



## Settlement preferences and early migration of the tropical sea cucumber *Holothuria scabra*

Annie Mercier<sup>a,b,c,\*</sup>, Stephen C. Battaglene<sup>b</sup>, Jean-François Hamel<sup>a</sup>

<sup>a</sup>*Society for the Exploration and Valuing of the Environment (SEVE), 655 Rue de la Rivière, Katevale, Québec, Canada J0B 1W0*

<sup>b</sup>*International Center for Living Aquatic Resources Management (ICLARM), Coastal Aquaculture Centre, P.O. Box 438, Honiara, Solomon Islands*

<sup>c</sup>*Institut des Sciences de la Mer de Rimouski (ISMER), Université du Québec, 310 Allée des Ursulines, Rimouski, Québec, Canada G5L 3A1*

Received 20 September 1999; received in revised form 22 February 2000; accepted 2 March 2000

### Abstract

Settlement and post-settlement processes of the sea cucumber *Holothuria scabra* Jaeger were studied in the laboratory. Independent and paired choice experiments revealed that several substrates could induce metamorphosis into pentactulae, but that specific substrates favoured settlement. Leaves of seagrass *Thalassia hemprichii*, with or without their natural bio-film, yielded the highest settlement rates (4.8–10.5%). *T. hemprichii* was preferred as a settlement substrate over sand, crushed coral, several other plant species and artificial seagrass leaves with or without a bio-film. Only settlement on the seagrass, *Enhalus acoroides*, was similar to that recorded for *T. hemprichii*. In the absence of a substrate, the larvae delayed settlement for nearly 96 h and survival was less than 0.5%. Sand and crushed coral, either alone or together, induced settlement from < 1.5% of the available larvae. The pentactulae found on sand, coral and in bare containers were 10–35% smaller than those on *T. hemprichii* leaves. Soluble extracts from *T. hemprichii* and *E. acoroides* successfully induced metamorphosis and settlement on clean plastic surfaces. Newly settled juveniles remained on the seagrass leaves for 4–5 weeks before migrating to sand at around 6 mm in length. Prior to this, the juveniles spent 4–5 days moving on and off the leaves. Once on the sand, the juveniles became deposit-feeders, but did not show the typical burrowing behaviour of older specimens until they reached around 11 mm in length. The larvae of *H. scabra* appear to actively select seagrass leaves, possibly through chemical detection. We hypothesise that larvae settling on seagrass have an increased chance of growth and survival because they are provided with a suitable substrate on which to grow, and a bridge to sand substrates as they become deposit-feeders. © 2000 Elsevier Science B.V. All rights reserved.

\*Corresponding author. Tel./fax: +1-819-843-3466.

E-mail address: seve@sympatico.ca (A. Mercier)