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LIZARDS FROM THE LATE MIOCENE OF POLGÁRDI (W-HUNGARY)

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Abstract. The Late Miocene (MN 13) localities of Polgárdi 4 Lower, Polgárdi 4 Upper, and Polgárdi 5 yielded at least five different saurian taxa: *Lacerta* cf. *viridis*, Lacertidae indet. (Lacertidae), *Ophisaurus* sp., *Pseudopus pannonicus* (Anguidae), and *Varanus* cf. *hofmanni* (Varanidae). In contrast to lacertid lizards which are reminiscent of some recent forms, the anguids and varanids belonged exclusively to extinct species. *Anguis polgardiensis* Bolkey, 1913 described from the locality Polgárdi 2 is not the synonym of *Pseudopus* (= *Ophisaurus*) *pannonicus* as it is indicated by the original description of this species. The composition of lizard fauna from Polgárdi 4 localities point to a mosaic of xeric or mesophilous vegetation, somewhat contrasting with those from Polgárdi 5 in which the occurrence of varanid lizards might indicate presence of aquatic habitats. Based on the available data the last occurrence date of *Varanus* cf. *hofmanni* might be from the Late Miocene of Polgárdi 5 locality.

Introduction

From the Upper Carboniferous limestone quarries of Somlyó Hill and Kőszár-Hill near the village of Polgárdi (W-Hungary) several vertebrate localities were discovered during the 20th century (Kormos 1911, Kretzoi 1952, Freudenthal & Kordos 1989, Jánossy 1991). The best known locality is Polgárdi 2 (Polgárdi 1 yielded few bones only), found in a cave deposit from the NW part of the quarry in 1910; usually it is cited as 'Polgárdi' in the literature (Freudenthal & Kordos 1989). Polgárdi 3 was discovered in the early seventies of last century in a small karst opening, filled with strongly brecciated sediments. Polgárdi 4 was discovered in 1984 in the southern wall of the quarry in a karst fissure system (the eastern fissure called as 'Lower', while the western one as 'Upper') yielding a rich microvertebrate

material (Freudenthal & Kordos 1989). Finally, Polgárdi 5 was discovered in 1988 in the NE part of the quarry (Jánossy 1991). The age of vertebrate assemblages may be defined as Pontian or Upper Turolian (mammalian biozone MN13). Studies on these vertebrate faunas focused on mammals (see Kretzoi 1952, Freudenthal & Kordos 1989, and references therein), birds (Jánossy 1991), or on other vertebrates (Bolkay 1913, Fejérváry-Lángh 1923, Szunyoghy 1932, Szyndlar 1991a, 1991b, Venczel 1994, 1997, 1998).

In this paper I (1) provide a brief description of lizard material derived from the newly discovered Polgárdi 4 and 5 localities, (2) compare the described remains with those resulting from the classical localities, reevaluating the taxonomic status of *Anguis polgardiensis* Bolkay, 1913 and (3) discuss the palaeoenvironmental implications of the described remains. All the fossil remains described in this paper are housed in the paleontological collection of Hungarian Geological Institute, Budapest (MÁFI). The systematics follows Estes (1983), while the anatomical nomenclature is after Klembara (1979) and Roček (1984).

Abbreviations used: **MÁFI** – Magyar Állami Földtani Intézet (Hungarian Geological Institute, Budapest); **P4L** – Polgárdi 4 Lower; **P4U** – Polgárdi 4 Upper; **P5** – Polgárdi 5.

Systematic descriptions

Class Reptilia McCartney, 1802
Order Squamata Merrem, 1820
Suborder Lacertilia Owen, 1842
Lacertidae Bonaparte, 1831

Lacerta cf. viridis

(Fig. 1: A-J)

Material examined: **P4L**: MÁFI V.06.1668.1, 1 maxilla; MÁFI V.06.1669.2, 2 dentaries; MÁFI V.06.1670.2, 2 premaxillae; MÁFI V.06.1671.1, 1 jugal; MÁFI V.06.1672.8, 8 maxillae; MÁFI V.06.1673.16, 16 dentaries; **P4U**: MÁFI V.06.1681.4, 4 maxillae; MÁFI V.06.1682.10, 10 dentaries.

Description and comment. - In anterior or posterior views, the nasal (=dorsal) process of premaxilla is lanceolate with the distal portion distinctly sculptured; the palatine process is thin but prominent posteriorly (Fig. 1: I, J). In the two available specimens the number of the tooth positions is nine.

In lateral view, the external vertical wall (=ascending process) of maxilla is slightly convex labially and bear an external sculpture which consist of grooves and pits of various size. Below the sculptured surface there is a smooth area which usually is concave labially and bear a row of foramina pro rami nervorum alveolarium superiorum; regularly six or seven foramina are present, joined by few smaller ones situated dorsally to the main row. In medial view, the lamina horizontalis is prominent but relatively thin; the labial margin of the latter is slightly bent ventrally delimiting a relatively deep sulcus dentalis. From the level of the

5th tooth position a posteriorly slanting ridge fix the lamina horizontalis with the ascending process of maxilla. In the available maxillae there are about 21-22 tooth positions preserved (Fig. 1: A-D).

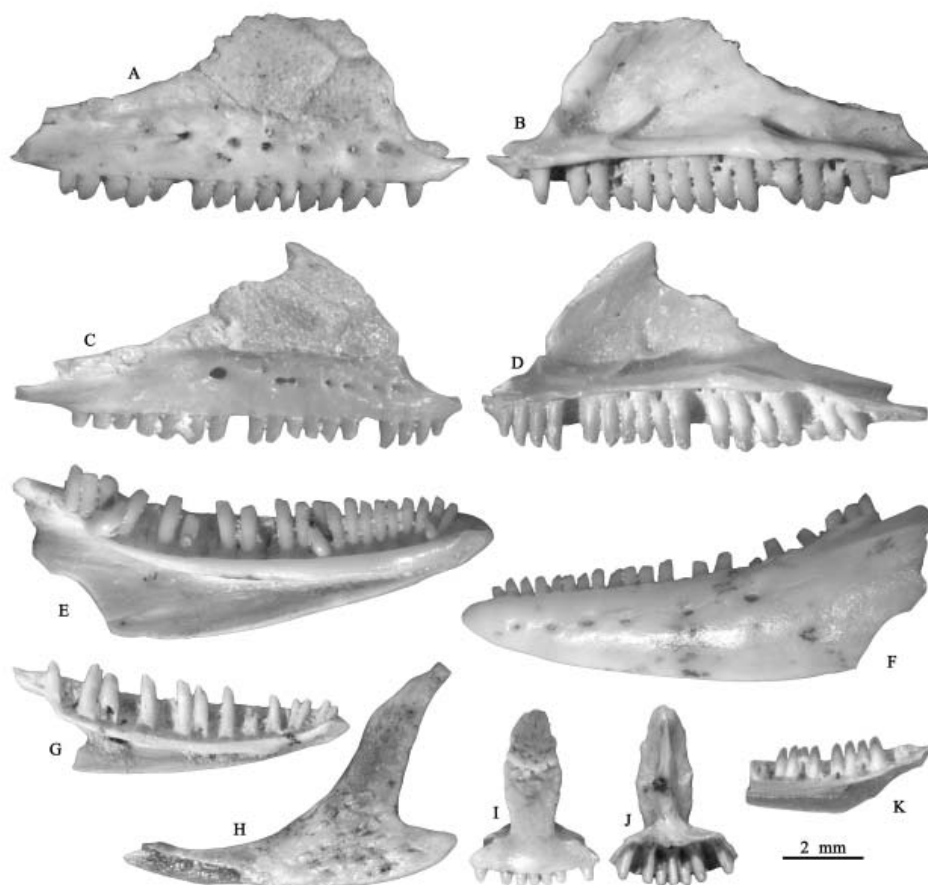


Fig. 1. *Lacerta cf. viridis* (A – J) and Lacertidae indet. (K) from the Late Miocene of Polgárdi 4. A, B: MÁFI V.06.1668.1, right maxilla from P4L; C, D: MÁFI V.06.1681.4/1, right maxilla from P4D; E, F: MÁFI V.06.1682.10/1, left dentary from P4U; G: MÁFI V.06.1669.2/1, left dentary from P4L; H: MÁFI V.06.1671.1, left jugal from P4L; I, J: MÁFI V.06.1670.2/1 premaxilla from P4L; K: MÁFI V.06.1683.2/1, right dentary from P4U. A, C, F, H – labial views; B, D, E, G, K – lingual views; I – anterior view; J – posterior view.

In lateral view the dentary is strongly convex labially; its labial surface is smooth with a row of six or seven foramina pro rami alveolarium inferiorum; ventrally and parallel with the posterior part of the dental parapet there is a well

marked groove left by the coronoid. In medial view, the lamina horizontalis is prominent with its labial margin rounded and gradually tapering posteriorly. The subdental shelf is relatively wide and deep, while the Meckel's groove is widely broadened posteriorly. In specimen MÁFI V.06.1682.10/1, 26 tooth positions are preserved (Fig. 1: E, F), and there are three replacement teeth, situated lingually to the tooth row; in a smaller individual from P4L, there are only 22 tooth positions.

The dentition is pleurodont; the teeth have monocuspid tips in the premaxilla and in the anterior section of dentary; except the posterior maxillary and dentary teeth which sometimes are tricuspid the remaining ones regularly bear bicuspid tips. The resorption pits are roughly circular, or sometimes oval in shape.

The processus zygomaticus of the jugal is well-marked, while the processus temporalis is relatively wide and slightly curved posterodorsally; the labial surface is sculptured (Fig. 1: H).

Except some variations of mainly ontogenic nature, all the above features are similar to recent *Lacerta viridis*. A closely related form, described as *Lacerta* cf. *viridis* was reported from the Late Miocene (MN 11) of Kohfidisch locality in Burgenland, Austria (Tempfer 2004).

Lacertidae indet. A

(Fig. 1: K)

Material examined: **P4L:** MÁFI V.06.1674.5, 5 dentaries; **P4U:** MÁFI V.06.1683.2, 2 fr. dentaries; **P5:** MÁFI V.06.16790.1, 1 dentary.

Description and comment. - All specimens belonged to small individuals. In medial view, the lamina horizontalis contrary to dentaries assigned to *Lacerta* cf. *viridis* has a nearly flat lingual margin tapering posteriorly; the Meckel's groove widens only moderately in posterior direction. Specimen MÁFI V.06.1690.1 preserves 24 tooth positions, and on the labial surface there is a clear imprint of the coronoid.

The available material is reminiscent of several small-sized members of Lacertidae, including the genus *Lacerta*, *Podarcis*, or *Zootoca*. A somewhat similar form from the Late Miocene of Kohfidisch (MN 11) was assigned to *Miolacerta tenuis* by Tempfer (2004). However, the latter lacks for an imprint of the coronoid on the labial surface of the dentary (Roček 1984).

Lacertidae indet. B

Material examined: **P4L:** MÁFI V.06.1675.26, 26 vertebrae; **P4U:** MÁFI V.06.1684.7, 7 vertebrae.

Description and comment. - The vertebrae are procoelous and of relatively small size, the majority of them belonging to the trunk region of the vertebral column. Because they lack for any relevant morphological features it is impossible to demonstrate if they belonged to the above described lacertid lizards.

