

An Offer of Bread, Beer [...] and every other Good Food: the Diet in Ancient Egypt and Paleonutritional Considerations on Prince Uage of El Fayum

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Introduction

Food is an expression not only of the state of health of a human group, but also of cultural, social and religious aspects. The main archaeological information about dietary habits are basically provided by studies on funerary contexts (Various, 1987). In order to guarantee the deceased *ka* survival in the afterlife, rich grave goods were buried inside the eternal mansions of the Egyptians to satisfy the needs of the dead, including food. This is often preserved *in situ* carefully mummified or only symbolically present through inscriptions reporting offer lists and sculptural or painted representations. The present study provides a description of dietary habits in ancient Egypt, focusing on an illustrious exponent of the senior class: prince Uage of El Fayum, a leading figure of the Middle Kingdom, whose tomb was found in the necropolis of Khelua by a mission conducted by the University of Pisa.

Materials and Methods

Paleonutritional analysis have sampled the skeletal remains of a male and mature aged individual, suffering from arthritis and osteoporosis and almost devoid of all teeth lost *ante mortem* (Mallegni, 2003). The advanced age, for the period in question, is indicative of a good nutritional status, considering that the average age of the ancient Egyptians was between 37 and 45 years. Among the few remains of the post-cranial, besides a rib - broken and then healed -, it is worth noting an interesting ergonomic marker: the right humerus shows a marked hypertrophy with strong muscle joints, representative of a frequent adduction movement of forearm on the arm (Mallegni, 2003). Considering the wetland, rich in wildlife and birds environment of Fayum and the social status of the high dignitary, it can suggest that he devoted himself to archery (Mallegni, 2003), hunting activity practiced by aristocrats as a entertainment. Paleonutritional analysis, conducted on the remains of Uage, are formulated by the valuation of some trace elements, set in the bones through diet. Strontium and magnesium are indicators of a vegetarian diet: particularly

high concentrations of strontium are contained in green leafy vegetables, but also in molluscs and small fish (Sillen and Kavanagh, 1982), while wheat germ, oatmeal and oat flakes, corn and above all glume and roughage, beans, peas and lentils are rich in magnesium (Mertz, 1987). Zinc and copper are indicators of a high-protein diet from animal product: significant levels of zinc are found in red meat, milk and dairy products, but also in molluscs and crustaceans of marine origin, whereas a high copper content is found in the offal, shellfish and marine and terrestrial, in seafood (Mertz, 1987). The sample, taken from the cortical portion of the skeletal remains, has been subjected to an appropriate and specific laboratory process (Bartoli and Bacci, 2009): it has been deprived of the surface and the trabecular portion through mechanical removal and washed in ultrasounds baths, in order to eliminate the presence of inorganic contaminants introduced during the deposition. Then it has been incinerated in the furnace at 600°C to destroy the organic component, pulverized in special mortars and in the end subjected to two consecutive hot acid attacks with HNO₃ and HCl, in order to obtain a solution for the spectrophotometric analysis. The results obtained from the analysis are processed on the basis of the different applied dilutions, according to the characteristics of the examined elements, and normalized in quantities of ppm (parts per million). In order to standardize the data and soften the influence of diagenetic contaminants, each analyzed trace element was usually related to calcium. The ratio element/Ca implies that any loss or enrichment in calcium involves changes of equal intensity in the other elements, a condition not always realized. Calcium is an element subjected to diagenetic alteration (Lambert *et al.*, 1985) and therefore the ratio with trace elements, which have a different behavior *post mortem*, could be problematic. Considering that calcium is in this case below the standard value, we recommended a paleonutritional reconstruction based on interpretation of the absolute values expressed in ppm (parts per million).

Results

The high concentration of strontium, above the reference values, cannot be related only with an intensive consumption of vegetables, but it seems to indicate the systematic use of fish resources. The impact of protein

assumption in the diet is shown by the discrete levels of zinc and the optimal concentration of copper, indicative of an intense and systematic consumption of protein-rich resources, such as offal and shellfish. The magnesium value denotes a discrete assumption of cereal, above all non-refined whole meal flours.

to the divine banquet. However, bearing in mind that only one individual cannot represent an entire category, the paleonutritional results seem to be consistent with the feeding models of ancient Egypt obtained from textual and archaeological sources.

Calcium	Strontium	Zinc	Magnesium	Copper
250-350 mg/g	Herbivores: 400-500 ppm Omnivores: 150-400 ppm Carnivores: 100-300 ppm	Herbivores: 90-150 ppm Omnivores: 120-200 ppm Carnivores: 170-250 ppm	2200-3100 ppm	20-30 ppm

Tab. 1. Reference values for paleonutritional analysis. Data expressed in ppm.

Calcium	Strontium	Zinc	Magnesium	Copper
180 mg/g	552 ppm	126 ppm	2040 ppm	49 ppm

Tab. 2. Paleonutrition analysis results. Data expressed in ppm.

Discussion

The results of the analysis have shown a nutritional pattern, consistent with the high status of the Prince, a senior official at the court of the pharaohs of the Twelfth Dynasty and priest of the cult of Sobek, as the titles inscribed on the walls of his tomb display. The wealthy condition and the resource-rich and fertile environment of the Fayum have probably allowed a substantial and varied diet, consisting of bread, vegetables and legumes in particular, but also meat, both bovine and game, out of lower classes' reach. In addition, the priestly functions, which bound him to the cult of Sobek, gave him the opportunity to take part

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