Riv. It. Paleont. Strat.	v. 99	n. 2	pp. 255-262	tav. 1	Ottobre 1993

A NEW FIND OF *OREOPITHECUS* (MAMMALIA, PRIMATES) IN THE BACCINELLO BASIN (GROSSETO, SOUTHERN TUSCANY)

LORENZO ROOK

Key-words: *Oreopithecus*, Primates, Mammalia, Baccinello V2, Late Miocene, Paleobiogeography, Southern Tuscany, Italy.

Riassunto. Viene segnalato il ritrovamento di una mandibola di *Oreopithecus* cf. *bambolii* nel bacino miocenico di Baccinello (Grosseto). Tale reperto consente di affermare con sicurezza la presenza di questo primate endemico nella associazione a mammiferi detta V2 di questo bacino. Viene sottolineata l'importanza di questo nuovo ritrovamento per le correlazioni tra le località con fauna endemica della Toscana meridionale.

Abstract. A mandible of *Oreopithecus* cf. *bambolii* was found in Miocene sediments of the Baccinello basin (Grosseto, Tuscany). It confirms, unequivocally, the occurrence of this peculiar primate in the V2 mammal fauna of the basin. This find allows some comments on the correlation among the Miocene sites with endemic vertebrate faunas in southern Tuscany.

Foreword.

The occurrence of a very peculiar Late Miocene mammal fauna in the lignites of the Maremma (Southern Tuscany, Italy) has been known since the last century. The fauna is endemic, and documents a peculiar association of taxa with European and African affinities that is unknown in other Late Miocene localities outside the borders of Tusco-Sardinian paleobioprovince.

The first coal mine to produce fossils was Monte Bamboli (Savi, 1843). At the turn of the century, several other mines in the Grosseto district (Montemassi, Casteani, Ribolla) were also producing fossils of this fauna (Fig. 1). The fossils from the different localities were long considered to be of the same age.

Lorenz (1968), in his study of the geology of the Baccinello area, recognized that two endemic faunal associations, from two different horizons which he called V1 and V2, may be distinguished in the basin. In the same area, a third mammal assemblage (named V3) was found at the top of the sedimentary succession; it is made up of mammals with European affinities and is completely different from the previous as-

Dipartimento di Scienze della Terra, Università di Firenze, via La Pira 4, 50121 Firenze.

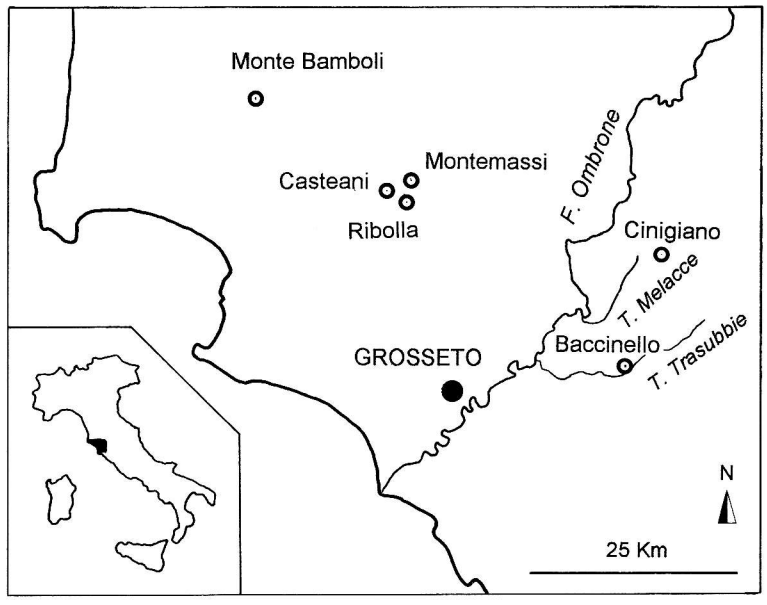


Fig. 1 - Location map of the localities quoted in the text.

semblages (De Terra, 1956; Lorenz, 1968). It may be referred to the MN 13 zone of the Turolian Mammal Age (Rook et al., 1991; Rook & Rustioni, 1991; Benvenuti et al., in press).

The high endemism of the V1 and V2 faunas makes their placement in the biochronological scale very difficult. However, a new fossil assemblage was recently recovered a few meters below the lignites that produced V1. It is the earliest fauna of the basin, and was referred to MN 11 zone of the Turolian Mammal Age on the basis of the presence of the murid *Valerymys vireti*, in association with taxa that have already become endemized (Engesser, 1989).

Two molluscan faunas (called F1 and F2 by Gillet et al., 1965) have been identified in the sedimentary succession. The F1 mollusks were collected from a clay bed underlying sediments bearing the Baccinello V2 mammal fauna. It consists mainly of taxa (*Dreissena* and "*Limnocardium*") that display some endemic features. The F2 fauna was collected from carbonate levels stratigraphically overlying the sediments containing fossils of the Baccinello V3 vertebrate assemblage. This molluscan fauna contains elements characteristic of hypohaline environments, and is similar to malacofaunas found in other Late Messinian localities of Italy (Esu & Girotti, 1989).

The Baccinello V1 assemblage occurs in a lignite facies, and is considered to be equivalent to the faunas collected in the coal mines at Casteani, Montemassi and Ribolla. The Baccinello V2 mammals were collected one hundred of meters above the V1 lignites (at the base of a thick layer of alternating conglomerates, silts, and marls),

in sediments that have been correlated with the Monte Bamboli fossil bearing lignites (Lorenz, 1968; Hürzeler, 1975, 1982, 1983, 1987; Hürzeler & Engesser, 1976; Engesser, 1983, 1989).

The correlation between the faunas from Baccinello V2 and Monte Bamboli is based mainly on the presence, in both localities, of a derived form of the alcelaphine *Maremmia* (*Maremmia lorenzi*), a taxon that is very abundant in the two localities and absent from Baccinello V1, Casteani, Ribolla and Montemassi sites, where the primitive *Maremmia haupti* is present (Hürzeler, 1983). Again the presence of a suid (*Eumaiochoerus etruscus*) and a murid (*Anthracomys majori*) in the faunas collected at Monte Bamboli and Baccinello V2, not mentioned from the other sites with "maremmian" faunas, seems to support this correlation (Hürzeler, 1982; Engesser, 1989).

This interpretation contrasts however with the study of the sedimentary facies. The occurrence of lignites with crocodiles and turtles indicates that there were swampy habitats around Monte Bamboli (as well as Baccinello V1, Casteani etc.), where localized peat bogs formed, and organic matter accumulated.

On the contrary, the facies analysis of the V2 mammal bearing sediments in the Baccinello basin (coarse sediments arranged in sheet-like bodies fining upward to grey-red banded massive clayey silts) suggests that the Baccinello V2 assemblage lived under drier conditions (Benvenuti et al., in press).

Oreopithecus is the best known taxon present in the Miocene endemic faunas of southern Tuscany, and its phylogenetic placement has been the subject of much discussion (cf. Delson, 1987). This primate is represented in the coal sediments of Baccinello V1, Monte Bamboli, and Casteani (only one specimen was reported from Ribolla and one from Montemassi), but until now its occurrence in the Baccinello V2 fauna had been suggested only on the basis of fragments of doubtful attribution (Hürzeler & Engesser, 1976).

In addition to the known Tuscan localities, specimens attributables to cfr. *Oreopithecus* sp. (and an associated "maremmian" fauna) was recently found in Miocene sediments of northern Sardinia (Kotsakis et al., in press).

The new *Oreopithecus* specimen.

Some years ago, field work was begun in the Baccinello area in order to better define the geological setting of the sedimentary basin deposits, and place the Maremma faunas in a more accurate chronological framework (Rook et al., 1991; Rook, 1991; Benvenuti et al., in press). During a study recently carried out along the Trasubbie river, a fragmentary mandible belonging to a very old individual of *Oreopithecus* was found few meters above the so called F1 mollusk level (thus undoubtedly belonging to the Baccinello V2 assemblage). The specimen (IGF 4883V) is composed of a fragment of a left ramus with P_4, roots of M_1, M_2-M_3, and two fragments of the right ramus,

one with P_3-P_4 and the root of the canine, and one with M_2-M_3 (Pl. 1).

A preliminary examination of the specimen reveals some very interesting features. First of all, the mandibular bone is heavy and massive. The dimensions of the molars are also characteristics, the M_3 is large with respect to M_2, and the premolars are massive.

A more accurate morphological study is in progress and the specimen is provisionally referred to *Oreopithecus* cf. *bambolii.*

Closing remarks.

As mentioned above, the Baccinello V2 and Monte Bamboli assemblages have been correlated on the basis of the occurrence, in both sites, of the derived *Maremmia* (*Maremmia lorenzi*) and the suid *Eumaiochoerus etruscus*. While *Eumaiochoerus* was not reported in the other sites of Maremma with these endemic mammal faunas, *Maremmia* is represented by the primitive species (*Maremmia haupti*). The differences between the Baccinello V2 and Monte Bamboli *Oreopithecus* need thus further investigation. As a matter of fact, the problems related to the correlation between the Baccinello and Monte Bamboli faunas will not be however resolved without a careful revision of the fossils from Monte Bamboli and a detailed geological and stratigraphical study of the Monte Bamboli area.

Furthermore, a comparison of the cfr. *Oreopithecus* sp. from Sardinia with either *Oreopithecus bambolii* or *Oreopithecus* cf. *bambolii* from Baccinello V2 could lead to some very interesting observations. Among other things, the regional paleobiogeographic setting of the Tusco-Sardinian bioprovince during the Late Miocene will require further investigation.

Is in fact clear that the paleogeography of the Tyrrhenian area during the Late Miocene was extremely complicated (cf. Azzaroli et al., 1987 and Boccaletti et al., 1990). There is no evidence of a continuous, simultaneous connection of the Maremma with Europe and Africa. More probably, the area was repeatedly connected to either Europe or Africa (cf. Engesser, 1989) by unstable lands that acted as temporary passageways to the Tusco-Sardinian area.

Acknowledgements.

I would like to thank dr. Marco Benvenuti who worked with me in the field and prof. Danilo Torre for the critical reading of the manuscript. Many thanks are due to prof. Johannes Hürzeler, prof. Terry Harrison and dr. Burkart Engesser for the profitable discussions. Work supported by M.U.R.S.T. and C.N.R. grants.

BIBLIOGRAPHY

Azzaroli A., Boccaletti M., Delson E., Moratti G. & Torre D. (1987) - Chronological and paleogeographical background to the study of *Oreopithecus bamboli. Journ. Hum. Ev.*, v. 15 (1986), n. 7, pp. 533-540, London.

Benvenuti M., Bertini A. & Rook L. (in press) - Facies analysis, vertebrate paleontology and palynology in the Late Miocene Baccinello-Cinigiano basin (Southern Tuscany). *Mem. Soc. Geol. It.*, Roma.

Boccaletti M., Ciaranfi N., Cosentino D., Deiana G., Gelati R., Lentini F., Massari F., Moratti G., Pescatore T., Ricci Lucchi F. & Tortorici L. (1990) - Palinspastic restoration and paleogeographic reconstruction of the peri-Tyrrhenian area during the Neogene. *Palaeogeogr., Palaeoclimat., Palaeoecol.*, v. 77, n. 1, pp. 41-50, Amsterdam.

Delson E. (1987) - An Anthropoid Enigma: Historical Introduction to the Study of *Oreopithecus bambolii. Journ. Hum. Ev.*, v. 15 (1986), n. 7, pp. 523-531, London.

De Terra H. (1956) - New approach to the Problem of Man's Origin. *Science*, n. 124, pp. 1282-1285, New York.

Engesser B. (1983) - Die Jüngtertiären Kleinsäuger des Gebietes der Maremma (Toskana, Italien). I Teil: *Gliridae* (Rodentia, Mammalia). *Ecl. Geol. Helv.*, v. 76, n. 3, pp. 763-780, Basel.

Engesser B. (1989) - The Late Tertiary small mammals of the Maremma region (Tuscany, Italy). II Part: *Muridae* and *Cricetidae* (Rodentia, Mammalia). *Boll. Soc. Paleont. It.*, v. 29, n. 2-3, pp. 227-252, Modena.

Esu D. & Girotti O. (1989) - Late Miocene and Early Pliocene continental and oligohaline molluscan faunas of Italy. *Boll. Soc. Paleont. It.*, v. 29, n. 2-3, pp. 253-263, Modena.

Gillet S., Lorenz H.J. & Woltersdorf F. (1965) - Introduction à l'étude du Miocène supérieur de la région de Baccinello. *Bull. Serv. Carte Géol. Als. Lorr.*, v. 18, n. 1, pp. 31-42, Strasbourg.

Hürzeler J. (1975) - L'age géologique et les rapports géographiques de la faune de mammifères du lignite de Grosseto (note préliminaire). *Coll. Int. C.N.R.S.*, n. 218 Problèmes Actuels de Paléontologie (Evolution des Vertébrés), pp. 873- 876, Paris.

Hürzeler J. (1982) - Sur le Suidé du lignite de Montebamboli (Grosseto, Italie). *C.R. Acad. Sc. Paris*, s. 2, v. 295, pp. 697-699, Paris.

Hürzeler J. (1983) - Un alcelaphiné aberrant (Bovidé, Mammalia) des "lignites de Grosseto" en Toscane. *C.R. Acad. Sc. Paris*, s. 2, v. 296, pp. 497-503, Paris.

Hürzeler J. (1987) - Die Lutrinen (Carnivora, Mammalia) aus dem "Grosseto Lignit" der Toskana. *Schweitz. Paläont. Abh.*, v. 110, pp. 25-48, Basel.

Hürzeler J. & Engesser B. (1976) - Les faunes de mammifères néogènes du Bassin de Baccinello (Grosseto, Italie). *C.R. Acad. Sc. Paris*, s. 2, v. 283, pp. 333-336, Paris.

Kotsakis T., Marras G. & Palombo M.R. (in press) - An *Oreopithecus* fauna from Late Miocene of Sardinia.

Lorenz H.J. (1968) - Stratigraphisches und mikropaläontologisches Untersuchungen des Braunkohlengebietes von Baccinello (Grosseto, Italien). *Riv. It. Paleont. Strat.*, v. 74, n. 1, pp. 147-270, Milano.

Rook L. (1991) - The genus *Anthracomys*, a Murid (Mammalia, Rodentia) endemic to the Baccinello region (Tuscany, Italy). *Boll. Soc. Paleont. It.*, v. 30, n. 2, pp. 235-238, Modena.

Rook L., Ficcarelli G. & Torre D. (1991) - Messinian carnivores from Italy. *Boll. Soc. Paleont. It.*, v. 30, n. 1, pp. 7-22, Modena.

Rook L. & Rustioni M. (1991) - *Tapirus* cf. *arvernensis* from the Late Turolian Baccinello V3 Faunal Assemblage (Grosseto, Tuscany). *Boll. Soc. Paleont. It.*, v. 30, n. 1, pp. 325-327, Modena.

Savi P. (1843) - Sopra i carboni fossili dei terreni miocenici delle Maremme Toscane. V. of 79 pp., Pisa.

Received April 13, 1993; accepted June 4, 1993

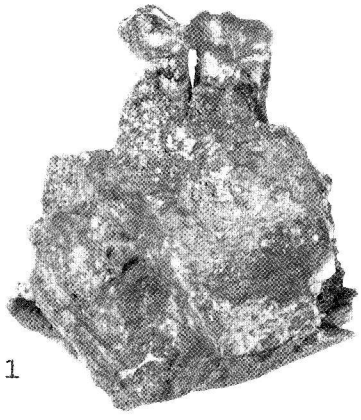
PLATE 1

Oreopithecus cf. *bambolii* (IGF 4883V) from Trasubbie river (all figures are 1.5x)

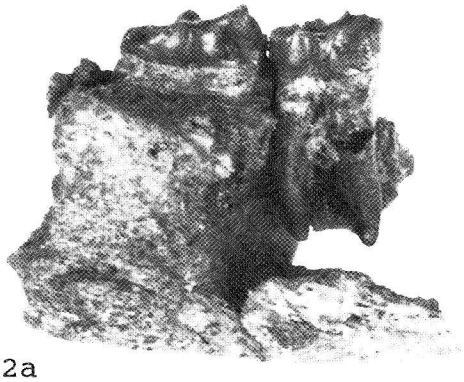
Fig. 1 - Fragment of right ramus with P3-P4. Lingual view.

Fig. 2 - Fragment of right ramus with M2-M3. a) Labial; b) lingual; c) occlusal views.

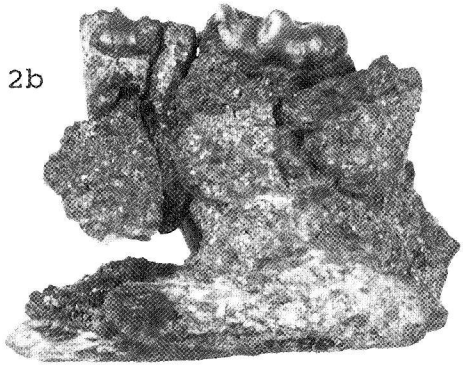
Fig. 3 - Fragment of left ramus. a) Lingual; b) labial; c) occlusal views.



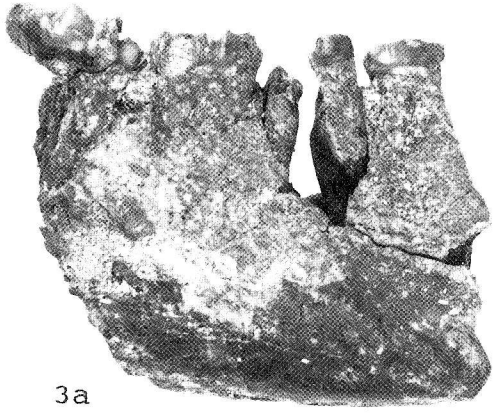
1



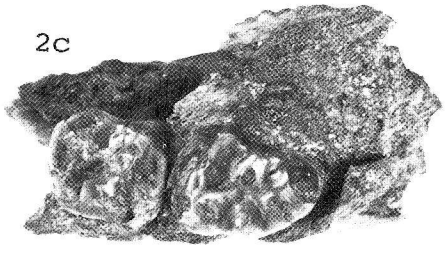
2a



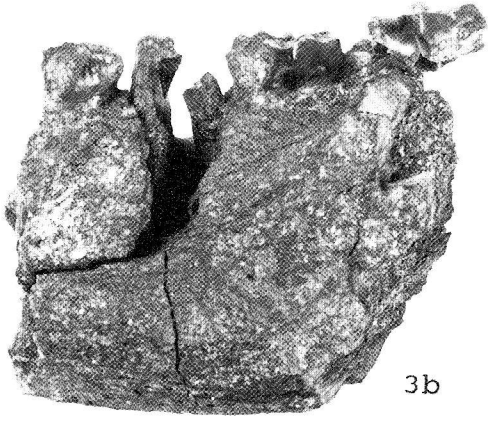
2b



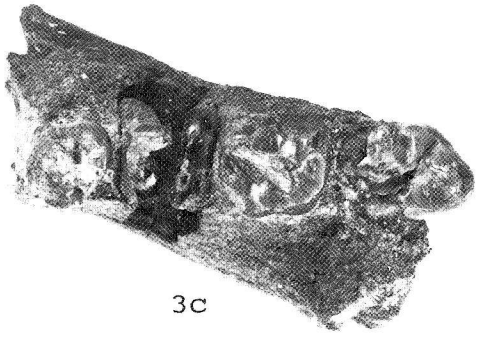
3a



2c



3b



3c