24. *Desmostylella*, a New Genus of *Desmostylidae* from Japan.

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A small tooth of *Desmostylus*-like mammal obtained by Dr. S. Shimizu some twenty years ago from the Hukuoka district, Iwate prefecture, is now stored in the Institute of Geology and Palaeontology, Tōhoku Imperial University, Sendai. Prof. H. Yabe of that institute generously permitted the present writer to examine and describe this important fossil. It appears certain that this tooth, although very closely related to a *Desmostylus* tooth, is different in some important points from all known specimens of the latter from both Japan and North America, so that the writer feels warranted in establishing a new genus for this specimen.

Desmostylella nov. gen.

Genotype:—*Desmostylella typica* nov. Monotypic.

Desmostylella typica nov. sp. Figs. 1–4

Type specimen:—A left upper M₂. Reg. No. 56701, Institute of Geology and Palaeontology, Tōhoku Imperial University, Sendai, Japan.

Locality:—Yuda (?), Kintaiti-mura, Ninohe-gun, Iwate Prefecture.

Geological horizon:—Yuda group of Shimizu (?),* (included in the lower Kadonosawa group of Otuka.** Miocene (Lower Miocene?).

Measurements:—Maximum length of tooth 46 mm.
 Maximum width of tooth 21 mm.
 Maximum height of tooth 29 mm.
 Maximum height of crown 22 mm.

Upper M₂ small, much elongated, narrow, oblong-ovate in inferior view. Crown rather low, hypsodont, consisting of 10 high columns in five transverse rows; first row of three columns, next three rows of two columns each, and fifth row of a single column at rear. Transverse rows perpendicular to axis of tooth. Root covered by a part of maxillary bone, not exposed but apparently very shallow. There is no surface showing contact with a tooth in front or behind.

All columns subequal in strength and closely united, but not firmly appressed. Summit of columns, except in unpaired one at rear, shallowly depressed with a small central nipple-like elevation. Those of three central rows nearly equal in height, almost straight. Three columns of first row and unpaired posterior column strongly curved with concavity toward contiguous rows and are a few millimeters lower than other

* H. Yabe: Recent Stratigraphical and Palaeontological Studies of the Japanese Tertiary. Spec. Publ. Bernice P. Bishop Mus., Vol. 7, 1921, p. 780.

** Y. Otuka: Tertiary Structures of the Northwestern End of the Kitakami Mountainland, Iwate Prefecture, Japan. Bull. Earthq. Res. Inst. Imp. Univ. Tokyo, Vol. 12, 1934, p. 575.

columns. Median one of first row most slender and situated between and a little anterior to columns on either side so as to give anterior free surface of tooth an even convexity from side to side.

The present tooth undoubtedly belongs to Desmostylidae, having numerous features in common with those of *Desmostylus*. Several important distinctive characters are recognized in this tooth. The crown is considerably smaller, more elongated, narrower, and lower than in any known *Desmostylus*. The most remarkable features of the tooth are in the number and arrangement of the columns. In these points this tooth stands closest to the second upper molar of *Desmostylus*, and hence is referred to such a position, in dental series. In *Desmostylus*, as stated by writers upon occasion, the number and arrangement of the columns seem to be relatively constant for a definite molar. The number of columns in *Desmostylus* is largest in the second upper molar in which they generally number 8 arranged in four transverse rows, although sometimes one or two accessory tubercles or columns may be added without deranging the general plan for the main columns. In the present tooth are 10 columns arranged in five distinct rows, one more row of paired columns being inserted between the third and fourth seen in a *Desmostylus* tooth.

The writer is not aware of unquestioned milk teeth of any kind of *Desmostylus*, but there seems no evidence for taking the present one as such. This tooth is more complicated with more numerous transverse rows of columns than even the second upper molar of the latter genus and it seems improbable that such a highly specialized tooth as the present one could be replaced by a simpler cheek tooth. Its much elongated crown, moreover, may indicate its being a molar rather than a premolar.

From the above statement, it is evident that the present specimen is a tooth quite distinct from any form of *Desmostylus*. The animal of this tooth may represent a short-lived side-branch of *Desmostylus*, or more probably it had a common ancestor with the latter in the Lower Miocene or Palaeogene age.

Dr. Shimizu divided the Tertiary deposits in the Hukuoka district as follows in descending order:

6. Takamori group.
5. Suenomatuyama group.
4. Kadonosawa group.
3. Yuda group.
2. Nisatai group.
1. Yotuyaku group.

In these groups Dr. Matsumoto¹⁾ enumerated two distinct horizons with "*Desmostylus*" remains, the one in the Yuda group at Yuda and the other in the Kadonosawa group at Sikonai. The fossils from both localities were referred to *Desmostylus japonicus* Tokunaga and Iwasaki from the Province of Mino. Of the Sikonai tooth or teeth the writer

1) H. Matsumoto: Mammalian Horizons in the Japanese Tertiary revised stratigraphically, and the Interrelation of the Terrestrial and Marine Deposits. Proc. 2nd Pan-Pacific Sci. Congr., Australia, 1923, pp. 891-892.

has no knowledge, but the tooth from Yuda is most probably one and the same specimen as that treated in the present article.¹⁾ Besides, another tooth-fragment seems to have been obtained from Yuda,²⁾ which is said to be allied to *D. japonicus*. Under these circumstances, the writer can learn that there were side by side two distinct forms of this kind of animal in the Yuda group, the one the *Desmostylella* described here and the other a species allied to *Desmostylus japonicus*. Whether the latter form may be specifically identical with, or distinct from, the type from Mino is uncertain at present.

Desmostylella typica Nagao, nov. Nat. size.

Fig. 1. Grinding surface. Fig. 2. Inner surface.
Fig. 3. Outer surface. Fig. 4. Anterior surface.

In 1934, Mr. Y. Otuka subdivided the Kadonosawa group into two parts, the upper and the lower, and considered the Yuda and Nisatai of Shimizu as contemporaneous with the lower part of his Kadonosawa. His lower Kadonosawa thus defined, is underlaid by the Yotuyaku, overlaid by the upper Kadonosawa, and includes the beds with the "*Desmostylus*" remains. He enumerated numerous fossils from the lower Kadonosawa, among which the writer finds, as he has already stated, a number of molluscan species which are also met with in the Kawabata series,³⁾ especially in its lower part, developed in Hokkaidô. The Kawabata series ranges, the writer now thinks, from the Lower to the Middle Miocene, with the possibility that some part of the Upper Miocene may

1) Compare the statement by Dr. Matsumoto: "The embryonal upper third molar at hand from the Yuda Formation.....is very much smaller than the embryonal one of the same type skull" (viz., *D. japonicus* from Mino).

2) Prof. Yabe kindly informed the present writer that he had seen a tooth fragment with a few columns obtained by the late Prof. Jimbo from this district, that this specimen was allied in size and other respects to the teeth of *D. japonicus*, and that it had been said to have been derived probably from Yuda.

3) The Kawabata series, defined, here, includes the Takinoue beds of Mr. Murata as its basal member.

be included. This series is represented in the western part of Hokkaidô by the Kunnui series.¹⁾ The lower Kunnui is characterized by the intercalation of the *Miogypsina ozawai* bed,²⁾ while the uppermost part of the series has *Desmostylus* bed with a *Desmostylus* allied either to *D. japonicus* or *D. mirabilis* Nagao. If the Yuda group is certainly contemporaneous with the lower Kadonosawa of Otuka, then the *Desmostylella* bed at Yuda may be older than the *Desmostylus* bed of the Kunnui.

On the other hand, the tooth collected by Prof. H. Yabe from Tesio, Hokkaidô, and described by Dr. Matsumoto³⁾ was obtained, according to Prof. Yabe's oral communication to the writer, in the valley of the Kami-Kenebetu, a tributary of the Obirasibe-gawa, at a point a little above the Palaeogene coal-seams. In this district the coal-bearing formation is overlaid by the Kawabata, and hence this tooth came most probably from the lower part of the latter complex, occupying a horizon which rather approaches the *Desmostylella* bed at Yuda. The Tesio tooth resembles *D. japonicus* and was referred to it, but, as already stated by Dr. Matsumoto, the tooth is different in some features from the corresponding one of the type of this form from Mino.

1) T. Nagao and Y. Sasa: On the Deposits and Geological History of the Cenozoic Age in the Western Part of Hokkaidô. Jour. Geol. Soc., Vol. 41, 1934, p. 214.

2) T. Nagao and Y. Sasa: On the occurrence of *Miogypsina* bearing bed in Hokkaidô. Ibid., Vol. 40, 1933, p. 278.

3) H. Matsumoto: A Contribution to the Morphology, Palaeobiology and Systematic of *Desmostylus*. Sci. Rep. Tôhoku Imp. Univ., Sendai, Ser. 2, Vol. 3, no. 2, 1918.