Induction of Molting in Hatchery-reared Mud Crab *Scylla serrata* Juveniles Through Temperature Manipulation or Autotomy

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Abstract

The effects of water temperature and autotomy of chelipeds on growth, survival and molting of mud crab, *Scylla serrata*, juveniles were investigated under laboratory conditions in separate experiments. Hatchery-produced crabs at the intermolt stage with 2.0-2.3 cm carapace width and 1.7-2.2 g body weight were either exposed to temperature levels of 29, 32 and 35°C and ambient temperature of 24-31°C or subjected to autotomy (voluntary removal of one or two chelipeds). The crabs were allowed to molt twice prior to termination.

All crabs held at 35°C had 100% mortality due to incomplete molting during the first molt. The mean survival of crabs upon termination was 58, 64 and 50% for ambient temperature, 29 and 32°C, respectively. Specific growth rate (SGR) of crabs in the ambient (2.83 ± 0.12%) and 29°C (3.02 ± 0.15%) were comparable but significantly lower than ($P<0.01$) those at 32°C (3.85 ± 0.28%). The molt interval of crabs was significantly shorter in treatments with constant water temperature (29°C: 32 ± 0.80 days, 32°C: 28 ± 1.11 days) compared to ambient temperature (39 ± 0.93 days).

The survival of crabs with intact chelipeds (51.17 ± 3.56%) was comparable to those with one (50.55 ± 2.36%) or two (43.41 ± 1.59%) autotomized chelipeds. Juveniles with intact (5.80 ± 0.47%) or one autotomized cheliped (5.45 ± 0.30%) had a significantly higher SGR than crabs with both chelipeds autotomized (4.20 ± 0.52%) in the first molt. On the second molt, however, high SGR was observed in crabs with two chelipeds autotomized. The molt interval was significantly shorter in the autotomized crabs (one cheliped: 28 ± 1.66 days; two chelipeds: 23 ± 0.63 days) compared to those with intact chelipeds (36 ± 1.52 days). The results suggest that optimum water temperature for rearing *S. serrata* juveniles ranges from 29 to 32°C. Likewise, autotomy of one cheliped can promote molting without adversely affecting the growth and survival of the juveniles.