

2006 Preliminary Report on Environmental Samples

The 2006 SVP field season and subsequent analysis period contributed substantially to the continued development of the project's paleoethnobotanical research program, and led to the discovery of interesting and unexpected patterns in ancient plant use and consumption. Environmental sample collection was undertaken at Acquachiara trenches 8000, 9000, and 10000; crop remains and weed seeds were successfully recovered from samples in 8000 and 10000. The construction of a second flotation tank, built according to the same plan as the first, both increased sampling capacity and reduced the possibility of misleading contamination between groups of samples, as samples from different trenches could be processed in different tanks. Finally, a series of AMS radiocarbon dates on plant materials recovered from the environmental samples have now provided secure dates for trenches 8000 and 10000.

Plant taxa recovered fall into four classes: cereals, legumes, segetal weed seeds, and fruit; all four have been recovered from trench 8000, but only cereals and fruit from trench 10000.

Triticum dicoccum (emmer wheat) is the only strain of wheat to have been definitively identified, and it so far appears only in trench 8000. *Hordeum vulgare* (barley) also occurs; it is slightly less common than emmer wheat in trench 8000, but is the sole cereal species so far recovered in trench 10000. The examples are still too few altogether, however, to draw any conclusions about relative importance either in relation to different cereal species in a single period or change over time between the Iron Age and Roman periods. Cereal chaff is also represented in a few cases in trench 8000 (rachis fragments). A ubiquity measure (the percent of samples in which a given taxon is present) reveals that cereals are common, occurring in 23 out of 30 samples (76%) in trench 8000.

The weed taxa that occur are generally segetal, and could have co-occurred with cereal crops, legume crops, or both. They are relatively common (appearing in 43% of the samples), and include seeds from the dock (*Polygonum convolvulus*), pink (*Silene* sp.), mustard (*Brassica* sp.), and goosefoot (*Chenopodium* sp.) genera, as well as various small grasses (Poaceae family). Weed taxa do not show any distinctive patterning with regard to their association with crop species, and so cannot at this point be used to consider crop cultivation, processing, or storage procedures.

The largest number of fruit taxa came from a single small pit in trench 10000. This pit contained the remains of a carbonized fig (*Ficus carica*) (represented by clumps of charred seeds, skin, and flesh), the flesh, skin, and pit fragments of a carbonized plum (*Prunus* sp.), as well as several whole carbonized grapes (*Vitis vinifera*), along with a number of separate grape pips and peduncles. In contrast to this rich deposit, fruit remains from trench 8000 are relatively scarce—only fragmentary grape seeds and peduncles are present. These grape seeds are fairly common (appearing in 47% of the samples), but are always in a fragmentary state, so that it is not possible to determine conclusively whether they came from wild or domesticated grapes. The earliest evidence for grape cultivation in the Biferno Valley is quite late by Mediterranean standards, and consists of tentative identification of very few grape seeds dating from the 8th to 5th centuries B.C. Bronze Age sites in the Biferno Valley have

produced only wild grapes, not domesticates. It is therefore possible that the deposits in trench 8000 are too early to expect cultivated grapes, or at least on the cusp of when they might appear. It is fair to assume that either they were simply eaten raw, dried, or used in small-scale wine-making, though there is no other evidence from the site that suggests wine production.

The ubiquity of legumes (appearing in 70% of the samples) is somewhat higher than would typically be expected on a Mediterranean site (a usual pattern being something like cereals in 70% of samples, legumes in 40%, and fruit in 40%). Legumes that are present include lentil (*Lens culinaris*) and bitter vetch (*Vicia ervilia*), discounting small weedy type legumes. The legume most commonly found on archaeological sites in the Biferno Valley (and in many parts of Italy, during many time periods) is *Vicia faba*, the horse bean, or broad bean. This species has so far not been identified at any site on Monte Pallano.

Lentils occur in small number in only trench 8000; Bitter vetch also occurs only in trench 8000, but is by far the more common of the two. Of the cases in which legumes are identifiable to genus, lentils make up 16% of the total, and bitter vetch 84%. Bitter vetch is the single most common taxon that occurs in either of the Acquachiara trenches, as it is represented in 53% of the samples from trench 8000. This is interesting, as bitter vetch, unlike lentil, has historically been considered an inferior food. Roman and Greek sources, for example, regarded it as unpalatable or even poisonous. It is often used as animal fodder, and it is sometimes difficult to determine on an archaeological site whether this species was being consumed by humans or grown for fodder purposes. Vetch is relatively easy to cultivate, requiring the lowest amount of work invested for the greatest return among domesticated legumes, and does well on dry soils. It thus often serves as a famine food when other crops are suffering from drought. A strong case can be made here that bitter vetch was actually consumed by humans.

While the sheer frequency of bitter vetch relative to other taxa is intriguing, the plant taxa with which it co-occurs suggest it was part of a human food assemblage. Bitter vetch is often in the same samples as cereals; of the 16 samples in which *V. ervilia* is represented, cereals are present in 69% of them. In addition, in all of the samples in which grape seeds occur, bitter vetch is also in the sample. It seems unlikely that if this vetch were being stored as a fodder crop, grapes would appear so commonly in the same samples. Lentils and weed seeds are also present in these same samples, but with lower frequency. They do not occur often separately (i.e., few cases with lentils or weed seeds in a sample, without cereals, grapes, and vetches).

Finally, the SVP secured funding in fall of 2006 to acquire a series of AMS radiocarbon dates from plant material recovered from both on-site environmental samples and a series of cores taken from Lago Nero, the nearby seasonal lake basin. The difficulty of recovering visible plant material from the cores resulted in two largely unsuccessful attempts at dating. A third core sample submitted for bulk soil ¹⁴C dating, however, appears to have been more successful. Re-sampling of the cores in tandem with this change of dating technique (from ¹⁴C AMS dates to ¹⁴C bulk soil dates for the core samples) will hopefully improve results. It is important to obtain radiocarbon dates from the

lake cores, as this will enable the project to situate the Monte Pallano archaeological sites within a broader context of local land-use and environmental change or stability.

The AMS dating of on-site plant remains proved very successful, and corresponded generally with the dates assigned to the trenches based on ceramics. One date was obtained on a grain of wheat from the Hellenistic sanctuary excavated in previous years by the SVP (Sample 1 MP 8909, the possible ritual deposit). This grain of wheat dated to 2180 ±50 calB.P. (before A.D. 1950), ca. 230 B.C. Fragments of the flesh of a grape from the fruit deposit in trench 10000 (Sample 2 ACQ 10011.8) were dated to 1870 ±50 calB.P., ca. A.D. 80, confirming use of this area during the early Roman Empire. Five dates were obtained from trench 8000, and all confirmed cultural activity in this area during the Iron Age and early Samnite period.

Two dates were taken from within the circular feature, one from a single whole carbonized bitter vetch seed and the other from fragments of coniferous charcoal. The vetch seed in the circular feature (Sample 4 ACQ 8041.36) dated to 2570 ±55 calB.P., ca. 620 B.C., and the charcoal Sample 5 ACQ 8046.40) dated to 2510 ±50 calB.P., ca. 560 B.C. There is a great deal of overlap in the probability range of these two dates, and it is easily possible that they represent approximately the same period, particularly since one of the dates was obtained from wood charcoal (trees having longer growth periods than seeds, which represent a single growth year). The two dates essentially place the construction of the circular feature sometime in the late 7th or first half of the 6th centuries B.C. A third date, obtained from coniferous charcoal found a meter or so east of

the circular feature (Sample 3 ACQ 8033.16), was 2380 ±50 calB.P., ca. 430 B.C., suggesting a slightly later date for the deposits filled in east of the circular feature and north of the terrace wall.

Two further dates were taken from material found south of the terrace wall, one from a bitter vetch seed and the other from hardwood charcoal. The bitter vetch seed (Sample 6 ACQ 8052.27.1) dated to 2510 calB.P., ca. 560 B.C., within the range of probable overlap with the dates from the circular feature on both bitter vetch and charcoal. The comparability of plant remains from these two features, combined with the similarity of two absolute dates from the same plant taxon, strongly supports the excavators' interpretation that these two features were constructed at approximately the same time. The final charcoal sample (Sample 7 ACQ 8058.38) dated from south of the terrace wall was 2380 ±50 cal B.P., ca. 430 B.C., again somewhat later in time than the terrace wall and circular feature. If 8058 does underlay 8052, this may suggest some downslope erosion of the terrace wall materials over later deposits.

The successful retrieval of plant remains from the Acquachiarra trenches has thus provided useful insights into the crop economy of the Apennine Iron Age, as well as fodder for modern absolute dating techniques that contribute to secure understanding of the cultural/chronological situation of our sites as well as perhaps the stratigraphy of the site itself. The 2007 field season will be an exciting opportunity to further refine these results.

China Shelton

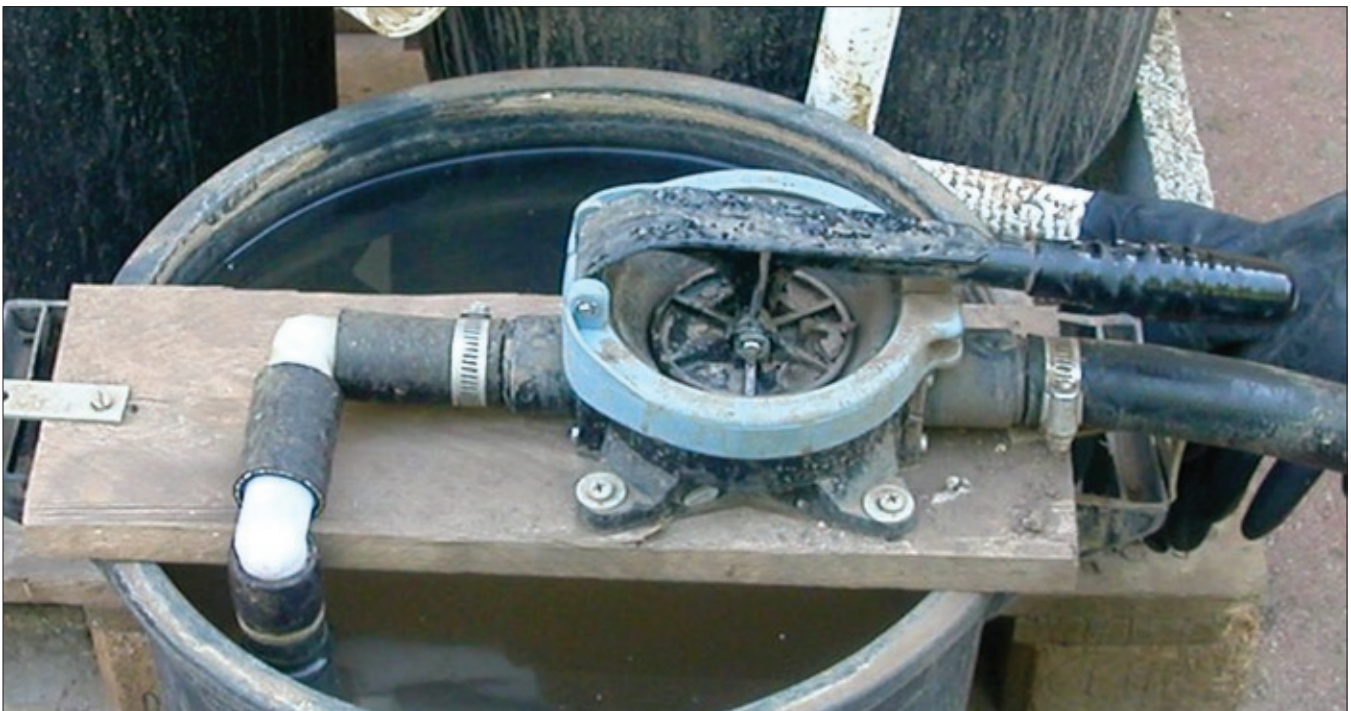
Sangro Valley Project On-Site Radiocarbon Dates

SVP Sample No.	Material	Context	Date Range cal A.D./ B.C.
MP 8909	1 grain of wheat	Ritual (?) deposit, Pallano	280-180 B.C.
ACQ 10011.8	3 fragments of grape	Pit with fruit deposit	30-130 A.D.
ACQ 8033.16	Coniferous charcoal	Just east of circular feature	480-380 B.C.
ACQ 8041.36	1 Bitter vetch	East part of circular feature	675-565 B.C.
ACQ 8046.40	Coniferous charcoal	SE quad. of circular feature	610-510 B.C.
ACQ 8052.27-1	1 Bitter vetch	South of terrace wall	610-510 B.C.
ACQ 8058.38	Hardwood charcoal	South of terrace wall	480-380 B.C.

Dating was done at the Center for Applied Isotope Studies, University of Georgia (in order of the SVP Sample Numbers above, UGAMS# 01713, 01714, 01718-01722)..



Flotation tanks in operation (Tornareccio, Italy summer 2006)



Bilge pump



Carbonized *Vicia ervilia* (bitter vetch) seeds