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Short fieldwork report

Plant remains from Berikldeebi, Georgia, 1979-1992

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The site of Berikldeebi is located in Inner Kartli (Shida Kartli), close to the modern city of Kareli, Georgia (coordinates 42°02′35″N, 43°52′39″E, 645masl). It is located on a promontory created by a confluence of the Eastern Prone and Kura rivers, dominating the valley filled with Quaternary alluvial deposits (Babetto et al. 2021; Kvavadze et al. 2020). The archaeobotanical samples originate from the Bronze Age Bedeni leyer—Berikldeebi Period III (ca. 2500–2000 BCE) according to Sagona (2017). The samples originate from the part of site excavated by the Georgian National Museum expedition directed by Aleksandre Javakhishvili (Jalabadze 2014, 2018).

The samples, according to their labels, were stored in the Georgian National Museum since their recovery from excavation in the last quarter of the 20th century. Usually the samples contained visible charred plant macro-remains, embedded in sediment. As they originated from several excavation seasons, their exact locality within the site is not always given, however, every sample is labelled as belonging to the Bedenian layer. One sample was taken from the floor of building No. 8 (sample 10 in **Table 1**).

In total 16 samples, of volume up to 0.5 litre per sample, were investigated by Aldona Mueller-Bieniek and Nana Rusishvili. Archaeobotanical carpological research was conducted in the Georgian National Museum in 2019. The samples were investigated with the help of a low-powered binocular microscope. Dry sieving using sieves of ca. 1mm mesh size was usually performed. The fraction smaller than 1mm was stored and partly sorted. In some cases flotation was used, always preceded by a test of a small subsample. In one sample (No. 5) soaking in water appeared destructive for well-preserved charred remains of pulses, which drowned very fast and before 1 minute they broke into tiny fragments.

All samples, except of two, contained charred seeds and fruits (**Table 1**). In sample 12 only uncharred specimens of *Onopordum acanthium* L. were found, while sample 14 contained only wood charcoal.

Table 1. List of taxa and their content. All plant remains are charred unless otherwise specified. Taxa listed in the last column are given according to their abundancy—from the most numerous to single items.

Sample	*Hordeum vulgare*	*Triticum* cf. *aestivum* (naked)	*Vicia ervilia* (large Fabaceae)	*Lolium persicum/ rigidum*	Other taxa and notes
1/1992	dominant (95–99%)	present			hulled barley
2/1985	present (20%)	dominant (80%)		present	hulled barley
3/1988	present	present	dominant (99%)		*Fallopia convolvulus*, cf. *Camelina sativa*, *Lolium* sp., cf. *Galium* sp., *Chenopodium album* type, cf. *Lens culinaris*, *Triticum* cf. *spelta*, *Lithospermum* sp., beetles
4/1985		present	dominant (99%)		*Fallopia convolvulus*
5/?			(dominant 100%)		all seeds preserved without testa, using water appeared destructive, probably few species
6/1979	dominant (100%)				ca. 100 grains, pure grain, hulled
7/?		dominant (100%)			ca. 100 grains, very diverse, 8 rachis fragments of *Triticum* cf. *aestivum*
8/1985		dominant (100%)			a lump of pure grain, strongly charred
9/?		present	dominant (99%)		ca. 200 seeds, probably not one species, *Fallopia convolvulus*, a bulb?
10/1986	dominant (50–60%)	present (10–20%)		present (10–20%)	large diversity of barley and wheat, *Triticum* cf. *dicoccum* (spikelet base), *T*. cf. *aestivum* (rachis fragment), *Fallopia convolvulus*, *Neslia paniculata*, bud, grass stem fragment, barley hulled and naked, also some immature grains
11/1985	present (10%)	dominant (90%)			*Triticum* cf. *aestivum* (few rachis fragments), *Hordeum vulgare* (few rachis fragments), hulled
12/?					*Onopordum acanthium*, ca. 100 uncharred seeds (diasporas), probably recent contamination, rodent storage
13/1985	co-dominant (50%)	present	co-dominant (50%)		*Lens culinaris*, *Lolium* sp., *Poaceae* indet., barley hulled
14/1979					wood charcoal, large fragments, also branches
15/1985	present	present	dominant (95%)		*Fallopia convolvulus*, cf. *Galium* sp., *Lens culinaris*, *Lolium* sp., cf. *Camelina sativa*, *Setaria verticillata/viridis*, *Lamiaceae* cf. *Thymus*, *Lithospermum* sp., beetles, stem fragments; barley hulled
16/1984	present	present	present		dominated by mineralised (or strongly burnt?) *Anchusa officinalis* type, cf. *Lithospermum dispersum*—one mineralised

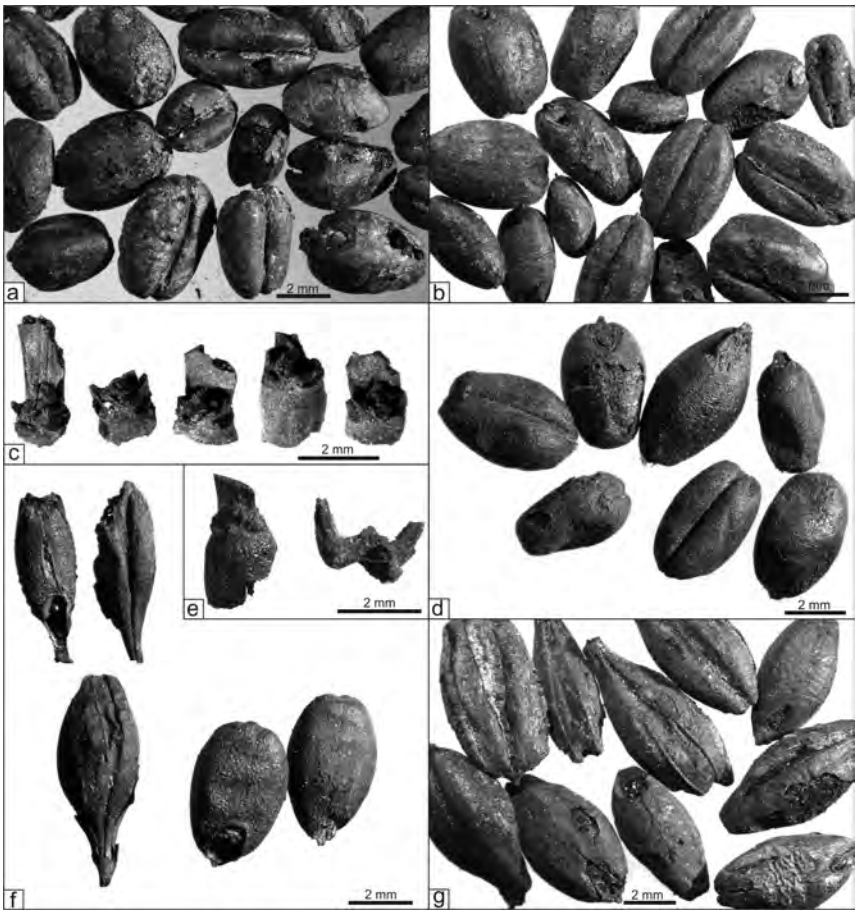

Figure 1. Charred remains from the Berikldeebi site: a-b, d – grains of naked wheat (*Triticum* cf. *aestivum*): a – sample 2, b – sample 7, d – sample 10; c – rachis fragments of naked wheat, sample 7, e – rachis fragment of hexaploid wheat (*T*. cf. *aestivum*) and spikelet base of hulled wheat (*T*. cf. *dicoccum*), sample 10; f – barley (*Hordeum vulgare*) naked and hulled forms, sample 10; g – grains of hulled barley (*Hordeum vulgare*), sample 6.

Three taxa dominated in the samples: barley (*Hordeum vulgare*), wheat (*Triticum* sp.) and bitter vetch (*Vicia ervilia* (L.) Willd.). Barley dominated in four samples and was present in five others as admixture in wheat or vetch. Mostly hulled grains were found but grains of naked barley were also present (**Figure 1e-g**, **Figure 2a-b**). Six-rowed and probably also two-rowed varieties of barley were found in the material. Wheat grains, of mostly naked forms, dominated in four samples and were present in eight samples, mostly as admixture of vetch. Hulled wheats are also present, which was marked by single remains of glume bases and spikelet bases of probably emmer

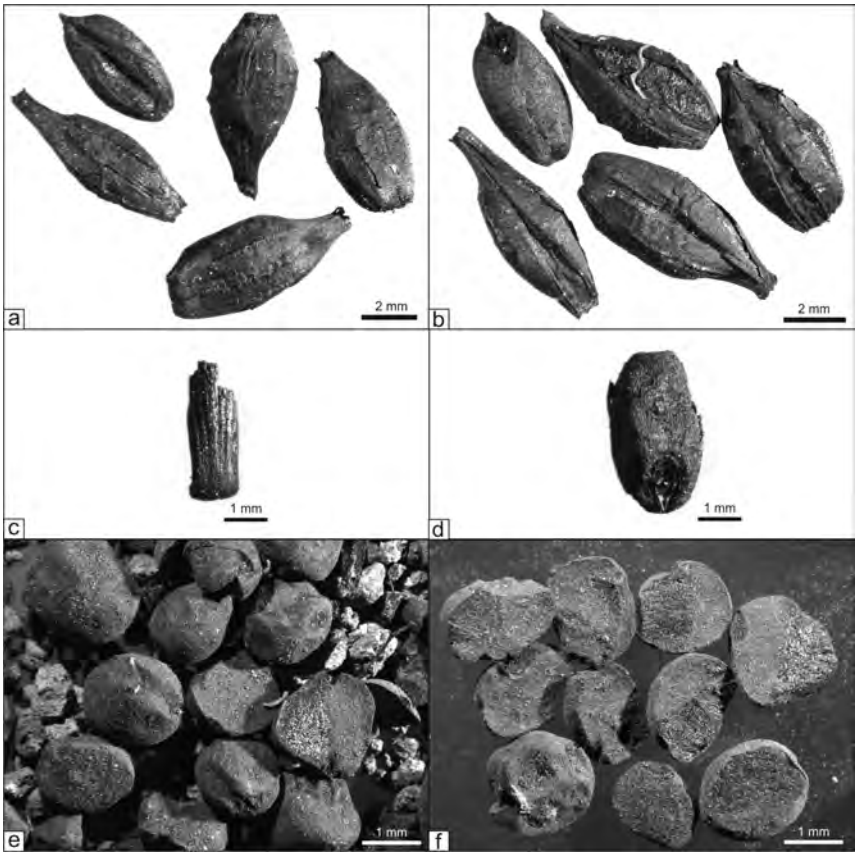

Figure 2. Charred remains from the Berikldeebi site: a-b – barley (*Hordeum vulgare*), naked grains still covered by palea and lemma, sample 3; c – wheat glume base (*Triticum* cf. *spelta*), sample 3; d – wheat grain (*Triticum* sp.), sample 3; e-f – large Fabaceae, sample 5.

and spelt (**Figures 1e**, **2c**). It was not possible to distinguish grains of hulled wheats, but their presence is very probable. Chaff remains (rachis fragments) of naked wheats, mostly hexaploid, were also noted (**Figure 1c**, **e**). Large Fabaceae, mostly bitter vetch, dominated in six samples, ones equally with hulled barley. The presence of other pulses, like *Pisum sativum* L., *Pisum arvense* L. and *Lathyrus* sp. is also possible. Lentils (*Lens culinaris* L.) were rare, with single items noted in three samples (**Table 1**). In a few samples (3, 4, 9, 5) seeds of pulses had been infested by insects before charring (**Figure 3b-c**). In cereal grains no mark of infestation was noted. Among other taxa, *Lolium* grass grains were very numerous in two samples and present in three others. Nutlets of *Fallopia convolvulus* (L.) Á. Löve (synonym: *Polygonum convolvulus* L.), which also has the common name 'wild buckwheat', were significant in a few sam-

Figure 3. Charred remains from the Berikldeebi site, sample 3: a – seeds of bitter vetch (*Vicia ervilia*), sample 3; b – seeds of bitter vetch, and other large Fabaceae, on some of them holes created by insects are visible; c – beetles.

ples (**Figure 4b**). Seeds of *Camelina sativa* (L.) Crantz (identification not certain), an oil plant also known as 'gold-of-pleasure', were found in two samples (**Figure 4a**). The majority of the finds are preserved by charring. In one case the mineralized remains of *Anchusa officinalis* L. (*A. pulla*, *A. arvensis*, *A. orientalis* cannot be excluded) and probably *Lithospermum* were noted (**Figure 5**). Remains of *Anchusa* were numerous, but most of them were fragmented (minimum number of specimens—ca. 50). They belong to the Boraginaceae family for which a high content of silica in fruits is characteristic. Intensive charring of such diaspores can lead to loss of carbon with the retained silica giving the remaining fragments a white colour (Lityńska-Zając & Wasylikowa 2005) so we cannot exclude that they were burned before deposition.

The studied samples mostly contained edible plants, usually cleaned storages, with low contamination of weeds and other plants. It can also result from an unclear type of sample collection during the excavations, as some of the samples contained pure grain. However other samples contained small seeds like *Camelina sativa* or *Chenopodium album*, and sediment. In the samples, clear evidence of insect infestation of the pulses was also noted, but the remains of beetles are usually absent or badly preserved due to charring and post depositional processes (see Antolín & Schäfer 2020; Kislev 2015).

The sample of uncharred achenes of Scottish thistle (*Onopordum acanthium*) has probably been impacted by some contamination and trace of recent animal activity. The achenes are produced in large quantities by the plant, they are naturally dark

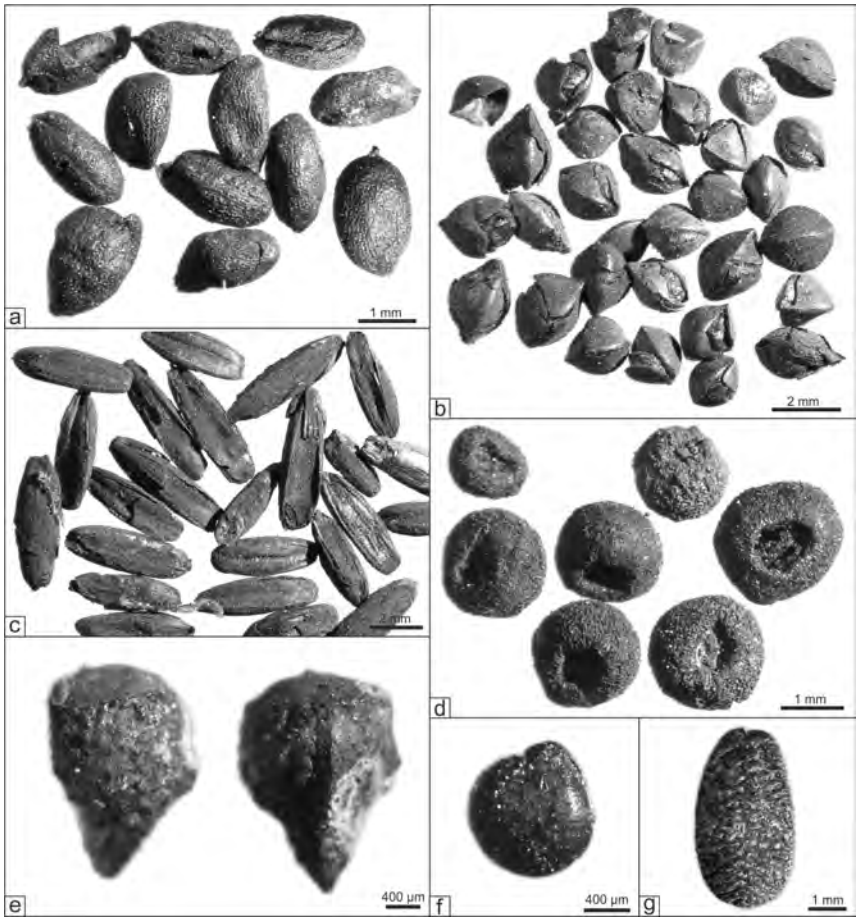

Figure 4. Charred seeds and fruits from the Berikldeebi site: a – probably gold-of-pleasure (cf. *Camelina sativa*), sample 3; b – wild buckwheat (*Fallopia convolvulus*), sample 3; c – *Lolium persicum/ridigosum*, sample 10; d – *Galium* sp., sample 3; e – *Lithospermum* sp., sample 3; f – *Chenopodium album* type, sample 2; g – *Onopordum acanthium*, sample 2.

brown and dormant, and rich in oil. It is hardly possible that they belong to the archaeological context. The plant is native to the studied region.

The other problematic sample, Sample 16, contained, except for a few charred barley and wheat grains, several mineralized (or burned to ashes, in high temperature) specimens of *Anchusa*. Their link with the Bedeni archaeological context is much more possible than in the case of thistle but checking of their age by use of radiocarbon dating, as visibly no carbon is preserved, is not feasible. *Anchusa officinalis* is known as a medicine plant, dying plant and also an important nectar source. If the

Figure 5. Mineralized remains from the Berikldeebi settlement, sample 16. *Anchusa* sp. and cf. *Lithospermum dispersum*.

Anchusa remains are contemporaneous to the studied period of time their appearance (relatively large quantity and uncommon type of preservation) can indicate some special character of the studied feature.

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