

## ABSTRACT

Oosthuizen, A., Roberts, M. J., Sauer, W. H. H. and D. Baird (1999).

**Temperature effects on embryonic development and hatching success of squid  
(*Loligo vulgaris reynaudii*).**

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*Loligo vulgaris raynaudii* is a commercially important squid species caught mainly on their spawning grounds along the southeast coast of South Africa. Chokka squid spawns in two environmentally different areas, shallow (<60m) inshore bays and in deeper (60m-130m) waters on the mid-continental shelf on the south east coast. The present study investigated the embryological development and hatching success of this species and how these would be influenced by the two different spawning environments. Temperature data collected from both these spawning areas were analysed. Temperatures in the inshore areas were found to be warm (16-22°C) but fluctuating, whereas the deeper areas were cold (9 -12°C) and stable. Large intrusions of warm water were also observed in these deeper, colder areas. The effect of these various temperature regimes on the embryonic development of chokka squid were investigated at both stable and fluctuating temperatures under laboratory and natural conditions. A linear relationship was defined between stable water temperature and embryonic development. An optimum development temperature range was identified between 12°C and 18°C, with abnormally developed embryos occurring outside this optimal range. Embryological abnormalities were identified and classified into types. The growth rates of early developmental stages were found to be more susceptible to variable temperature regimes than later development stages. Upwelling events in the inshore spawning areas were found to have a negligible effect on the development success of eggs deposited in these areas. Embryonic development under laboratory and natural conditions were found to be similar. The embryonic development scheme for *Loligo vulgaris raynaudii* revised and six developmental stages added to the original embryological study of the species.