The First Discovery of a Pterosaur from the Cretaceous Mifune Group, Kyushu, Japan

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Abstract  A pterosaurian wing-finger phalanx is reported from the early Late Cretaceous Mifune Group, Central Kyushu, Japan. This is the first report of pterosaur remains from Southwest Japan, and only the second occurrence from Japan. The presence of the pterosaur adds to the rich vertebrate fauna of the Mifune District, which includes carnivorous and herbivorous dinosaurs, turtles, crocodiles, mammals and fishes.

Introduction

This report concerns the first record of pterosaurs from Kyushu, Japan. The specimen was collected by the junior author from the river floor, near the Amagimi Dam on Oct. 29, 1992. Although the fossil was included in a flow stone, the matrix is almost the same as that observed in an outcrop near here. The horizon of the fossil, therefore, is the Upper formation of the Mifune Group (presumably Upper Cenomanian-Turonian: Tamura 1990).

The location of the present material differs from the localities of carnosaurian and herbivorous dinosaurs, reported by Tamura et al. (1991), but comes from almost the same horizon.

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Systematics

Pterodactyloidea, fam., gen. and sp. undetermined

Material: Proximal part of the left first wing-finger phalanx. Found by Naoshi Kitamura on Oct. 29, 1992. Held at Kumamoto City Museum (KCM VP 000,120)

Locality: Upper stream of the Amagimi Dam, 32°44'15" N, 130°50'45" E.
Horizon: Upper Mifune Group (presumably Upper Cenomanian-Turonian)

Description: The material consists of a slender and straight shaft with proximal articulation, but broken at the distal end. The shaft is almost straight and has an oval cross-section. The surface of the shaft is almost smooth, but there are several longitudinal breaks caused by compaction. The proximal end is expanded and bares two concave articular facets, both elongated antero-posteriorly. The proximal projection is not preserved. The dorsal surface of the shaft adjacent to the articulation has a somewhat rugose surface. There is a shallow groove at one third anterior. The ventral surface of the shaft near the articulation is rather smooth, with a distinct foramen toward the posterior margin.

The bone wall of the shaft is very thin. At the broken end, a smooth internal...
surface with fine transverse grooves is observed. The grooves have somewhat similar intervals, sometimes bifurcating posteriorly.

Measurements (in mm)
- total length as preserved: 121.3
- anterior-posterior diameter of proximal end: 25.7
- dorsal-ventral diameter of proximal end: 10.8
- anterior-posterior diameter of distal end: 10.0
- dorsal-ventral diameter of distal end: 4.4

Discussion

The present material is a bone of a pterosaur, as shown by its slender, straight shaft, and the very thin and compact nature of the bone walls. The proximal articulation baring two elongated facets indicates that the material is the first wing-finger phalanx.

Although there is wide diversity in their size, wing-finger phalanges have a uniform morphology and are difficult to identify, even to the family level. The present material shows close similarity to several pterosaurids, including the Early Cretaceous *Dsungaripterus weii* Young reported from the Jungar basin, Northwest China (Young 1964; Young 1973), and *Pteranodon* from the Late Cretaceous North America (Eaton 1910). Differences between the Mifune specimen and *Dsungaripterus weii*, such as the angle between the shaft and the articular facets, may reflect post depositional compaction and diagenesis of the fossil.

The present material is of juvenile or sub-adult, because the proximal projection is an epiphysis, and is often lost in juvenile and sub-adult animals.

The present material is too fragmental to suppose whole feature of the animal. If the profile of the present animals is similar to that of *Dsungaripterus*, the wing span of it may less than two meters.

In Japan there is only one report of a pterosaurid. The specimen, from Hokkaido, includes a femur(?) and other bones, and is reported from the Santonian to Campanian Yezo Group of Mikasa City, Hokkaido (Obata, Hasegawa and Otsuka 1972). Thus, the Mifune specimen is the second occurrence of pterosaurs fossil from Japan.

The Mifune Group has yielded many fossils of carnivorous and herbivorous dinosaurs (Tamura, et al. 1991; Hasegawa et al. 1992), crocodiles, a mammal, turtles, and fishes and is the most significant vertebrate fauna among the Southwestern Japanese Mesozoic faunas.
References


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Plate 12
Explanation of Plate 12

_Pterodactyloidea, fam., gen. and sp. undetermined_
Proximal part of the left first wing-finger phalanx.

1a: anterior view
1b: ventral view
1c: posterior view
1d: dorsal view
2: structure of internal surface of the bone wall