Dermal scales of *Carcharocles megalodon* (Agassiz) from the Miocene Mizunami Group, central Japan -Studies on dermal scales of some elasmobranchian fossils from Japan. Part 1-

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中新統瑞浪層群より産した*Carcharocles megalodon* (Agassiz)の楯鱗群 －日本産化石板鰓類の楯鱗の研究　その１－

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(要　　旨)

我々は，中新統八尾層群産*Carcharhinus egertoni* の楯鱗群化石の発見（西本ほか，1980）以降，酢酸処理によって，板鰓類の楯鱗化石の検出を試みてきた．その結果，中新統瑞浪層群産の*Carcharocles megalodon*顎歯群，中新統勝田層群産のCarcharhinid椎骨群，上部白亜系蝦夷累層群産の*Ptychodus* cfr. *latissimus* 顎歯群等にともない楯鱗化石群を認めることができた．ここでは，紙面の都合により，中新統瑞浪層群より得られた*Carcharocles megalodon*の楯鱗群化石について記載する．

今回報告する楯鱗群化石は，瑞浪青年会議所が1986年11月２日に開催した「瑞浪ふるさと祭」の化石掘りのイベントの際，瑞浪市明世町小狭間の道路工事中に掘りだした岩塊から産した合計８点の上下顎歯に伴って得られたものである．楯鱗化石は５つのタイプに識別でき，このことは，この種においても現生板鰓類同様，体の部位ごとに楯燐の形態が変化するものらしい．

There have been some studies on fossil dermal scales of elasmobranchs of Japan such as *Isurus* sp. from the Miocene Ono Formation (Goto, Kobayashi and Osawa, 1978), a hybodontid species from the Permian Adoyama Formation (Reif and Goto, 1979), *Carcharhinus egertoni* from the Miocene Yatsuo Group (Nishimoto, Tatematsu and Sawada, 1980) and *Squatina* sp. from the Miocene Mizunami Group (Itoigawa *et al.*, 1985). We found dermal scales of three fossil elasmobranchian species from Japan, by Acid method. They are *Carcharocles megalodon* (Agassiz) from the Miocene Mizunami Group, Gifu Prefecture, Charcharhinidae gen. *et* sp. indet. from the Miocene Katsuta Group, Okayama Prefecture, and *Ptychodus* cfr. *latissimus* Agassiz from the Late Cretaceous Yezo Supergroup, Hokkaido. In this paper, we describe dermal scales associated with the fossil teeth

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Received September 29, 1992

of *Carcharocles megalodon* from the Miocene Mizunami Group.

Description

Family Otodontidae Gluckman, 1957

Genus *Carcharocles* Jordan and Hannibal, 1923

Type species: *Carcharodon auriculatus* Blainville, 1818 by original designation.

Geologic range: Eocene to Pliocene.

Carcharocles megalodon (Agassiz, 1843)

(Fig. 1- 1-6 ; Pl. 33, Figs 1a, b-6a, b; Pl. 34, Figs 1a, b-7a, b)

1843 *Carcharodon megalodon* Agassiz, p. 7, pl. 4, figs. 1-6 ; pl. 5, figs. 1-3.

1987 *Carcharocles megalodon* (Agassiz): Cappetta, p. 103, fig. 91a, b.

Locality : MFM. Loc. 46 (Hesoyama, Yamanouchi, Akeyo-cho, Mizunami City, Gifu Prefecture); tuffaceous siltstone of the Yamanouchi Member, Akeyo Formation, Mizunami Group (Early Miocene).

Description of dermal scales :

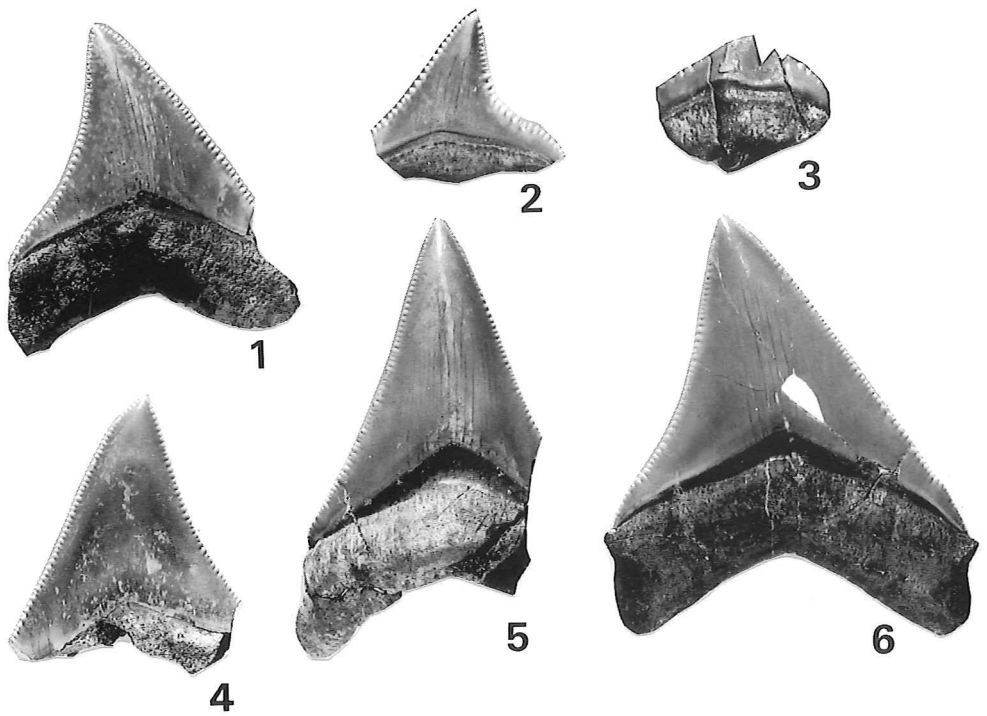


Figure 1

Carcharocles megalodon (Agassiz), teeth (×1.5), ×1.0 except figs. 2,3, labial view. 1, 7th right zpper tooth; 2, 9th or 10th left upper tooth; 3, 13 or 14 left upper tooth (×4.0); 4, 7th left upper tooth; 5, lst or 2nd left lower tooth; 6, 6th right upper tooth.

Type I (Pl. 33, Figs. la, b-6a, b) : The long, thin crown with a sharp apex is longitudinally elliptical or rhomboidal in outline and curved to posterior direction. On the dorsal surface, there are 2 to 5 ribs which do not reach the apex. The neck region is well developed. The base with a basal pore is simple.

Type II (Pl. 34, Figs. 4a, b, 7a, b) : The long, thick crown with a sharp apex is longitudinally elliptical in outline and curved to posterior direction. On the anterior dorsal surface, there are 6 weak ribs. The neck region is well developed. The base is simple and has a basal pore.

Type III (Pl. 34, Figs. 1a, b, 5a, b, 6a, b) : The thick crown with a blunt apex is rhomboidal in outline. The dorsal surface is flattened and the anterior lateral surface possesses many striae. The neck region is well developed. The base is simple.

Type IV (Pl. 34, Fig. 2a, b) : The long, thin crown is transversely rhomboidal in outline and curved to posterior direction. The posterior margin is pieced by two deep V-shaped notch. On the dorsal surface, there are 7 well developed ribs which reach the posterior margin. The neck region is well developed. The base is simple.

Type V (Pl. 34, Fig, 3a, b) : The thick crown is transversely rhomboidal in outline. The posterior margin has 2 shallow notches. The dorsal surface is flattened and bears 10 well developed ribs. The neck region is well developed. The base is simple.

Remarks : The above 5 types of dermal scales, associated with the fossil teeth (Fig. 1-1-6) of *Carcharocles megalodon* (Agazziz), can be distinguished. Among these types, the type I is very similar to that of the living species, *Carcharodon carcharias* (Linnaeus). A morphologic difference appears to derive from theY region of the body as Cappetta (1987) has already suggested.

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Plate 33

Figs. 1a, b-6a, b. *Carcharocles megalodon* (Agassiz), dermal scales, type I. x 100. a, dorsal; b, lateral view.

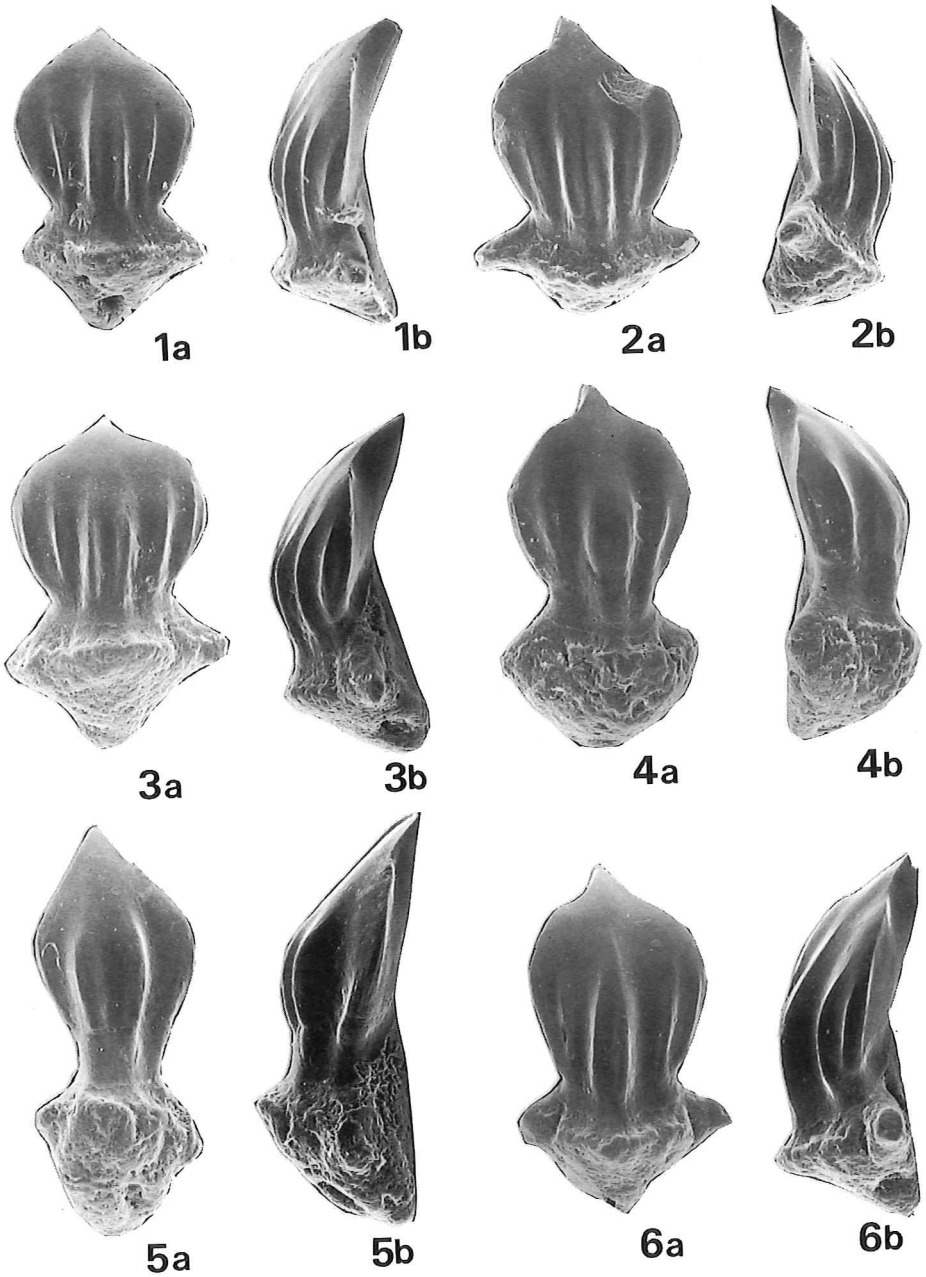

1a
1b
2a
2b
3a
3b
4a
4b
5a
5b
6a
6b

Plate 34

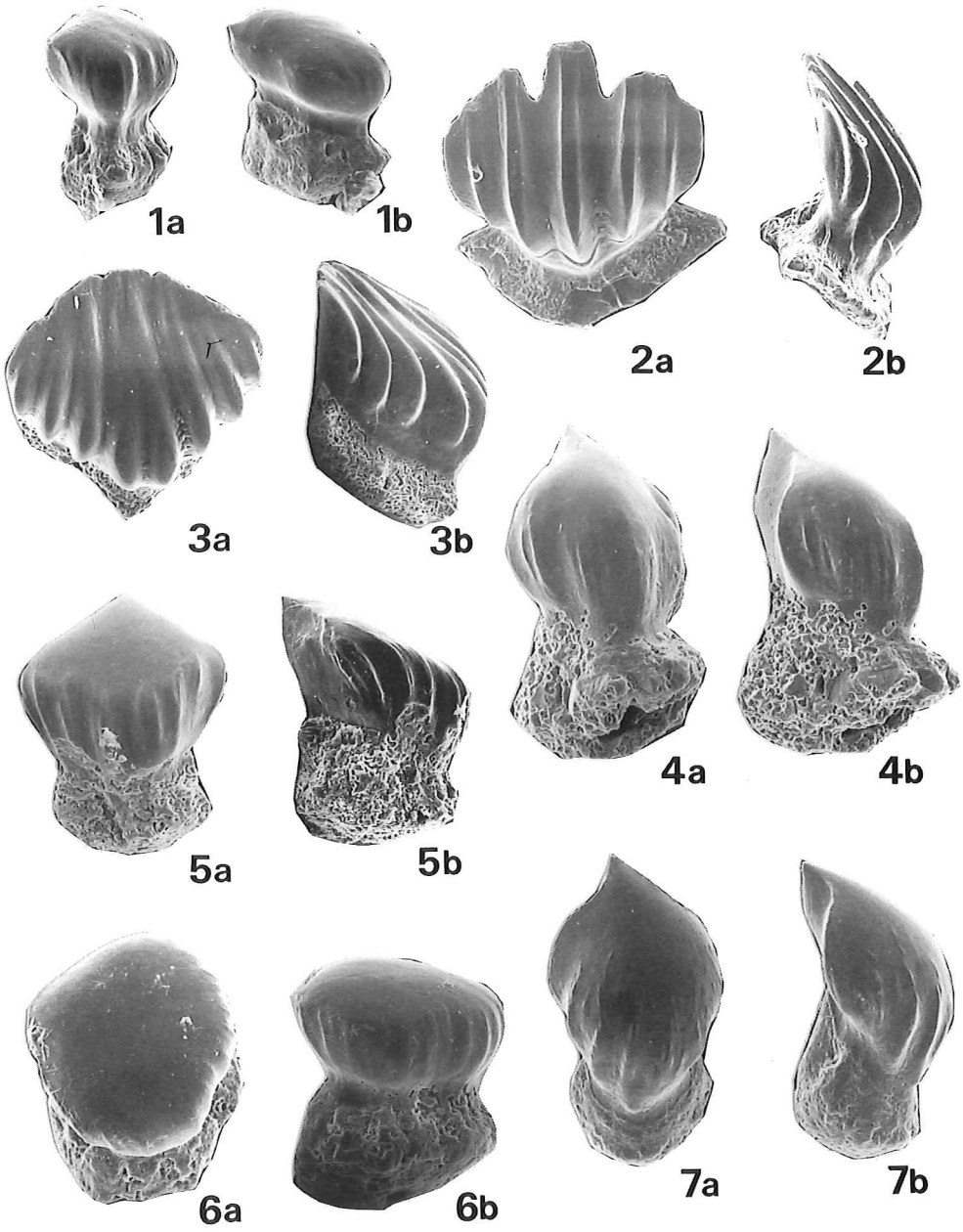
Figs. 1a, b-7a, b. *Carcharocles megalodon* (Agassiz), dermal scales, x 100. a, dorsal; b, lateral view.

Figs. 1a,b, 5a,b, 6a,b. Type III.

Figs. 4a,b, 7a,b. Type II.

Figs. 2a,b. Type IV.

Figs. 3a,b. Type V.


1a
1b
2a
2b
3a
3b
4a
4b
5a
5b
6a
6b
7a
7b