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Assessment of nesting green turtle (*Chelonia mydas*) remigration intervals in Playa Cabuyal, Costa Rica

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Introduction

- Remigration intervals between nesting seasons in sea turtles can vary depending on the species, population, quality of forage, and individual fecundity, among other conditions [1].
- These intervals assist with the estimation of population size, but due to the variability between and within nesting aggregations, they must be observed for each location [1].
- In Playa Cabuyal, Costa Rica, monitoring and registration of nesting sea turtles began in the second half of the 2009-2010 season. Green turtles are the primary species observed at this beach [2].
- Globally, green turtles have one of the widest variations in remigration intervals, possibly due to their herbivorous diet and the variation in dominant primary production between foraging areas [3].
- In an effort to better understand the nesting green turtles of Playa Cabuyal, we want to uncover the variation in remigration intervals for individuals using this beach. Additionally, we will look for relationships between remigration intervals and the factors that could potentially impact the duration.

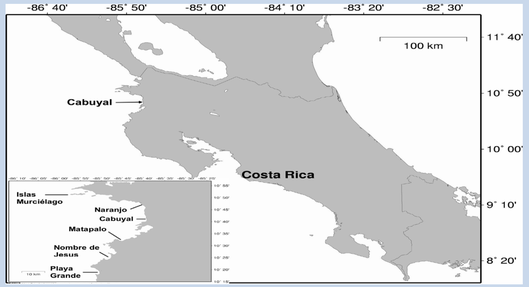

Figure 1. Map of Playa Cabuyal and neighboring beaches on the Pacific coast of Costa Rica.

Methods

- A metal and PIT tag are applied for all observed nesting green turtles. Curved carapace length (CCL), curved carapace width (CCW) and eggs per clutch are all recorded for nesting green turtles, when possible.
- 230 individuals have been tagged in Playa Cabuyal throughout the last 4.5 seasons, and 45 (19.13%) remigrants have been observed. Only 214 green turtles were used in this study because of insufficient data for the remaining individuals.
- We tested for relationships between multiple variables involving remigration intervals, such as body size and clutch frequency. The clutch frequencies were estimated (ECF) by dividing the number of days between the first and last observed nests by the observed internesting period [2].

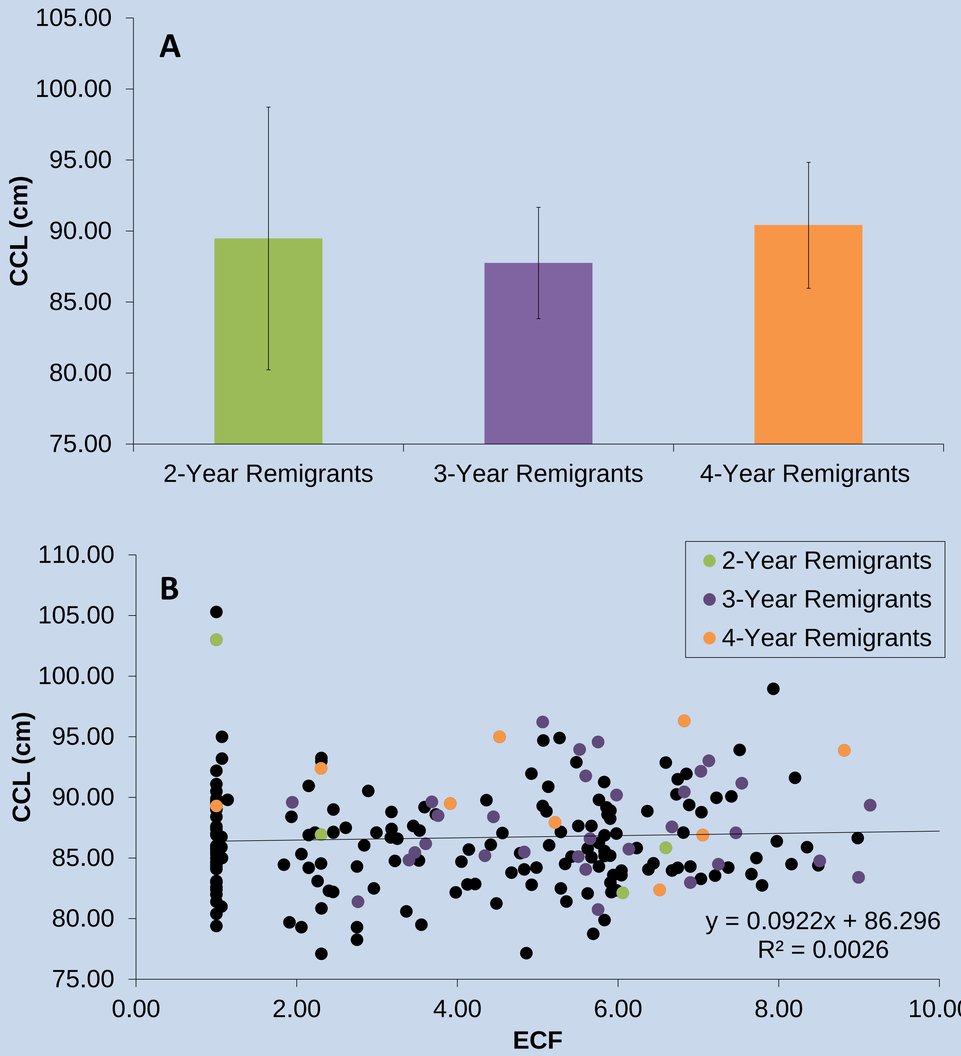

Figure 2. Relationships between body size and reproductive variables in nesting green turtles of Playa Cabuyal, Costa Rica, with the remigration intervals of the individuals represented by color. Relationships were measured by comparing (A) CCL vs. remigration interval, (B) CCL vs. ECF

Results

- The average remigration interval of nesting green turtles at Playa Cabuyal is 3.11 years with a range of two (n=4), three (n=32), and four years (n=9). Individuals with a remigration interval of two years have only been observed returning in the 2014-15 season.
- There is no significant difference between the body size of nesting green turtles in relation to their remigration interval, as seen in Figure 2A.
- No correlation was seen in between the average CCL of a turtle, and the ECF (Figure 2B). In addition, the remigration intervals of the turtles did not share a relationship with the ECF

Discussion

- The remigration intervals ranging 2-4 years in Playa Cabuyal mirror pacific green turtles nesting on the Mexican coast, while extending longer than the average interval seen on the Caribbean coast of Costa Rica [1,4]. The difference in resource availability is a potential cause of this variation [1]. It is possible Playa Cabuyal hosts turtles with longer periods between remigration, but this study is limited to the current duration of the monitoring project.
- Past evidence suggests that larger females would maintain similar, or shorter remigration intervals to their smaller counterparts [5,6]. While no significant difference in CCL was observed in this study, the slight variation in size between the individuals with 3-year and 4-year remigration could indicate the opposite.
- Remigration intervals do not appear to have an impact on the ECF of green turtles during their reproductive season, which likely means some other factor is influencing the frequency at which these turtles nest each season [1].

Acknowledgements

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