

Monitoring Spawning Activity in Cabo Pulmo National Park Using Molecular Identification of Fish Eggs and Larvae

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This study monitors the diversity and spawning periods of fishes with pelagic eggs in Cabo Pulmo National Park in Baja California, Mexico through molecular identification of fish eggs and larvae. Identification of fish eggs complements diver-conducted surveys, which until now have been the primary source of information about the species found in Cabo Pulmo's waters. In collaboration with staff at Cabo Pulmo and the Interdisciplinary Marine Science Institute in La Paz, Baja California Sur, Mexico, weekly plankton collections were conducted during the period of January 2014 through December 2015. The fish eggs and larvae were sorted, crushed, and processed using molecular methods. Using online databases of genetic barcodes we identified a total of 3,041 eggs consisting of 112 different species. The ten most abundant identified fishes were: *Scarus sp.*, *Halichoeres dispilus*, *Etrumeus acuminatus*, *Kyphosus sp.*, *Euthynnus lineatus*, *Synodus lacertinus*, *Vinciguerria lucetia*, *Caranx caninus*, *Auxis rochei*, and *Haemulon sexfasciatum*. Noteworthy species identified include rare mesopelagic species such as *Regalecus glesne* and highly migratory species such as *Thunnus albacares*. This study provides important information concerning seasonal variation of fish spawning activities, which plays a significant role in the assessment and management of this marine ecosystem. The resulting data can be used as a baseline to compare shifting populations and spawning patterns of species that may be affected by both the MPAs' protection and broader oceanographic changes associated with climate change, as well as aid in persuading the public and policy makers of the importance of setting aside spawning habitat for conservation.

Keywords: fish eggs, larvae, DNA barcoding, molecular ecology, gene amplification, sequence databases, marine conservation, genetics

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