

A mandible of *Tapirus arvernensis* from Central Italy

LUCA PANDOLFI & TASSOS KOTSAKIS

ABSTRACT

A fragmentary mandible of *Tapirus* housed at Museo di Paleontologia, Sapienza Università di Roma, was indicated as collected at Castel San Pietro (Rieti) and/or Nera Montoro (Terni), representing the southernmost occurrence of the taxon in Italy and suggesting a Pliocene age for the locality of the discovery. A careful analysis of the fossil records of tapir in Italy and the collection of several bibliographic sources revealed that the specimen was instead discovered at Spoleto (Perugia), within the lignite mines of Morgnano and Santa Croce, and it was donated to the Museo di Paleontologia in 1895. Therefore, *Tapirus* has been never recorded at Nera Montoro, which yielded remains of *Anancus arvernensis*, or Castel San Pietro, which instead yielded remains of *A. arvernensis* and *Stephanorhinus etruscus*.

KEY WORDS: *Tapirus*, lignite beds, collection, biochronology.

INTRODUCTION

The genus *Tapirus* occurred in Italy during the latest Miocene but it seems to disperse in Europe during the Middle Miocene (RUSTIONI, 1992; GUÉRIN & EISENMANN, 1994; MADE & STEFANOVIC, 2006). During the Pliocene only one species of *Tapirus* has been reported in Europe: *Tapirus arvernensis* CROIZET & JOBERT, 1828. The supposed Pliocene age for *Tapirus jeanpiveteaui* BOEUF, 1991 from the locality of Barro (France) (BOEUF, 1991; SPASSOV & GINSBURG, 1999) is uncertain (MADE & STEFANOVIC, 2006; GUÉRIN & TSOUKALA, 2013). Moreover MADE & STEFANOVIC (2006) suggested *T. jeanpiveteaui* as a possible synonym of *Tapiriscus panonicus* KRETZOI, 1951. *Tapirus arvernensis* is recorded in several European localities from MN13 (latest Miocene) to MN16b/MN17 (around the Plio-Pleistocene boundary), including France, Spain, Netherlands, Slovakia, Hungary, Romania and Greece (FEJFAR, 1964; JÁNOSSY & KROLOPP, 1981; RUSTIONI, 1992; RADULESCU *et alii*, 2003; MADE & STEFANOVIC, 2006; GÓMEZ DE SOLER *et alii*, 2012; GUÉRIN & TSOUKALA, 2013 and references therein). Two subspecies of *Tapirus arvernensis* are recognized (MICHAX *et alii*, 1976; GUÉRIN & EISENMANN, 1994; GUÉRIN & TSOUKALA, 2013): *T. arvernensis minor* Michaux, Sigé & Sudre, 1976 (Early Ruscinian, MN14) and *T. a. arvernensis* (Late Ruscinian and Early Villafranchian, MN15-MN16b). The first subspecies is smaller and slenderer than the nominal one (MICHAX *et alii*, 1976; GUÉRIN & EISENMANN, 1994; GUÉRIN & TSOUKALA, 2013).

The oldest reference of Italian tapir is probably MENEGHINI (1880), who reported the occurrence of *Tapirus* in the Garfagnana Basin (Tuscany). Later the taxon was recorded by several authors from various localities of Piedmont, Emilia, Tuscany and Umbria (DEL CAMPANA, 1910; RUSTIONI, 1992 and references therein; DOMINICI *et alii*, 1995; RUSTIONI & MAZZA, 2001). Almost all the collected specimens of tapir were attributed to *T. arvernensis* (DEL CAMPANA, 1910; RUSTIONI, 1992); nevertheless, the specimens collected at Il Casino and Baccinello V3 (latest Miocene, Tuscany) were tentatively referred to *T. arvernensis* whereas the specimens from Sarzanello (Pliocene, Tuscany) were attributed to *Tapirus* sp. by RUSTIONI (1992). According to RUSTIONI (1992) the taxon became extinct in Italy at the end of the Pliocene, during the Early Villafranchian, at the transition from the Triversa FU (= Faunal Unit) to the Montopoli FU (at the Plio-Pleistocene transition). Accordingly, *Tapirus* represents an important biochronological element which allows to discriminate between Pliocene and Early Pleistocene faunal complexes.

The specimen considered in this note is represented by two fragmentary and crushed mandibular corpi embedded in a lignite sample housed at the Museo di Paleontologia, Sapienza Università di Roma, Rome (MPUR).

DESCRIPTION AND COMPARISONS

The specimen (MPUR no code) lacks of the rami and symphysis; the two corpi are crushed (Fig. 2A). The teeth on the left corpus are strongly damaged whereas only p2-p4 and part of m1 are preserved on the right corpus (Fig. 2B-C). A negative print of the left corpus is impressed on the lignite sample suggesting the presence of six well-preserved teeth at the time of the discovery (Fig. 2A). Mesial and distal cingula are evident on the preserved tooth portions of the right corpus whereas lingual and labial cingula seem to be absent (Fig. 2B). The estimated length of p3-p4 (ca. 39 mm) and that of the molar row (ca. 64 mm) are close to the maximum values of *T. arvernensis* (39 mm and 66 mm, respectively) given by GUÉRIN & EISENMANN (1994). The estimated length of p2-m3 (ca. 122 mm) and that of p2-p4 (ca. 59 mm) fall within the range values of *T. arvernensis* from Upper Valdarno (respectively 120.2-133.6 mm and 55.7-63.3 mm) given by RUSTIONI (1992). These values are slightly larger than those of the specimens from Vialette (France) and other Italian Pliocene localities (Vignola, Ponzano di Magra, Montichiello, Villafranca) (cf. RUSTIONI 1992: p. 291).



Fig. 1 - Location map of the three localities discussed in the text. 1, Castel San Pietro (Rieti, Latium); 2, Nera Montoro (Terni, Umbria); 3, Spoleto (Perugia, Umbria).

DISCUSSION AND CONCLUSIONS

The dimensions of the studied specimen are clearly close to the maximal values of *T. arvernensis* and exclude an attribution to the smaller subspecies *T. a. minor*.

The studied specimen was figured by AZZAROLI (1980; p. 215) and indicated as collected at Castel San Pietro (Poggio Mirteto, Rieti, Latium) following AMBROSETTI *et alii*, (1972). KOTSAKIS (1986) also indicated Castel San Pietro as locality of provenance. The same specimen was reported by RUSTIONI (1992) as collected at Nera Montoro (Narni, Terni, Umbria) on the basis of a label attached on the specimen; this information was also mentioned by PALOMBO (1994). Later, the occurrence of *Tapirus* at Castel San Pietro was questioned by KOTSAKIS (1992) and PETRONIO *et alii* (2002) which indicated an uncertain provenance for the studied specimen.

Accordingly, “Nera Montoro, Castel San Pietro” or “Castel San Pietro (Nera Montoro)” has been cited as one of the Early Villafranchian sites which yielded remains of *Tapirus* (MADE & STEFANOVIC, 2006; GÓMEZ DE SOLER *et alii*, 2012; GUÉRIN & TSOUKALA, 2013).

As reported by RUSTIONI (1992), a kind of label attached on the studied specimen indicates an origin from Nera Montoro. Nevertheless this label was absent during the '70 and '80 of the past century, it was attached in recent time (C. Petronio pers. comm., December 2015) and it is not the original label of the specimen. Only *Anancus arvernensis* (CROIZET & JOBERT, 1828) and *Mammuthus meridionalis* (NESTI, 1825) (from different stratigraphic levels) have been indeed collected at Nera Montoro (TERRENZI, 1887; TUCCIMEI, 1891). Concerning Castel San Pietro, the discovery of a tapir from the lignite mine has

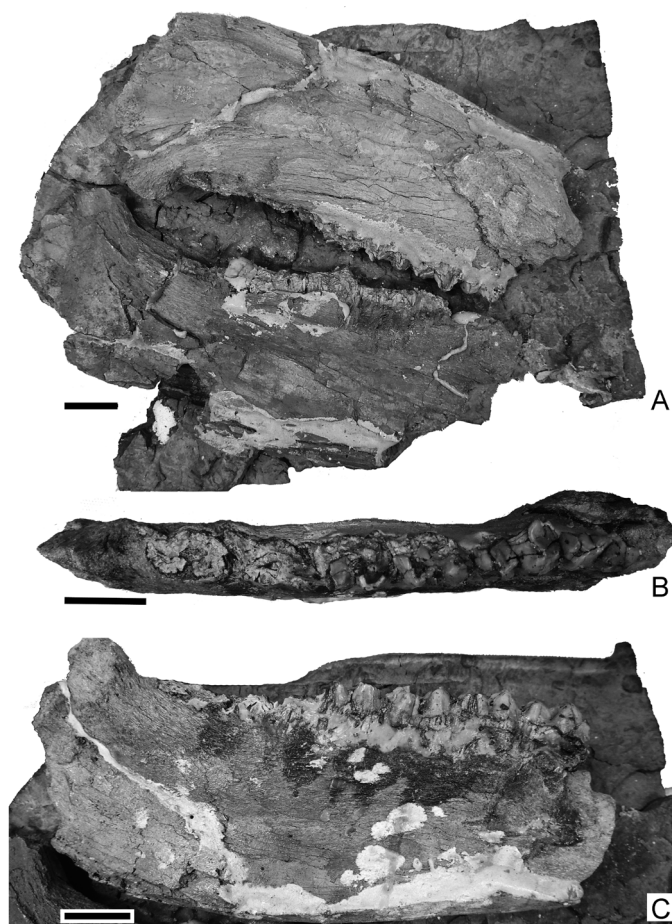


Fig. 2 - *Tapirus arvernensis* from Spoleto lignite beds (MPUR). A: crushed mandible embedded in a lignite sample; B: occlusal view of the right tooththrow; C: lingual view of the right corpus. Scale bars correspond to 2 cm.

been never reported by MAXIA (1949), who only recorded the occurrence of *A. arvernensis* and *Stephanorhinus etruscus* (FALCONER, 1868) (specimens currently housed at MPUR; see also PANDOLFI *et alii*, 2015). From the same lignite mine TUCCIMEI (1888) reported the presence of *Rhinoceros etruscus* [recte *S. etruscus*] and *Castor fiber* LINNAEUS 1758. Scanty and fragmentary remains of *Hippopotamus* were recorded from the surroundings of Castel San Pietro by MELI (1882) and TUCCIMEI (1891), and remains of *Bos* sp. (= *Leptobos* sp. in PETRONIO *et alii*, 2002) and *Cervus* sp. (= Cervidae indet.?) were mentioned by TUCCIMEI (1889). Unfortunately all these specimens were stored at the Istituto Tecnico di Poggio Mirteto and were destroyed during the World War II (A. Banchelli, pers. comm. December 2015).

In a short note, CLERICI (1895) cited the discovery of *Tapirus* remains from the lignite mines of Morgnano and Santa Croce at Spoleto (Perugia, Umbria). According to CLERICI (1895), the director of the mines Ing. L. Del Bene donated to him a sample of lignite which contained two corpi of the same badly crushed mandible of *Tapirus* with six teeth. The short description given by CLERICI (1895) clearly fit that of the studied specimen. In addition, the studied fossil is the only crushed mandible of *Tapirus* housed at MPUR and the only embedded in a lignite sam-

ple. Other three isolated upper teeth of a tapir housed at MPUR, and maybe lost, were reported as probably collected in Val di Chiana (Tuscany) by PORTIS (1896), but this record was questioned by DEL CAMPANA (1910). Accordingly, we refer the studied specimen as collected from the lignite mines of Spoleto. The occurrence of the tapir in this locality has been yet reported by PANTANELLI (1886) and confirmed by CAPELLINI (1888), DEL CAMPANA (1910), AZZAROLI (1980) and RUSTIONI (1992). The absence of *Tapirus* from the lignite beds at Castel San Pietro and the presence of *S. etruscus* and *A. arvernensis* suggests an age younger than Triversa FU for this locality.

ACKNOWLEDGEMENTS

We thank M.R. Palombo, Director of the MPUR, for granting us access to the studied material, and V. Codrea and M. Cherin for reviewing the manuscript. We also thank C. Petronio (Sapienza Università di Roma) and A. Banchelli (geologist, Poggio Mirteto) for useful informations.

REFERENCES

- AMBROSETTI P., AZZAROLI A., BONADONNA F.P. & FOLLIERI M. (1972) - *A scheme of Pleistocene chronology for the Tyrrhenian side of Central Italy*. Boll. Soc. Geol. It., **91**, 169-184.
- AZZAROLI A. (1980) - *I mammiferi fossili del Pliocene*. In: AA.VV., *I vertebrati fossili italiani*, Catalogo della Mostra, Verona, pp. 211-215.
- BOEUF O. (1991) - *Tapirus jeanpiveteaui nov. sp., nouvelle espèce de Tapiridae (Perissodactyla) du Pliocène de Charente (France)*. Palaeontogr. Abt. A, **217**, 177-194.
- CAPELLINI G. (1888) - *Sui resti di Mastodon arvernensis recentemente scoperti a Spoleto, Pontremoli e Castrocaro*. Mem. R. Accad. Sci. Bologna, s. 4, **9**, 251-258.
- CLERICI E. (1895) - *Rinvenimento di tapiro nelle ligniti di Spoleto*. Boll. Soc. Geol. It., **14**, 296-297.
- DEL CAMPANA D. (1910) - *I tapiri del Terziario italiano*. Palaeontogr. It., **16**, 147-204.
- DOMINICI S., ROOK L., BENVENUTI M. & ABBAZZI L. (1995) - *Tapir remains in paralic deposits of Pliocene age in Lower Valdarno (Tuscany, Italy): Facies analysis and taphonomy*. Geobios, Mém. Sp., **18**, 131-135.
- FEJFAR O. (1964) - *Early-Villafranchian vertebrates from Hajnáčka near Filakovo in Southern Slovakia*. Rozpr. Ústř. Úst. Geol., **30**, 1-115.
- GÓMEZ DE SOLER B., CAMPENY VALL-LLOSERÀ G., MADE J VAN DER., OMS O., AGUSTÍ J., SALA R., BLAIN H.A., BURJACHS F., CLAUDE S., GARCÍA CATALÁN S., RIBA D. & ROSILLO R. (2012) - *A new key locality for the Pliocene vertebrate record of Europe: the Camp dels Ninots maar (NE Spain)*. Geol. Acta, **10**, 1-17.
- GUÉRIN C. & EISENMANN V. (1994) - *Les tapirs (Mammalia, Perissodactyla) du Miocène supérieur d'Europe occidentale*. Geobios, **27**, 113-127.
- GUÉRIN C. & TSOUKALA E. (2013) - *The Tapiridae, Rhinocerotidae and Suidae (Mammalia) of the Early Villafranchian site of Milia (Grevena, Macedonia, Greece)*. Geodiversitas, **35**, 447-489.
- JÁNOSSY D. & KROLOPP E. (1981) - *Die pleistozänen Schnecken- und Vertebraten-Faunen von Süttő (Travertine, Deckschichten und Spalten)*. Fragm. Mineral. Palaeontol., **10**, 31-58.
- KOTSAKIS T. (1986) - *Elementi di paleobiogeografia dei mammiferi terziari dell'Italia*. Hystrix, **1**, 25-68.
- KOTSAKIS T. (1992) - *Giacimenti di vertebrati fossili nell'area della media valle del Tevere*. Libro-guida delle escursioni del V Simposio sull'Ecologia e Paleoecologia delle Comunità Bentoniche, Roma, 11-13.
- MADE J. VAN DER & STEFANOVIC I. (2006) - *A small tapir from the Turolian of Kreka (Bosnia) and a discussion on the biogeography and stratigraphy of the Neogene tapirs*. N. Jb. Geol. Paläontol., Abh., **240**, 207-240.
- MAXIA C. (1949) - *Resti di mammiferi rinvenuti nella miniera di lignite di Castel S. Pietro (Sabina)*. Ric. Scient., **19**, 346-347.
- MELI R. (1882) - *Sulla zona dei fori lasciati dai litodomi pliocenici nella calcaria giurese di Fara Sabina*. Boll. R. Com. Geol. It., **13**, 147-155.
- MENEGHINI G. (1880) - *Resti di tapiro e d'istrice nella lignite di Ghivizzano*. Atti Soc. Toscana Sci. Nat., P. V., **2**, 74.
- MICHAUX J., SIGÉ B. & SUDRE J. (1976) - *Présence de Tapirus arvernensis (Mammalia, Perissodactyla) dans le Pliocène supérieur de Bas-san (Hérault)*. C.R. Soc. Géol. Fr., **1**, 9-11.
- PALOMBO M.R. (1994) - *Le principali associazioni a mammiferi del Pliocene dell'Italia centrale*. St. Geol. Camerti, Vol. Spec. **1994**, 429-446.
- PANDOLFI L., GROSSI F. & FREZZA V. (2015) - *New insights into the Pleistocene deposits of Monte delle Piche, Rome, and remarks on the biochronology of continental Hippopotamus (Mammalia, Hippopotamidae) and Stephanorhinus etruscus (Mammalia, Rhinocerotidae) in Italy*. Estud. Geol., **71**(e026), 16 p.
- PANTANELLI D. (1886) - *Vertebrati fossili delle ligniti di Spoleto*. Atti Soc. Toscana Sci. Nat., Mem., **7**, 93-100.
- PETRONIO C., ARGENTI P., CALOI L., ESU D., GIROTTI O. & SARDELLA R. (2002) - *Updating Villafranchian mollusc and mammal faunas of Umbria and Latium (central Italy)*. Geol. Romana, **36**(2000-2002), 369-387.
- PORTIS A. (1896) - *Contribuzioni alla storia fisica del Bacino di Roma e studii sopra l'estensione da darsi al Pliocene superiore*. T. II, L. Roux e C., Torino-Roma, 513 pp.
- RADULESCU C., SAMSON P.M., PETCULESCU A. & STIUCĂ E. (2003) - *Pliocene large mammals of Romania*. Colloq. Paleontol., **53**, 549-558.
- RUSTIONI M. (1992) - *On Pliocene tapirs from France and Italy*. Boll. Soc. Paleontol. It., **31**, 269-294.
- RUSTIONI M. & MAZZA P. (2001) - *Taphonomic analysis of Tapirus arvernensis remains from the Lower Valdarno (Tuscany, Central Italy)*. Geobios, **34**, 469-474.
- SPASSOV N. & GINSBURG L. (1999) - *Tapirus balcanicus nov. sp., nouveau tapir (Perissodactyla, Mammalia) du Turolien de Bulgarie*. Ann. Paléontol., **85**, 265-276.
- TERRENZI G. (1887) - *Il Pliocene nei dintorni di Narni*. Boll. Soc. Geol. It., **5**, 321-336.
- TUCCIMEI G. (1888) - *Bradissimi pliocenici della regione sabina*. Mem. Pontif. Accad. N. Lincei, **4**, 107-120.
- TUCCIMEI G. (1889) - *Il Villafranchiano nelle valli sabine e i suoi fossili caratteristici*. Boll. Soc. Geol. It., **8**, 95-131.
- TUCCIMEI G. (1891) - *Alcuni mammiferi fossili delle province umbra e romana*. Mem. Pontif. Accad. N. Lincei, **7**, 89-152.