

MARINE SPECIMEN BANKING. A MEDITERRANEAN PERSPECTIVE

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Specimen banking for biological and human tissue has been well established for about two decades (ROSSBACH *et al.*, 1992). Environmental samples archived as part of monitoring programs have been found useful in a number of specific studies (WISE and ZIESLER, 1984).

The world ocean - being the final sink for many natural and anthropogenic substances (BRANICA and KNIEWALD, 1991), - is a "labile" ecosystem which is and has for a long time been the focal point of extensive interdisciplinary research. Measurements of heavy metals and a suite of various chemical compounds in the marine environment has mostly been carried out on limited scales, within national (or regional at best) monitoring programs (i.e. the Mussel Watch program in the USA, or the North Sea or Baltic survey by the Northern European countries). Most of these actions were restricted to coastal waters and estuaries which are more severely impacted by pollution than the open ocean. A long term systematic investigation of human impact on the oceans of the world (along the global currents, the Gulf stream or El Nino and verging on the main shipping trails) would ideally require a central survey station accompanied by an extensive banking facility, capable of handling a large volume of various marine samples.

As in the past, analytical performance will certainly continue to improve with respect to accuracy and sensitivity. The general awareness and public concern about important environmental factors has been permanently increasing over the last decade. Unless original materials from the past will be available in due time, neither trend-evaluation nor forecasting will be possible on sound scientific reasoning.

The storage of all kind of marine specimen (from water to sediment, fish and algae, plankton, etc.) on a global scale is necessary to provide future investigators with authentic materials which will facilitate an assessment and sources of environmental stress on various marine ecosystems.

Natural "banks" of specimens such as deep sea sediments or the ice sheets of the poles are very difficult to probe if trace elements or other micro-contaminants are considered. Stringent sampling procedures have to be developed and only specialized teams can assure that the quality standard of every sampling campaign is maintained. It is clear to day that the accuracy of an analytical result in the first place is a direct function of the sampling procedure. Data interpretation should therefore always start with a critical discussion of the various steps of the sampling procedure (ROSSBACH and KNIEWALD, 1993).

Transportation and intermediate storage requires special attention so that valuable material is not wasted by careless treatment. Contamination and losses are appropriately avoided if a centralized storage facility - with well trained personell - takes ultimate care to maintain full integrity of the materials over prolonged periods of time.

The state-of-the-art technology is permanent storage under liquid nitrogen vapor (-140°C) in glass or plastic containers. Large cryo-vessels of more than 1000 L capacity are available and maintenance can be automated.

The aim of such a long term, large scale banking programme is not the discovery of new compounds or unknown species but to provide future generations of researchers with authentic material of the past. A general oceanographic specimen bank is technically achievable and the value of such a sample repertoire will be shown soon after its instigation.

Regional marine specimen banks could serve as models for an appropriate sample storage facility (SSF) on a large (global) scale, and would serve the purpose of gathering requisite experience on various logistic aspects of such a project - ranging from site-location, accessibility to transportation routes and infrastructure, training of staff, operations etc. It is envisaged that a feasibility study for a regional Adriatic and/or Mediterranean marine specimen bank located on the Croatian Adriatic coast will be undertaken in due course.

The needs and prospects for a marine specimen bank are clearly evident. If the various aspects of marine research are well poised for the 21st century, a storage facility with samples from the past will strengthen its position in the concert of natural sciences aimed at a better understanding and prediction of environmental processes. Climatic changes - today a topic of prime concern - will only be an episode if one day the environmental collapse of the oceans should be encountered. To prevent such catastrophes, early trend monitoring and careful assessments should be started on the basis of long term observations.

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