

Larval development and phototaxis of *Striatobalanus tenuis*, a deep sea barnacle

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Abstract

Larval development of many shallow water barnacle species (Crustacea: Cirripedia) has been well studied. In the deep sea, the larval development of some goose barnacles (Order Pedunculata) was briefly described but remained unknown for acorn barnacles (Order Sessilia). In addition, the presence of phototactic behaviors, which are common in larvae of shallow water species, remained controversial in the deep sea where light is limited. *Striatobalanus tenuis* (Hoek, 1883) is a deep sea (300~400m) acorn barnacle found in East and South China Sea. It inhabits on rocks, gastropod shells and crab surface and is commonly found as a bycatch of bottom trawl in Taiwan. In this study, we collected adult *S. tenuis* individuals from Kezailiao fishing port and cultivated their fertilized egg masses at 20°C. The hatched larvae were fed with microalgae and water is changed once a week. Precipitation of microalgae, which may disturb larval movement, was frequently removed. Six stages (NI-NVI) of swimming nauplius larvae and one stage of non-swimming cyprid larvae were successfully observed. Different nauplius stages of *S. tenuis* show morphological features corresponding to "normal" developmental sequence of barnacles. Red, green, blue and white light were applied to test phototaxis of *S. tenuis* nauplii. NII and NIII larvae were attracted by all the light settings. NIV and NV larvae showed positive phototaxis to all the light settings except blue light, which was negative. NVI larvae were repelled by all the light settings. The change of light preference at different nauplius stages might relate to their sequence of vertical migration. We suggested that larvae migrate to shallower water, about 100m deep, to feed phytoplankton, then migrate back to the deep water for settlement.

Keywords- barnacle, larvae, deep sea, phototaxis