

The First Appearance of Dactylioceratids in the Western Carpathians

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Abstract: In this article a horizonized assembly of Upper Domerian Ammonites is described, in which appear the first representatives of *Dactylioceras*. In the Western Carpathians, similar to other areas of the Tethys, the first appearance of *Dactylioceras* coincides with the Upper Domerian - Hawskerense subzone. The Western Carpathians occurrences repeatedly suggest that in the Tethyan realm many Liassic Ammonite genera are precocious in comparison to NW Europe.

Key Words: Ammonites, *Dactylioceras*, first appearance, Upper Domerian, West Carpathians

Introduction

Dactylioceratids represent an index group of Ammonites the importance of which for the detailed stratigraphy of the Lower Toarcian is generally recognised. The majority of stratigraphers usually relate their first appearance to the Lower Toarcian time level. Although this assumption is plausible, it should be borne in mind that in the Tethyan palaeobiographic domain the first *Dactylioceratids* start appearing already in the Late Domerian - a fact frequently ignored by many ammonitologists.

The appearance of the first *Dactylioceratids* in the Late Domerian attests to their diachroneity of about 3 MA which may cause certain problems in time correlations between the NW Europe and the Tethys.

The following description concerns the *Ammonites* found at a locality in Northern Slovakia situated geologically in the Orava section of the Western Carpathians "Klippen Belt". Based on the succession of horizonized *Ammonites*, first *Dactylioceratids* are located in the uppermost part of the Domerian Hawskerense subzone. This stratigraphic position is in good agreement with other regions of the Tethys (FUCINI, 1935; GAKOVIC, 1986; SAPUNOV, 1974).

Locality Havranský vrch (Fig. 1)

This locality was already known to C. M. PAUL (1868) who described Lotharingian fossils from it. Later ANDRUSOV (1931) identified here many Lotharingian Ammonites. In the seventies this area was studied by HAŠKO (1975, 1977) including the compilation of a detailed geological map and fine-tuning of the local stratigraphy on the basis of a collection of horizonized Ammonites.

The geological setting of this locality is represented by an overturned, more or less complete succession of Jurassic - Lower Cretaceous sediments (Fig. 1):

1. At the base of the profile appears a relatively thick sequence of the "Allgäu Formation" (i.e. "Fleckenmergel" spotty limestones) of Sinemurian - Lotharingian age (ANDRUSOV, 1931).

2. Upwards the "Allgäu Formation" passes into a light-grey, greenish or reddish biomicritic, medium-bedded (approximately 20 cm) partly pseudonodular limestone of Pliensbachian age (RAKÚS in HAŠKO, 1977).

3. Beige to grey-greenish, well-bedded limestones with marly intercalations overlie the "Allgäu Formation."

4. Following is the sequence of grey, well-bedded (5-10-25-50 cm) partly quartzose spotty limestones alternating with bedded (3-15 cm) grey marlstones with *Juraphyllites* cf. *planorboides* RAKÚS, *Juraphyllites* sp. *Dactylioceras* (*Eodactylites simplex*, FUC., *Dactylioceras pseudocommune* FUC., *Dactylioceras* sp., (Upper Domerian).

5. The same as the underlying sequence (5) but containing *Partschiceras* gr. *anonymum* (HAAS), *Canavaria* (*Emaciatoceras* gr. *emaciatum* (CAT.)), Upper Domerian.

6. At the top there are grey, spotty, biomicritic limestones with *Partschiceras* gr. *anonymum* (HAAS), *Pleuroceras hawskerense* (YOUNG & BIRD), and *Amaltheus* sp., Upper Domerian. The Toarcian

Limestones (= *Ammonitico rosso*) lie approximately 8-10 m higher up.

Section: HAVRANSKÝ VRCH

M. RAKÚS 1973

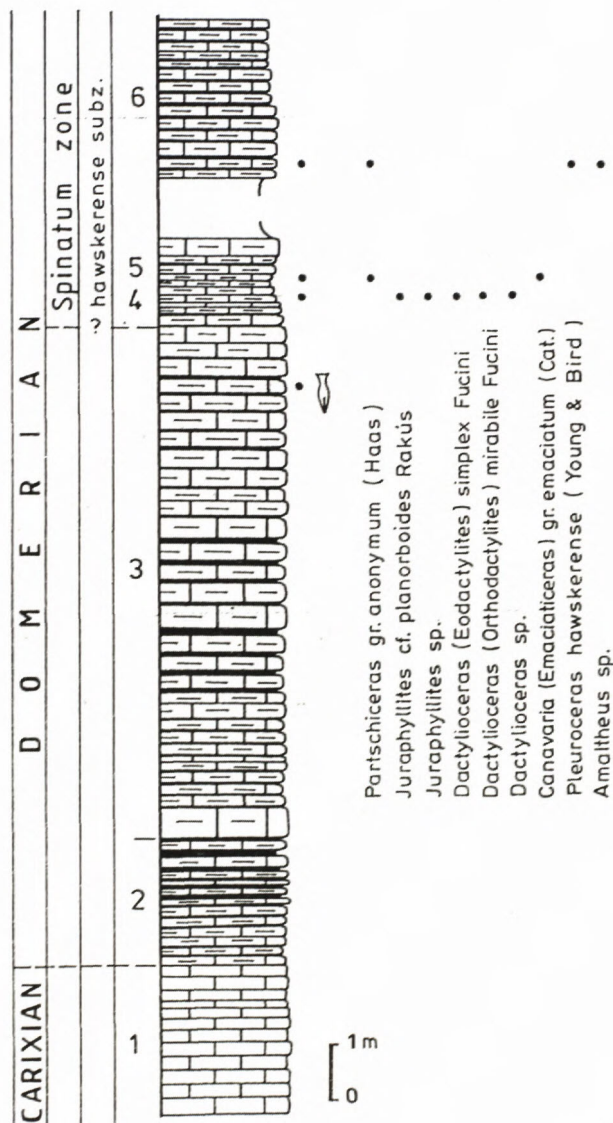


Fig. 1

Systematic

Phylloceratida ARKELL, 1950

Phylloceratidae ZITTEL, 1884

Partschiceras FUCICI, 1920

Partschiceras gr. *anonymum* (HAAS, 1913)

Material: One incomplete, sculptured cast, which represents a part of the whorl (levels 5 and 6).

Notes: Specimen from the locality Havranský vrch is in good accordance with the original depiction of the specimen (HAAS, 1913). Recently the specimen was exhaustively characterized by FATINI-SESTINI, 1971). **Stratigraphic range:** Pliensbachian (FATINI-SESTINI, 1971)

In the Western Carpathians this species is known from the Domerian (RAKÚS, 1964).

Juraphyllitidae ARKELL, 1950

Juraphyllites MÜLLER, 1939

Juraphyllites cf. *planispiroides* RAKÚS, 1993

(pl. 1, fig. 5)

Material: One compressed and incomplete specimen (level 4)

Notes: Our specimen is in good correspondence with original description and depiction of the species described by author (1994).

Stratigraphic range: Lotharingian to Domerian in Tethyan realm

Juraphyllites sp.

Together with the above mentioned species, a partly conserved specimen of costate juraphyllitid has been found. More detailed determination was not possible owing to bad preservation (level 4).

Family *Amaltheidae* HYATT, 1867

Genus *Amaltheus* DE MONTFORT, 1808

Amaltheus sp.

Notes: At the Havranovský vrch locality an incomplete specimen of *Amaltheus* was found together with *Pleuroceras*. Discoidal, oxycone shape of conche, sigmoidal ribs and crenulated keel leave no doubt that our specimen is indeed an *Amaltheus*. It is a little surprising that *Amaltheus* was found with *Pleuroceras*. However, we would like to emphasize that this *Amaltheus* assemblage is situated (approximately 1,5 m) above the first appearance of primitive *Dactylioceras*.

Stratigraphic range: Domerian, Spinatum zone, hawskerense subzone

***Pleuroceras* HYATT, 1867**

***Pleuroceras hawskerense* (YOUNG & BIRD, 1828)
(pl. 1, fig. 4)**

- 1828 *Ammonites hawskerensis* YOUNG & BIRD, p. 258, pl. XIV, fig. 6
- 1958 *Pleuroceras hawskerense* (YOUNG & BIRD) - HOWARTH: 45, text. fig. 18, pl. 9, fig. 3, 5-8, pl. 10, fig. 4 (cum. syn.)
- 1961 *Pleuroceras hawskerense* (YOUNG & BIRD) - DEAS et al.: 472, pl. 71, fig. 4
- 1980 *Pleuroceras hawskerense* (YOUNG & BIRD) *elaboratum* (SIMPSON) - WIEDERMAYER: 51, pl. 3, fig. 1, 22
- 1985 *Pleuroceras hawskerense* (YOUNG & BIRD) - SCHLATTER: 5, pl. 1, fig. 3, pl. 2, fig. 1

Material: Two more or less complete specimens (level 6)

Notes: All the basic characteristics of the specimens from Havranský vrch are in good accordance with specimens shown by HOWARTH (1958).

Stratigraphic range: Upper Domerian, Spinatum zone, hawskerense subzone.

***Dactylioceratidae* HYATT, 1867**

***Dactylioceras* HYATT, 1867**

***Dactylioceras (Eodactylites)* SCHMIDT - EFFING, 1972**

Notes: The subgenus *Eodactylites* was introduced by SCHMIDT - EFFING in 1972 (p. 91) without being accompanied by a diagnosis or bibliographic reference. Later the same author (1981, p. 31) corrected this error by designating his new subgenus as type species of *Dactylioceras pseudocommune* FUCINI, 1935. Further the same author included here also the species *D. (E.) simplex* FUC. (cf. p. 31). This broader understanding of subgenus *Eodactylites* is in contradiction with the original SCHMIDT - EFFING diagnosis. The typical specimen of *D. (E.) pseudocommune* is devoid of prominent primary ribs with tubercles in the juvenile or subadult stages (cf. FUCINI, 1935, pl. 9, fig. 1-3).

Because of this, the systematics of the late Domerian and early Toarcian *Dactylioceratids* is still unclear. We assume that for the time being the SCHMIDT-EFFING's conception is correct. I would like to remark, however, that this solution is not quite satisfactory.

***Dactylioceras (Eodactylites) simplex* (FUCINI, 1935)**

(pl. 1, fig. 4)

- 1935 *Dactylioceras simplex* n. sp. - FUCINI: 86, pl. 9, fig. 4, 5
- 1973 "*Catacoeloceras*" *simplex* (FUC.) - GUERX: 509, pl. 12, fig. 11
- 1981 *Dactylioceras (Eodactylites) simplex* FUCINI, 1935 - HILLEBRANDT 85, SCHMIDT - EFFING: 31, text. fig. 12, 16, pl. 1, fig. 1-4 (cum. syn.)
- 1982 *Dactylioceras cf. simplex* FUCINI - SCHLATTER: 761, pl. 1, fig. 2-3
- 1985 *Dactylioceras (Dactylioceras) cf. simplex* (FUCINI 1935) - SCHLATTER: 6
- 1986 *Dactylioceras (Dactylioceras) simplex* FUCINI, 1935 - GAKOVIČ: 78, pl. 5, fig. 1a-c

Material: Two partly preserved specimens (level 4)
Notes: Our specimen is featuring strong primary ribs, terminated distinct ventrolateral tubercles, branched to bi- or trifurcated secondary ribs are in good agreement with the original description and depiction by Fucini (1935, p. 78, pl. 9, fig. 4, 5).

Recent description of the species by GAKOVIČ (1986, p. 78, pl. 5, fig. 1a-c) shows the same characteristics. Moreover, from Gakovic's depiction it is evident that juvenile-subadult stages of *simplex* species have simple, prominent primary ribs with tubercles. This ontogenetic stage shows certain relationship with *Coeloceratinae* HAUG, 1910 sensu WIEDENMAYER, 1917

Stratigraphic range: Upper Domerian, Spinatum zone, hawskerense subzone to Lower Toarcian.

***Dactylioceras pseudocommune* FUCINI, 1935**

(pl. 1, fig. 2,3)

- 1935 *Dactylioceras pseudo-commune* n. sp. FUCINI: 86, pl. 9, fig. 1-3
- 1966 *Dactylioceras pseudocommune* FUCINI - FISCHER: 26, pl. 1, fig. 5, pl. 4, fig. 3, 6
- 1972 *Dactylioceras (Eodactylites) pseudocommune* FUCINI, 1935 - SCHMIDT - EFFING: 91, pl. 3, fig. 1a-c; pl. 18, fig. 7, text. fig. 15
- 1973 *Dactylioceras (Dactylioceras) pseudocommune* FUCINI - HOWARTH: 253, pl. 1, fig. 1 (cum. syn.)
- 1973 *Dactylioceras pseudocommune* (FUCINI) - GUERX: 508, pl. 12, fig. 2
- 1974 *Dactylioceras (Eodactylites) pseudocrassulosum* (FUC.) - ELM: 47, pl. 1, fig. 12

Material: One incomplete specimen and several fragments of whorls (level 4).

Notes: Types of ribs, identical intercostal distances and mode of bifurcation of secondary ribs are in good



Fig. 1 *Pleuroceras hawskerense* (YOUNG & BIRD); Upper Domerian, Spinatum zone, hawskerense subzone; loc. Havranský vrch, level no. 6; 0,5x

Fig. 2,3 *Dactylioceras pseudocommune* FUCINI; Upper Domerian, Spinatum zone, hawskerense subzone; loc. Havranský vrch, level no 4, fig. 3, 0,5x, fig. 3, 1x

agreement with the original conception of species by FUCINI (1935).

Stratigraphic range: Upper Domerian, Spinatum zone, hawskerense subzone.

Hildoceratidae HYATT, 1867

Arieticeratinae HOWARTH, 1955

Canavaria Gemmellaro, 1886

Canavaria (Emaciaticerias) FUCINI, 1931

Canavaria (Emaciaticerias) gr. *emaciatum* (CATULLO, 1853)

(pl. I, fig. 7)

Material: One partly deformed specimen; (level 5)

Notes: Although our specimen is insufficiently preserved, we are convinced that the principal characteristics as the size, section of whorls, involution, ribbing and ventral part of whorls are close to FUCINI's (1931) depiction. It should be noted, however, that the systematics of this group of *Arieticeratinae* is unclear and each author follows his own concept of classification.

Stratigraphic range: Upper Domerian, Spinatum zone, hawskerense subzone

Observation on the first appearance of *Dactylioceratids* in the Tethyan Realm

The first appearance of the genus *Dactylioceras* in NW Europe is linked to Lower Toarcian "Tenuicostatum Zone" (ARKELL, 1957; DEAN et al., HORWATH, 1973; SCHLATTER, 1985 and others).

This stratigraphical setting is automatically applied by the majority of stratigraphers also to the Tethyan realm, notwithstanding the long established fact that in the Tethyan domain the first *Dactylioceras* were reported from the Upper Domerian FUCINI, 1935; CANTALUPPI and SAVI, 1968).

Observations of these authors are, however, disputed by Horwath (1973: 271/272).

Meanwhile, the occurrence of *Dactylioceratids* has been proved at further three, from each other quite distant localities: Algeria (Djebel Nador, Hauts Plateaux de Tiaret; SAPUNOV, 1974), Spain (Cordilleras Béticas; BRAGA, 1983) and Bosnia (in the vicinity of towns Gacko and Nevesenije; GAKOVIC, 1986). At each of these localities the *Dactylioceratids* were found within the assemblages of Upper Domerian Ammonites, especially with *Lioceratoides* or *Emaciaticerias*. In Spain, according to Braga's information (l. c., p. 334), *Dactylioceras* sp. (= *D.* gr. *pseudocommune*) is situated in the Middle Domerian "Bertrandi subzone" which is the earliest reported appearance of this genus.

In the Western Carpathians the first *Dactylioceratids* occur slightly below (approximately 1,5 m) the assemblage of *Pleuroceras hawskerense* and *Amaltheus*, which corresponds to the Upper Domerian.

As a conclusion, all the above mentioned informations would seem to provide enough convincing evidence for the view that, in the Tethyan realm, the first *Dactylioceras* appear in the Upper Domerian. This conclusion should not be surprising bearing in mind that in the NW Europe, the first *Dactylioceras* are also found in the Upper Domerian (cf. HORWATH, 1958, p. XI or SCHMIDT-EFFING, 1972, p. 140). On the other hand their mass occurrence should, however, be identified with the Lower Toarcian *Tenuicostatum* zone.

Conclusion

The appearance of the *Dactylioceras*, similar to other groups of Ammonites in the Tethyan bioprovince, is precocious in comparison with NW Europe or the boreal bioprovince.

Fig. 4 *Dactylioceras (Eodactylites) simplex* FUCINI, Upper Domerian, Spinatum zone, hawskerense subzone; loc. Havranský vrch, level no 4, nat. size

Fig. 5 *Juraphyllites cf. planispiroides* RAKUS; Upper Domerian, Spinatum zone, hawskerense subzone, loc. Havranský vrch, level no 4; 0,5x

Fig. 6 *Dactylioceratidae* div. sp. (probably juvenil stages of *D. pseudocommune*); Upper Domerian, spinatum zone, hawskerense subzone; loc. Havranský vrch, level no 4, nat. size

Fig. 7 *Canavaria (Emaciaticerias)* gr. *emaciatum* (CATULLO) Upper Domerian, Spinatum zone, hawskerense subzone; loc. Havranský vrch, level no 5; 0,5x

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