

Salinity effects on the embryonic and larval development of the tropical species of Indo-Pacific sea urchin, *Salmacis sphaeroides* (Linnaeus, 1758)

ABSTRACT

Salmacis sphaeroides (Linnaeus, 1758), is one of the regular echinoids, distributed in the warm Indo-West Pacific Ocean including Johor Straits between Malaysia and Singapore. It has significant biological, ecological, aquacultural, conservational and nutritional values but still under the states of determination and exploration in Malaysia. Effects of salinity tolerances on fertilization, embryonic, early larval development and growth performances of this high-valued sea urchin, *S. sphaeroides* were examined in a controlled laboratory condition. The experiment was designed with seven different salinity treatments (15, 20, 25, 30, 35, 40 and 45 PSU), each of which was replicated. Fertilization rate was significantly highest ($P < 0.05$) at 30 PSU salinity, followed by those at 25, 35, 20, 40 and 45 PSU, while the lowest value was obtained at 15 PSU, decreased with increasing and decreasing salinities in this order. The time required to reach these stages was also increased with the salinity deviations from 30 till the extent to 25 and 35 PSU. There were no significant differences ($P > 0.05$) recognized among these three salinity levels on prism larval length and width. However, significance differences ($P > 0.05$) were noted in morphometric characters of 2-arm and 4-arm pluteus larvae. The findings of the this study indicate that *S. sphaeroides* is stenohaline and do not survive and develop out of the range from 25 to 35 PSU salinities. This study represents the first successful attempt to investigate the effects of different salinity levels on the embryonic and early larval development in tropical sea urchin, *S. sphaeroides*. The findings from the present study would immensely be helpful towards the development of breeding, larval rearing and seed production of this commercially important sea urchin for aquaculture production.

Keyword: Sea urchin; *Salmacis sphaeroides*; Salinity; Embryo; Larva; Development