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C. R. Palevol 5 (2006) 721–724
COMPTES RENDUS PALEVOL
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Systematic Palaeontology (Vertebrate Palaeontology) / Paléontologie systématique

The oldest record of *Clelia* (Serpentes – Colubridae) in South America

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Received 22 August 2005; accepted after revision 11 January 2006
Available online 05 April 2006

Presented by Philippe Taquet

Abstract

Trunk vertebrae of a colubrid from the Lower to Middle Pleistocene of the Buenos Aires province, Argentina, are described. They are assigned to the genus *Clelia* on the basis of the following combination of characters: the longitudinal development of the neural spine, the short vertebral body, prezygapophyseal processes robust and laterally oriented. This suggests that the origin of the subfamily Xenodontinae and their later dispersal in South America has occurred at least in or before Pliocene times. ***To cite this article: C.A. Scanferla, C. R. Palevol 5 (2006)***.
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Résumé

Le plus vieux fossile de *Clelia* en Amérique du Sud. Une vertèbre dorsale d'un colubridé, provenant du Pléistocène inférieur à moyen de la province de Buenos Aires, en Argentine, est décrite. Cette vertèbre est attribuée au genre *Clelia* sur la base des caractères suivants : développement longitudinal de la neurépine, court centrum vertébral, processus prézygapophysaire robuste et orienté latéralement. Ceci suggère que l'apparition de la sous-famille des Xenodontinae et sa dispersion ultérieure en Amérique du Sud devraient se situer au moins au Pliocène ou lors d'une période antérieure. ***Pour citer cet article : C.-A. Scanferla, C. R. Palevol 5 (2006)***.
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Keywords: Clelia; Pleistocene; Ensenadan age; South America

Mots clés : Clelia ; Pléistocène ; Âge Ensenadense ; Amérique du Sud

1. Introduction

The record of colubrid snakes in the Pleistocene of Argentina is restricted to some remains discovered in the Buenos Aires Province [2,3,5]. This contrasts with the extensive knowledge of the mammalian faunas [1, 13] discovered since the XIXth century. Because of the fragmentary condition of the Quaternary snake material from Argentina, mainly represented by isolated vertebrae, these records can be referred to as unspecified colubrid snakes. Other discoveries documented in the Upper Pleistocene–Holocene beds from the archaeolo-

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doi:10.1016/j.crpv.2006.01.006

gical site 'Cueva Tixi' (Buenos Aires Province) can be certainly assigned to *Clelia rustica* and *Philodryas patagoniensis*. The former taxon represents the first fossil record of *Clelia* [5].

The genus *Clelia* is currently represented by nine extant species, distributed from Mexico to Argentina [21]. In the latter country only three species are present (*C. clelia*, *C. bicolor* and *C. rustica*), mainly distributed in central and northern Argentina. *C. rustica* is the only species of this genus present in the Buenos Aires Province [15,20]. The aim of the present contribution is to describe new vertebral material referable to an undetermined species of *Clelia* as well as to show its importance in the poorly known Pleistocene ophidian fauna.

2. Materials and methods

The material used for comparison (temporarily housed in the personal collection of the author) includes the following extant snakes distributed in Argentina [9,19,20]: *Boiruna maculata, Clelia rustica, Clelia bicolor, Phimophis vittatus, Helicops leopardinus, Liophis miliaris, Liophis anomalus, Liophis poecilogyrus, Lystrophis dorbignyi, Oxyrhopus rhombifer, Philodryas patagoniensis, Philodryas baroni, Thamnodynastes hypoconia, Bothrops alternatus, Bothrops ammodytoides, Epicrates cenchria, Eunectes notaeus.* Anatomical terminology follows Auffenberg [6], Hoffstetter and Gasc [12], and Thireau [17].

3. Systematic paleontology

Colubridae Oppel, 1811
Xenodontinae Bonaparte, 1845
Genus *Clelia* Fitzinger, 1826
Clelia sp.

3.1. Material

MLP (Museo de La Plata) MLP 98-XI-12-1, four complete vertebrae, and fragments of eight other vertebrae and several ribs. This material was found partially articulated within a surface no longer than 30 cm.

3.2. Horizon and locality

The new material was recovered in a quarry from the locality of Gorina (S34°54′06″–W58°01′59″, Fig. 1A) at the Northwest of La Plata city. The fossils were found in a clayed paleosoil (Fig. 1B) in sandy silt loess (level LL of Bidegain [7]) corresponding to the upper levels of the Ensenada Formation, Early to Middle Pleistocene. The remains of *Clelia* were excavated 1.5 m below the level in which the paleomagnetic reversion of 0.8 Myr was documented [7]. Other fossil vertebrates collected from overlying and underlying levels include the tremarctine bear *Arctotherium latidens*, the gliptodontid *Doedicurus* sp. and an undetermined species of camelid *Hemiauchenia*. In agreement with these geological data, it must be said that *Arctotherium latidens* is considered as a guide fossil of the Ensenadan age [16].

4. Description

The vertebrae exhibit a marked degree of ossification, suggesting that the specimen corresponds to a mature individual. The morphology of the vertebrae corresponds to the medio-posterior trunk region, since there are no hypapophyses or lymphapophyses, and because the hemal keel is robust (Fig. 2). The vertebra is higher than long (height: 7.2 mm), with the vertebral body short (length: 5.2 mm). It is distinct from *Philodryas* and *Liophis* because these two taxa have more elongate vertebral centra. The cotyle and condyle are circular shaped. A conspicuous lateral foramen is present below the neural arch, as usual in snakes. The paracotylar foramen is present and located lateral to the cotyle. The hemal keel is transversely wide, typical of the medio-posterior trunk region, thus defining two subequal concavities together with the lateral margins (*margo lateralis*). The neural spines in the trunk region of *Clelia* are high and craniocaudally unexpanded. In contrast to *Philodryas* [5 (Fig. 3)] and *Liophis,* the tip of the neural spine forms both a cranial and caudal prominent expansion, which is distinctive of *Clelia*. The prezygapophyseal processes are robust ('obtuse shape' of Auffenberg [6]) and laterally oriented, in contrast to the condition present in various other xenodontines and non-colubrid cenophidian snakes (e.g., *Philodryas, Liophis, Bothrops*), in which the prezygapophyseal processes are smaller and sharper and laterocaudally oriented ('acuminate shape' of Auffenberg [6]). The articular surface of the prezygapophyses is oval-shaped and the zygosphene is crenate-shaped, as in *Clelia rustica*.

The ribs of the MLP 98-XI-12-1 show morphology typical of colubrids, with a conspicuous tuberculiform process and separate articulate facets owing to a groove in the articulate head.

5. Discussion

Because of the lack of a comprehensive survey of vertebral form of South American colubrids, it is a dif-

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