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# Plant Economy at Early Bronze Age Tel Yarmouth (Israel)

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The paleoethnobotanical study of Tel Yarmouth has been carried out in 2004-2005 in the framework of a Master's thesis (Salavert 2005). It mainly aims to comprehend the vegetal economy of the site and to enhance the importance of the fruit cultivation around the tell during the EBII and EB III periods.

## Environmental context

Tell Yarmouth is situated between 360 and 400 m a. s. l. at the foot of the central mountain chain, 25 km south-west of Jerusalem.

The vegetation is characterized by a maquis whit *Pistacia lentiscus* and *Quercus calliprini* as dominant species.



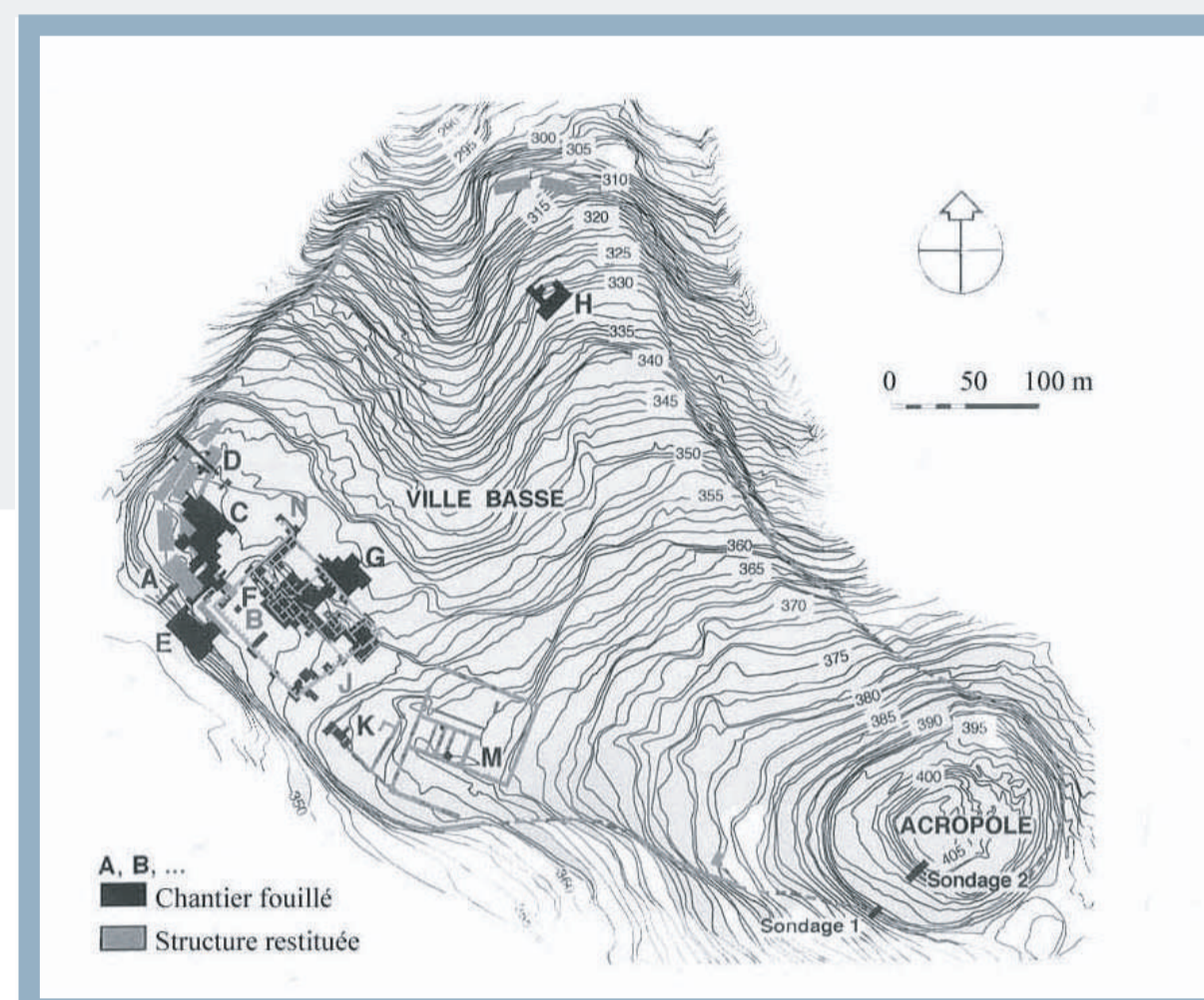
On the left, *Pistacia lentiscus* ; on the right, *Quercus calliprinos*.

The landscape around Tel Yarmouth.

## Archaeological context

**Tel Yarmouth** (*Khirbet Yarmuk*) is excavated by P. de Miroschedji (CNRS, CRFJ) since 1980. It's an important site of the southern Levant, that has been occupied from the EB I (3500 BC) to the Byzantin period. During the EB II and EB III (3000-2500 BC), the site appears as a City-state with a flourishing palatial economy. The site was abandoned in the EB IIIC period (2300 BC).

The site is a 16 ha settlement composed by an Acropole and a Lower City (de Miroschedji 1999a).



Topographical map of the tell (in De Miroschedji 1999a)



Air view of the site (in De Miroschedji 1999b)

## Material and methods

A total of 1081 l of sediment has been wet-sieved in 2004 from the area B (palatial context) and J (domestic context). Area B is composed of 2 superimposed palaces with ashy layers (palace B1-EB IIIC is situated on top of palace B2). The area J, dated to the EB IIIB (J-2) period, was destroyed by fire. The area C (domestic context) was sampled for botanical remains during the late 1980s, however without recording of neither sampling methods nor sample volumes. Samples have been sieved by manual flotation with 1 to 4 mm mesh. Charred macroremains were sorted out from 3 l of sieve refuse with the help of a binocular microscope.

## Results

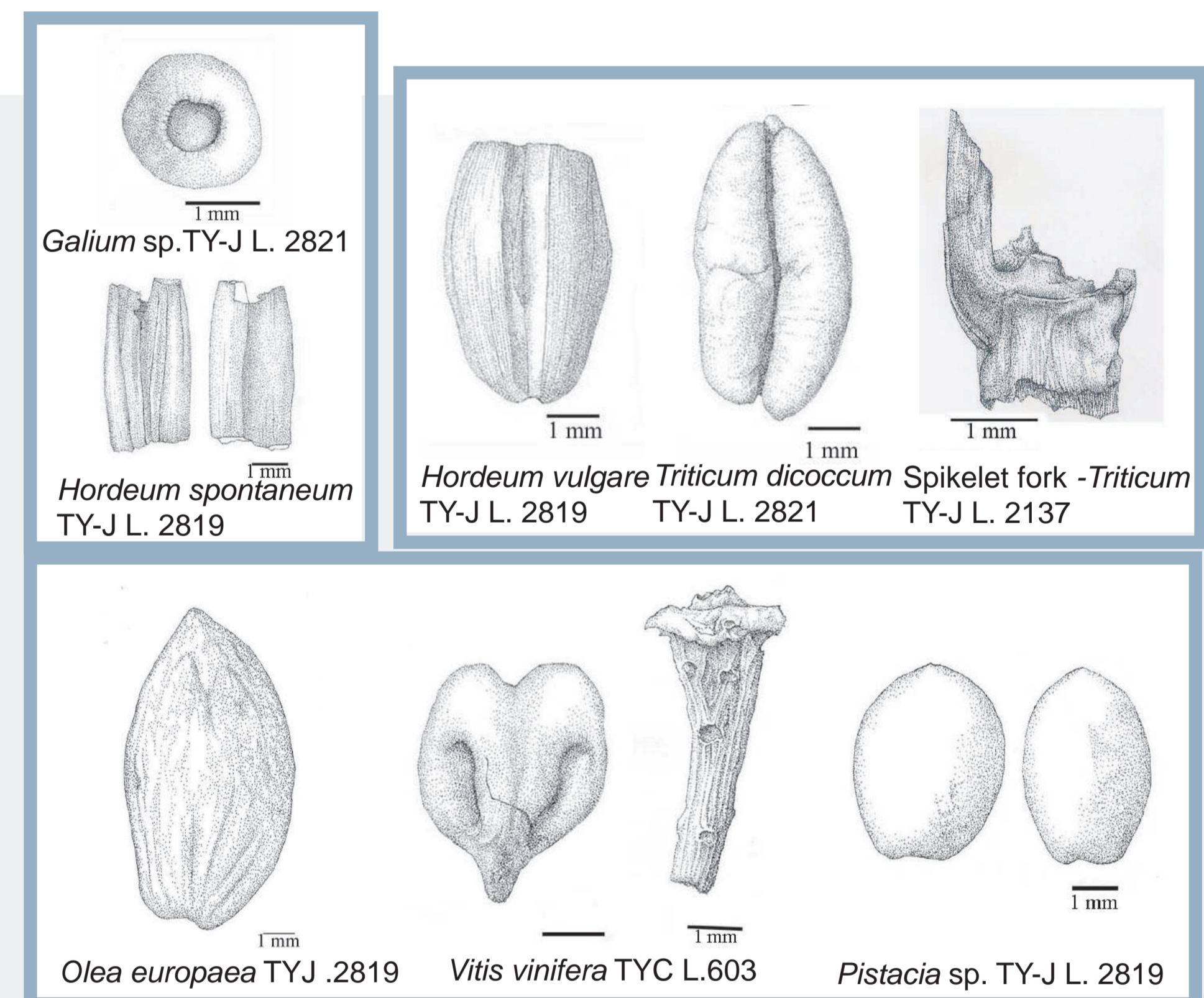
A little more than 3 700 macrorests and 33 taxa have been identified from areas B, C and J.

**Cereals** - Emmer (*Triticum dicoccum*) and barley (*Hordeum vulgare*) are identified in all three areas (67% of the total remains in area B, 26% in area C and 36% in area J). Glumes and spikelet forks from wheat represent the major part of the cereal assemblage (81% in area B, 58% in area C and 72% in area J).

**Pulses** - Pulses are rare on the site, lentil (*Lens culinaris*) being the main species identified.

**Weed and wild plants** - A total of 17 taxa have been identified, representing 10% in area B and 8% in areas C and J respectively. *Lolium* sp. is the most frequently identified taxon, followed by, among others, *Hordeum spontaneum*, *Galium*, *Scorpiurus* and *Thymeleae*.

**Fruit species** - *Pistacia* sp., *Ficus cf carica*, *Vitis vinifera* and *Olea europaea* are present, with olive being the most important species. Remains of olive, in the form of crushed stones, represent 84% of fruit remains in area B, 35% in area C and 89% in area J.



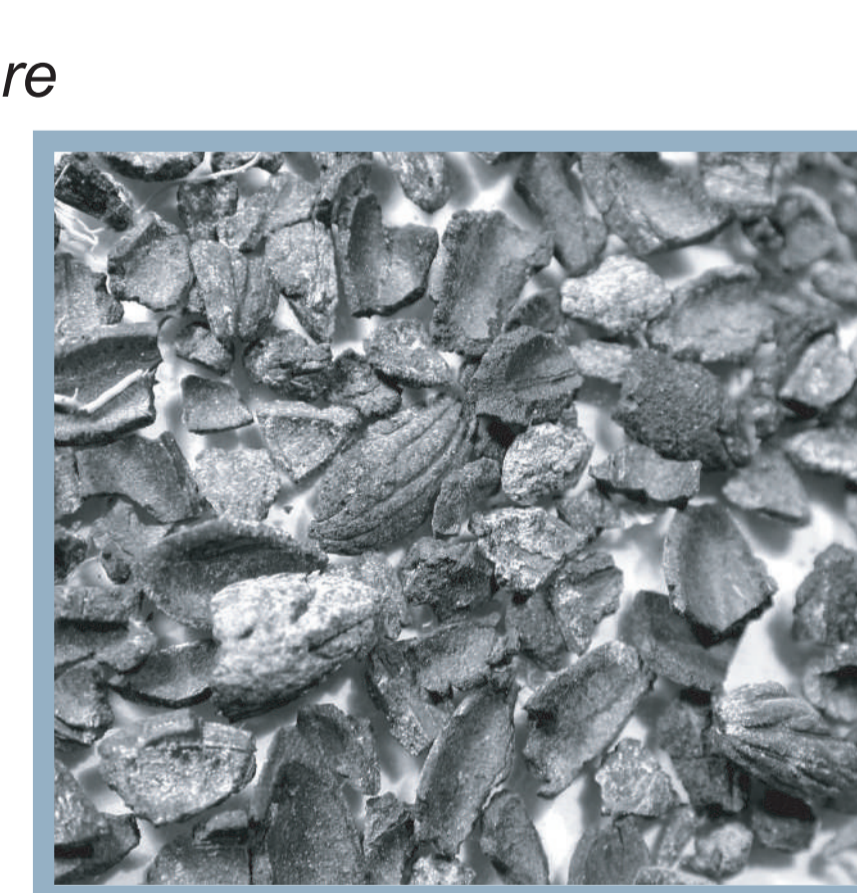
Drawings : A. Salavert

## Discussion

The vegetal economy of Tel Yarmouth is based on the cultivation on winter crops : emmer, hulled barley and lentils. Weeds (*Lolium*, *Phalaris*, *Avena*...) indicate the same seasonality (Charles 1989). *Triticum dicoccum*, *Hordeum vulgare* and *Lens culinaris* are the three main crops in Palestine during the Early Bronze age (Haelbaek 1958, Hopf 1978, 1983).

Olive remains represent 23% of the total assemblage. Crushed endocarps are interpreted as press remains (jift). They are characteristic of olive oil production and probably indicate the presence of an oil-fabric on the settlement or in its vicinity. Indeed, area H in the north of the Lower City seems to be linked to the production of olive oil (de Miroschedji 1999a). Today, jift is used as fuel in many oil-producing countries (Brun 2003). This was probably the case at Yarmouth too. Furthermore, the percentages of olive endocarps remain more or less constant throughout the period. It indicates a stability in the production of olive oil during the EB II and EB III. The olive tree culture, which provides a long-term return, requires an economic, social and politic stability (Finkelstein and Gophna 1993).

The importance of olive tree at Tel Yarmouth is also noticeable through the anthracological study where olive wood is represented by 63% of the identified fragments (Salavert 2005).



Crushed olive stones assemblage.



The area H interpreted as an oil-fabric (in De Miroschedji 1999).

## Conclusion

The choice of the installation of the settlement seems to have been motivated, at least in part, by the potential for agricultural production and especially that of olive cultivation (Rosen 1995). The culture and the production of olive oil might have played a role in the developed and stable economy of Tel Yarmouth. Further palaeoethnobotanical investigations should give informations about the trade and the complementarity between contemporary settlements. This should provide a general view of vegetal economy during the Early Bronze age in Palestine.

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