



Historical ecology of the northern Adriatic Sea: Field methods and coring device

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For an ongoing study on the historical ecology of the northern Adriatic Sea, the objective was to retrieve a high number of sediment cores at seven sampling stations spread across the entire basin. One set of cores is intended for sediment analyses including radiometric Pb-sediment-dating, grain size, TOC, TAC and heavy metal analyses. The other set of cores delivered enough shelly remains of endo- or epibenthic hard part producers (e.g. molluscs, crustaceans, echinoderms) to enable the reconstruction of death assemblages in core layers from top to bottom. The down-core changes of such assemblages record ecological shifts in a marine environment that has endured strong human impacts over several centuries. A 1.5 m-long core could, according to the available sedimentation data for the area, cover up to 2000 or even more years of ecological history. The coring method had to meet the following requirements: a) deliver 1.5-m-long cores from different sediment settings (mud to sand, reflecting a wide range of benthic habitats in the northern Adriatic); b) enable quick and easy deployment to ensure that multiple cores can be taken at the individual sampling stations within a short time; c) be relatively affordable and allow handling by the researchers themselves, potentially using a small vessel in order to further contain the operating costs.

Two types of UWITECTM piston corers were used to meet these requirements. A model with 90 mm of diameter (samples for sediment analysis) and another one with 160 mm, specifically designed to obtain the large amount of material needed for shell analysis, successfully delivered a total of 54 cores. The device consists of a stabilizing tripod and the interchangeable coring cylinders. It is equipped with a so-called hammer action that makes it possible, at least for the smaller cylinder, to penetrate even harder sediments. A closing mechanism of the corer retains the sediment in the cylinder upon extraction; it works either automatically through hydraulic pressure once the final core-length is reached, or can be triggered manually anytime from the surface using a connected hose and water pump. The whole coring device weighs less than 300 kg and can readily be transported in a van. It can easily be assembled, disassembled and operated by two to three persons after a brief training. With a newly designed, very simple and effective slicing device, the cores can be sliced in an upright position directly on board after extraction. This type of corer can be highly recommended for any smaller coring operations on lakes, streams, or at sea.