



Morphoceratid ammonites from the Upper Bathonian (Middle Jurassic) of Monte Kumeta, western Sicily



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ABSTRACT

The Upper Bathonian beds of the Rosso Ammonitico Inferiore on Monte Kumeta, western Sicily, yielded several rare or previously unknown ammonites, including representatives of the family Morphoceratidae. This family has been known basically from the Upper Bajocian and the Lower Bathonian, but here the local sedimentation circumstances (deposition on top of a submarine high) and the exceptional preservation (seemingly rapid burial of skeletal remains by clayey mud) resulted in the survival of shells of small ammonites, usually lost through aragonite subsolution common in this environment. One new genus: *Mangoldiceras* n. gen. with *Mangoldiceras distefanoi* n. sp. as type species is designated, and the Upper Bathonian occurrences of the genera *Ebrayiceras*, *Pseudodimorphinites* and probably *Polysphinctites* are demonstrated. *Ebrayiceras problematicum* (Gemmellaro, 1877), which was regarded formerly as a Lower Bathonian ammonite, now is strongly suggested, on the basis of several newly collected specimens, as an Upper Bathonian species. These appearances are understood as rare finds that help to reconstruct the morphoceratid lineage as more continuous in the Bathonian and longer than previously known.

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1. Introduction

The morphologically well-distinguished ammonite family Morphoceratidae plays an important role in uppermost Bajocian and especially in Lower Bathonian stratigraphy. *Dimorphinites*, the earliest representative, is characteristic, being restricted to the uppermost Bajocian Parkinsoni Zone, and species of *Morphoceras* and one of *Asphinctites* are subzonal and zonal indices, respectively, in the Lower Bathonian. While generally regarded as belonging to Superfamily Perisphinctoidea, the origin of the Morphoceratidae is uncertain (see Fernández-López and Chong-Díaz, 2011).

Nevertheless, this family has been repeatedly mentioned from the Middle and the Upper Bathonian, but in some cases with uncertain (bio)chronostratigraphic information. These records were suggested as appearances of Lazarus taxa by Mangold in a comprehensive paper (1997), giving detailed descriptions of all forms that could be taken into consideration.

In a well-studied Middle Jurassic section on the western Sicilian Monte Kumeta several species, representing previously known and new morphoceratids, were collected from a level unambiguously dated as Upper Bathonian. The study of these forms may elucidate

a phenomenon met commonly in Jurassic ammonite studies and described or labelled as homoeomorphy or in some cases cryptogenetic appearance.

2. Morphoceratids in the Middle and Upper Bathonian

While they are basically Upper Bajocian–Lower Bathonian, morphoceratids have been mentioned also from higher Bathonian in the literature. A very early indication is the one given by Wetzel, 1924, p.224, footnote 2), who refers to a record of '*Am. Parkinsoni dubius* Q.' of Behrensden from the 'Macrocephalenschichten' of Hildesheim. This record was later understood as that of an *Ebrayiceras* by Torrens, 1971, p.595).

A solid reference was the introduction of '*Morphoceras*' *gignouxii* by Guillaume (1927) from the Middle Bathonian of Normandy. Then Wendt (1963) recorded different small '*Dimorphinites*' specimens from the Bathonian of Sicily. These forms were determined as coming from Bathonian 'Mischfaunas', in which Upper Bathonian forms also appear. Very similar forms were found in Hungary, in the Upper Bathonian of the Vértes Hills (Galácz, 1995).

Berbericeras, a genus ranged into Morphoceratidae (see Sturani, 1967; Donovan et al., 1981) was long suspected as an enduring

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group which may include the problematic '*Cadomites*' *compressus* of de Grossouvre, 1930, p.374, pl.40, fig. 5). The age of this ammonite was well established as of Middle Bathonian Morrissi Zone by Mangold (1970). A *Berbericeras* species was recorded by Patrulius (1996) from the Upper Bathonian of the Apuseni Mountains, Romania, and this form was also identified (as *Berbericeras patruilii* n. sp.), with its corresponding microconch (*Microberbericeras* subgen. nov.), from the Upper Bathonian of Villány (Géczy and Galácz, 1998).

Outside the western Tethyan realm, morphoceratids are known as rare elements in the Andean Jurassic. Fernández-López and Chong-Diaz recently (2011) described *Dimorphinites* [M] and *Vigoriceras* [m] from the Upper Bajocian of northern Chile, and Riccardi and Westermann (1999) reported on a *Morphoceras* species from the Lower Bathonian of the Argentinian Andes. Westermann and Hillebrandt (1995) described some forms that they interpreted as morphoceratids from the Peruvian Upper Bathonian. These are large (65–70 mm diameter) ammonites, that Mangold (1997, p.99) regarded as fitting better to Tutilitidae. Nevertheless, the forms show similarities to the here designated, but much smaller *Mangoldiceras* gen. nov. (see below).

In this latter paper Westermann and Hillebrandt mentioned (p.28) that S. Elmi, in personal communication, gave information about North African morphoceratids that occur with *Epistrenoceras* and *Hemigarantia*, both indicating the Upper Bathonian Retrocostatum Zone.

There are some sporadic traces that may suggest Upper Bathonian morphoceratids from a wider area. Riccardi and Westermann, 1991, p.130), when discussing the unequivocally reineckeiid *Pseudoneuquenoceras yokoyamai* (Kobayashi and Fukuda) from the Upper Bathonian of Honshu, Japan, suggested an independent origin, possibly from a morphoceratid. A singular find from the Sula Islands is a specimen determined as *Asphinctites* cf. *pinguis* (Westermann and Callomon, 1988, pl.18, fig. 4) that represents the only indication of Early Bathonian for the whole Indo-West Pacific area (Westermann, 1981, p.476).

3. Locality and stratigraphy

Monte Kumeta (Fig. 1), near Piana degli Albanesi in western Sicily, is a well-known locality of Jurassic formations (see Di Stefano et al., 2002a). The best site to study the Jurassic rocks is Cava Cerniglia, a working quarry near the top of the hill (locality 14.1 in Di Stefano et al., 2002b). Ammonites from the Toarcian and Upper Bajocian levels of the here excavated Middle Jurassic Rosso Ammonitico Inferiore were published previously (Galácz et al., 2007; Galácz, 2008). The middle part of the Rosso Ammonitico Inferiore (RAIb) contains an Upper Bathonian level with a very rich ammonite assemblage dated as Retrocostatum Zone, probably

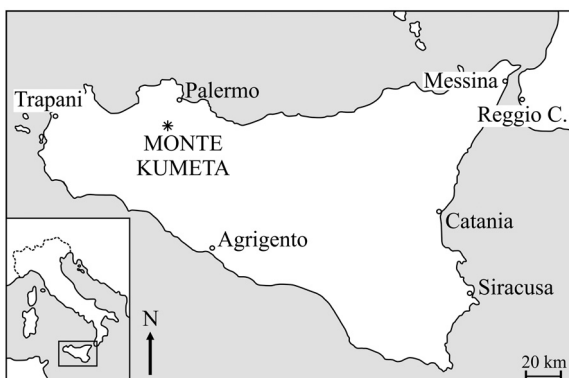


Fig. 1. Location of Monte Kumeta in western Sicily, Italy.

middle part (F.A. 7 in text-fig 4 in Di Stefano et al., 2002a, and see Fig. 2). Above this level, Lower Callovian ammonite assemblage appears, and from the following marly beds ("red/grey nodular marls" in Di Stefano et al., 2002a) a rich Upper Callovian to Middle Oxfordian belemnite fauna was described (Mariotti, 2002).

The Upper Bathonian ammonite assemblage marks only one of the local Bathonian faunal levels. There are indications of a Lower Bathonian assemblage from the quarry, and at an isolated nearby locality of the Rosso Ammonitico Inferiore Lower and Middle Bathonian ammonites were identified formerly (Galácz, 1985).

The age of the morphoceratids discussed below is Upper Bathonian, as indicated by, among others, the co-occurring *Oxycerites orbis* (Giebel), *Paroecotraustes densecostatus* (Lissajous), *Prohcticoceras retrocostatum* (de Grossouvre) and *Prohcticoceras blanazense* Elmi. These species unequivocally indicate the Retrocostatum Zone, and the occurrence of *P. blanazense*, regarded as faunal horizon index in the Submediterranean province (see

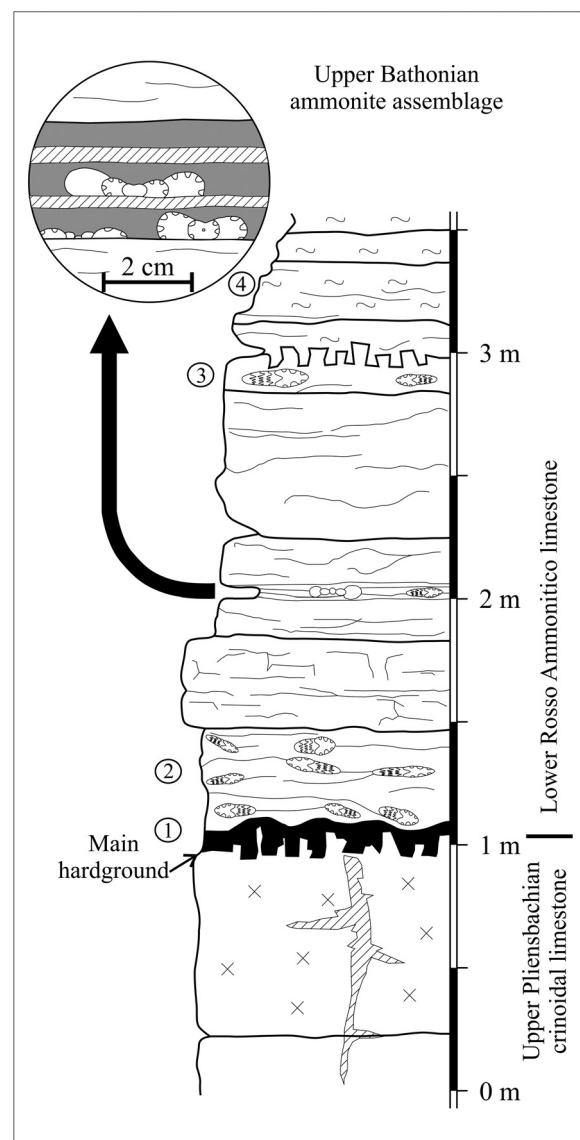


Fig. 2. The Rosso Ammonitico inferiore section in the Cerniglia Quarry, Monte Kumeta, with the ammonite assemblages. 1: Toarcian ammonite assemblage (Galácz et al., 2007), 2: Upper Bajocian ammonite assemblage (Galácz, 2008), 3: Middle Callovian ammonite assemblage (unpublished), 4: Upper Callovian–Middle Oxfordian belemnite assemblage (Mariotti, 2002). For the Upper Bathonian assemblage, see the inset.

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