

FIRST DISCOVERY OF A TERTIARY PLATANISTOID FOSSIL FROM ASIA

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ABSTRACT

A new genus and species of Lipotidae, *Prolipotes yujiangensis* collected from the bank of Yujiang River and considered roughly as Miocene in age, is the first discovery of Platanistoid fossil from Asia. The holotype is a fragment of mandible with teeth, including posterior part of symphyseal portion and initial part of free portion of mandibular rami. Comparison of the new specimen with the mandible of *Lipotes* and *Kampholophos* indicates that *Prolipotes yujiangensis* is the fossil odontocetes species most closely related to *Lipotes* known thus far.

The superfamily Platanistoidea is a declining group consisting four modern families which are found in areas far away from each other. Lipotidae occurs in China. Platanistidae is found in the Indian subcontinent. Another two live in South America: Iniidae lives in Amazon and Orinoco river basins and Pontoporiidae occurs in coastal central Atlantic waters of South America. In each family only one or two species restricted to very narrow areas are living. Our knowledge concerning the history of the Platanistoids is still scanty. Fossil studies indicate that they were widely distributed in America, Europe and Africa during Miocene and Pliocene. No Platanistoid fossil from Asia, however, has been reported so far. A fragment of mandible belonging to Lipotidae collected from the bank of Yujiang River in Guiping County, Guangxi in 1981 and considered roughly as Miocene in age is the first discovery of Platanistoid fossil from Asia.

SYSTEMATICS

Order CETACEA Brisson, 1762

Superfamily PLATANISTOIDEA Simpson, 1945

Family LIPOTIDAE Zhou, Qian et Li, 1978

Prolipotes, new genus

Type species: *Prolipotes yujiangensis*

Diagnosis: See diagnosis of *Prolipotes yujiangensis* (generic type).

Prolipotes yujiangensis, new species
(Figs 1-3, Plates I-II)

Holotype: A fragment of mandible with teeth, including posterior part of symphyseal portion and initial part of free portion of mandibular rami.

Type locality: Bank of Yujiang River 500 m SE of Oucun village in Mengwei Commune, Guiping County, Guangxi Zhuang Autonomous Region, People's Republic of China. Coordinates of the type locality are 23°17'20"N latitude, 110°3'30"E longitude.

Age: The specimen was collected from "Yongning Group" (upper part?) of Tertiary age. At first the "Yongning Group" was considered to be as new Tertiary (Pliocene?) in age according to the molluscs discovered. Later the geological age of this Group was revised on the basis of a large number of fossils of reptiles (crocodiles) and mammals found successively from Yongning Group beds or corresponding beds in Baise and Yangle Basins (Tiandong and Tianyang County), assigned Early Tertiary and further determined Late Eocene to Early Oligocene in age (Tang *et al.*, 1974). Our Platanistoid fossil was found from the upper part of this Group and is of later age. Its differences from the extant species are not very big. The phylogenetic history of the superfamily indicates that they probably arose at the end of Early Tertiary. At present, in the light of the general stratigraphic condition of the type locality and data for the geohistorical distribution of Platanistoidea, we suggest that the new specimen is of Miocene age.

Diagnosis: Mandibular symphysis long, its posterior end very thick; deep longitudinal furrow between two tooth rows; anterior part of two rami in shape of a curve where they join symphyseal portion; teeth closely spaced; crowns of teeth slightly compressed antero-posteriorly, their upper half recurved interiorly, cingulum rounded and broad; enamel of crowns ornamented with irregular vertical striae and ridges; tip of roots not widen to form an anterior and posterior projection.

Description: The mandibular symphysis is very long, its preserved posterior part measures 80 mm in length. A deep broad longitudinal furrow extending gently to the posterior end is found between the two tooth rows of the symphyseal portion of the mandible. The posterior end of mandibular symphysis is slightly thinner than the anterior break (seven teeth from the posterior end of mandibular symphysis), about half of the height of the lingual side of the anterior end of the free portion of the ramus. The preserved free portion of the two rami is very short. The anterior part of the two rami is in the shape of a curve where they join the symphyseal portion. The angle between the two lines extending from the anterior end of the two rami is about 37.5°. Several mental foramina located below the 1st, 3rd and 6th-7th teeth respectively before the hind extremity of the mandibular symphysis, are found at the labial side of the lower jaw.

Additional one is found on the left mandible below the 5th tooth situated before the posterior end of the symphysis. A faint groove runs longitudinally below the mental foramina near the lower rim of the mandible.

Eight teeth (two broken) and two alveolus are found on the preserved right

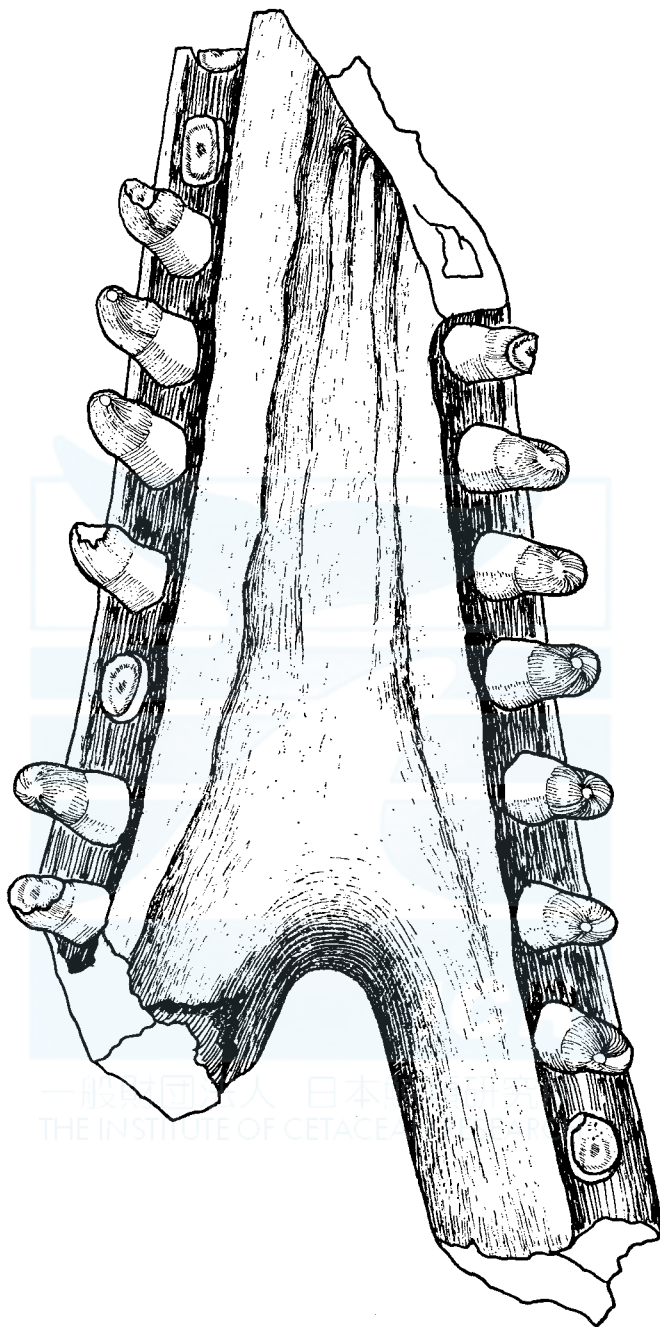


Fig. 1. *Prolipotes yujiangensis*, holotype, occlusal view of mandible, $\times 1.5$.

TABLE 1. MEASUREMENTS (MM) OF MANDIBLE, HOLOTYPE

	Left	Right	Symphysial portion
Length of mandible as preserved	100.0	111.6	
Length of free portion of ramus as preserved	13.7	27.7	
Height of labial side of anterior end of ramus	27.0	27.0	
Height of labial side of anterior break of mandible	21.5 ¹⁾	23.8 ²⁾	
Thickness of mandibular symphysis at posterior end			15.0
Thickness of mandibular symphysis at anterior break			18.3
Transverse diameter of mandible at posterior end of symphysial portion			51.0
Transverse diameter of mandible at front edge of the 3rd tooth before posterior end of symphysis			40.0
Transverse diameter of mandible at front edge of the 6th tooth before posterior end of symphysis			32.0
Length of tooth row of last six teeth of symphysial portion	57.5	55.6	

¹⁾ Eight teeth from posterior end of symphysial portion.

²⁾ Six teeth from posterior end of symphysial portion.

mandible, of which three are located on the free portion of the ramus. Only the lower half of the anteriormost part of the free portion of the left ramus has been preserved and all of the preserved nine teeth (four broken) of the left mandible are situated on the symphysial portion. The alveoli are transversely elliptical in outline, about 7 mm in antero-posterior and 6 mm in labio-lingual diameter. They are located on the mid-line of the mandible of the symphysial portion. The position of the three teeth on the anterior part of the free portion of the right ramus is slightly lateral to the lingual side.

The teeth are closely spaced. The intervals are about 3 mm between the anterior teeth and 4 mm between the hinder ones. In the posterior part of the symphysial portion, there are as an average one tooth per 9.2 mm on the right mandible and one per 9.6 mm on the left. The crown of the teeth is inclined labially conspicuously and slightly compressed anterior-posteriorly. Its upper half is recurved interiorly and places the apices of the mandibular teeth which are slightly worn in an upward direction. The lower half of the lingual side of the crowns is a broad, rounded cingulum where the largest diameter of the crown cross. The enamel of the whole crown is ornamented with irregular vertical striae and ridges. The bases of the crowns constrict to join the roots. The exposed portion

TABLE 2. MEASUREMENTS (MM) OF RIGHT MANDIBULAR TEETH, HOLOTYPE

	0 ¹⁾	1	2	3	4	5
Length of labial side of root above alveolus	3.5	3.5		3.7	4.2	3.9
Length of lingual side of root above alveolus	3.1	3.2	3.3	3.6	3.6	3.5
Greatest anteroposterior diameter of exposed portion of root	6.2	6.2	6.0	6.2	6.4	6.5
Greatest labio-lingual diameter of exposed portion of root	5.8	5.9		6.1	6.0	5.9
Greatest anteroposterior diameter of crown	4.6	4.5	4.5	4.4	4.3	4.3
Greatest labio-lingual diameter of crown	6.3	6.3	6.4	6.3	6.2	6.0
Length of crown	7.8	7.8	7.7	7.5	7.4	7.2

¹⁾ Counting ahead from the 1st tooth behind the symphysis, the Nos. are 0, 1, 2, 3, 4, 5 in proper order.

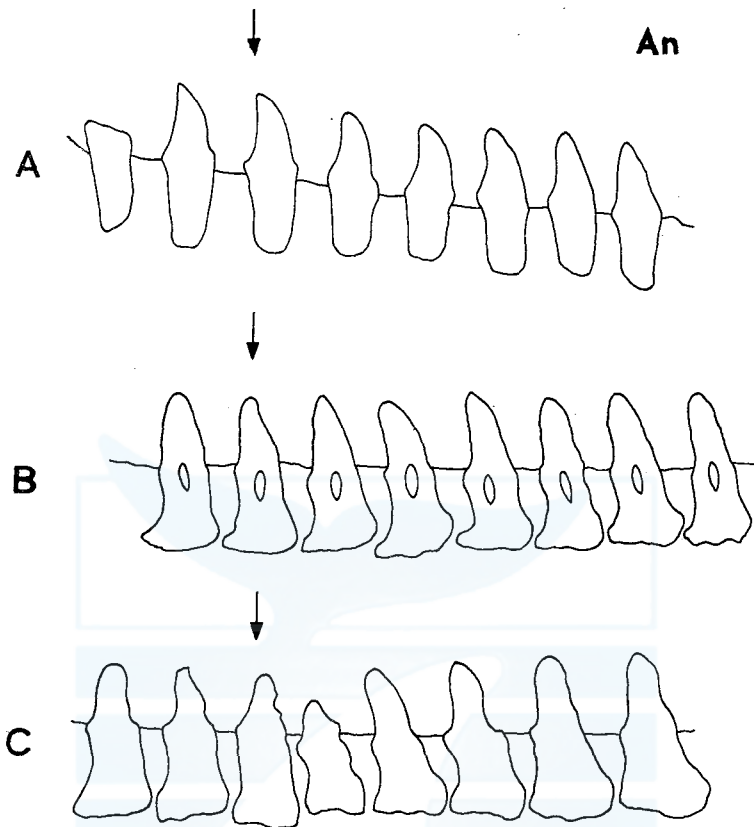


Fig. 2. Lateral view of part of teeth of right mandible, trace over radiographs, $\times 1$.

Arrow indicating posterior end of mandibular symphysis. An: anterior.

A. *Prolipotes yujiangensis*, holotype

B. *Lipotes vexillifer*, NNC (Nanjing Normal College) 7909

C. *Lipotes vexillifer*, NNC 7405

of the roots is larger in diameter than the crowns and the anterior-posterior diameter of the former is larger than its labiolingual diameter. The radiograph of the mandibular teeth shows that the base of the roots is not widened to form an anterior and posterior projection.

Comparison: In the Yujiang specimen, the hind part of the mandibular symphysis as preserved is rather long. The intervals between the teeth are relatively short, as on average there is one per 9.3 mm (right) or 9.6 mm (left) on the hind part of the mandibular symphysis. The crowns are ornamented with vertical irregular striae and ridges, recurved interiorly and with a well developed cingulum on the lower half. The above mentioned characters resemble those of the *Lipotes vexillifer*. Rensberger (1969) has concluded that among the described fossil odontocetes only the Miocene *Kampholophos serrulus* is related to *Lipotes vexillifer*. But the teeth of the former are widely spaced, only one per 21.3 mm on the posterior

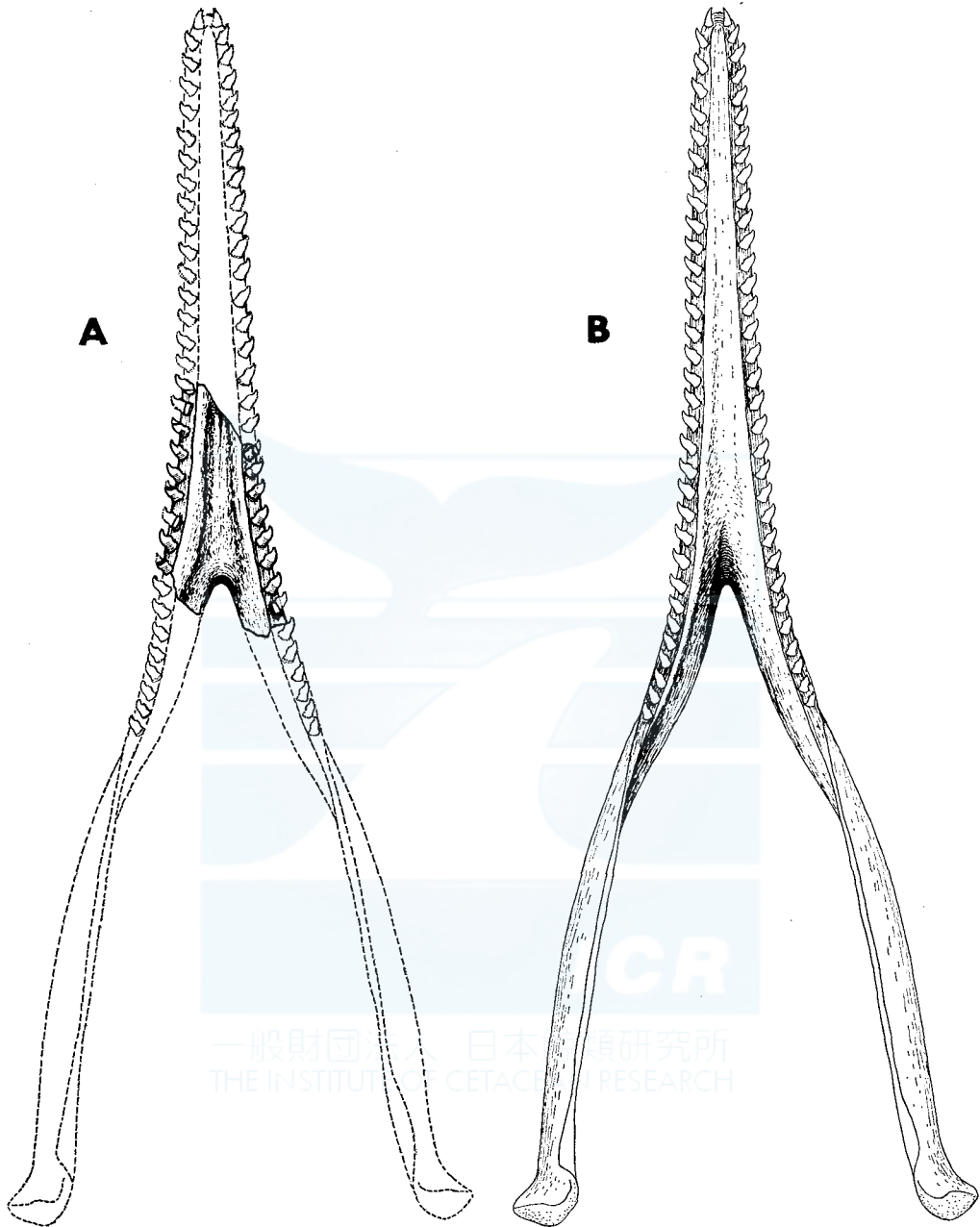


Fig. 3. Comparison of (A) restored mandible of *Prolipotes yujiangensis* with (B) mandible of *Lipotes vexillifer*, about $\times 1/3$.

part of the right mandible. In an old adult of *Lipotes vexillifer* (NNC 7405), the teeth along the posterior part of symphyisial portion are closely spaced, or one per 9.3 mm (right) or 9.8 mm (left). The posteriormost teeth of *Kampholophos serrulus* bear a prominent-based accessory cusp which is absent on the anterior teeth. Their crowns are laterally compressed with vertical striae and ridges which are most prominent on the lower two-thirds of each crown. They are coarsest on the labial and anterior sides (Rensberger, 1969). The structure of all the teeth of *Lipotes vexillifer* is alike. The crowns are slight antero-posteriorly compressed with vertical striae and ridges which are most prominent on the upper two-thirds of each crown. They are coarsest on the lingual side. Since the differences of the teeth between *Kampholophos* and *Lipotes* are more than those between the Yujiang specimen and *Lipotes*, it is beyond all doubt that the new specimen is the fossil odontocetes species which is most closely related to *Lipotes* known thus far and should be placed in the family Lipotidae.

Five mandibles of different ages of young and adult of *Lipotes* (NNC 5601, 7808, 7909, 7907, 7405) were examined for comparison. The longitudinal furrow between the tooth rows of the symphyisial portion is shallow and narrow in the anterior part and descends abruptly to form a valley-like steep depression at about last 3–4 mm of the posterior end of the mandibular symphysis. The posterior end of the mandibular symphysis is very thin, inferior to half of the thickness of the symphysis at the 7th tooth before its posterior end (corresponds to the anterior break of the Yujiang specimen), or less than one-third of the lingual height of the front end of the free portion of the rami. The anterior part of the two rami is in the shape of an acute angle where they join the symphyisial portion. The vertical striae and ridges of the crowns are relatively shallow and are fewer at anterior and posterior side. The base of the labial side of the crowns is comparatively smooth. The tip of the roots widens to form an anterior and posterior projection. On the basis of the above mentioned differences between the Yujiang specimen and *Lipotes*, we therefore proposed to name the former as a new genus and new species.

Because of the paucity of the available material, which is confined to a fragment of lower jaw with corresponding teeth, the finding of the skulls and post-cranial skeletons of this new species for the further studies of the characters of the genus and species is expected.

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EXPLANATION OF PLATES

PLATE I

Prolipotes yujiangensis, holotype, $\times 1$.

A, occlusal view; B, ventral view; C, lateral view.

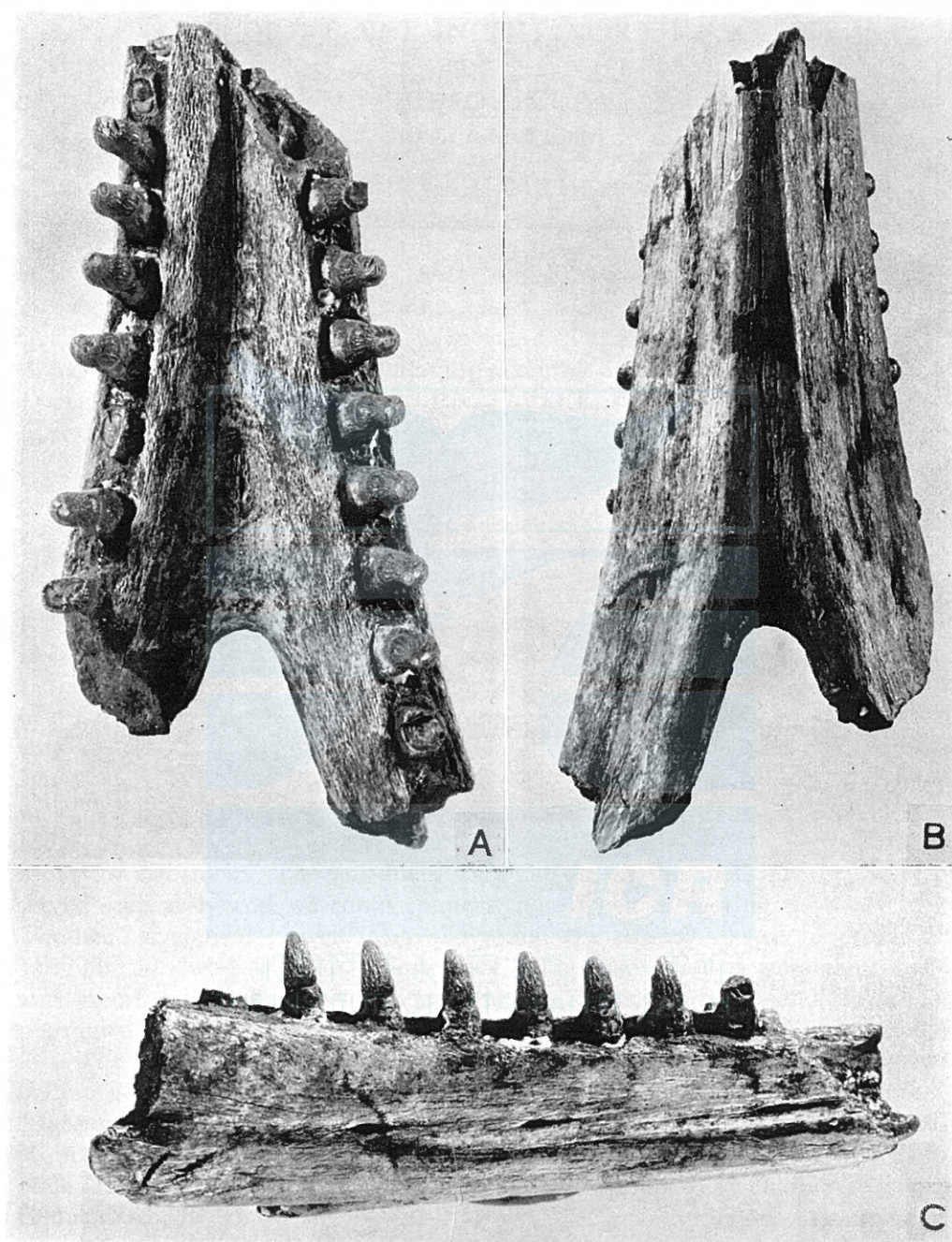
PLATE II

Prolipotes yujiangensis, holotype, $\times 3$.

1st tooth on the right mandible behind the posterior end of the mandibular symphysis, left, labial view; middle, lingual view; right, posterior view.



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