



An experimental approach for archeological soil micromorphology: building a model for site taphonomy in coastal shell middens of the Beagle Channel (Argentina)

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There are still many archaeological contexts where soil micromorphology has been little applied. Examples of such are anthropic shell deposits, common in coastal settings worldwide. These archaeological sites have complex stratigraphies composed mainly of shell from diverse species of local mollusks and gastropods. They have the peculiarity of being highly porous sediments with a coarse fraction that is dominated by gravel-sized bioclastic remains (shell, fish bones) and a fine fraction composed of organic material (charcoal, organic matter). The use of soil micromorphology in shell deposits was started by the Spanish-Argentinean research team working in Tierra del Fuego (Argentina) since 1986. This project focused on excavation of hunter-gatherer sites from the contact period. One of the main objectives was to develop a detailed excavation method for shell middens that maximized the amount of recorded data during archaeological excavation. In this perspective, microstratigraphy was conceived as a fundamental complement for the study of site formation processes, as it would provide with high definition data for identification of shell accumulation episodes, trampling on site, abandonment periods, taphonomic alterations etc. A reference collection of known environmental and anthropic control features, such as hearths, trampling areas, wood ashes from local species, among others, was built to help in the microscopic characterization of archaeological samples. In this work, we analyze this experimental collection and compare it with samples from the Tunel VII archaeological site, located in the northern coast of the Beagle Channel and dated from the 18th-19th centuries. The set of modern samples included: trampling area from an animal pathway; beach deposit; forest litter; soil under the forest; hearths lit in diverse contexts (on the prairie, the beach and from the archaeologist camp site); and experimental burnt valves of *Mytilus edulis*, the main malacological component of the Tunel VII archaeological site, combusted in a muffle furnace at temperatures from 200 to 800° C. The original archaeological samples from Tunel VII included resin-consolidated columns taken from various profiles within the shell midden site. The thin sections analysed here were taken from a profile dug through a passageway that crosses the shell dumping area. The experimental reference collection showed the intense bioturbation of both exposed and buried surfaces, despite the low temperatures that characterize the area, commonly associated to inhibition of biological activity. The same intense bioturbation was observed in the shell midden, were a form of anthrosol develops during abandonment periods of the site. The experimental samples of *Mytilus edulis* served as reference for identification of burning temperatures reached by the anthropic fires and were useful aids to identify reworked burnt layers as accretion material for the shell midden.