

Nesting Behavior of the Male Sergeant Major

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Abstract

Abudefduf saxatilis, or Sergeant Majors, are a tropical damselfish found in reefs along the Caribbean islands and along the Atlantic Coast. I observed nesting behavior in male sergeant majors off the western coast of Dominica in order to better understand territorial aggression in proximity to other male nesting territories. The goal was to sample 10 nests with different spatial proximities to other nests and tally the number of chases or acts of aggression against other fish. I hypothesized that the nests that were less than 1 meter away from another nest would be less aggressive than a nest that was further away from other nests. Assuming that the chases only occurred in that male's territory, that my presence did not affect the number of aggressive acts and that specific time of day did not affect the number of chases I discovered that on average, males in closer proximity to other nesting males had less acts of aggression than males that had nests that were alone.

Introduction

Sergeant Majors get their name from the 5 solid black lines that run vertically across their body. They are part of the *Pomacentridae* family, in the order *Perciformes*. Sergeant Major males clear and defend nests on rock or dead coral and change color to signify their readiness to spawn by changing to a bright blue color. During spawning males display 6 different main behaviors: nipping, fanning, guarding, chasing, circling, and inviting, but for the purpose of this study I focused on chasing, or aggressive acts against other fish. Observations were recorded at Champagne Reef off the western coast of the Island of Dominica, a Caribbean island in the Lesser Antilles. Dominica is known as the "Nature Isle" and is home to over 40 diving and snorkeling sites. Champagne reef itself is known for its bubbly volcanic gases emerging from the bottom of the ocean. I performed an observational study of *Abudefduf saxatilis* looking at aggressive behaviors and estimating spatial proximity to other nesting males. I also looked at

inter- and intraspecific reactions to see whether aggression was related to predation or spawning patterns.

Methods and Materials

4 trips were made to Champagne Reef over three weeks at the end of May and beginning of June in 2011. Using masks and snorkels, nests were observed at different times of the day for 5 minute intervals each trial. Using an underwater tablet and a watch I observed three 5 minute intervals for each of the 7 nests observed and tallied the number of chases for each male Sergeant Major and the species that was chased. I also looked at relative proximity to other Sergeant Major nests including both colony nests and unaccompanied nests. Spatial proximity was estimated by sight alone.

Results

Time Interval	Trial	Proximity	Yellow Fish	Yellow Tail	Sergeant Major	Bicolored Damselfish	Blue Tang	Parrot Fish	Small Grey	Blue Headed Wrasse	Total Chases	Average Chases per nest
10:07-10:12	1	Near 1	0	0	0	0	0	2	0	0	2	1.33
10:12-10:17	2		0	0	0	0	0	0	0	0	0	
10:17-10:22	3		0	0	2	0	0	0	0	0	2	
10:28-10:33	1	Alone (1)	0	0	1	0	0	0	2	0	3	5.00
10:33-10:38	2		2	1	1	0	0	0	0	0	4	
10:39-10:44	3		6	0	0	0	0	0	1	1	8	
11:14 - 11:19	1	Alone (2)	0	0	7	0	0	0	0	0	7	6.00
11:19 - 11:24	2		0	0	3	0	0	0	2	0	5	
11:24 - 11:29	3		1	0	5	0	0	0	0	0	6	
2:13-2:18	1	Alone (3)	0	0	7	0	0	0	0	0	7	9.33
2:18-2:23	2		0	0	11	0	0	0	0	0	11	
2:23 - 2:28	3		1	0	9	0	0	0	0	0	10	
2:32 - 2:37	1	Near 6 (1)	0	0	1	0	0	0	0		1	1.33
2:37 - 2:42	2		1	0	0	0	0	0	0	0	1	
2:42 - 2:47	3		2	0	0	0	0	0	0	0	2	
2:32 - 2:37	1	Near 6 (2)	0	0	1	0	0	0	0	0	1	

2:32 - 2:37	1		0	0	1	0	0	0	0	0	1	
2:37 - 2:42	2		0	0	0	0	0	0	2	0	2	
2:42 - 2:47	3		0	0	1	0	0	0	0	0	1	1.33
2:50 - 2:55	1	Near 2	0	0	0	0	0	0	0	1	1	
2:55 - 3:00	2		0	0	1	0	0	0	0	0	1	
3:00 - 3:05	3		0	0	0	0	0	0	0	0	0	0.67

Table 1: Shows the proximity of each nest compared to other nesting Sergeant Males. A nest near a certain number indicates colonial nesting. A nest alone is considered unaccompanied. 7 nests were observed with three 5 minute interval trials for each nest. The number in parenthesis is used to indicate between two different nests that have the same type of proximity.

Nest Type	Intraspecific	Interspecific	Total
Near 1	2	2	4
Alone (1)	2	13	15
Alone (2)	15	3	18
Alone (3)	27	1	28
Near 6 (1)	1	3	4
Near 6 (2)	2	2	4
Near 2	1	1	2

Table 2: Shows a summary table of each occurrence of aggression at each nest type and whether the interaction was between the Sergeant Majors themselves or with another species. The number in parenthesis is used to indicate between two different nests that have the same type of proximity.

Discussions and Conclusions

As shown by the table there is a measurable difference between colonial nesting and unaccompanied nesting. The average number of chases of 5, 6, and 9.3 are higher in males that are further away from other nests when compared to averages of 1.3 and 0.6 found in males that were nesting in close colonies, indicating that colonial nesting is more efficient in warding off possible

predators. The table also shows that intraspecific aggression is much more common than interspecific aggression. This could possibly have been due to the mating habits of the Sergeant Major.

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