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# Multidisciplinary Approach in the Study of Early Middle Age Burials discovered in Sovana (GR)

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## Introduction

Since 2004, the team of the voluntary organization Turin Archaeological Group (GAT) has carried out the "Fiora Hills Archaeological Research Project" with the supervision of the Superintendence for Archaeological Heritage of (Diciotti, 2011). Among a wealth of archaeological sites, a Roman rural villa, overlaid by a Medieval cemetery, has been identified near Sovana (Sorano-Grosseto). Field situation was complex: sampling test excavations showed different burial phases and a pluristratified rural settlement. The investigation of the site was part of a two-year multidisciplinary study that has identified different human burials and isolated grave goods. The research was conducted by the field school thanks to the synergic action of authorities and universities that have guaranteed the admission to their physical and anthropological laboratories to volunteers.

## Materials and Methods

During the archaeological campaign, some burials and assemblages of bones were excavated (Fig. 1). An isolated belt element covered by hard sediment was retrieved too.



Fig. 1. Excavation of a burial.

Field procedures for skeletal remains were planned in order to ensure their integrity during exposure and recovery. Several laboratory analyses have been applied for sex and age-at-death determination, stature estimation and paleopathological observations (Charlier and Lorin De La Grandmaison, 2008; Canci and Minozzi, 2005; Murail *et al.*, 2005; Aufderheide and Rodriguez Martin, 1998; Barnes, 1994; Borgognini Tarli and Pacciani, 1993; Iscan and Kennedy, 1989; France and Horn, 1988; Brothwell, 1981; Acsádi and Nemeskéri, 1970; Trotter and Gleser, 1958; Manouvrier, 1892-93).

The accelerator mass spectrometry (AMS) radiocarbon dating was performed by CEDAD (University of Salento) in order to obtain a chronology by human bones analyses (Calcagnile and Quarta, 2011). Non-invasive techniques, such as digital radiography and qualitative X-Ray Fluorescence (XRF), were performed on metal artifact in order to evaluate the structure, highlight decorations and assess chemical composition (Corsi, 2011).

## Results

Eight individuals have been recovered until now: four male, two female, one subadult (around 16-17 years) and one infant. Average stature estimated is about 157 cm for females and 170 cm for males. The skeletons are in poor condition, showing differing degrees of preservation due to diagenetic events: only in two cases it was possible to reconstruct the entire skeleton and identify probable traces of decomposition (Fig. 2). Paleopathological analysis



Fig. 2. Left parietal (endocranial). Traces of decomposition.

has identified the presence of degenerative joint disease as a result of mechanical stress (in particular on axial skeleton and knees), congenital defects such as incomplete sacralization of L5 resulting from cranial shifting of lumbosacral border (Fig. 3) and cranial non metric variations

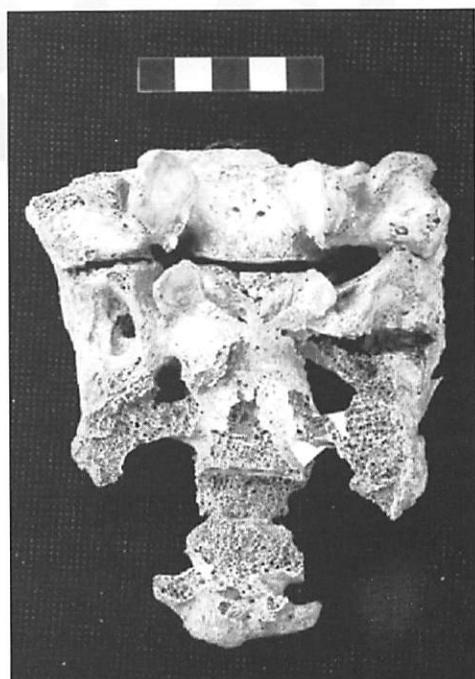


Fig. 3. Sacrum (posterior view). Developmental field defect of the axial skeleton: sacralization of fifth lumbar vertebra.

(sutural bones). Cases of bone remodelling are also present, such as enthesiopathies and micro-trauma (myositis ossificans) due to intense physical activities, and teeth wear, due to a heavy attrition on anterior dentition (Fig. 4).



Fig. 4. Tooth wear due to heavy attrition on anterior dentition.

The uncalibrated  $^{14}\text{C}$  dating of the bone samples is:  $1180 \pm 45$   $^{14}\text{C}$  yr BP (calibrated AD 700-750 and AD 760-980 ( $2\sigma$ ), samples LTL5705A and LTL5707A) and  $1284 \pm 50$   $^{14}\text{C}$  yr BP (calibrated AD 650-870 ( $2\sigma$ , sample LTL5706A).

The most significant result in digital radiography performed on the belt element was the identification of a refined

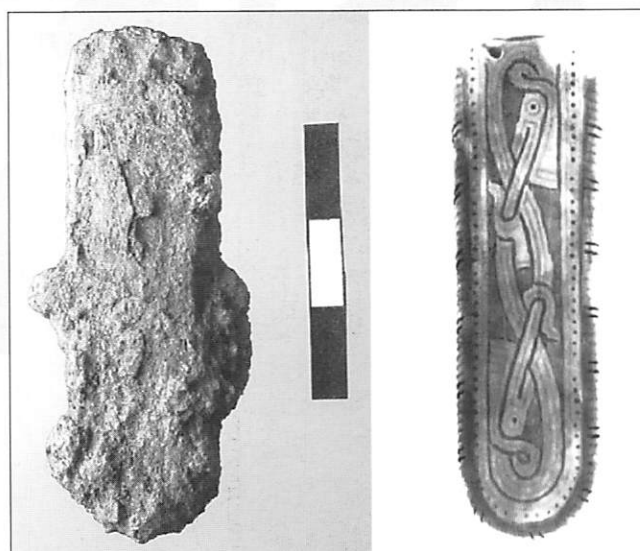


Fig. 5. Belt element: object (left) and X-Ray (right), with micro-focus Hamamatsu source and TDI Hamamatsu detector, tube voltage of 90 kV and tube current of 500 microA.

decoration depicting a zoomorphic composition (Fig. 5). Qualitative XRF analyses showed that the metals used are iron, for the base, and silver and brass (copper-zinc) for the decoration, which is realized with *agemina* and plating techniques.

## Discussion

The analyses of the archaeological context highlight a close similarity between our case and adjacent archaeological areas, where the existence of small Lombard settlements are already proved (Ferrarese Lupi, 2011). Anthropological analyses outlined stature values similar to the other Lombard groups in the region (Turini, 2009). Robustness of the bones and evidences of biomechanical stresses, mostly in the load-bearing joints, particularly in the spine and knees, suggest active occupations during life. Regarding the observation of non metric traits, the study highlights the presence of frequent sutural bones. The presence and the distribution of non metric cranial variants have been used by some authors to assess biological relationship.

Chronological limits (from second half of 7<sup>th</sup> - 10<sup>th</sup> century) and stylistic and elemental analyses of the metal object by X-ray, support the hypothesis of a Lombard cultural context. In conclusion, the study provided several interesting data to understand a complex historic moment, at the present not much known, such rural settlements near Sorano and Sovana during the Early Middle Ages. The multidisciplinary approach has reinforced the network among authorities, not always so close.

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