Archeologia e Calcolatori
Supplemento 4, 2013, 233-238

AN OPEN SOURCE OSTEOLOGICAL DATABASE PROPOSAL

1. Introduction

Since 2005, after the Human Paleontology course was activated within the Archaeology degree at the University of Padua, an osteo-archaeological study team has been created. In order to record the paleobiological research data in a comprehensive and systematic way, a database became necessary. Since no centralized database for archeological and osteological data exists on ministerial scale, every University and research team process their own data collection system, using in most cases proprietary software. The presented database has instead been developed on an open source platform, ensuring this way a free and most functional use of such data. Open source choice is moreover the most suitable one for what concerns university research (Lotto 2012; Lotto, Biscani, Tibolla 2012), as it allows release data from software solutions that may become outdated or incompatible and that can prevent the use of their data.

2. The database

The database is based on a multi-platform software which is versatile and easy to use, called LibreOffice Base (Gris 2011), but it can also be compiled using OpenOffice Base or NeoOffice Base. The software has been chosen mainly for its simplicity and intuitiveness, making its use suitable also for unskilled users. Even if the project is still on an advanced testing stage, the transfer of the database itself on a RDBMS platform such as PostgreSQL has already been planned; another scheduled improvement is the remote Internet access of the database server. The data is entered and stored in the table within the software, which is easily exportable through application (also provided by the LibreOffice software package). The table is visualized through eight different forms created into LibreOffice Base, and described in the following paragraphs.

2.1 *Biological forms*

The first section collects all information relating to the general biological profile of each individual (Brothwell 1972; Canci, Minozzi 2005; Duday 2004; Mays 2010). The section (Fig. 1) was structured in four different types, according to the specific needs of various classes of age at death (0-2, 3-12, 13-20 and adults). Each of them collects data about sex, age at death, stature and other main anthropological measurements based on the bones of the individuals. Each individual is catalogued by an identification number

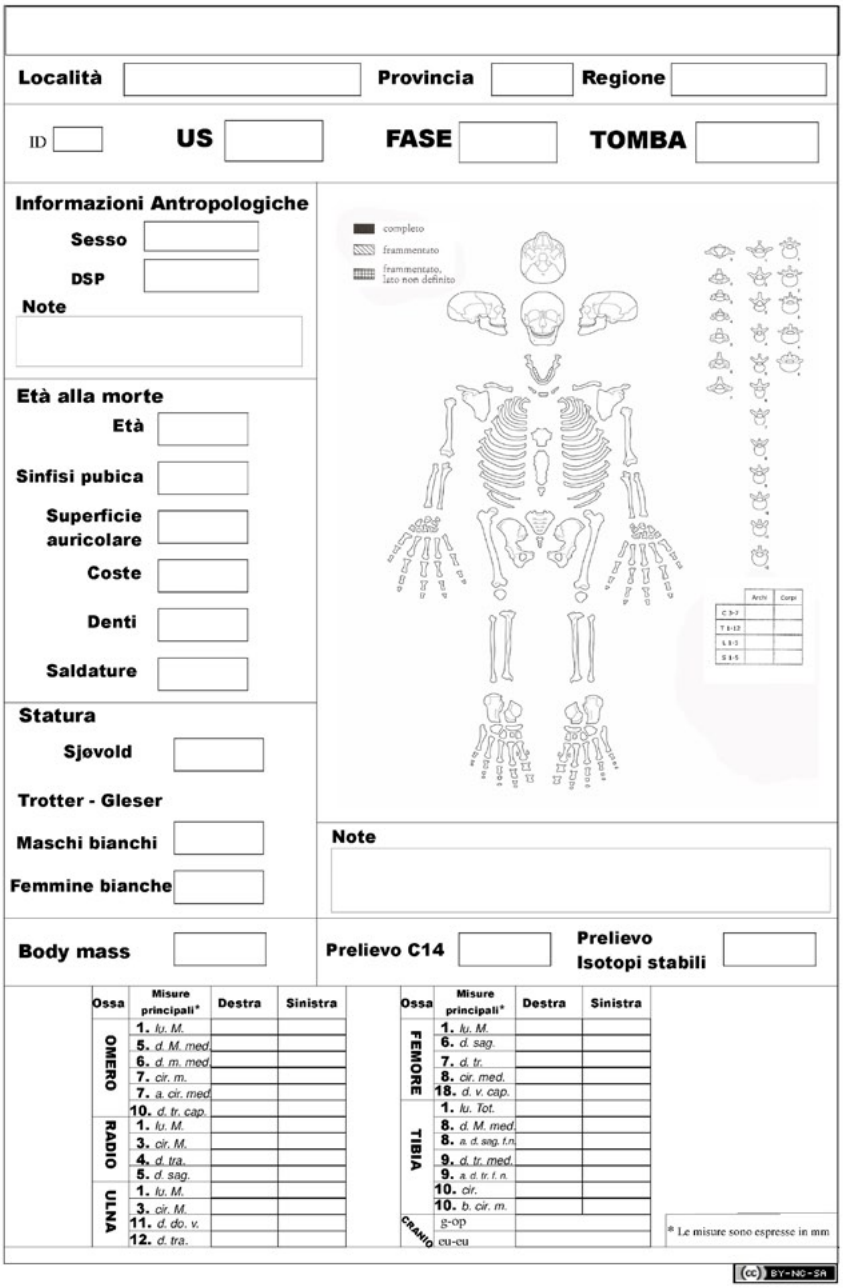

Fig. 1 – Biological form for adults.

ID

Scheda Patologie e Varianti Anatomiche

Ossa	Caratteristiche	Destra	Note	Sinistra	Note
Cranio	Granulazioni di Pacchioni				
	Ossa sovrannumerarie				
	Sutura metopica				
	Cribra cranii				
	Cribra orbitalia				
	Sinusite seni frontali				
	Sinusite seni mascellari				
	Sinusite seni etmoidali				
	Concha Bullosa				
Clavicola	Erosione legamento costoclavicolare				
	Lipping legamento costoclavicolare				
	Bone spurs legamento conoideo				
	Osteoartrosi				
Scapola	Pattern bisolcato				
	Entesopatia inserzione tricipite brachiale				
	Osteoartrosi				
Omero	Erosione cresta pettorale				
	Erosione grande rotondo				
	Ipertrofia tuberosità deltoidea				
	Pitting sopraspinato				
	Pitting sottoscapolare				
	Bone spurs epicondilo mediale				
	Bone spurs epicondilo laterale				
	Foro olecranico				
	Osteoartrosi				
Radio	Entesopatia bicipite brachiale				
	Entesopatia supinatore				
	Entesopatia pronatore quadrato				
	Osteoartrosi				
Ulna	Entesopatia tricipicite				
	Entesopatia bicipite brachiale				
	Entesopatia supinatore				
	Cresta pronatore quadrato				
	Osteoartrosi				
Mani	Osteoartrosi falangi				
	Osteoartrosi carpo				
	Osteoartrosi metacarpo				
	Entesopatia falangi				
Coxale	Faccette accessorie articolazione con sacro				
	Entesopatia otturatori esterni				
	Entesopatia grande gluteo				
	Osteoartrosi				
	Solco preauricolare				
Sacro	Faccette accessorie articolazione con coxale				
	Lombarizzazione S1				
	Spina bifida occulta				
	Sacralizzazione L5				
	Osteoartrosi				

Fig. 2 – Paleopathologies and alterations form.

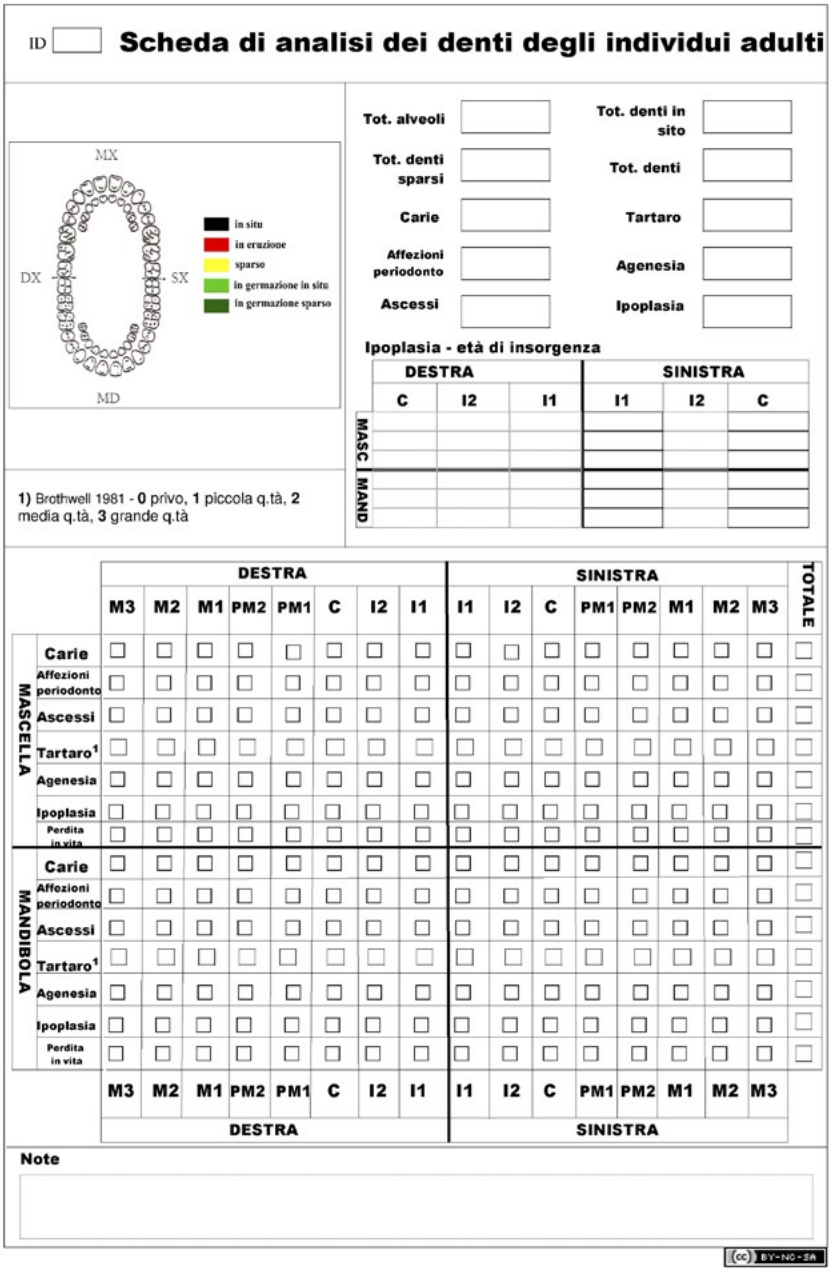

Fig. 3 – Dental health analisys form.

(ID) given by the user, and used to relate each form to the others and to make easier the database querying; the ID hence represents the primary key. The form is completed by an image of a skeleton type (Duday 2004), which is colored using a color scheme that visually describes the quantity and state of conservation of the skeleton itself.

2.2 *Palaeobiological and palaeopathological forms*

This specific section, dedicated only to adults, is designed to record palaeobiological data and consists of two different forms. The first one is a summary where the user can recall presence or absence of trauma and/or pathologies, by graphically locating them on the skeleton picture presented in the form. In the second one all pathologies, alterations and bones characteristics (Canci, Minozzi 2005; Baxarias, Herrerìn 2008) are listed in a more detailed way for each single bone (Fig. 2).

2.3 *Dental form*

The final form is intended to recording data about dental health status of adult and sub-adults (Fig. 3). First of all the form presents a graphical illustration which shows presence or absence of teeth, and is then followed by an extensive table that allows reporting of pathologies for each observed tooth (Hillson 2005).

3. Future plans and conclusions

A study for a new database version is under way, and it is intended to collect data on multiple and/or collective burials both for adults and children. Moreover, other two forms for the recording of cremation data are under development as add-ons (either for the current database or its newer version): the first form will collect general information about bone's fragments and their related temperatures. The other one will provide a table to study in detail the cremated bones.

The database is now available in a release candidate 1.5 version formally called "Bumblebee", but still being tested and therefore subject to further changes or add-ons. A new database version based on PostgreSQL as on-line server and LibreOffice as client is now under testing. Currently the database is distributed under a Creative Commons Attribution Non Commercial Share Alike 3.0 Italy (CC BY-NC-SA 3.0).

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ABSTRACT

At the University of Padua, since 2005, after the inclusion of a course in Human Paleontology as part of the degree in archaeology, an osteo-archaeology study team has been active. In order to record in a comprehensive and systematic manner data relating to paleobiological research, an open source osteological database was developed. The database is based on LibreOffice Base, a versatile and easy to use software, as well as a multiplatform. The data is entered and stored in a table within the software, which is freely and easily exportable. The table is visually expressed through eight forms created in LibreOffice Base. The first section collects all information relating to the general biological profile (sex, age at death, stature, etc.) of each individual. The next section, developed only for adult subjects, is intended for the recording of paleobiological data and consists of two different parts, reporting of the possible presence or absence of trauma and/or pathologies. All pathologies, alterations and bone characteristics are listed in detailed form. The final form is intended for recording data about the state of dental health of adult and child subjects. Currently the database is distributed under a Creative Commons Attribution - Non Commercial - Share Alike 3.0 Italy (CC BY-NC-SA 3.0).