



## Freshwater turtle or tortoise? The exploitation of testudines at the Mousterian site of Nahal Mahanayem Outlet, Hula Valley, Israel



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### ABSTRACT

Numerous sites showing human occupation during the Pleistocene were discovered at the Hula Valley — in the northern segment of the Jordan Valley, Israel. At the Middle Paleolithic site of Nahal Mahanayem Outlet (NMO; OSL dated to ca. 65,000 B.P.), two testudine species were recovered, a freshwater turtle — the Western Caspian Turtle (*Mauremys* cf. *rivulata*), and a tortoise — the Mediterranean Spur-thighed Tortoise (*Testudo graeca*). The faunal and lithic assemblages were deposited during repeated short-term occupation events. The site was fast covered by mud deposited by rising water in the nearby paleo-Hula Lake, resulting in excellent preservation that provides a rare opportunity to reconstruct the process of procurement, use and eventual disposal of the testudines step-by-step. Evidence of consumption of the Mediterranean Spur-thighed and its carapace exists from the late Lower Paleolithic onward, however, no systematic exploitation of the Western Caspian Turtle has been reported to date from any Pleistocene archaeological sites in the Levant. This is the first and earliest evidence of butchering of the freshwater turtle, *M. cf. rivulata*, at a Levantine Paleolithic site. Based on detailed taxonomic identification and taphonomic analysis, we suggest that both species were exploited in a similar way at NMO. Their limbs were torn apart, and then the bridge connecting the carapace and plastron was broken. Stone tools were used to separate visceral tissues from the peripheral bones in order to detach the meat. However, due to the different shell thickness, the survival rate of the bridge area varies slightly between the two species. Finally we would like to draw attention to the presence of pits mimicking man-made percussion notches on the shells of extant specimen of both species, advocating caution when identifying percussion signs in the fossil record.

### 1. Introduction

The Hula Valley, situated in the northern segment of the Jordan Valley (Dead Sea Transform), Israel, has yielded important archaeological evidence from the early Middle Pleistocene onward. Several significant prehistoric sites were found in association with water-bodies (lakes, streams and springs) in this fertile environment, rich in flora and fauna (Goren-Inbar et al., 2000; Sharon et al., 2002, 2010a, 2010b; Goren-Inbar and Speth, 2004; Valla et al., 2007; Marder et al., 2015). The current research focuses on a unique Mousterian open-air site in the Hula Valley, Nahal Mahanayem Outlet (NMO).

#### 1.1. The site

The site of Nahal Mahanayem Outlet (NMO) is situated at the southern edge of the Hula Basin, on the eastern bank of the Jordan

River opposite the outlet of Mahanayem stream. The site was discovered during a drainage operation in 1999 (Sharon et al., 2002). The subsequent excavation exposed an open-air site, OSL dated between 55 and 65 ka (Kalbe et al., 2014). The lithic assemblage was ascribed to the Middle Paleolithic Mousterian tradition (Sharon et al., 2010b; Sharon and Oron, 2014; Kalbe et al., 2014). The site was waterlogged, resulting in excellent preservation of floral and faunal remains throughout the stratigraphy (Sharon et al., 2010b; Aharonovich et al., 2014). The combined stratigraphic sequence of the excavated areas, the geological trenches and the riverbank sections revealed a complex sequence of several sedimentary layers (Fig. 1C, D). At the base of the archaeological stratigraphic sequence lies a layer of unknown thickness, comprising basalt boulders and cobbles (Layer 5; Fig. 1A, D). The morphology of this conglomerate is of a hill sloping gently towards the north and tilted to the east (Kalbe et al., 2014). Excavation of the Mousterian horizons focused on Area D (Fig. 1A, B, C). The primary

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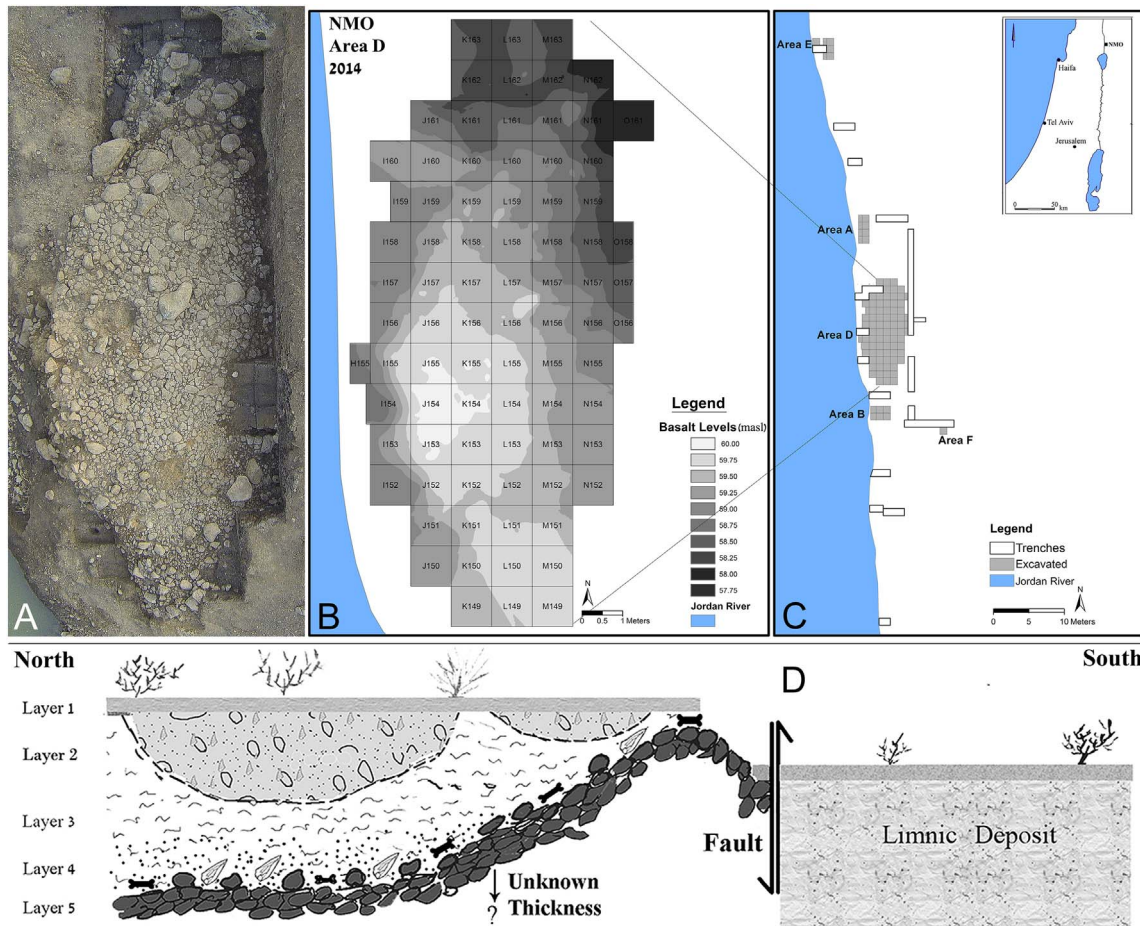


Fig. 1. Nahal Mahanayem Outlet site (NMO). (A) General view of the main excavation Area D; (B) excavated squares in Area D; (C) site location and the location of all the excavated areas; (D) schematic stratigraphic composition of the geology and the archaeological layers at NMO.

archaeological layer, Layer 4, is an accumulation of dark fine silt, lying directly on top of Layer 5, the basalt floor. The archaeological remains, primarily bones and flint tools, are scattered in distinguishable horizons within the dark mud of Layer 4. A minimum of two, and probably three such horizons were identified. The human occupation at the site is reconstructed as repeated short-term occupation-episodes of a lakeshore-accumulation environment (Sharon and Oron, 2014). The remains of these activities were soon covered by fine silty mud that sealed the archaeological horizons as the water level of the paleo-Hula Lake rose. On top of the archaeological Layer 4, there is a sequence of Late Pleistocene silty muds and clays. The mud probably sealed the archaeological horizons of this layer before they were subjected to significant post-depositional movement (Kalbe et al., 2014; Sharon and Oron, 2014). The excellent preservation of faunal and floral remains makes Layer 4 at the site a key location for the study of Levantine Mousterian sites in the Levant.

### 1.2. The testudines in the Hula Valley

Nowadays there are three testudine species in the Hula Valley: the Western Caspian Turtle, *Mauremys rivulata* (Valenciennes, 1833), the Mediterranean Spur-thighed Tortoise, *Testudo graeca* (Linnaeus, 1758) and the Nile Soft-shelled Turtle (*Trionyx triunguis*). This last was introduced into the Hula Reserve (Werner, 2016, p. 124) and therefore will not be further discussed.

The freshwater turtle, *M. rivulata*, is associated with standing, stagnant and flowing water bodies, both polluted and unpolluted. It usually lives in shallow water, less than a meter deep. In Israel *M. rivulata* is found nowadays in water sources from the Northern Negev

northwards. It is a flat-shelled turtle up to 240 mm long; the carapace ranges in color from green to black, the plastron is dotted. The neck, legs and tail are decorated with thin, light-colored stripes. The plastron in the male is concave to flat, while in the female it is convex. *Mauremys rivulata* is mostly diurnal, although in summer it is occasionally active at night. Most of its life is spent in the water, taking advantage of protruding surfaces to bask in the sun on substances sticking out of the water. The young are fully carnivorous, adding plants to their diet as they become adults (Werner, 1988, 2016; Disi et al., 2001; Bar and Haimovitch, 2011). Until recently, *M. rivulata* was considered to be a subspecies of *M. caspica*, but its specific status was changed on the basis of distribution and morphological characteristics (Gasith and Sidis, 1983; Sidis and Gasith, 1985; Fritz and Freytag, 1993; Fritz and Wischuf, 1997).

The earliest evidence for the probable presence of *M. rivulata* in Israel is from the Early Pleistocene site of 'Ubeidiya in the Lower Jordan Valley (Haas, 1963, 1966). However, because of their larger size and the thickness of their shells, the attribution of the 'Ubeidiya specimens as *M. rivulata* is equivocal (Haas, 1963, 1966). The earliest definitive appearance of *M. rivulata* therefore dates to ca. 780 thousand years ago, at the site of Gesher Benot Ya'akov in the Hula Valley (Hartman, 2004).

The tortoise, *Testudo graeca*, inhabits a wide variety of terrestrial habitats. In Israel it is found from the Northern Negev northwards. The shell is very convex, and up to 185 mm long. The carapace is yellow-brown, with each carapace plate surrounded by a black rim and the adult's plastron is black. The carapace of the male is smaller than that of the female, and the male plastron is concave or flat. This species is mostly diurnal. Its diet consists primarily of vegetation, with an occasional addition of meat (Werner, 1988, 2016; Disi et al., 2001; Bar and

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