

ON THE LIKELIHOOD OF AGRICULTURE AND A THRESHING FLOOR AT OR ‘AQIVA

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A 2000 excavation at Or ‘Aqiva unearthed gray or dark brown-gray soil, identified as agricultural soil, and a level *hamra* surface, probably a threshing floor; the excavator dated the *hamra* surface to the early Byzantine period (see Nagorsky 2017).¹ Since threshing floors are traditionally situated in the immediate vicinity of fields and were used for both cereal grains and seeds of pulses (e.g., Whittaker 2003:381), these finds seem to provide direct evidence for the cultivation of crops.

However, previous archeological evidence of agricultural activity in the area is not conclusive. Six Byzantine-period flour mills near Nahal Tanninim (Alon 2003:263) point to intensive flour production in this area, but the grains could have been brought to the mills from afar. Similarly, food remains found in a fourth–sixth centuries AD refuse pit in Caesarea (Area TN 02, L003; Ramsay 2010), suggesting the important role of wheat in the local diet, might be the result of imported products. Moreover, the local soil in the Or ‘Aqiva area is sandy, belonging to an ancient dune, as indicated by probes in the eastern part of the excavation. Thus, the present note addresses the following questions: How could such sandy soil be fertile enough to support the growing of crops in the Byzantine period? What crops could grow in this area?

Geobotanical studies of the coastal plain conducted in 1938–1943 identified approximately 300 plant species. In the area between Hadera and Zikhron Ya‘aqov, which is formed mainly by sandy soils and is covered for the most part by unstable sand dunes, the vegetation was dominated by long-rooted shrubs, such as Sand Wormwood² (*Artemisia monosperma*; see Map of Palestine Soils by F. Menchikovsky in Elazari-Volcani 1930:8; Eig 1939: esp. 256–264; Zohary 1982:17, 338). Zohary noted that the depleted and shifting soils of this area are not suitable for cultivation. However, not far from Or ‘Aqiva, to its northwest and southeast, there are fertile soils that could have been transferred to Or ‘Aqiva so as to allow crop cultivation. Moreover, the geobotanical analysis of these fertile soils revealed no wild, local plant associations, but rather various species that are ecologically adapted to disturbed habitats. Since this analysis was carried out prior to the start of Israeli intensive agriculture activity, it was suggested by Zohary (1982:106, 115) that the numerous weeds were the result of the agricultural exploitation of the area over many centuries. This hypothesis is supported by several isolated remnants of fruit trees—fig (*Ficus carica*), almond (*Amygdalus communis*), pomegranate (*Punica granatum*) and grape (*Vitis vinifera*)—suggesting that there were orchards and vineyards in this area.

An analysis of the fertile soils in the nearby basins of Naḥal Tanninim, Naḥal Poleg and Naḥal Alexander revealed that these comprised alluvial (fluvial) loess soils, grumusols and *ḥamra*, which have a small-grained structure and a relatively low basicity (Goldberg 1995:49). Cereals, such as wheat (*Triticum*) and barley (*Hordeum*), as well as pulses, such as chickpea (*Cicer arietinum*), grass pea (*Lathyrus sativus*), lentil (*Lens culinaris*), faba bean (*Vicia faba*) and bitter vetch (*Vicia ervilia*), could be cultivated on these types of soils, and have been staple food plants in the Middle East for millennia (Dan et al. 1976:8; Zohary and Hopf 2000:16).

Local conditions, such as warm temperatures throughout the year (+13° C mean temperature of the coldest winter month), 500–650 mm of annual precipitation and a relatively high water table—all allow irrigated crop cultivation in the area (Elazari-Volcani 1930:120; Dan et al. 1976:8). Moreover, the climate conditions and water availability allow for even two yields a year.

The date of the possible threshing floor, the early Byzantine Period (Nagorsky 2017), was a period of interchanging wet and dry climatic episodes (Rosen 2007:169, and see references therein), suggesting the need for irrigation solutions for sustaining agriculture in this area. Indeed, the remains of an irrigation system unearthed near Caesarea point to an investment in land improvement for developing and maintaining agricultural activity on these sandy soils during the late Byzantine and Early Islamic periods (‘Ad 2009).

In sum, the local climatic, water and soil conditions in addition to the disturbed type of vegetation, all support the likelihood of local agriculture during antiquity and the accompanying need for a threshing floor. Judging by patterns of local diet and archaeological finds in the area, it is most likely that the threshing floor was used for cereals rather than for pulses. However, a decisive answer as to whether it was used for cereals, pulses or both, or for some other type of crop or plant, can be obtained only through archaeobotanical analysis, making it crucial to collect soil samples during excavations.

NOTES

¹ I thank Alla Nagorsky for the opportunity to discuss here the geobotanical aspects of her finds. The article was first submitted in 2012. Dafnah Strauss edited the article

² For the English vernacular plant names I follow Fragman et al. (1999).

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