

Jeletzkytes dorfi LANDMAN & WAAGE 1993,
a North American ammonoid marker from the lower
Upper Maastrichtian of Belgium, and the numerical
age of the Lower/Upper Maastrichtian boundary

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With 3 figures in the text

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Abstract: *Jeletzkytes dorfi* a distinctive scaphitid ammonite originally described from the Maastrichtian of the U.S. Western Interior is here recorded from the lower part of the *Belemnitella junior* Zone, 'Vijlen' Member of the Gulpen Formation at Haccourt (province of Liège). An approximate correlation between the base of the *junior* Zone and the base of the *Hoploscaphites birkelundi* Zone of the U.S. Western Interior is proposed; if accepted, the Lower/Upper Maastrichtian boundary of the European sequence is dated at slightly younger than 69.42 ± 0.37 Ma, as this is the age of bentonites in the underlying *Baculites clinolobatus* Zone of the Western Interior.

Zusammenfassung: Die leitende Scaphiten-Art *Jeletzkytes dorfi* LANDMAN & WAAGE 1993 ist kürzlich aus dem Maastrichtium des Western Interior der Vereinigten Staaten beschrieben worden. Sie wird hier aus dem unteren Teil des unteren Oberen Maastrichtium (*Belemnitella junior* Zone, *tegulatus/junior* Zone sensu SCHULZ & SCHMID 1983) des 'Vijlen'-Kalksteins (Gulpen-Formation) von Haccourt (Provinz Lüttich, Belgien) beschrieben. Eine Korrelation zwischen der Basis der *junior* Zone und der Basis der *Hoploscaphites birkelundi* Zone des Western Interior wird vorgeschlagen. In diesem Fall würde die Unter/Ober-Maastricht-Grenze in Europa als wenig jünger als 69.42 ± 0.37 Ma datiert, dem Alter von Bentonitablagerungen in der liegenden *Baculites clinolobatus* Zone des Western Interior.

Introduction

The giant scaphitid *Jeletzkytes* RICCARDI 1983, is a widespread and stratigraphically significant element of Middle Campanian to Upper Maastrichtian faunas of the United States Western Interior. The recent recognition that the type species, *J. nodosus* (OWEN 1852), occurred in the Upper Campanian of the U.S. Gulf Coast, Atlantic seaboard and the Vistula Valley of Poland (where *Acanthoscaphites praequadriscopinosus* BLASZKIEWICZ 1980, is a synonym; see KENNEDY & COBBAN 1993), as part of a

widely occurring *Nostoceras* (*Nostoceras*) *hyatti* Zone (KENNEDY, COBBAN & SCOTT 1992; BURNETT, HANCOCK, KENNEDY & LORD 1992) established a firm correlation of the Campanian-Maastrichtian boundary between western Europe and the U.S. Western Interior. The base of the *Belemnella lanceolata* Zone of the European sequence thus lies between the *Baculites jenseni* and *Baculites eliasi* zones of the Western Interior. We recently recognised a second species of *Jeletzkytes*, *J. dorfi* LANDMAN & WAAGE 1993, from the lower part of the 'Vijlen' Member of the Gulpen Formation as exposed at the "Ciments Portland Liégeois SA" quarry, Haccourt (Liège, Belgium), associated with elements of the lower Upper Maastrichtian *Belemnitella junior* Zone or *tegulatus/junior* Zone sensu *germanico* (JAGT & MICHELS 1987, JAGT & KENNEDY 1989, JAGT & FELDER, in press). Available evidence indicates the specimens to be from low in the *junior* Zone (Fig. 1), suggesting that the Lower/Upper Maastrichtian boundary as recognised in northwest Europe lies at the approximate level of the base of the *Hoploscaphites birkelundi* Zone (Fig. 2) of the U.S. Western Interior to which *J. dorfi* is restricted. A bentonite from the underlying *Baculites clinolobatus* Zone is dated at 69.42 ± 0.37 Ma (OBRADOVICH 1994), so that the Lower/Upper Maastrichtian boundary of the European standard sequence is a little younger than this. OBRADOVICH dated the Campanian/Maastrichtian boundary at 71.3 ± 0.5 Ma, and the Maastrichtian/Palaeocene boundary at 65.4 ± 0.1 Ma in the Western Interior. If the above correlations are correct, then the Maastrichtian is divided into a relatively short Lower, and much longer Upper Maastrichtian.

UPPER MAASTRICHTIAN	<i>Belemnella caslmirovensis</i> Zone ★ <i>Belemnitella junior</i> Zone ★
LOWER MAASTRICHTIAN	<i>Belemnella fastigata</i> Zone <i>Belemnella cimbrica</i> Zone <i>Belemnella sumensis</i> Zone <i>Belemnella obtusa</i> Zone <i>Belemnella pseudobtusa</i> Zone <i>Belemnella lanceolata</i> Zone

Fig. 1. Maastrichtian belemnite zonation for northwest Europe. The position of *Jeletzkytes dorfi* from Haccourt is marked by asterisks.

MAASTRICHTIAN	(Triceratops Beds : non-marine)
	<i>Jeletzkytes nebrascensis</i> Zone
	<i>Hoploscaphites nicoletti</i> Zone
	* <i>Hoploscaphites birkelundi</i> Zone *
	<i>Baculites clinolobatus</i> Zone
	<i>Baculites grandis</i> Zone
	<i>Baculites baculus</i> Zone
	<i>Baculites eliasi</i> Zone

Fig. 2. Maastrichtian ammonite zonation for the U.S. Western Interior. The position of *Jeletzkytes dorfi* as described by LANDMAN & WAAGE (1993) is marked by asterisks.

Locality data

All specimens before us have recently been collected from the lowermost four metres of the 'Vijlen' Member (Gulpen Formation) as exposed at the CPL (Ciments Portland Liégeois) SA quarry, Haccourt. This is one of three major key sections for the Santonian-Maastrichtian of the Maastrichtian type area (JAGT & FELDER, in press).

Amongst macrobiota this unit has yielded both index taxa of the early Late Maastrichtian *tegulatus/junior* Zone of the northwest German biozonation scheme (SCHULZ & SCHMID 1983), i. e. the belemnite *Belemnitella* gr. *junior* NOWAK 1913 and the inoceramid *Spyridoceramus tegulatus* (VON HAGENOW 1842). Previous records of early Maastrichtian belemnite marker species from the base of this unit invariably refer to reworked specimens found in burrows in the chalkstone below the Froidmont Horizon, and capping the underlying Zeven Wegen Member of early Late Campanian age.

Ammonite assemblages from the lower part of this unit are dominated by the scaphitid *Hoploscaphites constrictus* (J. SOWERBY 1817), while a small number of associated, generally rare and poorly preserved species include the scaphitid *Acanthoscaphites varians* (LOPUSKI 1911), specifically indeterminate baculitids, pachydiscids of the *neubergicus/gollewillensis* group, the diplomoceratid *Glyptoxoceras rugatum* (FORBES 1846) and the desmoceratid *Hauericeras* sp.

A revision of the stratigraphy of the Beutenaken and Vijlen Members of the Gulpen Formation by P. J. FELDER et al. is currently under way and adaptations in lithostratigraphic terminology will certainly turn out necessary. This explains the use of inverted commas in 'Vijlen' Member; there is, however, no doubt about the biostratigraphy of this unit as exposed at the CPL SA quarry.

Systematic palaeontology

Superfamily Scaphitaceae GILL 1871

Family Scaphitidae GILL 1871

Subfamily Scaphitinae GILL 1871

Genus *Jeletzkytes* RICCARDI 1983

Type species: *Scaphites nodosus* OWEN, 1852, p. 581, pl. 8, fig. 4, by original designation of RICCARDI (1983, p. 14).

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Fig. 3a-e

1993 *Jeletzkytes dorfi*. – LANDMAN & WAAGE, p. 184, figs. 141–148 (with synonymy).

Type: The holotype by original designation is no. YPM 23175, a macroconch, in the collections of the Peabody Museum, Yale University, from the *Hoploscaphites birkelundi* Zone, Fox Hills Formation, SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 14 and NW corner of sec. 23, T. 38, N, R62 W, Bower Flat quad, Niobrara County, Wyoming (LANDMAN & WAAGE 1993: fig. 141a-e).

Description: Naturhistorisch Museum Maastricht Collections NHMM 1993070 (ex JAGT Coll.) (Fig. 3c) is a crushed composite mould of the shaft and final hook of an adult microconch with a maximum preserved whorl height of 11.5 mm. The flanks of the shaft and adapical section of the hook are ornamented by narrow, distant, prorsiradiate, convex ribs that arise in pairs from sharp umbilical bullae on the hook, the umbilical part of the shaft being damaged. The ribs link in pairs at strong ventral clavi on the shaft, with traces of occasional intercalated ribs. The final section of the hook prior to the aperture is decorated by crowded delicate riblets that pass over the venter in a broad convexity, without tubercles.

NHMM 1993071 (ex JAGT Coll.) (Fig. 3a, b) is a further highly distorted microconch showing comparable coarse adapical and fine adapertural ornament; it also shows the last part of the phragmocone, with umbilical bullae giving rise to pairs of narrow ribs with two short intercalated ribs between; ribs may branch again on the outermost flank. There are suggestions of feeble inner ventrolateral tubercles, and strong outer ventrolateral clavi that link pairs of ribs.

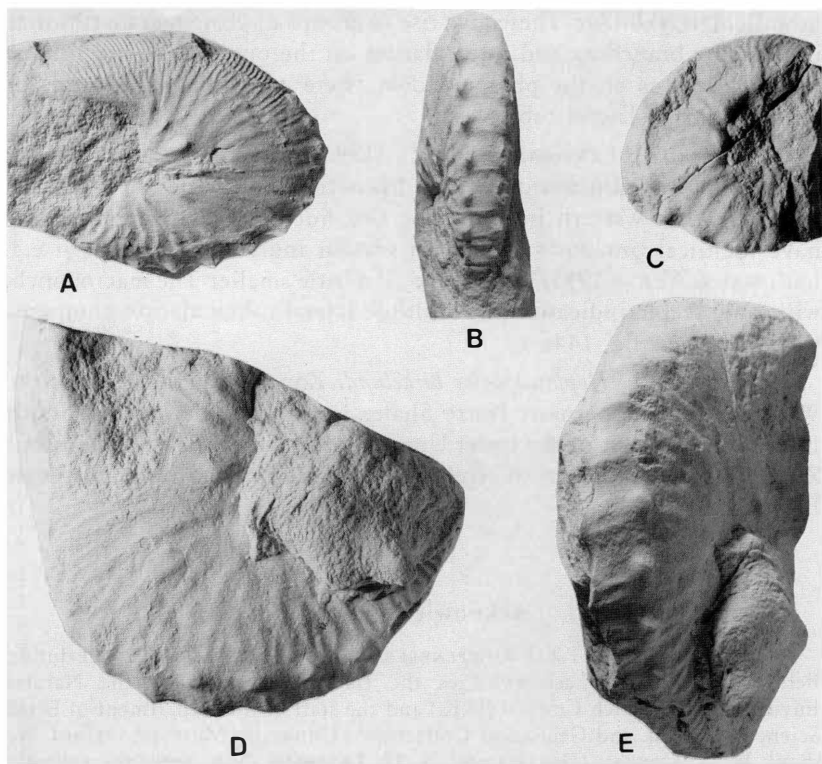


Fig. 3. *Jeletzkytes dorfi* LANDMAN & WAAGE 1993. A, B, microconch, NHMM 1993071; C, microconch, MHMM 1993070; D, E, macroconch, NHMM 1993072, all from the lower part of the lower Upper Maastrichtian 'Vijlen' Member of the Gulpen Formation (*Belemnitella junior* Zone) at Haccourt (province of Liège, Belgium). All figures are $\times 1$.

NHMM 1993072 (ex JAGT Coll.) (Fig. 3d, e) is also crushed, and consists of part of the outer whorl of the phragmocone and adapical body chamber shaft of a macroconch with a whorl height of 30 mm approximately at the end of the phragmocone. Flank ornament on the phragmocone consists of narrow prorsiradiate primary ribs that increase by branching and intercalation on the outer flank, where the ribs are crowded and irregularly developed with occasional feeble inner ventrolateral tubercles. Ribs link in groups of two or three at widely separated ventral clavi, or intercalate between. Groups of up to three ribs loop between clavi on opposite sides of a broadly arched venter, or intercalate between. A flint nodule obscures the juncture of phragmocone and body chamber, but the adapical section of preserved shaft has pronounced

umbilicolateral bullae. These give rise to groups of prorsiradiate ribs that increase by branching and intercalation on the outer flank and link to ventral clavi, as on the phragmocone. There are feeble indications of several rows of lateral tubercles.

Discussion: LANDMAN & WAAGE (1993) provide a comprehensive description and illustration of the Maastrichtian species of *Jeletzkytes* from the U.S. Western Interior. The two microconchs from Haccourt have identical ornament to that of certain individuals of *J. dorfi* e.g. LANDMAN & WAAGE 1993: fig. 146d, e), if a little smaller. The macroconch, with only feeble indications or multiple lateral tuberculation compares well with their fig. 144a-c.

Occurrence: *Hoploscaphites birkelundi* Zone, Fox Hills Formation, Wyoming, and uppermost Pierre Shale, east of the Black Hills, South Dakota. Lower part of the lower Upper Maastrichtian *Belemnitella junior* Zone, 'Vijlen' Member of Gulpen Formation, Haccourt, northeast Belgium.

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