

Dental remains of Pliocene-Pleistocene Cercopithecidae from Romania

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Introduction

Extinct cercopithecids are important elements in Pliocene-Pleistocene Europe, and their adaptation to regional environmental changes is frequently discussed in the context of early *Homo* migration. Here, we re-examine published material and present for the first time older, unpublished primate fossils from Romania. This review aims to assess their taxonomy, their paleoenvironmental conditions, and to provide an updated biochronology of the including vertebrate assemblages.

Materials and Methods

Dentognathic materials ($n = 8$) from the sites of Mălușteni (MN14b), Berești (MN14–15), Ciuperceni-2 (MN15b), and Betfia (MN17–MN18; Fig. 1):

- a left mandibular fragment with P_4 in the crypt; a right maxilla fragment (with M^2) of *Dolichopithecus ruscinensis*¹ (at Mălușteni; Fig. 2A);
- an isolated left M_1 crown of *Mesopithecus monspessulanus* (at Berești; Fig. 2B);
- a fragmented colobine molar; an isolated right $M^{2/3}$ *Macaca sylvanus* ssp.; a left I^1 of *D. ruscinensis* (at Ciuperceni-2; Fig. 3);
- right M^2 from a subadult of *M. sylvanus florentina* (at Betfia-XIII) and a left dP^4 of *M. sylvanus* cf. *florentina* (at Betfia-IX; Fig. 4).

Digital calipers were used to measure maximum mesiodistal crown length (MD) and buccolingual crown breadth (BL).

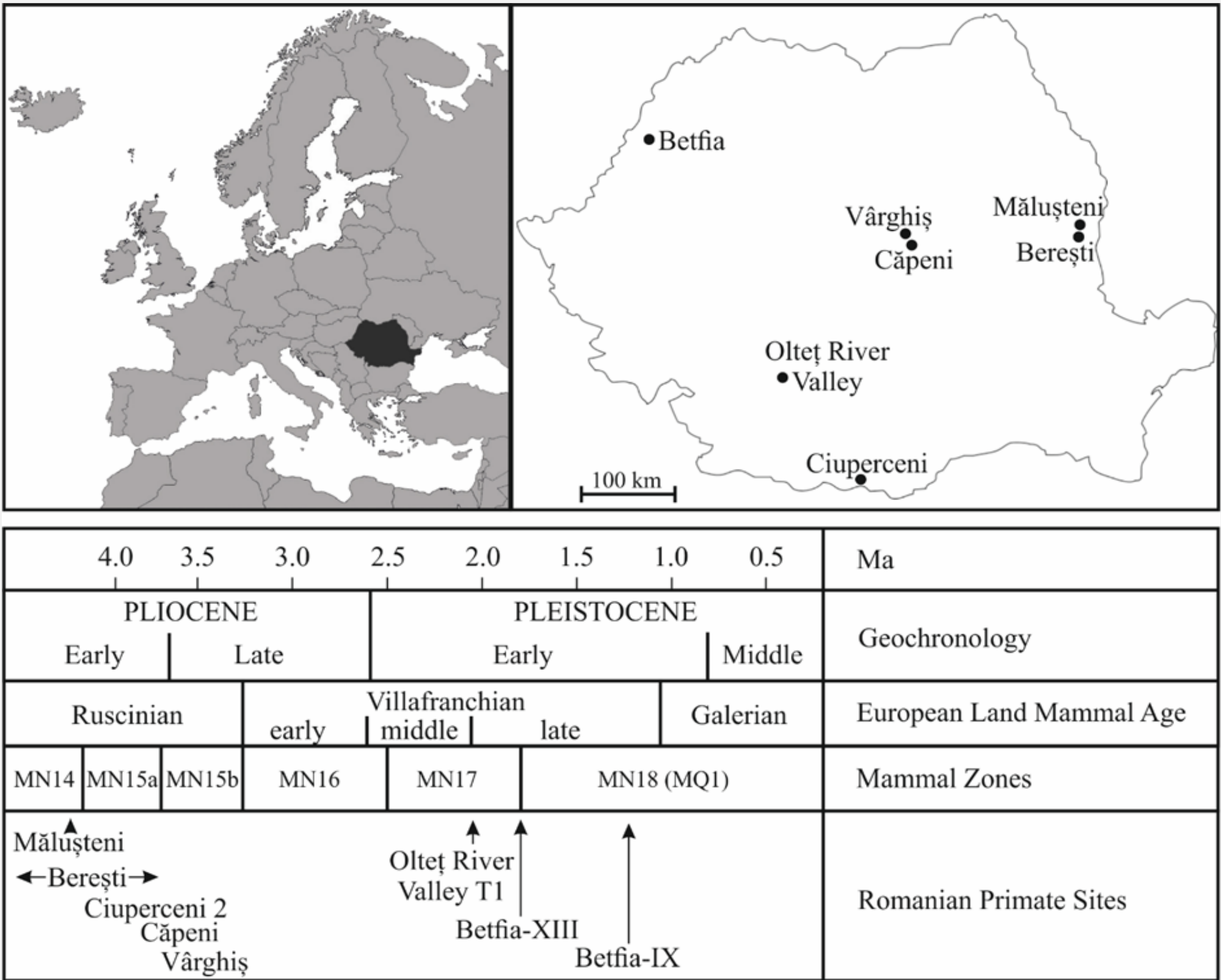


Figure 1. Geographic position of primate fossil sites in Romania (top) and the stratigraphic position of primate fossil sites from Romania (bottom).

Acknowledgments

Research was funded by two grants of the Romanian Ministry of Research and Innovation, CNCS – UEFISCDI, project numbers PN-III-P4-ID-PCE-2020-2282 (V.D., Ș.V.) and PN-III-P1-1.1-TE-2021-0664 (Ș.V.), both grants within PNCDI III.

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1. Delson, E. (1973). *Fossil Colobine Monkeys of the circum-Mediterranean region and the evolutionary history of the Cercopithecidae (Primates, Mammalia)*. Ph.D. Dissertation, Columbia University.
2. Simionescu, I., 1932. Les vertébrés pliocènes de Berești. Bul. Soc. Rom. Geol. 1, 215–228.

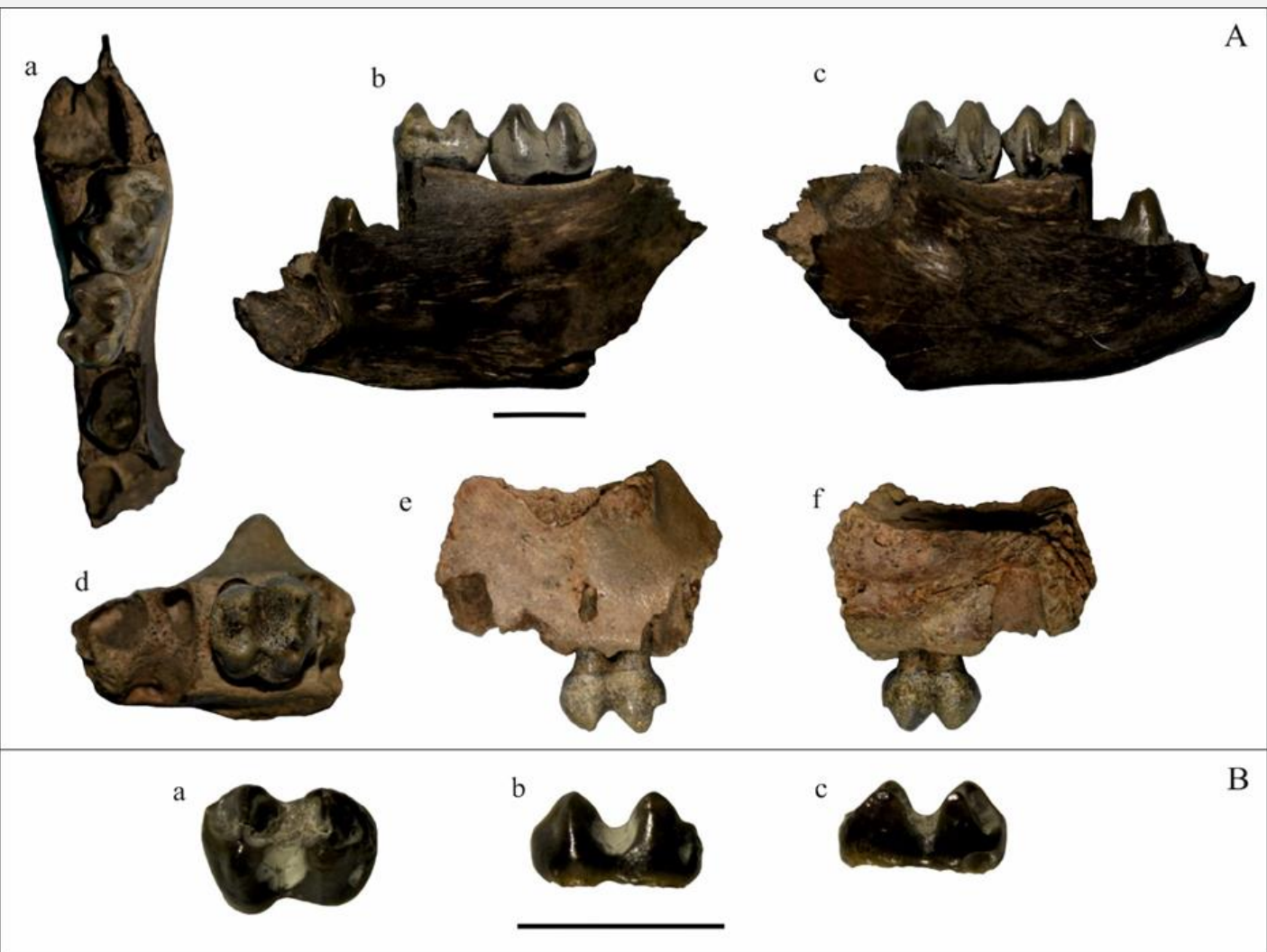


Figure 2. Cercopithecid material from Mălușteni **A.** a–c: left mandibular fragment of *D. ruscinensis*, in occlusal (a), buccal (b), and lingual (c) views; d–f: right maxilla fragment of *D. ruscinensis*, in occlusal (d), buccal (e), and lingual (f) views. **B.** left lower M_1 of *Me. monspessulanus* from Berești, in occlusal (a), buccal (b), and lingual (c) views. Scale = 1 cm.

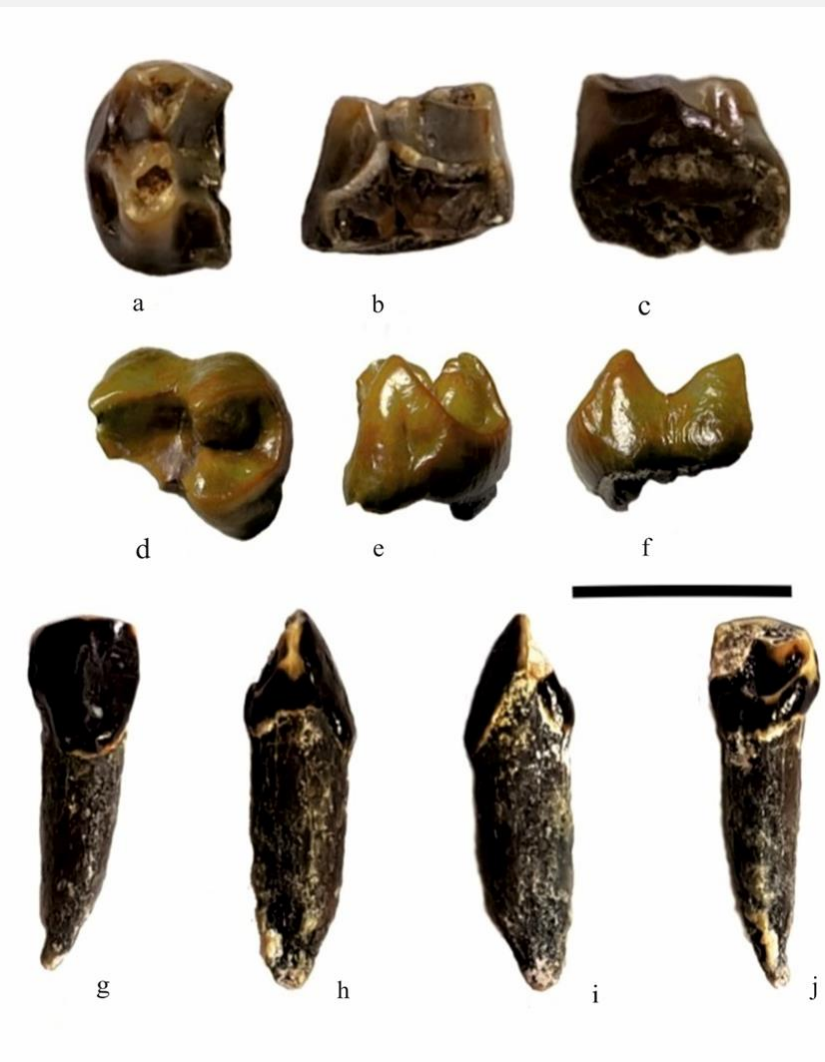


Figure 3. Cercopithecid remains from Ciuperceni-2. a–c: left lower M_1 of *D. ruscinensis* in occlusal (a), distal (b), and mesial (c) views; d–f: upper right $M^{2/3}$ of *M. sylvanus* in occlusal (d), distal (e), and buccal (f) views; g–j: lower left I_2 of *D. ruscinensis* in labial (g), distal (h), mesial (i), and lingual (j) views. Scale = 1 cm.

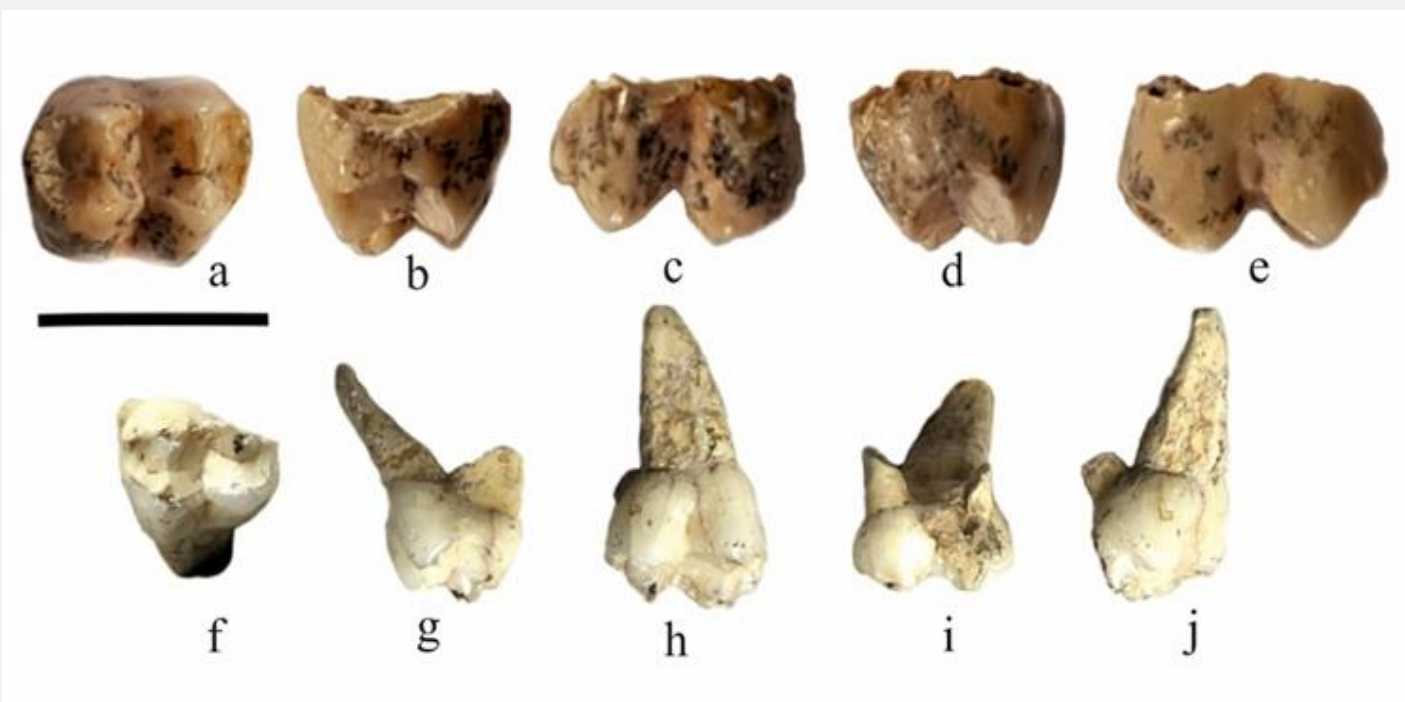


Figure 4. Cercopithecid remains from Betfia. a–e: upper right M^2 of *M. sylvanus florentina* from Betfia-XIII, in occlusal (a), mesial (b), lingual (c), distal (d), and buccal (e) views. f–j: upper left dP^4 of *M. sylvanus florentina* from Betfia-IX, in occlusal (f), mesial (g), lingual (h), distal (i), and buccal (j) views. Scale = 1 cm.

Results

- The left M_1 from Berești supports the presence of the colobine *Mesopithecus monspessulanus* rather than a cercopithecine²: high relief of the crown, deep large cleft on the buccal face, deep lingual cristid.
- Measurements of the macaque specimen from Ciuperceni-2 overlap with the extinct and extant forms of *M. sylvanus*, while chronologically coexisting with *M. s. prisca* (Fig. 5).
- The anterior tooth from Ciuperceni-2 presents a flat rectangular occlusion, a deep cervix fossa on the lingual face characteristic of colobines; the cervical line tends to curve convexly; its size is slightly larger, falling within the range of fossil colobines (Fig. 6).
- The dP^4 from Betfia-IX is close in size to *M. s. pliocena* (Fig. 7).

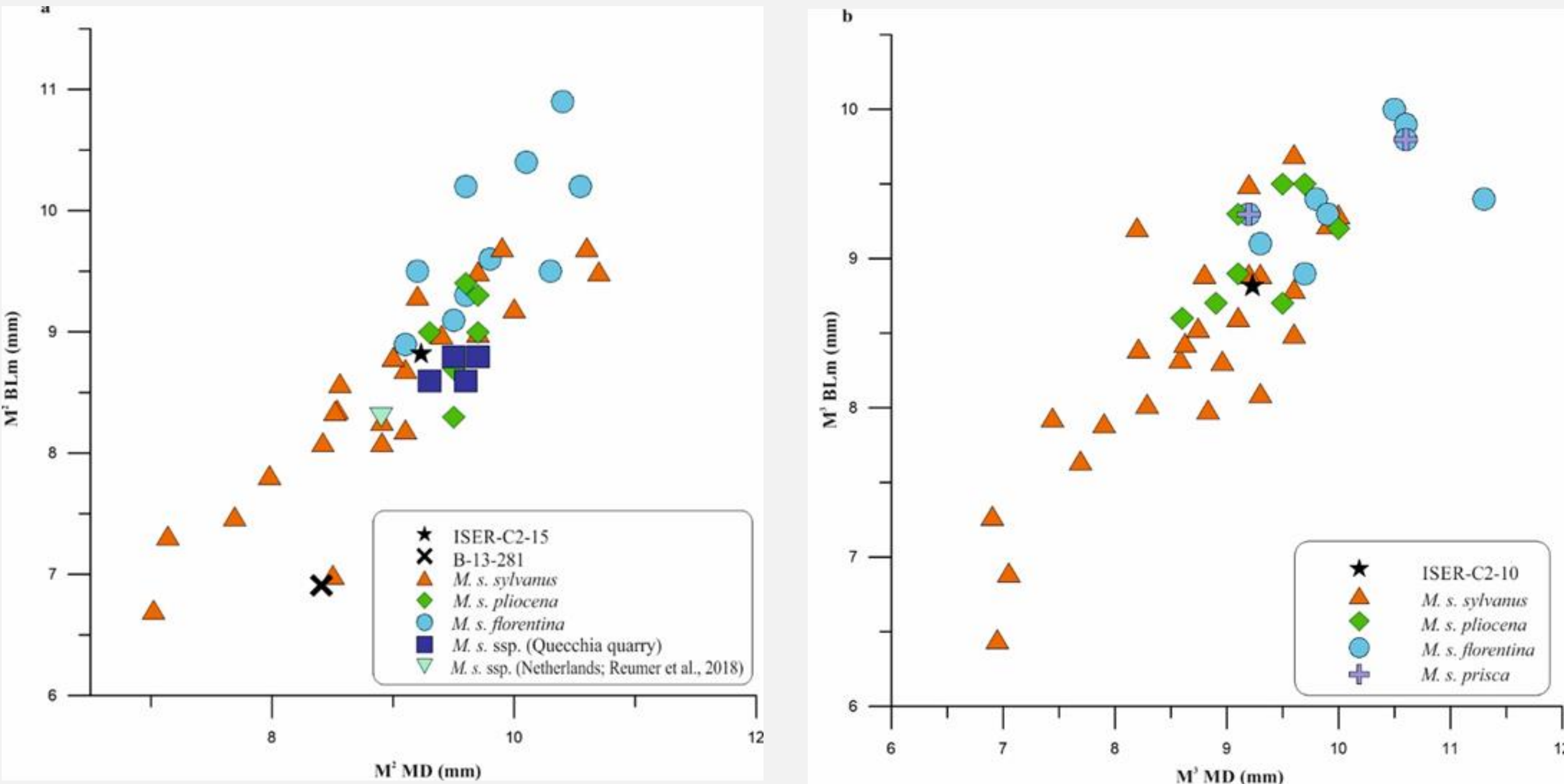


Figure 5. Buccolingual breadth vs. mesiodistal length (BL breadth vs. MD length in mm) of *Macaca sylvanus* ssp. upper M^2 (left), and M^3 (right) molars from Romania and other European fossil localities.

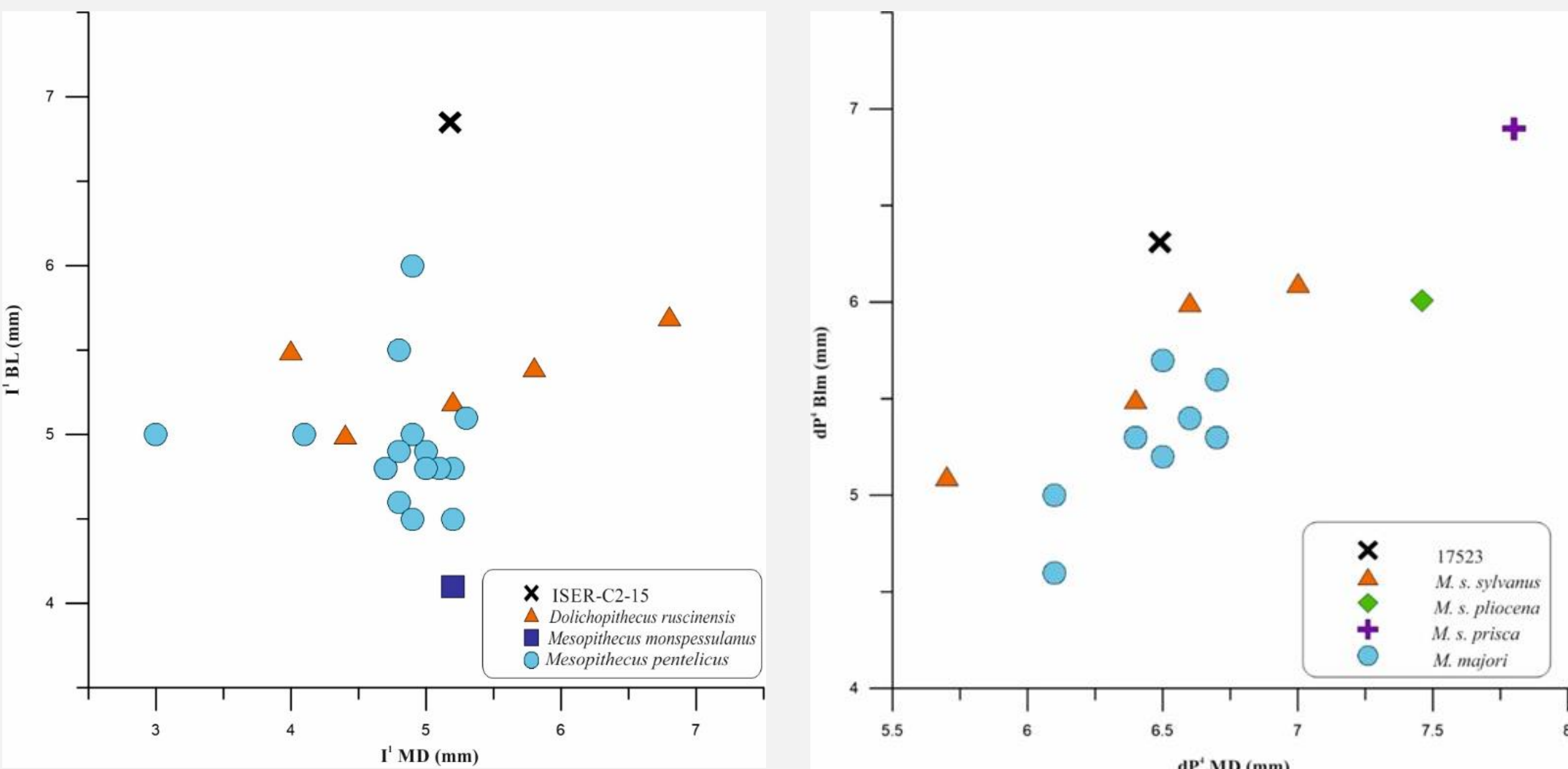


Figure 6. Buccolingual breadth and mesiodistal length (BL breadth vs. MD length in mm) of upper I^1 of *Dolichopithecus ruscinensis* from Ciuperceni-2 (Romania) and other European colobines.

Figure 7. Buccolingual breadth and mesiodistal length (BL breadth vs. MD length in mm) of individual upper dP^4 of *M. sylvanus* ssp. from Betfia-IX (Romania) and European fossil remains.

Discussion

This study is in accordance with the general view of European cercopithecids from the Plio-Pleistocene. The presence of *Dolichopithecus ruscinensis* at Mălușteni and *Mesopithecus monspessulanus* at the nearby locality Berești are an indication of the coexistence of colobines in an arid, continental environment. Towards the second part of the Pliocene, *Macaca sylvanus* ssp. co-occurred with *Dolichopithecus ruscinensis* at Ciuperceni-2, in a mixed habitat of forest and open landscape, with a warm Mediterranean climate. Later on, the presence of *Macaca sylvanus florentina* at Betfia marks a transitional phase of this species. With respect to the climate instability of the Pleistocene, macaques are described in an open and arid landscape at both Betfia-XIII and Betfia-IX.