

Neocomian belemnites from the Bersek Hill (Gerecse Mountains, Hungary)

A gerecsei Bersek-hegy alsó-kréta belemniteszei

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Abstract

About 220, bed-by-bed collected belemnites were examined from the Neocomian succession of the Bersek Hill (Gerecse Mts, Transdanubian Range). The rich fauna included the genera *Belemnites*, "*Combemorelites*" *Curtohibolites*, *Hibolithes*, "*Mesohibolites*", *Vaunagites* (Mesohibolitidae) and also *Duvalia*, *Pseudobelus*, *Pseudoduvalia* (*Duvaliidae*). Altogether 36 taxa were determined. The ranges of the species suggest latest Valanginian or earliest Hauterivian – Barremian age for the succession. The fauna has a Mediterranean affinity. These results fit well those obtained on the basis of ammonite and nannofossil data of the same profiles.

Összefoglalás

A gerecsei Bersek-hegyen rétegről-rétegre begyűjtött mintegy 220 belemnitesz példány 36 taxonba volt sorolható. A Mesohibolitidae családon belül a *Belemnites*, a „*Combemorelites*”, *Curtohibolites*, *Hibolithes*, „*Mesohibolites*”, *Vaunagites* nemzetségek, a Duvaliidae családon belül a *Duvalia*, *Pseudobelus*, *Pseudoduvalia* genuszok voltak meghatározhatók. A gazdag fauna késő-valangini vagy korahauterivi–barremi korú. Ósszállatföldrajzi affinitását tekintve a fauna jellegzetesen mediterránnak tekinthető. A belemniteszek vizsgálata alapján levonható eredmények jól egyeznek a szelvények ammoniteszfauna és nannoflora vizsgálati eredményeivel.

Introduction

In 1963–1964 a large amount of fossils were collected by Tibor STEINER and his coworkers from the Hungarian Geological Survey in the uppermost part of the Bersek Hill (Transdanubian Range, Gerecse Mts). The work was supervised by the late Prof. József FÜLÖP. The collected huge Neocomian fossil material, known today as "FÜLÖP Collection", is deposited in the Palaeontological Department of the Hungarian Natural History Museum, Budapest.

The largest part of the fossil material is build up by the 11 000 ammonites, but it contains belemnites and benthos elements also.

The geological setting of the region, the historical aspect of the geo/ palaeontological studies of the Neocomian of the Gerecse, and the detailed lithostratigraphic description of the sampled Lower Cretaceous sections are discussed in FÜLÖP (1958) and more recently in FÓZY & FOGARASI (2002).

The early studies done by HANTKEN (1872), HOFMANN (1884) and SOMOGYI (1914) contained very limited information on belemnites from the Gerecse Mountains.

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Belemnites described in this paper were collected from five sections (A, B, C, D and E), sampled very close to each other on the uppermost level of the Bersek Hill quarry. Fossils were collected bed-by-bed, but no documentation on the circumstances of the collecting was available. In spite of the lack of the original field notes, the successive order of the sampled profiles and their relation with the log of the quarry was successfully traced (FÖZY & FOGARASI 2002).

The latest Valanginian–Hauterivian fossil material originates from the dark red coloured Bersek Marl Formation (CSÁSZÁR 1984, 1996). The covering Lábatlan Sandstone Formation (HANTKEN 1868) yielded already Barremian fossils. These units are separated by a slump-like, grey-greenish horizon, the “graugrüne mergelige Sandsteinbank” of FÜLÖP (1958, p. 34, 79), rich in coaly plant material. The section, where the large-scale collecting was carried out in the early 60s, was depicted by FÜLÖP (1958, fig. 27 and pl. 2, fig. 2), and later by FÖZY (1995, fig. 3). The present article uses exactly the same nomenclature (“sections A, B, C, D, and E”) as the description and figure in the recently published paper of FÖZY & FOGARASI (2002, Fig. 4.) Bed 200 of section “C” is probably comparable to the “faunenreichen oberen Schicht der graugrünen Sandsteinbank” as indicated in FÜLÖP (1958, p. 34, 79), or “Harte, graugrüne, sandige Mergelbank” (FÜLÖP 1958, fig. 27).

Material

The larger part of the material consists of belemnites that belong to the family of Mesohibolitidae, and the preservation is in general good. However, sometimes corroded fragments were found, while specimens of the genus Duvaliidae are generally better preserved.

The material includes the following genera and species. Note that the numbers between brackets behind the bed-number indicates the amount of specimen. If no indication is given, only one specimen was available.

Mesohibolitidae

undet. specimen (juvenile and fragments)	Section “C”, beds: 206, 205, 203(2), 202(2), 200(7), Section “B”, beds: 131, 129, 128(2), 122, 110, 109, Section “A”, beds: 18, 17, 15(2), 7, Section “D”, beds: 379, 349, 312, 304, and 300/09
<i>Belemnites marginatus</i> RASPAIL 1829 (pl. 8, fig. 74)	Section “C”, beds: 217, 215(3), 213, 211(2), and 208(5)
<i>Belemnites pistilliformis</i> RASPAIL 1829	Section “C”, beds: 242, and probably 212, Section “D”, beds: 410, and 399
<i>Curtohibolites? pinguis</i> (SHVETSOV 1913)	Section “A”: bed 38
<i>Curtohibolites</i> sp.	Section “D”, beds: 300/31, and 300/26
<i>Curtohibolites trubatchensis</i> STOYANOVA-VERGILOVA 1963	Section “A”, bed: 15, and Section “D”, bed: probably 300/45
<i>Hibolites inae</i> ERISTAVI 1955	Section “C”, beds: 221(4), 220, 217(2), 215(4), 214(2), 212, 208, and probably 213, 207, and 206
<i>H. jaculiformis</i> var. <i>brevissulcatus</i> SHVETSOV 1913	Section “C”, beds: 201, and possibly an immature specimen from bed 208
<i>H. jaculiformis?</i> SHVETSOV 1913	Section “B”, beds: 132(2), 130, 128, and probably 117
<i>H. gr. jaculiformis</i> SHVETSOV 1913	Section “C”, beds: 208(8), 206, 205, 203(13), 202(4), 201(2), 200(20), and Section “B”, beds: 135(2)
<i>H. aff. josephinae</i> (HONNORAT-BASTIDE 1889)	Section “C”, beds: 212, and 211
“ <i>H. krimholzi</i> ” STOYANOVA-VERGILOVA 1970	Section “C”, beds: 316, Section “E”, beds: 300/13(6), 300/10(3), 300/09, and 300/08

<i>H. gr. longior</i> SHVETSOV 1913	Section "C", beds: 245(4), 243, and 242(2)
<i>H. mirificus?</i> STOYANOVA-VERGILOVA 1965	Section "B", bed: 126, and Section "A", bed: probably 12
<i>H. gr. subfusiformis</i> (RASPAIL 1829)	Section "C", beds: 254, 248, 242, 240 and 237
<i>H. gr. subfusiformis?</i> (RASPAIL 1829)	Section "C", bed: 200, Section "B", beds: 135, 134, and 131(2)
<i>H. subfusiformis</i> (RASPAIL 1829) [typical form]	Section "C", beds: 233, and probably 208
" <i>Mesohibolites</i> " aff. <i>beskidensis</i> (UHLIG 1883)	Section "B", beds: 130(2), 129, and 127
" <i>Mesohibolites</i> " aff. <i>elegans</i> (SHVETSOV 1913)	Section "A", beds: 34, 33 and 17[=> SV, 1970: pl. XI, fig. 2]
" <i>Mesohibolites</i> " <i>garshini</i> STOYANOVA-VERGILOVA 1965	Section "A", bed: 42, Section "D", beds: 395 and probably 353, 350, Section "E", beds: 300/28(2), and probably 300/15, 300/13, 300/11
" <i>Mesohibolites</i> " (gr.) <i>gladiiformis</i> (UHLIG 1883)	Section "B", bed: 111, Section "A", beds: 44, 43, 12, 6, and Section "D", bed: 411(2)
" <i>Mesohibolites</i> " <i>tzankovi?</i> STOYANOVA-VERGILOVA 1965	Section "E", beds: 363
" <i>Mesohibolites</i> " sp.	Section "D", beds: 392, 389, 316, 301 and Section "E", beds: 300/01
<i>Vaunagites pistilliformis</i> COMBÉMOREL & GAYTE, 1981	Section "C", beds: 236(2), 233, 217, 216 and 214
<i>Vaunagites?</i> sp. A	Section "B", bed: 102, Section "A", beds: 36(2), and 35
<i>Mesohibolitidae</i> nov. gen et nov. sp. (= " <i>Combemorelites mariae</i> GAYTE 1984 (manuscript))	Section "C", bed: 241

Duvaliidae

<i>Duvalia</i> cf. <i>binervia</i> (RASPAIL 1829)	Section "C", bed: 244
<i>D. dilatata</i> (DE BLAINVILLE 1827) juv.	Section "C", beds: 222, and 221
<i>D. dilatata binerviooides</i> STOYANOVA-VERGILOVA 1965	Section "C", beds: 246, 239, 217, 208(3), 205, and 204
<i>D. dilatata dilatata</i> (DE BLAINVILLE 1827)	Section "C", beds: 219, and 208(2)
<i>D. gagrica</i> SHVETSOV 1913	Section "C", beds: 202, 201(2), and 200
<i>D. grasiana</i> (DUVAL-JOUBE 1841)	Section "B", bed: 124, Section "A", beds: 33, 25, 23, 7, Section "D", bed: 336, Section "E", beds: 300/34, and 300/29
<i>D. aff. grasiana</i> (DUVAL-JOUBE 1841)	Section "A", bed: 26, Section "E", beds: 300/02, and probably 300/10, 300/01
<i>D. silesiaca</i> UHLIG 1901	Section "C", bed: 200(5)
<i>Duvalia</i> sp. nov. aff. <i>hybrida</i> (DUVAL-JOUBE 1841)	Section "C", beds: 216(2), and 208(5)
<i>Pseudobelus</i> spp.	Section "C", beds: 240(2), 232(2), 225, 222, 221(4), 219, and 217(2)
<i>P. brevis</i> PAQUIER 1900	Section "C", beds: 213(2), 212(2), 211(4), and 210
<i>Pseudoduvalia polygonalis</i> (DE BLAINVILLE 1827)	Section "C", beds: 217, and 216
<i>P. rafaëli</i> STOYANOVA-VERGILOVA 1965	Section "C", bed: 217

Conclusions

An association of belemnites, which in the Vocontian Basin of SE France is typical for the uppermost Valanginian and lower(most) Hauterivian, is found in the beds 258 to 241 (*D. binervia* (RASPAIL), "*C. mariae* GAYTE). While the upper part of the lower Hauterivian is mainly characterised by large numbers of species from the family Mesohibolitidae in SE France, this interval is rather devoid of belemnites in the investigated material. However, most characteristic for the Hauterivian are *D. dilatata* (DE BLAINVILLE), *H. (gr.) subfusiformis* (RASPAIL), and relatively small *Pseudobelus* spp.

The first belemnites that clearly indicate a late Hauterivian age i.e. the genus *Pseudoduvalia* together with *P. brevis* PAQUIER, were found from bed 217 on. The first

belemnites that characterise the Hauterivian–Barremian boundary were found from bed 208 on [*H. (gr.) jaculiformis* SHVETSOV], like in SE France the genus *Pseudobelus* and *Pseudoduvalia* are absent from these deposits. Definite lower Barremian species was found from bed 202, i.e. *D. gagrica* SHVETSOV. The latter together with *D. silesiaca* UHLIG and the last *Hibolites* characterise the lower part of the Lower Barremian. Also, the first *Mesohibolites*-like belemnites are found in these layers.

A characteristic “mid” Barremian fauna is found from bed 124 on. This association is characterised by *Curtohibolites*, “*Mesohibolites*” gr. *gladiiformis* (UHLIG) and genuine *Duvalia grasiana* (DUVAL-JOUVE). The first upper Barremian species are indicated by the first genuine *Mesohibolites* from bed 392 on.

It is worth mentioning, that the biostratigraphic results obtained on the basis of the belemnite assemblages fit well those based on the earlier ammonite studies (e.g. NAGY 197, 1968; FÓZY & FOGARASI 2002).

The belemnites described in this paper suggest that there is a mixture of western and eastern Mediterranean belemnites. However, it is believed that in most cases this is simply the result of the poor knowledge about both the horizontal and the vertical distribution of Neocomian belemnites. Only the upper Hauterivian *Pseudoduvalia rafaëli* STOYANOVA-VERGILOVA is not known to occur in the western Mediterranean area.

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