TERTIARY CHELONIA FROM NORTHWESTERN KYUSHU

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TERTIARY CHELONIA FROM NORTHWESTERN KYUSHU

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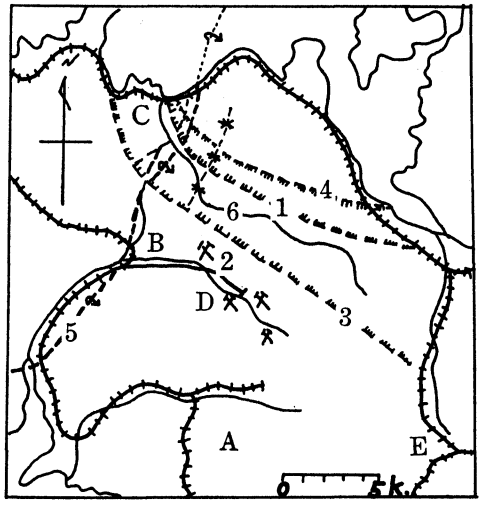
Introduction

This paper contains the description of a species of Trionychidae from the Tertiary Sasebo Group of northwestern Kyushu. Its relationships with the species from the Tertiary to the Pleistocene of Japan are discussed.

In 1968, I had an oppotunity to examine fragmental carapace of mud turtle stored in the Institute of Earth Sciences, Kagoshima University. It was supplied for me to study by Professor Nobuhiro Hatae of our Institute. The present material has collected by Mr. Nobuo Tashiro from the Iino Coal Mine, Sechibaru-machi, Kita-matsuura-gun, Nagasaki Prefecture, northwest Kyushu. I wish to express my hearty thanks to Prof. Nobuhiro Hatae for his valuable suggestion and encouragement through the course of this study and also to Professor Tatsuro Matsumoto of the Department of Geology, Kyushu University, for reviewing the manuscript. Thanks are also expressed to Mr. Nobuo Tashiro who kindly gave instructive informations about the stratigraphy of the Iino Coal Mine.



Text-fig. 1. Map showing the area of Hokusho (Kita-matsuura) Coal Field. A. Sasebo City, B. Yoshii town, C. Matsuura City, D. Sechibaru town, E. Arita town. 1. Nagahama fault, 2. Kasuga-ko, 3. Kunimi-yama fault, 4. Kusuhisa fault, 5. Sasagawa fault, 6. Shisa river. (after Hatae, Akiyoshi and Tashiro, 1964).

Paleontological Description

Order Chelonia

Manuscript received Sep. 2, 1970.

Family Trionychidae Gray, 1925

Genus *Trionyx* Geoffroy, 1809

Type-species.–*Trionyx triunguis* (Forskal), 1775

Remarks.–Trionyx sinensis japonicus Temminck & Schlegel is a single living species of Trionychidae in the Japanese islands, while three fossil species of Trionychidae have been reported from the Cenozoic of the Japanese islands, one of which is from western Honshu, and one from northern Kyushu; and one from Hokkaido; *T. desmostyli* Matsumoto from Hokkaido (Kawabata series, Miocene (?), Matsumoto, 1918); *T. ubeensis* Chitani from Yamaguchi Prefecture (Ube Group, early Oligocene, Chitani, 1925); and *T. kazusensis* Otsuka from Shimabara Peninsula of Nagasaki Prefecture (Ôya formation of the Kuchinotsu Group, early Pleistocene, Otsuka, 1969).

Trionyx sp. aff. *T. desmostyli* Matsumoto, 1918

Pl. 2, Figs. 1a and 1b; Text-fig. 2.

Compare.–Trionyx desmostyli Matsumoto, 1918. *Sci. Rep. Tohoku Imp. Univ.*, ser. 2, vol. 3, p. 22–25, pl. 1.

Material.–Fragmental carapace (ESK*)Reg. No. F–5005), collected from a greyish, medium-grained sandstone, belonging to the basal part of the Sechibaru Formation, upper part of the Sasebo Group (middle Miocene).

Description of the specimen.–The fragmental carapace of the posterior end is preserved. The shell of the carapace is large and moderately thick. The last costal is nearly rectangular (trapezoid) and not in contact with the last neural. It is about 36 mm near the margin and 33 mm along the posterior border.

The last second costal is irregularly oblong and has convex anterior, concave posterior borders. The posterior border of the last two costals are arranged straightly on a line or slightly concave forward.

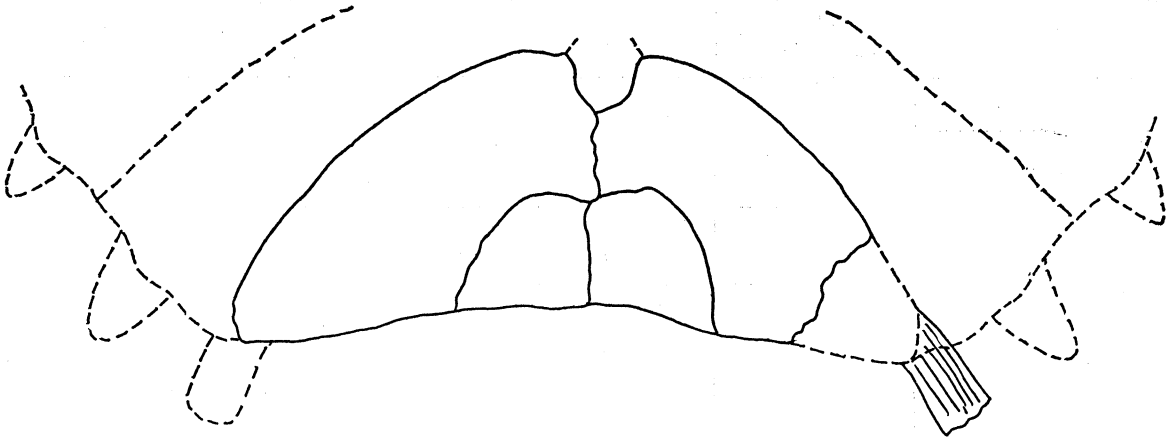
Measurements in mm:

	Last second costal (Left)	Last second costal (Right)	Last costal (Left)	Last costal (Right)
Transverse length along the anterior border	95.6	95.5	—	—
Width along the free border	50.4	51.5	33.2	29.0
Ditto along the inner border	33(+)	31.9	—	—

Comparisons.–The present specimen most closely resembles the holotype of *T. desmostyli* Matsumoto from the Miocene (?) deposits of Hokkaido (Matsumoto, 1918) in the rather prolonged form of the last costal and straightly arranged free borders of the last two costals. But strictly speaking, it slightly differs from the latter in the more rectangular last costal which is closer to the last neural.

The present specimen apparently differs from the recent Japanese species *Trionyx sinensis japonicus* Temminck & Schlegel in general outline of the last two costals,

*) Abbreviation for the Institute of Earth Sciences, Faculty of Science, Kagoshima University.



Text-fig. 2. Fragmental part of the carapace of *Trionyx* sp. aff. *T. desmostyli* Matsumoto. Partly restored (×1/2).

almost straight free border and the last costal separated from the last neural.

The present specimen is also distinguishable from the Chinese species of *Aspideretes impressus* Yeh and *Amyda gracilia* Yeh in the same respects as seen in the comparison with *T. sinensis japonicus* Temminck & Schlegel.

The present species is clearly distinguishable from *T. ubeensis* Chitani from the Tertiary sandstone bed of the Ube Coal Mine, Yamaguchi Prefecture (Chitani, 1925) by its more rectangular last costal and straightly arranged free borders of the last costals. *Trionyx petersi* R. Hoern. var. *siegeri* Her., a middle Miocene species of Trionychidae from Australia (Mottl, 1967) is also distinguishable in the same respects.

The present specimen is similar to *T. pontanus* Laube, so far as the last two costal are concerned, but strictly speaking, the former slightly differs from the latter in the more rectangular last costals and anteriorly concave free borders of the second costal count back from the last one.

Remarks on the Sasebo Group

Iino Coal Mine lies in the Hokusho (Kita-matsuura) Coal field and is working coal of the Sasebo Group. According to Iwahashi (1961) the Sasebo Group and overlying strata are divided into the following stratigraphic units in descending order:

The Sasebo Group (Lower and Middle Miocene), as a whole, is characterized by the sediments of fluvio-deltaic or lacustrine environments. They are mainly composed of sandstone, shale and alternation of them, intercalting many well traceable coal seams. Marine molluscan faunae are seen in the underlying Ainoura Group and the Yunoki and Fukui Formations of the Sasebo Group. Abundant plant remains and some fossil turtles have hitherto been recorded from this group.

Regard ing the geologic age of the Sasebo Group, there have been controversies among authors. *Brachiodus japonica* Matsumoto, occurring in the Yunoki Sanmai Bed of Ikeno Coal Mine, is regarded by Matsumoto (1929) as indicating Lower Oligocene. Against

Formation name		Thickness (in meter)	Main coal seam	Vertebrate fossils
Nojima Group				
Group	Kasé F.	85-100		
	Fukui F.	170	Fukui Ichimai Bed	
	Sechibaru F.	150		*Trionyx* sp. aff. *T. desmostyli* Mat.
Sasebo	Yunoki F.	310	Matsuura Sanjaku Bed Yunoki Nimai Bed Yunoki Sanmai Bed	*Geoclemmys matsuuraensis* Shikama *Senryuemys kiharai* Shikama *Brachiodus japonicus* Matsumoto
	Nakazato F.	100-140	Ôse Gosyaku Bed	
Ainoura Group				*Geoclemmys matsuuraensis* (?) Shikama

this Takai (1938) is of opinion that *Brachiodus* of Oligo-Miocene forms does not indicate age so precisely as Matsumoto says and that the Lower Sasebo Group may be Lower Miocene, being correlated to the Hiramaki Formation of Gifu Prefecture. Tanai (1955) agrees with Takai, from the view point of palaeobotany, and has correlated the flora of the Sasebo Group to the Aniai flora of the Aniai coal field of northeast Japan (Low. Miocene). Matsushita (1949) has a view that there are no distinct differences between the marine faunae of the Sasebo and the Asiya Groups and called the two groups together the Tsukushi series of Oligocene age. Prior to this Hatai (1938) referred a part of Nishisonogi or Asiya to Miocene, on the basis of the revision of the molluscan fossils. But as the result of examination of the present turtle, I can not get the conclusion concerning the geologic age of the Sechibaru Formation, because the geologic range of the *T. desmostyli* Matsumoto is not known.

The specimen at hand, according to the Tashiro's information, occurred in the "Shimairi sandstone" immediately above the Matsuura Sanzyaku bed which is intercalted in the uppermost part of the Yunoki Formation. The Shimairi sandstone bed which belongs to the lowermost part of the Sechibaru Formation overlies the Yunoki Formation with a diastem in the Sechibaru region. (Hatae et al., 1964). As to the sedimentary environment of the upper part of the Yunoki Formation, Hatae et al. (1964) assumed the fluvio-deltaic to lacustrine environment based on the occurrence of abundant non-marine molluscs. The present occurrence of mud turtle from the Shimairi sandstone bed may suggest that the fluvio-deltaic to lacustrine environments continued to the Sechibaru Formation.

Short Review on the Tertiary Chelonia from Japan

Nowadays, four families, seven genera and eight species of chelonia have been known from the Oligocene and Miocene formations in the Japanese islands. Their occurrence are as follows.

Emydidae

* *Geoemyda takasago* MATSUMOTO: Basal part of the Asiya Group (lower Miocene?), 2. Basal part of the Kishima Group (upper Oligocene?)

* *Geoemys* cfr. *takasago* MATSUMOTO: Sea bottom of the Sasebo Harbour, probably derived from the Ainoura Formation of T. UEJI (lower Miocene)

* *Senryuemys kiharai* SHIKAMA: Sari sandstone bed of the Kishima Group and the Yunoki Formation of the middle Sasebo Group (lower to middle Miocene)

* *Geoclemmys matsuuraensis* SHIKAMA: Ainoura, Yunoki and the Sechibaru Formations of the lower to middle Sasebo Group (lower to middle Miocene)

Geoclemmys yudaensis SHIKAMA: Tate bed of the lower Kadonosawa Formation (middle Miocene)

* *Graptemys*? *yamashitai* URATA: Basal part of the middle Yoshinotani Formation of the Ôchi Group (lowest Oligocene)

Cheloniidae

Kurobechelys tricarinata SHIKAMA: Upper Tozyo Mudstone Formation of Tomari Member, upper Yatsu Group (uppermost Miocene)

Trionychidae

Trionyx ubeensis CHITANI: Ube Group (lowest Oligocene)

Testudinidae

* *Sinohadrianus iwayaensis* URATA: lower Yoshinotani Formation of the Ochi Group (lower Oligocene)

Of the above listed species those marked with asterisk came from the Hokusho-Karatsu coal field in northeast Kyushu.

In addition to them, *Trionyx desmostyli* MATSUMOTO, has been recorded from the province of Teshio, Hokkaido (MATSUMOTO, 1918), although its locality and horizon are not precisely known. SHIKAMA (1956) has mentioned about the horizon and the age of this specimen as follows. "MATSUMOTO regarded, after H. YABE's suggestion, its horizon to be same as that of *Desmostylus japonicus* TOKUNAGA & IWASAKI of Opirashibets, Rumoi-gun. According to Takai (1938), the locality of *Desmostylus* above mentioned in the Kamikinebetu, upper reaches of the Opirausibets and its horizon belongs to the Kotanbetu Formation, which Y. SASSA regarded as Middle Miocene. But according to the recent survey made in Hokkaido by many geologists, the area of Kamikinebetu is almost composed of Cretaceous formation. Each tributary of the Opirausibets river is composed of Paleogene Ishikari-Poronai Series, Chikubetsu (Lower Miocene) and Kotanbetsu Forma-

tion etc. Thus we have not yet been successful to find the very bed of *Trionyx*".

The first discovery of Pleistocene Trionychidae in Japan has been made rather recently from the early Pleistocene Kuchinotsu Group in west Kyushu (Otsuka, 1969) and the specimen was named as *Trionyx kazusensis* Otsuka. The fossil Trionychidae from the Sasebo Group is the fourth occurrence in Japan.

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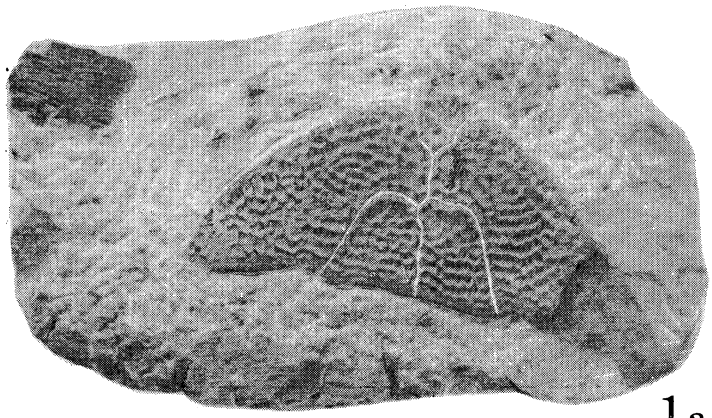
PLATE 2

Explanation of Plate 2

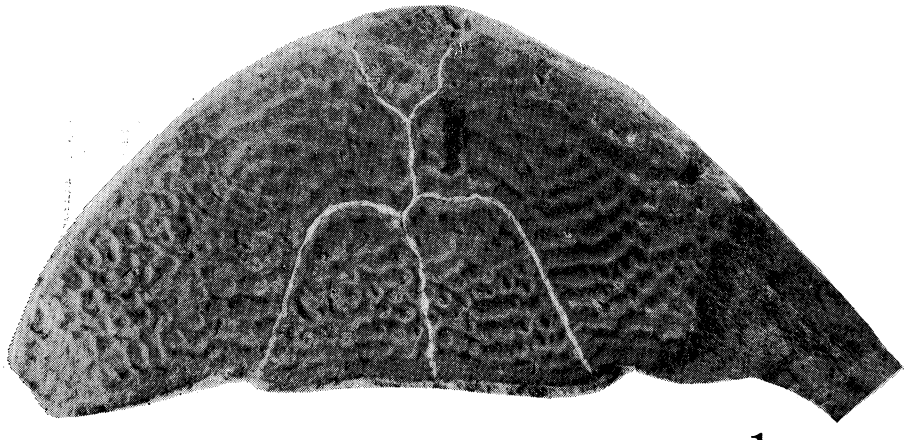
Figs. 1a-b. *Trionyx* sp. aff. *T. desmostyli* Matsumoto ..... Page 23-28

1a. ESK. Reg. No. F-5005, a fragmental carapace in the state of preservation, ×ca. 1/3

1b. ESK. Reg. No. F-5005, a fragmental carapace, ×1.



1a



1b