Supplement 1 to

Geoarchaeological Investigation in a Domestic Iron Age Quarter, Tel Megiddo, Israel

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Sedimentary Archaeological Microfacies

Fifteen blocks were extracted from sediments and features associated with Level Q-5. Twenty-six large-format, 5x7 cm thin sections were prepared from these blocks. To efficiently process the large amount of information obtained from these samples, we use the microfacies approach (Courty 2001). "Facies" is a geological term referring to the sum total of features that characterize the depositional environment in which a sediment formed. It thus includes basic characteristics such as composition, structure, texture, and fossil content. Similarly, in archaeological micromorphology, the term "microfacies" is used to define specific sedimentary facies within which each microfacies indicates specific human activity as well as formation processes. Five general microfacies have been identified in sediments associated with Level Q-5 (see Table 2 in the main article).

Nine blocks were extracted from sediments and features associated with Level Q-4, yielding 12 large-format, 5x7 cm thin sections. We present here results from three blocks only—those extracted from the lower levels of the localized destruction debris. The microfacies observed in these samples conform to the general microfacies skeleton built on the Q-5 sediments. Therefore, the microfacies defined thus far form the basis for future micromorphological studies in Tel Megiddo and may be used for comparison between different tell sites in the Levant dating to the Bronze and Iron Ages.

Microfacies A:

This microfacies coalesces fill deposits. In the field, these appear as gray-colored sediments. Two subgroups have been identified in microfacies A.

Microfacies A(1) has a massive compact structure and is composed of unsorted materials including rocks, pottery, bones (burned and unburned), plaster, occasional dung fragments, and low amounts of ash and charcoal (**Fig. 1**). It is highly calcareous and is often found as thick accumulations above floor levels. This deposit is interpreted as constructional fill. When it is disturbed—mostly due to bioturbation—its structure becomes crumbly.

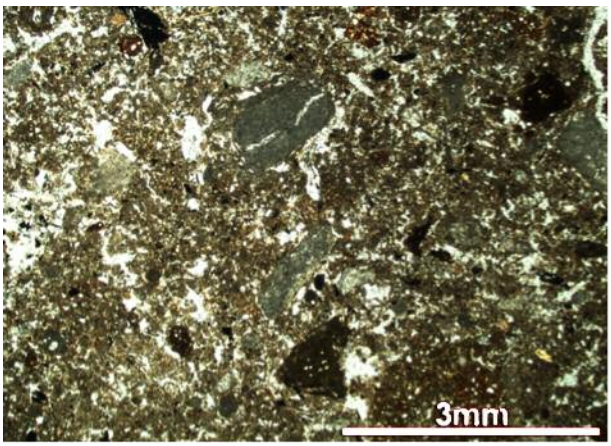

Fig. 1: Microfacies A(1). Constructional fill.

Microfacies A(2) is finely laminated, found at or above floor levels. Its maximal thickness is in the order of 20 cm, and it is composed of large amounts of phytoliths and ash in a micro-laminated structure (**Fig. 2**). Occasional bone, pottery, and charcoal fragments occur. Microlayers are discontinuous over distances of a few centimeters, and lenses are common. This deposit is interpreted as a fill that accumulated during human activity. It is impossible to deter-

mine at this stage whether the laminae were deposited intentionally or unintentionally.

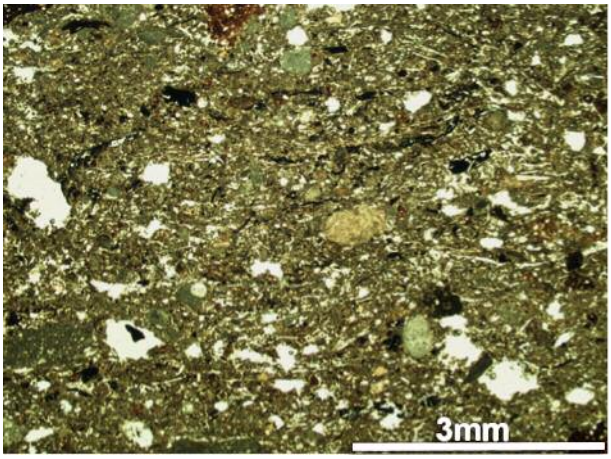

Fig. 2: Microfacies A(2). Activity fill.

Microfacies B:

This microfacies coalesces white-colored phytolith-rich deposits. In the field, these deposits are found at or close to floor levels, and they range in thickness from less than 1 mm to a few centimeters. Three subgroups have been identified in this microfacies.

Microfacies B(1) is dominated by phytoliths and is associated with calcitic ash (appearing as gray stringers; **Fig. 3**). The calcite tends to appear on phytolith surfaces, thus obscuring their contours. The structure is micro-laminated. It often forms very thin layers (ca. 1 mm thick) associated with floor deposits (mostly Microfacies A(2)). The thickness of these deposits indicates that the original vegetal matter was ca. 2 cm thick. No dung spherulites have been observed. This deposit is therefore interpreted as the remains of in situ burned grass-rich vegetal matter, possibly from matting or spread of thresh on floors.

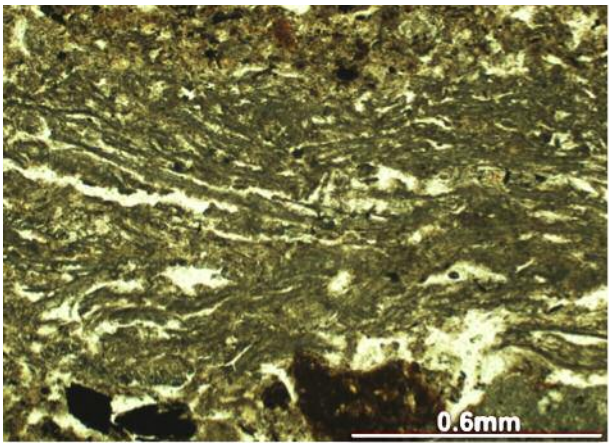

Fig. 3: Microfacies B(1). Degraded thin accumulation of vegetal matter (possibly matting or thresh).

Microfacies B(2) is composed almost entirely of phytoliths with little or no carbonaceous elements, other silicate, or phosphate minerals. The structure is micro-laminated (**Fig. 4**). It forms layers that are ca. 5 mm thick (i.e., the original organic matter may have reached a thickness of ca. 10 cm). It is found in association with floor deposits, often underlying other types of floor deposits. This deposit is interpreted as the remains of in situ degraded grass-rich vegetal matter, possibly either as bedding material or as a constructional foundation to floors.

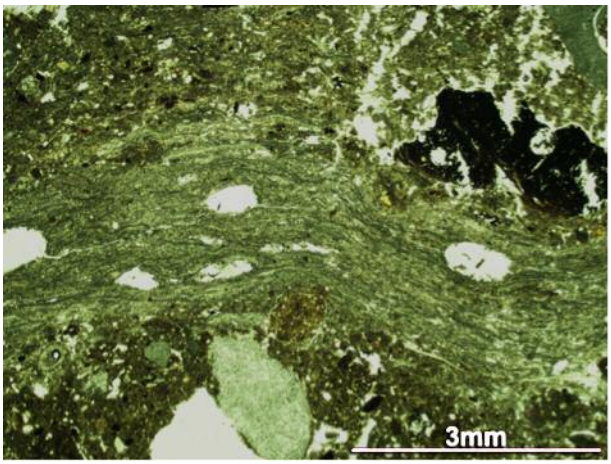

Fig. 4: Microfacies B(2). Remains of possible bedding or vegetal floor foundation.

Microfacies B(3) is composed of phytoliths associated with higher amounts of calcite than those observed in Microfacies B(1) and B(2). It has a micro-laminated structure and may reach thicknesses up to 5 cm (**Fig. 5**). Dung spherulites are sometimes associated with it. It was found in a pit context. Considering the thickness of this deposit, it originated from vegetal matter that could have been as thick as 1 m. This deposit is interpreted as remains of degraded livestock dung.

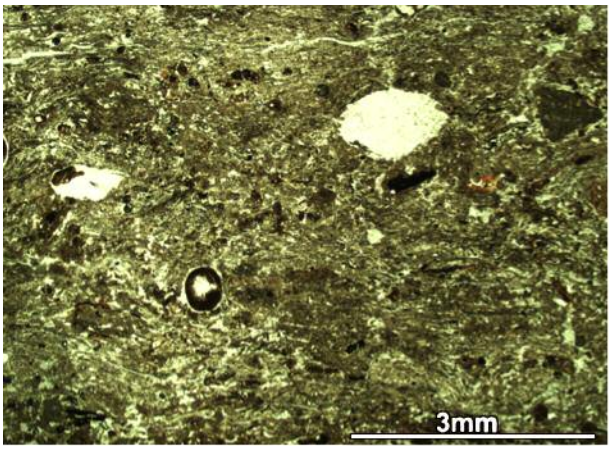

Fig. 5: Microfacies B(3). Degraded remains of livestock dung deposited within a pit.

Microfacies C:

This microfacies coalesces brown-colored sediments that are associated with soil-based construction materials. It includes five subgroups.

Microfacies C(1) is composed of soil material incorporating voids that are pseudomorphic after grass fibers (the voids sometimes contain grass phytoliths). These voids are randomly oriented in the soil matrix, which is highly compacted and includes deformation features (**Fig. 6**). This deposit is identified as well-preserved mud brick (see Friesem, Karkanas, et al. 2014).

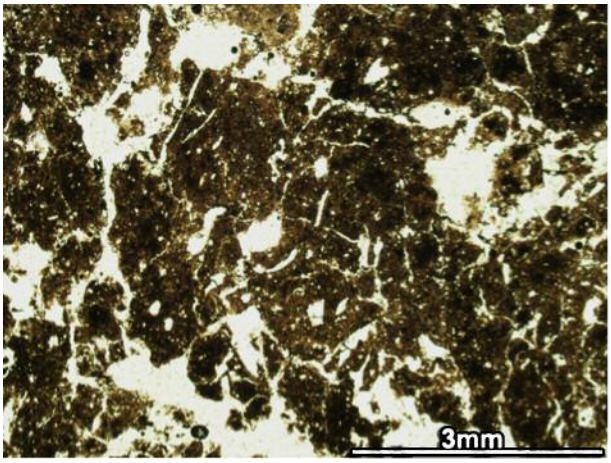

Fig. 6: Microfacies C(1). Well-preserved mud brick fragments.

Microfacies C(2) is composed of soil material without indications for grass temper. The structure is not as compact as that of mud bricks, and graded bedding may sometimes be identified (**Fig. 7**). The groundmass may include fragments of preserved mud brick. This deposit is interpreted as decayed/degraded mud brick material (see Friesem, Karkanas, et al. 2014).

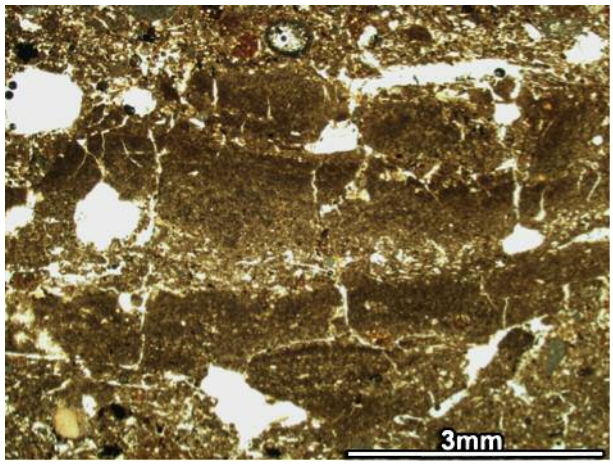

Fig. 7: Microfacies C(2). Graded bedding formed due to degradation of mud brick material (indicative of abandonment phases).

Microfacies C(3) appears in the field as dark reddish brown thin laminae (1–2 mm thick). It is composed of soil material and sub-horizontally micro-laminated charred fibers (most probably grass fibers; **Fig. 8**). It is highly compacted. This deposit is found in association with Microfacies A(2). It is interpreted as a constructed mud floor (or floor makeup). The deposit is burned, but it is impossible at this stage to determine whether it was burned purposefully as part of construction, or accidentally, post-depositionally.

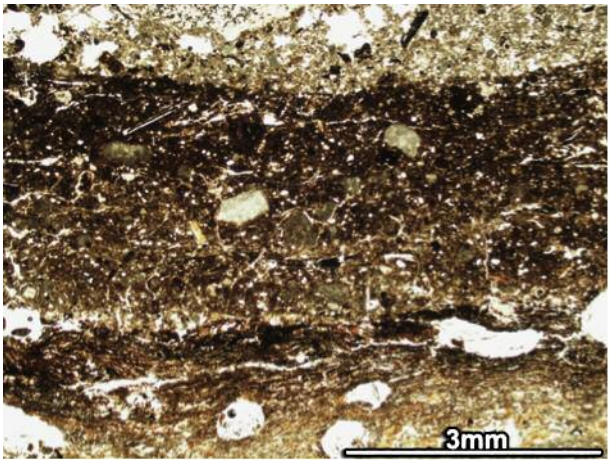

Fig. 8: Microfacies C(3). Grass-tempered and burned floor made of soil.

Microfacies C(4) is dominated by phytoliths and is associated with rounded calcitic-clay soil aggregates. It has a micro-laminated structure (**Fig. 9**). This deposit is often associated with Microfacies A(2). It is interpreted as the remains of a constructed mud floor that included abundant grass temper. (This microfacies is not included with Microfacies B because it seems to represent intentional construction, whereas the Microfacies B varieties do not appear as constructional but as remains of vegetal accumulations.)

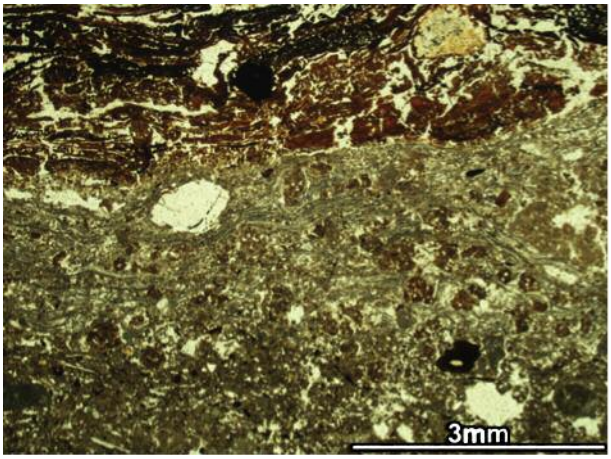

Fig. 9: Microfacies C(4). Grass-rich floor prepared with low amounts of soil.

Microfacies C(5) is a microlayered feature about 1–2 cm thick. Its bottom part is black, composed of charred vegetal matter (wood and fibers) and is associated with burned soil material appearing as aggregates (**Fig. 10, lower**). This layer is overlain by a lighter-colored layer composed of micro-laminated phytoliths and calcite. The calcite often appears ashy (**Fig. 10, upper**). In the field, this feature is intimately associated with floor deposits but may be found draping over ceramic vessels that lie on floors in destruction levels. This feature is interpreted as burned roof remains, whereas the lower layer is a partially burned (charred) wattle-and-daub construction and the upper layer is fully burned (oxidized) thatch (see Friesem, Tsartsidou, et al. 2014).

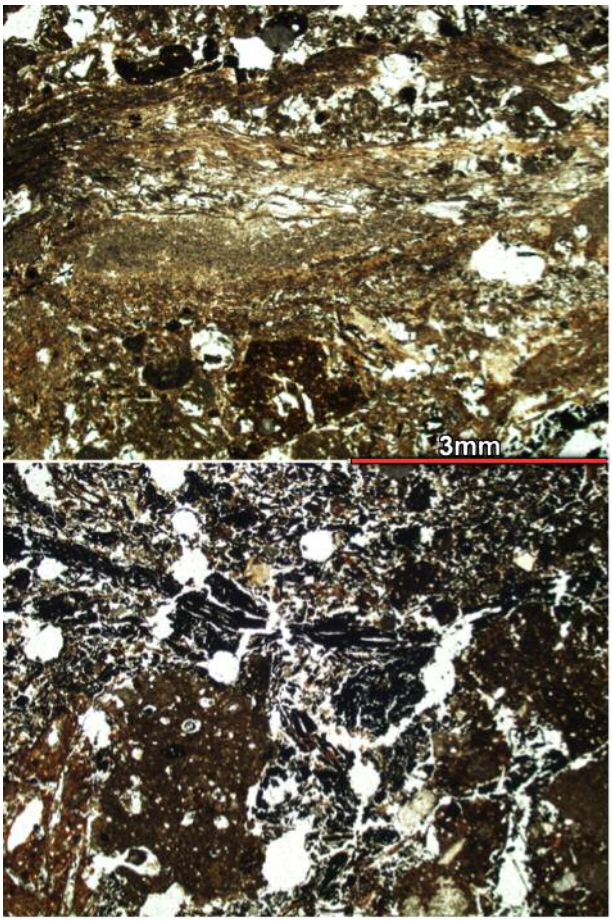

Fig. 10: Microfacies C(5). Remains of a burnt roof, constructed from a wattle-and-daub framework covered by thatch.

Microfacies D:

This microfacies coalesces carbonaceous rock-based construction materials. It includes two subgroups.

Microfacies D(1) is calcitic, with a massive microstructure including randomly oriented voids that are pseudomorphic after decayed vegetal matter (mostly grasses; **Fig. 11**). Patches of unreacted lime may be present, as well as occasional fragments of bones, rocks, and pottery. It may include several layers, with clear sharp boundaries indicating several episodes of replastering (**Fig. 12**). It is often found associated with collapse piles dominated by sediments originating from mud bricks. This microfacies is therefore interpreted as wall plaster.

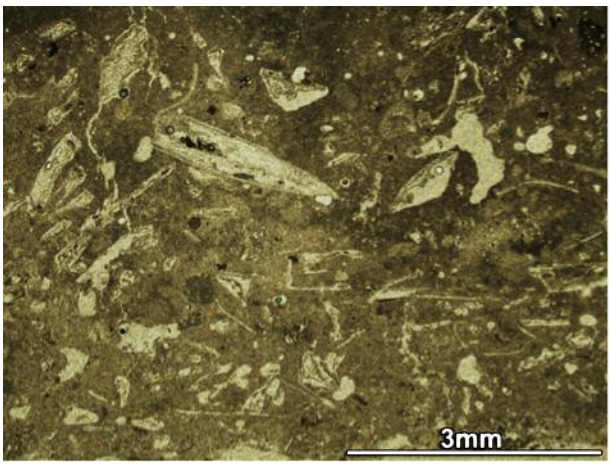

Fig. 11: Microfacies D(1). Wall plaster composed of grass-tempered lime.

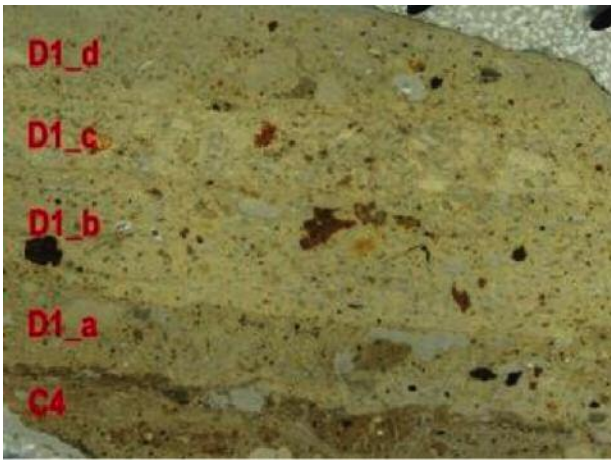

Fig. 12: (width of slide is 3.9 cm): Lime plaster fragment (sample MEG11Q-3, from Square H/6) that includes four consecutive layers, each ca. 0.5 cm thick. The plaster applications include coarse fragments of pottery, some surrounded by sedimentary rotational features, ash, burned compacted dung fragments, and phytoliths in pseudomorphic voids after chaff temper. Unreacted lime is present as well. The four layers differ in porosity, where in the more porous layers chambers exist as well as secondary sparitic calcite, indicating that porosity is secondary, due to dissolution.

Microfacies D(2) is calcitic, with a massive microstructure including a few randomly oriented voids that are pseudomorphic after decayed grass fibers. This deposit includes large amounts of marine microfossils (foraminifers) and no indications for lime (**Fig. 13**). It is found as horizontal compact layers, associated with Microfacies A(2), C(3), and C(4). It is interpreted as plaster floor makeup composed of crushed/powdered chalk.

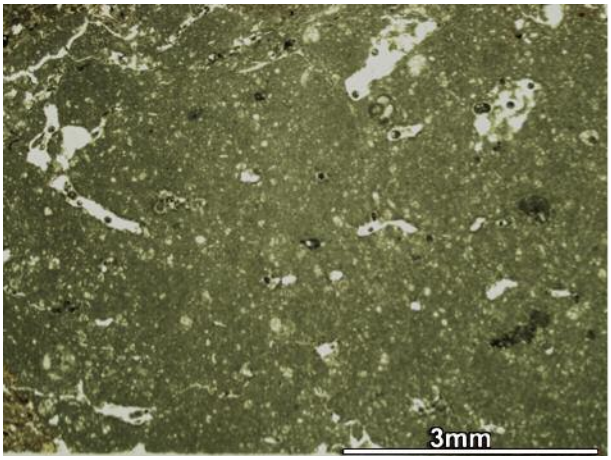

Fig. 13: Microfacies D(2). Floor makeup composed of crushed/powdered, compressed, chalk.

Microfacies E:

This microfacies coalesces deposits that formed due to burning of organic matter. It includes two subgroups.

Microfacies E(1) is uncompact black-gray deposit composed of micro-laminated charred fibers, calcitic ash, and phytoliths (**Fig. 14**). It appears interspersed with Microfacies A(2), forming very thin (up to 1 mm thick) layers. This microfacies is interpreted as charred grass material that accumulated during human activity.

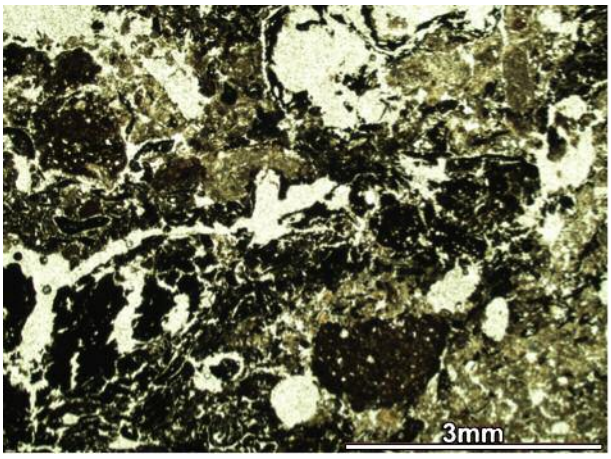

Fig. 14: Microfacies E(1). Charred grass material (associated with activity fill deposits).

Microfacies E(2) is an uncompact gray-white, often powdery, deposit. It is mostly found at the lowermost levels within baking ovens (*tabuns*). It is composed of large amounts of wood ash pseudomorphs associated with phytoliths (some of them partially melted), some charcoal, and occasional dung spherulites (**Fig. 15**). This microfacies is interpreted as ash that formed due to combustion of wood and dung during operation of baking ovens (see Gur-Arieh et al. 2014).

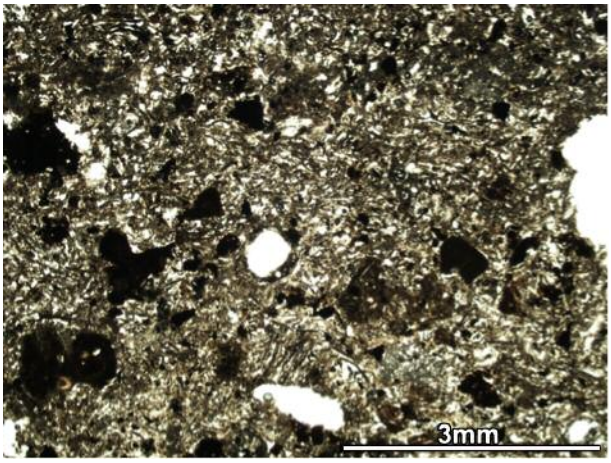

Fig. 15: Microfacies E(2). Remains of wood and dung ashes found within *tabuns*.

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