variation in numbers of radial ribs; most of them including the holotype specimen have eighteen or nineteen ribs, while other few having sixteen, seventeen or twenty-one ribs.

Geologic range: Lower? Oligocene

Geographic distribution: Central Honshū

Family Ostreidae

Genus *Ostrea* LINNÉ, 1758

*Ostrea eorivularis* OYAMA et MIZUNO, sp. nov.

(Plate IV, figs. 1a, b, 2a, b, 3a, b)

Holotype: GSJ. Reg. No. 5001

Type locality: Cliff of the Shitakara river, about 200 m south to the tributary of the Shitakara river and Pon-shitakara river, north to the Yūbetsu

coal mine, Akan-machi, Akan-gun, Hokkaidō. (Shitakara formation, Urahoro group)

Description: Shell of moderate size, ovate, comparatively thick, gently convex, inequivalve. Cardinal area comparatively broad antero- and postero-dorsal margins with crenations, but not vermiculation. Inside of ventral margin smooth. Adductor scar situated somewhat subcentrally. Sculpture without prominent radial folds.

Dimensions:	Length (mm)	Height (mm)
Holotype	46.1	51.5
Paratype	79.5	111.1
—	64.5	87.2

Comparison: Recent *Crassostrea ariakensis* FUJITA, 1913 (= "*rivularis*" auct.) resembles this new species, but the living form differs from the new species by having larger size and lacking crenations on the margin. *Ostrea vitrefacta* SOWERBY, 1871 has more slender shell and more inequilateral than *O. corivularis* OYAMA et MIZUNO, sp. nov., but the both may have close relationship to each other.

Remark: This new species is richly included in the shallow sea deposits of Paleogene throughout the Kushiro coal field; especially it shows a crowded occurrence in the lower part of the Shitakara formation, forming a so-called *Ostrea* bed. Also, it is found in the Akabira formation in the Ishikari coal field.

Geologic range: Oligocene

Geographic distribution: Central and eastern Hokkaidō

Family Crassatellitidae

Genus *Crassatellites* KRÜGER, 1823

Subgenus *Crassatellites* s. str.

*Crassatellites* (*Crassatellites*) *komodai* OYAMA et MIZUNO, sp. nov.

(Plate III, figs. 1a~d, 2a~c)

Holotype: GSJ. Reg. No. 5004 (conjoined valve)

Type locality: In the main incline of the Sakito coal mine, Sakito-machi, Nishi-sonogi-gun, Nagasaki-ken. (the lowermost part of the Maze formation, Nishisonoki group)

Description: Shell moderate in size for the subgenus, rather thick, well inflated, transversely elongated; antero-dorsal margin short and slightly convex; postero-dorsal one concave under the beak; posterior border sub-truncated; ventral border broadly convex; striking ridge concavely running from umbo to postero-ventral corner. Beak small, pointed. Surface of the shell ornamented with concentric growth-lines and fine ribs, the ribs being visible only at the anterior area of the above-mentioned ridge in immature

stage of shell. Lunule narrow, long and deep; escutcheon cordate, deep, the both about same in length. Inner margin of shell finely crenulated.

Dimensions of the holotype: Length 34.1 mm; height 22.4 mm; thickness 14.6 mm.

Comparison: The new species is distinguished from all the species of *Crassatellites* from the Paleogene in Northern Kyūshū in having fine crenulation of internal margin. It is somewhat similar in outline to some specimens of *Crassatellites* (*Eucrassatella*) *yabei* NAGAO, 1928, but it differs in having the crenulation of the ventral border and striking ridge on posterior area of the shell. Also the new species is clearly distinguished from the living species *Crassatellites* (*Crassatellites*) *nanus* (A. ADAMS et REEVE), 1850, in having longer and more inflated shell.

Geologic range: *Venericardia yoshidai* zone (lower Oligocene)

Geographic distribution: Northern Kyūshū

#### Family Carditidae

Genus *Venericardia* LAMARCK, 1801

Subgenus *Cyclocardia* CONRAD, 1867

*Venericardia* (*Cyclocardia*) *harukii* OYAMA et MIZUNO, sp. nov.

(Plate III, figs. 3a, b)

Holotype: GSJ. Reg. No. 5014 (right valve, more or less broken in beak)

Type locality: Nakado, Oshima-machi, Nishi-sonogi-gun, Nagasaki-ken. (Higire formation, Nishisonoki group)

Description: Shell moderate for the subgenus in size, rather thick, inflated, slightly higher than long, subcircular; anterior and posterior borders regularly rounded nearly in equal; ventral border broadly arcuated. Beak prosogyrous, prominent, at about central part of the shell. Surface of the shell ornamented with very fine, concentric growth-lines and radial ribs; the ribs about twenty-two in number, rather narrow with bluntly angulated top, separated by narrower interspaces, finer and more crowded in the posterior part than in the anterior part of the shell; several ones on the anterior extremity concavely well arcuated.

Dimensions of the holotype: Length 20.5 mm; height 21.3 mm; thickness 6.5 mm (right valve)

Comparison: The new species resembles *Venericardia siogamensis* NOMURA, 1935, a well-known Miocene Carditid fossil in Japan, in its outline of the shell and the number of ribs, but differs from the latter in having more rounded postero-ventral part and wider ribs. Also, it is similar to some specimens of *Venericardia subnipponica* NAGAO, 1928, from which it is distinguishable in having fewer ribs and more rounded postero-ventral part.

Geologic range: *Venericardia vestitoides* zone (upper Oligocene)

Geographic distribution: Northwestern Kyūshū

*Venericardia (Cyclocardia) yokoyamai* OYAMA et MIZUNO, nom. nov.

1890, *Venericardia compressa* YOKOYAMA, Palaeontographica, Vol. 36, p. 196, pl. 25, figs. 4a, b (non *Cardita compressa* REEVE, 1843).

1953, *Venericardia (Cyclocardia) compressa* YOKOYAMA — UOZUMI, Shinseidai-no-Kenkyū, No. 17, p. 27, pl. 21, figs. 168~170.

1953, ? *Venericardia compressa* YOKOYAMA — TAKEDA, Studies on Coal Geology, No. 3, pl. 12, fig. 9; pl. 8, fig. 14.

Remark: *Cardita compressa* REEVE, 1843 (Conch. Icon., Vol. 1, pl. 9, fig. 46) belongs to *Venericardia*, and then it invalidates the YOKOYAMA's name. Here the writers introduce a new specific name for the latter.

Geologic range: Upper Oligocene

Geographic distribution: Central and eastern Hokkaidō

Family Lucinidae

Genus *Lucinoma* DALL, 1901

*Lucinoma nagaoui* OYAMA et MIZUNO, sp. nov.

(Plate IV, figs. 7a, b, 8a~c, 9a~c)

1928, *Phacoides (Lucinoma)* sp. indet. NAGAO, Sci. Rep., Tōhoku Imp. Univ., Ser. 2, Vol. 12, No. 1, p. 59(49), pl. 10, figs. 2, 12~14.

1956, *Lucinoma acutilineata* (CONRAD) — HIRAYAMA, Sci. Rep., Tōkyō Kyōiku Daigaku, Sec. C, Vol. 5, No. 45, p. 108, pl. 6, fig. 8.

Holotype: GSJ. Reg. No. 5027 (conjoined valve)

Type locality: Nittan-Takamatsu coal mine, Mizumaki-machi, Ongagun, Fukuoka-ken. (Yamaga formation, Ashiya group)

Description: Shell small to moderate in size, suborbicular in outline, almost equilateral; postero-dorsal border faintly convex; the antero-dorsal slightly concave and shorter than the former; anterior and posterior borders nearly vertical and faintly convex, gradually passing into regularly arched ventral border. Beak slightly prosogyrous, very small, pointed, situated on about middle of the shell. Lunule deep, narrow. Surface of shell ornamented with many concentric fine ribs, being separated by broad, flat interstices.

Dimensions:	Length (mm)	Height (mm)	Thickness (mm)
Holotype	25.0	23.1	11.0
Paratype	32.1	29.0	16.9
—	18.5	16.1	ca. 4.0 (left valve)

Comparison: The new species is closely akin to *Lucinoma columbiana* (CLARK et ARNOLD), 1923, and it is very difficult to separate the both species.

by their outline and surface ornamentation. However, the present species differs from the latter in having smaller shell and less prominent and smaller beaks. Further, this new species resembles *Lucinoma acutilineata* (CONRAD), 1849, but differs from the latter in having smaller shell with longer antero-dorsal border.

Remark: *Phacoides (Lucinoma)* sp. of NAGAO (1928) is apparently the new species, and also *Lucinoma acutilineata* of HIRAYAMA (1956) are referable to the species. The new species occurs widely in the *Venericardia vestitoides* zone (upper Oligocene) in northern and northwestern Kyūshū, such as the Ashiya group, Meinohama formation, upper part of Kishima and Nishisonoki groups, and no specimen is found in the lower Oligocene horizons of these areas. Several specimens referable to this new species now at hand have slight difference, especially in the proportion of the length and height of the shell, but they agree with their small size and the shape of the shell.

Geologic range: *Venericardia vestitoides* zone (upper Oligocene)

Geographic distribution: Northern and northwestern Kyūshū

Family Thyasiridae

Genus *Thyasira* LEACH, 1818

Subgenus *Conchocele* GABB, 1866

*Thyasira (Conchocele) bisecta omarui* OYAMA et MIZUNO, subsp. nov.

(Plate III, figs. 4a, b, 5~7)

Holotype: GSJ. Reg. No. 5011 (Conjoined valve; shell somewhat broken in anterior part)

Type locality: Ashibetsu-shi, Sorachi-gun, Hokkaidō (exactly unknown). (Akabira formation, Ishikari group)

Description: Shell rather small, trigonally oval, slightly longer than high, moderately inflated, with apical angle about 110°. Antero-dorsal border nearly straight or faintly convex, obtusely turned to broadly curved ventral border, drawing a subangulated arch; the postero-dorsal regularly arcuated, about three-second or twice of the antero-dorsal in the length. Surface of the shell sculptured by concentric, rough, and irregularly arranged growth-lines. Posterior surface excavated from the upper side of the beak to the posterior corner, making oblique ridge. The anterior part of the shell excavated like in the posterior one, but it is less excavated, with two, oblique, faint ridge under lunule.

Dimensions:

	Length (mm)	Height (mm)	Thickness (mm)
Holotype	29.3	28.5	17.0
Paratype	ca. 30.0	ca. 29.0	16.0
—	21.2	21.0	11.0
—	16.0	14.8	—

Comparison: The new subspecies is similar to the typical form of *Thyasira bisecta* CONRAD, 1849, a familiar species from the upper Oligocene to Recent in Japan, but it differs from the latter in having smaller, more circular form with nearly straight or faintly convex antero-dorsal border.

Geologic range: Lower Oligocene

Geographic distribution: Central Hokkaidō

Family Veneridae

Genus *Pitar* RÖMER, 1857

*Pitar sorachiensis* OYAMA et MIZUNO, sp. nov.

(Plate IV, figs. 1a, b, 2~4, 5a, b, 6)

Holotype: GSJ. Reg. No. 5021 (conjoined internal moulds)

Type locality: In the vicinity of Manji, Kurisawa-machi, Yūbari-gun, Hokkaidō. (Wakkanabe formation, Ishikari group)

Description: Shell large, trigonally oval, moderately inflated, inequilateral; antero-dorsal border short, the postero-dorsal long, regularly arched, the both passing gradually to broadly arched ventral border. Beak small, situating at anterior two-fifth or one-third of the whole shell. Surface ornamented with fine, rather irregularly arranged concentric growth-lines. Pallial sinus large, wide, triangular, pointed at the end.

Dimensions:	Length (mm)	Height (mm)
Holotype	50.0	44.4
Paratype	44.4	38.5
—	35.3	31.2
—	49.4	41.2

Comparison: The new species is very similar to *Pitar okadana* (YOKOYAMA), 1932 and *Pitar yokoyamai* (NAGAO), 1928, in outline of shell, but it differs from the former in having less inflated shell and from the latter in having pointed pallial sinus.

Remark: *Pitar sorachiensis* sp. nov. richly occurs in the Ishikari group, especially in the Wakkanabe formation, throughout the Ishikari coal field, and also the writers know its similar occurrence in the lower part of the Shitakara formation, Urahoro group near the Yūbetsu coal mine in the Kushiro coal field.

Geologic range: Lower Oligocene

Geographic distribution: Central and eastern? Hokkaidō

Family Myidae

Genus *Mya* LINNÉ, 1758

*Mya grewingki nagaoui* OYAMA et MIZUNO, nom. nov.

1941, *Mya grewingki* MAKIYAMA, var. *elongata* NAGAO et INOUE, Jour.

Fac. Sci., Hok. Imp. Univ., Ser. 4, Vol. 6, No. 2, p. 150, pl. 33(2), figs. 1~4, (non *Mya elongata* BROCCHI, 1814).

Remark: According to the Copenhagen Decision on Zoological Nomenclature (p. 84), the trinomen for fossil form is to be deemed a subspecific name. *Mya grewingki* var. *elongata* NAGAO et INOUE has a subspecific rank and is preoccupied by *Mya elongata* BROCCHI, 1814, as a primary homonym. The writers introduce, then, a new name *nagaoi* for Japanese form reported by NAGAO and INOUE.

Geologic range: Upper Oligocene

Geographic distribution: Southern Sakhalin

Family Periplomatidae

Genus *Periploma* SCHUMACHER, 1817

*Periploma iesakai* OYAMA et MIZUNO, sp. nov.

(Plate I, fig. 13)

Holotype: GSJ. Reg. No. 5029 (right outer cast)

Type locality: Kakinoura-jima, Sakito-machi, Nishi-sonogi-gun, Nagasaki-ken. (Tokuman formation, Nishisonoki group)

Description: Shell large, compressed, transversely oval, inequilateral, inequivalve, right valve with slightly higher beak; broadly rounded in front, truncated behind, ventral border gently arched, the antero-dorsal broadly arched, the postero-dorsal abruptly concave behind beaks. Beaks not prominent, situated at the posterior one-third of the shell. Surface sculptured with numerous growth-lines, and oblique fine ribs, strongly wrinkled in the posterior extremity.

Dimensions of the holotype specimen: Length 43.3 mm; height 31.0 mm (in right valve)

Comparison: This new species differs from *Periploma besshoense* (YOKOYAMA), 1924 in its posteriorly situated beak and posterior wrinkled sculpture.

Geologic range: *Venericardia vestitoides* zone (upper Oligocene)

Geographic distribution: Northwestern Kyūshū

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## 本邦産古第三紀化石貝類の新種について

大山桂 水野篤行

### 要 旨

この数年間の研究により、古第三紀層産の貝化石には多数の新種が含まれていることがわかった。それらのうち、漸新統産の次のものをここに記載する。

### 新 属

*Trominina* OYAMA et MIZUNO, gen. nov.

### 新種および新亜種

*Minolia tsuchii* OYAMA et MIZUNO, sp. nov.

*Calyptraea sorachiensis* OYAMA et MIZUNO, sp. nov.

*Siphonalia ishikariana* OYAMA et MIZUNO, sp. nov.

- Siphonalia*? *nipponica* OYAMA et MIZUNO, sp. nov.  
*Pseudoperissolax iesakai* OYAMA et MIZUNO, sp. nov.  
*Saccella hokkaidoensis* OYAMA et MIZUNO, sp. nov.  
*Acila* (*Truncacila*) *nagaoi* OYAMA et MIZUNO, sp. nov.  
*Acila* (*Acila*) *shimoyamai* OYAMA et MIZUNO, sp. nov.  
*Mytilus mabuchii* OYAMA et MIZUNO, sp. nov.  
*Lima* (*Acesta*) *sameshimai* OYAMA et MIZUNO, sp. nov.  
*Ostrea eorivularis* OYAMA et MIZUNO, sp. nov.  
*Crassatellites* (*Crassatellites*) *komodai* OYAMA et MIZUNO, sp. nov.  
*Venericardia* (*Cyclocardia*) *harukii* OYAMA et MIZUNO, sp. nov.  
*Lucinoma nagaoi* OYAMA et MIZUNO, sp. nov.  
*Thyasira* (*Conchocele*) *bisecta omarui* OYAMA et MIZUNO, subsp. nov.  
*Pitar sorachiensis* OYAMA et MIZUNO, sp. nov.  
*Periploma iesakai* OYAMA et MIZUNO, sp. nov.

新 名

- Cirsotrema* (*Cirsotremopsis*?) *nagaoi* OYAMA et MIZUNO, nom. nov.  
(*Epitonium* sp. indet. NAGAO, 1928)  
*Venericardia* (*Cyclocardia*) *yokoyamai* OYAMA et MIZUNO, nom. nov.  
(*Venericardia*) *compressa* YOKOYAMA, 1890)  
*Mya grewingki nagaoi* OYAMA et MIZUNO, nom. nov.  
(*Mya greweingki elongata* NAGAO et INOUE, 1941)

Plate I

- 1a~c *Minolia tsuchii* OYAMA et MIZUNO, sp. nov.  
Holotype (GSJ. Reg. No. 5008)  $\times 1.75$   
Loc. : In the vicinity of Ashikubo, Miwa-mura, Abe-gun, Shizuoka-ken. (Setogawa group)
- 2, 3 *Siphonalia nipponica* OYAMA et MIZUNO, sp. nov.  
2 Paratype (GSJ. Reg. No. 5036)  $\times 1$   
Loc. : Obō, Arita-machi, Nishi-matsura-gun, Saga-ken. (Kishima formation, Kishima group)  
3 Holotype (GSJ. Reg. No. 5035)  $\times 1.6$   
Loc. : In the boring core of the shaft "Kita-tatekō", at the Sakito coal mine, Sakito-machi, Nishi-sonogi-gun, Nagasaki-ken. (Maze formation, Nishisonoki group)
- 4, 5 *Pseudoperissolax iesakai* OYAMA et MIZUNO, sp. nov.  
4 Paratype (GSJ. Reg. No. 5038)  $\times 1.6$   
Loc. : Okuura, Sakito-machi, Nishi-sonogi-gun, Nagasaki-ken. (Tokuman formation, Nishisonoki group)
- 5a, b Holotype (GSJ. Reg. No. 5037)  $\times 1.85$   
Loc. : Near Shirahama, about 700 m north of Nakado, Oshima-machi, Nishi-sonogi-gun, Nagasaki-ken. (Shioda formation, Nishisonoki group)
- 6a, b *Calyptraea sorachiensis* OYAMA et MIZUNO, sp. nov.  
Holotype (GSJ. Reg. No. 5030)  $\times 1$   
Loc. : Naié-machi, Sorachi-gun, Hokkaidō (exactly unknown). (Wakkanabe formation, Ishikari group)
- 7~10 *Siphonalia ishikariana* OYAMA et MIZUNO, sp. nov.  
7a, b Paratype (GSJ. Reg. No. 5033)  $\times 1.1$   
Loc. : Upstream of the Tanzan river, Ashibetsu-shi, Hokkaidō. (Akabira formation, Ishikari group)  
8 Paratype (GSJ. Reg. No. 5034)  $\times 1.1$   
Loc. : ibid.
- 9a, b Paratype (GSJ. Reg. No. 5032)  $\times 1.1$   
Loc. : ibid.
- 10a, b Holotype (GSJ. Reg. No. 5031)  $\times 1.1$   
Loc. : ibid.
- 11, 12 *Lima (Acesta) sameshima* OYAMA et MIZUNO, sp. nov.  
11 Paratype (GSJ. Reg. No. 5007)  $\times 1$   
Loc. : In the vicinity of Ashikubo, Miwa-mura, Abe-gun, Shizuoka-ken. (Setogawa group)  
12 Holotype (GSJ. Reg. No. 5006)  $\times 0.9$   
Loc. : ibid.
- 13 *Periploma iesakai* OYAMA et MIZUNO, sp. nov.  
Holotype (GSJ. Reg. No. 5029)  $\times 1$   
Loc. : Kakinoura-jima, Sakito-machi, Nishi-sonogi-gun, Nagasaki-ken. (Tokuman formation, Nishisonoki group)

- 14, 15 *Acila (Truncacila) nagaoui* OYAMA et MIZUNO, sp. nov.  
14 Paratype (GSJ. Reg. No. 5020)  $\times 1.75$   
Loc.: Otō, Arita-machi, Nishi-matsura-gun, Saga-ken. (Kishima formation,  
Kishima group)  
15 Holotype (GSJ. Reg. No. 5019)  $\times 1.75$   
Loc.: ibid.
- 16, 17 *Acila (Acila) shimoyamai* OYAMA et MIZUNO, sp. nov.  
16 Paratype (GSJ. Reg. No. 5018)  $\times 0.93$   
Loc.: A branch of the Tanzan river, Ashibetsu-shi, Hokkaidō. (Akabira  
formation, Ishikari group)  
17 Holotype (GSJ. Reg. No. 5017)  $\times 1.67$   
Loc.: A branch of Kakino-sawa, the Penke-poronai river, Penke, Ashibetsu-  
shi, Hokkaidō. (Akabira formation, Ishikari group)
- 18a~c *Cirsotrema (Cirsotremopsis?) nagaoui* OYAMA et MIZUNO, sp. nov.  
Holotype (IGPS. Reg. No. 36183)  $\times 2$   
Loc.: Beach rocks, west of Hachiman-zaki, Wakita, Wakamatsu-shi, Fuku-  
oka-ken. (Wakita formation, Ashiya group)

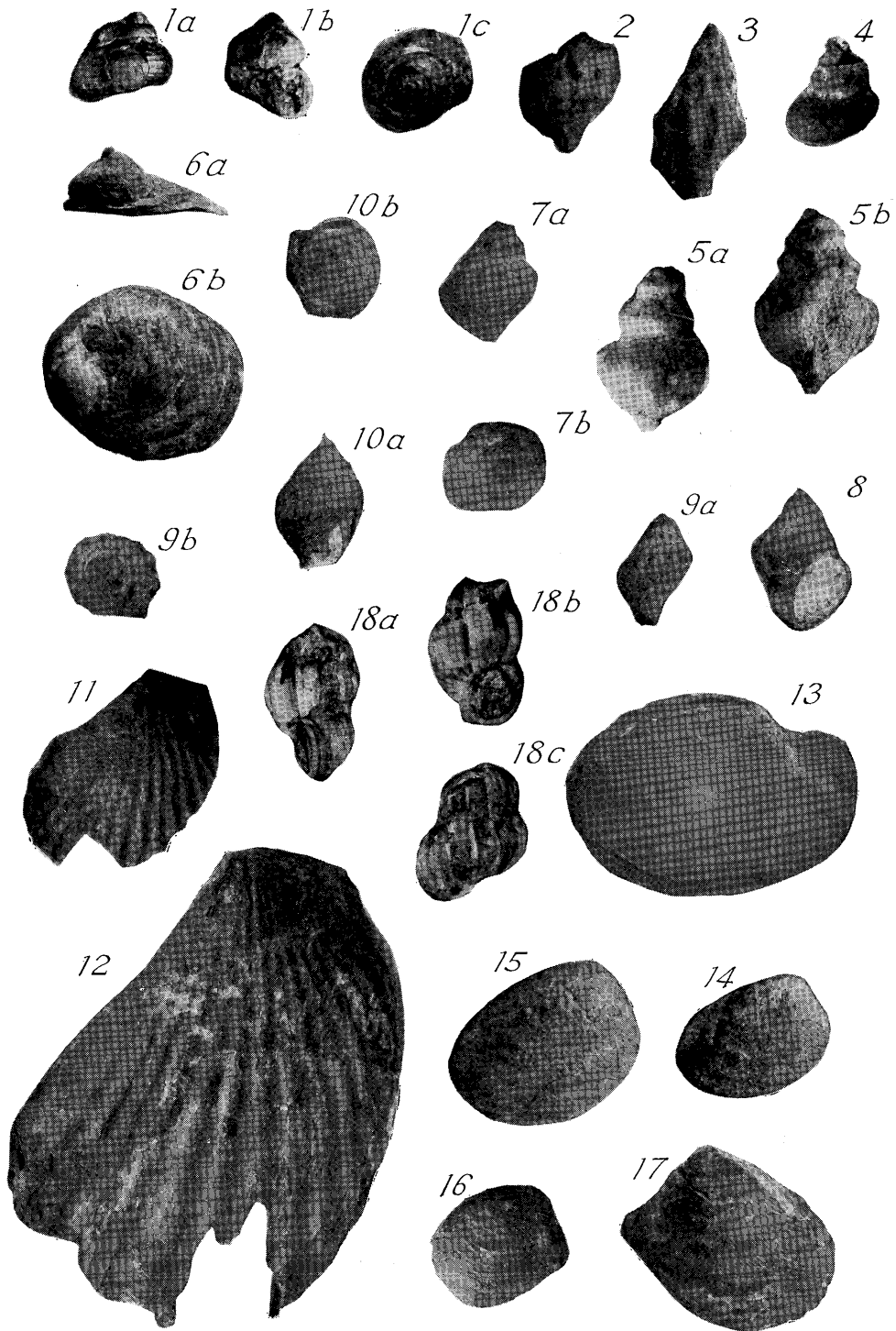


Plate II

1~3 *Ostrea eorivularis* OYAMA et MIZUNO, sp. nov.

1a, b Holotype (GSJ. Reg. No. 5001)  $\times 0.89$

Loc. : Cliff of the Shitakara river, about 200 m, south of the junction of the Shitakara river and the Pon-shitakara river, north of the Yūbetsu Coal mine, Akan-machi, Akan-gun, Hokkaidō. (Shitakara formation, Urahoro group)

2a, b Paratype (GSJ. Reg. No. 5002)  $\times 0.93$

Loc. : ibid.

3a, b Paratype (GSJ. Reg. No. 5003)  $\times 0.94$

Loc. : ibid.

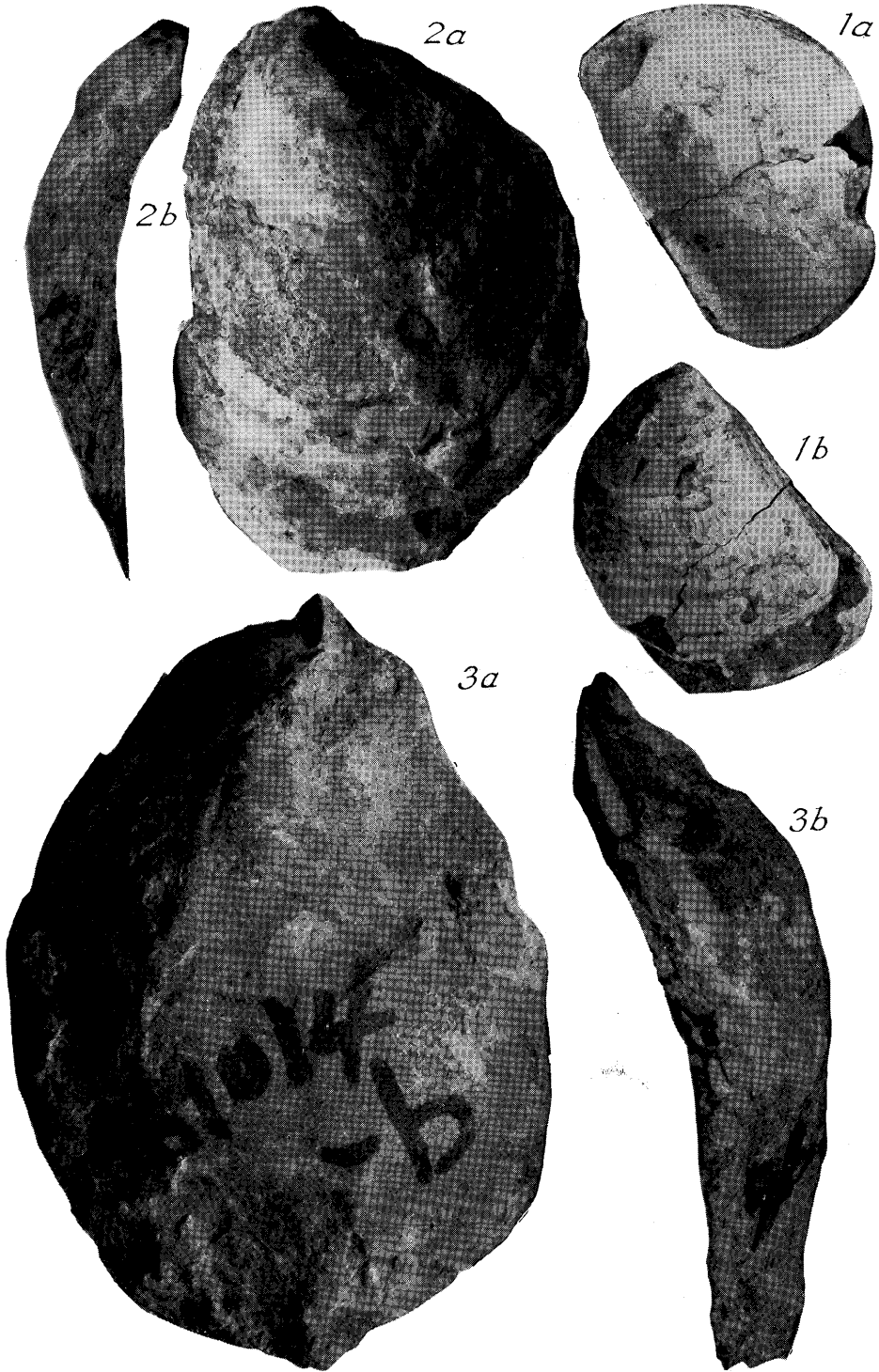


Plate III

- 1, 2 *Crassatellites (Crassatellites) komodai* OYAMA et MIZUNO, sp. nov.  
1a~d Holotype (GSJ. Reg. No. 5004), 1a, b  $\times 1.23$ , 1c, d  $\times 1.1$   
Loc. : In the 1st gallery of the Sakito coal mine, Sakito-machi, Nishi-sonogi-gun, Nagasaki-ken. (Maze formation, Nishisonoki group)
- 2a~c Paratype (GSJ. Reg. No. 5005)  $\times 1.13$   
Loc. : ibid.
- 3a, b *Venericardia (Cyclocardia) harukii* OYAMA et MIZUNO, sp. nov.  
Holotype (GSJ. Reg. No. 5010)  $\times 1.12$   
Loc. : Nakado, Oshima-machi, Nishi-sonogi-gun, Nagasaki-ken. (Higire formation, Nishisonoki group)
- 4~7 *Thyasira (Conchocele) bisecta amarui* OYAMA et MIZUNO, subsp. nov.  
4a, b Holotype (GSJ. Reg. No. 5011)  $\times 0.98$   
Loc. : Ashibetsu-shi, Sorachi-gun, Hokkaidō (exactly unknown). (Akabira formation, Ishikari group)
- 5 Paratype (GSJ. Reg. No. 5012)  $\times 0.9$   
Loc. : ibid.
- 6 Paratype (GSJ. Reg. No. 5013)  $\times 0.9$   
Loc. : ibid.
- 7 Paratype (GSJ. Reg. No. 5014)  $\times 0.9$   
Loc. : ibid.
- 8, 9 *Mytilus mabuchii* OYAMA et MIZUNO, sp. nov.  
8a, b Holotype (GSJ. Reg. No. 5015)  $\times 0.99$   
Loc. : Chambetsu-gawa, Ombetsu-mura, Shiranuka-gun, Hokkaidō. (Omagari formation, Ombetsu group)
- 9a, b Paratype (GSJ. Reg. No. 5016)  $\times 0.88$   
Loc. : Sen'no-sawa, Satombetsu river, Ombetsu-mura, Shiranuka-gun, Hokkaidō. (Shitakara formation, Urahoro group)



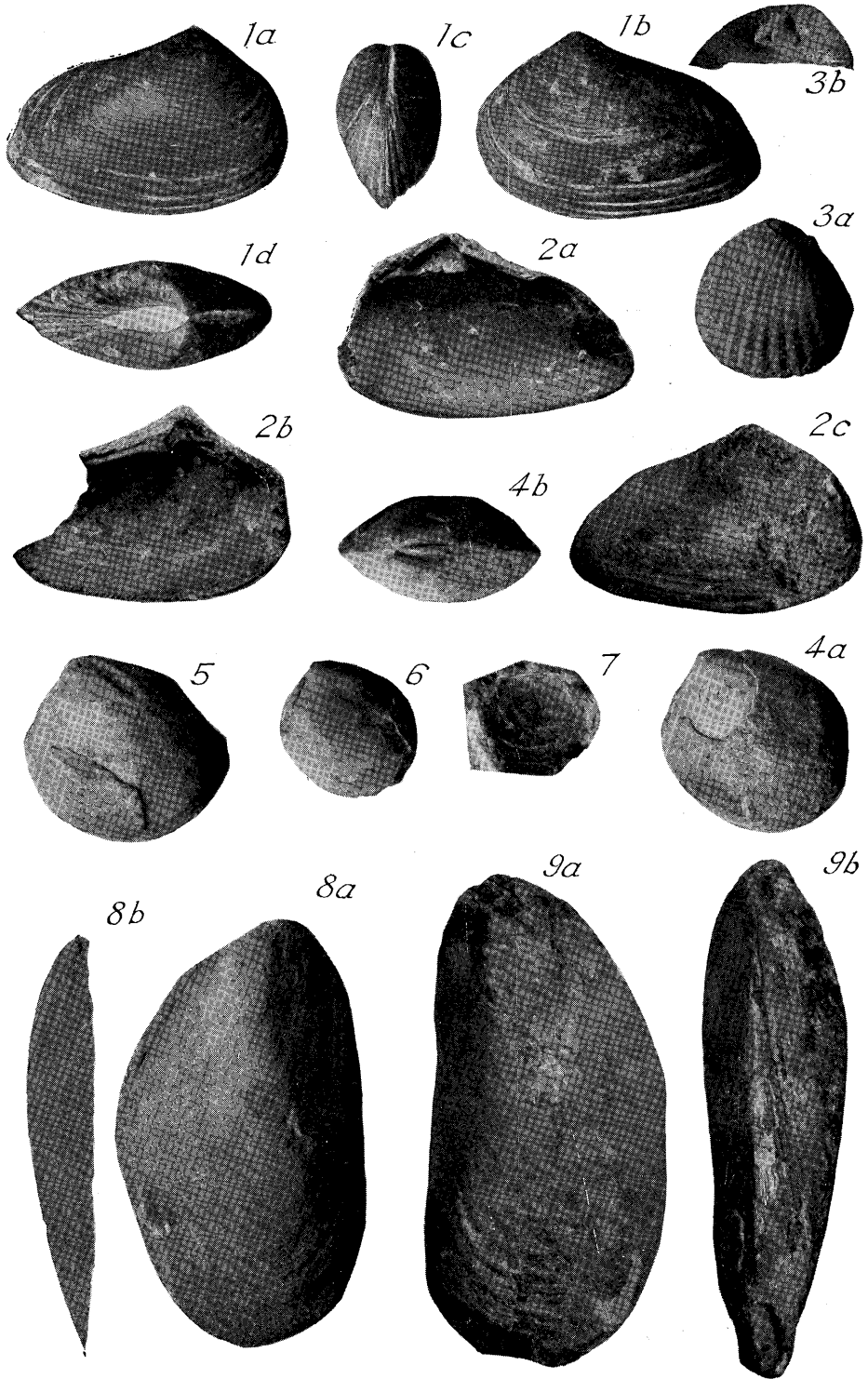


Plate IV

- 1~6 *Pitar sorachiensis* OYAMA et MIZUNO, sp. nov.  
1a, b Holotype (GSJ. Reg. No. 5021)  $\times 0.94$   
Loc.: In the vicinity of Manji, Kurisawa-machi, Yūbari-gun, Hokkaidō.  
(Wakkanabe formation, Ishikari group)
- 2 Paratype (GSJ. Reg. No. 5022)  $\times 0.90$   
Loc.: ibid.
- 3 Paratype (GSJ. Reg. No. 5023)  $\times 0.86$   
Loc.: ibid.
- 4 Paratype (GSJ. Reg. No. 5024)  $\times 0.90$   
Loc.: ibid.
- 5 Paratype (GSJ. Reg. No. 5026)  $\times 0.88$   
Loc.: Upstream of the Tanzan river, Ashibetsu-shi, Hokkaidō, (Wakkanabe  
formation, Ishikari group)
- 6 Paratype (GSJ. Reg. No. 5025)  $\times 0.88$   
Loc.: Same as Figs. 1~4
- 7~9 *Lucinoma nagaoi* OYAMA et MIZUNO, sp. nov.  
7a, b Paratype (GSJ. Reg. No. 5040)  $\times 1.59$   
Loc.: Southwestern coast of Oshima, Oshima-machi, Nishi-sonogi-gun, Naga-  
saki-ken. (Shioda formation, Nishisonoki group)
- 8a~c Paratype (GSJ. Reg. No. 5028)  $\times 1$   
Loc.: Nittan-Takamatsu coal mine, Mizumaki-machi, Onga-gun, Fukuoka-  
ken. (Yamaga formation, Ashiya group)
- 9a~c Holotype (GSJ. Reg. No. 5027)  $\times 1$   
Loc.: ibid.

