

## THE SUBSISTENCE AND THE PLANT USE IN TELL GHANEM AL-ALI: EARLY BRONZE AGE SYRIA

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### 1. Introduction

The Early Bronze Age (EB), equivalent to the 3rd millennium BC, indicates a dramatic change in settlement pattern and material culture within the Middle Euphrates area. The number of settlement sites increased dramatically at the beginning of the EB, but many of them were (temporarily) abandoned or declined at the end of EB. It is also known that this decline was not general throughout Syria, and some large cities survived well into the Middle Bronze Age (MB) (Schwartz 2007). Many studies have focused on how much of the increased aridity there was around 4200 cal.BP (Weiss et al. 1993) had been affected, or what kind of human factors had been concerned with this phenomenon (e.g., Schwartz and Miller 2007, Riehl 2010). In this paper, I will present the preliminary archaeobotanical results obtained from a recent excavation undertaken in Tell Ghanem al-Ali in ar-Raqqa district in Syria. This region has few excavated sites to date for there was no salvage works accompanied by dam constructions.

Tell Ghanem al-Ali (TGA) is located in the lower river terrace of the Euphrates, 50 km east from the modern city of ar-Raqqa (Fig. 1). The area between ar-Raqqa and Deir ez-Zor is a semi-arid land area with less than 200 mm of rainfall per year. A Syro-Japanese team started preliminary excavation sounding in 2007 and discovered some EB layers (Hasegawa 2010). The occupation of this site began in the Late Chalcolithic period / the beginning of the EB, and generally ended during the Early Bronze Age IVa. The original size of the site was approximately 12 ha in total, although unfortunately the southern and northern parts of the tell have been partially destroyed.

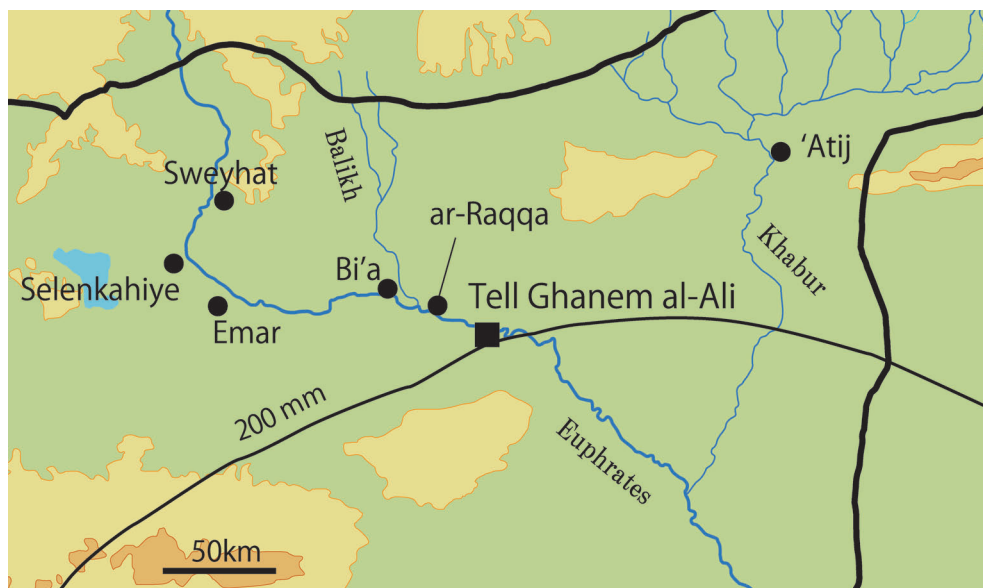


Fig. 1 EB sites mentioned in this paper

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The largest EB site in the ar-Raqqa area is Tell Bi'a, and is situated at the junction between the Euphrates and the Balikh River. This location is considered to be the regional centre. Two contemporary sites of medium size are located 5–6 km east and west of TGA: Tell Mughla as-Saghir and Tell Hamadin. A settlement survey indicates that middle sized EB sites are situated at regular intervals along the river east of ar-Raqqa (Nishiaki 2010), so it seems probable at this stage to identify TGA as one of those settlements.

## 2. Methodology

Archaeological soil samples were taken mainly from Square 1, 2, 7 and 8 but this paper deals only with results obtained from Square 2 (Fig. 2). Square 2 is a step-trench (4 m × 27 m) dug on the northern slope. During the excavations three phases through 3rd millennium BC were identified by the team. There is a presumable hiatus between the oldest Phase 1 and Phase 2. The structures of Phase 3 were discovered just 50 cm below the surface soil.

The soil samples that were taken were identified as cultural fill, hearths, pot contents and ashy layers. The author collected charred remains by water-flotation with 0.3 mm mesh. The observations through the use of a microscope was undertaken in a laboratory facility at Waseda University in Tokyo.

## 3. Results

A total of 36 soil samples (328 litres) yielded some 20,000 identifiable plant items covering a range of 60 species.

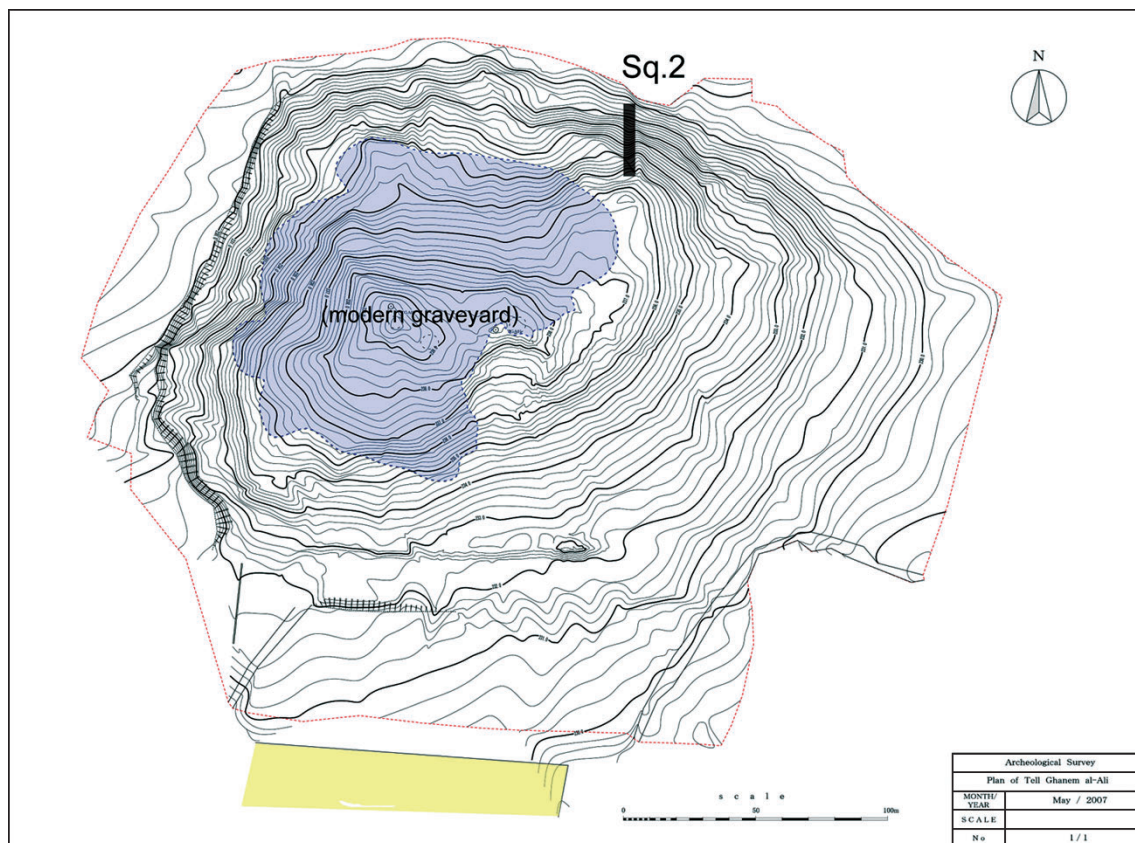


Fig. 2 Tell Ghanem al-Ali

### 3.1. Edible Plants (Fig. 3, Tab. 2)

Most predominant crop remains were barley through the three phases, and it occupies 66% of whole food plants. Both grains and chaff of barley are mostly of the two-row hulled type. Wheat grains were scarce, although the number of the spikelet bases reached nearly one third of barley rachis. The most common legume is lentil, followed by grass pea and bitter vetch, but its quantity is negligible compared to barley. Grape is the only fruit in TGA and their pips are numerous in Phase 3.

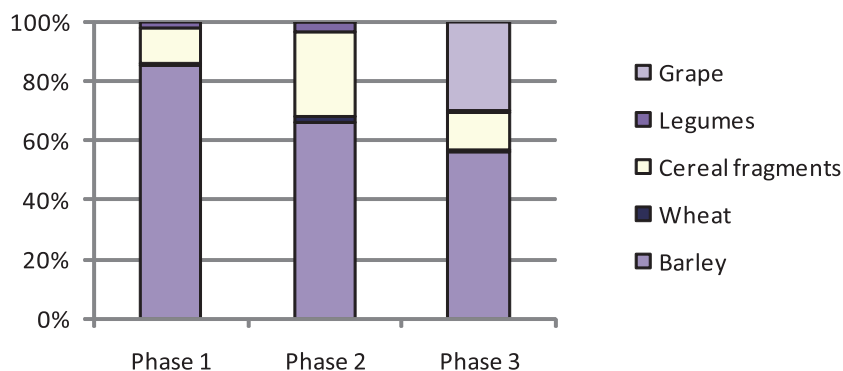


Fig. 3 Edible Plants from TGA (Sq.2)

### 3.2. Wild Species (Tab. 2)

Chenopodiaceae, like *Atriplex* sp. and *Suaeda* sp., was the most dominant among wild species, followed by Gramineae (*Lolium* sp., *Bromus* sp., *Aegilops* sp., *Phalaris* sp.) and Leguminosae (Trifoliae and *Prosopis* sp.). Other species are: *Aizoon* sp., *Galium* sp., *Malva* sp., *Silene* sp., *Ziziphora* sp., Boraginaceae and Polygonaceae and so on.

The most prominent characteristic of the weed plant assemblage is the large quantity of Chenopodiaceae. Especially *Atriplex* sp. and *Suaeda* sp. appear in great abundance (1102 and 3734 items each). The composition of wild taxa of Phase 1 has several differences from Phases 2 and 3, but this can be due to the small number of samples.

## 4. Discussions

Food plants are similar to contemporary sites in the Middle Euphrates. No stored grains were recovered, but it is safe to assume through the evidence that barley cultivation was the staple food in TGA, just as in the other EB sites in the Middle Euphrates. Wheat is not as tolerant to the arid environment as barley therefore environmental conditions may have limited its cultivation to a small scale. The importance of legumes is not clear from the archaeobotanical data. The second dominant food crop is grape and appears in large numbers in Phase 3. Grape is the most common fruit found in many EB sites and it seems that its cultivation was widespread within the Middle Euphrates area. Probably grape was one of the crop assemblage in TGA as well. Food assemblage does not generally change from Phase 1 to Phase 3 except for grape.

Among the wild taxa, the abundance of Chenopodiaceae characterizes the plant assemblage of TGA. The large amounts of Chenopodiaceae has also been reported in Tell Selenkahiye (van Zeist *et al.* 1985/86 ) and Tell 'Atij (McCorriston 1995), and TGA is the third example of this discovery. An interpretation of this abundance of Chenopodiaceae has not been made, but their concentration indicates its exploitation because chenopod seeds appear in only small numbers in the other sites (Tab. 1).

Chenopodiaceae is typical of the draft- and saline-tolerant species and some of them are known as a useful fodder for dry regions (Otal *et al.* 2010). Besides, small, hard-coated seeds like chenopods

Tab. 1 Number of Chenopodiaceae found in Syrian EB sites (Riehl 2010, Miller 1997, van Zeist *et al.* 1985/86, McCorrison 1995)

	TGA	Emar(EB)	Sweyhat	Selenkahye	Atij
Atriplex	1102	1	2	0	929
Suaeda	3734	2	0	4586	0
Other Chenopodiaceae	1716	7	8	36	9
total wild taxa	12247	1659	24663	16409	5825

Tab. 2 Plant remains from Sq.2 of TGA

	Square 2			
	Phase 1	Phase 2	Phase 3	total
num. of samples	6	19	11	36
soil amount (L)	55	175	98.4	328.4
charred amount (ml)	118	188	256	562
Barley	1168	1407	1421	3996
Wheat	15	33	4	52
Cereal fragments	166	612	319	1097
Legumes	25	62	26	113
Grape	0	6	748	754
Barley (chaff)	189	172	364	725
Wheat (chaff)	89	4	105	198
<i>Atriplex</i>	32	598	472	1102
<i>Suaeda</i>	2560	817	357	3734
Chenopodiaceae	616	725	375	1716
<i>Aegilops</i>	15	13	20	48
<i>Bromus</i>	173	85	80	338
<i>Lolium</i>	166	120	57	343
<i>Phalaris</i>	1	23	25	49
Graminaceae	234	446	224	904
<i>Aizoon</i>	10	323	204	537
<i>Heliotropium</i>	6	131	5	142
Boraginaceae	139	81	29	249
<i>Astragalus/Trigonella</i>	47	644	672	1363
<i>Prosopis</i>	4	38	534	576
<i>Malva</i>	3	126	21	150
<i>Silene</i>	2	1	2	5
<i>Vaccaria</i>	0	2	0	2
Caryophyllaceae	3	14	13	30
<i>Ziziphora</i>	14	74	4	92
Lamiaceae	5	4	0	9
Polygonaceae	8	44	235	287
<i>Galium</i>	5	83	10	98
Othres	56	169	248	473
total.	5751	6857	6574	19182

survive in good preservation even after digestion (Anderson and Ertug-Yaras 1998). It is likely that these two taxa were important fodder for sheep and goats, and their remains are derived from dung

fuel. There is hardly any original vegetation around TGA now due to intensive cultivation and grazing, therefore it is difficult to reconstruct their distribution exactly. But considering their general habitats, they were probably grown in damp, saline soil on the river terrace or along big wadis on the plateau. The presence of *Aizoon* sp., another halophytic species, also suggests there was a saline land not far from the settlement.

Because many soil samples are from secondary deposition, only a few of them allowed reconstructing the human activities associated with the seed assemblages. But grasses are typical field weeds and *Prosopis* sp. is quite likely to come from dung fuel. Small-seeded Trifoliae may be either field weeds or steppe plants. Boraginaceae remains were found mineralized. Because a few of the boraginaceous fruits contained charred contents, at least some of them are not contaminated by modern habitation.

## 5. Conclusion

The preliminary analysis of the plant remains from TGA revealed that the agricultural produce was heavily dependent upon the barley in this marginal existence area. Grape was probably cultivated locally at least in the Phase 3. The remarkable characteristic is the large quantity of Chenopodiaceae found and this indicates its considerable utilization by the inhabitants within this area. The analysis and interpretation of site findings obtained from excavations at TGA are still continuing at present and it clear that further analysis will enable us to gain a clearer understanding of the local economy during the early Bronze Age period.

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