HERBIVORY AS AN INDICATOR OF THALASSIA TESTUDINUM PALATABILITY FOR PARROTFISH

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ABSTRACT (PLK)

We investigated the effects of pre-existing bites on Thalassia testudinum blades, simulated by a series of four hole punches, on blade preference by parrotfish (Scaridae). We hypothesized that blades with evidence of previous herbivory would act as a visual cue and advertise blade palatability; and therefore expected herbivory to be greater on blades which had already been grazed. Our results supported this hypothesis, which may indicate that parrotfish use visual cues of palatability as an important part of their foraging strategy.

Key Words: Thalassia testudinum , parrotfish, herbivory

INTRODUCTION (JLB)

Previous studies have shown that parrotfish (Scaridae) herbivory on Thalassia testudinum is greater when the blades have high epibiotic cover, suggesting that the fish use epibionts as cues for more palatable and nutritious food.

In the dense Thalassia beds of Discovery Bay, Jamaica, some leaves appeared to be heavily grazed, while similar blades remained untouched. We hypothesized that parrotfish bites were signals for other parrotfish advertizing leaf palatability, and predicted that herbivory (in a 24 hour period) would be greater on blades which had already been grazed.

METHODS (JLB)

On 21 February, 1994, we selected Thalassia testudinum leaves from the inner reef west of the Discovery Bay Marine Laboratory dock, Jamaica. 120 leaves with luxuriant epibiotic growth were standardized to 25cm length and rounded at the tip. Parrotfish herbivory was simulated in 60 leaves using a hole puncher to make a pattern of four semi-circles on the upper leaf margin.

Leaves of "punched" and "unpunched" treatments were separated, and placed in 10 bunches of 6 blades each. Bunches were secured with a clothespin and attached with string to a bolt.

Treatments were kept in circulating sea water overnight, and placed in the same Thalassia bed, west of the lab, on the morning of 22 February in a 5m x 1.5m grid formation: 0.25m between punched and unpunched treatment bundle pairs, 1m between replicates. All pairs were marked with a flagged buoy (Figure 1). We collected the bundles after 24 hours and counted the number of blades which had been grazed. A Mann-Whitney U-test was used to evaluate differences in herbivory between punched and unpunched leaves.

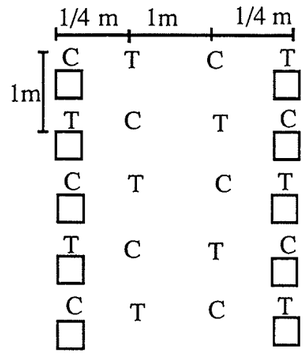

Figure 1. Placement of T. testudinum contol and treatment bundles in the backreef, Discovery Bay, Jamaica.

RESULTS (BME)

Parrotfish ate Thalassia testudinum leaves with pre-existing bites at a significantly higher frequency than leaves without bites, with 38% and 19% of the leaves showing new signs of herbivory, respectively ($U = 44$, $n_1 = 8$, $n_2 = 7$, $p < 0.05$; Figure 2). Five of the original 20 replicates were not included in our study; four were lost and one was damaged.

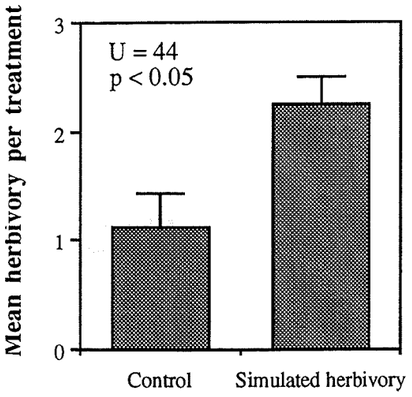

Figure 2. The amount of herbivory shown on Thalassia leaves in the control and manipulated treatments.

DISCUSSION (PLK)

Supporting our initial hypothesis, parrotfish showed a marked preference for Thalassia testudinum blades which had pre-existing bites. This suggests that these bites may act as a visual cue for parrotfish and identify which leaves are highly palatable. By selecting partially eaten Thalassia leaves, parrotfish may eliminate travel to leaves of questionable palatability. There may, however, be a threshold of herbivory on Thalassia above which parrotfish may not forage. If the surface area of a leaf has been significantly reduced by herbivory, it may not be worthwhile for a parrotfish to forage on that leaf.

In future studies, sample size should be increased, and experimental design should be improved to increase the probability of finding treatments located in dense Thalassia beds.