

THE PLEISTOCENE STEPPE BISON (*BISON PRISCUS*, BOVIDAE, MAMMALIA) FROM MOVILENI (VASLUI DISTRICT)

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Abstract. Pleistocene deposits are widespread in Moldova, mainly as river terraces. Such a situation is in Movileni village (Coroiеști commune), northwest of Bârlad, on the Hreasca Creek. The Pleistocene rocks concern the quartz sands with sand clay interbeddings, exposed on the right bank of the creek. Some years ago, a steppe bison (*Bison priscus*) skull was unearthed from these sands. The skull documents a bison bull. Apart this skull, this locality yielded also few postcranial bones belonging to Bovidae too. The discovery evidences the presence of this species on Scythian Platform, in the Upper Pleistocene.

Keywords: steppe bison, Pleistocene, Scythian Platform.

Rezumat. Bizonul de stepă pleistocen (*Bison priscus*, Bovidae, Mammalia) de la Movileni (județul Vaslui). Depozitele Pleistocene sunt larg răspândite în Moldova, în special sub forma unor terase de râuri. O astfel de situație apare în satul Movileni (comuna Coroiești), la nord-vest de Bârlad, pe Pârâul Hreasca. Succesiunea pleistocenă implică nisipuri cuarțoase cu intercalații de nisipuri argiloase, ca aflorimente în malul drept al văii. În urmă cu câțiva ani, din această locație a fost recuperat un craniu de bizon de stepă (*Bison priscus*), aparținând unui mascul. Din același loc au mai fost colectate și alte oase postcraniene de Bovidae. Descoperirea documentează existența speciei în acest sector al Platformei Scitice, în Pleistocenul superior.

Cuvinte cheie: bizon de stepă, Pleistocen, Platforma Scitică.

INTRODUCTION

The Scythian Platform (East Romania; SĂNDULESCU, 1984; SĂNDULESCU & DIMITRESCU, 2004) presents, on large areas, Pleistocene deposits that cover older formations (IONESI, 1994). As it turned on, the Pleistocene formations yielded several times vertebrate remains, mainly of large mammals. The majority of these fossils belongs to large herbivores, mainly to mammoth (APOSTOL, 1968; URSACHI & CODREA, 2008). Southwards, in Tecuci, bovids had been reported too, in assemblages including mammoth, woolly rhinoceros, horses (APOSTOL, 1967; APOSTOL & VICOVEANU, 1970; SIMIONESCU, 1990). We report now the presence of the steppe bison at Movileni (commune Coroiești), northwest of Bârlad town (Vaslui District), on Tutovei Hills (Fig. 1).



Figure 1. Location of Movileni on the map (Google Earth 2010 satellite imagery); the fossil-bearing site is marked F.
Figura 1. Localizarea satului Movileni (Google Earth 2010 imagine satelitară); punctul fosilifer, marcat cu litera F.

Location and geological setting

Movileni area is part of the Scythian Platform, inside the sector also known as "the Bârlad Platform" (IONESI, 1994). The platform basement remains unknown, as far as no drilling succeeded to cross its rocks. That explains the diversity of viewpoints: while some geologists consider this sector as part of the Scythian Platform (e.g. SĂNDULESCU, 1984), others brink up the possibility to represent just a collapsed block of the Moldavian Platform (e.g. IONESI, 1994). This detail is less important for this study, because the Quaternary formations cover continuously the older sedimentary deposits belonging both to the Scythian and the Moldavian platforms. In this context, there are available only data

issued from boreholes, referring to the sedimentary cycles which cover this unknown basement: i. Devonian; ii. Permian-Triassic; iii. Jurassic-Cretaceous-Eocene; iv. Middle Miocene-Pliocene (Badenian-Romanian; IONESI, 1994). Only the deposits of the last sedimentary cycle may be studied in outcrops, the older ones being documented exclusively by borehole data. In Bârlad area, the Miocene and Pliocene formations are covered by Quaternary deposits, usually clastic (gravel and sand).

North of Movileni, there is the Hreasca Creek, a left tributary of the Pereschiv Creek. About one kilometer upstream from the village, on the right bank of the creek, there is a ravine named by natives “Râpa Hreasca” (Hreasca Ravine). In the outcrop, one can observe a six meters high vertical succession of strata, white-yellowish cross-bedded sand with thin interbeddings of sandy-clay. This sedimentation is indicative for a fluvial deposit, with sand bars accumulated through lateral accretion. Inside these sands, there are cranial and postcranial bones (limb bones, vertebrae etc.) belonging to various Pleistocene mammals, mainly large herbivores such as bovids. These bones are always scattered, devoid of any anatomical connections. For instance, at Movileni, there are no traces of human hunting, so we interpret these bones as removed by water streams.

Among these fossils, the most illustrative is a steppe bison fragmentary skull curate at the School no. 1 in Bârlad, which will be further described and discussed. Even fragmentary, the skull still preserves enough characters for an accurate species assignment.

Systematic paleontology

Order Artiodactyla OWEN, 1848
 Suborder Ruminantia SCOPOLI, 1777
 Super-family Bovoidea SIMPSON, 1931
 Family Bovidae GRAY, 1821 (= Cavicornia ILLIGER, 1811)
 Sub-family Bovinae GILL, 1945
 Tribe Bovini SIMPSON, 1945
 Genus *Bison* SMITH, 1827

Bison priscus BOJANUS, 1827
 (Fig. 2: 1-2)

The fossil refers to a fragmentary skull, preserving the neurocranium and both horncores. The facial bones miss, being broken below the upper margins of the orbits. Even severely damaged, the orbits are tubular shaped, trended upward.

The horncores are long, expanded laterally and backwards beyond the nuchal line, with tips bending forward. Their bases are not swollen. The surfaces expose well marked furrows on their whole length, deeper on ventral side, as it can be observed also on others steppe bison skulls described from Romania, as the cow specimen from Țapu (=Abtsdorf) (PHLEPS, 1926). The horncores are devoid of spiraling. The bases are oval in section, with large basal diameters, features indicative for bulls (SALA, 1987). The cows have opposite horncore morphologies, with circular basal sections and smaller diameters at base (PHLEPS, 1926).

Measurements (mm; technique by GROMOLARD, 1981; SALA, 1987; DUVERNOIS, 1989): least distance between the horncore tips – 1,118; dorsal taut length of horncores – 440; length of horncore lower side – 600; basal circumferences of horncores – 410; basal diameters – 131; circumferences of horncores at 10 cm – 340; diameters of horncores at 10 cm – 110; circumference of horncores at 20 cm – 285; diameters of horncores at 20 cm – 90; least breadth between the bases of horncores – 335; frontals length – +230; maximal width at orbits – 363; width post-orbits – 314; length parietals-anterior margin of chignon – 70; length posterior margin of chignon-foramen magnum – 112; length anterior margin of chignon-foramen magnum – 128; length condyles-posterior margin of chignon – 164; width at mastoid apophysis – 310; width at jugular apophysis – 206; width at condyles – 139; transverse diameter of foramen magnum – 54; antero-posterior diameter of foramen magnum – 44; length anterior tuberosities-condyles – 81.5; length posterior tuberosities-condyles – 47.

The horns span is close to the values for *B. priscus* from the Moesian Platform Pleistocene localities as Nana, being smaller compared to the largest specimens from Bucharest (APOSTOL, 1967). Two of *B. priscus* skulls from Tecuci are also larger than the one from Movileni (APOSTOL & VICOVEANU, 1970; labeled as “inv. no. 1” and “inv. no. 3”: 373-374). But, the Movileni skull has a larger value than the one from Sf. Gheorghe (RADULESCO et al., 1965). Horn morphology is closer to the Bucharest specimen than to Nana (APOSTOL, 1967, Pl. I, Figs. 1-4). Further size comparison is difficult to do, mainly because some authors as e.g. Apostol did not indicate the exact techniques they followed for some measurements.

DISCUSSIONS

As in many other European regions, in our country the history of *Bison* is rather unclear, as long as such fossils are rare or are even nearly missing in several regions (e.g. western and northwestern Romania; JURCSÁK, 1975). Even

when present, their preservation is poor, the majority of discoveries referring to fragmentary skulls or bones. For instance, in our country, there is no locality bearing a steppe bison population. In such context, it is difficult to have a good image about the evolutionary tendencies of this species inside this area.

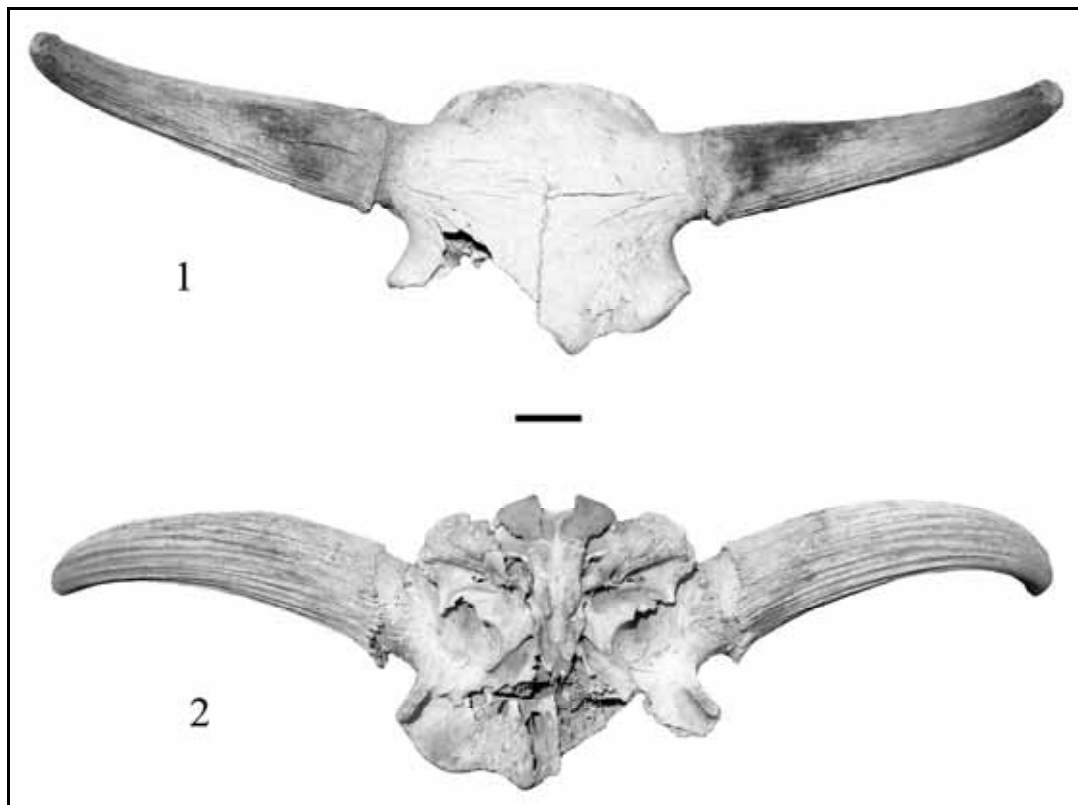


Figure 2. *Bison priscus* fragmentary skull, Movileni, Pleistocene: 1 – frontal view; 2 – ventral view; scale bar, 50 mm (photo: V. Codrea).

Figura 2. *Bison priscus*, craniu fragmentar, Movileni, Pleistocen: 1 – vedere frontală; 2 – vedere ventrală; scara, 50 mm (foto: V. Codrea).

In the history of *Bison*, apart the Pliocene sub-genus *Eobison* (FLEROW, 1979), BRUGAL (1995) mentioned two evolutionary lines in Western Europe: a first one concerns the *schoetensacki*-type (forest bison), while the second refers to the steppe bison *B. priscus*. As evolutionary tendency, in older Pleistocene deposits, the steppe bison had large sized specimens, the size decreasing in younger localities. The smallest specimens from Western Europe had been assigned to a distinct sub-species, *B. priscus mediator* (FLEROW, 1979). The steppe bison was the ancestor both for the European wisent (*B. bonasus*) and American *B. bison*.

Although very few details are known on the first bovidae in Romania, same evolution can be loomed. The oldest “large bovid with bisonine (?) affinities” is mentioned outside the Carpathians, at Berești (top of MN 14; RĂDULESCU & SAMSON, 1995). In Late Pliocene, “Bovid gen et sp. indet” is reported also in southern Moldavia at Mălușteni (MN 15a; RĂDULESCU et al., 2003), but a “*Bison*-like” bovid was recorded in Căpeni and Vârghiș faunas too (MN 15b; Romanian), in the Baraolt basin (RADULESCO et al., 1965; RĂDULESCU & KISGYÖRGY, 1970; SAMSON et al., 1971; RĂDULESCU & SAMSON, 1985; RĂDULESCU et al., 2003).

Forest bison, *B. schoetensacki* FREUDENBERG 1910 remains were unearthed from the Middle Pleistocene localities Betfia V, VII/3, VII/4 (JURCSÁK, 1970; TERZEA, 1994, 1995). Outside the Carpathians, the species is reported in Dealul Viilor-Tetoiu (RADULESCO & SAMSON, 1990).

As for *B. priscus*, there are several middle and late Pleistocene localities where the steppe bison was mentioned from. The oldest specimens - “very large form”- are in the Mindel (Elster) deposits from southwestern Transylvania, at Araci-Carieră and Araci-Fântâna Fagului (RĂDULESCU & SAMSON, 1985). Unfortunately, the Mindel fossils are too scarce for outlining an appropriate image about this bison physiognomy. In late Pleistocene, it was a main component of the mammalian cold climate assemblages, reported either from Riss (Saale) localities (e.g. Tușnad-Sat, Sândominic 2), or from localities with poorer stratigraphy, coined as “late Pleistocene” (Bucharest, Nana, Tecuci etc.; APOSTOL, 1967; APOSTOL & VICOVEANU, 1970).

Only a single near complete skeleton of a steppe bison cow was unearthed by PHLEPS (1907) at Teliu (= Kreuzberg bei Schässburg; Brașov District). This skeleton is nowadays mounted in Brukenthal Museum Sibiu, Natural History Branch (inventory no. 32577; Figs. 3, 4).



Figure 3. Photograph from Teliu, during Phleps' diggings for the steppe bison skeleton.

Figura 3. Fotografie de la Teliu, în timpul săpăturilor efectuate de Phleps pentru recuperarea scheletului de bizon de stepă.

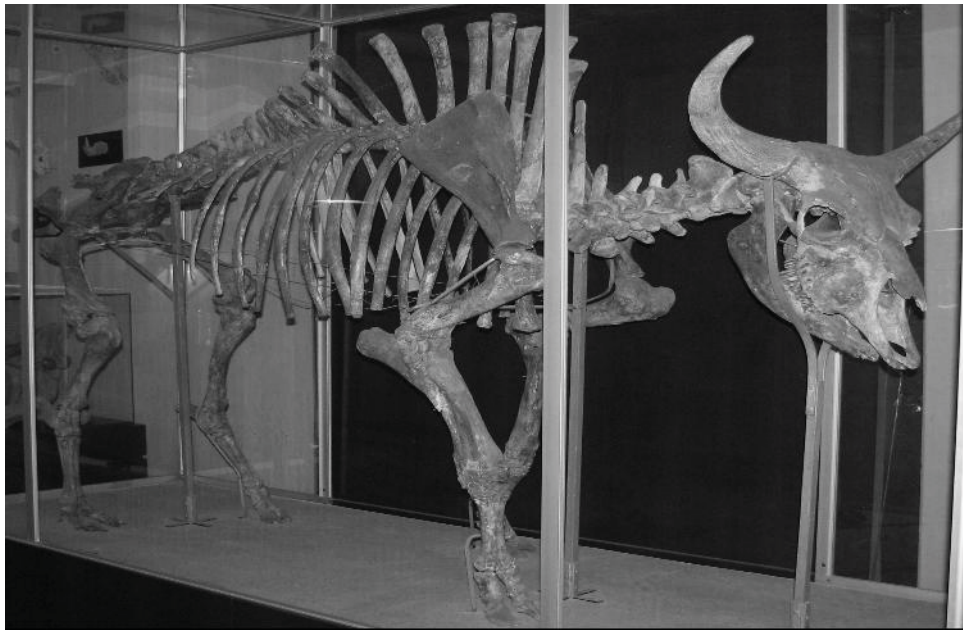


Figure 4. Steppe bison cow skeleton from the Pleistocene of Teliu, found by Phleps, at Brukenthal Museum Sibiu (photo: V. Codrea).

Figura 4. Schelet al unei femele de bizon de stepă descoperit de Phleps în Pleistocenul de la Teliu, Muzeul Brukenthal Sibiu (foto: V. Codrea).

At Movileni, as the *Bison* remains were not found in association with other mammals, it is difficult to coin a more precise age for the deposits where the fossils originate from. It is worth to stress out that in Moldova, in several localities (Mitoc-Malul Galben, Stâncă Ripiceni, Ripiceni Izvor, Iași, Buda, Hulubăț, Rateș), *B. priscus* is associated with *Bos primigenius*, but this association lacks in the Holocene localities where only *Bos primigenius* and *Bison bonasus* had been recorded (SIMIONESCU, 1990). It indicates that in the Holocene, the steppe bison disappeared, replaced by the successor wisent (*B. bonasus*).

The steppe bison often appears associated to some other large mammals (mammoth, woolly rhinoceros, horses) marking cold environments. However, as SALA (1987), not without reason, mentioned, the "steppe bison" name is in some wise inadequate, as long as this species is rather ubiquitarian, living both in open environments and close

ones (forests). We consider Movileni as a Late Pleistocene locality, basing this presumption on the large size of the specimen. For a refined stratigraphy, additional evidence should be added.

CONCLUSIONS

In the Pleistocene formations covering the Scythian Platform, the steppe bison was present among other large herbivores, mainly during the cold events. Movileni is probably a Late Pleistocene locality, where this species is now reported. The deposits from Hreasca Ravine have enough potential for other mammal findings, which could refine the actual stratigraphy. In Moldova the steppe bison was mentioned in few localities, but detailed data are still long in coming.

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