

El-Khanasry (Deir Waraq) Ground Stones

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Abstract

During the archaeological activities at Deir Waraq, Sixty-Seven ground stones were found, they include twenty four complete artifacts and forty three broken artifacts.

The pestle is dominant in the assemblage and most of the pestles are made from basalt.

The pestles of Deir Waraq can be classified into four categories according to their form such as cylindrical, conical, bend top and oval shape.

Similar pestles were discovered at many prehistoric Levantine archaeological sites, they date to Pre-Pottery Neolithic A.

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Deir- Waraq site was first reported in 1999 during the archaeological survey which was conducted by the Institute of archaeology and anthropology/Yarmouk University and German Institute of Archaeology. Two seasons of excavation were carried out by one of the authors in 2000 and 2001

The site is located about 15 km west of Mafraq and roughly 3.5 km south of Tell Khanasry (carte 1), at an elevation of.900m above sea level .

No architectural features were found at the excavated area with the exception of one muddy floor. The muddy floor is relatively thin (ca.5.15cm).It was laid above a layer of pebbles and small limestones which was directly found on the top of a Terra rossa soil. One pestle and many flint tools (such as axes and four arrowheads) were found on the surface near the floor.

During the 2000 survey and the 2001 excavation at Deir Waraq many ground stones were collected. The assemblage were represented by sixty-seven pieces. They were mostly pestles; Twenty-four items were complete and forty-three pestles were broken pieces. They were divided as follows: sixteen top part pestles' fragments, ten lower part pestles' fragments, and seventeen small body parts fragments. Moreover, five pestles found within stratified layers during the 2001 excavation season within area B. The rest came from surface collection, and they were distributed as follows: Three pestles and one quern in area "A", thirty-three in area B, fifteen in area C, six in area D, and 7 in area E.

Only one item represents a quern and one represents complete handstone, while the rest belong to pestles. The complete pestles in general have a feature of missing parts of the used face (the broad end) or both ends. It seems that the heavy use of the tool caused a damage of the pestles, and was responsible for the missing use parts of it, while it still preserve the whole diameter.

It is most likely that the secondary use of the pestle as a hammer caused its breakage at the center. On the other hand, it seems that the sides breakage in elongated position was due to the very heavy use.

Virtually, Mesolithic pestles were broken or heavily battered; in high proportion compared with later periods (Dorrell 1983). This might suggest that some of the tools were used as mauls or hammer stones rather than pestles. But the survival of the flat convex grinding surface at the broad end, demonstrates their use as pestles.

Pestles from Khanasry are similar to Jericho PPNA types Fig.221: 1 and 7 (Dorrel 1983), Beidha PPNA types Fig.7: 4, 5, 6 and 10 (Kirkbride, 1966) and Jarmo north of Iraq (Braidwood et al 1983). Although, similar forms found at Kalavassos-Ayious in Cyprus dated to the Chalcolithic period (see Fig.6: 1-6), (South, A.K. 1985).

Pestles (Fig. 1)

Pestles and mortars are the earliest stone tools which were used for daily food production in the Levant. Both have long been recognized as a central feature in the development of early farming societies in the Near East. They were first recognized during the Kebaran period and could be noticed clearly during the Natufian and the Neolithic periods (Wright 1991:19, 22).

Pestles with oblong of cylindrical shape and were used as in tandem with mortars, or cupped stones for pounding food substances and other materials (Seeden 1982:57; Marfoe et al.1986: 79). The used surfaces were constricted in plan and confined to one or both ends of an elongated blank. Faces are sub circular or oval in plan; in section they are gently convex or flat (Wright 1991:21; 1992b: 69).

Raw material:

The local Basalt availability in the area made it the most favorite raw material to be used for producing grinding stones, except one pestle found made of sand stone and the quern made of limestone.

The basalt pestles were homogeneous, black, fine grained, and usually without inclusions. Few examples show magnitude structure and little porosity noticed on few examples. Some tools carried a very thin red layer affected by the red soil covering a layer of whit pinkish color lime noticed stuck to the bottom of the tool surface which seems to be affected by the nature of the limy bedrock covering the area.

The active face:

In many cases, the shape of the grinding surface presumably indicates the shape of the vessel in which the pestle was used, or last used for any length of time. Thus, pestles with flattened grinding surfaces might have been used with flat-bottomed or through-like querns and possibly with platters; while those with rounded grinding surfaces might have been used in the heavier curved-bottomed vessels in mortars or in cup-marked stones. This indicates that the tool was used for pounding rather than grinding (Dorrell 1983).

Deir Waraq pestles have a convex or almost convex flat circular-grinding surface at an oblique angle to the long axis of the pestle, mostly at its thickened end. Twelve pestles carried use traces at one end, and eighteen pestles carried use traces on both ends. This, indicates that they were used with curved-bottomed vessels as mortars or in cup-marked stones.

In addition the sides of eight pestles have smooth and shiny traces, which indicate that they were used for **multipurposes** such as hand stone for grinding.

All the tools could have been used comfortably in one hand, and may be inconvenient to be used in two because of the relative sharpness of the butts.

Four different forms of pestles were classified according to longitude and short section. The pestles were relatively of the different sizes and weights. The measurements of complete tools' lengths ranges between 21.75cm-9.75cm and the diameters ranges between 8.05cm-5.89cm for the bottom end and 6.26cm-4.8cm for the top end.

Cylindrical pestles

The cylindrical type form was common during the PPNB period (Dorrell et al.1983: Fig.226.12). It was found at Beidha (Wright: 1992a: Fig 5-22) and within the Late Neolithic levels at Abu Thawwab (Qadi 2001:Fig. 7:2).

The Deir Waraq example provides eight complete pestles and six fragments; four of them came from surface collection and two fragments (numbers 8 and 18) came from area B excavation. Some of these pestles have straight sides and the rest have convex sides. Some of the fragments were distal parts and broad end. Moreover, area B provided three complete pestles (numbers 6, 7 and 9), and three fragments (number 8 which is part of sand stone pestle and 18 parts of pestle body, the third one is small fragment kept without number). The complete tool's measurements are as follow:

Number	Length	Diameter
6	12.9	7.02 cm
7	17.8	8.05 cm
9	13.4	7.03 cm





8



Both sides have several chips. Pestle number 7 with convex sides has been roughly worked and partly smoothed on its sides. One of the sides was manufactured and flaked such as similar pestle came from Beidha (Wright: 1992a: Fig 5-22a). The same could be said about number 9, which has slightly convex sides, highly smoothed, but large part of one side missing as parts of both ends. One of the fragments (number 8) represents one third of the complete pestle. It was made of sandstone, mostly of straight sides well finished and carrying traces of use at its preserved end.



23







12



Two items came from area C, a complete one number 13 of 9.75cm for length and 5.9cm for diameter with roughly smoothed sides and vertical flaking on both active faces similar one to this pestle war found at Jilat 6(Wright: 1992a: Fig 5-2b).

Other two complete pestles come from area D measuring as follows:

Number	Length	Diameter
12	14.8	5.9
23	12.2	7

Pestle number 12 was perfectly shaped and have a vertical flaking on top active face and roughly smoothed straight sides. Similar form to this pestle found at Abu Hamid (Wright: 1992a: Fig 5-58a). While pestle number 23 was roughly shaped sides with flakes on broad end. Similar one has found at Beidha (Wright: 1992a: Fig 5-22b).





32



31



Area E yielded two fragments (number 36 of broad end and number 31 of top end), and two complete pestles of different lengths, the short one number 32 Well shaped with slightly convex sides and a lot of flaking from both ends due to heavy use a similar form found at Wadi Jilat 7 (Wright: 1992a: Fig 5-29d). While number 33 is longer with slightly convex sides well shaped and smoothed with large flakes on both ends. Measurements of both pestles are as follows:

number	Length	Diameter	
32	11.57	6.1	5.48
33	16.71	5.6	5.24

(When two measurements one taken for diameter, the first for bottom and the second for top of object).

The active face of these pestles have sub circular forms in plan and convex shape in section, and roughly rounded. Sides were smoothed or roughly smoothed by the effects of manufacture technique such as pecking and grinding. Long flacker scars came as a result of pounding with strike off the shaft alongside the face. The diameter and the active face indicate that these pestles were used with large or wide U-shape hollow mortars. Similar forms were reported from Beidha (Kirkbride 1966:Fig.7: 4).

Conical pestles

This form was found within the late Neolithic levels at Jericho and Jarmo. It corresponds to the continuation of the PPNB period (Dorrell et al.1983, Fig.226: 9).



One complete pestle (number 15)

And



42



40



29



28



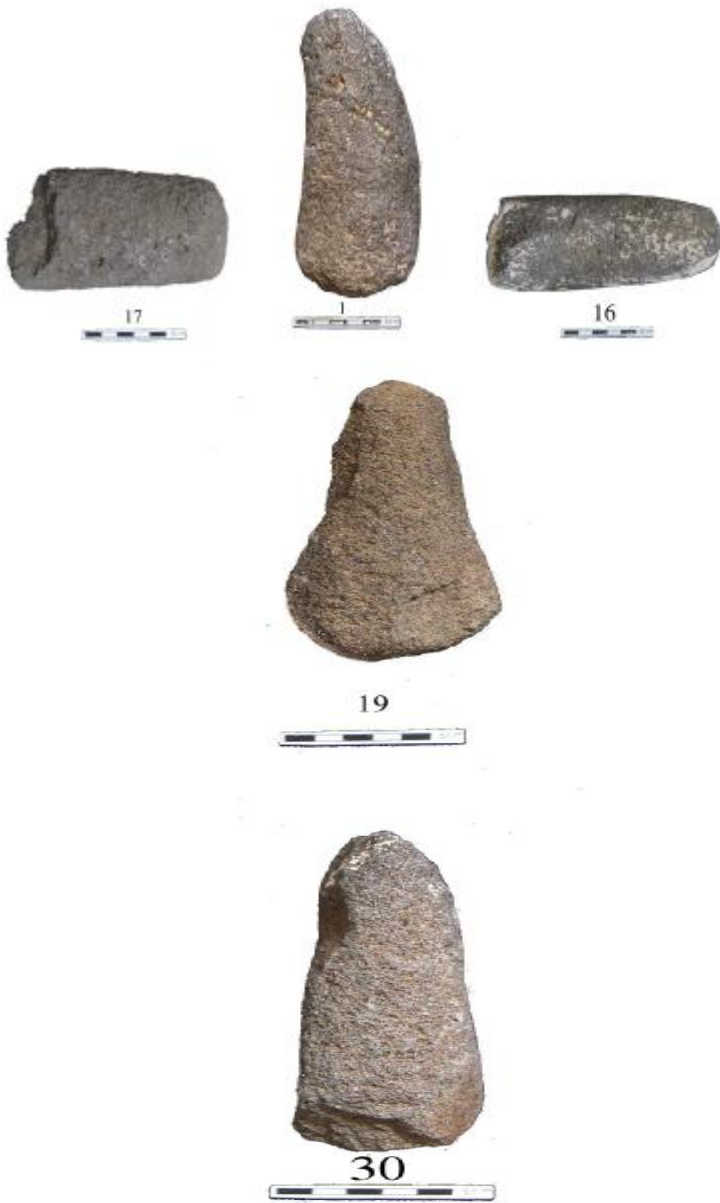
eleven fragments (24-29, and 38-42)

of this form were found at Deir Waraq within surface layers. Seven of them from Area C, and three from Area B. It was made of fine grain basalt and broken from both ends. The complete pestle number 15 fits with Wrights classification uni-polar Conical pestle (Wright 1992b: fig 7: 68) but our example has a conical form, and domed bottom with an oval plan section in longitude and width, measuring 20.64cm for length, 7.68cm for width and 6.54cm for thickness. Large part of one side was left natural or untouched, on flaking stage, to preserve the form. This form of pestles is common and known in Jerico (Dorrell et al.1983, Fig.221: 1, 226: 9), and Jarmo in Iraq. Our example is very close to Jarmo pestles (Braidwood et al 1983) with few variations in bottom where it tends to be plano convex at Jarmo while our example is convex as the preserved part show. It is manufactured by flaking followed by pecking and fine grinding.

Some fragments show the pointed end as a small dome, which means that it is not sharply pointed such as numbers 27-29 and 40-42.

A sub-form could be added to this category, which is a conical form pestles but with wide top instead of pointed top. This type of pestles (numbers 19, 30, 34 and 43) roughly shaped. It was made of medium fine grain basalt. Three of them are mostly complete and one is a fragment. The measurements of the complete ones are as follow:

number	Length	width	thickness
19	12.2	6.8	5.67
30	13.8	5.7	4.57
34	11.8	4.8	2.3





34



43



Bend top Pestles

This type of pestles seems to be common in Deir Waraq. samples were collected from all areas. The pestles in general have a sub rectangular-oval form which obtain two different sides; the broad side has sub oval rectangular concave convex form or tends to be sub oval

elongated concave convex, while the narrow side have sub oval convex elongated form.



21



2



35



10



Four complete pestles and three fragments were collected; pestle numbers 1, and two fragment (numbers 16 and 17) from area A, pestle number 2, fragment number 21 from area B, pestle number 10 from area C. and pestle number 35 from area E.



Pestles number 1, 10, 16 and 17 with bend top at one of the broad sides are of oval form in short section, mostly conical in longitude section. Similar pestles occurred in Hayonim cave fig.10: 13 (Bar-Yosef et al. 1973).

number	Length	width	Thickness
1	15.3	6.87	5.91
10	14.8	6.85	5.58

Pestles number 2, 12 and 35 one similar to Hayonim cave pestles fig.10: 9 (Bar-Yosef et al. 1973). Pestles numbers 2, 21,16,17 and 35 are similar but have less convex; they have large vertical flakes on their sides (2 and 35), while (21 and 16) got a vertical flakes divided it into halves, their measurements are as follows:

number	Length	Diameter		width	thickness
2	17.7	6.4	6.3	6.4	5.69
16	15.9	x	x	6.1	?
21	13.1	6.5			
35	16.5	7.8	5.04	7.8	6.25

Pestle number 21 was made of fine grain basalt. It has very fine finishing accompanied with shinning on its concave side. This suggests a secondary use for it as a polishing or rubbing stone.

Oval pestles



This group of pestles is oval in longitude with short section. They are different in size and weight. Three of them (number 3,4 and 11) represent this category; all came from 2001 excavation in area B; square 101 yielded number 3 and 4 from locus 3, and square number 102 yielded pestle number 11 from surface level, their measurements are as follows: -





11

number	Length	Diameter		width	thick
				h	
3	14.79	B7.64	T6.26	7.4	5.24
4	16.07	X	X	8.4	5.6
11	9.13	7.1	5.53	x	x

This type was well shaped and finely finished; pestle number 3 is the only one persevered completely, with small vertical flaker on its side, while number 4 were exhausted due to the heavy pounding. Therefore, all of its active face lost by several flacks. Number 11 was probably broken at the center where only the active face preserved carrying also small flak on one side. Similar pestles were found at Wadi Jilat 7 (Wright 1992a Fig.5-30: a-c)

Miscellaneous



This represents a type of pestles which were not finished, partly shaped especially at the place of handhold or used as it was found in nature.



Three pestles have been collected; pestles number 5, 14 and 22, all came from surface collection of area B and their measurements are as follows:

number	Length	Diameter	width	thick
5	21.75	x	99	7.22
14	17.82	x	8.7	6.9
22	14.82	x	6.73	7.09

Other tools is a handstand perfectly shaped and finished. Number 37 of Plano convex form, made of fine grain basalt. It has multi active faces, the grinding active face is of convex form and in long and short section, the upper face mostly shaped in a semicircular form and fits perfectly to handhold. At least one side war used for pounding where some wear traces were. This type of hand stone fit with Wright classification or Bifacial Polishing Pebble (Wrights 1992b: fig 8:81). Similar form came from Beidha (Wright 1992a Fig.5-14 a;1993 Fig.1-f).



The quern number 44 is made of hard limestone, of saddle shape with a cup hole at the center, it is broken at one of the corners. Only the active face shows the traces of manufacturing while the sides carris traces of large flaking. The cup hole of the U shape of circular opening of diameter measuring 8.84cm and 4.56cm of depth ,and the depth of the concave surface of the quern up to the lip of cup hole measures 5.49cm. This type of quern fit with Wright classification or “Quern/Mortar” (Wright 1992b: fig 12:135). The hand stone and quern measurements are as follows:

number	Length	width	thick
37	11.86	10.01	58.03
44	39.8	30.05	18.03

Conclusion:

A large number of basalt pestles, many chisels and four arrow-heads were discovered at Deir al-Warraq. The type of finds and the absence of permanent structures indicate that the site was only used for camping during the harvest season.

Despite the large number of pestles, only one portable stone quern was found at the site. This disparity may suggest that, given the rocky nature of the site, the occupants used the querns which were carved in the rock.

These bedrock querns would have been destroyed when the site was leveled in the recent past.

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Bibliography

- Bar-Yosef O. and Goren A., 1973 "Natufian Remains in Hayonim Cave". **Paléorient** 1: 49-68.
- Braidwood L.S., and Braidwood, R., 1983 "Prehistoric Archeology along the Zagros Flanks". The University of Chicago. Oriental Institute Publications. Volume 105. Chicago.
- Kirkbride, D., 1966 "Five Seasons at the Pre-Pottery Neolithic Village of Beidha in Jordan". Palestine Exploration Quarterly 98 : 8-72.
- Dorrel, P.G., 1983 "Appendix A: Stone Vessels, Tools and Objects". in: (K. Kenyon and T. A. Holland eds.) : Jericho V : 485-575. London.
- Marfoe, L. et al. 1986 "The use of Ground stone Tools at Kurban Hoyuk". **Anatolica** XIII : 76-82.
- Qadi, N., 2001 "The Ground Stone Industry. In : Z. A. Kafafi. **Jebel Abu Thawwab (Er-Rumman), The Late Neolithic and Early Bronze Age I Occupation**". Ex oriente, Berlin.
- Seeden, H., 1982 "Ethno archaeological Reconstructions of Halafian Occupational Units at Shams ed-Din Tannira". **Berytus** XXX : 55- 95.
- South, A. K., 1985 "Figurines and Other Objects from Kalvasos-Ayios". **Levant**, XVII: 65-79.
- Wright, K., 1991 "The Origins and Development of Ground Stone Assemblages in Late Pleistocene Southwest Asia. **Paléorient** 17/1:19-45.
- 1992a **"Ground Stone Assemblage Variation and Subsistence**

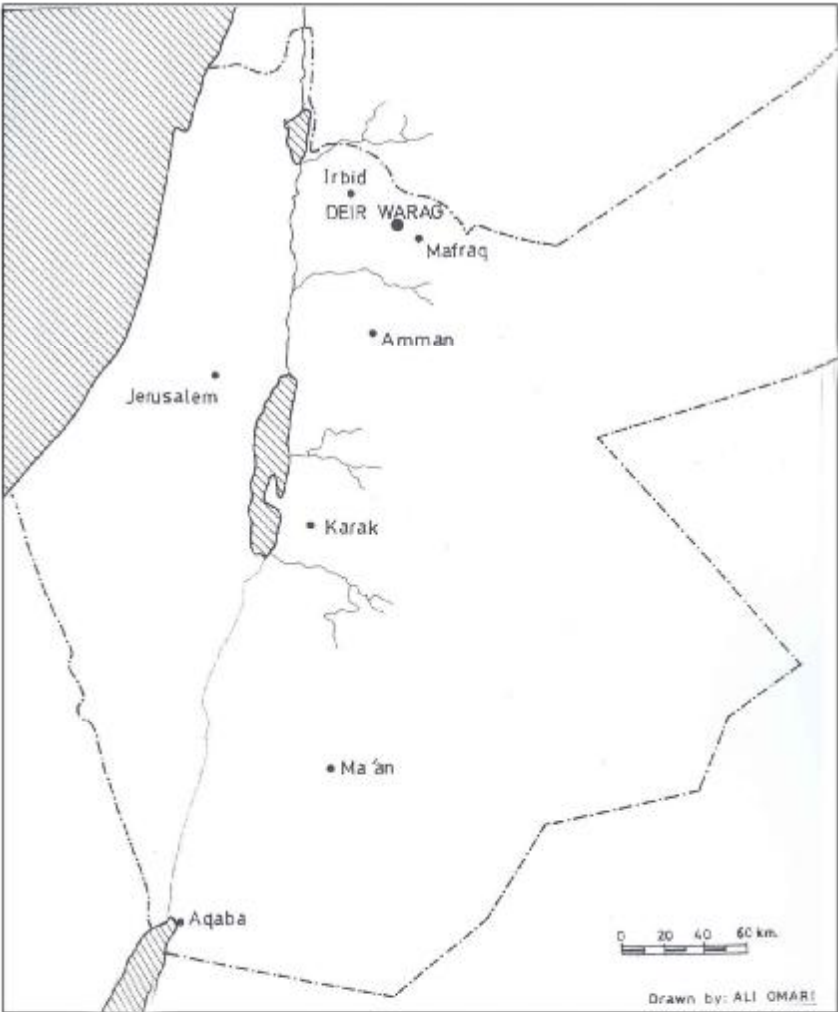
Strategies in the Levant". Unpublished Ph.D.dissertation, Yale

University. U.S.A.

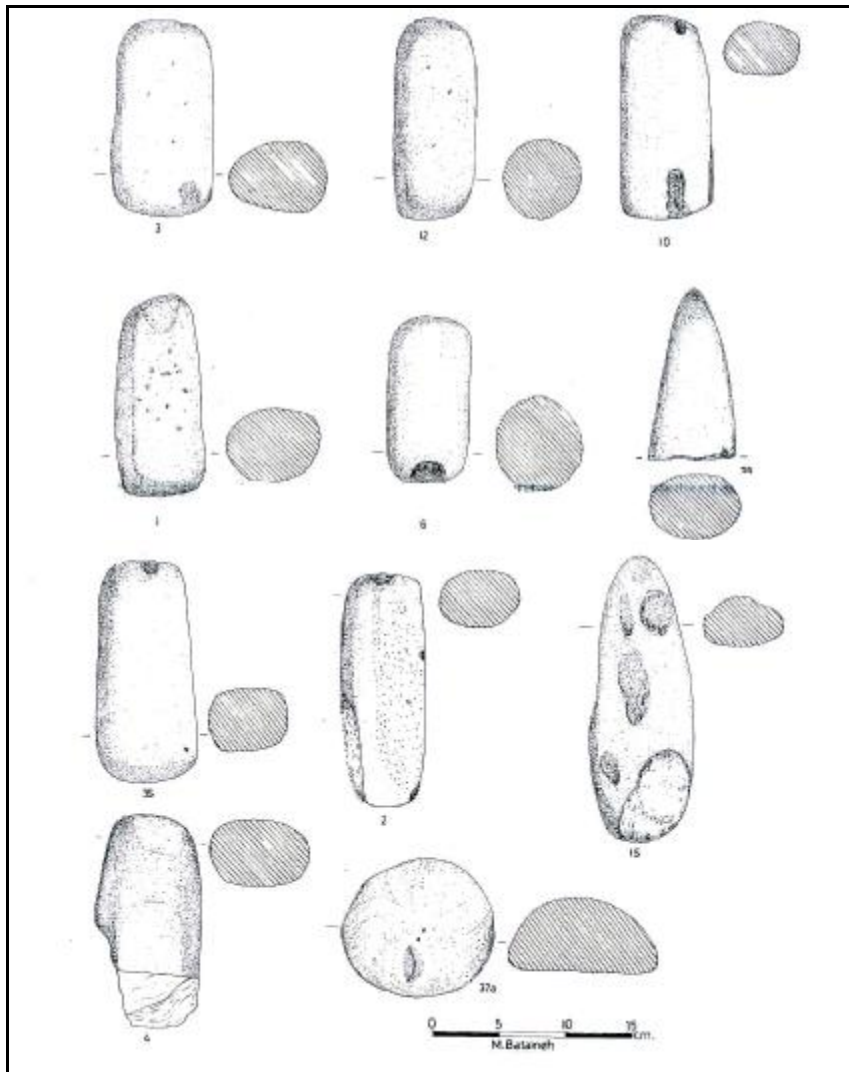
- 1992b " A Classifications System for Ground Stone Tools from the Prehistoric Levant". **Paléorient** 18/2:53-81.

- 1993 "Early Holocene Ground Stone Assemblage in the Levant".

Levant XXV : 93-111.



Map (1) Location of Deir Waraq



Plat 1: Showing different kind of Pestles

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