ON SOME GASTROPODA FROM THE MOMIJIYAMA FORMATION

(Palaeontological studies of the Tertiary System, Southern Part of the Ishikari-Coal-Field, Hokkaido, Ist Report.)

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(With one plate)

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The Momijiyama formation developed occupying the narrow area from Momijiyama-Takinoue to Hobetsu-Tomiuchi (former Hetonai) regions in the southern part of the Ishikari-Coal-Field, has been believed to be neritic or regression facies of the Poronai-Series by some geologists.[1] Of the fossils of this formation only a little has been known up to the present and the fauna has been considered quite indistinguishable from that of the typical Poronai Series.

On the previous short note concerning the Momijiyama formation one of the writers (MATSUI) pointed out, however, that the formation now under consideration, does not represent the heteropic facies of the Poronai Series, but has to be regarded an independent stratigraphical unit interrening between the typical Poronai and Takinoue formation on both stratigraphical and palaeontological evidences.[2]

First of all, the Momijiyama formation unconformably covers the Poronai Series, and is covered in turn by the Takinoue formation also with a distinct unconformable relation in the Momijiyama-Takinoue district. In the recent investigation, several palaeontologically characteristic species with a short stratigraphical range have been recognized in the fauna of this formation.

In the Momijiyama district, the Momijiyama formation can be divided according mainly to the lithologic characters into two sub-formations. The lower consists dominantly of green sandstone and mudstone, and the upper of black mudstone. Both these sub-formations are fossiliferous, being especially rich in molluscan remains, and we have collections of numerous specimens from both the sub-formations. Among them those

from the green sandstones and sandstone nodules of the upper part are in an excellent state of preservation.

In the Hobetsu district, this formation also consists of fine mudstone and fine sandstones intercalated by the layers of fine to medium grained sandstone. Here also the formation is fossiliferous.

In this short note the following gastropod species are dealt with. All of them are confined to the Momijiyama formation in Hokkaido.

1) *Neptunea hobetsuensis* MATSUI ····· Localities: Hobetsu-mura, prov. Iburi; Yubari city, prov. Ishikari.
2) *Neptunea onnaica* (YOKOYAMA) ····· Localities: Hobetsu-mura, prov. Iburi; Yubari city, prov. Ishikari.
3) *Ancistrolepis yudaensis* OTUKA var. *ishikariensis* HAYASAKA and MATSUI var. nov. ····· Locality: Yubari city, prov. Ishikari.
4) *Melongena angasiana* YOKOYAMA ····· Locality: Hobetsu-mura, prov. Iburi.
5) *Melongena angasiana* YOKOYAMA var. *yubariensis* HAYASAKA and MATSUI var. nov. ····· Locality: Yubari city, prov. Ishikari.

Description of Species

Genus *Neptunea* BOLTEN, 1798

Neptunea hobetsuensis MATSUI

Pl. I. fig. 1.

1950. *Neptunea hobetsuensis*, MATSUI, Shinseidai no Kenkyu (Studies of the Cenozoic Era) No. 2, pp. 6, fig. 4.

Description: Shell large in size, rather thin and elongate, spire high, with seven to eight round convex whorls. Body whorl especially convex; embryonal whorl lacking.

The whorls separated by distinct deep suture, and sculptured by some spiral ribs, that are nearly equal in size and form in all the whorls: they are round and gently elevated, and sittuated at irregular intervals the inter spaces being flat and wider than these ribs themselves. They number as many as 11, or even more on the body whorl, and decrease in number in the penultimate and upper (earlier) whorls.

No spiral striation observed, but there are fine grouth lines, which are especially conspicuous on the ribs.

The aparture is widely rhomboidal in form, and the canal is thick and nearly straight, although its distal portion is not preserved.

Dimensions: Height 93 mm, Diameter 52 mm, Apical angle 47°.

Remarks: This species is closely related to *Neptunea eos* (KURODA)[3], but is distinguishable from the latter, in which the spire is lower and the spiral ribs, that are irregular in size and more numerous than in the former. Moreover, the interspaces of the ribs are ornamented with fine spiral striae in the latter species, while such are almost wholy lacking in the former.

Neptunea modestus (KURODA)[4] is also on ally of the present species, but it has less numerous spiral ribs, and the interspaces of their spiral ribs are also provinded with fine spiral striae. Besides, the upper surface of each whorl of "*modestus*" is flatter than in the present species although they are not completely horizontal.

Neptunea oomurai OTUKA[5] is of the same category as the present form, as far as its outer form, is concerned, but the former has beside the ordinary strong ribs, weak ones and spiral striae and the suture is quite feeble.

Buccinum sahalinensis YOKOYAMA[6] also looks allied to the present form in point of the outer form of the spire, but it may be easily distinguished from the latter in its larger number of spiral ribs.

Occurrence:

Hobetsu river, Hobetsu-mura, prov. Iburi.

Yubari river, Yubari city, prov. Ishikari.

Neptunea onnaica (YOKOYAMA)

Pl. I. figs. 2a, 2b.

1932. *Melongena onnaica* YOKOYAMA, Imp. Geol. Surv. Jap. No. 111. pp. 11. Pl. IV, fig. 1.

Description: Shell medium in size, spire with five or six convex whorls, beside the embryonal part which is lacking. Whorls ornamented with strong spiral ribs in the middle. Body and penultimate whorls with a sharp keel. Upper whorls convex and rounded, keel not conspicuous.

Surface above keel slightly convex, gently inclined, and ornamented with a weak rib in the middle. Surface below keel slightly concave, ornamented with two spiral ribs, the one almost in the middle strong and conspicuous, the other, close to the lower suture is weak.

On the basal part of the body whorl, spiral ribs are counted up to 10, and the ribs and interspaces tend to be finer and weaker down wards.

Dimension: Height 75 mm. Diameter 39 mm. Apical angle 45°.

Remarks: That the present form is quite indistinguishable from YOKOYAMA'S *Melongena* onnaica from Onnai river, SAKHALIN,[7] is almost beyond doubt. H. TAKEDA, a geologist of the Imperial Oil Commpany, informed of his opinion, that this species may rather be regarded *Ancistrolepis* than *Melongena*.

According to our opinion, however, this belongs neither to *Ancistrolepis* nor to *Melongena*, from its form and ornamentations, because usually the species of *Melongena* has a smooth body whorl and is provided with one row of tubercles on its shoulder, while in *Ancistrolepis* the columella is shorter than the aperture, and conspicuously bent, and the suture is deeply notched, too. Such being the case, the present form is most likely to be regarded as a *Neptunea*.

In having distinct keel on each whorl, the present species is somewhat comparable to each of *Ancistrolepis magnus* DALL,[8] *Buccinum castaneum triplostephanum* DALL,[9] *Buccinum angulosum* GRAY,[10] and *Buccinum baeri mächianum* FISHER,[11] but it may be easily distinguished from all of them by the outer form, especially by the aperture and the canal characters.

Meanwhile, *Neptunea* (*N.*) *lirata* (MARTYN),[12] *Chrysodomus pribiloffensis* DALL,[13] and *Chrysodomus vinosus* DALL,[14] seem rather closely allied to the present species in the form of aperture and canal, but these three species have more numerous spiral ribs and weaker keels than the latter.

Occurrence:

Hobetsu river, Hobetsu-mura, prov. Iburi.
Momijiyama, Yubari city, prov. Ishikari.

Genus *Ancistrolepis* DALL, 1895

Ancistrolepis yudaensis OTUKA var. *ishikariensis* HAYASAKA and MATSUI var. nov.

Pl. I. figs. 3, 4a, 4b.

Description: Shell large or medium in size, rather thin, spire high, with six or seven whorls, suture well marked. Embryonal and vepionic whorls are convex and smooth. Adult whorls sharply keeled in the middle, keel accompanied by series of conspicuous strong spiral ribs.

Surface above the keel, viz, between the shoulder and the suture above, is ornamented with many fine spiral striae of variable numbers.

Surface below keel almost flat, with four, rather conspicuous ribs with fine striae in between. The fourth rib on the body whorl forms

another keel. Base ornamented with about 10 almost equidistant spiral ribs, without any spiral striae between them.

Fine grouth lines distinct on the body whorl. Aperture wide, canal rather short, conspicuously bent backward, and shorter than the aperture.

Dimentions:

Height	Diameter	Apical angle
85 mm	48 mm	53
55 mm	37 mm	55 (Holotype)
52 mm	36 mm	53
56 mm	38 mm	56

Remarks:

Original description of OTUKA of yudaensis runs as follows:[15]

"Shell large, solid, with two uncler and about five subsequent whorls rapidly enlarging; uncleus whorls smooth, the later whorl with a shoulder keel ornamented with spiral cords. On the surface between the shoulder keel and next suture line, three prominent spiral cords are present. The lowest of them forming a keel which defines the base of the shell on the body whorl. The interspace of these cords has finer spiral lines intercalated in. The surface area between the shoulder keel and the suture (preceding) ornamented with fine spiral cords which number about 16."

This specimen is closely allied to yudaensis, but differs slightly from it in having four spiral ribs below the keel. Moreover the fourth spiral ribs below the keel in this specimen forms the second keel, as before mentioned.

On the other hand, OTUKA established his species *yudaensis* on quite an imperfect specimen. The major part of the body whorl is lost of its, and consequently it can not be said that comparing the present specimen with it is free of criticism. Moreover we even find a few distinguishing points in the form of the spire and its ornamentation. It therefore plausible to separate this as a variety from OTUKA's species.

Occurrence:

Momijiyama, Yubari city, prov. Ishikari.
Hobetsu river, Hobetsu-mura, prov. Iburi.
Mukawa, Hobetsu-mura, prov. Iburi.

Genus *Melongena* Schum. 1817

Melongena angasiana Yokoyama

Pl. I figs. 5a, 5b.

1932. *Melongena angasiana*, Yokoyama, Imp. Geol. Surv. Jap. No. 111, pp. 10, Pl. IV. fig. 2.

Description: Shell of medium size, convex, fasiform, very thin. Whorls count as many as six or seven spire not so high, last four whorls may be probably being intact. Suture well marked. Body and penultimate whorls have three or four indefinite spiral ribs, and sharply keeled at a little distance above the lower suture; surface above keel flatly convex and gently inclined, and surface below keel concave. Other whorls have only roundly convex, smooth surface.

Grouth lines somewhat distinct only on the body whorl, almost obsolete on the others.

Aperture wide and may be rhomboidal in form. Canal probably shorter than aperture, although its extreme point is not preserved.

Dimention: Height 48 mm, Diameter 51 mm, Apical angle 85.

Remarks: Although the species now at hand, is deformed and imperfect, it may will be identified with the species described and figured by Yokoyama under the name of *Melongena angasiana* from Onnai river, Sakhalin.[16]

As already mentioned by us in the description of the preceding species, there remains some doubt as to whether this species is really congeneric with the genotype of the genus *Melongena* or not. But it is so far certain that this specimen is specifically indistinguishable from Yokoyama's.

This species has quite characteristic form, and is known have occured at several locallities until present day. Namely, Mr. K. Sakakura listed this from Aragai formation of South Sakhalin,[17] which no doubt is to be correlated with the Momijiyama formation of Hokkaido. Mr. Nemoto and his collaborators also once recorded the occurrence of conferrble specimen of this species from "the uppermost part of the Poronai Series" (possibly corresponding to the writers' Momijiyama formation) in the Momijiyama district.

Occurrence:

Hobetsu river, Hobetsu-mura, prov. Iburi.

Melongena angasiana YOKOYAMA var. *yubariensis* HAYASAKA and MATSUI var. nov.

Pl. I. figs. 6a, 6b.

This is closely allied to the preceding species but differ from the spire which is somewhat higher, and the form of the keel and the number of the spiral ribs. The following is the table of comparison of the corresponding features in the species and the new variety.

	M. angasiana	*M. yubariensis*
1) Apical angle	85°	70°
2) Keel	Present only on the body and penultimate whorls, close to lower suture.	Present on the adult 3/5 of the whorls.
3) Form of whorl	Upper surface convex, Lower surface concave.	Both surfaces rather flat and smooth.
4) Base	6–8 ribs rather irregular in strength and interval.	12–14 ribs, regular in strength and interval.

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Plate I

Explanation of Plate.

(The figures are in $^3/_4$ size)

Fig. 1. *Neptunea hobetsuensis* MATSUI,
Mukawa, Hobetsu-mura, Prov. Iburi.

Figs. 2a. 2b. *Neptunea onnaica* (YOKOYAMA),
Hobetsu river, Hobetsu-mura, Prov. Iburi.

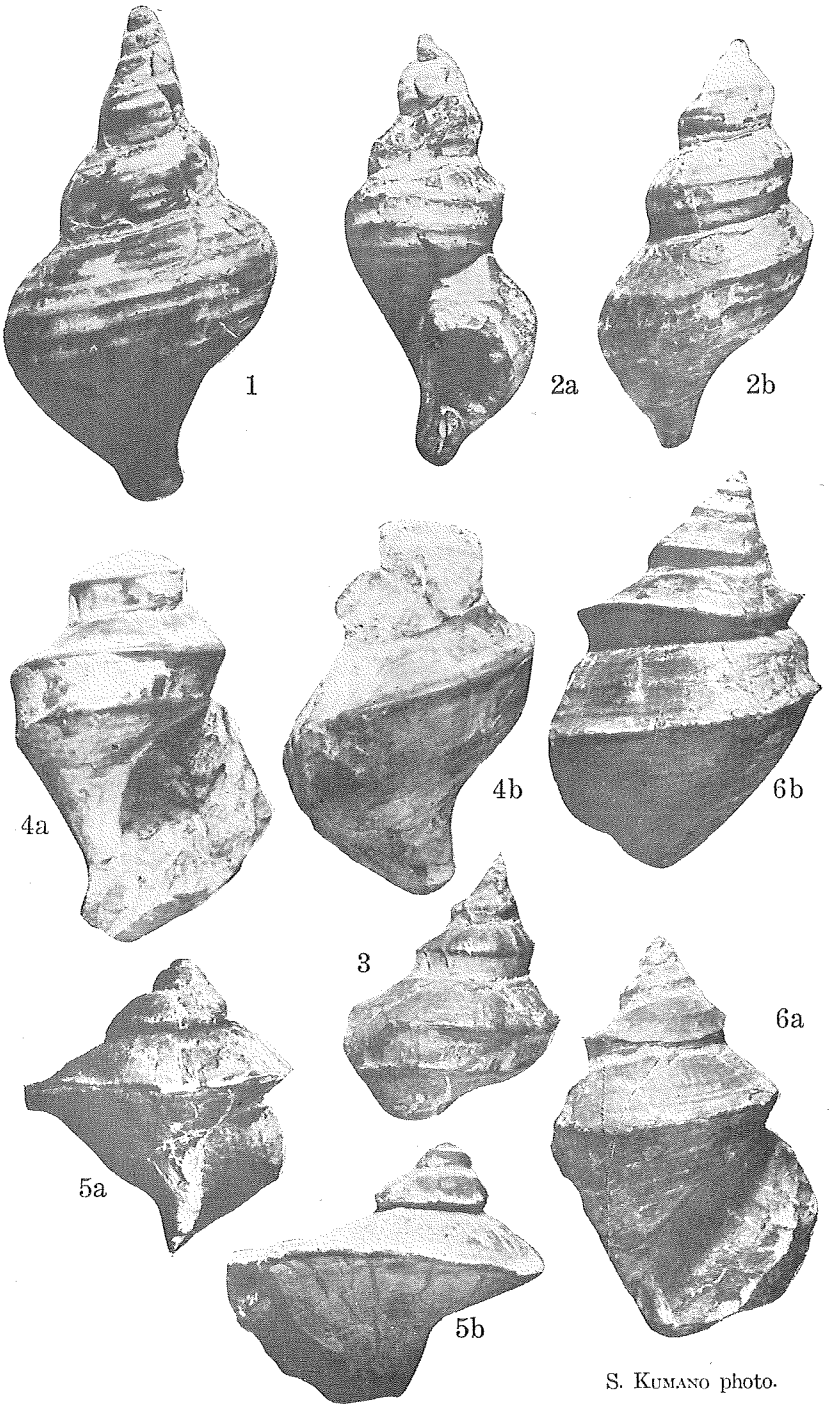
Figs. 3. 4a. 4b. *Ancistrolepis yudaensis* OTUKA var. *ishikariensis*
HAYASAKA and MATSUI. var. nov.

3. Momijiyama, Yubari river, Prov. Ishikari.

4a. 4b. Mukawa, Hobetsu-mura, Prov. Iburi.

Figs. 5a. 5b. *Melongena angasiana* YOKOYAMA,
Hobetsu river, Hobetsu-mura, Prov. Iburi.

Figs. 6a. 6b. *Melongena angasiana* YOKOYAMA var. *yubariensis*
HAYASAKA and MATSUI, var. nov.
Momijiyama, Yubari river, Prov. Ishikari.



S. KUMANO photo.

I. HAYASAKA and M. MATSUI: Gastropoda from the Momijiyama Formation.