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A New Enchodontoid Fish of the Genus *Eurypholis* from Cretaceous of Japan

by

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Introduction

A bed of the Upper Cretaceous Izumi Group was found at Dogo-Himezuka, Matsuyama City, Ehime Prefecture. The bed have yielded teeth of sharks belonging to 4 genera in 4 families (UYENO and others, 1981): *Hexanchus microdon* (AGASSIZ), *Squalicorax* sp., *Orthacodus longidens* (AGASSIZ), and *Lamna appendiculata* (AGASSIZ). From the same locality, two specimens of enormous teeth were collected by the junior author. They are very similar to the palatine and palatine teeth of *Eurypholis pulchellus* (WOODWARD, 1901) which belongs to the teleostean order of Salmoniformes, and originally described from the Turonian of south-east England. The horizon of the locality yielded the specimens from Dogo-Himezuka is assigned to the Upper Campanian in the international scale (UYENO and others, 1981).

Description

Class Osteichthyes
Subclass Actinopterygii
Order Salmoniformes
Suborder Enchodontoidei
Family Eurypholidae GOODY, 1969
Genus *Eurphyolis* PICTET, 1850
Eurypholis japonicus, new species

(Figs. 2–3)

Holotype. Catalogue number of National Science Museum, Tokyo PV 17127. A left palatine bone and tooth, with the lateral side exposed.

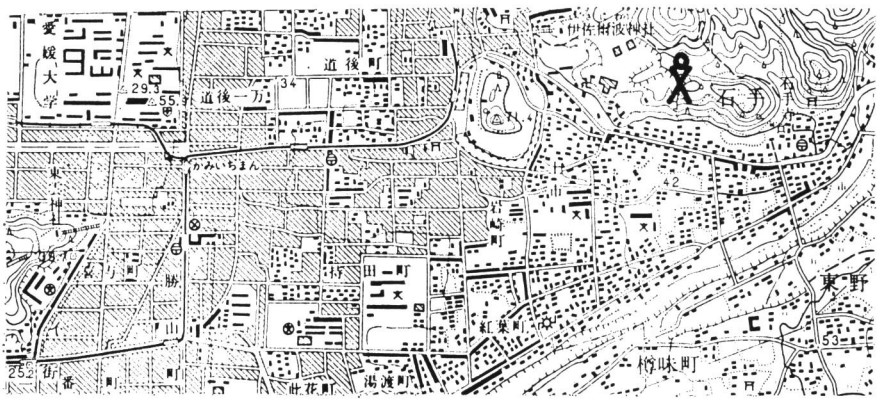

Fig. 1. A map showing the locality in Matsuyama City, where yielded the specimens of *Eurypholis japonicus* n. sp.

Paratype. PV 17128. A right palatine bone and tooth, with the lateral side exposed.

Diagnosis. This species differs from other members of the genus by combination of following features. This species has a long palatine tooth which is almost equal in length with the palatine bone itself. The ventral surface of the palatine is broadly convex, and the anterodorsal corner of the bone is slightly produced forming a sharper angle than in previously figured and described specimens (Fig. 4). From the corner of the palatine bone, many ridges radiate toward the posterior end.

Description. The holotype has an almost complete tooth (a very small portion, about 5 mm, of the tip is broken and missing). The length of the tooth is about 43 mm, and the width at the middle of the length is 7 mm. The tooth is slightly broken near the base and somewhat twisted. The both cutting edges of the tooth are sharp and smooth. The tooth is about 6 mm thick at the area near the base. The surface of the tooth is shiny and finely striated, and about 40 ridges are observable near the base. The tooth becomes narrower and thinner toward the tip. The anterior cutting edge does not reach the base of the tooth. The transitional border of the tooth and the palatine bone is faint and imperceptable. The palatine bone is massive and bulbous with numerous fine striations on the surface. They run from the base of the crown toward the posterior end. The posterior portion of the palatine is broken and incomplete, but similar to the specimen PV 17128 which is more complete.

In the paratype, about one third from the tip of the tooth is missing. The palatine bone itself is well preserved excepting a small posterior portion. The remainning portion of the tooth is 30 mm. The width of the tooth at the middle of the length is 6.5 mm. This tooth is thicker and rounder than the specimen PV 17127 which is somewhat flatter. Other characters of the tooth are identical with the specimen PV 17127.

The palatine bone is more complete in the paratype than in the holotype, and described here in more detail. The palatine bone is massive and bulbous. According

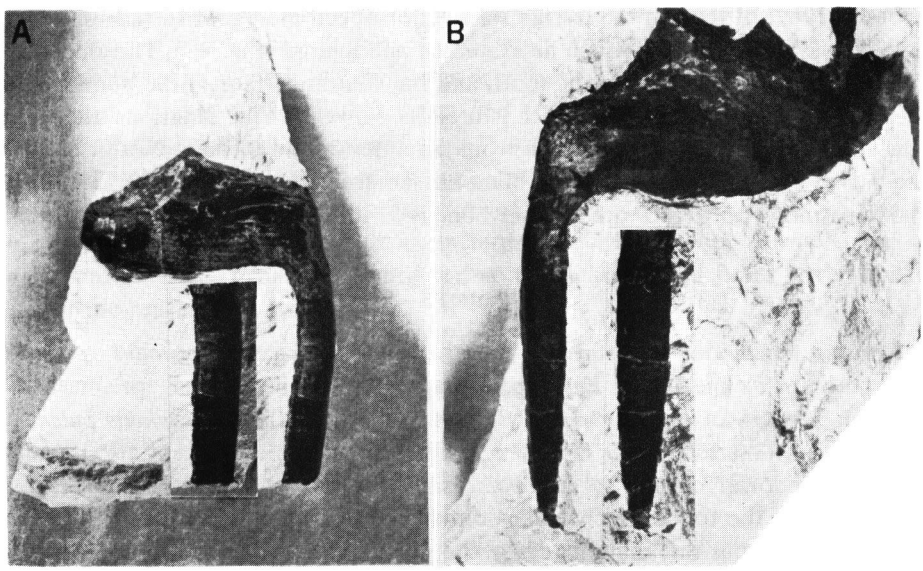

Fig. 2. Photographs of right and left palatine bones and teeth of *Eurpyholis japonicus* n. sp. Both photographs show lateral sides of the bone. The inserted photographs are showing the widest aspects of the teeth. ×1. A, paratype PV 17128; B, holotype PV 17127.

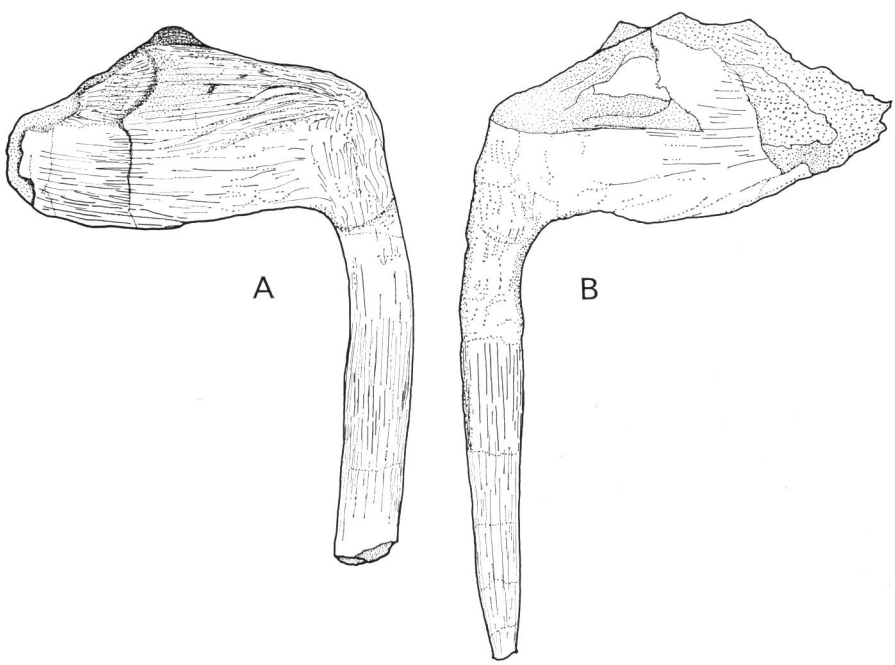

Fig. 3. Drawings of the palatine bones and teeth of *Eurypholis japonicus* n. sp. from Matsuyama City. A, paratype; B, holotype.

to Goody (1969), it rests in the trough on the dorsal ectopterygoid surface in a specimen of *Eurypholis pulchellus* which he examined and figured (Fig. 4). The angle made by the posterior cutting edge of the tooth and the ventral surface of the bone is about 90 degree or less. The ventral surface is broadly convex. Fine striations are present on the surface of the bone. They run from the anterior end to the posterior end with slight curve. The dorsal half of the bone has an area slightly concave. The length of the remainning portion of the palatine bone is 33 mm, and the widest part is 19 mm.

Remarks

Revising enchodontoid fishes, GOODY (1969) placed *Enchodus pulchellus* WOODWARD under the genus *Eurypholis*, and regarded the figured specimens of a palatine in WOODWARD's report (1903, Fig. 11 of Plate 14) as *Eurypholis pulchellus*. The specimens described here closely resemble the specimen, except for the more angular anterodorsal corner in *E. japonicus*. The WOODWARD's specimen lacks a large portion of the tooth which makes difficult to compare the length of the tooth and the palatine, and the angle made by the posterior edge of the tooth and ventral surface of the palatine.

GOODY (1969, Fig. 53) illustrated the mandible, hyopalatine, and opercular bones of *Eurypholis pulchellus* on the basis of the specimen P. 10984 of British Museum (Natural History). The form of the palatine and the tooth of this illustration markedly differ from WOODWARD's figure above mentioned and the specimens from Japan in the length and shape of the palatine and the tooth. The figure 14 of *E. pulchellus* in WOODWARD (1903: 62) resembles more closely to specimens described here.

Eurypholis japonicus and other enchodontoid fishes were placed in the order Salmoniformes by GOODY (1969) and the scheme is employed here. There are some fishes with similar enlarged sharp teeth among Myctophiform fishes, such as *Alepisaurus*, *Anotopterus*, and Miocene *Polymerichthys* (UYENO, 1967). These fishes are predatory and eat fishes and cephalopods of considerable sizes. KUBOTA and UYENO

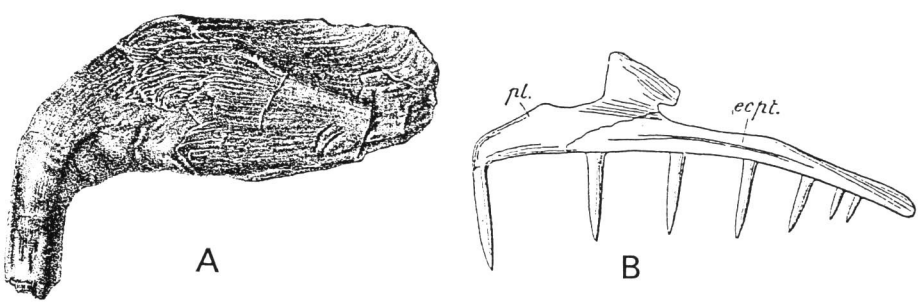

Fig. 4. Drawings in WOODWARD (1903), which GOODY (1969) considered as *Eurypholis pulchellus*. A from Plate XLV; B from Page 63.

(1970) examined stomach contents of 36 specimens of the lancetfish *Alepisaurus ferox* stranded on the Pacific coast of Japan, and found out that the largest prey eaten by a lancet fish (standard length 862 mm) was a scombrid fish, *Scomber japonicus*, which were about 350 mm long. Fishes eaten had few scars but remained intact in the stomachs of the lancetfish. This indicates that the enormous teeth serve to hold and direct the prey while it is being eaten, as suggested by GOODY (1970). Our data on the stomach contents of the lancetfish showed no selectiveity on preys, so that they ate everything available around them, including pieces of wood, bamboo, and even plastic and rubber. Probably feeding habits of enchodontoid fishes were similar to those of the present day lancetfish.

Acknowledgements

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