Supporting Information

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SI Methods

An experiment was carried out to check the technique for using the Bilancino grindstone and pestle grinder. We used two fragments of sandstone of a similar size and shape to the archaeological tools to grind the dried rhizomes of cattail. Flour obtained in this way is a fine, white–beige powder with a slightly sweet aroma (1).

The analysis (Table 2) shows the proximate composition of different meals of *Typha* and emmer (*T. dicoccon* Schrank) (per 100 g wb, standardized at 14.5% moisture).

Hulled wheats (einkorn, emmer, spelt), known in Italy by the common name of *farro*, are among the most ancient Triticeae cultivated in the world and have long represented a staple food.

The composition of rhizome flour is similar to the composition of emmer meal (in particular, whole meal). However, rhizome flour has a lower protein and digestible carbohydrate content and a higher dietary fiber content than emmer kernel meals.

An indirect evaluation of protein quality can be obtained through the determination of the amino acid composition, taking the essential acids in particular into consideration.

The amino acid pattern of rhizome is characterized by high levels of valine (12.1 g/100 g protein), glutamic acid (15.2 g/100 g protein), and aspartic acid (25.6 g/100 g protein) and low levels of essential amino acids such as lysine (3.4 g/100 g protein), leucine (5.7 g/100 g protein), and sulfur amino acids (1.4 g/100 g protein). From a nutritional point of view, the limiting amino acids are lysine and sulfur amino acids (chemical score 0.56–0.58, respectively). In emmer and in wheat species, the most widely represented amino acids are glutamic acid (30.0 g/100 g protein), proline (10.0 g/100 g protein), and leucine (6.5 g/100 g protein), and the limiting amino acid is lysine (chemical scores 0.47 and 0.38 for whole meal and refined flour, respectively).

The principal fatty acids of rhizome flour are linoleic (C18:2) (40% of total fatty acids), palmitic (C16:0) (35% of total fatty acids), stearic (C18:0) (9% of total fatty acids), oleic (C18:1) (6% of total fatty acids), and linolenic (C18:3) (5% of total fatty acids). This fatty acid composition presents an unsaturated/saturated fatty acid ratio close to 1, providing a higher stability versus oxidation phenomenon than emmer with an unsaturated/saturated fatty acid ratio of 4.6–4.8.

1. Aranguren B, Revedin A, eds (2008) *Bilancino: A 30,000 Years Ago Camp-Site in Mugello, Florence* (Istituto Italiano di Preistoria e Protostoria, Florence, Italy) (in Italian, English).

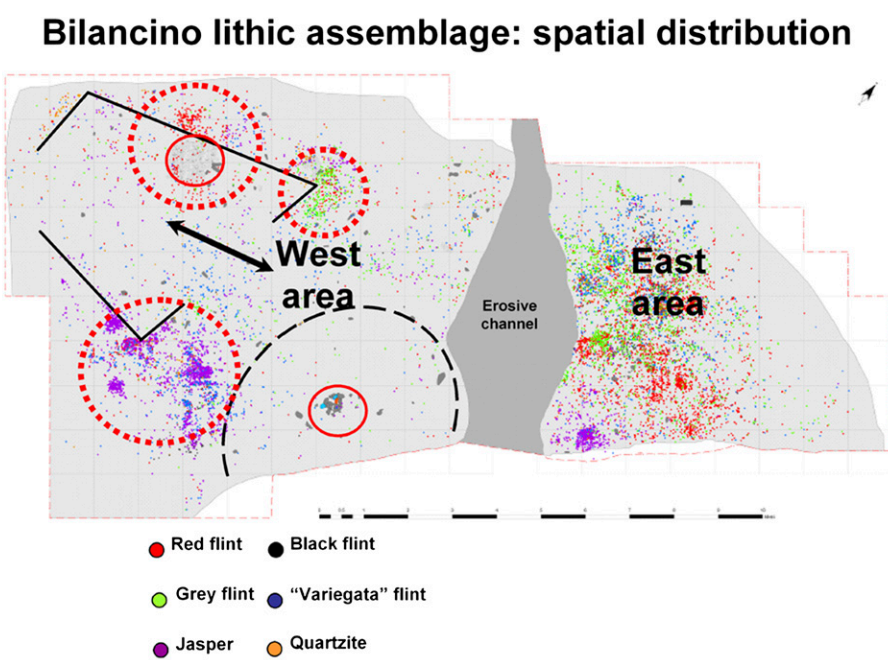

Fig. S1. Bilancino II. Spatial distribution of the lithic assemblage and the activity areas on the living floor.

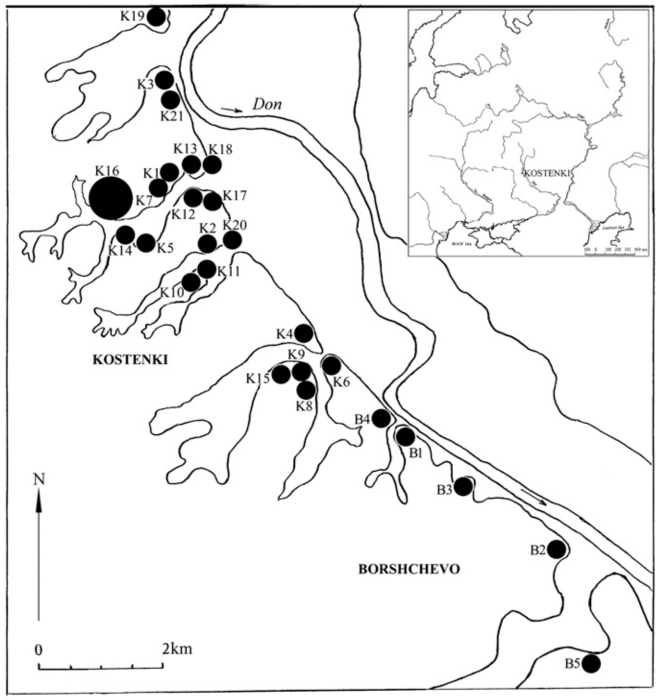

Fig. S2. Kostenki 16 (Uglyanka) in the context of Kostenki–Borshchevo sites.

Fig. S3. Pavlov VI. The living floor.

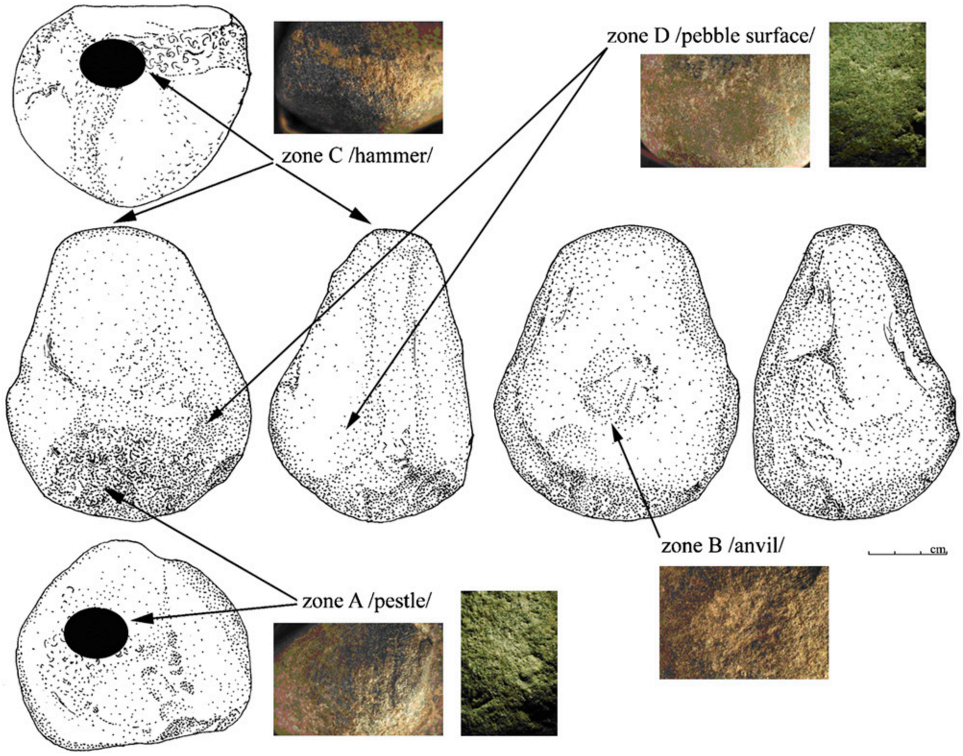

Fig. S4. Kostenki 16 (Uglyanka). The pestle grinder wear traces.

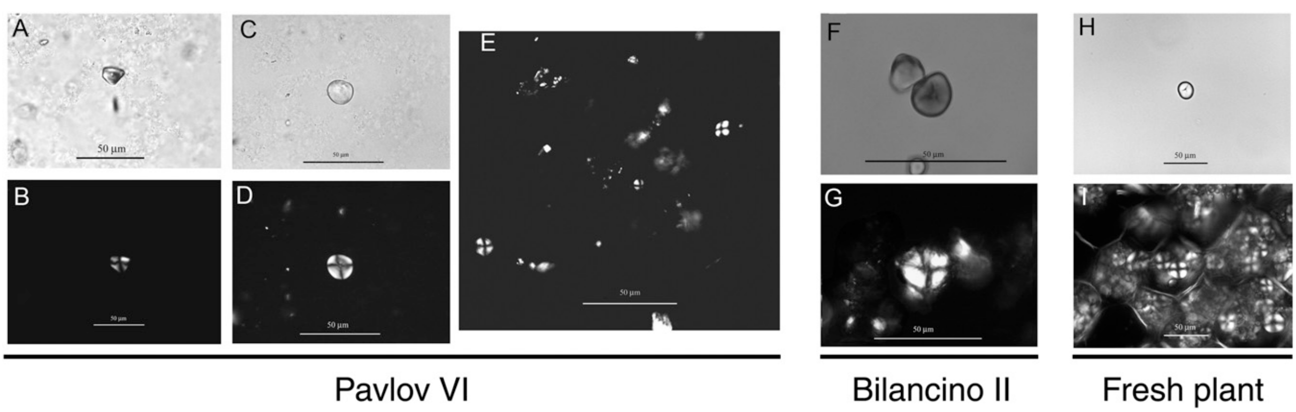

Fig. S5. Starch grains. (*A*) From Pavlov pestle grinder, morphotype l, angular grain, hilum not evident. (*B*) From Pavlov pestle, morphotype l, angular grain, hilum not evident, polarized light. (*C*) From Pavlov pestle, morphotype p, circular–elliptic, hilum not evident. (*D*) From Pavlov pestle, morphotype p, circular–elliptic, hilum not evident, polarized light. (*E*) From Pavlov pestle, various circular–elliptic grains, polarized light. (*F*) From Bilancino grindstone, morphotype e, circular–elliptic grain, hilum Y shaped. (*G*) From Bilancino grindstone, morphotype e, circular–elliptic grain, hilum Y shaped, polarized light. (*H*) From *Typha angustifolia* (fresh plant). (*I*) From the rhizome parenchyma of *Typha angustifolia* (fresh plant), polarized light.

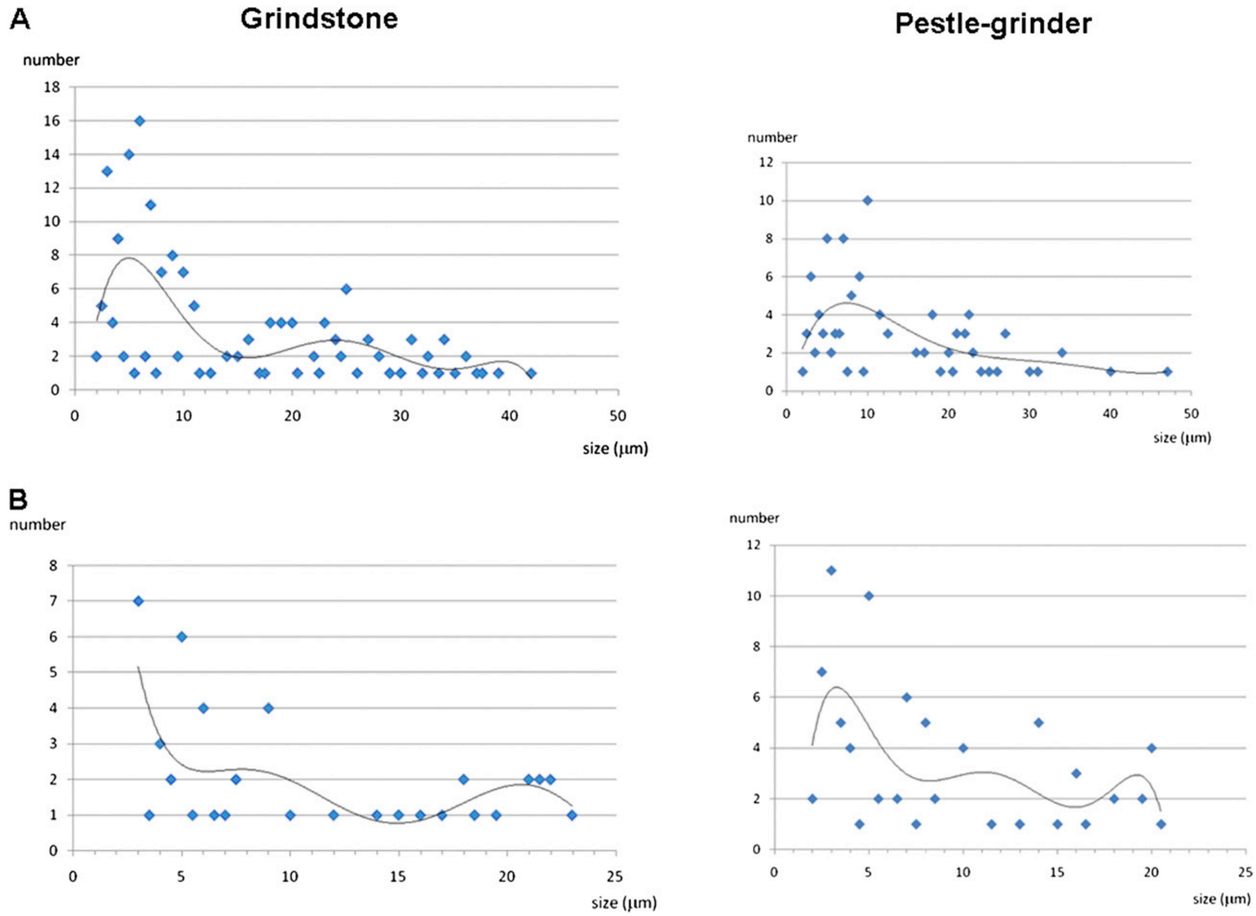

Fig. S6. Bilancino II: grindstone and pestle grinder. (*A*) Circular elliptic grain size distribution. (*B*) Angular–slightly angular grain size distribution.

Fig. S7. Bilancino II. (*A* and *B*) Experimental reconstruction of the two phases of use of the pestle grinder.

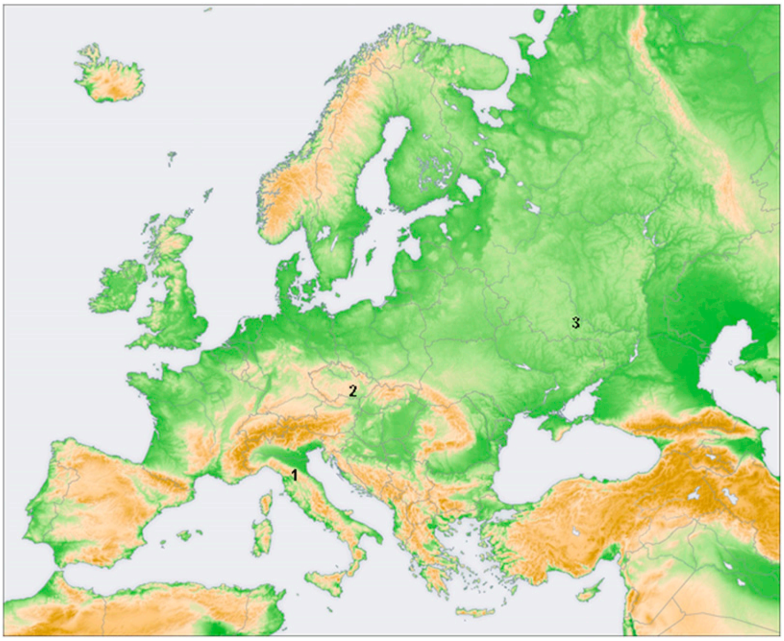

Fig. S8. Location of the three Upper Paleolithic sites in Europe: 1, Bilancino II; 2, Pavlov VI; and 3, Kostenki 16–Uglyanka.