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*SARGODON TOMICUS* PLIENINGER, 1847  
FROM THE NORIAN OF VAL PREONE (UDINE, ITALY)\*

*SARGODON TOMICUS* PLIENINGER, 1847  
DAL NORICO DELLA VAL PREONE (UDINE, ITALIA)

**Abstract** — The finding of an almost complete specimen of *Sargodon tomicus* PLIENINGER, 1847 (Osteichthyes, Semionotidae) and of two isolated incisiforms belonging to the same species is described. This is the more ancient specimen of *Sargodon* (Lower Norian) known. Its stratigraphical meaning is therefore rediscussed.

**Key words:** Fishes, *Sargodon tomicus* PLIENINGER 1847, Norian, Carnic Prealps.

**Riassunto breve** — Viene segnalato il ritrovamento di un esemplare pressochè completo di *Sargodon tomicus* PLIENINGER, 1847 e di due denti isolati appartenenti alla stessa specie. Trattandosi del più antico ritrovamento di questo pesce (Norico inferiore) ne viene ridiscusso il significato stratigrafico.

**Parole chiave:** Pesci, *Sargodon tomicus* PLIENINGER 1847, Norico, Prealpi Carniche.

## Introduction

In 1986, during a paleontological research organized by the Museo Friulano di Storia Naturale of Udine in Val Preone (prov. of Udine, Italy), among other materials, several specimens of fishes, more or less complete, have been found.

Most of them were the so-called «flying fishes» (Thoracopteridae) and the Pholidophoridae. Less numerous were the *Saurichthys* and the Coelacanthidae. Besides

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these, one almost complete specimen of *Sargodon tomicus* PLIENINGER, 1847, even if not well preserved, and two isolated teeth belonging to the same species, have been found.

### Paleontological description

Class *Osteichthyes* HUXLEY, 1880  
 Subclass *Actinopterygii* KLEIN, 1885  
 Family *Semionotidae*  
 Genus *Sargodon* PLIENINGER, 1847  
*Sargodon tomicus* PLIENINGER, 1847

The specimen is stored in the Museo Friulano di Storia Naturale of Udine (n. 1878 GP). At the opening of the block of rock, the specimen was found broken between the two slabs without the possibility of defining the section of the preserved bones and their impression. The splitting occurred along a thin calcitic film, rather difficult to remove and which could result in the damaging of the bones.

The preservation of the bones is not very good, therefore a detailed anatomic study is rather difficult. On the other hand the *Sargodon tomicus* has been recently studied by TINTORI (1983).

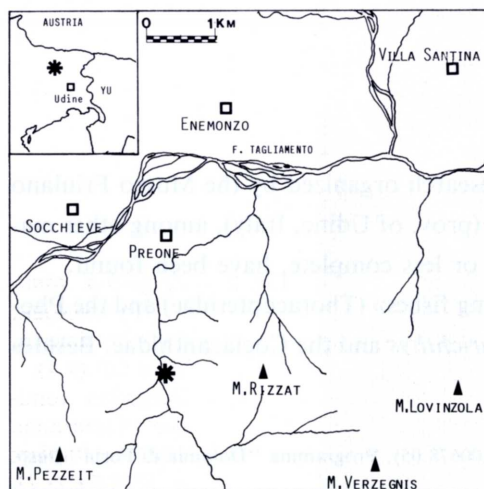


Fig. 1 - Location of Val Preone from where the specimens described come.  
 - Individuazione dell'area della Val Preone da cui provengono gli esemplari descritti.

The isolated teeth are also stored in the Museo Friulano di Storia Naturale of Udine (n. 1879 GP and n. 1880 GP).

The complete specimen is 15 cm long and 12 cm deep: these measurements are relatively reduced in comparison with those (from 30 to 100 cm) in so far found of this species. The head is 4.5 cm long. All the measurements ratios correspond with those pointed out by TINTORI (1983) for this «deep-bodied» fish.

**S k u l l** - For the reasons formerly expressed, only few bones are recognizable. All the visible dentition is preserved in the same slab («A») where also part of the dentary, the subtriangular angular, some infraorbitals, the susopercular, a part of the rectangular formed opercular, the premaxilla, the maxilla and fragments of the palatal bones are recognizable.



Fig. 2 - *Sargodon tomicus* PLIENINGER, 1847: specimen n. 1878 GP (x 1).  
 - *Sargodon tomicus* PLIENINGER, 1847: esemplare n. 1878 GP (x 1).



On the slab «B» a fragment of the nasal, part of the frontal and of the parietal with an ornamentation of the surface more evident than in other bones, are preserved. In this slab the remaining part of the opercular is also present.

**D e n t i t i o n** - In the visible dentary 4 chisel - shaped incisiforms with a bifid crown, from 6 to 15 mm long, are plunged. The crown, from 1 to 2 mm long, forms like a protruding step in relation to the root; the terminal part is bifid with a well impressed «V» groove. The asymmetry of these terminations is present even if it is not marked. The incisiforms show a well marked median longitudinal groove, on the continuation of the «V» one of the crown, reaching the radical part. This groove is deep in the first two teeth and shallow in the following ones. The radical part is rather thick and it is long about half to the tooth in the first incisiforms and a little less in the following.

There are then other teeth, lacking the upper section and which seem to be «pointed» or, more probably, incisiforms.

The visible part of the 7th tooth plunged in the dentary, is 2 mm long and presents an emispherical termination. The cleaning of the fossil has revealed a fragment of tooth, without bifid termination, in the lower level. It could be attributed to a pointed one; its structure is similar to that of the 7th tooth.

At least 4 incisiforms are plunged in each premaxilla; their characteristics are similar to those described for the teeth of the dentary. The only difference is the absence of the step at the beginning of the crown.

The incisiforms are followed by a rather high number of emispherical teeth (molariforms): 13 are present, of the others remains only the base, or the transversal section of the tooth, because of the facility of detachment at the crown. They look like transparent emispheres plunged in the palate, with a diameter ranging from 0,3 to 1.3 mm. The length of the teeth, at least from what is possible to ascertain, as they are positioned vertically in relation to the surface of the fossil and plunged up to the crown, ranges from 1 to 3 mm.

The two isolated teeth are incisiforms respectively 7 and 8 mm long; the final part of the bifid crown are long respectively 1 and 2 mm; the radical part is about half of the whole length of the tooth. All those measures are comparable with those of the complete specimen.

**A x i a l s k e l e t o n** - The scales are not evident, while the neural and haemal

spines are well recognizable. In the upper part of slab «B» it is possible to count 19 neural spines. They are not smooth but present some well marked costate-like lines. On the whole the spines seem to be intersected by some (? 6) transversal costate-like lines. In slab «A» these lines are not evident.

In a smaller segment the final part of the nothocord can be reconstructed: it is long 4 cm. From it 20 pairs of archs derive, alternating neurals and haemals. The neural spines are visible only in part: nevertheless they seem to be united with the respective arches. This is in contrast with the reconstruction by TINTORI (1983) based on better preserved specimens. It is possible therefore that this difference is a result of fossilization.

**F i n s** - In slab «B» a part of the pectoral fin is recognizable; it results 6-7 mm large and 15-16 lepidotrichia are distinguishable: only the first 6 are preserved, while the others are present as impression.

In slab «A» a segment of the caudal fin and some fragments of the dorsal are preserved.

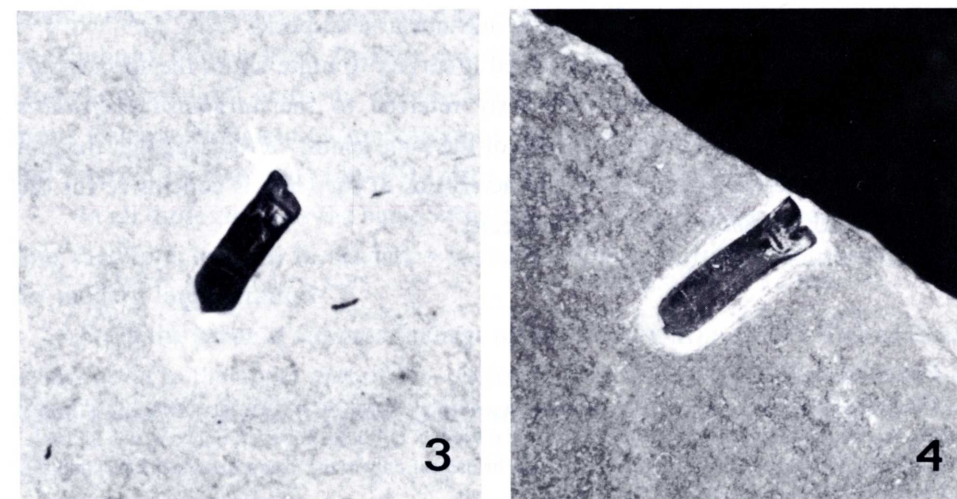


Fig. 3 - *Sargodon tomicus* PLIENINGER, 1847: isolated incisiform n. 1879 GP (x 3).  
- *Sargodon tomicus* PLIENINGER, 1847: incisiforme isolato n. 1879 GP (x 3).

Fig. 4 - *Sargodon tomicus* PLIENINGER, 1847: isolated incisiform n. 1880 GP (x 3).  
- *Sargodon tomicus* PLIENINGER, 1847: incisiforme isolato n. 1880 GP (x 3).



**D i s c u s s i o n** - The attribution of this fossil to the *Sargodon tomicus* species is based on the characteristics of the teeth, showing particular histologic and morphologic characters, peculiar to this genus: till some years ago *Sargodon* was known only from isolated teeth, whose peculiarities allow a sure determination.

Recently ØRVIG (1978) has reviewed the histologic and morphologic characteristics of the teeth of the *Sargodon*: he remarks the fact that the acrodin contains digitations from orthodentine coming from the basal side. This structure is not known in any other fish. This Author does not refer to the medial groove in the incisiforms, while this characteristic is considered as a diagnostic one for this genus by WOODWARD (1895) <sup>(1)</sup>.

Beside the dentition, however, other characteristics of the specimen of Val Preone can be compared with those reported by TINTORI (1983) and also by BONI (1937).

A final consideration is the possibility that this specimen belongs to a new species of the same genus *Sargodon* to be instituted on the basis of the morphological and dimensional differences previously emphasized. But we believe that they are not significant enough for the instituting of a new species. The reduced dimensions of the specimen, the slightly accentuated convexity of the anterior part in comparison with those described by TINTORI (1983) are perfectly in accordance with the possibility that the specimen is a young one and not a new species <sup>(2)</sup>.

Recently ØRVIG (1978) has deemed it correct to unite under the species *Sargodon tomicus* also the teeth previously referred to the *Sargodon orbicularis* (PLIENINGER, 1844) and of other species of the same genus, considering that the presence of the described histological characteristics of the teeth is conclusive for the attribution to the *Sargodon tomicus* species.

(1) This groove seems to be absent in the material described by BONI (1937), GUERIN (1958) and TINTORI (1983). It is absent also in the isolated teeth from Val Preone. Of these, however, only one side is visible. WOODWARD (1895) states that this groove seems to be present only in the «supposed inner face» and this fact is verified in the specimen of Val Preone.

(2) The examination of the materials stored in the British Museum (Natural History) of London, permitted us to verify that the largest part of the known teeth of *Sargodon* is characterised by measures closer to those of the specimen of Val Preone. A fragment of axial skeleton (probably some neural spines) belongs to a specimen 25-30 cm long. Tintori (pers. com.) confirms the presence of specimen of similar measures also in Lombardy: the material was found after the publication of 1983.

### Stratigraphic considerations

The specimens of Val Preone come from the «Dolomia di Forni», an informal unity that consists of calcareous or bituminous dolostones, which can be found in the south of the upper Tagliamento river; it is coeval with the lower part of the «Dolomia Principale». At this stage of the research the age of the «Dolomia di Forni» is based on its superimposition on the Carnian «Dolomie Cariate», while we lack a direct verification.

Several Authors have insisted on the paleoenvironmental characteristics of this unity (MATTAVELLI & RIZZINI, 1974), the paleontological contents and its age (CALZAVARA, MUSCIO & WILD, 1981; CARULLI, FRASCARI & SEMENZA, 1982; WILD, 1984; TINTORI, MUSCIO & NARDON, 1985). In any case it is possible the referral of the fossiliferous levels to the Lower Norian or, at most, to the Middle-Lower Norian.

For a long time *Sargodon tomicus* was considered typical of the Rhaetic deposits of Württemberg, England and Italy (LEHMAN, 1966; DANILCHENKO, 1967); GUERIN (1958) has also signaled some isolated teeth from the Rhaetic of France <sup>(3)</sup>. The findings from Italy were described by BONI (1937) who reported the finding of some isolated teeth from the Rhaetic of Lombardy, two fragments of bones with molariforms from Valcava (Bergamo) and one incisiform from Montagna of Cetona (Umbria). Only in 1983 TINTORI described the first complete specimen, derived from the Norian of Lombardy. He also referred to the *Sargodon tomicus* some fragments from the Norian of Giffoni (Salerno), previously described by COSTA (1853-60) and referred by BASSANI (1892-95) to the genus *Dapedium*.

In all those citations the name «Rhaetic» is used in its wider meaning, considering, therefore, not only the Rhaetic s.s., but also Upper Norian, in conformity with the modern interpretations <sup>(4)</sup>.

From this point of view the findings reported by TINTORI (1983), derived from levels coeval to the upper part of the «Dolomia Principale», could also be included in the Rhaetic A.A., as proposed by BONI (1937) and by LEHMAN (1966).

(3) More precisely the findings reported by GUERIN (1958) come from the deposits of the lower Rhaetic (considered in its largest meaning) of the southern Giura of French.

(4) The Rhaetic bone-beds of Württemberg contain, for example, both faunas of Rhaetic and Upper Norian.



With the findings of Val Preone the stratigraphic distribution of the *Sargodon tomicus* becomes larger and includes the whole Norian<sup>(5)</sup>. This fossil has lost its meaning as fossil index the «Rhaetic bone-beds».

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(5) DEECKE (1926) in the distribution of the *Sargodon tomicus*, describes a finding from «? Ob. Muschelkalk (Bonebeds) Crailsheim (Württemberg)». This report is clearly incorrect because no teeth of *Sargodon* were found in the bone-bed of the Muschelkalk of Crailsheim (Wild, pers. com.).

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