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Latest Cretaceous hadrosauroid (Dinosauria: Ornithopoda) remains from Bulgaria

Restes d'hadrosauroïdes (Dinosauria : Ornithopoda) du Crétacé terminal de Bulgarie

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ABSTRACT

Disarticulated dinosaur bones have been discovered in a fossiliferous lens in the Labirinta Cave, southwest of the town of Cherven Bryag, in NW Bulgaria. This cave is formed within marine limestones belonging to the Kajlâka Formation of Latest Cretaceous age. Associated fossils and Sr isotopy suggest that the fossiliferous sediments belong to the uppermost part of the Upper Maastrichtian. The dinosaur bones discovered in this lens include the distal portion of a left femur, a right tibia, the proximal part of a right fibula, a left metatarsal II, the second or third phalanx of a left pedal digit IV, the proximal end of a second metacarpal, and a caudal centrum. All the bones undoubtedly belong to ornithopod dinosaurs and more accurately to representatives of the hadrosauroid clade. All belong to small-sized individuals, although it cannot be assessed whether they belong to juveniles or small-sized adults, pending histological analyses. Hadrosauroid remains have already been discovered in Late Maastrichtian marine sediments from western, central and eastern Europe, reflecting the abundance of these dinosaurs in correlative continental deposits. Indeed, hadrosauroids were apparently the dominating herbivorous dinosaurs in Eurasia by Late Maastrichtian time.

Mots clés :
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RÉSUMÉ

Des ossements isolés de dinosaures ont été découverts dans une lentille fossilifère de la Grotte de Labirinta, au sud-est de la ville de Cherven Bryag, dans le Nord-Ouest de la Bulgarie. Cette grotte s'est formée dans des calcaires marins appartenant à la Formation de Kajlâka, d'âge Crétacé terminal. Des fossiles associés et l'isotopie Sr suggèrent que les sédiments fossilifères appartiennent à la partie terminale du Maastrichtien supérieur. Les ossements de dinosaures découverts dans cette lentille comprennent la portion distale d'un fémur gauche, un tibia droit, la partie proximale d'une fibula droite, un second métatarsien gauche, la deuxième ou troisième phalange d'un quatrième orteil gauche, l'extrémité proximale d'un second métacarpien et un centrum caudal. Tous les ossements appartiennent sans aucun doute à des dinosaures ornithopodes et, plus particulièrement, à des représentants du clade des hadrosauroïdes. Tous appartiennent à de petits individus, mais, en l'absence de

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données histologiques, il n'est pas possible de savoir s'ils appartiennent à des juvéniles ou à des adultes de petite taille. Des restes d'hadrosauroïdes ont déjà été découverts dans des sédiments marins en Europe occidentale, centrale et orientale, reflétant l'abondance de ces dinosaures dans des formations continentales du même âge. En effet, les hadrosauroïdes étaient apparemment les dinosaures herbivores dominants en Eurasie au Maastrichtien supérieur.

1. Introduction

Non-avian dinosaurs were unknown in Bulgaria until recently when Mateus et al. (2010) reported the discovery of a fragmentary left humerus possibly belonging to an ornithomimosaur, from the Upper Maastrichtian of Vratsa district (NW Bulgaria). Because this bone was obviously redeposited in marine sediments, this first discovery provoked our interest to look in closer detail into previous vertebrate findings in correlative marine sediments, which were considered to belong to marine reptiles, but were never investigated in detail and officially published. These vertebrate remains were collected in the summer of 1985, from a cave called Labirinta in Vratsa district, NW Bulgaria. From this locality, Jagt et al. (2006) briefly described the fragmentary lower jaw of a mosasaurine squamate, *Mosasaurus* cf. *hoffmanni*, with two teeth preserved *in situ* and mentioned the presence of possible other marine reptiles. However, closer examination revealed that most of the remaining fragmentary bones collected from the Labirinta Cave belong in fact to hadrosauroid dinosaurs. Here we provide the detailed description of these dinosaurian bones. The description of the remaining marine reptile fragments will be provided in another paper by a different set of authors.

2. Geological setting and taphonomy

The dinosaurian material described in the present paper was collected from the Labirinta Cave during a paleontological expedition in 1985. This cave is situated southwest of the town of Cherven Bryag, between the villages of Drashan and Breste, in NW Bulgaria (Fig. 1). The history of the expedition and the details of the geographical and geological setting are provided by Jagt et al. (2006). All the bones belong to individuals of small size, but in the absence of histological analysis, it cannot be known whether they are juveniles of a large species or adults of a small species. The fossil bones were collected from the cave wall at two sites (see Fig. 2 in Jagt et al. (2006)): all accessible fossil material was collected, albeit rather chaotically without documenting the exact position of specimens taken from the rock. The material from the two sites was subsequently mixed and transferred to the collections of the National Museum of Natural History Sofia. Therefore, it cannot be decided now whether all the dinosaur bones described in the present article come from a single site, whether they were mixed together with mosasaur bones, and of course whether they belong to a single specimen or several individuals.

The Labirinta Cave is formed within limestones belonging to the Kajlâka Formation of Latest Cretaceous age (see

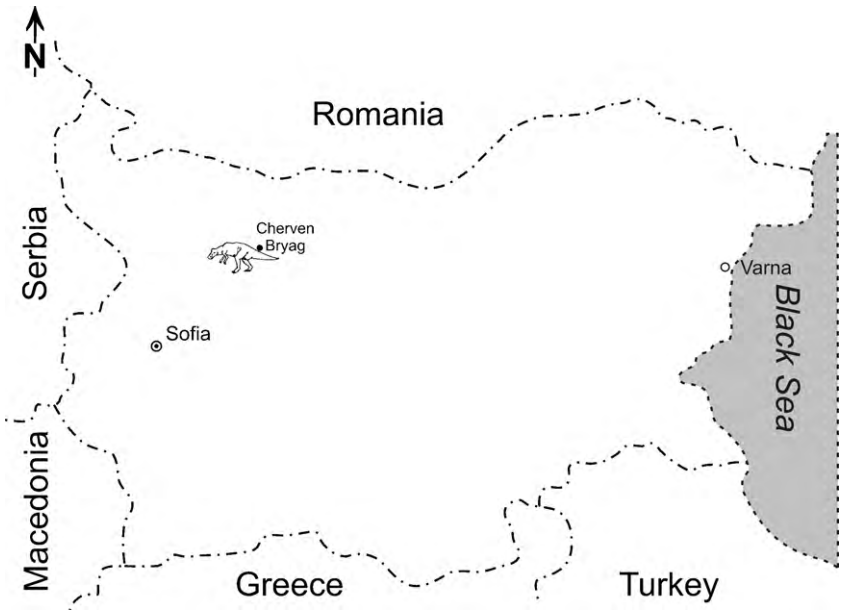

Fig. 1. Map showing the location of the Labirinta Cave (NW Bulgaria).
Fig. 1. Carte montrant l'emplacement de la Grotte Labirinta (Nord-Ouest de la Bulgarie).