

## A Tooth of *Desmostylus* Found at Shiratori, Southern Noto, Japan\*

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石川県七尾市白鳥産のデスモスチルス臼歯

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### Introduction

In the Noto district, the occurrence of Desmostylids has hitherto been reported from three localities by F. TAKAI (1944) and N. IKEBE (1954).\*\* The present note deals with the fourth occurrence of Desmostylid from Noto, with reference to the geology of the environs of the locality.

In summer of 1958, on the way of a geological trip to Nanao, Southern Noto, the writer was fortunate enough to obtain information about an interesting fossil tooth which was found at Shiratori village, Nanao City. This specimen which was collected by Mr. Sôji HAMANAKA of Shiratori village in June, 1950, had been kept in the Enotomari Primary School since then. The writer had an opportunity to visit the locality with Mr. K. MORISE and Mr. S. HAMANAKA, the collector, and the specimen was offered to the writer for study through permission of Mr. T. MARUYAMA, the schoolmaster of the Enotomari Primary School of Nanao City.

The writer wishes to express his hearty thanks to Messrs. T. MARUYAMA, K. MORISE and S. HAMANAKA, without courtesy of whom the present study would have been impossible. The writer is greatly indebted to Drs. S. IJIRI and T. KAMEI for their valuable suggestions rendered during the course of this work. His thanks are also due to Dr. H. OZAKI of the National Science Museum of Tokyo for permitting me to study the specimens of *Desmostylus* preserved in the Museum. The writer's cordial thanks are due to Dr. H. YABE for his invaluable advice.

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\*Read on the 79th general meeting of the Palaeontological Society of Japan held at Kanazawa, Nov. 23, 1961.

\*\*IKEBE, N. : "A Tooth of *Desmostylus* from the Upper Miocene Yoshitaki Formation, Yatsuo Group in Toyama Prefecture, Japan." Read on the general meeting of the Palaeontological Society of Japan held at Kanazawa, Oct. 9, 1954 (as yet unpublished).

### Locality and Occurrence

According to the collector, the present specimen was picked up by him at the north coast of Shiratori village, Nanao City, Ishikawa Prefecture, Japan (Long.  $137^{\circ}3' 15''.2$  E ; Lat.  $37^{\circ}3' 25''.8$  N) (Fig. 1). He found it as a strange pebble rolling on the beach, and offered it to the Enotomari Primary School near

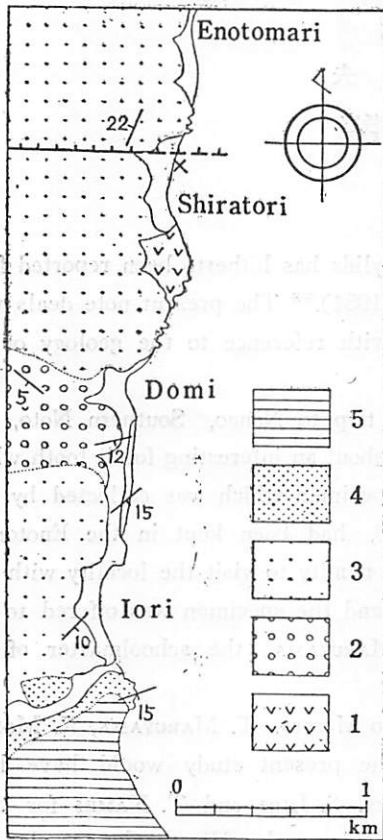


Fig. 2. Geologic map of the environs of Shiratori, Nanao City

X : Locality of *Desmostylus*.

- 1 : Andesite and agglomerate,
- 2 : Conglomerate and sandstone,
- 3 : Sandstone (Iori sandstone),
- 4 : Calcareous sandstone and glauconitic sandstone,
- 5 : Shaly mudstone (Mushizaki shale).

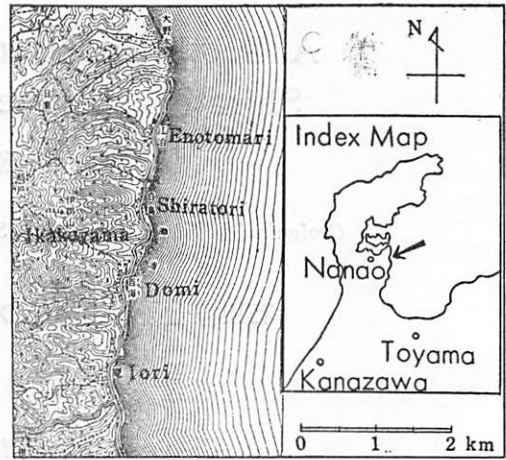


Fig. 1. Map showing the locality of the Shiratori specimen.

X : Locality (Topographical map in scale 1 : 50,000, "Koguchisetu" sheet)

the locality.

Thus, we have no more information about exact beds which yielded this specimen. Both the geology of the environs of locality and the cementing material which filled up the holes of the tooth specimen, however, are helpful to infer the source or derivation of the fossil tooth.

Geologic map along the east coast of Sakiyama peninsula including the locality is shown in Fig. 2. The lowest member which crops out in the area is the andesite and its agglomerate belonging to the Anamizu formation, the age of which being of Early Miocene. Unconformably covering the andesites, the alternated beds of sandstone and conglomerate belonging to the Kurosedani stage (Middle Miocene) are found, which contain some fossils such as *Operculina* sp. The Iori sandstone member which is composed of coarse-grained sandstone with thin insertions of white tuff layers, is correlated to the Higashibescho stage (upper Middle Miocene). The uppermost part of the Iori sand-

stone member is sometimes glauconitic.

The cementing material filling the holes of the present tooth suggests that the fossil was presumably derived from the glauconitic sandstone layer occupying the uppermost horizon of the Iori sandstone member.

### Description of the Shiratori Specimen (PLATE I)

Material : A molar tooth of *Desmostylus*, missing the root ; one column broken off ; each column has a deeply penetrated cylindrical hole which is filled up by the greenish medium sandstone.

Measurements : The measurements of the Shiratori specimen compared with those of the right upper 1st molar of the Togari specimen, are shown in Table 1.

Table 1. Measurements of the Shiratori specimen (right lower 3rd molar ?) compared with the Togari specimen (right upper 1st molar)

		Shiratori specimen, right lower 3rd molar (?)	Togari specimen, right upper 1st molar
Mesio-distal length	maximum	61 mm	64 mm
	occlusal surface	59	56
Bucco-lingual width	1st row	24+*	42
	2nd row	41	44
	3rd row	38	38
	4th row	18	18
Number of columns		8	8
Supernumerary column		none	1
Maximum diameter of column on the occlusal surface	1st row	buccal	—*
		middle	15
		lingual	16
	2nd row	buccal	21
	lingual	22	
3rd row	buccal	19	
	lingual	20	
4th row		18	18
Height of crown	1st row	buccal	—*
		middle	32+
		lingual	32
	2nd row	buccal	31
	lingual	31	
3rd row	buccal	31	
	lingual	29+	
4th row		29	31+

\* one column missing

**Description :** The Shiratori specimen closely resembles the Togari specimen, the holotype of *Desmostylus japonicus* TOKUNAGA et IWASAKI, and also resembles the Ichinoseki specimen described by S. ONODERA (1957). It has eight pillows or columns, three in 1st row, two in 2nd and 3rd rows, and one in 4th row. Among three columns of the 1st row, one is broken off. The occlusal surface is present in the mesial part and absent in the distal part. Although the number and arrangement of columns suggest the upper jaw, it is appropriate to regard it as a tooth of the lower jaw, judging from the characteristic curvature of the occlusal surface. The irregularity of molarization in each pillow of the Shiratori specimen suggests the 3rd molar. It is not easy to decide whether the present specimen belongs to the right or left mandible, but the converging tendency of the lines running across each row suggests the right mandible. Thus, the Shiratori specimen is assigned to be of the right lower 3rd molar of *Desmostylus japonicus* on the basis of the criteria mentioned above.

### Remarks

In Noto Peninsula, four specimens of Desmostylid have been known as shown in Fig. 3. Among them, the Han'noura specimen (Left upper 3rd premolar <sup>3</sup>P) may belong to the genus *Paleoparadoxia*, and other three evidently belong to *Desmostylus japonicus*. These specimens, to our regrets, have no exact record of occurrence, but seem to have been derived from the phosphorous deposits (Han'noura and Shitsumi specimens), the glauconitic tuffaceous beds (Iwaodaki specimen), and the glauconitic sandstone (Shiratori specimen). According to the stratigraphic correlation, these members should be assigned to be the upper horizon of Higashibessho stage or the upper horizon of Middle Miocene. In other words, the geological horizons of the Desmostylid fossils in Noto are more or less higher than other localities in Japan except for that of San'in district facing the Japan Sea. The Desmostylids presumably survived until Late Miocene in the Hokuriku-San'in province along the Japan Sea coast of Southwest Japan, mainly due to the palaeogeographic conditions favourable for Desmostylids. (Y. KASENO, 1963).

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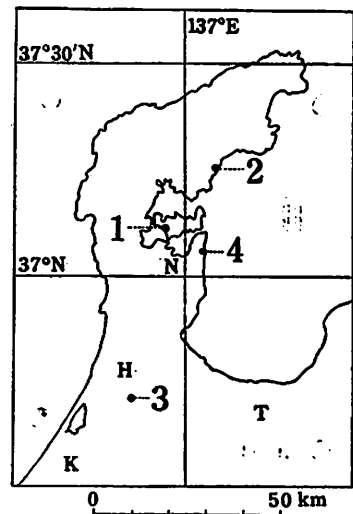


Fig. 3. Localities of Desmostylid fossils in Noto, Japan.

1. Han'noura, Noto-jima, Kashima-gun, Ishikawa Prefecture (Han'noura specimen).
  2. Shitsumi, Noto-machi, Fugeshi-gun, Ishikawa Prefecture. (Shitsumi specimen).
  3. Iwaodaki, Isurugi-machi, Toyama Prefecture (Iwaodaki specimen).
  4. Shiratori, Nanao City (Shiratori specimen).
- K : Kanazawa, T : Toyama, N : Nanao, H : Hōdatsusan.

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## 要 約

石川県七尾市白鳥海岸(宮ノ下)で拾得(採集者:浜中宗次氏)されたデスモステルスの臼歯について記載し、能登半島における既知の産地と層準に言及した。白鳥標本は、*Desmostylus japonicus* TOKUNAGA et IWASAKI の、右下顎第3臼歯と判定される。産出層準は不詳であるが、臼歯の空孔を充填する海緑石質砂岩から判断して、当地区に分布する庵砂岩層最上部の海緑石質砂岩に由来するものと推定される。能登と山陰におけるデスモステルスの産出層準は、他の地域にくらべていくらか上位で、中新世中期の末あるいは中新世後期のはじめにあたる。このことは、デスモステルスの生息環境から考えて、中新世中～後期の古地理について暗示を与える。

**Explanation of Plate I**

(All figures in natural size)

*Desmostylus japonicus* TOKUNAGA et IWASAKI

Presumably the right lower 3rd molar tooth.

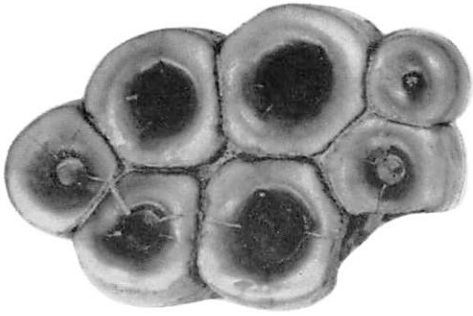
Locality : A pebble at the sea coast of Shiratori village of Nanao, Noto Peninsula, Japan.

Collector : Mr. Sôji HAMANAKA of Shiratori village.

Geological Horizon : Presumably the glauconitic sandstone layer occupying the uppermost part of the Iori sandstone member. The uppermost horizon of Middle Miocene.

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- Fig. 1. Occlusal view. Left distal, right mesial ; top lingual, bottom buccal.
- Fig. 2. Linguo-occlusal view. Left mesial, right distal.
- Fig. 3. Buccal view. Left distal, right mesial.
- Fig. 4. Mesial view. Left buccal, right lingual.
- Fig. 5. Lingual view. Left mesial, right distal.
- Fig. 6. Distal view. Left lingual, right buccal.



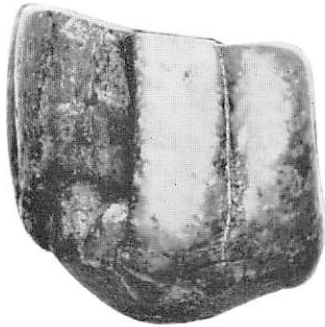
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