

# **Neolithic Shellfish Gathering at Yeşilova: An Ethnoarchaeological View**

*Zafer Derin*

The significance of shellfish gathering has long been underestimated among archaeologists studying the role of marine resources in the subsistence base of prehistoric societies. As a result, marine shells identified among the cultural assemblages of prehistoric sites did not receive much attention in the literature until several decades ago when the importance of shellfish gathering as part of the prehistoric diet was accepted. Shellfish represent an easily-gathered year round food source found in shallow bays and no specialized equipment is required to procure them. By analyzing the shellfish remains, archaeologists can consider how prehistoric people interacted with the coastal environment. There are various studies proposing that shellfish exploitation was an important economic activity for the settlers of coastal western Anatolia and the Marmara region from Neolithic to Early Bronze Age, including sites of Yassitepe, Ege Gübre, Yeşilova, and Ulucak in the İzmir Region (Derin 2006: 1; 2007, 381, fig. 17; Sağlamtimur 2007: 376; Çilingiroğlu 2007: 368), Fikirtepe, Pendik, and Ilıpınar in the eastern Marmara region (Buitenhuis 1995: 151), Coşkuntepe, Beşik-Sivritepe, Kumtepe, and Gülpınar on the coastal Troad (Takaoğlu 2005: 424; 2006a: 412; 2006b: 49; 2006c: 311; Boessneck 1986: 332; Sperling 1976: 324), and Hocaçeşme at the mouth of River Meriç and Toptepe in Turkish Thrace (Özdoğan 1999: 15, fig. 25). Such studies are gradually changing the way archaeologists look at shellfish. It seems that past coastal communities supplemented their subsistence base by exploiting marine resources in shallow bays located close to their settlements (Takaoğlu 2006b: 49; Çakırlar 2006: 42). Shellfish gathering in this sense might have been an important supplementary economic activity along with agricultural pursuits in the Aegean and the Marmara region (Çakırlar 2006: 45; Karali 2002: 201). There is also evidence to show that marine shells as valued artifacts were transported to the inland regions of Anatolia through exchange (Duru and Umurtak 2005: 138; Özdoğan et al. 1994: 112, fig. 3a, c). Examinations of modern patterns of shellfish

gatherers in coastal parts of İzmir may help us to obtain a better picture of this economic strategy in relation to social and economic processes.

Recent archaeological excavations undertaken in the İzmir region in central-western Anatolia has begun to enrich our archaeological data of the Neolithic period in this geographically important region. Excavations of such sites as Ulucak, Ege Gübre, and Yeşilova illuminated various aspects of Neolithic life in the İzmir region, including subsistence strategies. Among these three Neolithic sites, the mound of Yeşilova provides us with valuable information about the ways coastal Neolithic villages supplemented their diet with marine resources, since a large assemblage of marine shells were identified in the course of archaeological excavations undertaken at the site in 2005 and 2006.

The Neolithic mound of Yeşilova is located in the Karacaoğlan district of the town of Bornova in the province of Izmir (Fig. 1). Today, the mound is to be found between the Manda and Gökdere streams in the center of the Bornova Plain, roughly 2.5 to 4 km. from the coast. Yeşilova is basically a mound-type settlement covered by alluvial deposits (Fig. 2). Soundings undertaken in the settlement area have demonstrated that the site, with thick cultural deposits, was located on hill-formed alluvial deposits 14 m. above sea level during Neolithic times. These soundings also indicate that the mound was subsequently covered by alluvial deposits. Three major cultural levels have been identified at the site. Level I represents the Late Roman/Early Byzantine period, the pottery remains of which have been found scattered over the surface on the site. Level II (phases 1-2) belongs to the Chalcolithic period, while Level I (phases 1-8) represents the Neolithic occupation at the mound. The Neolithic and Chalcolithic levels were determined about 80 cm. below the surface of the site. Archaeological excavations demonstrate that the site was among the earliest Neolithic villages so far known to us in the Aegean. In particular, the phases 6-8 of level III represent the oldest stages of the Neolithic era in central western Anatolia.

Evaluation of the archaeological evidence recovered from the mound of Yeşilova has so far provided us with significant information about the subsistence strategies and other aspects of life of Neolithic settlers of the İzmir region during the Neolithic period. As in most Neolithic Anatolian settlements, the inhabitants of Yeşilova fulfilled their subsistence needs in two ways. They either attempted to exploit wild species of animals and plants found around their settlements, or obtained their food through agricultural activities. It is clear that the exploitation of ready food resources was a common strategy during the earliest phases of the Neolithic period. Thus, the availability of food

resources was an important factor in selection a site prior to settlement. The mound of Yeşilova in this context is located in an environment rich in natural food resources between two streams in the center of the Bornova Plain (Derin and Batmaz 2004: 78, 88-90) (Fig. 2). In addition to natural vegetation cover, the area of Yeşilova was also rich in fresh water springs. Although they are few in number, food processing implements discovered there, such as millstones, mortars, and pestles, can be accepted as evidence for the practice of cereal production at the site. Evidence for barley, wheat, and lentils has been identified among carbonized plant remains recovered from the floors of the houses and hearths confirms this.<sup>1</sup> This can be accepted as evidence showing that the Neolithic settlers of Yeşilova practiced crop cultivation to supplement their subsistence base, since the land surrounding the site was optimal for tilling and there were ample water sources in the area for a productive crop yield. Analysis of animal bones from the cultural deposits of the site demonstrates that they also hunted wild boar and deer for meat. Faunal analysis also shows that stock-raising was practiced at the site as well. The recovery of large animal bones in the earliest phases (7 and 8) of the Neolithic Level at Yeşilova seems to imply that large animals such as cattle were consumed for meat. However, there was apparently an increase in the consumption of sheep, goats, and pigs in the later phases (3-6) of the Neolithic level. At first glance, it seems that consuming sheep and goats was the prevailing pattern in the last phases (1-2) of the Neolithic level. This apparently points to a decline in the kill-off pattern of the cattle and pigs.<sup>2</sup> This may imply that raising of sheep and goats gained importance in the local economy of the site. In addition to cereal production, stock-raising, and hunting, the Neolithic inhabitants of Yeşilova also included oysters and mollusks as part of their subsistence base. The shallow waters located very close to the site to the west were also optimal for the exploitation of marine resources such as the edible species of oysters and mollusks. It appears that the prehistoric settlers of Yeşilova also relied heavily on shellfish as a source of food to supplement their diet.

Over 2000 shells were identified in the cultural deposits of the site. Among this shell assemblage, the most numerous species represented are *Cerastoderma glaucum*, *Arca noae*, *Callista chione*, *Hexaplex trunculus*, and *Bolinus brandaris*, *Ostrea edulis* and *Spondylus gaederopus* (Fig. 4-5).<sup>3</sup> *Cerithium vulgatum*, *Patella spp.*, and *Pectenidae* are also represented among the marine shell assemblage, albeit in small numbers. Examples of *Unio sp.* peculiar to riverine environments have been identified among the assemblage, too. Moreover, the recovery of fragments representing the shell of a sea turtle demonstrates the variety of marine resources exploited for food. In addition to marine- and riverine-based

shells, it seems that the settlers of Yeşilova occasionally included terrestrial species such as land snails as part of their diet (Derin 2007a: 381, fig. 17; 2007b: 125). Nearly all of these shellfish represented by numerous species of univalve and bivalve mollusks can still be found in the shallow bays and sandy environment near the coast close to the site. This gathering strategy appears to be a prevailing pattern at Yeşilova, since the site was located very close to the shoreline (Fig. 6).

The prehistoric settlers of Yeşilova apparently consumed shellfish as a food source from the Neolithic to Chalcolithic period. A shell midden has been identified in ash remains starting from phase 8 of the Neolithic Level (III), which dates somewhere around the middle of the 7th millennium B.C. or earlier. The lack of traces of fire on these shells seems to indicate that shellfish were prepared for food in the ashes of fire in areas located outside the living units. These shellfish appear to have been eaten in the area where they were cooked (Fig. 8). There seems to be an increase in the consumption of shellfish towards the last phases of the Neolithic level and throughout the following Chalcolithic period, implying that shellfish consumption was as important as other animal-based food consumption at the site. This pattern might have been based on the rise in sea level during this period, eventually bringing the shoreline closer to the settlement than before.<sup>4</sup> This, in fact, made shellfish gathering a practical strategy for the settlers of the site. The evidence in particular indicates how coastal Neolithic societies included alternative non-agricultural food resources such as shellfish in their diet. In addition to giving us information about what people ate and how they procured it, studying shellfish is also of archaeological importance for a number of reasons. Marine shells are often used to produce beads, adzes, and fishhooks. Crushed marine shells were used as a pottery temper. Marine shells, furthermore, often served as valuable items of trade during the Neolithic and Chalcolithic periods. Archaeological and ethnographic evidence shows that inland societies acquired marine shells through various forms of exchange for raw materials, agricultural products and artifacts from the coastal societies. Thus, it may be stated that marine sources played an important role in the development of prehistoric coastal communities.

Examination of present-day shellfish gatherers on the shores of the İnciraltı and Bostanlı districts of coastal İzmir help us to obtain a picture of such strategies adopted in the past. Shellfish gathering is particularly a seasonal activity, lasting from the beginning of November to the end of June. It is not an activity geared towards local consumption in this region. Moreover, we can get an idea of what kind of implements are used in shellfish gathering nowadays. They use

wooden framed rectangular sieves, shovels with wide a blade, and mesh sacks. Each individual gathers a maximum of 4 kilograms of shellfish in a single day. Gathering shellfish is primarily the work of men who came to İzmir from southeast Anatolia to earn their living. These shellfish gatherers, who live in the district of Kadifekale, also turn the shells into ornaments to sell in regional and inter-regional markets. Although the current shellfish gathering activity appears to have been developed only over the past few several decades, this modern case can still be used for archaeological purposes.

### Notes

1. Ayla Erkal (M.A.) has been preparing her Ph.D. dissertation on the plant remains of ther sites of this region. This information supplied in the text is based on her preliminary observations.
2. The preliminary report about the animal remains from the site of Yeşilova is prepared by Can Yümni Gündem.
3. The preliminary study of marine shells recovered from the site of Yeşilova has been undertaken by Canan Çakırlar.
4. The sea level was 40 m lower than present day one about 10.000 years before present. It gradually first rose up to 2 m above present day sea level about 5000 years ago. See Kayan 1988 and 1996. The fact that the sea level of the Aegean started to rise from the beginning of Neolithic might have effected the situation at the site.

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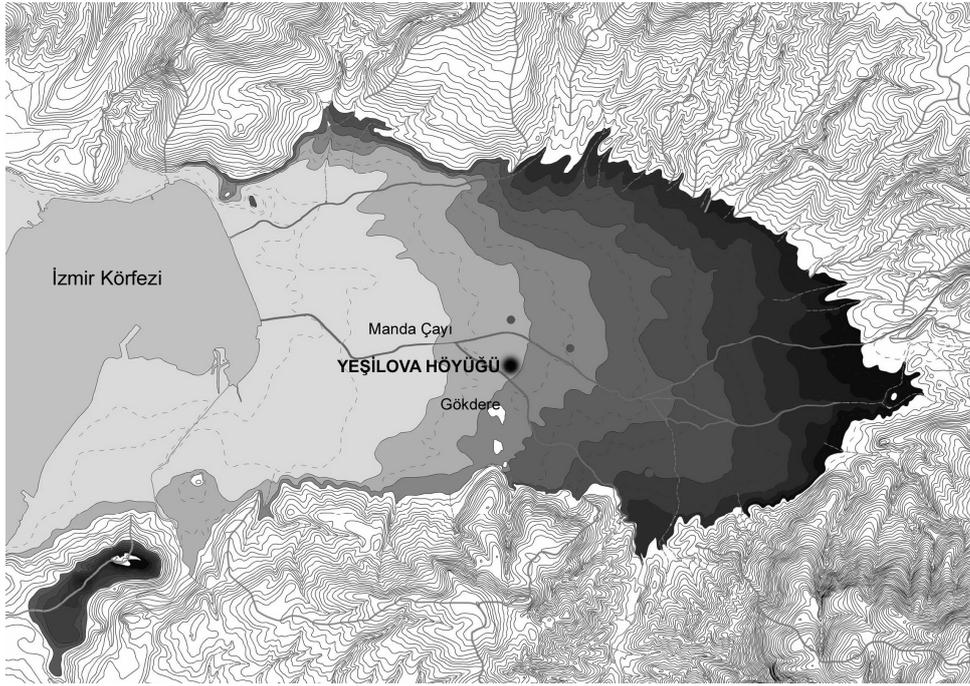
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*Fig.1. Map locating the Neolithic mound of Yeşilova in the İzmir-Bornova Plain*



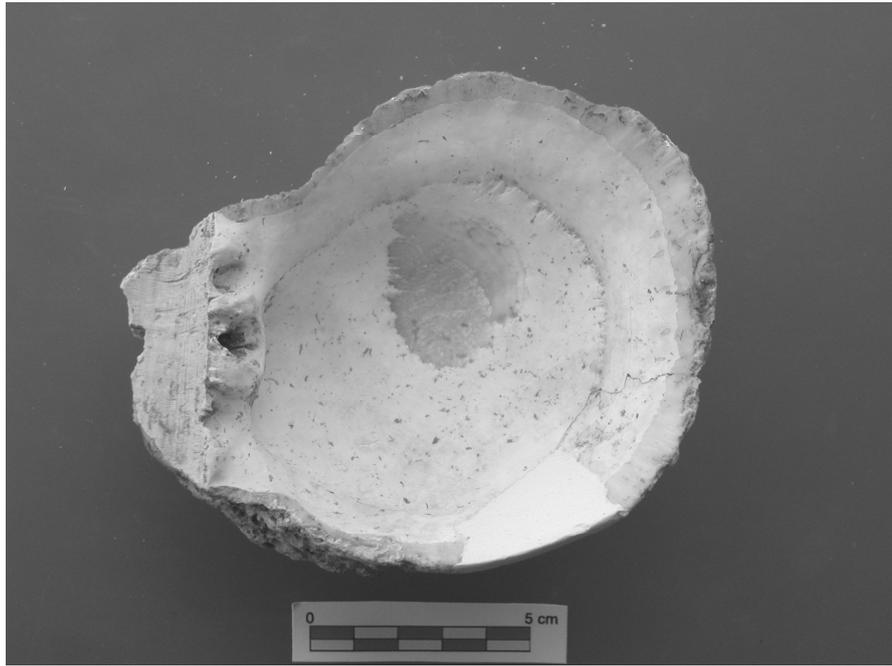
*Fig.2. A view of the mound and the excavated area from the south*



*Fig. 3. Shells of landsnails in a bowl from the Neolithic level III*



*Fig. 4. Some of the marine shells recovered from Yeşilova*



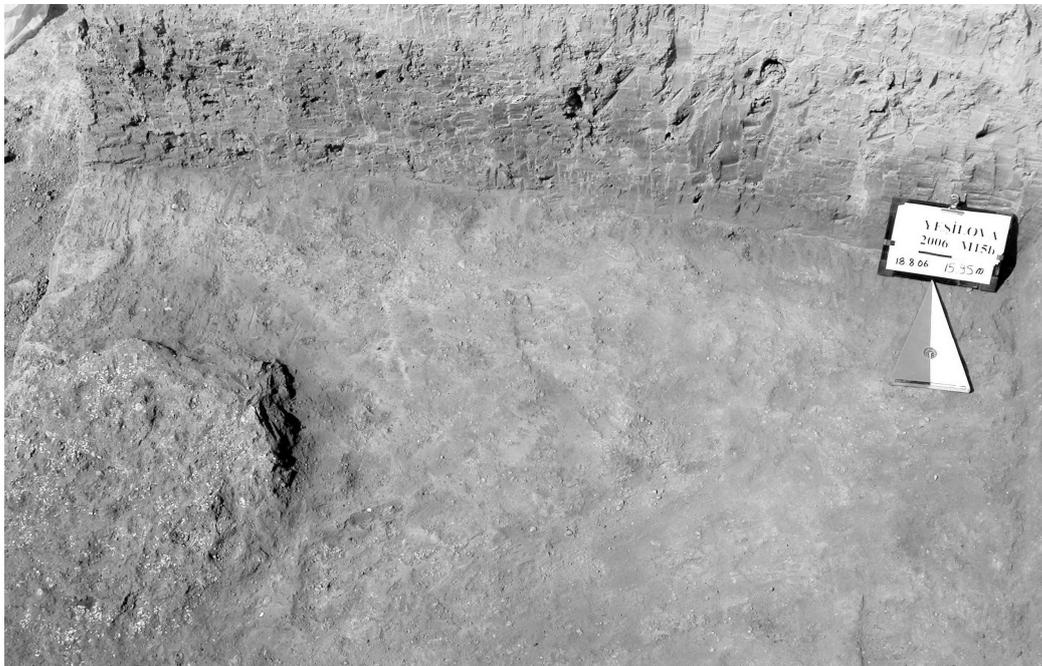
*Fig. 5. A Spondylus gaederopus shell from Yeşilova*



*Fig. 6. Present day shellfish gathering at shallow waters at the district of İnciraltı of İzmir Province*



*Fig.7. Necklaces made from Cardium shells at Yeşilova*



*Fig. 8. A view of the southwestern corner of trench M15 b where marine shells were processed for food*