

Territorial Nature of Sicydium punctatum
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Territorial Nature of *Sicydium punctatum*

Abstract:

The purpose of this report was the study of *Sicydium punctatum* on Dominica, West Indies, investigating whether or not they exhibit territoriality. Two sample populations were studied, one at Emerald Pool and the other in the Check Hall River. General observations were taken during fifteen minute time periods. These observations measured size of territory (in meters) and the relationship between various morphs. The observations demonstrated that *Sicydium punctatum* does exhibit a territorial nature.

Introduction:

The Gobidae family is composed of both marine and freshwater species. The *Sicydium punctatum* is a diadromous species that inhabits the freshwater rivers and pools of Dominica. When mating season arrives the adult gobies migrate downstream to spawn. The fertilized eggs drift out to sea with the currents where they develop from a larval stage into adults. Once in the adult stage they migrate upstream (Figure 1, Murdy & Hoese, 2004) (Figure 1). Gobies have been known to travel far upstream, even climbing waterfalls. These young gobies later develop into iridescent gobies (Evans Peter G.H. and James A., 1997). The species *Sicydium punctatum* has been collected from the Check Hall River and the Springfield Estate.

The purpose of this project was to determine if *Sicydium punctatum* exhibited any territorial characteristics. This study focused on two populations located in the Check

Hall River and at Emerald Pool. The gobies were observed watching for a display of a territorial nature.

Materials and Methods:

- PVC Snorkel
- Butterfly Net
- Aquarium Net
- Collection Bottles
- Homemade net with four strings attached to the corners
- Goggles
- Large Bait Seine
- Small Seine
- 50 meter measuring tape
- Underwater Camera

The first data were collected from the Check Hall River. The Check Hall River is a tropical river that flows west through the steep slopes of the island. The river begins in the mountains east of the Springfield Estate flowing to the Caribbean Sea north of Roseau; just a five minute walk from Canefield Airport (Mejia, 1995). Four sample pools were selected on the Check Hall River for observation. The second site was Emerald Pool. Emerald pool is located in the Morne Trois Pitons National Park. The pool is fed by a 25-foot waterfall that creates the pool.

In order to study territoriality, groups of gobies were observed for a period of fifteen-minutes. This observation was conducted using goggles and a makeshift snorkel. Once the time had expired an attempt to catch the goby was made and then the area guarded was measured using a meter tape.

Several methods were employed to attempt to catch gobies.

- 1) Using an aquarium net
- 2) Trying to herd them into the butterfly net
- 3) Trying to herd them over the net with four strings and then lift them up
- 4) Seining in the Check Hall River

Results:

Emerald Pool: On 6-11-04 from 9:30 to 9:45 AM a blue morph was observed on the right edge of Emerald Pool. The blue morph patrolled an area approximately 1 meter by 1.5 meters. Three times during this period the blue morph chased away a smaller blue morph. This process was repeated until the smaller morph left the area. At one point during this time period the goby left the area and returned a minute later. The same spot was observed from 10:00 – 10:15 am. The same blue morph was observed chasing away smaller gobies. Several pictures of both goby morphs were taken with an underwater camera. (Figure 2 & 3)

Check Hall River

Pool 1: On 6-13-04 from 1:30 – 1:45 PM a blue morph was observed. During this time period this blue morph chased away both brown and blue morphs a total of ten times from a .5 meter by .5 meters area.

Pool 2: On 6-13-04 from 1:50 – 2:05 PM a blue morph was observed. This gobie did not move much, however it did chase away a brown morph. Subsequently the territory was not measured due to the gobies stationary position.

Pool 3: On 6-13-04 from 2:10 – 2:25 PM a blue morph was observed. It chased away both color morphs. This gobie patrolled an area .5 meter by .5 meters.

Pool 4: On 6-13-04 from 2:45 – 3:00 PM a brown morph was observed The gobie continuously chased away other gobies. It chased away both color morphs The area guarded was .25 meter by .25 meters.

All attempts to capture a live specimen failed.

Another observation from the Check Hall River was related to location of gobies. On three separate occasions gobies were spotted on the same rock 6-6, 6-8, 6-13

Discussion:

The observations from these five pools present a strong case for territoriality of Sicydium punctatum. In each of the cases the gobies chased others out of a defined area. The area defended by may be based on environment. This is shown by the large territory of the gobies in the Emerald pool in comparison to the territory of gobies located in the Check Hall River. However, the size of the territory in Emerald pool is based on a single observation. This characteristic is most likely associated with the amount territory distributed between the gobies in a pool. The pools studied in the Check Hall River had a smaller area of habitable water thus the gobies were not able to protect as large an area. On several occasions gobies returned to the same area after disturbance, indicating that they protect a distinctive area of the pool.

The difficulty of catching gobies was caused by a combination of factors. The general nature of Sicydium punctatum is they are bottom feeders. This fact, combined with the cobbled nature of the bottom, allows the gobies to escape from underneath nets. Several attempts were made using a seine in the Check Hall River. The gobies escaped by hiding in the rocks or swimming past the seine. The attempts with the aquarium net failed because the gobies were always able to swim underneath or around the nets. Finally attempts to herd the gobies were thwarted by their ability to escape under the rocks. Another factor that limited my ability to catch live gobies was little or no help from others. One idea was to use a baited trap, though enough time was not available to test this method.

Conclusion:

Sicydium punctatum appears to exhibit a territorial nature. The area defend by gobies is not uniform but varies based on habitat. Based on limited observations it was shown that the gobies in Emerald Pool protect a larger area than the gobies from the Check Hall River. Future studies could demonstrate a correlation between larger habitat and gobie territory size. Another interesting facet that may affect the territory of a gobie may be related to the size of the gobie. Larger gobies would most likely protect a larger area in comparison to smaller gobies. Further studies could investigate for what reason the gobies exhibit this nature. It would be interesting to study if territoriality is associated with mating or foraging.

Literature Cited

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(Figure 2, Blue Morph of gobie Sicydium punctatum photographed 6-11-04)

(Figure 3, Brown Morph of gobie Sicydium punctatum photographed 6-11-04)

