

Daily burrowing cycle and feeding activity of juvenile sea cucumbers *Holothuria scabra* in response to environmental factors

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Abstract

This study investigated the daily activities of juvenile sea cucumbers *Holothuria scabra* Jaeger. All individuals exhibited daily burrowing and feeding rhythms in response to environmental factors. The cycle of the smallest juvenile, >10–40 mm, was linked to light; they began to burrow around sunrise and emerged close to sunset. Their burrowing activity was inhibited by continuous darkness. Juveniles >40–140 mm responded to changes in temperature; they burrowed earlier around 03:30 h, seeking shelter in the sediment as temperature declined, and emerged around mid-day. The maintenance of a constant warm temperature prevented them from burrowing. For all juveniles, time spent on the surface corresponded with feeding and periods of locomotion; while burrowed they remained stationary, did not feed and had a low intestinal transit. Organic matter content in the intestine was also found to vary with the daily cycle. Decreases in salinity from 35 to 30, 25 and 20‰ induced the burrowing of all juveniles within minutes, but they began to re-emerge after a few hours. Acclimation occurred most rapidly at salinity 30‰ and was slowest at salinity 20‰. Conversely, nearly 40% of the juveniles were unable to cope with a decrease to salinity 15‰. Juveniles of all sizes demonstrated a strong selectivity for sediment characteristics. In two substrate selection experiments, their preference for sand with a grain size around 0.4 mm and for organically rich material was firmly expressed within an hour. The general behavior of juvenile *H. scabra* reflects their ability to inhabit shallow sandy areas with high terrigenous inputs and variable environmental conditions. © 1999 Elsevier Science B.V. All rights reserved.

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