

SEARCHING FOR BIOLOGICAL CHARACTERISTICS OF BENTHIC MEDITERRANEAN EXOTIC SPECIES: PRELIMINARY RESULTS

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Abstract

A large number of metazoan organisms have arrived in the Mediterranean basin during the past decades and most of these species are benthic. The biological characteristics of 489 benthic macro-faunal invasive species were collected from the scientific literature and databases. The analysis of these results indicated that the more species are represented in each family, the more biological characteristics are recorded. Results on the biology of a small proportion of exotic species is shown.

Keywords: Invasive species, Mediterranean Sea, Zoobenthos, NIS, Life cycles

The introduction of alien species in the Mediterranean has been thoroughly investigated and the results of new invasive species are recorded in various databases[1]. The available species-lists include information on the impact of invasive species, the date and vectors of introduction in the Mediterranean, the degree of interaction with native species and the status of establishment success [2]. However, the biological characteristics for most of these species are poorly known. Exceptions to this rule are species used in aquaculture or of other economic importance. The biology of species is a useful information source in order to assess the potential for introduction and spread of invasive alien species[3] and to manage wildlife and habitats, according to European legislation [4]. The biological characteristics of 489 benthic invasive species were collected from 980 scientific literature sources and 25 databases. The information on most characteristics was obtained between 1970 and 2016, and include papers reporting new records of species in the Mediterranean. The traits collected, covered various aspects of biology (morphological, behavioural, reproductive and larval traits) of the benthic invasive species in the Mediterranean. A total of 52 traits were collected, subdivided into 278 sub-categories, called modalities. This group of species belong to six phyla (Annelida, Arthropoda, Echinodermata, Mollusca, Porifera and Sipuncula), the most abundant being Mollusca with 209 species, followed by Annelida-Polychaeta (138 species) and Crustacea (110 species). In total species from 195 families have been registered. Data on the total number of modalities for 25 of these families are shown in Figure 1. Families including more than four invasive species have numerous known biological traits recorded in the scientific literature.

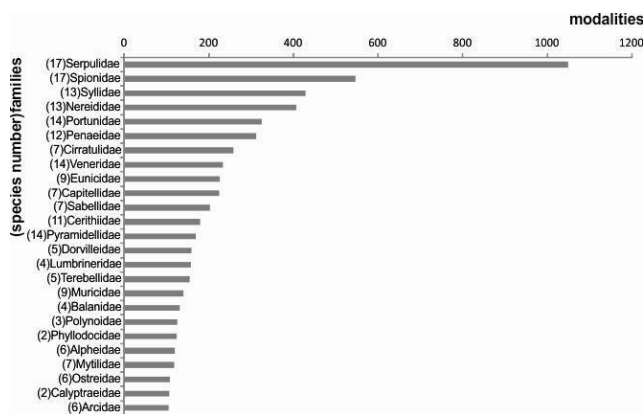


Fig. 1. Number of modalities collected, for 25 families (in parentheses the number of species per family).

Biological characteristics have been collected and stored in a data base. These continuous numerical traits are grouped into different number of range-classes, as shown in figure 2. Published information has been registered for lifespan (36 species), fecundity (80 species), egg size (90 species), age at first maturity (95 species) and maximum body-size (324 species). Body size and age at first maturity showed a maximum in the middle of the modality classes. On the other hand, species tend to have more variable egg sizes, fecundity and lifespan.

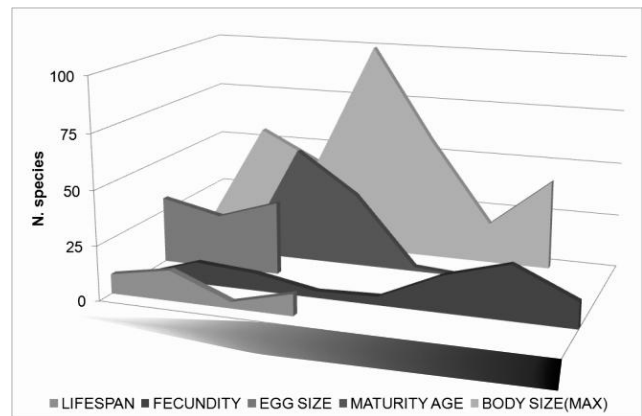


Fig. 2. Number of species per selected trait and range-class. As arrow gradually darkens, the modality values in the range-class increases.

Conclusively, invaders are characterized by mixed biological characteristics according to the published literature. Although aggregating the biological characteristics of so different taxa with a high phenotypic plasticity is risky, it could be a useful approach to detect patterns related to different life strategies of benthic invasive species[5]. At the same time the review of this scattered information is a tool for identifying gaps in the knowledge on the biology of these species which largely determines their dispersal ability.

References

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