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Archaeobotanical remains from late 6th/early 5th millennium BC Tel Tsaf, Israel

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ABSTRACT

This study illustrates how archaeobotanical information is a key line of evidence for investigating the emergence of social complexity in the southern Levant during the late 6th/early 5th millennium BC. The ability of emerging elites to produce surplus agricultural produce was an important factor in social stratification. Excavations at the site of Tel Tsaf (5200–4600 cal BC) in the central Jordan River Valley, Israel revealed four courtyard buildings each containing a number of large storage silos indicating that the inhabitants of the site had the ability to store large amounts of comestibles. The results of the archaeobotanical analysis indicate the presence of barley (*Hordeum* sp.), wheat (*Triticum* sp., *Triticum dicoccum*, *Triticum monococcum*), lentil (*Lens culinaris*), and pea (*Pisum sativum*) throughout the site. Analysis of flotation samples from the silos indicate that cereals were stored relatively free of processing debris, but that weeds mimicking crops (wild grasses of a similar size to the cultivars) had not been removed. This suggests a relatively high degree of labor organization due to the large amount of work involved in cleaning cereals of processing debris post-harvest.

1. Introduction

The late 6th/early 5th millennium is an important period during which the foundations for the first state level societies that appear in the succeeding Bronze Age were laid. Most models describing the emergence of state level societies require surplus agricultural production (Carneiro, 1970; Childe, 1950; Redman, 1978; Wittfogel, 1981; Earle, 1997; Stein and Rothman, 1994). Archaeobotanical remains are thus an important line of evidence for investigating the process of social complexity, including the development of social stratification. To support larger populations and generate more wealth, people had to grow more food. This can be accomplished via two basic strategies: extensification, the expansion of the amount of land under cultivation and intensification, the extraction of more agricultural produce from a given unit of cultivated land. To examine the degree of social complexity during the late 6th/early 5th millennium BC Tel Tsaf, this study evaluates the archaeobotanical remains to detect the presence and describe the nature of extensification and intensification strategies used by the site's inhabitants.

Tel Tsaf (5200–4600 cal BC) is a large site located in the central Jordan River Valley, Israel (Gophna and Sadeh, 1988). Between 2004 and 2007, the site was excavated by a team from the Hebrew University of Jerusalem directed by Garfinkel et al. (2007). The site is composed of three shallow hills and reaches approximately 20 ha in total size (for a complete discussion of the site and its geographic setting see Garfinkel et al., 2007). Three areas were excavated by Garfinkel designated A, B, and C. Area A consisted of eight 2 × 2 m squares on the eastern side of the main mound. No archaeobotanical samples were taken from this area. Area B was located on a small hill just south of the main mound. Here excavators found a well and associated living surface (Garfinkel et al., 2007). A total of 44 flotation samples were collected from Area B, primarily from within the well itself. The focus of this research is Area C which is the largest excavation area. Approximately 800 square meters were excavated in Area C revealing four courtyard buildings.

The courtyard buildings are made out of mudbrick and average 250 square meters in size (Fig. 1). Each building contained a mix of rectilinear and round rooms, hearths, large clay or brick-lined roasting pits 21 circular features interpreted as silos (Ben-Shlomo et al., 2009; Garfinkel et al., 2009) (Figs. 1 and 2). Both the round and rectangular rooms have been interpreted as living or storage spaces based on the assemblage of artifacts in these spaces (Garfinkel et al., 2007; but see Hubbard, 2010). A total of 58 flotation samples were collected from a variety of contexts from in and around these four courtyard building complexes including fill from courtyards, fill from round and rectangular rooms, hearths, ovens, a buried jar, two silos, a burial (located within a third silo), and mudbrick installations (Table 1).

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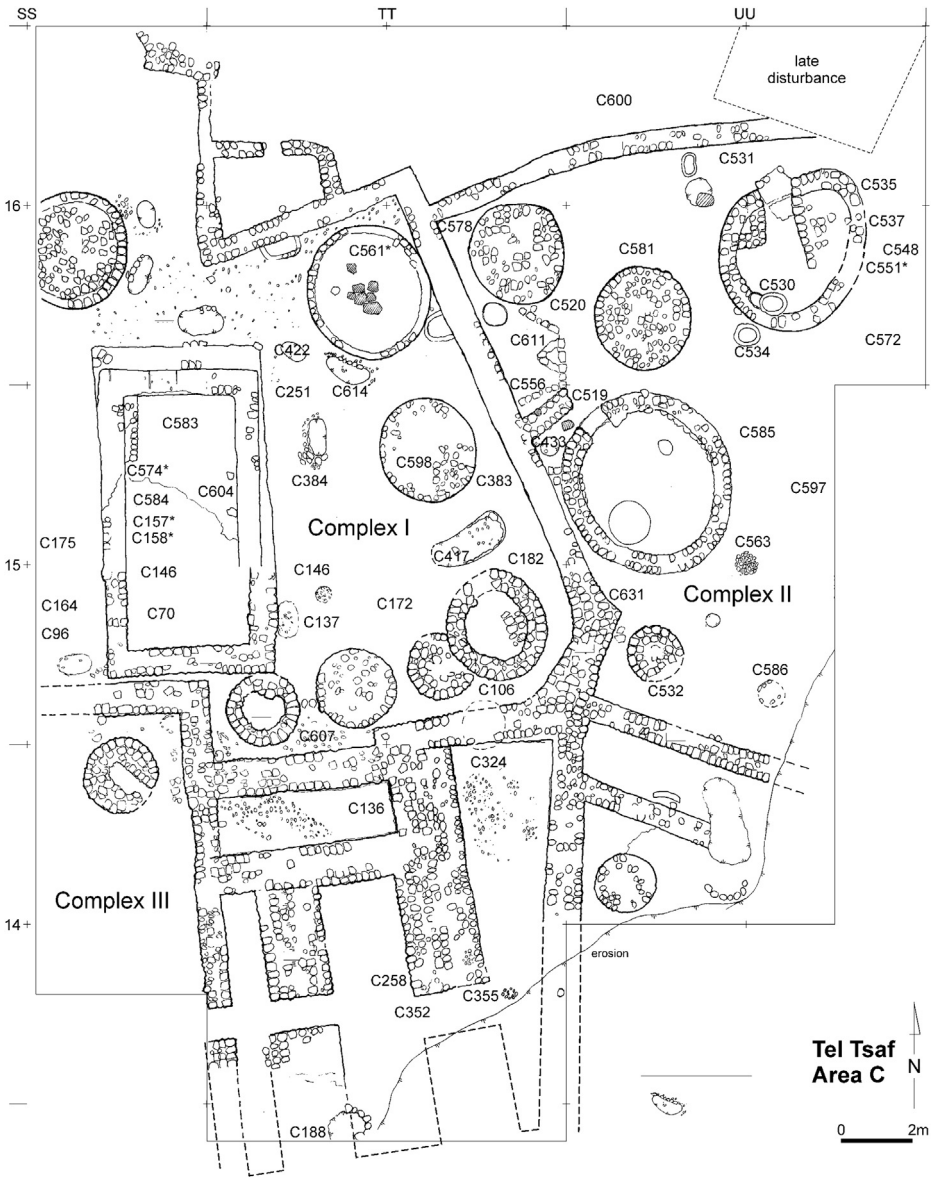

Fig. 1. A map of Tel Tsaf Area C showing the location of the various archaeobotanical flotation samples (courtesy Yosef Garfinkel). Sample numbers with an *denote samples taken from a layer below the one depicted.

Previous excavations at Tel Tsaf conducted by R. Gophna in the 1980s yielded a limited number of charred wood remains that were analyzed by Liphschitz (1988). She found wood remains from Acacia, Pistachio, Poplar, Oak, Tamarisk, Olive, and Jujube (Liphschitz, 1988). No other archaeobotanical study from the site has been published. The site is situated in the Irano-Turanian vegetation zone and receives just under 300 mm of rainfall a year which, though low, falls within the zone of rainfed agriculture (Liphschitz, 1988). Fertile soils, numerous springs, and the proximity to the Jordan River make this a productive agricultural land.

How Tel Tsaf fits into the overall prehistoric sequence of the southern Levant is debatable. The generally accepted dates for the Chalcolithic are 4500–3600 cal BC (Gilead, 1988; Levy, 1998; Rowan and Golden, 2009). The radio carbon dates from Tel Tsaf (5200–4600 cal BC) place it earlier than what is generally considered the Chalcolithic period in the southern Levant. Garfinkel et al. (2007) notes that the material remains from Tel Tsaf differs from the Wadi Rabah (late Neolithic) and Ghassulian (Chalcolithic) but argues that the presence of V-shaped bowls with two handles, fan scrapers, and fenestrated basalt vessels makes the assemblage more like the Chalcolithic than Neolithic. Based on his interpretation of the Neolithic and Chalcolithic pottery sequence in the southern Levant, Garfinkel (1999, 2007) places the Tel Tsaf remains in a period he calls the Middle Chalcolithic (but see Banning, 2001; Braun, 2008; Lovell, 2000 for contrary views). Because of the ongoing debate about Tel Tsaf's placement in the sequence of prehistoric cultures in the southern Levant, I have chosen to use the term transitional Chalcolithic here.

Tel Tsaf is significant both because of its large size and the large number of storage silos recovered. Nineteen silos were found at Tel Tsaf. The remains consist of round mudbrick foundations that vary in diameter from 1.5 to 4 m. The walls of the silos did not survive except in one instance where they were preserved to a height of 30 cm. Garfinkel et al. (2009: 376) note that "the outer wall of the silo was thin and built on top of the podium, with elongated bricks laid on their narrow end." Since the walls are not well preserved it