

Effects of life-history and fishing pressure on the genetic structure and effective population size through time: a tale on two coastal marine species

Sara M. Francisco & Joana I. Robalo

Abstract

Species with planktonic larvae and subjected to commercial exploitation are more likely to show temporal genetic variation. The shanny *Lipophrys pholis* is a benthic rocky intertidal fish with its dispersion limited to a long larval stage. The commercially exploited white seabream *Diplodus sargus* has shorter planktonic life and considerable swimming ability as adults. A total of 226 shanny specimens (collected in 2003, 2013 and 2014) and 181 white seabreams (collected in 2006, 2009, 2011 and 2014) were screened for genetic variation using the mitochondrial control region and the first intron of the S7 ribosomal protein gene. For *D. sargus* and *L. pholis* results for the two markers were congruent and highly divergent, respectively. Genetic diversity indices showed little variation among sampling periods and were generally high, with the exception of the shanny's S7. No temporal structure was found for both species. However, for *L. pholis* significant genetic differentiation was detected between 2013 and 2014 (CR), and between 2006–2013 and 2006–2014 (S7), while no significant differences were detected between sampling periods in *D. sargus*. The shanny showed higher effective population size per generation when compared to the white seabream, which yielded lack of evidence for genetic drift for the 2nd (CR and S7) and 3rd (S7) periods of the study. These results highlight the fact that temporal changes in the gene pool composition need to be considered when evaluating population structure, especially for species with long pelagic larval dispersion, more vulnerable to recruitment fluctuations, and species subjected to commercial pressure.

Keywords: Population genetics; planktonic larval dispersion; temporal structure; effective population size; commercial vs non-commercial species

Contact author: Sara M Francisco (sara_francisco@ispa.pt) MARE – Marine and Environmental Sciences Centre, ISPA Instituto Universitário, Rua Jardim do Tabaco 34, 1149-041 Lisboa, Portugal.