

Yolk utilization, metabolism and growth in reared *Loligo vulgaris reynaudii* paralarvae

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Abstract:

To understand the mechanisms that influence recruitment of the commercially important chokka squid *Loligo vulgaris reynaudii*, knowledge of its early life history is required. This paper evaluates the influence of food supply on yolk utilization, metabolism and growth of paralarvae. Eggs collected on the spawning grounds were incubated and the paralarvae reared in the laboratory under 'fed' and 'starved' conditions for 22 d at 16 ± 1.0 °C. Some paralarvae lasted 42 d in the laboratory. Mantle length (ML), wet and dry weights (WW and DW) and yolk weight (YW) were measured daily from samples of ~ 30 (10–51) paralarvae from each group. Yolk weight was calculated using image analysis to determined yolk volume. Three methods (growth model, O₂ consumption rates and yolk utilization rates) were used to estimate metabolic rates. Input parameters included daily mean wet weight of paralarvae and temperature. Mean ML, WW, DW and YW at hatching were found to be 2.3 mm, 1.86 mg, 0.45 mg and 0.21 mg, respectively. The experiment revealed that daily yolk utilization rates were 86 and 95% d⁻¹ for fed and starved paralarvae respectively, and that the yolk reserve was almost exhausted 3–4 d after hatching. Starved paralarvae survived for 6 days (with 80% mortality), while fed paralarvae attained a growth rate of 7.8% body WW d⁻¹ over the first 22 days after hatching. Results illustrate that temperatures on the chokka squid spawning grounds allow paralarvae to grow at the fastest rates possible without being subjected to a growth 'slow down' caused by a high temperature dependent imbalance between sustaining high metabolic and commitment high feeding rates.

Keywords: squid, paralarvae, temperature, growth, metabolic rate, feeding rate