

Short Note



Articulated skeletons of *Prolagus sardus* (Mammalia, Lagomorpha) from the Quaternary of Grotta del Campanaccio (Santadi, south-western Sardinia)

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Prolagus sardus (Wagner, 1829) is probably the most common fossil taxon in the Quaternary insular mammal assemblages of Sardinia and Corsica. Remains of this taxon are abundant both in Pleistocene bone breccia and in more recent anthropogenic deposits, until the Iron Age (Comaschi Caria, 1968; Vigne, 1998; Wilkens, 2000; Angelone et al., 2008). Anatomic features have been studied on the basis of numerous disarticulated bones by Dawson (1969) who also provided an accurate skeleton reconstruction. Despite the considerable amount of *P. sardus* remains found in several deposits of Sardinia and Corsica, the occurrences of articulated skeletons have not yet been reported. Only a few associations, such as radius and ulna or radius, ulna, and humerus have been reported (Dawson, 1969). Thus, *P. sardus* skeletons exhibited in several paleontological and archaeological museums (Fig. 1) have been reconstructed with disarticulated bones belonging to different individuals. Conversely, articulated skeletons of continental *Prolagus* species are known from the Neogene of Europe: *P. crusafonti* López Martínez & Thaler, 1975 (Mein et al., 1983; López Martínez, 2001), *P. sorbinii* Masini, 1989 (Masini, 1989), *P. cf. P. apricenicus*

Mazza, 1987 (Mazza et al. 1995). In this short note two partially articulated skeletons of *P. sardus* are reported for the first time in the Sardinian and Corsican fossil record.

STUDY AREA

The *P. sardus* skeletons have been found inside the Grotta del Campanaccio (Fig. 2), a cave located in the Monte Meana hill, 5 km South of Santadi village (south-western Sardinia). In the same hill other caves are known, including the famous Is Zuddas cave. These caves open in the lower Cambrian dolostones of the S. Giovanni Formation (Pillola, 1991). A map of the Grotta del Campanaccio was completed and registered in 2000 by the speleological group “Gruppo Archeo Speleo Prolagus” of Santadi (Federazione Speleologica Sarda, 2000). The ochotonid skeletons are still located inside the cave at 100 m from the entrance, in a block partially covered by flowstone. These remains were probably transported into the cave by water through an old aperture of the ceiling currently blocked by terrigenous sediments. This is suggested since the cave develops along some subvertical fractures through the Cambrian dolostones.

DESCRIPTION

The two *P. sardus* skeletons have been found on the same flowstone surface. In addition to these remains, some isolated postcranial bones and a complete skull of the same taxon have been identified. Furthermore, the two skeletons have been preserved in different conditions. One of them (Fig. 3a-b) is resting on its right side and it is almost completely covered by a thin layer of lime. In this specimen some elements are easily recognizable, as well as the skull (Sk), thoracic (TV) and lumbar vertebrae (LV) and some limb bone elements. However, several bones cannot be identified with absolute certainty, due to the covering layer of lime deposit. The other skeleton (Fig. 3c-d) rests on its left side and shows some articulated bone elements. In this specimen it was possible to recognize the incomplete skull (Sk), a fragment of the right jaw (RJ), both scapulae (RS, LS), the left humerus (LH), the proximal part of the left radius (LR) and the still articulated



Fig. 1 - Composite skeletons of *Prolagus sardus* exhibited in the Museo dei Palaeoambienti Sulcitani - E.A. Martel of Carbonia (reconstructions and photo by D. Zoboli).

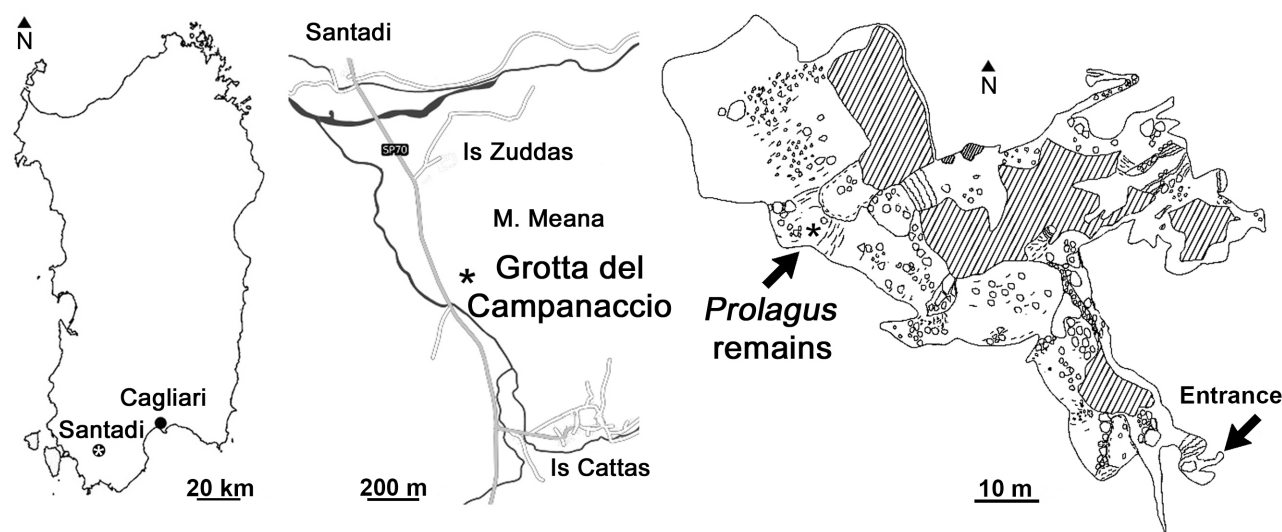


Fig. 2 - Location map of Grotta del Campanaccio and map of the cave showing the position of the remains of *P. sardus*.

ulna (LU), the incomplete right ulna (RL), some cervical (CV), thoracic (TV) and lumbar vertebrae (LV), the sacrum (Sc), some fragments of ribs (Ri), the pelvic bones (LI, RI), both tibiofibulas (LTf, RTf) with several elements

of the right (RFo) and left (RFo) foot (calcaneus, navicular, metatarsals and proximal phalanges). Several cervical vertebrae, ribs, femurs and other forelimb elements are missing. This skeleton is about 16.5 cm long from the

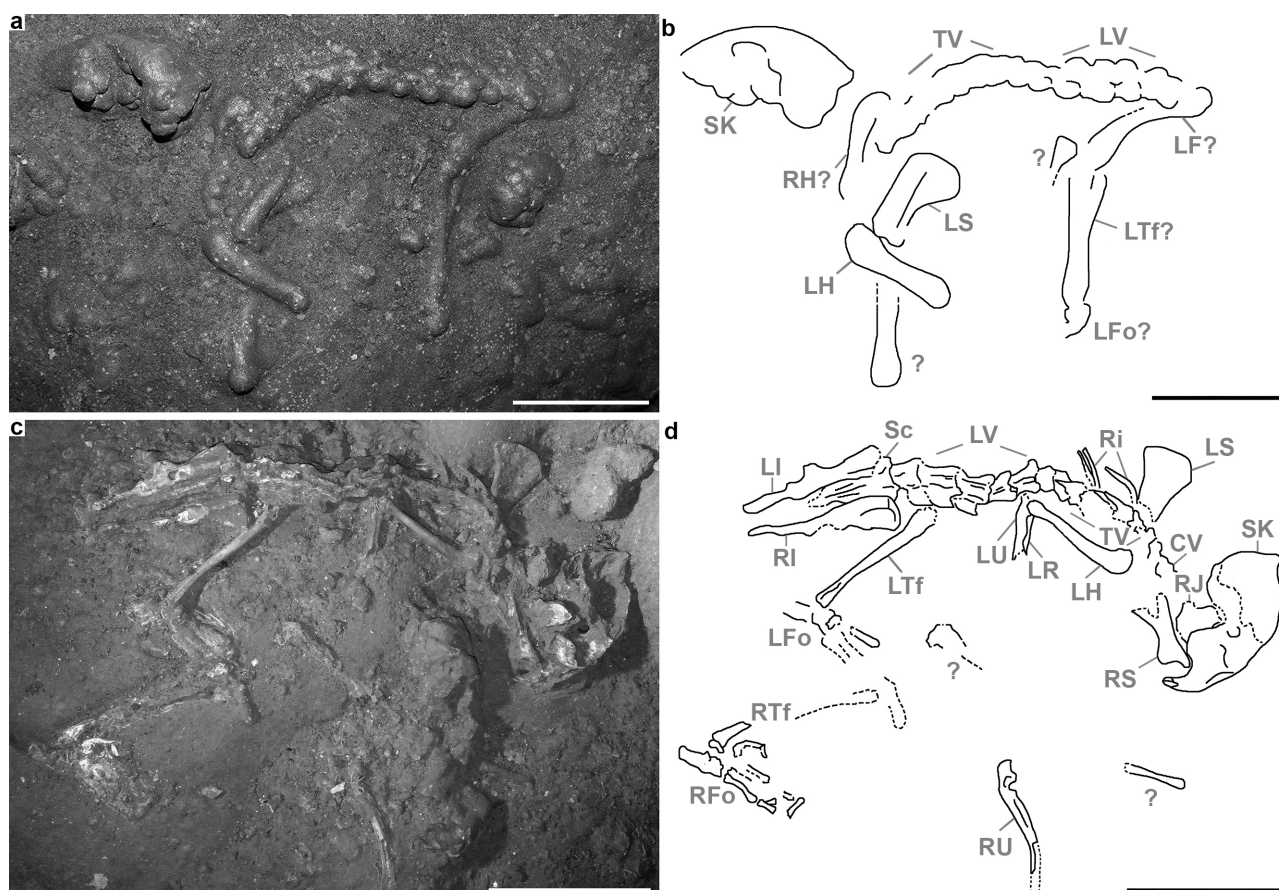


Fig. 3 - Articulated skeletons of *Prolagus sardus* from Grotta del Campanaccio (a, c) and drawings of the skeletal elements (b, d). Abbreviations: Sk: skull, RJ: right jaw, CV: cervical vertebrae, TV: thoracic vertebrae, LV: lumbar vertebrae, Sc: sacrum, LS: left scapula, RS: right scapula, LH: left humerus, RH: right humerus, LU: left ulna, RU: right ulna, LR: left radius, Ri: ribs, LI: left innominate, RI: right innominate, LTf: left tibiofibula, RTf: right tibiofibula, LFo: left foot, RFo: right foot, ? : indeterminate bones. For all figures scale bar = 5 cm. Photos by S. Papinuto (a) and G.A. Caddeo (c).

skull (frontal bone) to the left ischium. Although the skeleton is almost complete, some bones were broken. Due to the bad exposure and preservation it was possible to take a limited number of linear measurements (skull: 52.5, left humerus: 36.9, right calcaneus: 14.0 and right V metatarsal: 13.0, lengths in mm).

REMARKS

Prolagus remains from Grotta del Campanaccio do not permit a large statistical dataset of bone measurements. However, the humerus length indicates that this specimen is comparable in size with the samples of the fissure filling “IX-p” of Monte Tuttavista (min: 33.57, max: 39.40, mean: 36.43, length in mm) (Angelone et al., 2008). Unfortunately, a precise chronological position of the *Prolagus* assemblage from “IX-p” is not clear due to a taphonomic problem. In addition, it is difficult to attribute an age to the Grotta del Campanaccio ochotonid remains, because no associated taxa have been identified. *P. sardus* is certainly attested in Sardinia until the Iron Age (Wilkins B., 2000) therefore, a Holocene age for the Grotta del Campanaccio remains cannot be excluded.

In conclusion, this short note provides a contribution to the knowledge of *P. sardus*. In fact, articulated skeletons of this lagomorph have never been previously documented in the Sardinian and Corsican fossil record. In addition, the Grotta del Campanaccio is currently the only place where they are visible “in situ”. Therefore, it would be desirable to protect and enhance these valuable paleontological assets for future generations.

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