

Oligocene squalodont (Cetacea: Mammalia) from the Ashiya Group, Japan

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Abstract A lower jaw and an isolated tooth of a squalodont, *Squalodon* sp. are reported as the first record of the genus from Japan. The presence of the genus from the Ashiya Group indicates the Late Oligocene.

Introduction

In 1982, OKAZAKI proposed a new species, *Metasqualodon symmetricus* from the Ashiya Group, North Kyushu. That species has rather small cheek teeth among the squalodontids. From the same district, a fossil specimen of a lower jaw with two cheek teeth has been collected. The size and shape of the teeth is remarkably different from *M. symmetricus*, and it represents character of the genus *Squalodon*. Adding to this specimen, an isolated cheek tooth of the *Squalodon* is collected. That

Table 1. Fossil List of the Ashiya Group (1988. 9.)

	Wakamatsu	Ainoshima Isl.	Umashima Isl.	Hikoshima Isl.	unknown
Mammals					
Dugongidae, gen. et sp. indet.	*				
<i>Metasqualodon symmetricus</i> OKAZAKI (1982, 1987)	*		*	*	
<i>Squalodon</i> sp. (present report)	*				
squalodontid, gen. et spp. indet.		*	*	*	
<i>Patriocetus</i> ? sp. (MATSUMOTO 1923), etc.	*			*	
<i>Mauicetus</i> ? sp. (OKAZAKI, oral)	*			*	
<i>Amynodon</i> ? sp. (unreported)			*		
Aves					
plotopterid, spp. (HASEGAWA, <i>et al.</i> 1979)	*	*	*	*	
Reptiles					
Chelonia, gen. et spp. indet. (unreported)	*	*	*	*	
<i>Trionyx</i> sp. (unreported)		*			
<i>Geoemyda takasago</i> MATSUMOTO (1929)					*

tooth has character of slight different from the lower jaw. The presence of the genus *Squalodon* in the Japanese Tertiary is reported as the first time in the present report. The geological age of the Ashiya Group is estimated as Oligocene in the recent studies on the micropaleontology (SAITO and OKADA, 1984, etc.). As the genus appeared in the Late Oligocene in other districts, age of the Ashiya Group (at least of its upper part) must be Late Oligocene.

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Systematic description

Family Squalodontidae

Genus *Squalodon* GRATELOUP, 1840

Squalodon sp.

(1) Tomoro Berch specimen; right mandible with two cheek teeth.

KMNH VP 000,011

Locality; "Tomoro Beach", Waita, northern coast of Wakamatsu, Kitakyushu City, Japan.

Horizon; Waita Formation, Ashiya Group.

Discovery; by Mr. Toshiyuki KAMEI, Kitakyushu Natural History Society, Kitakyushu City, in Aug. 16, 1982.

Description;

Almost complete right lower jaw preserved. Only its buccal side cleaned up. Most anterior part and angular process broken. Ventral margin of ramus straight with slight concave part at middle. Buccal side almost flat but with a straight and weak ridge from articular process to the middle part of the ramus. Buccal face of the mandibular process concave. Coronoid process with rather low and round apex. Articular process partly broken, with small articular facet of caudal-lateral face. Dorsal margin of the mandible with concave curve. Among the preserved alveoli, two teeth preserved in situ; Most posterior tooth, identified as B7, and at middle, identified as B3. Between these teeth, alveoli for three teeth observed, and anterior to the B3, alveoli for four teeth observed. Posterior to the B3, alveolar openings situated along the alveolar groove. Diastema absent between posterior alveoli, but in the anterior part, short distance visible between alveolar openings. Judging from the alveoli, anterior two teeth with single root, and posterior seven teeth with double root with isthmium.

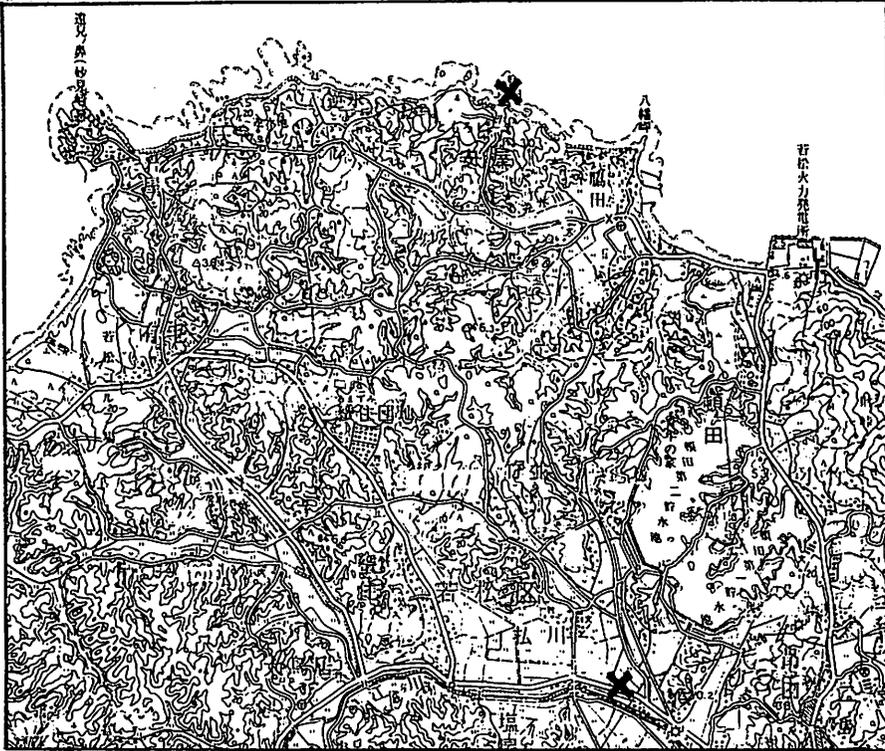


Fig. 1 Location of the materials of *Squalodon* sp. X; materials reported here.

B3: Tooth with triangular, depressed lingulo-buccally. At the middle part of anterior cutting edge, a small accessory cusp situated (lost in the preparation process). Cutting edge between the anterior accessory cusp and main cusp with minute crenulations. Along the posterior cutting edge, three accessory cusps and a minute basal denticle. The dimension of the accessory cusps decrease from main cusp to the base. Buccal face of crown smooth, with weak striations at middle-basal part. Lingual face of the crown more rugose, especially on its posterior half. Cingulum not visible, crown and root with continuous surface. Double root with isthium. Without occlusal trace.

B7: Triangular crown with less height compared with the B3. Anterior cutting edge without accessory cusps. Along the posterior cutting edge, three accessory cusps. Main cusp with very minute inflations of cutting edge at both sides. Buccal face of the crown smooth with rugose part at the middle part of the

base. Lingual face of the crown also smooth. Cingulum absent, crown and root with continuous surface. Double root with isthium. Without occlusal trace.

Followings are measured (in mm).

Total length as preserved	408
Length from anterior end to apex of coronoid process	327
Height of ramus at widest part near anterior end	38.4
Height of ramus at first buccal tooth	39.4
Height of ramus at posterior to the last tooth	71.5
Height of coronoid process from ventral margin of ramus	152
Height of mandible at posterior to the coronoid process	107
Length of anterior end to posterior end of alveoli	241.6
Distance from distal margin of alveolus I3 to that of each alveolus	
C: 24.4 B1: 48.6 B2: 73+ B3: 108.8	
B4: 133.6 B5: 164.8 B6: 190.2 B7: 215.4	
Height of crown of third buccal tooth	28.1
Length of anterior cutting edge of third buccal tooth	30.9
Length of posterior cutting edge of third buccal tooth	29.9
Medial-distal length of crown of third buccal tooth	27.1
Medial-distal length of root of the third buccal tooth	27.2
Lingual-buccal thickness of the third buccal tooth	10.1
Height of crown of seventh buccal tooth	21.7
Length of anterior cutting edge of seventh buccal tooth	24.0
Length of posterior cutting edge of seventh buccal tooth	26.0
Medial-distal length of crown of seventh buccal tooth	24.2

(2) Haraigawa isolated tooth; Left upper posterior cheek tooth. KMNH VP 000,012
 Locality; Haraigawa, Wakamatsu, Kitakyushu City, Japan. The specimen is collected from stones derived from construction of a drainage pump pit, depth reaching 15 meters beneath surface.

Horizon; Sakamizu Formation, Ashiya Group.

Discovery; by Yoshihiko OKAZAKI, Kitakyushu Museum of Natural History, May 13, 1988.

Description;

Almost complete crown preserved. Root only small part preserved. Crown triangular, depressed lingulo-buccally. Buccal face of crown with smooth surface with low but distinct cingulum. Weak striations in basal part. Both anterior and posterior cutting edges with accessory cusps; 3 anterior and 5 posterior accessory cusps, and a basal anterior nod. Accessory cusps decrease in size from main cusp basally. Crenelation absent. Lingual face of crown also smooth with distinct

cingulum. Weak striations in basal part.

Root double with isthium between them.

At the anterior cutting edge of main cusp and the apex of the largest anterior accessory cusp, small occlusal facet observed.

Measurements (in mm).

Total height as preserved	28.4
Height of crown of tooth	23.4
Length of anterior cutting edge	26.8
Length of posterior cutting edge	27.7
Medial-distal length of crown	29.9
Lingual-buccal thickness	10.1

Discussion

The present lower jaw, KMNH VP 000,011, has characters and size of the genus *Squalodon*. Although the preservation is incomplete, the number of cheek teeth of the jaw does not increased. It indicates rather primitive state of the present species in the genus *Squalodon*.

The isolated tooth of Haraigawa specimen, KMNH VP 000,012, is posterior upper left buccal tooth of the genus *Squalodon*. Compared with the lower jaw, it shows slight difference in possessing distinct cingulum both buccal and lingual surface of the crown.

These two specimens are quite different from the squalodontid, *Metasqualodon symmetricus*, which has been reported from the Ashiya Group (OKAZAKI, 1982, 1987), in their size, accessory cusp arrangement and crown ornamentations.

The present report is the first record of the genus *Squalodon* from Japan. The genus *Squalodon* appeared in the Late Oligocene in Atlantic and Pacific Oceans, and the present record, with other data from vertebrate assemblage, indicates the geological age of the Ashiya Group is Late Oligocene.

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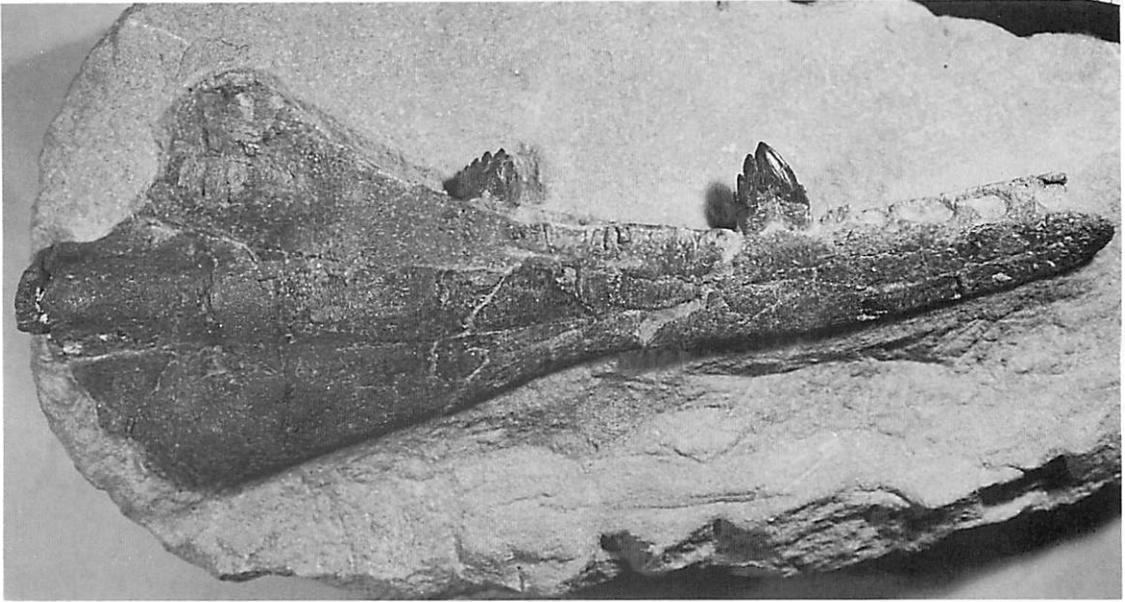
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Plate 1

Explanation of Plate 1.

Squalodon sp.

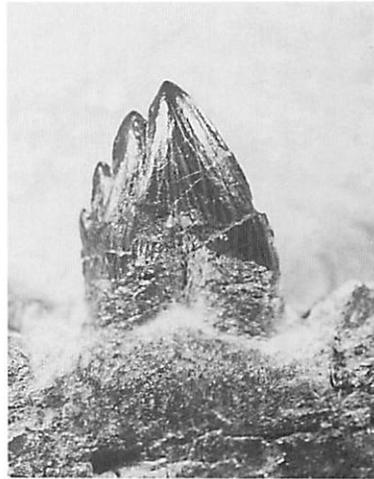
- Fig. 1. Tomoro Beach specimen; KMNH VP 000,011.
Right lower jaw from Waita, buccal side. $\times 0.35$
- Fig. 2. Seventh buccal tooth of the Tomoro Beach specimen; KMNH VP 000,011. $\times 1$
- Fig. 3. Third buccal tooth of the Tomoro Beach specimen; KMNH VP 000,011. $\times 1$
buccal view.
- Fig. 4. Haraigawa isolated tooth; KMNH VP 000,012. $\times 1$
4a; lingual view.
4b; buccal view.
4c; crown view.



1



2



3



4a



4b



4c