**Appendix: The Sea of Galilee palynological diagram**

The Sea of Galilee palynological diagram (Figure 3) is based on the analysis of 56 samples, which were processed at the Bonn palynological Laboratory by using standard pollen extraction techniques (Faegri and Iversen 1989). At least 500 terrestrial pollen grains were counted per sample. Pollen was identified to the highest possible systemic level. For identification a reference collection of Israel pollen flora was used (Steinhardt Museum of Natural History, Tel Aviv University), as well as pollen atlases (Reille 1995; Reille 1998; Reille 1999; Beug 2004). The diagram covers the Bronze and Iron Ages time interval; its chronology is presented in Langgut et al. 2013a.

The calculation of pollen concentrations (by using *Lycopodium* spore tablets; Stockmarr 1971; Bryant and Holloway 1983) included all pollen types and also indeterminable pollen grains (unidentified and degraded pollen). The diagram demonstrates that pollen concentration was high and generally stable throughout the Bronze and Iron Ages (last curve in Figure 3). Pollen preservation was reasonable in all the analyzed samples and there were no signs of disturbed and reworked sediments, such as a distinctly increased percentage of indeterminable and corroded pollen or noticeably abnormal pollen concentrations.

The group of Total Trees is composed of the arboreal members of the Mediterranean maquis/forests and *Olea* pollen(most probably cultivated olives); thelatter were combined within the Mediterranean arboreal pollen since they occupy the same ecological niches (e.g., Horowitz 1979; Baruch 1986). Some of the taxa which appear in less than 1% of the total pollen sum are not presented in Figure 3. All trees and shrubs common to the bank vegetation of the lake (hydrophil plants), as well as aquatic plants, were excluded from the total pollen sum (hydrophil trees: various species of *Tamarix*, *Fraxinus syriaca*, *Salix*, *Populus euphratica*, *Platanus orientalis* and *Nerium oleander*; Hydrophil shrubs that were excluded are mainly Cyperaceae [sedges], *Typha* [cattail] and *Rubus sanctus* [holy bramble]). The diagram was then divided into five main groups based on taxa geographical origin and on ecological and cultural characteristics. This division follows a similar one that was applied to the Ze'elim (Dead Sea) pollen record that covers the same period (Langgut et al. 2014a):

1. **Mediterranean trees** – this group includes mainly wind pollinated trees. The most dominant are the two oak pollen types: evergreen oak (the *Quercus calliprinos* type) and the deciduous oak (the *Quercus ithaburensis* type). The distinction between these two types is based on differences in pollen morphologies (Horowitz and Baum 1967). While *Q. calliprinos* is the only evergreen oak tree in the eastern Mediterranean, among the *Q. ithaburensis* type some may have been *Q. boissieri*, which is a deciduous oak species of the upper mountain, and some *Q. ithaburensis*, a tree typical of lower elevations (Zohary 1973). The two deciduous species are palynologically indistinguishable. The appearance of other Mediterranean trees is inconsistent and their pollen appears in lower percentages: *Phillyrea* sp., *Pistacia* spp. and *Pinus halepensis* (the only naturally occurring pine species in Israel; Weinstein-Evron and Lev-Yadun 2000).
2. **Cultivated plants** – this group consists of high occurrences of olive and cereals and sporadic occurrence of walnut and grape:

Olive trees (*Olea* *europaea*) grow today in Israel in the Mediterranean territory both as cultivated (the vast majority) and natural elements; in addition, some of the trees are feral and hybrids between domesticated, wild and feral (Zohary 1973; Zohary et al. 2012). The wild olive is a minor component of the native Mediterranean *Quercus calliprinos* - *Pistacia palaestina* association as evident by Pleistocene and Early Holocene pollen diagrams (Horowitz 1979; Weinstein-Evron 1983; Kadosh et al. 2004; van Zeist and Bottema 2009; Langgut et al. 2011). The first evidence of olive oil production is dated to the Late Neolithic to Early Chalcolithic and was found in submerged sites along the Carmel coast (Galili et al. 1997). Significant cultivation of olives most probably began in the Late Chalcolithic, some six millennia ago, when much higher olive pollen values are documented in several southern Levant palynological spectra (Baruch 1990; Neumann et al. 2007a, 2007b; van Zeist et al. 2009; Litt et al. 2012), in comparison to those available from the Pleistocene and Early-Holocene pollen diagrams (wild and domestic olive pollen grains are palynologically indistinguishable; e.g., Langgut et al. 2014b). The dramatic rise in *Olea* pollen is considered to reflect the spread of olive cultivation in the region (e.g., Cappers et al. 1998; Baruch and Bottema 1999; Litt et al. 2012). The palynological evidence is supported by archaeological findings of olive oil extraction facilities and crushed olive pits at Chalcolithic sites in Samaria (Eitam 1993), the Jordan Valley (Gophna and Kislev 1979; Neef 1990), and the Golan Heights (Epstein 1978, 1993, 1998). The olive has been the most important fruit tree of the Mediterranean basin diet (Zohary et al. 2012).

The Cerealia-type pollen (Cereals) is distinguished from wild grasses by its larger size, thick pollen walls, and the pronounced annulus around the pore. In this study the limit to differentiate between Cerealia type and other grasses was set to > 37 µm (as recommended by Beug 2004). The Cerealia type includes cultivated cereals as well as some wild taxa; from regular pollen grain identification it is difficult to determine whether they are domesticated or wild cereals (van Zeist et al. 2009).

Grapes (*Vitis*), one of the most important fruits of the Old World diet, are mostly monoecious when domesticated and are self-pollinated, while wild grapes, which currently grow in the region only in the Golan Heights and the Huleh Basin (Danin 2004), are dioecious plants (have unisexual flowers) with obligatory cross-pollination (Zohary et al. 2012). Therefore, cultivated grapes have low pollen dispersal efficiency (van Zeist et al. 2009), which explains their low presence in Near Eastern pollen diagrams and their sporadic appearance within the Sea of Galilee palynological diagram.

Walnut *(Juglans regia)* – the palynological information from the southern Levant supports the hypothesis regarding the survival of *J. regia* during the Last Glacial period in some areas in Eurasia (Langgut 2015). The appearance of *J. regia* in the Sea of Galilee pollen record (Figure 3), as well as the archeobotanical evidence of *J. regia* plant remains from northern Israel (Liphschitz 2000), both dated to the Middle Bronze Age I, suggests the beginning of horticulture of walnut in the southern Levant around that time (Langgut 2015). The growing of walnut within the land of Israel probably started in the north, and nearly one millennium later, palynological evidence indicates that *J. regia* cultivation spread to the Judean Highlands (Neumann et al. 2007a; Langgut et al. 2013b, 2014a).

(3) **Secondary anthropogenic indicators** – also called ruderal weeds – a group of plants that may be related to human activities (Zohary 1973). The plants that comprise this group are native to the region and often adapted to human-induced habitats, like members of the Polygonaceae family, *Urtica,* and plantain (*Plantago lanceolata* type which also includes *P. lagopus*) (Danin 2004). Other plants within this group are spiny Asteraceae, mainly thistles (*Cirsium*, *Carduus*, *Carthamus*, *Xanthium* and *Echinops*), and different species of *Centaurea* (*C. nigra*, *C. solsticialis* and *C. cyanus*), which are all grazing-resistant plants (termed *Carduus-Centaurea* group in Figure 3).

(4) **Semi-desert and desert elements** – the most dominant plants in the Sea of Galilee sequence belong to the Chenopodiaceae and *Artemisia* which occupies areas around lake shores (mainly in the southern part where the Irano-Turanian vegetation territory is present; Zohary 1962; Figure 1c). Another steppe plant identified in the pollen spectrum is *Ephedra* with the dominance of *Ephedra fragilis* pollen type (rather than *Ephedra distachya* pollentype).

(5) **Open land indicators** – a group of herbs and dwarf-shrubs belongs to the following families: Poaceae, Caryophyllaceae, Brassicaceae and Asteraceae (the latter is divided into two pollen types: Asteraceae *Asteroideae* and Asteraceae *Cichorioideae*; *Artemisia* andall thethistles Asteraceae taxa [the *Carduus-Centaurea* group which are the grazing-resistant plants] were excluded from the Asteraceae sum and are presented in the groups mentioned above: the secondary anthropogenic indicators and the semi-desert and desert elements). They mainly derive from the semi-desert and desert vegetation (e.g., Baruch 1993) but can also originate from sparse maquis/forests, open fields, and disturbed areas in the Mediterranean territory, e.g. forest clearances and building sites.

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