

## SHORT NOTE - NOTA BREVE

## A PLIOSAURID TOOTH FROM THE ARGILLE VARICOLORI FORMATION NEAR CASTELVECCHIO DI PRIGNANO (MODENA PROVINCE, NORTHERN ITALY)

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*Key-words:* Sauropterygia, Pliosauridae, *Polyptychodon interruptus*, tooth, Upper Cretaceous, Northern Italy.

*Abstract.* The first discovery of a Cretaceous pliosaurid tooth in Italy is reported. It comes from the Cenomanian-lower Campanian Argille Varicolori Formation near Castelvecchio di Prignano (Modena Province, northern Italy). Excepting this new specimen, Italy's only reported pliosaurid is a humerus from the Upper Cretaceous of Zavattarello near Pavia. The tooth morphology allows it to be ascribed to *Polyptychodon interruptus* Owen, 1841, a species only reported thus far from northern-central Europe (England, Germany, and the Czech Republic). This suggests the presence of marine reptile remains in the northern Apennines may have been underestimated.

*Riassunto.* Viene segnalato per la prima volta in Italia un dente di pliosauride del Cretaceo. Il reperto è stato trovato vicino Castelvecchio di Prignano (Modena), nella Formazione delle Argille Varicolori, attribuita al Cenomaniano-Campaniano inferiore (Cretaceo superiore). L'unico altro resto di pliosauride finora trovato in Italia è un omero del Cretaceo superiore di Zavattarello (Pavia), attribuito tentativamente alla famiglia Pliosauridae. La morfologia del dente studiato permette un'attribuzione a *Polyptychodon interruptus* Owen, 1841, considerata l'unica specie di pliosauride sicuramente presente in Europa durante il Cretaceo. Finora essa era stata trovata soltanto in Inghilterra, Germania e Repubblica Ceca. Il nuovo ritrovamento suggerisce che i resti di rettili marini dell'Appennino settentrionale siano forse più frequenti di quanto finora stimato.

### Introduction

Plesiosaur remains from the Upper Cretaceous of Europe are rare, and usually fragmentary. Nevertheless, they have been recovered from several localities in different countries including Belgium, the Czech Republic, England, Germany, the Netherlands, Poland, Portugal, and Sweden (Milner 1987; Bardet & Godefroit 1995). In

their synopsis of Upper Cretaceous plesiosaur from Europe, Bardet & Godefroit (1995) did not include any Italian plesiosaurs. Renesto (1993) reported the first discovery of a plesiosaur in Italy: a single Pliosauridae indet. humerus from the Santonian-Campanian Argille Varicolori Formation near Zavattarello (Pavia Province, Lombardy, northern Italy). In this note, another fragment of Cretaceous Pliosauridae from the northern Apennines is recognised and described. Moreover, in this case a specific taxonomic assignment is possible.

The tooth under study was collected in a gully along the right side of the Secchia River, some 2-3 km north-east of Castelvecchio di Prignano (Modena Province; Fig. 1). It comes from the Argille Varicolori Formation, of Cenomanian-lower Campanian age according to Bettelli et al. (1989a, b). Unfortunately, the lacking of any matrix adhering to the tooth means that the age cannot be better determined.

### Palaeontological description

Class **Reptilia** Laurenti, 1768

Subclass **Sauropterygia** Owen, 1860

Order **Plesiosauria** de Blainville, 1835

Superfamily **Pliosauoidea** (Seeley, 1874) Welles, 1943

Family **Pliosauridae** Seeley, 1874

Genus ***Polyptychodon*** Owen, 1841

***Polyptychodon interruptus*** Owen, 1841

Fig. 2a, b

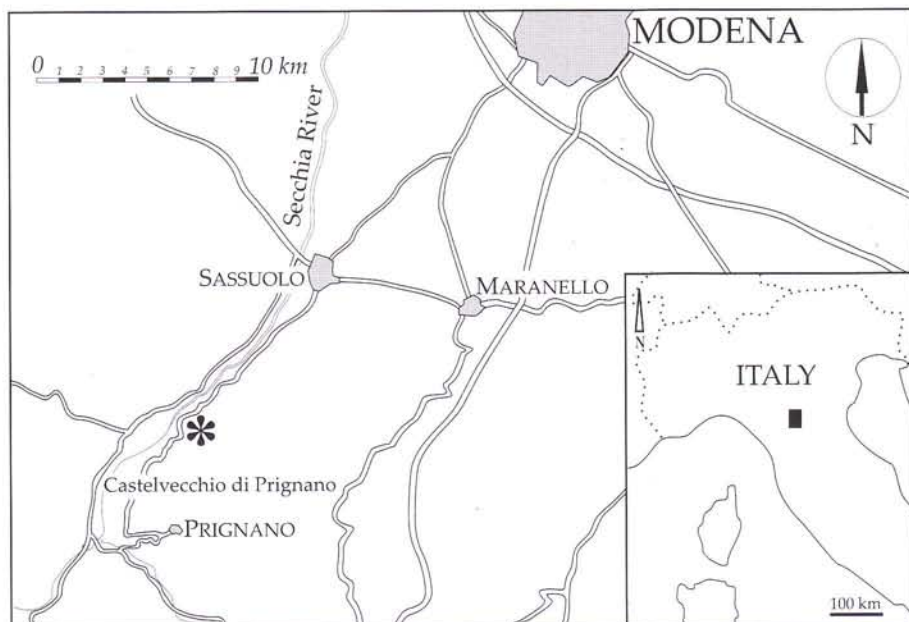


Fig. 1 - Location-map of Castelvechio di Prignano, with the site (asterisk) where the tooth was collected.

- 1841 *Polyptychodon interruptus* Owen, p. 19, pl. 72, fig. 3, 4.  
 1851a *Polyptychodon interruptus* Owen - Owen, pp. 209-212, Lacertilia pl. 2, fig. 16, 17, pl. 8, fig. 3. Crocodilia, pl. 26, fig. 1(?), 2-7, 8 (?), pl. 29, fig. 1-3.  
 1851b *Polyptychodon interruptus* Owen - Owen, pp. 55-58, tab. 10, fig. 7-9, tab. 11, fig. 1(?), 2-7, 8 (?), tab. 14, fig. 1-3.  
 1856 *Polyptychodon interruptus* Owen - von Meyer, pp. 3-7, pl. 2, fig. 5-8, 10-13, 15, 16 (?), 17.  
 1861 *Polyptychodon interruptus* Owen - Owen, pp. 20-22, tab. 4, fig. 3.  
 1987 *Polyptychodon interruptus* Owen - Milner, p. 272, pl. 57, fig. 2.

**Material.** A single tooth crown.

**Locality.** In the vicinity of Castelvechio di Prignano (Modena Province), on the right side of the Secchia River (Fig. 1).

**History.** Collected by Mr. Enzo Grazioli, this specimen was mentioned (but not described) by Rompianesi & Sirotti (1995) as an ichthyosaur tooth.

**Repository.** Collection of the "Istituto di Paleontologia", University of Modena and Reggio Emilia (IPUM 30142), donated by Mr. Pietro Rompianesi.

**Description.** The maximum height of the tooth is 37 mm (Fig. 2a). The basal diameters are 14.5 mm (transverse) and 16.5 mm (longitudinal), therefore the crown is laterally compressed (Fig. 2b). The enamel is very thin, and dark brown in colour. There are alternating long and short longitudinal ridges, a feature which Owen (1851a) retained as diagnostic of the species *Polyptychodon interruptus* Owen, 1841. For 8-9 mm at the crown tip, the enamel is fairly smooth. One of the ridges could reach the tip on one side, but the enamel is lacking on it, so we cannot verify this condition. It is noteworthy that the ridges are formed by enamel folding, so they leave impressions on the outer surface of the dentine.

**Remarks.** This tooth was previously regarded as belonging to an ichthyosaur, given the presence of

some *Platyterygius* remains very close to Castelvechio di Prignano (Rompianesi & Sirotti 1995). During the revision of the ichthyosaur remains from the northern Apennines (Sirotti & Papazzoni 2002) the taxonomic attribution of this tooth has been reconsidered. Because the tooth morphology matches that of pliosaurids, and appears very similar to the holotype teeth of *P. interruptus*, it is here regarded as referable to that species. Apart from some authors (e.g. White 1940), who included it within the family Polycotylidae, the genus *Polyptychodon* has been usually regarded as a member of the family Pliosauridae (Milner 1987; Bardet & Godefroit 1995). According to Bardet & Godefroit (1995), *Polyptychodon* is the only valid genus of Pliosauridae presently recognized in Europe. The species *P. interruptus* has been reported from England (Cenomanian-Campanian), Germany (Cenomanian), and the Czech Republic (Turonian). The only other valid species of this genus, *P. hudsoni*, was described from North America (Welles & Slaughter 1963). The IPUM 30142 tooth is the first record of *P. interruptus* Owen, 1841 in Italy, thus extending the known geographical range of the species.

Analysing the tooth morphology in *P. interruptus* according to Massare (1987), one notes it bears an acute but rounded apex, with a natural smooth surface; moreover, the longitudinal sculpture is not pronounced, the cross-section is slightly compressed, and there are no cutting edges (Fig. 2). This suggests the species belongs to the general guild of piercing-smashing predators, which probably ate both soft prey (cephalopods, small fishes) but also somewhat harder ones (ammonites, large vertebrates).

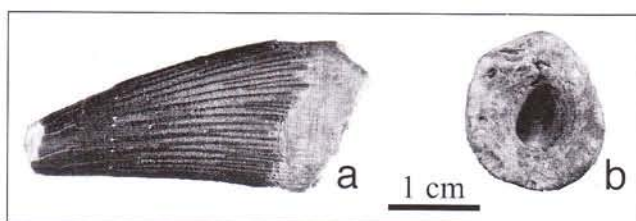


Fig. 2 - *Polyptychodon interruptus* Owen, 1841. Tooth from Castelvécchio di Prignano (Modena Province) cat. no. IPUM 30142. a) Lateral view; b) Proximal (basal) view.

## Conclusions

The Italian record of Cretaceous marine reptiles is very poor, so even the single tooth IPUM 30142 is of some importance, because:

- a) it represents the first time the species *Polyptychodon interruptus* Owen, 1841 has been recognised in Italy;
- b) this discovery, together with that of Renesto (1993), substantiates the presence of the Pliosauridae in Italy during the Late Cretaceous.

Moreover, this suggests the Cretaceous marine reptile fossil record in the northern Apennines region has probably been underestimated.

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