

Perspective

Harvest Techniques: Hand-Pulling and Its Potential Impact on the Archaeobotanical Record Vis a Vis Near Eastern Plant Domestication

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Abstract: A “cultivation prior to domestication”, or a “pre-domestication cultivation” phase features in many reconstructions of Near Eastern plant domestication. Archaeobotanists who accept this notion search for evidence to support the assumption regarding a wild plant’s cultivation phase, which in their view, preceded and eventually led to plant domestication. The presence of non-crop plant remains in the archaeobotanical record interpreted as arable weeds, i.e., weeds of cultivation, is viewed as a strong argument in support of the pre-domestication cultivation phase. Herein, we show that the simple practice of harvest by hand-pulling (uprooting) has the potential to secure an almost weed-free harvest. Indeed, rather clean (weed-free) Neolithic seed caches from a range of relevant sites were documented in archaeobotanical reports. These reports, alongside ethnographic observations suggest that (in certain cases) ancient harvest may have been carried out by selective hand-pulling. Hence, one has no reason to view archaeobotanical assemblages from occupation sites as fully representative of cultivated fields. Therefore, the concept of “arable—pre-domestication weeds”, its logic, and its potential contribution to the prevailing reconstructions of Near Eastern plant domestication need be reconsidered.

Keywords: arable weeds; Neolithic Near East; plant domestication; pre-domestication cultivation



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1. Introduction

Interpretations based on analyses of archaeobotanical assemblages recovered from Neolithic Near Eastern occupation sites have a fundamental role in all reconstructions of Near Eastern plant domestication (e.g., [1–8]). However, the basic question, *what exactly such archaeobotanical assemblages* (obtained from occupational contexts) *represent*, is hardly discussed in the literature. In other words, the question is: can we directly attribute any archaeobotanical remains (or an archaeobotanical assemblage as a whole) to certain human operations, (e.g., cultivation, foraging from the wild, refuse, or else) and if so, then how? Likewise, is there any systematic procedure to determine what was the relative contribution of any of the presumed/optional human activities to the deposition of plant material in relevant occupation sites?

An acceptable answer to the above dilemmas may be helpful in deciding between (assigning reliability measures to) the two debated models for Near Eastern plant domestication: the core area—one (rapid) event model [9–11] and the geographically diffused—protracted model [8,12]. The protracted domestication model (see also [13]) that we take issue with, includes an integral (sine qua non) component of pre-domestication cultivation (e.g., [5,8,14]). Needless to say, claims for evidence attesting pre-domestication cultivation

are based on archaeobotanical assemblages (e.g., [15–18]). Consequently, and by definition, even if not explicitly stated, such claims are made under the assumption that the archaeobotanical assemblage represents the ancient managed/cultivated plant populations. Accordingly, the major aim of this contribution is to reconsider and challenge the assumption that early Near Eastern Neolithic (let alone Epipaleolithic) archaeobotanical assemblages may be considered as 1:1 representatives of cultivated/arable fields. We wish to address several (often overlooked) aspects related to the concept of “weeds of cultivation” in the archaeobotanical record. Readers are reminded that the status of “weed of cultivation” is in fact an interpretation (granted to certain archaeobotanical finds) based on assumptions concerning ancient husbandry operations. Hence, our specific aim is to reconsider harvest techniques (emphasizing hand-pulling) that may impact the potential of such remains interpreted as weed remains to serve as indicators of pre-domestication cultivation in the Neolithic Near East. In doing so, we will devote special attention to recent ethnobotanical observations of crop harvest by uprooting—hand-pulling.

2. Pre-Domestication Cultivation in Near Eastern Plant Domestication Research

Many students of Near Eastern plant domestication (PD) are in favor of the idea that morphologically domesticated crop forms have arisen by way of pre-domestication cultivation (e.g., [15–18]). Some authors have argued that pre-domestication cultivation was an essential phase prior to domestication (e.g., [5,19,20]). The notion of pre-domestication cultivation as a prelude to genetic fixation of alleles conferring domesticated plant morphology has deep roots in the literature. Ever since the pioneering work of Helbaek [21,22] a theoretical framework that views human management (husbandry operations) exerted upon wild plant stocks (i.e., land clearing, seed corn selection, sowing, tending, weeding, harvesting, seed stocking; in one word—cultivation) as the key selective force underlying plant domestication has been in vogue. Human husbandry operations are envisaged as part of the so-called automatic (unconscious) selection that grants a selective advantage to the morpho-physiological domestication traits [5,23–25]. The recognition that certain domesticated phenotypes (e.g., non-brittle cereal spike, indehiscent legume pods, free seed germination) are ill adapted to natural settings, and the significant adaptive value of such phenotypes under a cultivation regime, led to the assumption that the first and most decisive (practical) step in the domestication of plants occurred when certain seed stocks were subjected to repeated cycles of sowing–harvesting–stocking (e.g., [21,23,25]).

If one adopts (or wishes to scrutinize) the pre-domestication cultivation scenario for plant domestication, the question of how can such presumed pre-domestication cultivation activities be identified in archaeological and archaeobotanical assemblages, becomes crucial. This is because genuine direct evidence for pre-domestication cultivation may help answer a number of currently debated questions in PD research. For example, when and where such pre-domestication cultivation activities commenced and how long did it take before morphologically domesticated plant populations were established in those pre-domestication cultivation arenas? Besides answers based on theoretical constructs (e.g., [26]), direct answers are dependent upon the archaeobotanical record. Hence, over the years, many archaeobotanists have made efforts in search of evidence for prehistoric cultivation (e.g., [2,18,21,22,27–30] to mention but a few).

3. What Does the Archaeobotanical Record Provide?

At face value, the presence of “weeds of cultivation” is a strong argument in favor of pre-domestication cultivation (e.g., [30,31]) and we accept this argument as long as it is supported by reliable evidence. However, we are unaware of criteria to distinguish between genuine weeds of cultivation (i.e., segetal taxa) and naturally occurring species typical of disturbed habitats ([11], pp. 7–11). Dennell [32] have analyzed archaeobotanical assemblages from Neolithic occupation sites in Bulgaria to infer about crop processing activities. However, given the presence of domesticated wheat and barley forms in those assemblages, the floral composition of such assemblages can hardly be helpful in inter-

preparing plant husbandry in Near Eastern Neolithic (and likewise earlier) sites where no morphologically domesticated crop forms were recorded. Later, in the framework of an ethnobotanical study in Greece, Jones [33,34] developed guidelines to distinguish between the residues of the different stages of post-harvest processing of free-threshing cereals. While the procedures developed by Jones [33,34] are certainly reliable, they cannot be easily translated into criteria to distinguish between residues derived from cultivated (wild or domestic morphology) and of foraging (from the wild) derived residues. This is for the simple reason that Jones' procedures were developed based on samples that originated from arable fields (of Greek traditional farmers). The above notwithstanding, we are unaware of any attempt to apply Jones' procedures to Neolithic assemblages recovered from specific contexts that enable drawing firm conclusions concerning the origin of the identified plant remains. Therefore, it may be prudent to ask the following:

Does the archaeobotanical record from occupation sites of the relevant periods provide reliable data on taxa considered as weeds of cultivation that allow for a reconstruction of cultivated fields? Can such remains be separated from plants brought to the sites for non-food purposes?

In our view, it would be fair to consider the option that seeds of non-target plants were brought onto the sites as contaminants alongside plant materials collected and brought as food, or for other purposes e.g., bedding for humans [35]. Likewise, archaeobotanical finds may include seeds (or other organs) of gathered wild plants since gathering continued, or of plants that grew in the sites themselves, or of plants that have dispersed their seeds (e.g., blown by wind or via hunted or domestic animal dung) from the surrounding environs.

One should bear in mind that even when domesticated crops were available, people may have still resorted to their surrounding environment for the procurement of staple plant materials (cereals included) and for other purposes (see above), as they still do to the present day [36]. Therefore, seeds (or other organs) from a wide range of plant species may have been deposited in occupation sites regardless of pre-domestication cultivation as can be seen in the long lists of taxa recovered from Neolithic and later sites (e.g., [37,38]) for the Pre-Pottery Neolithic B (PPNB) and Pre-Pottery Neolithic C (PPNC), respectively.

Our controlled harvest exercises of wild lentil and wild chickpea in Israel may provide a lesson regarding possible interpretations of archaeobotanical datasets. After the post-harvest cleaning of the gathered plant material, grains from both the target taxa (lentil or chickpea) and non-target (often toxic, short-statured *Lathyrus aphaca*) were present. Therefore, (in case that cleaning the gathered material was done on site) it implies that in certain instances, the imperative of cleaning food stuffs prior to consumption may result in biasing the original proportions of seeds from the target plants relative to those of the non-target species ([39], p. 3176). Under such circumstances, the archaeobotanical finds from occupation sites may reflect an enrichment effect with non-target plant species in the sampled archaeological layers [39]. This is for the simple reason that most of the target grains are expected to have been processed and consumed (which is the reason they were harvested and brought onto the site in the first place), while most of the non-target grains (toxic or else) are expected to have been discarded. Indeed, a higher proportion of *Lathyrus* (toxic) seeds (relative to other edible pulses) was reported by Miller ([40], Figure 2 therein) from a context interpreted as a trash deposit in PPNB Gritille (Turkey). So, even with meticulous identification to the species level lacking in many cases, e.g., [18,30,41], the documented effect of selective species enrichment [39] calls for caution in the interpretation of datasets of archaeobotanical plant remains before granting a "weed" status (e.g., [18,30]), or for the same matter "food-remains" status (a la [42]) to any particular species [43,44].

4. Do Archaeobotanical Assemblages Represent the Arable Fields' Plant Populations?

For the time being, and due to the millennia of intensive land management and soil erosion across the Near East and the following changes in the botanical spectrum, the presumed pre-domestication "cultivated" fields have remained elusive. We are unaware of archaeobotanical remains from any genuine pre-domestication cultivation context (a plot or

a field); this leaves us only with interpretations stating that pre-domestication cultivation was the case based on archaeobotanical remains extracted from the occupation deposits of Neolithic (and/or Epipaleolithic) sites. Can these remains be considered unequivocally as representative samples of plant communities from fields cultivated by the sites' inhabitants?

Regardless of one's opinion in the discussions on the role of plant remains in reconstructing Neolithic pre-domestication cultivation (e.g., [43,44]), it may be rewarding to reconsider some of the old-timers' statements made on the subject. Specifically, in the context of claims for arable/field weeds, a careful consideration of records and interpretations of archaeobotanical remains made by van Zeist [45] and likewise by van Zeist and de Roller [46,47] come to mind. van Zeist [45] considered very seriously the possibility of "pre-agricultural plant manipulation" or in present-day jargon, pre-domestication cultivation. Interestingly enough, at some stage of the discussion he stated that "one can only be certain of plant cultivation if remains of crop plants with the morphological characteristics of the domesticated species are found." Being aware of the weedy tendency of certain Near Eastern species, van Zeist [45] noted that "The evaluation of bitter vetch in the archaeobotanical record is handicapped by the fact that this species is also found as a weed in and along fields in the Near East . . . "

Considering the archaeobotanical finds from the PPNB layers of Tell Sabi Abyad, van Zeist and de Roller [46] questioned the indicative potential of weed remains to demarcate "proto agricultural" practices (i.e., cultivation) and stated that these taxa " . . . are not conclusive in this respect because usually they cannot be identified to the species level. Moreover, these taxa could equally well have formed part of the natural (plateau) steppe which was probably grazed by the domestic animals" ([46], p. 142).

Three years later, and being aware of Gordon Hillman et al.'s [2] and de Moulins' [37] intensive search for an archaeobotanical signature of pre-domestication cultivation in the Tell Abu-Hureyra archaeobotanical remains, van Zeist and de Roller [47] approached the subject via the PPNB plant remains of Asıklı Höyük by presenting a series of questions, of which we refer to the first three (quoted verbatim):

- Is there evidence for plant cultivation, and if so, what does the evidence consist of, and which species were cultivated?
- What can be said about the role of wild plant gathering at Asıklı?
- What information do the vegetable remains provide on plant husbandry practices (harvesting, crop processing)?

Obviously, during later excavation seasons at Asıklı Höyük in the 2000s, more archaeobotanical remains have been recovered and studied ([48] and references therein). Still, the careful attitude of van Zeist and de Roller [47] remains relevant as we write.

The first question was answered in the positive because while no remains of wild einkorn or emmer were found, non-brittle rachis remains of barley and wheat were identified.

Regarding the third question (on the possible signature of husbandry operations); being of the view that domesticated crop forms arose by way of cultivation [45] the authors were concerned by the scarcity of arable weed seeds in the relevant strata of Asıklı Höyük. The latter fact, and the identification of some cereals' culm bases prompted van Zeist and de Roller [47] to suggest that (at least, our addition) part of the cereal crops were harvested by uprooting and that the uprooted material was brought to the site for later processing; noting that in uprooting, fewer weeds are harvested together with the crop (*ibidem*). The second question was eventually resolved by Ergun [48] pointing at a wider range of plant-related activities including gathering from the wild, in retrospect justifying van Zeist and de Roller's [47] uncertainty about the source of the culm remains, that may have originated from reeds rather than from the wheat or barley fields of the Asıklı Höyük PPNB farmers. If, however, the option of harvest by uprooting is to be entertained, then the role of identified arable weed remains in the reconstructed pre-domestication cultivation man-made niche should be reconsidered. In other words, even with weed plant remains identified to the species level (which we reiterate, is not the case in most available PPNA

and not a few PPNB sites reports), the option of nearly weed-free harvest by uprooting, questions one of the basic premises of the pre-domestication cultivation reconstruction. Namely, the archaeobotanical record of occupation sites does not necessarily (or is highly unlikely to) represent the plant communities' repertoire of the assumed cultivated fields. Rather, it would reflect a wider range of plant-related activities including gathering from the wild, e.g., sensu Ergun [48].

It is, of course, impossible either to refute or corroborate the suggestion of harvest by uprooting of the specific cereals remains from Asıklı Höyük, and whether this was a common practice among other Near Eastern Neolithic farming communities. However, our recent ethnobotanical observations made in southeastern Turkey and in the southern Levant during the 2000s may shed some light on the subject and may, at least partly, corroborate van Zeist and de Roller's [47] considerations. This becomes highly relevant in light of the persistent claims for "weeds of cultivation" as evidence supporting pre-domestication cultivation. Likewise claims for "small-scale trial cultivation", "elementary cereal cultivation", "intentional systematic cultivation", "successful intentional cultivation", "entrenched-pre-domestication cultivation" and the like, all seemingly attested for by the presence of archaeobotanical weed remains (e.g., [8,15,29]).

Prior to describing the ethnographic observations let us describe the difference between the morphology of the roots systems of cereals and legumes and its bearing on the harvest practice. Legumes like chickpea, lentil, pea, or bitter vetch have a single seminal root that develops into a tap root system upon germination (e.g., [49], Figure 1). The fibrous root systems of cereals such as wheat and barley consist of seminal roots (usually 3–5) that emerge upon germination and develop perpendicular to the soil surface followed by a prolific nodal (also termed crown roots, adventitious) root system. The cereals' nodal root system has a more lateral growth pattern, that upon maturity makes a significant portion of the total root biomass (e.g., [50] and see Figure S1 of Hendel et al. [51]). With a tap root, and given the physical properties of Near Eastern fine textured alluvial soils (high silt and clay content, in which many deep cracks develop upon summer drying), hand uprooting of legumes is a rather easy operation (see below). However, with the extensive fibrous root system of the cereals, harvest by cutting the culms is usually the preferred, easier option, while uprooting by hand is less common, mostly practiced in lighter (smaller silt and clay fraction) sandier soils (e.g., [52]).

5. Manual Harvest of Grain Crops in Southeast Turkey during the 2000s

During several field trips made in 2002, 2003, 2007, and 2014 in southeastern Turkey one of us (SA) was able to observe and document mechanical as well as manual (traditional) harvest in grain legume fields. In the Diyarbakır region, for several decades, large tracts of the basaltic plateau have been cultivated using modern farming practices. Cereal fields in the region are mostly weed free, due to large-scale selective herbicide usage. Sprinkler and flood irrigation is common in the region, and sowing and harvest operations are mostly done by modern machinery. For example, lentil (a common crop in the region) fields are harvested by mowing and swathing followed by pick-up for mechanical threshing to release the grains. Two large-grain wild chickpea species are native to the basaltic vertisols west of Diyarbakır, namely *Cicer bijugum* and *C. echinospermum*. Because these two wild species are hardly affected by selective herbicides (against monocot plants) that are being used in grain legumes fields, they may often be seen as "weeds" in present-day commercial lentil or chickpea fields in this region (Figure 1). Under the modern mechanical harvest regime, some parts (e.g., seeds, pods, branches) of those associated wild plants may end up as part of the harvested materials (Figures 2 and 3). This is akin to the situation in which seeds of non-target plants are present within the manually harvested material of target species (e.g., [39]).



Figure 1. Wild *C. echinospermum* (right) with prostrate growth habit alongside domesticated (left, erect) chickpea near Siverek, southeast Turkey, June 2002 (photo by S. Abbo).



Figure 2. Wild *C. echinospermum* after mechanical mowing and swathing in a lentil field between Hilvan and Siverek, southeast Turkey, June 2003 (photo by S. Abbo).



Figure 3. Wild *C. bijugum* after mowing and swathing in a lentil field between Hilvan and Siverek, southeast Turkey, June 2003. Note the leftovers from the lentil crop, surrounding plant parts including intact pods beside the pencil (photo by S. Abbo).

Despite the fact that seeds of both *C. bijugum* and *C. echinospermum* are edible and native to the region that holds important early farming sites (e.g., Çayönü, Nevalı Çori),

seeds from these two wild species are not mentioned in the literature on plant domestication or pre-domestication cultivation from the area. Is it possible that the harvest from the early arable fields around Çayönü, for example, was done by selective hand-pulling (uprooting) of the target plants? This would have reduced the likelihood of bringing the seeds of these two locally native wild *Cicer* sp. taxa onto the site.

As mentioned above, a possible answer to the question may be obtained from observations of manual harvest in the region made during the last two decades. East of Mardin, and between the small townships of Midyat and Savur (southeast Turkey), small valleys with alluvial vertisols were being harvested by uprooting (hand-pulling) at the time of our field trips. Indeed, careful inspection of photographs taken in those fields shows that harvest by uprooting is a rather selective operation. Moreover, the local farmers knew and have identified the associated weeds, including for example the wild *C. bijugum* (as *Yabahni Nohut*, wild chickpea in Turkish). Yet, despite the edibility of its seeds, those farmers refrained from pulling them and left the intact plants behind (Figures 4–6).

Such a hand-pulling practice of a mature grain crop results in an almost pure crop material (stover and grain). Therefore, it is an efficient way to secure high purity of palatable seed yield for future human consumption (or other purposes). Indeed, some of the Neolithic domesticated “seed caches” were reported to have been rather pure e.g., bitter vetch in Çayönü ([47], p. 121, citing [53]), and likewise for lentil and faba bean in PPNB Yiftaḥel [54,55], faba bean in EPPNB/MPPNB Aḥiḥud [56], and lentil in Final PPNB (PPNC) Motza granaries [57]. Making heaps of weed-free crops (Figure 5) may also help in minimizing the energy invested in transporting the harvested material by avoiding the unwanted weed load, and to secure pure seed stocks with few contaminants (weeds) for next year’s sowing.



Figure 4. A bitter vetch field during manual harvest (by uprooting) near Midyat, Mardin Province, southeast Turkey, June 2002. A range of weeds can be seen (some still green) within the canopy of the fully mature crop (yellow).



Figure 5. A lentil field after harvest by hand-pulling near Midyat, Mardin Province, southeast Turkey, June 2002. A range of weeds can be seen (some still green) while the mature lentil plants are piled and await transportation to the threshing grounds near the village (Photo by S. Abbo).



Figure 6. Two wild *C. bijugum* plants (center and right) after hand harvest of a lentil field near Midyat, southeast Turkey, June 2002. Note that the plants have retained their morphology and most of the pods, dry as well as partially green; in contrast to the (mechanically damaged) plants depicted in Figures 2 and 3 (photo by S. Abbo).

Primary ethnographic records from across the Near East suggest that our observations in Mardin Province (southeast Turkey) were not isolated cases and that manual harvest by hand-pulling (of cereals and legumes alike) may have been rather common through time across the entire region. For example, (see [58], Figure 5) and likewise ([59], Figure 6) for records of cereals harvested by hand-pulling in other Turkish provinces. Similar observations of barley harvest by hand-pulling were made by Simms and Russell [52] in

southern Jordan and of einkorn uprooting in Morocco by Peña-Chocarro et al. [60]. We have also observed bitter vetch and lentil harvest by hand-pulling in the southern Hebron Mountains Israel, during the late 1990s. An interesting secondary source was provided by Vorsila Bohrer [61] who studied the relation of harvest methods to the development of early agriculture in the Near East. In doing so, Bohrer [61] cited 13 recent ethnographic sources alongside 5 classic Roman sources reporting harvest by uprooting of more than 14 different grain and forage crops (cereals, legumes, flax, and buckwheat). Bohrer [61] mentioned various considerations that may eventually determine the harvest method. For example, is it destined as a food or feed crop? does the farmer need long straw culms for thatching or basketry? and so forth.

We acknowledge that 20th and 21st century ethnobotanical observations represent an agrarian world, and therefore have but a limited explanatory power concerning reconstruction of Neolithic crop husbandry. Still, it would be prudent, in our view, at least to consider the possible role of uprooting by hand-pulling among other harvest techniques.

6. Concluding Remarks

Indeed, viewing archaeobotanical assemblages as representatives of Neolithic cultivated fields need be reconsidered. Firstly, since people continue gathering from the wild and the possible enrichment of the archaeobotanical record by non-target/not-consumed plants (see above). Second, we have recently addressed this notion from the perspective of the proportion of wild (shattering) vs. domesticated (non-shattering) cereal remains in archaeobotanical assemblages [62]. Based on agronomic considerations we have exposed certain methodological and theoretical drawbacks in the protracted domestication reconstruction vis-à-vis the proportions of shattering to non-shattering spikelets in archaeobotanical assemblages. We concluded that cereal remains from occupational contexts cannot furnish a quantitative representation of the presumed cultivated plant populations [62].

By considering crop harvest by hand-pulling (uprooting) we bring forward an additional element that corroborates the above conclusion. Indeed, in modern and traditional farming systems alike, grain legume fields usually make 15–20% of the total arable land (e.g., [63,64]). If we assume similar proportions of arable land for cereals and legumes for the Neolithic period, and even if selective harvest by uprooting is mostly attributed to grain legume crops, this would still considerably undermine the feasibility of attributing a 1:1 link between the archaeobotanical assemblages and the presumed Neolithic (and Epipaleolithic by some researchers) cultivated fields. Taken together, our inability to relate the proportions of domestic-wild cereals' morphology to the presumed managed populations and the option of selective harvest by uprooting, require that we reconsider the way by which archaeobotanical assemblages are being viewed and interpreted.

While assessing the archaeobotanical record, it is imperative to take into account a wide range of husbandry scenarios, as was done by Hillman and Davies [58], especially before assigning a weed (or a crop) status to the assembly of identified taxa. However, the imperative of careful consideration also necessitates full awareness to a wide range of underlying assumptions for which the investigator cannot possibly obtain any evidential support. Indeed, the reconstruction depicted by Hillman and Davies (Figure 12 in [58]) provides an extremely good example for multiple interdependent assumptions taken for granted by generations of scholars by adopting the pre-domestication concept.

Rereading through our own arguments in this paper, we acknowledge that while dealing with foragers (H-G) we assumed that they brought gathered plant materials to the site where cleaning of non-target (sometimes toxic?) seeds was carried out prior to consumption (see above and [39], p. 3176). To farmers, however, we have attributed a tendency to minimize the energy invested in transporting their harvested crops by sorting out the unwanted weeds already in the field similar to recent observations in southeastern Turkey presented herein (Figures 4–7). While the two operations (foraging wild legumes across the landscape and harvesting a field of domesticated legumes) are eventually very different and may (again, if our assumptions can be corroborated by data) reflect in a

nutshell two different ways of past thinking and relating to the world, this may also bear out our own biases.



Figure 7. A wild *C. bijugum* plant (center) after hand harvest of a lentil field near Midyat, southeast Turkey, June 2002. Note the two (pale green) lentil plants that were left by the harvesters (probably due to their close proximity to the wild chickpea plant). Note the intact morphology of the wild chickpea; in sharp contrast to the (damaged) plants depicted in Figures 2 and 3 (photo by S Abbo).

Obviously, there are many more sources (or ways) by which certain plant remains reach the archaeobotanical record. Bohrer's [61] illuminating discussions provide a glimpse into a complex and an almost endless space comprising various husbandry options, seasonality profiles (that affect crop performance), primary and secondary use of the produce (and by-products), site formation processes, and probably more that we are unaware of. Consequently, we are too limited in our ability to fully (or even partially) reconstruct the underlying processes to the degree that makes the assumption that archaeobotanical finds may represent arable fields, a naïve if not an altogether futile non-constructive notion. All in all, and with awareness to methodological and ethical aspects concerning the interpretation of archaeobotanical remains (weeds of cultivation included) elaborated on elsewhere ([11], pp. 7–11), we would emphasize yet again the fragility of the theoretical construct concerning pre-domestication cultivation (e.g., [11,43,62]). The case of Chogha Golan may indeed serve as a good example: the archaeobotanical remains of this site gained a paramount role in support of pre-domestication cultivation and we welcome the recent withdrawal of this interpretation [65].

The growing volume of archaeobotanical data across the Near East notwithstanding, the issue of pre-domestication cultivation remains a challenge. At present, basic methodological and practical aspects of the archaeobotanical work (some of which were highlighted above) do not permit drawing firm conclusions regarding the role of archaeobotanical remains in conclusively supporting a pre-domestication cultivation scenario (e.g., [11,62]).

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