PLANT REMAINS FROM VILLE ROYALE II, SUSA

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Cahiers de la Délégation Archéologique Française en Iran
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Several small samples of soil and one of charcoal were submitted for ethnobotanical analysis from the Ville Royale II excavation at Susa *. Material from level 7 B is from Neo-Elamite funerary contexts, Grave 734 and Tomb 683; Parthian material (level 3 A) was found on the floor of a burnt room, Locus 652.

Procedures

All samples (except 156-I) were floated at Susa (1). Identification of the material was carried out at the Ethnobotanical Laboratory of the University of Michigan with a variable power (7 x - 30 x) binocular microscope. The criteria for sample selection were judgmental (2). Soil from within vessels associated with burials was taken, as were clearly visible concentrations of seeds and one chunk of charcoal. The remains do not therefore represent a systematic sample of the entire excavation, though their occurrence will be explained in terms of intentional and post-depositional factors (Table 1).

Level 7B (Neo-Elamite)

Most archaeologically recovered soil from Near Eastern mounds contains at least some carbonized material. Very low densities can generally be assumed to represent environmental "noise" in the soil matrix. At Ville Royale II, Level 7 B vessel contents have densities of carbonized material (whether or not burnt dung is included) that range from low (less than 1 g/I) to high (over 25 g/I). In the absence of control samples and other evidence to the contrary, those vessels in the first category can be assumed to contain the general fill of the surrounding burials, which in turn are filled with the surrounding soil matrix (3). Vessels having an intermediate density of carbonized material (4), which could be interpreted as general burial fill, might instead show evidence of funerary procedures involving fire (e.g., fuel for the burning of funerary offerings). Vessel 686-1, with a concentration of date pits, is the only one which can reasonably be interpreted as having in situ remains of a burnt food offering.

Grave 734 (late 8th-7th century B.C.) : The samples come from the contents of six vessels found in Grave 734, but no soil samples surrounding the vessels were taken. Compared to the other burial examined (Tomb 683), there is a relatively low density of carbonized material. The proportion of charcoal to seeds is high, and there is a relatively high proportion of burnt dung. The seeds tend to be those of weeds, rather than cultivated: 920-2 also has some wheat spikelet forks. The use of dung as fuel may be tentatively inferred from

(*) ACKNOWLEDGMENT : I would like to thank Dr. Jean Perrot, Dr. Pierre de Miroisi, and Genevieve Delitras for their help and hospitality at Susa. I would also like to thank Dr. Richard T. Ford, Trinette Lee Smart, and Dr. Henry T. Wright for reading and commenting on an earlier draft of this paper.
(1) See Naimi, 1977, for technical details.
(2) P. de Miroisi, personal communication.
(3) Sample nos. 970-1, 970-3, 970-7, 900-1.
(4) Sample nos. 687-5, 687-9, 920-2.

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### TABLE 1: Plant Remains from Ville Royale II, Susa

<table>
<thead>
<tr>
<th>Sample</th>
<th>Charcoal (g)</th>
<th>Seeds (g), incl. frags.</th>
<th>Other Carbonised Material (g)</th>
<th>Appare. soil vol. (l)</th>
<th>Bt. remains</th>
<th>Density (g/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>165</td>
<td>0</td>
<td>0.3</td>
<td>0.6</td>
<td>0.7</td>
<td>0.1</td>
<td>0.3</td>
</tr>
<tr>
<td>190</td>
<td>0</td>
<td>0.3</td>
<td>0.6</td>
<td>0.7</td>
<td>0.1</td>
<td>0.3</td>
</tr>
<tr>
<td>65-1</td>
<td>0.4</td>
<td>0.3</td>
<td>0.6</td>
<td>0.7</td>
<td>0.1</td>
<td>0.3</td>
</tr>
<tr>
<td>65-2</td>
<td>0.4</td>
<td>0.3</td>
<td>0.6</td>
<td>0.7</td>
<td>0.1</td>
<td>0.3</td>
</tr>
</tbody>
</table>

**CULTIGENS**

- Hordeum
- Panicum
- Gramineae: Amenorrhoea
- NUTSHELL: Amegropsis
- WEED SEEDS: Cyperaceae
- Gramineae: Avena
- NUTSHELL: Aegretopsis
- Panicum: Phoenice
- WEED SEEDS: Asteraceae
- Panicum: Aegretopsis
- NUTSHELL: Micrantho
- Malvaceae: Plano...naceae
- Rubiaceae: Guttat
- Umbelliferae: Undetermined
- Asteraceae: Phoenice

### TABLE 1 (cont.)

<table>
<thead>
<tr>
<th>Level</th>
<th>Loc. 54</th>
<th>Locus 522</th>
<th>1st Cent. AD.</th>
<th>7th Cent. BC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>150-1</td>
<td>12</td>
<td>10</td>
<td>12 (9)</td>
<td>10</td>
</tr>
<tr>
<td>165</td>
<td>3.50</td>
<td></td>
<td>5.25</td>
<td>2.60</td>
</tr>
<tr>
<td>190</td>
<td>3.90</td>
<td></td>
<td>5.40</td>
<td>4.80</td>
</tr>
<tr>
<td>65-1</td>
<td>0.40</td>
<td></td>
<td>0.46</td>
<td>0.40</td>
</tr>
</tbody>
</table>

(1) We. includes seed fragments; + < .01 g.
(2) Not floated; charcoal only.
(3) Burnt dump.
(4) 4 twisted, 10 straight; rounded cross-section.
(5) .12 g whole, plus fragments.
(6) 1.15 g whole, plus fragments.
(7) .20 g whole, plus fragments.
(8) 1 whole, plus fragments.
(9) Small stone fragments.
(10) 5 twisted, 5 straight, 4 indeterminate; .13 g whole, plus fragments.
(11) .23 g whole, plus fragments.
(12) .20 g whole, plus fragments.
(13) .60 g whole, plus fragments.
(14) .87 g whole, plus fragments.
(15) < .01 g whole, plus fragments.
Rice (Oriza): Unlike wheat and barley, rice is not native to the Near East. Ultimately from East Asia, the cultivation of rice spread west. Possibly cultivated rice was found in the third millennium levels at Lothal and Rangpur in west-central India; definitely cultivated rice was found in the second millennium levels at Maheshwar and Navdatoli in central India and at Pirak in Pakistan (12). Literature evidence shows that rice was at least known in Mesopotamia in the seventh century B.C. and that "rice was already in Mesopotamia in the Persian period is well known" (13). The rice at Parthian Susa belongs to a short-grained variety, with an average carbonized length of 4.7 mm and thickness of 2.3 mm (Table 4) (14). In general respect, the rice at Ville Royale II is not unlike rice from Navdatoli-Maheshwar (15). Compared to wheat and barley, rice has a higher water requirement. It is grown today in Susiana.

**TABLE 4: Oriza nativa from Ville Royale II, Susa, Locus 552, no. 163 (N = 90; in mm)**

<table>
<thead>
<tr>
<th>L</th>
<th>B</th>
<th>T</th>
<th>L:B</th>
<th>T:B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>2.8</td>
<td>0.9</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Av.</td>
<td>4.7</td>
<td>1.5</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Max</td>
<td>5.6</td>
<td>2.0</td>
<td>2.9</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Note: L(T × B) = 142, with a range of 62 to 352.

**Lentil (Lens):** Lentils are not common in these samples, but there is no reason to believe this is representative of the importance of lentil as a crop. Lentil is common on other Susiana sites (16). Date (Phoenix): The date palm is represented by both charcoal and fruit pit (Table 5). Lwala and Mesopotamia are well known date producing regions, and have been since the fourth millennium B.C. (17). Dates seem to have been used as a funereal offering in the Neo-Elamite burial 693. A similar custom has been reported for the mid to late third millennium burials at Ur, as well; at Ur, carbonized date pits, some of which were actually placed in sauce with other food remains, were found (18).

**TABLE 5: Phoenix dactylifera from Ville Royale II, Susa (N = 21)**

<table>
<thead>
<tr>
<th>L</th>
<th>B</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>10.7</td>
<td>5.4</td>
</tr>
<tr>
<td>Av.</td>
<td>14.7</td>
<td>6.2</td>
</tr>
<tr>
<td>Max</td>
<td>15.1</td>
<td>6.6</td>
</tr>
</tbody>
</table>

**NUTSHELL**

*Almond:* A few fragments have been tentatively identified as a smooth-shelled wild almond. Almond would have grown on the lower slopes of the Zagros, extending into the steppe (19).

**Notes:**
(12) **VHISA-MITTRA, 1977:** Companion 1979.
(13) **TISRIER, 1969:** 196.
(14) **C. GRIFFITH, 1962:** fresh seeds of a short variety have average measurements of 8.5 mm by 2.2 mm. Thickness is the maximum measurement between the dorsal and central side of the grain.
(15) **VHISA-MITTRA, 1977:** Pl. 2.
(16) **MILLER, 1977.**
(17) **ZADAK AND SPEECHER-ROY, 1974.**
(18) **ELLISON ET AL., 1974.**
(19) **TURNBONE AND GIBB, 1966.**

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the presence of weed seeds and spikelike forks (5). Although there are no control samples from the grave itself, the vessel contents seem to represent general grave fill; it is unlikely that the poplar, willow charcoal or burnt dung were themselves burnt offerings, though they could represent fuel used in religious activities. Any macroscopic traces of the original contents of these vessels have disappeared. All of the taxa identified from the fill and tabulated in Table 1 could be expected to have grown in and around the fields at Susa.

*Table 3: Tritium aestivum from Ville Royale II, Susa, Locus 652, no. 190 (N = 25, in mm)*

<table>
<thead>
<tr>
<th>L: B</th>
<th>T: B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td>4.1</td>
</tr>
<tr>
<td>Avg.</td>
<td>4.6</td>
</tr>
<tr>
<td>Max.</td>
<td>5.3</td>
</tr>
</tbody>
</table>

*Table 4: Oryza sativa from Ville Royale II, Susa, Locus 652, no. 143 (N = 90; in mm)*

<table>
<thead>
<tr>
<th>L: B</th>
<th>T: B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td>3.3</td>
</tr>
<tr>
<td>Avg.</td>
<td>4.4</td>
</tr>
<tr>
<td>Max.</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Note: L:B × T:B = 142, with a range of 92 to 252.

1. Lentil (Lens): Lentils are not common in these samples, but there is no reason to believe this is representative of the importance of lentil as a crop. Lentil is common on other Susiana sites (16).

2. Date (Phoenicea): The date palm is represented by both charcoal and fruit found in grave 652 (Table 5). Lowland Iran and Mesopotamia are well known date producing regions, and have been since the fourth millennium B.C. (17). Dates seem to have been used as a dietary offering in the Neo-Elamite burials 652. A similar custom has been reported for the mid to late third millennium burials at Ur, as well as at Ur, carbonized date pits, some of which were actually placed in saucers with other food remains, were found (18).

3. Nutshell

Amphorula: A few fragments have been tentatively identified as a smooth-shelled wild almond. Almond would have grown on the lower slopes of the Zagros, extending on to the steppe (19).

(5) Meller, ms. in preparation.
(6) P. de Menessout-Herena, unpublished communication.
(7) Sample 151-1.
(8) Geography, Book 11.
(9) Samples 103 and 140.
(10) P. de Menessout-Herena, unpublished communication.
(13) Thompson, 1949: 196.
(14) C. Gray, 1953: Fresh seeds of a short variety have average measurements of 5.5 mm by 3.2 mm. 'Thickness' is the maximum measurement between the dorsal and ventral sides of the grain.
(18) Elamites et al., 1978.
WEEDS

All of the weeds found could have been grown in and around irrigated crops. These include wild grasses (Hordeum, Lolium, Phalaris, Setaria), sedge (Cyperaceae), wild legumes (Astragalus, Medicago), mallow (Malvaceae), plantain (Plantago), bedstraw (Galium), and a member of the wild carrot family (Umbeliferae). Several of these genera could have grown wild on the steppe plain, and all could be eaten by cattle, sheep or goats. It is suggested that weed seeds found in the tombs were originally carbonized as constituents of dung fuel. Some of the samples actually contain the fibrous fragments of burnt dung, but these fragments cannot be attributed to any particular herbivore. Dung is a standard source of fuel in pastoral societies which produces a steady, even heat.

CHARCOAL

Palm wood and poplar/willow are the only two tree species identified in these samples. The former was cultivated, and the latter might have been planted in groves, or grown wild along the Karthos, as today. Tamarisks, which today is (and would have been) a common species in the area is not found in these limited samples.

Summary

Carbonized plant remains from the Ville Royale II excavations at Susa provide a glimpse of economic and ritual activity. Evidence from the Neo-Elamite funerary deposits is suggestive of the ritual and economic importance of the date. Almond could have been obtained from a short distance, but the fuel represented in these samples consisted of local wood or readily obtainable dung. Dietary and economic information can be gleaned from the burnt Parthian room. Wheat, barley, rice, lentils, and date were all cultivated as food crops, and palm wood was used in construction.

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REFERENCES