

INTERNATIONAL WORKSHOP
MOLECULAR TOOLS
FOR MONITORING
MARINE INVASIVE
SPECIES



Lecce 12-14 September 2012

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BARCODING OF THE MARINE BIOTA IN THE LEVANTINE BASIN

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There is no zoogeographic marine area of the world that has been affected by anthropogenic activities more than the eastern Mediterranean. Two major endeavors significantly influenced the Levantine marine ecosystem: excavation of the Suez Canal and construction of the Aswan High Dam that resulted in the cessation of fluvial sedimentation and nutrients into the Mediterranean. This has been leading to a long lasting sharp decrease in fish populations. Consequently, the Egyptian purse seine fishing industry takes only 10% of the pre-dam catch. In addition, following the physical connection between the Red Sea and the Mediterranean Sea, two disparate faunistic and hydrographically important water bodies, the biota of the Mediterranean Sea were changed. These changes have begun which are markedly revealed migration of Indo-Pacific species, from the eastern Mediterranean, but nowadays alien species were reached entire Mediterranean basin and also the Black sea as well. Nearly 600 species of alien macrophytes, invertebrates and fish have already been recorded (by traditional taxonomy) as invasive species in most coastal habitats of the Levant. Except for a few species, the ecological impacts on the native Mediterranean biota are poorly known, though it is believed that alien species may have caused major shifts on biodiversity. Numbers of alien species have been increasing substantially, with the possibility that many others are present which have not been identified yet. Responding to above challenges, we have been working on, within the framework of PERSEUS Project, to describe the Levantine biota using the DNA barcoding technique. DNA barcoding is particularly suitable for: 1) molecular identification of previously described species; 2) discovery/reconfirmation of already described species and 3) identification of organisms from body parts or from a mixture of biological material. There are still major points for consideration when applying the barcoding method as a novel approach for describing biodiversity. In this presentation, we shall outline the initial steps in barcoding the marine fauna/flora in the eastern Mediterranean, for emphasizing steps yet to be undertaken.

Brachidontes pharaonis (BIVALVIA, MYTILIDAE), A LESSEPSIAN INVADER FROM A PROBLEMATIC SPECIES-COMPLEX

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Brachidontes pharaonis (P. Fischer, 1870) is a small lessepsian bivalve, which succeeded in rapidly colonizing the Mediterranean basin, becoming a potential competitor for the habitat with other inhabitants of the intertidal zone. To date, little is known about this species from an ecological and a physiological perspective; however, it shows a noteworthy adaptability to different aquatic ecosystems, such as salty, brackish and highly polluted zones. *Brachidontes pharaonis* was recognized as a putative taxon attributable to the species rank through analyses of mtDNA only recently (COI and 16S). Until then, *B. pharaonis* was considered synonymous of *B. variabilis* (Krauss, 1848), a species with a wide distribution, from Pacific to Indian Ocean, and the Red Sea. The currently available genetic dataset has been enriched with sequences of two nuclear markers (28S and ITS), that supported the complex *B. pharaonis-variabilis* as composed of three distinct clades, most likely to be elevated to the rank of "bonae species". The lack of sharply defined morphological diagnostic characters imposed the use of a supplementary approach: the Geometric Morphometric analysis on the shell further confirmed the genetic pattern.