Food remains from Bronze Age Archondiko and Mesimeriani Toumba in northern Greece?

Soultana Maria Valamoti

Dept. of Archaeology, Aristotle University of Thessaloniki, 54006 Thessaloniki, Greece, e-mail: sval@hist.auth.gr

Received January 8, 2002 / Accepted April 1, 2002

Abstract. Finds of fragmented cereal grain from the sites of Mesimeriani Toumba and Archondiko in Macedonia, northern Greece, dated to 2100-1900 cal. B.C. provide the basis for the experimental investigation of the effects of a) fragmentation before and after charring, b) treatment of grain with water and c) charring conditions, on the morphology of the fracture surface. The experiments indicate that it is possible to distinguish fragmentation before and after charring and, with low charring temperatures, it is possible to distinguish prior treatment of grain with hot water. Comparison of the archaeological grain with the grain produced experimentally suggests that both archaeological finds represent ground grain, and at least those from Mesimeriani correspond to some type of wheat bulgur, probably intended for human consumption. These finds mark the prehistoric origins of a foodstuff widely used in Mediterranean cuisine. Further experimentation along the lines followed here would be desirable.

Key words: Greece -- Bronze Age -- Bulgur -- Charring experiments -- Cereal processing -- Grain morphology

Materials and methods

The archaeological material

The finds consist of charred fragmented cereal grain and come from the tell sites of Mesimeriani Toumba (Grammenos and Kotsos, in press), in the region of central Macedonia, and Archondiko (Papaefthymiou-Papanthimou and Pilali-Papasteriou 1995; Papaefthymiou-Papanthimou et al. 2002; Chrysostomou and Chrysostomou 1999), in the region of western Macedonia (Fig. 1). Both finds have been dated to 2100-1900 cal B.C. which corresponds to the end of the Early Bronze Age in northern Greece. The find of fragmented grain from Mesimeriani Toumba comes from the interior of a 'pot' which was imbedded in a clay construction. The find from Archon-
Fig. 2. The archaeological finds: a. fragments from Mesimeriani (top row), fragments from Archondiko (bottom row); b. close-up of Mesimeriani fragments; c. Archondiko fragments fused together. Scale 2mm.

diko consists of three samples associated with two bin-shaped clay constructions. Both finds come from the interior of houses that were destroyed by fire.

The fragmentary cereal grain was retrieved from soil samples that were processed by flotation using a variant of the Ankara machine (French 1971). The smallest mesh size used was 300 μ. Identification of the fragments was carried out with the help of a stereomicroscope (magnification x8 - x40).

The Mesimeriani fragments are mostly free or disaggregated while at Archondiko, conglomerations of fragments stuck together are common (Fig. 2). The Mesimeriani fragments are mostly small: 57% of the fragments are smaller than 1 mm and 43% range between 1 mm and 2 mm. The reverse is observed in the Archondiko material where 35% are smaller than 1 mm and 65% range between 1 mm and 2 mm. The conglomerates represent approximately 10% of the total volume of fragments at Archondiko. The surface where the fragments had been broken (hereafter referred to as the fracture surface) differs at the two sites. The fracture surface of the Mesimeriani frag-ments is smooth and shiny in most cases, and there is evidence for the endosperm slightly oozing out at the fracture surface (Fig. 2). Unlike the Mesimeriani fragments, those from Archondiko have a pitted structure on the fracture surface, lack the shiny appearance of the Mesimeriani finds, and very rarely have the slight bulging observed at the fracture surface of the Mesimeriani fragments.

Most of the fragments result from the longitudinal frag-mentation of caryopses. Fragmentation prevents identification to genus or species. Those fragments from Mesimeriani which are large enough to be identifiable to genus or species probably represent wheat caryopses as their overall appearance resembles wheat, having a deep ventral groove and a high dorsal ridge. This high dorsal ridge suggests einkorn or emmer, and where the ventral surface is preserved for some length it is either convex like einkorn (grains from one-seeded spikelets), or flat as in emmer (or grains from two-seeded einkorn spikelets). The fragments from Archondiko resemble barley grain, having a shallow ventral groove and being biconvex in lateral view.

These finds from Mesimeriani and Archondiko provided the basis for an experimental investigation of the processes that resulted in the specific morphological characteristics of each concentration. First it was necessary to establish the stage during which fragmentation occurred, i.e. before or after charring. A further step was to explore some of the factors that may have influenced the appearance of the grain fragments, both a) the effects of treatment of the grain with water prior to charring and b) the effect of charring conditions on the appearance of the grain.

Charring experiments

Charring experiments were conducted using a muffle furnace and the following cereal grain material.
a) Grain that had not received treatment with water. For this purpose dehusked einkorn grain was used as this was readily available and the grain had received no treatment. By contrast, whole durum wheat grain sold in supermarkets was rejected as it is boiled and dried prior to packaging. The dry einkorn grain used was both whole and cut in two with a dissecting knife.
b) Grain that had received treatment with water. This category included i) dehusked einkorn grain, both whole and cut in two with a dissecting knife, boiling water then being poured onto the grain which was left to soak for 15 minutes ii) bulgur treated with boiling water in the same way, and iii) unsoaked bulgur. After soaking, the material was emptied on kitchen paper where it was left for 1-2 minutes so that excess water was absorbed. The soaked material, still wet, was subsequently charred.

Bulgur is one of the names given to a cereal product, widely used in the Mediterranean and the Middle East as an ingredient for the preparation of many dishes (Abdalla 1990, pp 33-35). It is usually made from macaroni or emmer wheat (Hillman 1984, p 135; Bayram 2000, p 81) and occasionally bread wheat (Bayram 2000, p 81). Bulgur was considered in these experiments because its preparation involves the treatment of cereal grain with water. Whole wheat grains, after being thoroughly cleaned of impurities, are boiled or simmered for 1 to 3 hours (Bayram 2000, pp 81-82), or until they taste right (Abdalla 1990, p 30). They are subsequently dried, the bran is removed and the grain is ground into fragments. These fragments are then sieved and different size ranges are used for different dishes.

Two types of bulgur were used in these experiments. The first, sold under the name of piligouri (a word derived from the word bulgur), included durum wheat grain fragments of a wide size range and was purchased from a Greek supermarket. The other type, purchased from an English supermarket, consisted of smaller and more uniform grain fragments, with the commercial name taboulé, taken from the Arab salad for which this type is used; the wheat species used was not indicated, though durum wheat would seem the most likely candidate.