

ABSTRACT

ROBERTS, M. J.(1998)

The influence of the environment of chokka squid *Loligo vulgaris reynaudii* spawning aggregations: steps towards a quantified model.

In Cephalopod Biodiversity, Ecology and Evolution. Payne, A. I. L., Lipinski, M. R., Clarke, M. R. and M. A. C. Roeleveld (Eds).

S. Afr. J. mar. Sci. 20: 267–284.

Published and anecdotal information was used to formulate a conceptual (logic) model which describes the biological components and dynamics of chokka squid spawning aggregations. Into this was an integrated potential environmental influence. To determine quantitatively the impact of environmental factors on the spawning process (and ultimately catches), a theoretical methodology was developed based on the use of underwater video images to estimate the rate at which egg pods are deposited. Results from a pilot study undertaken off the Tsitsikamma coast of South Africa demonstrated the viability of this quantitative technique, and while not intended to be a definitive experiment, showed that 1) an upwelling event was coincident with the formation of a spawning aggregation, supporting the hypothesis that changes in temperature trigger spawning; 2) biological activities such as egg deposition, predator-induced interruptions in egg deposition, and absence of squid from the egg bed, occupied 19, 22 and 59% of the event time respectively, and 3) spawning was completed in about 33 h in the absence of female immigration. An overall decline in deposition rate, combined with the absence of adverse environmental conditions, indicated that spawning was terminated by the ovaries of female squid becoming partially or fully spent, rather than by environmental stimuli. Based on this experience, hardware was then designed and manufactured to realize the methodology, and it is currently being used in a new series of squid spawning experiments.