

NEW DATA ON THE AMMONITE OCCURRENCE IN THE LOVEČ URGONIAN GROUP (LOWER CRETACEOUS) OF THE CENTRAL FORE-BALKAN (BULGARIA)¹

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Urgonian sediments in the Central Fore-Balkan construct a complex geological body, separated as a Loveč Urgonian Group. It is composed of four terrigenous and four carbonate formations [10]. Spatial relationship of the Loveč Urgonian Group and its constituent formations have been characterized and illustrated in detail [10,9,11].

The existing concepts about the age of the Loveč Urgonian Group are based on single ammonite finds [5,12,8] and some data on small benthic foraminifera [7]. Chronostratigraphically the group have been considered to span the Upper Barremian - Lower Aptian interval. The Barremian - Aptian boundary has been placed [10,9,11] in the lower part of the Loveč Urgonian Group - within the Emen Formation (in the area of the town of Veliko Târnovo) and in the lower part of the Bâlgarene Formation (in the section near Ablanica, South of the town of Loveč).

Current experience of the Urgonian investigators in the world and particularly in Bulgaria shows that ammonites are extremely rare in these specific sediments. Therefore every ammonite find is of great value. So far, ammonites have been reported from different sections and levels of the Loveč Urgonian Group [5,12,10,8,11]. Unfortunately, the exact position of these finds in the sections is not precisely given. Most of the specimens are not available. The data about the ammonite occurrence in the Loveč Urgonian Group until the end of the sixties are summarized by NIKOLOV [8] and the possible position of the finds in the sections is given.

Recently, during the intensive investigations of the Urgonian complex in the Central Fore-Balkan, ammonites were also found. Some of the results have already been published [3,2]. These new ammonite finds change significantly the existing concepts about the age of the group and the stratigraphical ranges of constituent formations.

In the present paper, certain new data about the ammonite occurrence in the middle and upper part of the Loveč Urgonian Group are reported. The ammonite localities are situated north of the town of Veliko Târnovo in the area of the villages Samovodene and Hotnica, near the "Aleksander Stambolijski" dam, and north of the town of Loveč.

Near of Samovodene, the ammonites have been found in the section west of the village. It crops out in the ravine of the western vicinity and in the limestone quarry above the old road to Hotnica. The lower part of the section is built up of the terrigenous

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sediments of the Bâlgarene Formation. The latter is represented by an alternation of sandstones, calcareous sandstones, siltstones, marls with calcareous concretions, silty and clayey marls. In the topmost part of the terrigenous interval the following species have been observed: *Holcodiscus diversicostatus*, *H. geronimaeformis*, *Holcodiscus* sp. juv. (cf. *angulatus*), *Astieridiscus elegans*, *A. cf. cadoceroides*, *Barremites* sp. indet. The presence of the genus *Astieridiscus*, as well as the vertical range of the identified *Holcodiscus*-species determines Early Barremian age of this interval.

The sediment sequence is followed along the road to and inside the limestone quarry. Here, the sediments of the Emen Formation are exposed (probably they belong to the Mladen Wedge). In the lower levels of the quarry, an alternation of marly limestones and marls occurs; and the ammonites recognized here are: *Holcodiscus fallax*, *H. irregularis*, *Barremites (Cassidoiceras) feigirensis*, *B. (B.) cf. difficilis*, *B. (Reboulites) sp.* indet. The first two species are restricted within the Lower Barremian only [1,4].

Previously reported ammonites from the area of the town of Veliko Târnovo [5] also indicate the presence of Lower Barremian. The species *Spitidiscus gastaldianus* is characteristic for the Lower Barremian, whereas *Holcodiscus perezianus* is the index-species of the upper zone of the Lower Barremian [1,4]. According to some authors, *H. caulaudianus* occurs in the lower and middle part of the Upper Barremian as well.

Two localities were newly found near the village of Hotnica. One of them is situated south-east of the village, in the place "Peshterata". Here a terrigenous-carbonate sequence, representing the transition between the Emen Formation (probably the Mladen Wedge) and the Mâgara Wedge of the Bâlgarene Formation is exposed. In these sediments the following species were identified: *Holcodiscus cf. perezianus*, *Valdedossella renevieri*, *Barremites hemiptychus*. The presence of *H. perezianus* suggests unequivocally Early Barremian age of the sequence.

To the west of Hotnica, in the place "Rimski pat", the higher levels of the Mâgara Wedge (Bâlgarene Fm) are exposed. The latter is represented by beige, thin-bedded marls and marls with calcareous concretions of irregular shape. The ammonites recovered from the marls are pyritized, small-sized to micromorph. In contrast, the ammonites from the calcareous concretions have normal size and very good preservation. The following species are recognized here: *Emericiceras* aff. *barremense*, *Hamulina subalternata*, *Acrioceras* sp., *Protetragonites crebrisulcatus*, *Barremites (B.) difficilis*, *B. (B.) subdifficilis*, *Barremites (Reboulites) issarpayensis*. Most of the species listed above range across the Lower - Upper Barremian boundary. So far *Hamulina subalternata* has been found in the Lower Barremian only [1]. Genus *Emericiceras* occurs predominantly in the Lower Barremian, but the species *E. barremense* is characteristic for the basement of the Upper Barremian. It has been used as index-species of the lowermost zone of the Upper Barremian in France. Thus, the lower part of the Mâgara Wedge (Bâlgarene Formation) west of the village of Hotnica should be assigned to the Lower - Upper Barremian boundary interval.

The Lower Aptian ammonite *Deshayesites deshayesi* (= *Deshayesites callidiscus* sensu Димитрова [6]) is frequently quoted [12,10,8,11] from the upper part of the Mâgara Wedge of the Bâlgarene Formation near the wall of "Aleksander Stambolijski" dam. This unique find has been the only reason for the reference of the upper part of the Emen Formation and its successive Bjala Reka and Stratesh Formation to the Lower Aptian [12,10,8,9,11]. Recently in the same region (North of "Aleksander Stambolijski" dam) Upper Barremian ammonites have been documented from the base of the Smočan Formation [2]. These newly obtained data have thrown certain doubt on the exact position of the sample with *D. callidiscus*.

We did find ammonites in the upper part of the Mâgara Wedge, cropping out at the east bank of the dam, some 15-20 m below the limestone of the Emen Formation. Here,

the Bălgarene Formation consists of an alternation of marls with calcareous concretions and clayey marls. The species found are *Barremites* (*B.*) *subdifficilis subdifficilis*, *B.* (*B.*) *psilotatus*, *B.* (*B.*) cf. *difficilis*. They prove beyond doubt the Barremian age of the interval. It is known that the representatives of genus *Deshayesites* and of *D. callidiscus* respectively, are characteristic of the upper part of the Lower Aptian. The finding of barremian ammonites so close to the probable position of the questionable *D. callidiscus* specimen makes us suspect that it comes from some other stratigraphic section. Inspection of this specimen, kept at the Palaeontological Museum of the Sofia University, has shown that the host material resembles very much the Trambesh Formation marl.

Until now, the only Lower Aptian ammonites found in the Loveč Urgonian Group come from the upper part of the Smočan Formation north-west of the town of Loveč. They derive from marls alternating with sandstones (the Prodimčec Member of the Smočan Formation). The latter is exposed along the Trojan - Pleven road, North of the branch to the villages of Bahovica and Lisec. Here, the species *Chelonicerias* cf. *crassum* and *Ch.* cf. *quadrarium* are identified. The representatives of the genus *Chelonicerias* first occur in the lower part of the Lower Aptian (*Prochelonicerias pachystephanum* Zone). These finds prove Early Aptian age for the upper part of the Smočan Formation. They are in good agreement with the previously reported *Prochelonicerias albrechtiaustriacae* south of the village of Yoglav (Loveč District) [12,10,8]. The latter comes from the upper part of the Smočan Formation as well.

Currently obtained data about the ammonite occurrence in the Loveč Urgonian Group allow us to draw the following conclusions: 1) part of the Loveč Urgonian Group (below the Măgara Wedge of the Bălgarene Formation) is of Early Barremian age; 2) in the eastern exposures (around and north of the town of Veliko Târnovo), where the section of the Loveč Urgonian Group is reduced (comprising the sequence from the Kormjansko Fm to the Emen Fm), the age of the entire group is Barremian; 3) Late Barremian age is biostratigraphically proved for the lower part of the Smočan Fm only, whereas its upper part is of Early Aptian age; 4) the Barremian - Aptian boundary should be conventionally placed in the middle part of the Smočan Fm.

The Urgonian complex in the Central Fore-Balkan is mainly assigned to the Barremian Stage. Only the uppermost part of the Smočan Fm and the Devetaki Fm are of Early Aptian age.

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