

ABSTRACT

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The effects of temperature on embryonic development and hatching success of squid *Loligo Vulgaris Reynaudii* eggs.

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The study incorporated in-depth investigation into the effect of various temperature regimes on the embryonic development of *Loligo vulgaris reynaudii*. *Loligo vulgaris reynaudii* was found to spawn in two environmentally different areas, the shallow (<60m) inshore bays and in deeper (60m- 130m) waters on the mid-continental shelf on the south east coast of South Africa. Analyses of temperature data collected from both these spawning areas were conducted. Temperature 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 embryonic development scheme for *Loligo vulgaris reynaudii* was revised and six developmental stages added to the original embryological study for the species. The effect of temperature on embryonic development was investigated at 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 defined 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 rate of early developmental stages was found to be more susceptible to variable temperature regimes. 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 was found to be similar.