Early Pleistocene *Lacerta* Remains from Souther Italy (Apricena, Foggi): Is it Lacerta siculimelitensis?

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Abstract. Fissure-fillings in Mesozoic limestones in the Gargano Peninsula yielded abundant vertebrate remains referred to the Late Villafranchian (about 1.2 m.y.). Lizard remains belong exclusively to the family *Lacertidae*: either small or "medium" size forms are present. Some of the dentaries and maxillaries belonging to the "medium" size form, display an heterodont dentition similar to that of *Lacerta siculimelitensis* Bohme and Zammit-Maempel, 1982. A proper taxonomic allocation of the Gargano fossils is discussed.

Introduction

In the last few years, the study of Early Pleistocene amphibian and reptile remains from Apricena (Foggia, Southern Italy), was begun. By the analysis of the first 8000 remains emerged that the lizard remains belonged exclusively to the family *Lacertidae*: either small or "medium" size forms are present.

The dentaries and maxillaries of the "medium" size form, seem to share some features with *Lacerta siculimelitensis* BÖHME and ZAMMIT-MAEMPEL, 1982.

Böhme & Zammit-Maempel attributed a *Lacerta* dentary (Late Pleistocene, Malta) characterised by 5 little posterior teeth of conical shape, to a new species because this kind of heterodont dentition is not known in any recent or fossil *Lacerta*. The same authors recognised as conspecific some remains recovered from Spinagallo (Middle Pleistocene, Sicily, Italy) and previously considered by Kotsakis (1977) as *Lacerta* sp. Concerning its distribution, the new species was defined *Lacerta siculimelitensis*.

The dimension of both the remains (the Maltese fragment measures 21 mm and the "arcata dentaria" of the Spinagallo remains measures 24-25 mm) indicates the presence of lizards attaining a total length comparable to that of the living *L. lepida*.

The following year Estes (1983) synthesised the diagnosis of L. siculimelitensis in this way: "A large Lacerta (total length ca. 700-750 mm) with expanded molariform teeth and last few dentary teeth much reduced in size."

The aim of this work is to analyse the dental morphology of the "medium" size form and to propose a proper taxonomic allocation.

The site

The quarrying activity of the Mesozoic carbonates located in the Apricena area (Foggia, Southern Italy,

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fig. 1) revealed the presence of a complex karst network. Biochronologic and magnetostratigraphic information allowed to attribute some network fillings to the latest Early Pleistocene (late Villafranchian, about 1.2 M.y.; Abbazzi *et al.*, in press, give detailed data and a comprehensive bibliography). The faunistic uniformity suggests a rapid, geologically contemporaneous, filling. The fossil remains herein described come from different fissures of the sites known in literature as Pirro Nord (PN) and Cava Dell'Erba (DE). Though formerly distinct, the sites are physically adjacent and their materials will be considered together.

Fig.1
Location map of the site.

Materials and methods

The "medium" size lizard is represented by dentaries, maxillaries, premaxillaries, pterygoids and several other skeletal elements. The best preserved teeth bearing bones are listed in fig. 2.

PN1	right maxillary (4)
	left maxillary (5)
	right dentary (0)
	right pterygoid
PN 5 b	left maxillary (3)
	left maxillary (0)
	6 premaxillaries
PN 12	right dentary (6)
PN 16	left maxillary (3)
	left dentary (6)
PN 17	left maxillary (5)
	2 premaxillaries
PN 34 c	left maxillary (3)
	left dentary (3)
DE 6.2B-5	4 premaxillary
	left pterygoid

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A complete list of the remains, actually stored in the Department of Earth Sciences, University of Florence, will be included in a later and more general article.

All the well-preserved teeth were measured: the height has been taken from the *crista dentalis* to the tip of the crown while, to improve its precision, the width has been taken near the crown, considering that the teeth are cylindrical and the width of the crown is approximately equal to the width of the base (Rocek, 1980).

The number of teeth, which depends on the size of animal, and the number of *foramina* in the lateral wall of dentaries and maxillaries, has not been taken into account for taxonomic considerations as suggested by Rocek for *L. viridis* (*op. cit.*).

The size probably attained by this species, has been obtained using the methods and data indirectly provided by Rocek (*op. cit.*) and by Barbadillo & Sanz (1983).

The morphological features here used have been checked on the comparison osteological collection of the author and on the *L. trilineata* specimen ZFMK 3509.

The measurements have been taken using a micrometer Wild MMS 235. The microscopic scanning analysis has been realised using Cambridge Instruments Stereoscan 120.

Results

Size. A *crista dentalis* length of a little more than 18 mm is consistent with the biggest *L. viridis* while the body length of presacral vertebrae of about 6 mm and other remains (i.e. femur and humerus) suggest bigger dimension. Considering such dimensional variation, the size of this form has been indicated as "medium".

Some characters, as the shape and height of neurapophysis, indicate the presence of adult specimens.

Caudal vertebral pattern. All the autotomic caudal vertebrae are divided in their anterior and posterior portion. Some of the posterior portions bear robust transverse processes but unfortunately, their bad conservation doesn't allow a precise attribution to the B or C-pattern *sensu* Arnold (1973).

Teeth bearing bones. Premaxillaries bear fang-like teeth and pterygoids conical ones.

The more evident feature of the maxillary is the presence of reduced posterior teeth in 6 of the 7 well preserved remains (fig. 3-a,b). Their number varies from 5 to 3. Only one maxillary shows a normal dentition (fig. 3-c,d).

The teeth's length and width variations of 3 maxillaries are represented in fig. 4-a,b,c. A careful examination with optical or scanning electron microscope (SEM) shows the presence of 2 or 3 cusps on the crown of the posterior undamaged teeth (fig. 5).

The maxillary posterior part turns laterally if observed in dorsal view (fig. 6-a). This feature, present but less marked in the maxillary without little teeth (fig. 6-b), might suggest a head posterior widening similar to that of L. trilineata. The analysis of the *L. trilineata* specimen at my disposal shows however that this morphology is principally produced by the relative jugal and maxillary position instead of the maxillary structure.

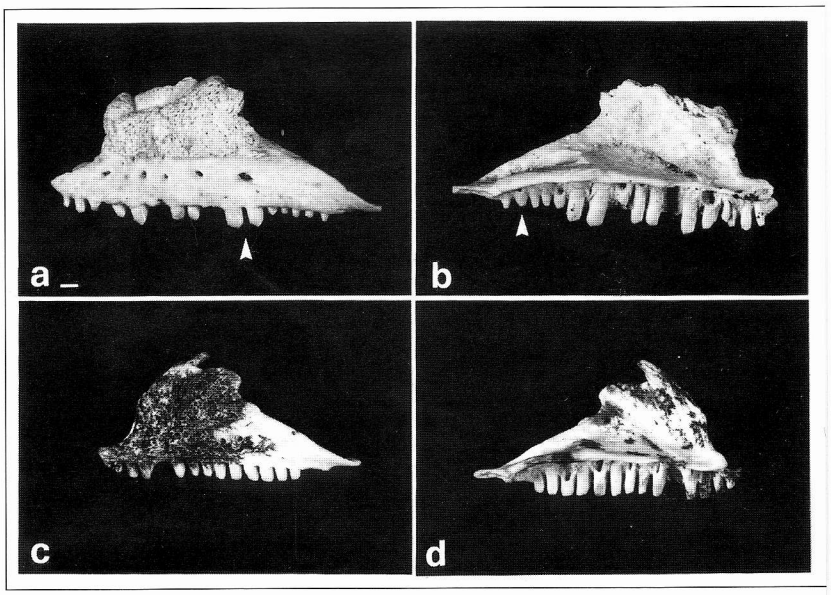


Fig.3
a, b) left maxillary from PN 17: this remain clearly shows the presence of reduced posterior teeth; c, d) left maxillary from PN 5b: no appreciable reduction is present. The maxillaries are represented in, from left to right, external and internal view.The bar is equal to 1mm.

At the level of the curved region beginning, we find the smaller posterior teeth preceded by some particularly robust bicuspid ones (see arrow in fig. 3-a).
Three of the four dentaries display little posterior teeth which number varies from 6 to 3 (fig. 7-a,b).

Conclusions

By these few remains it is not possible to explain without any doubt, the contemporary presence of maxillaries and dentaries with reduced teeth and with normal ones. The similar size of the remains excludes the presence of ontogenetic changes. Although the morphological variability seems to be excessive for the recent species, it seems to me incorrect their attribution to two different species of the same size and similar morphology of the maxillary posterior part. Therefore the taxonomic allocation I propose, is *Lacerta* aff. *L.*

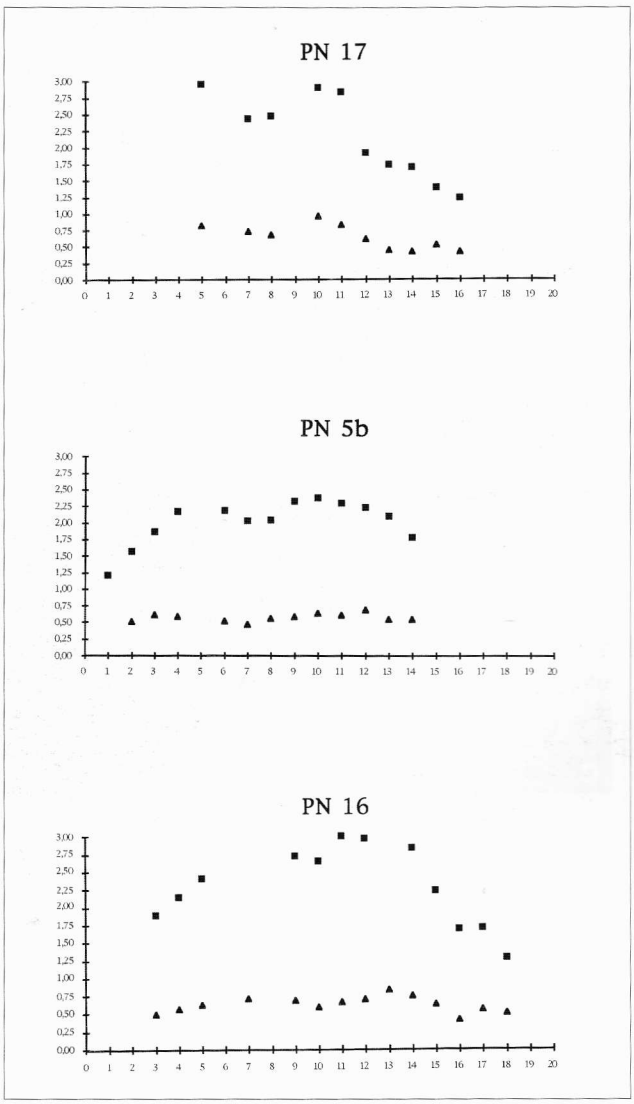
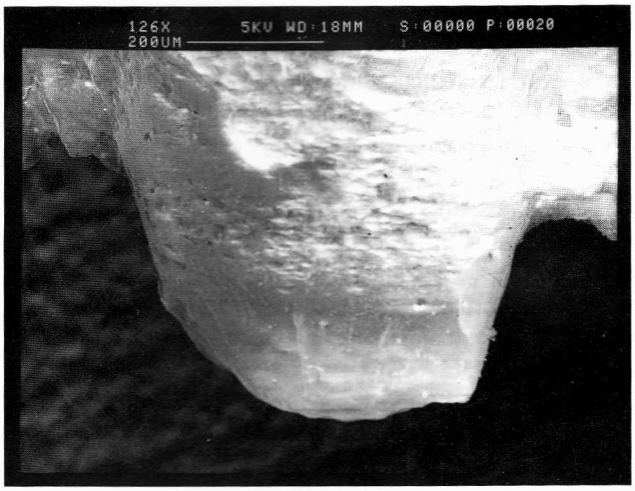


Fig.4
Teeth's length (squares) and with (triangles) variations in three maxillaries:
a) PN 17,
b) PN 16,
c) PN 5b.
Note the absence of great variations in PN 5b. The values of the abscissa represent the tooth's number and the ordinate ones represent the tooth's dimensions (mm).



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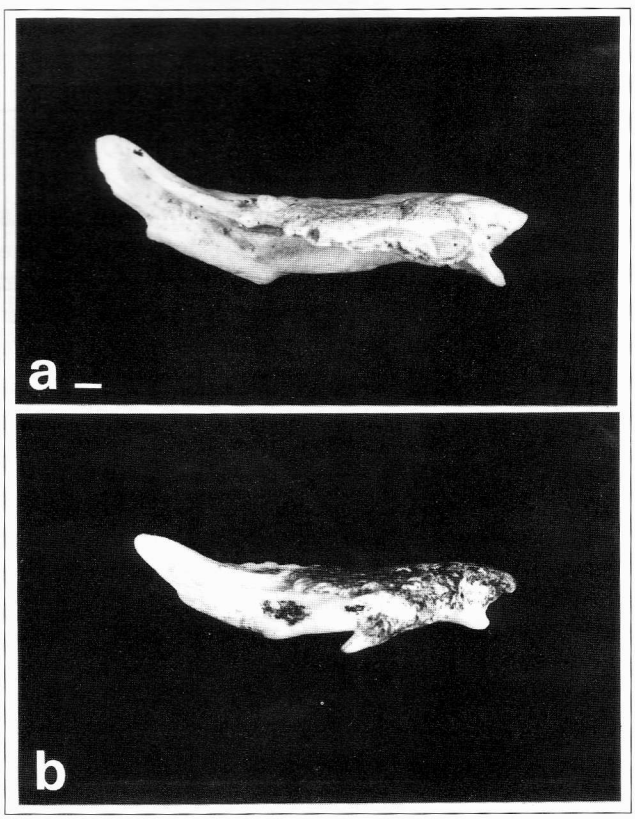

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siculimelitensis using the qualifier with the meaning suggested by Sanchiz (1977). This definition is a way to stress the presence of common features and to focus the attention on different aspects of a general problem.

Concerning the adaptive value of the dentition, Böhme & Zammit-Maempel (*op. cit.*) consider *L. siculimelitensis* more specialised in its nutrition than the recent forms. It's interesting that Pregill (1984) and Estes and Williams (1984) suggest instead that morphological innovations in teeth and jaws can lead to a generalised diet. To conclude my contribution, I would like to underline that Estes and Williams (*op. cit.*) hypothesise that on islands dental adaptation (durophagous teeth in their case) might confer strong selective advantages. Curiously, Malta and Sicily are islands and the Gargano at the end of Lower Pleistocene was connected to the Italian peninsula but probably there were ecological barriers (for example marshes; Abbazzi *et al.*, in press) that limited the communication with the peninsula.

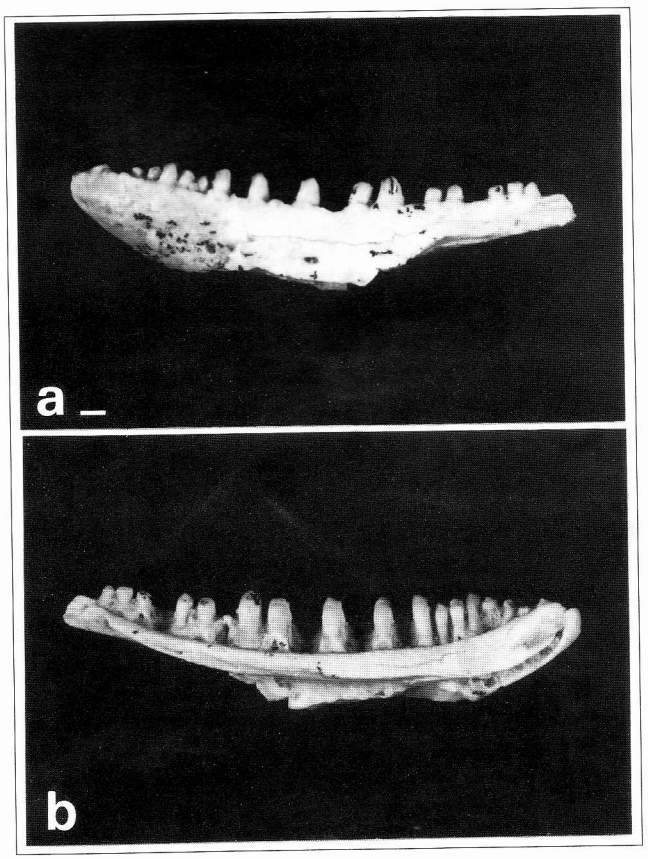

Fig.7
Left dentary from PN 16 represented in a) external and b) internal view. The bar is equal to 1 mm.

Acknowledgements. I am grateful to Prof. F. Masini (Dip. Geodesia e Geol., Università di Palermo) and Prof. D. Torre (Dip. Sci. Terra, Università di Firenze) which allowed me to study the material and provided useful information and unpublished data. Ph.D. Claudia Corti (Museo Zoologico "La Specola", Università di Firenze) gave the initial input for this poster and continuous remote assistance. Ph.D. Wolfgang Böhme (Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn; Museum acronym: ZFMK) kindly put at my disposal the L. trilineata specimen. The SEM analysis and the photos were made at the Lab. Pal. Umana (Dip. Anat. e Fisiol. Umana, Università di Torino) with the collaboration of Ph.D. A. Aimar. Any errors of interpretation are, however, my own responsibility.

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