

Report of the CIESM Round Table on

PORT SURVEYS IN THE MEDITERRANEAN SEA FOR SHIP-TRANSPORTED ALIEN ORGANISMS

The Mediterranean Sea, with its high-volume shipping routes, and fringed by major ports and innumerable marinas - 10% of commercially active ports of the world are in the Mediterranean - is exceptionally susceptible to ship-transported bioinvasions, whether by fouling or ballast. The *CIESM Atlas of Exotic Species in the Mediterranean* revealed that the rate of invasions by fouling or ballast - transported organisms has increased in recent decades in the Mediterranean Sea. The multidisciplinary CIESM Research Workshop on “Ship-transported alien species in the Mediterranean and Black Sea” (Istanbul, November 2002) recommended implementing a **Mediterranean-wide program** of port and port-proximate surveys using **standardized protocols** to identify alien species and organisms that pose significant risk to human health that might be disseminated by shipping from the region – a harmonized, modular “port-watch” program for the Mediterranean.

While only a spatially and temporally comprehensive survey is likely to detect all alien species, scientific, logistic and cost constraints necessarily restrict the survey’s scope. CIESM thus adopted a targeted survey strategy that provides a cost-effective approach to the collection of baseline data based on protocols developed by the Australian *Centre for Research on Introduced Marine Pests* for baseline port surveys for alien species (Hewitt & Martin, 1996, 2001), and later adopted by Globallast programme of the International Maritime Organization (IMO). CIESM launched, in late 2003, the first Basin-wide port-survey program – PORTAL. The survey targets macrophytes, bryozoans, serpulids, hydroids, ascidians, mollusks and barnacles inhabiting port and port-proximate manmade hard-substrates and organisms that pose significant risk to human health that might be disseminated by shipping from Mediterranean ports (*Vibrio cholerae*, dinoflagellate cysts) in **a dozen ports**. The “core” participants are mostly part of CIESM’s region-wide network of scientists and marine institutions, including taxonomic experts who will assist in analyzing the material collected, on an entirely voluntary basis.

Bella Galil, National Institute of Oceanography, Israel, the programme coordinator, opened the roundtable session by relating the inception and the objectives of PORTAL, and called on the participants to join the core group. Anna Occhipinti-Ambrogi, Pavia University, Italy, in charge of sampling the port of Venice, discussed the need to harmonize and clarify the terminology of marine bioinvasions, since in the many communications conducted in the preparation of PORTAL it has become clear that the rapidly expanding study of marine bioinvasions resulted in a proliferation and confusion of terms.

Enric Ballesteros, Centre d'Estudis Avançats de Blanes, Spain, described his experience in sampling the port of Barcelona, and offered a glimpse into the preliminary results.

Greg Ruiz, Smithsonian Environmental Research Center, Edgewater, U.S.A., reviewed invasion databases across global regions, and discussed the need for networking databases using a standardized 'template' and the application to PORTAL (see Annex below).

A lively discussion session, that lasted well beyond the allotted time, followed the presentations. The enthusiastic 'standing room only' crowd showered the participants with questions and suggestions, such as preserving part of the sample in alcohol for genetic studies (already in the protocol); adding plankton to the sampling (not feasible at this stage); several attendees voiced the need for a trans-Mediterranean survey outside port environments. Other suggestions concerned the terminology and the timescale of bioinvasions including a discussion of the temporal definitions of native and alien. A question was raised whether the recent evidence of western Atlantic biota spreading into the Alboran Sea should be considered a bioinvasion. And last, it was suggested that alien biota, whether arriving via the Suez Canal, mariculture or shipping, is enriching the Mediterranean's biodiversity – but it was largely agreed that even if a certain locale 'gains' more taxa, the sea's unique ecosystems lose, and we would rather preserve its diverse habitats and native inhabitants.

Bella Galil
IOLR, Haifa, Israel
Moderator

ANNEX - THE PORTAL DATABASE: A BLUEPRINT FOR FORM & FUNCTION

The information derived from PORTAL on native and non-native species of the Mediterranean will be organized, maintained, and accessed through a database that resides at CIESM. Participants in PORTAL will maintain original records in a standardized format (template), submitting electronic and paper copies submitted to the CIESM PORTAL Database (hereafter CPD) on a regular basis. The cumulative dataset will be accessible through the CPD, providing the basis for a wide range of analyses of invasions (and biodiversity more broadly), including mapping and updates to the CIESM Atlases. Guidelines and timetables for access to the CPD information, as well as its uses for development of research products, will be decided by the PORTAL group. In this way, it will be possible to have different levels of data access among user groups, allowing only partial data access for non-PORTAL members until which time analyses and publications are completed.

For the CIESM PORTAL Database, we intend to adopt an existing template. Several databases on non-native marine species have been developed, including those at the Smithsonian Environmental Research Center (SERC), the U.S. Geological Survey (USGS), and the Commonwealth Science and Industrial Research Organization (CSIRO). Moreover, the structure and nomenclature for these have been harmonized in the past few years, providing a standardized approach for such databases from the U.S. and Australia. Other countries, geographic regions, such as Pacific Islands, New Zealand, and the Baltic Sea have similar database structures, and are at various stages of harmonizing with the U.S. and Australian templates. Importantly, this template includes the capacity to record very fine-grained detail about collection localities, biology, ecology, and impacts of species --- distinguishing among native, non-native, and cryptogenic taxa.

This approach to creating the CIESM PORTAL Database has several significant advantages. First, a template already exists that has gone through several years of development and testing. By adopting this template, PORTAL avoids the duplication of efforts and costs, allowing it to leap ahead with the implementation. Second, and of considerable significance from both a research and management perspective, use of this template will serve to enable and promote information exchange across an international database network (NISbase), which is now taking form.

More specifically, NISbase creates the ability to search distributed databases throughout the world and return results to a single, web-based site. At this stage, NISbase can exchange species-level information and locality data among the U.S. and Australia databases (see www.NISbase.org). We are now advancing the capacity for expanded mapping and analytical tools, to document and predict patterns of invasion across the globe, creating both research and management applications. Thus, we envision the CIESM PORTAL Database forming a node in this global network of distributed databases, allowing simultaneous access of data from PORTAL and other databases. This approach will provide attribution of data to the original source (e.g., CIESM) but also allow rapid viewing and synthesis across many different sources and regions.