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The palaeoenvironment of the Middle Pleistocene archaeopalaeontological site of Fontana Ranuccio (Anagni, central Italy) and implication for the human settlement

Flavia STRANI, Daniel DEMIGUEL, Raffaele SARDELLA & Luca BELLUCCI

F. Strani, Dipartimento di Scienze della Terra, "Sapienza – Università di Roma", P.le Aldo Moro 5, 00185 Roma, Italy; PaleoFactory, "Sapienza – Università di Roma", P.le Aldo Moro 5, 00185 Roma, Italy; flavia.strani@uniroma1.it
D. DeMiguel, Institut Català de Paleontologia Miquel Crusafont, Edifici Z, C/ de les Columnes s/n, Universitat Autònoma de Barcelona, 08193 Cerdanyola del Vallès, Barcelona, Spain;
R. Sardella, Dipartimento di Scienze della Terra, "Sapienza – Università di Roma", P.le Aldo Moro 5, 00185 Roma, Italy; PaleoFactory, "Sapienza – Università di Roma", P.le Aldo Moro 5, 00185 Roma, Italy;
L. Bellucci, Istituto Italiano di Paleontologia Umana, Piazza R. Bonghi 2, 03012 Anagni, Frosinone, Italy; Polo museale Sapienza, "Sapienza – Università di Roma", P.le Aldo Moro 5, 00185 Roma, Italy; PaleoFactory, "Sapienza – Università di Roma", P.le Aldo Moro 5, 00185 Roma, Italy;

During the early Middle Pleistocene (0.6-0.4 Ma) humans bearing Acheulean or Mode 2 technology spread successfully into Europe and their presence is recorded in numerous fossil assemblages. Most of the human remains in the Italian Peninsula from this period have been found in central Italy. The Middle Pleistocene site of Fontana Ranuccio (Frosinone, central Italy, ca. 458 ka), near the town of Anagni, has yielded a remarkable fossil record of more than 25,000 exceptional faunal remains and, among them, four teeth belonging to the genus *Homo*. Fontana Ranuccio thus represents a crucial locality to investigate the paleoenvironment settings in which the European human populations may have thrived during the early Middle Pleistocene. Herbivore ungulates are highly susceptible to changes in vegetation and through the study of their diets it is possible to gain paramount information about niche occupation and habitat conditions. Feeding behaviours of fossil ungulates is commonly investigated by analysing tooth morphology and dental wear patterns. In particular, hypsodonty (height of tooth crown), mesowear (long-time effect of items ingested on the tooth morphology), and microwear (scars left on the enamel by the food) represent the gold proxies for paleoenvironmetal recostructions. Here we studied the tooth wear patterns of fossil ungulates from Fontana Ranuccio in order to gain information about their feeding behaviour and provide new data on the paleoenvironmental conditions of the habitats occupied by *Homo* during this phase of the Middle Pleistocene. Our preliminary results indicate a mostly browsing diet for the cervids and a discrepancy between mesowear and microwear results is observed in the case of the bovid *Bos primigenius*, that has been tentatively explained as a temporal switch towards a sub-optimal diet possibly reflecting the effects of a marked seasonality. The wear patterns of the perissodactyls *Stephanorhinus* sp. and *Equus* cf. *E. mosbachensis* indicate a mixed feeeder-towards-grazer and pure grazer diet, respectively. None of the Fontana Ranuccio ungulates display brachydont teeth indicating higher dietary abrasion. The presence of a plethora of ungulated displaying different degrees of mixed diets suggests the existence of heterogeneous landscapes, where seasonality may have played a key role. These findings open new considerations regarding the conditions that favored the settlement of Middle Pleistocene *Homo* populations in Italy.