Earth is a building material frequently encountered on archaeological sites. It is a ubiquitous material found all around the world in traditional vernacular housing, but also in complex societies with prestigious buildings in areas where building stone is not available and where climatic conditions allow its use.

In a few areas, the clayey sediment of the subsurface can be used, but it generally has to be tempered, and the role of straw is paramount in this process (for both bonding and plasticity). Various parts of cereals are used as temper and in most cases these are by-products of crop processing (chaff, straw, weeds, etc.).

Through time, the organic parts of the plant temper decompose, leaving impressions in the clay that once contained them and providing an opportunity for their study. Attempts to identify the cereal species involved have been made (Willcox, 1995; Willcox and Tengberg, 1995; Willcox and Fornte, 1999).

However, the impressions are incomplete making species identification difficult. The major problem is in fact the absence of detailed information on the vegetal structure of cereal glumes and inner glumes (glumelles).

This lack of information led to the building of a reference system in which distinctive criteria for the different elements involved was established (Bonnaire, 2005 and 2006). The choice of the descriptive criteria is inspired partially by L. Martin (2002), S. Jacomet and collaborators (2008) and G. Jones et all. (2000).

The aim was to provide a tool for taxa identification in situations where no macro-remains were available.

The by-products of crop processing used for tempering clay for building.

Reference system of Identification of the glumes and glumelles imprints.

This level is based on the analysis of key characters of modern cereals (various species of wheat, barley, oat and rye). In addition, some sub-species typical from temperate regions were also chosen (for example: emmer, hard wheat, bread wheat, spelt or six row barley).

Most of the diagnostic characters were observed in the glumes, paleas and lemmas at the level of species and sub-species. These elements are extremely fragile and tend to disappear when plant remains are preserved by charring, but they are represented in the majority of impressions found in building material.

Following this descriptive work on modern specimens (Bonnaire and Tengberg, 2007; Bonnaire, 2011; Bonnaire, in press), particular anatomical characters were attributed to each cereal species and the results were presented in atlas form with each sub-species described on a card.

One statistic method (ACF) has been tried on the morphological criteria as well as each cereal species to distinguish the most characteristic criteria about one cereal sub-species.

After this step and in addition to the atlas, a French summary of all the morphological criteria observed for each taxon was produced in the form of a classical botanical identification key (Bonnaire, 2006).