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Three Species of Fossil Corbiculids from the Tertiary Formation of Karahuto

By

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With 1 Plate

(Contribution from the Department of Geology and Mineralogy, Faculty of Science, Hokkaidô Imperial University, Sapporo. No. 306).

Fossil corbiculids have never been described from the Tertiary deposits of Karahuto, although the occurrence of the fossil has often been reported only in lists accompanied with the geological reports covering several parts of this island. Fortunately, the present writer had an opportunity of examining a good number of specimens of fossil molluscan shells recently collected from Karahuto by Messrs. R. HUKAYA and S. SAKAKIBARA on the occasion of their geological survey as graduate thesis, and found that there are a number of specimens which belong to *Batissa* and *Corbicula*. *Batissa* comprises two species, of which one is referable to a known species, while the other is a new species; *Corbicula* comprises only one species and belong to a new species. They are as follows:

Batissa sitakaraensis (SUZUKI)
B. sakakibarai, nov. sp.
Corbicula hukayai, nov. sp.

Of these species, *Batissa sitakaraensis* and *B. sakakibarai* are the collection of Mr. SAKAKIBARA from the Platy Sandstones of the Naibuti Series in the middle course of the Manui-gawa, Siranui-mura, Sakaéhama-gun[1], while *Corbicula hukayai* was collected by Mr. HUKAYA from the Nayosi Coal-bearing Beds in Nayosi-mura, Nayosi-gun.[2]

1) 樺太榮濱郡白縫村眞縫川中流，內淵統.
2) 樺太名好郡名好村，名好夾炭層.

According to SAKAKIBARA, the Naibuti Series in the Manui district is divided into two parts, the upper the Platy Sandstones and the lower the Coal-bearing Group. The former contains a thin layer with shells of fluvio- and non-marine habitat, and *Batissa sitakaraensis* and *B. sakakibarai* described in this paper were collected from this layer. This Platy Sandstones are unconformably overlain by the Nisisakutan Bed which contains Asagai-Poronai fauna of Oligo-Miocene age, and the Coal-bearing Group which underlies the Platy Sandstones covers unconformably the Upper Cretaceous Formation with fossils.

The Nayosi Coal-bearing Beds in Nayosi-mura from where Mr. HUKAYA collected *Corbicula hukayai* are equivalent to the Esutoru Coal-bearing Beds and Naihoro Coal-bearing Beds in Karahuto, and moreover, it is also equivalent to the Kawabata Series in Hokkaidô. These coal-bearing beds contain numerous plant-fossils which are now under investigation by Assistant Prof. ÔISHI and Mr. HUZIOKA in our Department. The geological age of these coal-bearing beds is considered to be Miocene.

Although little is known of the non-marine fossils of the Naibuti (Palaeogene) and the Nayosi Coal-bearing Beds (Naihoro Coal-bearing Beds) of Karahuto and accordingly the faunal correlation of these beds with their equivalents deposits in Hokkaidô can hardly be made out in the present state of our knowledge, it is somewhat interesting that *Batissa sitakaraensis* is common in both Platy Sandstones in the Naibuti Series in Karahuto and the Sitakara Bed in the Urahoro Series of Hokkaidô from which *B. sitakaraensis* was first described by SUZUKI.

In preparing this note, the present writer is deeply indebted to Assistant Prof. S. ÔISHI in reading over the manuscript and in making correction in many ways and to Assistant Prof. Y. SASA and Mr. K. HUZIOKA from whom he received helpful suggestions. Furthermore, he must acknowledge to Messrs. K. SUZUKI and K. ÔYAMA in Sigen Kagaku Kenkyûzyo (Research Institute of Natural Resources) for giving him valuable advices, and also to Messrs. T. HUKAYA and S. SAKAKIBARA, collectors of the specimens.

Description of Species

Family Corbiculidae

Genus *Batissa*, GRAY, 1852

Batissa sitakaraensis (SUZUKI)[1]

Pl. IV, Figs. 7–9.

1941. *Corbicula sitakaraensis*, SUZUKI: Three New Species of Non-Marine Shells from the Tertiary Formations of Hokkaidô and Karahuto. Jap. Jour. Geol. and Geogr., Vol. XVIII, nos. 1–2, p. 57, pl. IV, figs. 1a, b.

Description: Shell moderately large, transversely elongated, subpentagonal, inequilateral, the posterior side three times as long as the anterior; test thick. The anteriors margin shortly rounded, the posterior obliquely truncated. The dorsal margin bisected by umbo, steeply sloping forwards, while gently backwards; the antero-dorsal margin nearly straight, gradually descending to the anterior margin; the postero-dorsal margin long, bluntly arched at the middle portion of it, and steeply descending with an obtuse angle to the posterior margin, then abruptly bent forward into the ventral margin, and forming a round postero-ventral corner. The ventral margin broadly rounded, passing gradually into the anterior margin. Umbo slightly coroded, however, low, compressed, not so much elevated above the hinge margin. Lunule large fusiform; ligamental groove long deeply depressed, and occuping more than a half as long as the postero-dorsal margin, where the distinct nymph slightly projecting.

Surface ornamented with more or less crowded and irregular incremental lines. A faint ridge marked from umbo toward the postero-ventral corner.

The hinge plate of the left valve excellently well preserved, and provided with three divergent cardinal teeth and one lateral tooth

1) This species was first described by SUZUKI under the generic designation *Corbicula*, but he later suggested the writer that it was not *Corbicula* but a *Batissa*. Having examined many specimens of molluscan fossils collected by Assistant Prof. SASA from the Sitakara Bed of the Urahoro Series in the Kusiro Coal-field, the writer found that there contained a number of well-preserved specimens which belong certainly to the category of the genus *Batissa* and moreover certainly identical with SUZUKI's *Corbicula sitakaraensis*.

on the anterior and posterior sides respectively, which placed on the lower margin of the hinge plate. The anterior cardinal smallest of all, nearly vertical, and slightly bifid; the middle cardinal sloping backwards, and also slightly bifid; the posterior cardinal narrow, longest of all, and much obliquely backwards. The lateral teeth long, crenulated; the anterior one being about two-thirds as long as the posterior, and whose anterioir terminal become thin and reaches the middle of the anterior muscle-scar; the posterior lateral long, sharply ridged. Nymph well developed behind the posterior cardinal, slightly projecting above the ligamental groove as already described.

Inner surface of the shell smooth. Umbonal cavity relatively shallow. Muscle-scars well marked, especially whose inner margins being well-defined by depression; the anterior one ovate, pointed downwards, nearly vertical; the posterior one subquadrate; pallial line simple, and devoid of the pallial sinus.

Dimensions		
Length (m.m.)	Height (m.m.)	Thickness of one valve (m.m.)
45	25	11

Pl. IV, fig. 7 is fairly well preserved right valve, slightly coroded at the umbonal part, however, its inner part is invisible. Pl. IV, fig. 8 is left valve and its antero-ventral part is broken, although the surface of the shell is invisible, the inner surface and the hinge plate are excellently preserved.

The outline of the shell, the hinge teeth, the ligamental groove, and the nymph are provided with the characteristic features of the genus *Batissa*.

The present species is well allied to *corbicula sitakaraensis* SUZUKI from the Sitakara Bed of Kusiro Coal-field, in the eastern part of Hokkaidô in outline.

The specific name is dedicated to Mr. S. SAKAKIBARA, a geologist of the Kita-Karahuto Sekiyu Co., who collected the present specimens.

Locality and geological horizon: The middle course of Manuigawa, Siranui-mura, Sakaéhama-gun; the Platy Sandstones of the Naibuti Series.

Batissa sakakibarai, nov. sp.

Pl. IV, Figs. 1–6.

Description: Shell medium-sized, moderately convex, thick-tested; slightly longer than high, subpentagonally rounded, in-

equilateral, the posterior portion about twice as long as the anterior. The anterior margin well rounded, the posterior margin subtruncated. The antero-dorsal margin nearly straight, rather steeply sloping obliquely backwards and descending gradually to the anterior margin; the postero-dorsal margin weakly arched, sloping obliquely backwards, being almost as long as the antero-dorsal margin, and forming a blunt and rounded angle with the posterior margin; the ventral margin broadly arched, gradually passing to the anterior margin, abruptly ascending to the posterior margin, and forming a subangulated postero-ventral corner in each other. Umbo small, subroundly pointed in the perfect form, but not so much projecting from the hinge margin, slightly tending forwards, and bruntly rounded in coroded specimens. Lunule is large, fusiform; ligamental groove external, lanceolated, occupying about a half as long as the postero-dorsal margin behind the umbo; ligament projecting from the postero-dorsal margin.

The hinge plate thick, provided with diverging three cardinal, and anterior and posterior each lateral tooth on the left valve. The anterior cardinal nearly vertical, bifid; the middle one slightly oblique backwards, also bifurcated, and a little longer than the former; the posterior one narrow, much obliquely sloping backwards. The anterior and posterior laterals narrow, long and finely crenulated; however, the anterior being two-thirds as long as the posterior, the terminal part of the former becomes thin almost without crenulation on this portion not exceeding from the anterior muscle-scar, and ended above it; the posterior very long. Nymph platy relatively broad behind the posterior cardinal, slightly projecting from the ligamental groove.

Surface ornamented with fine, somewhat crowded line of growth. A faint angle runs from beak to the postero-ventral corner.

Inner surface smooth. The anterior muscle-scar is ovate, the posterior subrounded. Pallial line simple.

Dimension		
Length	Height	Thickness
32	28	14*
35	30	8**

* Both valve united; ** One valve.

Remarks: Many specimens occurred in aggregation were examined. The description above was based on some almost perfect specimens which are fortunately provided with ligament in Pl. IV, fig. 1; the hinge teeth are well preserved in the specimen in Pl. IV, fig. 2; the inner feature of the shell is fairly observed in the internal moulds in Pl. IV, fig. 4.

The present specimens were carefully compared with the preceding species *Batissa sitakarensis*, however, the present form is distinguished from the latter in shorter length and subpointed umbo.

This species resembles *Cyrena sakaensis* MAKIYAMA[1]. The latter is considered by KURODA[2] as a *Corbicula* (?), but ours may be distinguished from the latter in having more rounded postero-dorsal margin, lower in height and more delicate in surface sculpture of the shell. Another allied type is *Cyrena* (*Batissa*) *crawfurdi* NOETLING[3] from the Miocene of Yenangyong in Burma, especially the specimens in his Pl. XI, figs. 4 and 5 appear to be almost indistinguishable from the present species, except that in ours the shell has more rounded postero-dorsal margin and the angle which runs from umbo to the postero-ventral corner of the shell is more blunt.

Locality and geological horizon: The middle course of Manui-gawa, Siranui-mura, Sakaéhama-gun; the Platy Sandstones of the Naibuti Series (Palaeogene). S. SAKAKIBARA coll.

Genus *Corbicula*, MERGELE, 1811

Corbicula hukayai, nov. sp.

Pl. IV, Figs. 10–17.

Description: Shell moderately large, convex, thick-tested; transversely elongated, subpentagonally rounded, inequilateral, the posterior portion about twice as long as the anterior. The anterior margin well rounded, the posterior margin obliquely subtruncated. The antero-dorsal margin nearly straight, steeply sloping forwards

1) Z. MAKIYAMA: Brief Note on the Tertiary Fossils from Kami-Minauti-gun, Sinano Province (in Japanese). Chikyû, vol. VIII, 1927, p. 186, pl. III, fig. 3.

2) T. KURODA: In Homma's Geology of Central Sinao (in Japanese). 1931, p. 46, pl. IV, figs. 22, 23.

3) E. NOETLING: The Fauna of the Miocene Beds of Burma. Pal. Indica, N.S., Vol. I, Mem. No. 13, 1901, p. 188, pl. XI, figs. 9–11.

and descending gradually to the anterior margin; the postero-dorsal margin gently sloping backwards, nearly straight behind the umbo, but weakly arched backwards, and gradually descending to the sub-truncated posterior margin, and subangulately to the posterior. Umbo moderately projecting from the hinge margin. Lunule large, ovate, lanceolated.

Surface ornamented with the dense and fine line of growth.

The hinge plate thick, provided with three divergent cardinal teeth, and with crenulated and nearly equally long lateral tooth in each side of the left valve; the anterior and posterior cardinals bifurcated and the former slightly oblique backwards, the latter slightly backwards, and a little longer than the former, the posterior one narrow, thin and much obliquely backwards. On the right valve, the anterior cardinal very small; the lateral teeth of both sides provided with two narrow parallel ridges with socket between them, and also corrugated with fine crossed striae.

The inner surface of the shell smooth with faint radial striae between the ventral margin and the pallial line. Muscle-scars well marked, the anterior one slightly smaller than the posterior one, the former ovate in outline, the latter subquadrately round. Pallial line simple.

Among the living Japanese corbiculids, the present species is most related to *Corbicula atrata* REINHARDT but may be distinguished in more convex shell, lower umbo, and shallower umbonal cavity. Among fossil corbiculids, the present species differs from *C. tokudai*[1] in having more strongly arched postero-dorsal margin and a more distinct angle which runs from beak to the postero-ventral corner of the shell. It differs also from *Corbicula matusitai* SUZUKI[2] from the Palaeogene deposits of Kyûsyû, but in ours the postero-dorsal margin is more strongly arched.

The specific name is dedicated to Mr. R. HUKAYA, collector of the specimens.

Locality and geological horizon: Nayosi-mura, Nayosi-gun; the Nayosi Coal-bearing Beds (Miocene).

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1) T. NAGAO and K. ÔTATSUME: The Fossil Corbiculids from the Palaeogene Isikari Series in the Isikari Coal-Field, Hokkaidô. This number of this Journal.

2) K. SUZUKI: The Palaeogene Corbiculids of Northwestern Kyûsyû. Journ. Fac. Sci., Tôkyô Imp. Univ., Sec. II, Vol. VI, pt. 3, 1941, p. 58, pl. IV, figs. 8–11.

EXPLANATION OF PLATE

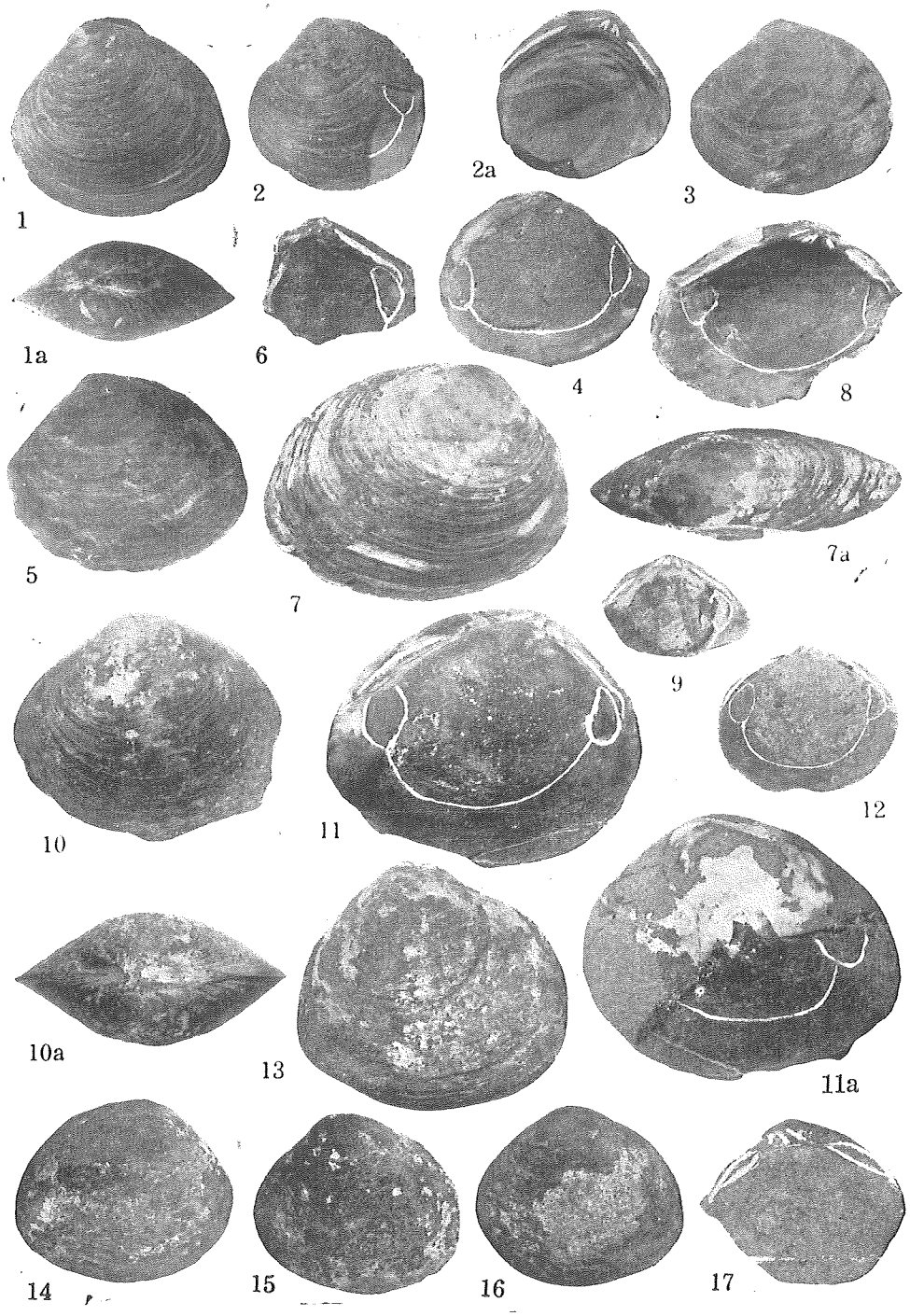
Plate IV

(The figures are of natural size)

Figs. 1–6. *Batissa sakakibara* ÔTATUME. The Platy Sandstones Bed of the Naibuti Series. The middle course of Manui-gawa, Siranui-mura, Sakaéhama-gun, Karahuto. 1. the holotype, 2. the paratype. Reg. No. 9309.

Figs. 7–9. *Batissa sitakaraensis* SUZUKI. The Platy Sandstone Bed of the Naibuti Series. The middle course of Manui-gawa, Siranui-mura, Sakaéhama-gun, Karahuto. Reg. No. 9310.

Figs. 10–17. *Corbicula hukayai* ÔTATUME. The Nayosi Coal-bearing Bed. Nayosi-mura, Nayosi-gun, Karahuto. Reg. No. 9311.



Kumano photo.

K. Ôtatume: Three Fossil Corbiculids from the Tertiary Formation of Karahuto.