

Molluscs as an indicator of palaeo-environmental changes: A case study on Kalamatiya shell middens

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Abstract

This research, discussing a possible micro-climatic shift and palaeo-environmental changes that had occurred on the boundaries of wet, intermediate and dry climatic zones in Southern Sri Lanka during the late Holocene period was conducted by using mollusc shell remain as evidence. The sedimentary properties, stratigraphic sequence and the frequency of material remains from a coastal shell midden in Kalamatiya, were tested by using sub-surface sampling methods. Taxonomic list of the site was analysed with species-related environmental data. The shell midden is located in the dry zone ca. 50 km and ca. 20 km distance from the hypothetical boundaries of wet zone and intermediate zone respectively. Mollusc shells (Number of Individual Specimens (NISP) = 5174/complete shells only) recorded from nine layers of the site, and Number of Taxa (NTAXA) (n=18) represents higher species diversity. Apart from most frequent Asiatic hard clam (*Meretrix meretrix*-Minimum Number of Individuals (MNI) = 2624), *Anadara* sp., *Donax cuneata*, *Saccostrea* sp., *Cerithedia cingulate*, *Acavus haemastoma*, *Aulopoma hofmeisteri*, *Beddoma trifasiatus*, *Papyridea soleniformis*, *Eunaticina* sp., *Umbonium vestiarium*, *Oligospira polei*, *Lissachatina fullica*, *Tapes sulcarius*, *Purpura persica* and *Cryptonatica operculata* and two unidentified bivalve species (nacreous and calcareous) were recorded. Except for recently introduced *Lissachatina fullica*, all other shells are archaic and represent a wide range of environments, such as littoral muddy sand, coastal sands, terrestrial and arboreal habitats. *Anadara* sp. (NISP = 32) was used as a key indicator for identifying the existence of lagoonal brackish water and almost coastal mangrove swamps at one point of environmental change. The presence of tree-living species along with aquatic species and the dark greyish/blue soil sediments below ca. 90 cm from the surface provide further evidence of such an environment. *Acavus haemastoma* (MNI = 26), *Aulopoma hofmeisteri* (MNI = 58) and *Oligospira polei* (MNI = 2) reported from this dry zone midden are species which are currently limited to the wet and the intermediate zones. None of the said shells of the above three species shows evidence for the human agency on the deposition. It is possible to shift the environment conditions back and forth constantly as a result of the dynamic nature of the climate which opened corridors for animals to approach into new habitats. Further, the results of the present study revises the previously accepted human agency hypothesis of the occurrence of wet and intermediate zone snail shells in the dry zone.

Keywords: Climatic zones, Holocene, Middens, Molluscs, Palaeo-environments

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