Late Turolian Amphibians and Reptiles from Brisighella (Northern Italy): preliminary report

Tassos Kotsakis
C.N.R. c/o Dipartimento di Scienze della Terra
Università “La Sapienza”, Roma

KEY WORDS — Amphibia, Reptilia, Late Miocene, Italy, Systematics.

ABSTRACT — A preliminary study of the fossil herpetofauna collected in the site of Brisighella (Romagna, N Italy), of Late Miocene age (MN 13), indicates the presence of the following species: Rana sp., Trionyx sp., Emydidae gen. et sp. indet., (?) Testudinidae gen. et sp. indet., Gekkonidae gen. et sp. indet., Lacerta (s.l.) sp., Argus sp., Ophiomorus cf. O. pannonicus, Varanidae gen. et sp. indet., cfr. Erxleben sp., Colubridae gen. et sp. indet., Natricidae gen. et sp. indet. The predominance of Ophiomorus testifies a generally arid environment.


INTRODUCTION

A great quantity of fossil vertebrates has been recently discovered in karst fissure-fillings near Brisighella (Romagna, N Italy) (Costa et al., 1986). The micromammals and especially the murids are the dominant component of the association, but some large mammals and lower vertebrates have been also collected. The mammals discovered in the different fissures indicate that all the sites are of the same age, i.e. Late Turolian (MN 13). The present paper is a preliminary report on the amphibians and reptiles of Brisighella. The fossil remains belonging to this classes are extremely fragmentary, nevertheless eleven or twelve taxa have been recognized. Only one of these belongs to amphibians (anurans) while two or three are ascribed to turtles, five to saurians and three to snakes.

SYSTEMATICS

Family Ranidae

One vertebra and one left humerus are the only remains belonging to amphibians. The former specimen is very damaged but the latter, with the condyle centrally placed and the fossa cubitalis not very deep but well marked, makes possible an attribution to the genus *Rana* (see Rage, 1974 for the morphology of recent European genera and Spinar, 1972 for the palaeobatrachids). Members of the family Ranidae are relatively common among the Neogene amphibians of Europe. In Italy remains of anurans are reported from oligohaline Messinian deposits of Piedmont (*Rana* sp., Morisi & Tropeano, 1983) and of Marche (*Ranavirus* scarabelli Portis, *Bufoavus* meneghini Portis, Portis, 1885a). The presence of these fossils in brackish environment is due to transport. The species erected by Portis (1885a) need a systematic revision. Ranids are known also from the Ruscian site of Mandriola (Sardinia) (Pecorini et al., 1973).

Family Trionychidae

A single fragment of small dimensions of a heavy sculptured carapace of turtle belongs to the family Trionychidae. Trionychids are relatively common in European Miocene deposits and become more rare with the beginning of Pliocene. Nevertheless in Southern Europe their real decline starts with the Late Pliocene. In Italy Turolian members of this family are known in Tuscany (*Trionyx bambollis* Ristori) and Sardinia (*Trionyx sardus* Portis), while in the Ruscian deposits of Tuscany remains of *Trionyx picopedemontanus* Sacco or *T. cfr. picopedemontanus* were collected. The last species is also known in the Ruscian deposits of Southern France. Near Parma (Emilia) was discovered a skull of a trionychid, *(?)*Trionyx cortesi* (Portis), but both the systematic and stratigraphic (Late
Miocene or Early Pliocene) position of this species are uncertain (Portis, 1885b, 1901; Sacco, 1889; Ristori, 1895; Fucini, 1912; Brein, 1977; Kotsakis, 1985).

Family Emydidae

A fragment of plastron belongs to the family Emydidae. Some more fragments of the carapace and plastron possibly belong to the same taxon. A generic attribution is not possible. Many species of turtles of this family have been described from European deposits of Turowian and Ruscinian age (Brein, 1977; Schleich, 1981). Some of these come from Tuscany and Piedmont but need a systematic revision (Ristori, 1895; Kotsakis, 1980; Kotsakis & Mori, 1981). Fragmentary remains belonging to the same family were collected also in the Ruscinian site of Mandriola (Sardinia) (Esu & Kotsakis, 1983).

Family Testudinidae

A very damaged peripheral bone possibly belongs to a member of the family Testudinidae but the classification is very uncertain. Testudinids were collected in Turowian deposits of Tuscany and Piedmont (Pantanelli, 1892; Kotsakis & Mori, 1981).

Family Gelemidae

A fragment of a dentary, very thin and fragile, is referred to the family Gekkonidae. A generic attribution is not possible. Miocene gekkonid remains from France are ascribed by Hoffstetter (1946) to the fossil genus Gerandogekko (G. arambourgi) Hoffstetter from the Agenian of St-Gerand-le-Puy (Allier); G. gaillardi Hoffstetter from the Aaracian of La Grive-St. Alban (Ille) but as this author notes may belong to an extinct genus. Schleich (1987) described Palaeogekko rigocienis Schleich on abundant material from S. Germany. Remains of a gekkonid ascribed by Estes (1969) to cfr. Phyllocaecilius sp., an extinct genus, are reported from Devinska Nova Ves (= Neudorf a.d. March) in Czechoslovakia (see also comments in Estes, 1983). Pecorini et al. (1973) signaled the presence of gekkonids in the Ruscinian deposit of Mandriola (Sardinia).

Family Lacertidae

Several fragmentary dentaries and maxillaries and two vertebrae belong to a lacertid of medium-small dimensions. I classify them as Lacerta (s.lat.) sp. following Estes (1983) who includes the members of the genera Podarcis, Gallotia etc. to Lacerta. Some fragmentary remains belonging to the same family are somewhat larger than the majority of the lacertids collected in this site, but I prefer for the moment to assign all the lacertids of Brisighella to the same taxon. Many species of Lacerta have been erected for European Neogene remains (L. bifidentata Larret; L. sambucinensis Larret; L. cruciata Gervais etc.). These taxa are considered as nomen dubium by Estes (1983). Modern authors prefer to classify the remains of this genus as Lacerta sp. (cf. Mlynskis, 1956, 1962, 1977). A revision of the whole fossil European material of the genus is necessary. The presence of the genus Lacerta is well documented in many Neogene deposits of Europe (France, Austria, Hungary, Poland, etc.) (Estes, 1983). In Italy lacertids of Ruscinian age are reported from Mandriola (Sardinia) (Pecorini et al., 1975).

Family Anguidae

Remains belonging to the family Anguidae are, by far, the most abundant lower vertebrae of Brisighella. Two taxa of this family are present. Two thin, rounded osteosutures belong to the genus Anguis. The genus is known from a limited number of European Neogene sites. Two species were erected for Miocene remains (Anguis robusta Klembara from the Agenian of Dolnice, Czechoslovakia; Anguis acaudata Larret from the Aaracian of Sansan, France — nomen dubium after Estes, 1983), while the Late Pliocene remains from Poland were ascribed tentatively to the living Anguis fragilis Linnaeus (Mlynskis, 1956, 1962, 1964, 1977). All the fossil remains belonging to the anguids, with the exception of the two osteosutures above mentioned, are assigned to the genus Opisodus (a genus perhaps not monophyletic, Klembara, 1979). Fragments of dentaries and maxillaries, a premaxillary and very numerous osteosutures, have been collected in Brisighella. Many species of this genus were described for the Neogene remains of Europe. After Estes (1983) some of them (O. fejleri Klembara, O. spini Klembara, O. bibronianus Larret, O. laurillardi Larret) are nomen dubium. But three species are well established: O. moguntinus Boettiger (= O. frans Hilgendorf), O. pannonicus Komsos and O. acuminatus Jorg. The last form is characterized by strongly acuminated teeth. This character is not present in the specimens of Brisighella. The specific separation between O. moguntinus and O. pannonicus is not very clear but generally the specimens of Miocene specimens are more distinguishable from those of Latest Miocene and Pliocene to the latter (Mlynskis, 1956, 1960, 1962, 1977, 1984; Bachmayer & Mlynskis, 1977; Estes, 1983). The type of O. pannonicus is described from the Hungarian site of Polgárdy (MN 13) (Korns, 1911). The specimens of Brisighella are identical with the Hungarian
and Polish specimens ascribed to *O. pannonicus* but the lack of cranial fragments (maxillaries excepted) suggests the classification of our material as *Opibisaurus* cf. *O. pannonicus* Kormos. The glass lizards are very common in the Neogene European deposits (Fejervary Láng, 1923; Estes, 1983). In Italy *O. pannonicus* is reported also from Pleistocene deposits but an attribution to the recent species *O. apodis* Linnaeus is more probable for these remains. From the Ruscian site of Mandriola (Sardinia) are reported remains of anguids (Pecorini et al., 1973).

**Family Varanidae**

A single tooth belongs to the family Varanidae. Two species of *Varanus* have been described for Neogene remains of Europe, *V. hofmanni* Roger (Orleanian-Vallesian) and *V. maravibonensis* Weithofer (Turolian-Late Pliocene) while for remains from many localities the attribution is only generic. A second genus, *Beroenurus*, was collected in some Miocene sites of the Iberian Peninsula (Fejervary, 1918, 1935; Hoffstetter, 1969; Rage & Sen, 1976; Estes, 1983). In Italy a varanid occurs in the Ruscian insular fauna of Gargano and perhaps it belongs to an endemic species. The presence of *V. maravibonensis* in the Upper Pliocene site of Arene Candide (Liguria) (Morelli, 1891) must be confirmed.

**Family Colubridae**

A fragmentary vertebra belongs to the family Colubridae. The reduction of hypapophysis to an haemal keel indicates the subfamily Colubrinae. On the contrary a second fragmentary vertebra, elongated, with a sigmoid-shaped hypapophysis, belongs to the subfamily Natricinae. A generic classification of these fossils is not possible. Many species of colubrids belonging to both living and fossil genera are described from Miocene and Pliocene deposits of Europe (Szyndlar, 1984; Rage, 1984).

**Family Boiidae**

One very characteristic caudal vertebra belongs to the subfamily Erycinae of the family Boiidae. It is similar to the erycine from the Ruscian of Mandriola (Sardinia) signaled by Pecorini et al. (1973) (unpublished material of the Author of the present note) and very close to the living genus *Eryx*. Erycines belonging to the living genus *Eryx* are signalized in Ruscian sites of France and Turkey (Hoffstetter & Rage, 1972; Rage & Sen, 1976; Rage, 1984).

**Ophidia indet.**

One cloacal and two caudal vertebrae and some fragmentary dentaries without teeth belong also to snakes.

**Remarks**

The aquatic elements such *Rana*, *Trionyx*, an emydid and a natricine (and also some teeth of freshwater fishes) collected at Brisighella, indicate the presence of freshwater in the neigbourhood of the fossiliferous site. *Trionyx* is common also in coastal-lagoonal waters. Nevertheless the aquatic species are represented by one or two fragments. On the contrary the dominant form is *Opibisaurus* cf. *O. pannonicus*. If we accept an ecology of this species similar to that of recent *O. apodis* we can recognize a generally arid environment. The presence of an erycine belonging (or very close) to the living genus *Eryx* (and in any case to
REFERENCES


(Manuscript received April 10, 1988 accepted May 31, 1989)

T. KOTNANS

Centro di Studio per la Geologia dell’Italia Centrale, C.N.R. c/o Dipartimento di Scienze della Terra Università “La Sapienza”, Roma

piazza A. Moro 5, 00185 Roma, Italy