Tales from the Olteț River Valley of Romania: Implications for hominin dispersals into Eurasia during the early Pleistocene

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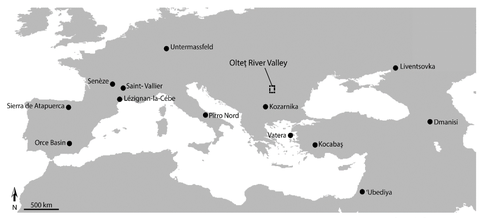
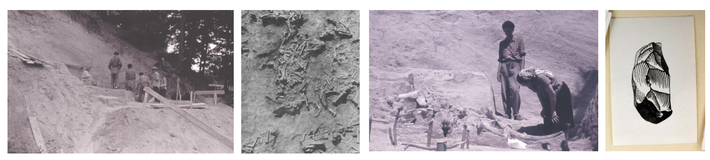
BACKGROUND

The hominin fossil record from the early Pleistocene of Africa is relatively well-documented, in large part because of contributions from researchers like the late Bill Kimbel. However, the exact timing and sequence of the dispersal of hominins out of Africa and into Eurasia is unclear, and the fossil record for this time period remains sparse. The earliest and most secure evidence of hominins out of Africa comes from the site of Dmanisi, Georgia at ~1.8 Ma (Ferring et al., 2011), but other, earlier fossil sites scattered across Europe and Asia have been suggested.

Here we present ongoing work describing the taxonomy, paleoecology, and taphonomy from fossil sites of the Olteț Valley of Romania, focusing on the site of Grăunceanu (MN17/MmQ1; Late Villafranchian, ~2.2-1.9 Ma). Originally excavated in the 1960s, Grăunceanu is one of the most fossiliferous sites from Eastern Europe and has the potential to significantly increase our understanding of the timing and patterns of the earliest hominin dispersals into Eurasia during the early Pleistocene.



Maps showing relevant localities in Europe (left) and the ORV project area (right)

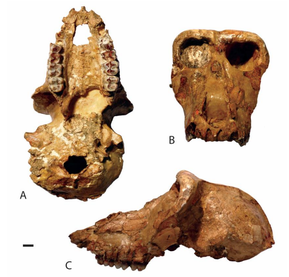


Photos of the original Grăunceanu excavations (left three images) and a photograph showing an illustration of a stone tool recovered in the ORV during work in the 1960s (right)

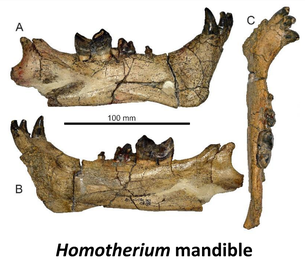
TAXONOMY

Fauna identified from Grăunceanu. Total NISP= ~5,000, spread across at least 32 taxa

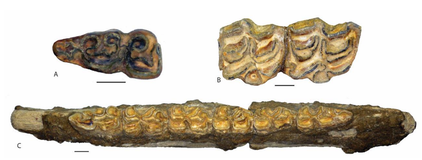
Artiodactyla	Proboscidea	Perissodactyla
Bison (Eobison) sp.	*Mammuthus meridionalis*	*Equus* sp. (cf. *livenzovensis*)
Pliotragus ardeus	**Carnivora**	*Stephanorhinus* sp.
Gazellospira torticornis	*Vulpes alopecoides*	**Primates**
Metacervocervus rhenanus	*Nyctereutes megamastoides*	*Paradolichopithecus arvernensis geticus*
Dama eurygonos	*Meles thorali*	**Rodentia**
Eucladoceros sp.	cf. *Lutraeximia simplicidens*	*Hystrix refossa*
Eucladoceros dicranios	*Ursus etruscus*	*Trogontherium* sp.
Eucladoceros ctenoides falconeri	*Lynx issiodorensis*	**Pholidota**
Rucervus radulescui	*Puma pardoides*	*Smutsia olteniensis*
Alces sp.	*Megantereon cultridens*	**Aves**
Praemegaceros cf. *mosbachensis*(?)	*Homotherium latidens*	*Pachystruthio* cf. *pannonicus*
Mitilanotherium inexspectatum	*Pliocrocuta perrieri*	**Testudines**
Sus strozzi	*Pachycrocuta brevirostris(?)*	Geoemyidadae indet.

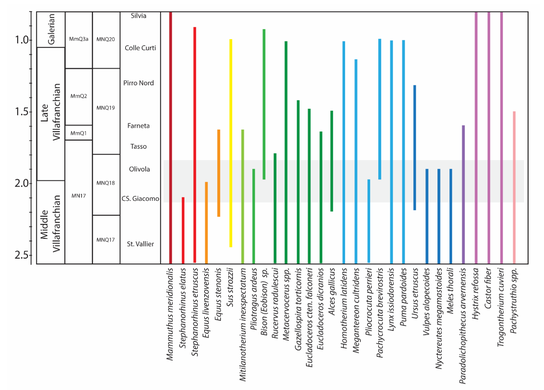


Paradolichopithecus **cranium (VGr.0345; above) and horse dentition (below) from Grăunceanu**



Homotherium **mandible (VGr.3134; above) and the type specimen of the pangolin** ***Smutsia olteniensis*** **(VGr.2362; below) from Grăunceanu**

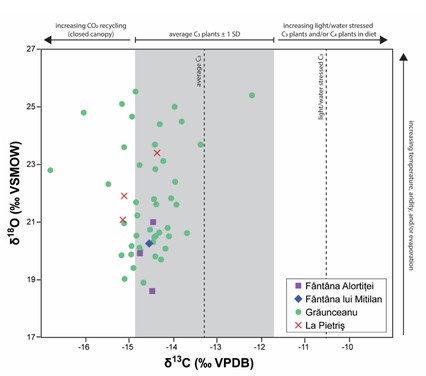




Grăunceanu (2.2-1.9 Ma)

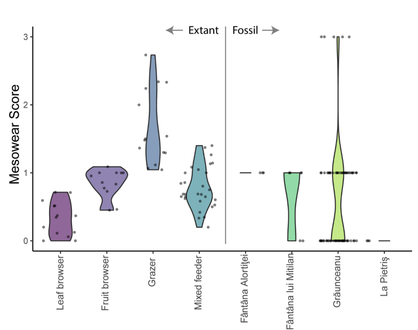
There are a minimum of 32 taxa represented at Grăunceanu spread across 16 families. This includes the first representatives of ***Puma pardoides***, ***Lutraeximia simplicidens***, **and** ***Pachystruthio pannonicus*** **from Romania, and the only known pangolin fossils from Pleistocene Europe,** ***Smutsia olteniensis***. **Biochronology places Grăunceanu at approximately 2.2-1.9 Ma.**

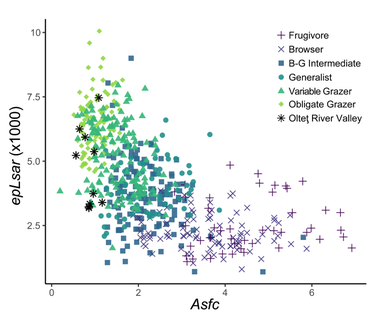
PALEOECOLOGY



Bivariate plot of the carbon (x-axis) and oxygen (y-axis) isotope data for the ORV localities. These data indicate the specimens sampled had a primarily browsing diet.

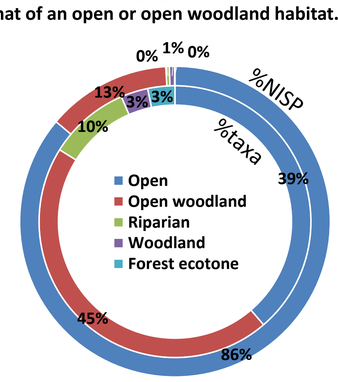
Mesowear scores from extant dietary categories (from Fortelius and Solounias, 2000) vs. the ORV localities. Data demonstrate that, for the most part, the fossils show a browsing signal.





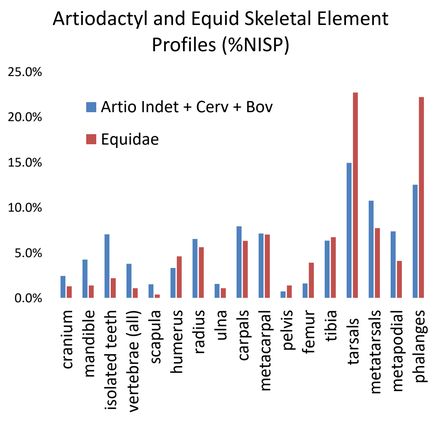
Microwear data from extant bovids (Scott, 2012) compared to specimens from the ORV. Here, the ORV data show a primarily grazing signal.

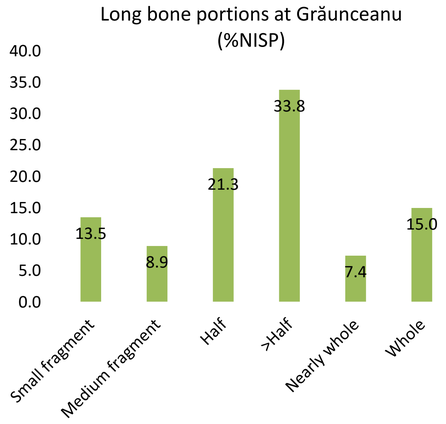
Pie charts showing proportions of taxa (inner circle) and proportions of NISP (outer circle) identified to different habitat types. The overwhelming signal at Grăunceanu is that of an open or open woodland habitat.

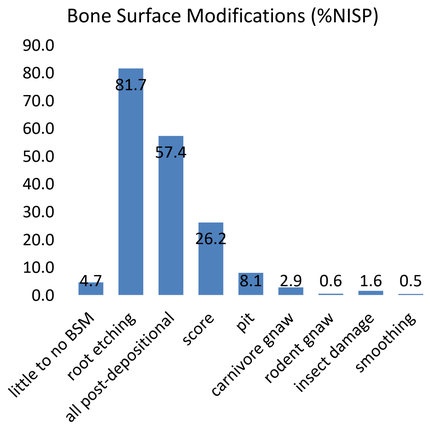


Artistic reconstruction of Grăunceanu in an open habitat near the paleo-Olteţ River. Featured taxa include (L-R): ***Pliocrocuta***, ***Paradolichopithecus***, ***Mammuthus***, ***Pachystruthio***, ***Eucladoceros***, **Testudines,** ***Mitilanotherium inexspectatum***, ***Equus sp.***, ***Smutsia olteniensis***, **and** ***Megantereon***. **Digital art by Emi Olin, 2022.**

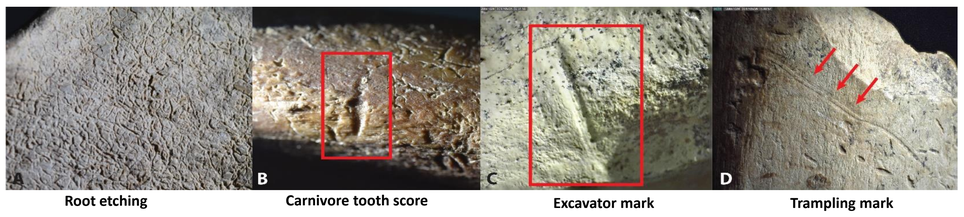
TAPHONOMY







Skeletal element frequencies (left), long bone portions (middle), and proportions of different bone surface modifications (right) at Grăunceanu. In general, the assemblage can be characterized as having a large number of intact or nearly intact bones (>half), many of which are the distal limb element (e.g., metapodials, tarsals, phalanges, etc.). Bone surface modifications are dominated by root etching and post-depositional damage, but also show a number of other changes.



Root etching | Carnivore tooth score | Excavator mark | Trampling mark

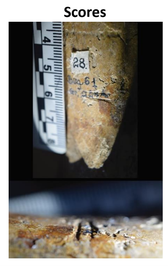
In general, the taphonomy of Grăunceanu can be further characterized as having:

- **Very unweathered surfaces (97.8% are weathering stages 0 and 1)**
- **Very complete circumferences (84.7% have a complete circumference)**
- **Fossil remains with very visible surfaces (73.1% have >75% visibility)**
- **Some scores of interest that require further investigation**

?Insect damage

Carnivore gnawing

Scores



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BILL KIMBEL

This work wouldn't have happened without Bill. He had a massive influence on our research team, far more than he knew. We're proud to continue his legacy of investigating the hominin fossil record; this research is dedicated to his memory.