

WANDERING SHELLFISH: NEW INSIGHTS INTO INTRA-REGIONAL DISTRIBUTION NETWORKS FROM SOUTHEASTERN COASTAL ECUADOR

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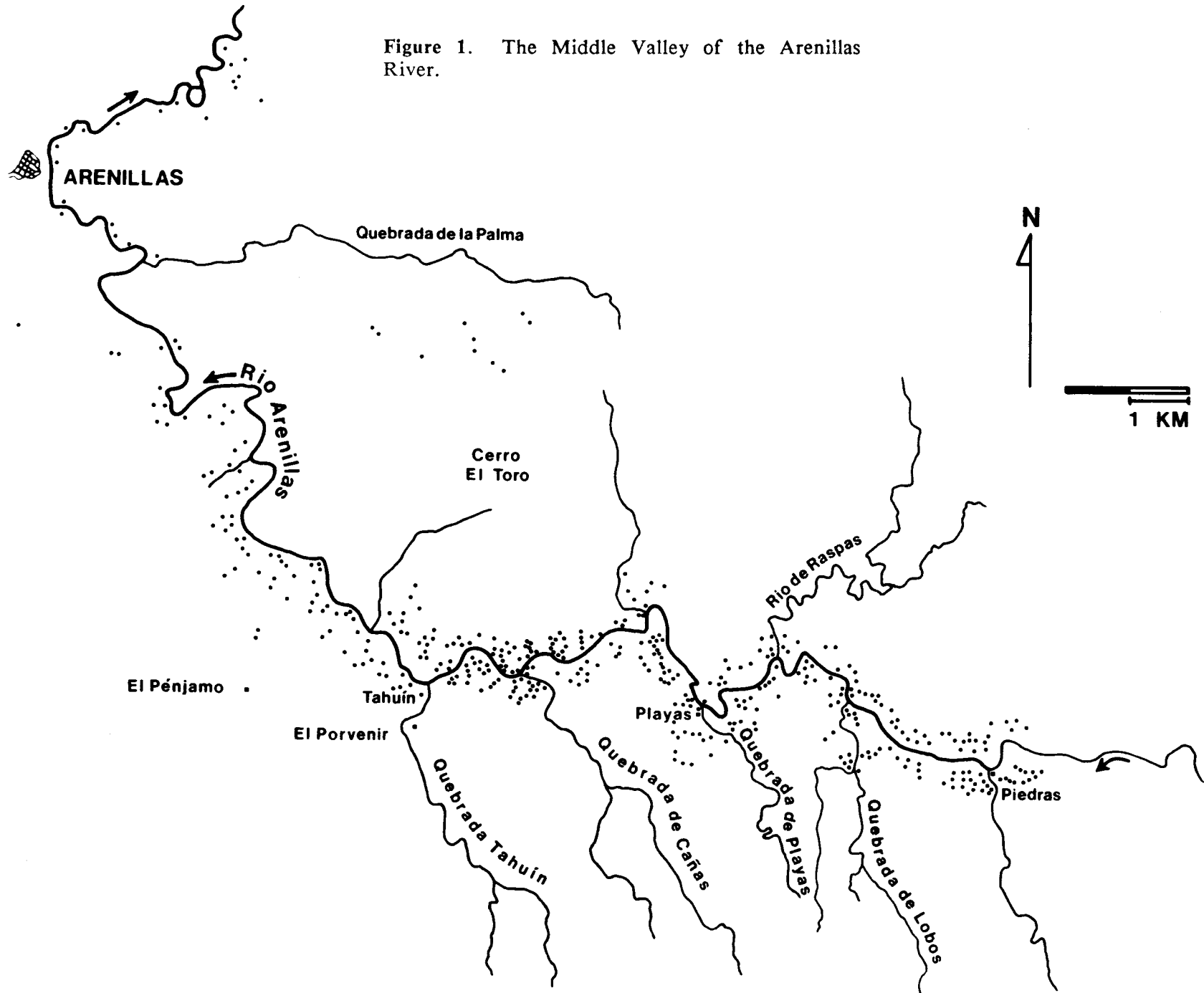
The Tahuin Project is a salvage program of archaeological survey and excavation within the impact area of the Tahuin Dam, which is located in the Middle Arenillas Valley, El Oro Province, in southern Ecuador. The Arenillas Valley lies within 20 km. of the border with Peru, and the Arenillas River empties into the eastern edge of the Gulf of Guayaquil. Research in this area was begun in 1978-1979 under an interagency agreement between the Museums of the Central Bank of Ecuador and PREDESUR, the regional development agency responsible for the construction of the Tahuin Dam.

Prior to the beginning of the Tahuin Project, this region was essentially unknown archaeologically. Estrada, Meggers, and Evans (1964) included four sites from the mangrove littoral of El Oro in their report on Jambelí ceramics. The excavations of the Japanese expeditions in the Tumbes Valley of Peru, some 45 km. to the west, produced evidence for ceramics of a related style, which the Japanese designated Garbanzal, as well as for somewhat earlier periods (Ishida et al. 1960; Izumi and Terada 1966). Some excavations, as yet unreported, have been carried out on shell mounds on the littoral of the Santa Rosa Valley at Garumal by Elizabeth Carter of the Institute of Archaeology, London.

A program of survey and testing carried out during the 1978-1979 season of the Proyecto Arqueológico Tahuin resulted in the location and description of some 525 sites and test excavations at four of these. In September of 1982, it was possible to return to one of the sites, the Romero Site (O-O-Ar-Ar-160), for more extensive testing. The El Niño rains, which began in this region in October, 1982, forced suspension of excavation and closure of the pits in mid-December. The site was inundated and it is problematic whether further work will be possible. The ceramic analysis from this and other sites in the survey area is only just begun and will have to await further excavation before a regional chronology for this little-known area can be established. For this reason, the data presented here are necessarily incomplete and the conclusions tentative.

The Arenillas River empties into the Gulf of Guayaquil through a coastal belt of mangrove. The shoreline of the entire valley fronts on the Jambelí Channel, a series of shallow, winding, interconnected waterways through low, mangrove-covered islands. Only the outer islands front on the open waters of the Gulf itself. The mangrove habitat is home to numerous species of mollusc, particularly *Anadara tuberculosa* or *concha prieta* (Olsson 1961:87-88) and *Anadara grandis* or *pata de mula* (*pata de burro*) (Ibid:93). These species predominate in the shell middens of all periods. The coast in this area has been undergoing a slow process of progradation over the past five or six millenia, so that sites dating to the second millenium BC are now found on the first beach ridge south of the backswamp or *salinas* zone and behind the active mangrove margin. Sites dating to the Jambelí Period (roughly 500 BC to 500 AD) are found on both landward and seaward margins of the backswamp zone and well inland

Figure 1. The Middle Valley of the Arenillas River.



where tidal streams and inlets (*esteros*) offered access to the mangrove channels.

Ecologically, the region in which the Arenillas Valley lies is transitional between the dry valleys to the west and south and the much wetter regions along the coast of Azuay north of Machala. In the Arenillas Valley itself there is a narrow band of desert behind the beach ridges with columnar cactus and grasses, followed by a much broader zone of desert scrub including trees such as *ceibo* and *palo santo*, shading first from dry thorn scrub including *algarrobo*, deciduous thorny shrubs, and grasses into a tropical dry thorn forest with many tree species including *hualtaco*. As one ascends the western escarpment of the Andes, the forest passes through a number of transitional zones becoming progressively more humid and culminating at ca. 1500 m. in a humid tropical montane forest (monsoon forest).

Unlike the much longer and larger Puyango-Tumbes and Jubones Rivers, the Arenillas heads on the immediate western slopes of the cordillera and exhibits highly seasonal variations in discharge. Rainfall to the north of the city of Arenillas on the coastal plain is only 100-150 mm. per annum and is insufficient to maintain agriculture. Today this area is farmed under irrigation, although floodwater farming and a system of water storage with pot irrigation may have been strategies used in the past. Inland to the south, however, rainfall between December and April is adequate to permit one crop slash-and-burn farming, especially on the low hills. The Middle Valley between Arenillas and Piedras offers relatively little bottomland, although some *playa* areas may have been regularly flooded and others are suitable for irrigation.

There is a perceptible break in slope between the headwater streams--the Rios Piedras and Naranjal--which join at Piedras to form the Arenillas, and the Middle Valley between Piedras and Arenillas (Figure 1). There is an extensive pocket of level bottomland roughly in the center of this area around Playas and closure at the western end at Cerro el Toro, the site of the modern dam. Beyond this point the climate becomes noticeably more arid and the river is entrenched between the hills until it breaks out onto the coastal plain at the city of Arenillas.

The initial research has been carried out with the following hypotheses in mind: 1) that there would be a full sequence of occupation from the Preceramic Period to the arrival of the Europeans; 2) that there would be evidence for the utilization of the diverse ecozones present in the valley, either in the form of colony-settlements or in the form of exchange patterns; 3) that there would be evidence for contact with adjacent highland populations; and 4) that there would be evidence for contact with populations to the east and west along the Gulf of Guayaquil and with those of the Isla de Puná and the Santa Elena Coast to the north.

The methodology employed was conditioned by the salvage nature of the project, which prompted an intensive (100%) survey in the reservoir and reserve area behind the Tahuin Dam in the Middle Arenillas Valley. Shovel tests were necessary at many sites to expose the original occupational surface. Because of the importance of the Lower Valley and the fact that ceramic preservation is better in this drier region, blocks from three stratified transects were randomly sampled. These transects included the banks of the Lower Arenillas River between San Vicente and Jumón; both sides of the road connecting the town of

Arenillas and the port of La Pitahaya in the center of the valley; and either side of an occasional water course on the western edge of the valley called Rio Nuevo.

The data reported here touch on the occupation of the Middle Valley and on the second of the four hypotheses proposed. In the course of time human occupation of the Middle Valley covered all possible topographic locations--hilltops, hillsides, and river terraces. Over 360 sites were located in this area alone. It is hypothesized that this occupation was not simultaneous, and most sites seem to have just one or possibly two components, suggesting frequent relocation of even major settlements and, perhaps, avoidance of previously occupied sites. There is an evident hierarchy of site size, some settlements consisting of only one structure; others are villages, consisting of several structures around a plaza. Not surprisingly, the largest villages are found in the Lower Valley. Structures are of wattle and daub construction and seem to have been regularly burned. Fired daub with cane impressions is most common and post molds are found in the course of excavation. Burial in the Middle Valley appears to have been in hilltop cemeteries. Lower Valley burials are found in low artificial mounds, or *tolas*.

Surprisingly, a number of inland sites, lying between 15 and 45 km. and more from the coast, have extensive shell middens. These sites are all located on river terraces, suggesting transport by canoe rather than by land. This is an important factor since the shell of mature *Anadara* is thick and dense. While a general gradient of more shell in the middens closest to the sea and less in those at a greater distance can be observed, the sites furthest inland have a much higher proportion of shell from immature and hence smaller specimens. The sites in which shell occurs in quantity appear also to be segregated by time period, falling into what I hypothesize to be Early to Middle Jambeli. It should be noted that the game resources of the inland areas included both Virginia and brocket deer, peccary, rodents such as capybara, reptiles, and large snakes, e.g. boas. Freshwater fish were extremely abundant in the Middle Arenillas River until they were literally exterminated by dynamite fishing some twenty years ago. Presumably they were also abundant in the past.

One of the most interesting of these inland sites with middens is the Romero Site (O-O-Ar-Ar-160) (Figure 2). This site is located on the second terrace of the north bank of the Arenillas River at the foot of Cerro El Toro and some 900 m. upstream--around the base of the Cerro--from the modern dam site. It is defined by two small quebradas and the slope of the hill spur behind it and appears to have extended some 160 m. along the river and some 80 m. in from the edge of the terrace. The terrace rises some 6 m. above the river and gently rises some two meters more.

During our survey in 1979, we found a midden area of some 20x30 m. partially exposed on the surface. Two 1x1 meter test pits were placed in this midden. The location of these tests was motivated initially by the fact that preservation of the painted decoration on the ceramics was unusually good in the midden and infinitely superior to the highly eroded surfaces found on sherds from sites elsewhere in the Middle Valley. Since one of our primary objectives was, and still is, the establishment of a regional chronology, a reasonable ceramic sample from this site was desirable. The midden was taken down in arbitrary levels of 4 cm., there being no discernable stratification. A broad band of shell, of some 50 to 70 cm. in width, consisting almost exclusively of

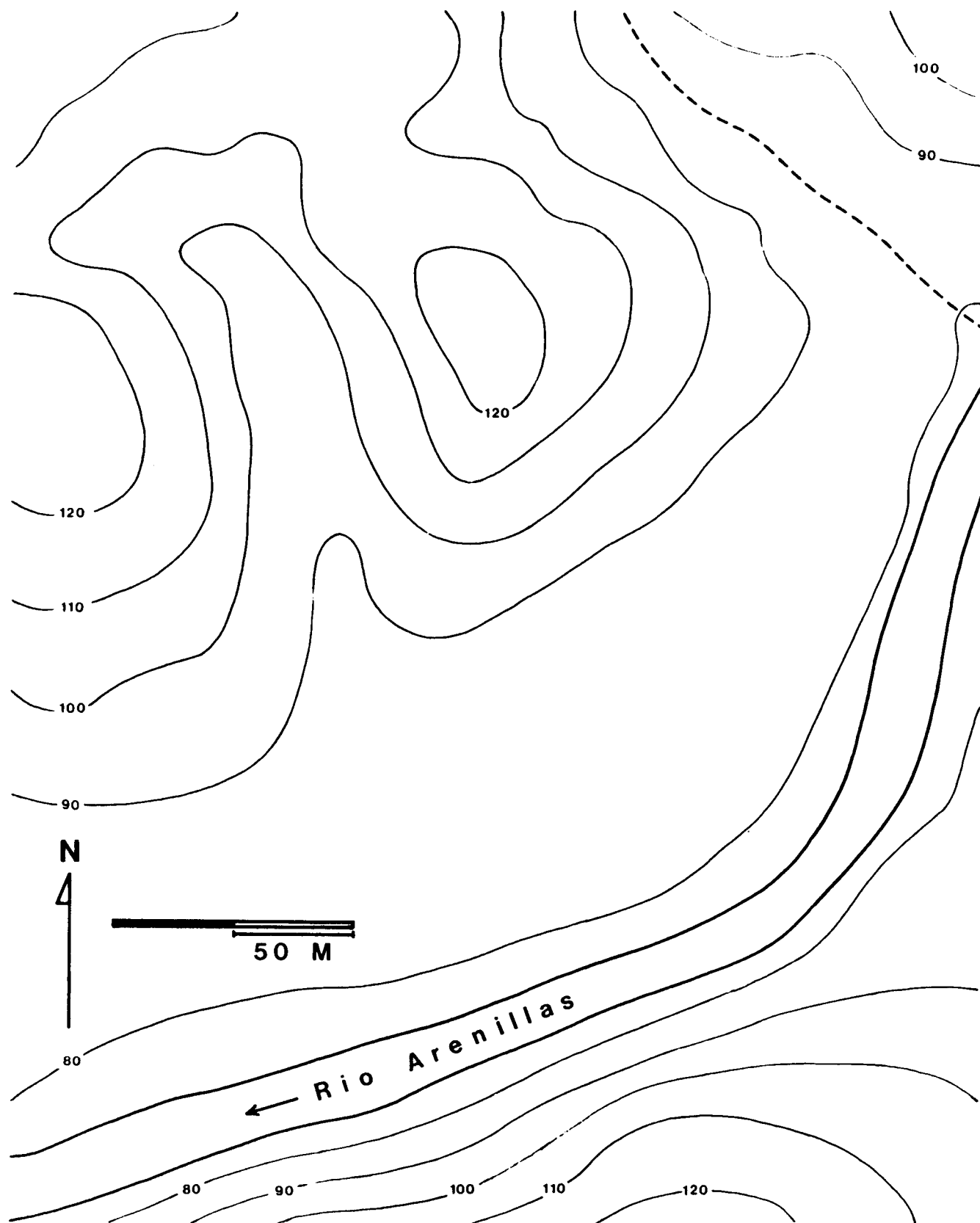


Figure 2. The Romero Site (0-0-Ar-Ar-160) largely occupies the lower terrace between the two small quadrangles that define the hill.

immature *A. tuberculosa*, dominated the midden. In the course of excavation, large bones were encountered and recognized; some were obviously mammalian and others appeared to be quite large fish vertebrae, presumably from marine species. They were certainly too large for any fish likely to be found more than 55 km. from the mouth of a river with such seasonal fluctuations in discharge as the Arenillas. Riverine species of fish today are all relatively small.

A 4% sample of midden from each level was floated and yielded large quantities of small bone, mostly of fish and shark. Approximately three-fourths of this material has been analyzed under the supervision of Dr. Elizabeth Wing of the Florida State Museum. Since tabulation is not complete, I have not performed any statistical operations with these data. However, simple tabulation offers some very interesting results. Of mammal bone there was surprising little. There is evidence for the following:

- 1 dog
- 1 unidentified carnivore
- 1 Virginia deer
- 1 cervid
- 1 medium-sized mammal
- 2 rodents

Among the birds there was bone from:

- 1 gull or tern (*Laridae*)
- 1 vulture (*Catharridae*)
- 1 unidentified bird

The explosion occurs when we get to the fishes. Cartilaginous fish were represented by a total of seven individuals:

- 1 tiger shark (*Galeocerdo cuvieri*)
- 2 sharks (*Carcharhinidae*), which can attain a length of 2 m.
- 1 shark (*Mustellus* sp.)
- 1 shovelhead shark (*Sphyrna tiburo*)
- 1 ray (*Rajiformes*)

All of these species can be found inshore in shallow coastal waters or estuaries.

The bony fishes were of even greater interest. There was a total of 31 individuals which could be identified as catfish:

- 2 *Arius* sp.
- 8 *Bagre panamensis*
- 10 *Bagre* sp.
- 11 *Ariidae*

The following other bony fish species were also represented:

- 1 toadfish (*Batrachoides pacificus*)
- 2 grouper (*Epinephalus* sp.)
- 2 sandfish (*Serranidae*)

3 jack or scad (*Carangidae*)
 1 grunt (*Haemulon*)
 2 sea bass (*Cynoscion*)
 1 *Sciaenidae*
 1 mullet (*Mugil* sp.)
 1 pufferfish (*Sphaeroides* sp.)
 35 unidentified fish

This makes a total of 80 individual bony fishes.

It would be premature to assay a final interpretation of this material. However, there are a number of observations that can be made. The tests made in 1982 in the area to the west of the midden tend to confirm my earlier suspicion that this is not an everyday "normal" domestic midden for this time period in the Middle Valley. The pottery is one indicator of the unusual nature of the midden. Sherds from storage vessels are conspicuous by their absence and fragments of large cooking pots are rare. What abound are small and medium-sized decorated bowls and plates, i.e. fancy serving dishes (cf. Izumi and Terada 1960; Estrada, Evans, and Meggers 1964). In the area to the west there were at least two structures around which the proportion of fancy ware and small cooking vessels was very high. A radiocarbon assay on large mammal bone from the midden gave a date of 1880 ± 70 BP, or 70 AD. If anything, this date is young (Tamers and Pearson 1965). It will be supplemented by carbon dates on charcoal recovered in the 1982 excavations. In the meantime, it provides a time frame for this particular assemblage.

The faunal assemblage which has been analyzed to date is disproportionately skewed toward large fish and young shellfish, which were presumably easier to haul around. These species must have been collected from the estuary, the mangrove zone, and, perhaps but not necessarily, the open Gulf outside the islands. While one can assume that some of the unidentified bony fish may be fluvial, the small number of inland species compared to the large number of species and many individuals of marine and estuarine fish leads me to suggest that this midden represents an extraordinary event or events in the life of this community, rather than ordinary patterns of subsistence (cf. Wing 1977). The only remotely comparable material comes from Loma Alta, a much earlier site some 15 km. inland from the mouth of the Valdivia River, where a more limited array of fish species was found (Byrd 1976). Shell is present in small quantities on a number of Middle Valley sites, but middens such as the one described here are very rare in the Middle Valley.

The Romero Site is strategically located and large enough to have controlled a substantial sector of the Middle Valley. While one midden does not an inter-regional polity make, the observed segregation by time and location of sites with such middens suggests a socio-political explanation for the uneven distribution of edible mollusc and fish remains on inland sites. It is suggested that the extensive circulation of shellfish and presumably dried or salted species of marine fish represents an episode of greater socio-economic and perhaps political cohesion, reminiscent of that found by Coe and Flannery at Ocos (1967). The failure of this pattern to persist over time most probably reflects changes in socio-political organization, since economic and nutritional protein needs were not an over-riding factor.

Acknowledgements

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