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The Effect of Different Substrates on Larvae Settlement in the Sea Cucumber, *Holothuria scabra*, Jaeger, 1833

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Abstract: In this project, the effect of various substrata on a sea cucumber (*Holothuria scabra*) larvae settlement was evaluated. The preferences of the larvae settlement in the experiments with three different substrata (polyethylene plastic sheet, rough tile surface and a 500 µ planktonic net) were compared and showed that a 500 µ planktonic net attracted significantly more larvae than the others.

Key words: Larvae Settlement · Sea Cucumer · Planktonic Net

INTRODUCTION

Holothuria scabra is noted as one of the most promising sea cucumber species for aquaculture that can be turned into Grade-A beche-de-mer [1, 2]. Several researchers are currently working on the Sandfish hatchery [1-6]. In order to get larvae, it is necessary to collect Broodstock during the reproductive season, which should be induced to spawn. The resulting larvae are fed with a mixed diatom culture. When a pentactula is observed, it is necessary for a conditioned plated to be settled [3, 7-10]. Different types of settling plates have been used, such as rough tile surfaces and polythene sheets [7, 10]. There are various methods to condition the settlement plates, such as using Sargassum extract [8, 9, 15], diatom cultures and Spirulina [2].

Although some literature shows echinoderm larval settlement experiments that used a number of species [12-16], this project has tried to determine the best settlement plates in Iran for a substrate larvae settlement for the sea cucumber *Holothuria scabra*.

MATERIALS AND METHODS

The pentactula larvae of *Holothuria scabra* (15 h old), were utilized for the experiments. Three 300 L tanks containing 250 L of 1 µ filtered water were used for the experiments. Two surfaces of each substratum were provided for each tank. All of the settlement surfaces were painted with Spirulina powder and allowed to air dry. The larvae were exposed to three different substrata (polyethylene plastic sheet, rough-sided tile and a 500 µ planktonic net). The temperature was kept at 27-28°C during the experiments. When doliolaria was first observed, we put the different substrata into the tanks. The numbers of settled early juveniles were counted after one week. The collected data were analysed with the Kruskal-Wallis one-way ANOVA, on ranks using SPSS media, to determine the significant differences between the treatments.

RESULTS

The pentactula larvae of *Holothuria scabra* were significantly more attracted to the planktonic net than were the others ($P<0.05$). The rough tile surface showed that it could be appropriate for inducing the larvae to settle. In addition, many larvae settled on the smooth tile surface.

DISCUSSION

When some of the doliolaria larvae transformed into pentactula larvae, they needed to be settled down on the bottom of the tank. The pentactula larvae will be induced to settle while food is sufficient and a hard

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substratum is available [10]. Furthermore, a lack of light would also induce them to settle [7]. For this reason, three different substrata were examined for this project.

Some researchers used PVC, polythene, or polypropylene [2]; rough surface tiles [10]; and fibreglass surfaces[8]. Li *et al*. [14] showed that a polyethylene plastic sheet was able to attract more larvae than plastic films and monofilament nylon. Our results in this project show that can be used as settlement surfaces, in addition to those mentioned. Moreover, a 500 µ planktonic net would be an effective surface for inducing larvae to settle.

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