

Short Note

What Do the Sergeant Major *Abudefduf vaigiensis* Lose from Nesting in the Territories of Pacific Gregory *Stegastes fasciolatus*?

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(Accepted July 7, 1994)

Rong-Quen Jan (1995) What do the sergeant major *Abudefduf vaigiensis* lose from nesting in the territories of Pacific gregory *Stegastes fasciolatus*? *Zoological Studies* 34(2): 131-135. The behavioral response of the territorial damselfish Pacific gregory *Stegastes fasciolatus* to nests built within their territories by the sergeant major damselfish *Abudefduf vaigiensis* was studied on the northern coast of Taiwan in the summer of 1986. In one instance where 24 *A. vaigiensis* nests were built on a reef area already occupied by 27 territorial *S. fasciolatus*, 75% of *S. fasciolatus* individuals were observed to take eggs from these new nests when the opportunity was available. The number of eggs consumed did not correlate significantly with the standard length of the predator. On the average, a *S. fasciolatus* individual consumed 1,100 eggs (SD = 370, $n = 11$) daily. The high incidence of egg predation suggests that eggs can be an important food item for these original territory-holders; when *A. vaigiensis* outcompete *S. fasciolatus* for a substrate for nesting, they have also made this otherwise unavailable food resource available to the latter fish.

Key words: Competition, Damselfish, Egg, Nest, Predation.

Pacific gregory, *Stegastes fasciolatus*, which predominates over most of the reef-flat region of northern Taiwan, is a damselfish highly aggressive toward both conspecifics and heterospecifics (Rasa 1969, Losey 1982). It defends both food and space resources within its territory (Losey 1982, Chiou 1984). Because of this strong territoriality, its presence is an important factor in determining the distribution and abundance of potential competitors, including not only fishes but other animals (Hourigan 1986). Nevertheless, Jan and Ormond (1992a) reported that, during the spawning season in 1986, most of the nests of another damselfish — the sergeant major *Abudefduf vaigiensis* — occurred within territories of *S. fasciolatus*. The association between these two fish species persisted for the entire spawning season (of *A. vaigiensis*). Thus it is of interest to closely examine reactions of the original territory holders to the intrusion, and to see what the intruder, the sergeant major, might lose from nesting on substrates within these territories. Herein the behavioral response of the original territory-holder, *S. fasciolatus*, to the territory-intruder's nests is examined, and an alternative tactic to the territory defence primarily adopted by *S. fasciolatus* is described.

Abudefduf vaigiensis were studied at this site. *S. fasciolatus* inhabits shallow reefs. Adults generally hold territories on the reef surface suitable for algal growth. *A. vaigiensis* is a free-ranging damselfish and a demersal spawner (Jan and Ormond 1992b). Spawning commences with the search, in groups, for spawning sites. When a suitable site is located, males settle and establish temporary territories covering available nesting substrates. Members in each group spawn synchronously. After spawning, the male remains at his nest and is responsible for egg-caring. In this study observations were made at three of these colonial spawning sites (designated Sites A, B, and C), where substrates were previously dominated by *S. fasciolatus*.

This study includes two parts. In part one the behavior of *S. fasciolatus* towards adjacent *A. vaigiensis* and their nests was observed at Site A on May 2, at Site C on May 8, and at Site B on May 16. A total of twelve 20 minute observations were made. All were conducted in the afternoon of either the second or the third day after spawning. During the observation period a distance of three meters from the nests was maintained by the observer. In part two the number of egg predators appearing in each *A. vaigiensis* nest was counted on the afternoon of May 11 at site A, where 24 *A. vaigiensis* nests were built on a reef area already occupied by 27 territorial *S. fasciolatus*. Removal of some of the original territory holders was done on the same day after completion of counting. Countings were conducted again at the same site on May 12-14. Hatching occurred on May 15. Nest-guarding *A. vaigiensis* frequently formed small groups which at intervals left the nesting site for the reef channel approximately 20

Materials and Methods—This study was carried out in the subtidal waters at Kuei-hoe Village on the northern coast of Taiwan (121°41'E, 25°12'N) in the summer of 1986. The study site was located approximately 50 meters from the break-water of the fishing port in the village; it was described in greater detail in Jan and Ormond (1992a,b). Relationships between two damselfishes, namely, *Stegastes fasciolatus* and