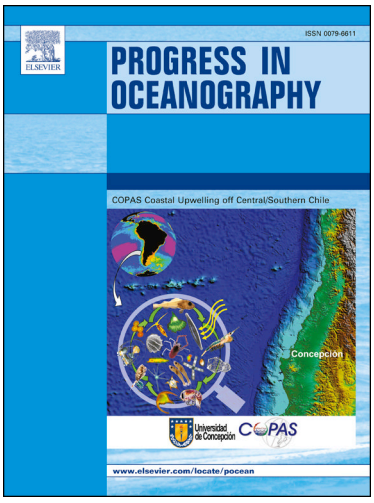

The ZooCAM, a new in-flow imaging system for fast onboard counting, sizing and classification of fish eggs and metazooplankton

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Abstract

In this paper we present the ZooCAM, a system designed to digitize and analyse on board large volume samples of preserved and living metazooplankton (*i.e.* multicellular zooplankton) and fish eggs > 300 µm ESD. The ZooCAM has been specifically designed to overcome the difficulties to analyse zooplankton and fish eggs in the framework of the PELGAS survey, and provide high frequency data. The ZooCAM fish eggs counts were comparable to those done with a dissecting microscope. The ZooCAM enabled the accurate prediction and fast on board validation of staged anchovy and sardine eggs in almost real time after collection. A comparison with the ZooScan, on a more complex zooplanktonic community, provided encouraging results on the agreement between the 2 instruments. ZooCAM and ZooScan enabled the identification of similar communities and produced similar total zooplankton abundances, size distributions, and size spectra slopes, when tested on the same samples. However these results need to be further refined due to the small number of samples used to compare the two instruments. The main ZooCAM drawback resides in a slight but sensible underestimation of abundances and sizes, and therefore individual and community biovolumes. The ZooCAM have been successfully deployed over 4 years, on numerous surveys without suffering any major failure. When used in line with the CUFES it provided high resolution maps of staged fish eggs and zooplanktonic functional groups. Hence the ZooCAM is an appropriate tool for the development of on board, high frequency, high spatial coverage zooplanktonic and ecosystemic studies.

Keywords: ZooCAM; in-flow imaging; fish eggs; zooplankton; ecosystemic survey