

DOES CARAPACE SIZE EFFECT CLUTCH SIZE? COMPARISON OF BIOMETRIC AND CLUTCH DATA OF OLIVE RIDLEY IN THE SOUTHERN NICOYA PENINSULA OF COSTA RICA

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Abstract

According to the IUCN's Red List of Threatened Species, the Olive Ridley (*Lepidochelys olivacea*) is Vulnerable, and its population steadily declines. This species has been one of the most studied sea turtles due to its two types of nesting behaviors: solitary and arribada (synchronized mass nesting events). Although there are many studies regarding Olive Ridley morphometry, as well as all the features of the respective nest, they typically illustrate a large variety of sizes and forms. The sizes of solitary nesters and their clutches could be different globally, and due to their possible effect on hatching success, further research is necessary. This is the case for the recurring solitary nesting behaviors in the Southern Nicoya Peninsula of Costa Rica. The Rescue Center for Endangered Marine Species (CREMA) is a Costa Rican NGO that monitors three solitary sea turtle nesting beaches in this area, which provides a significant opportunity to collect quantitative data for the Olive Ridley. The aim of this study is to describe the carapace size and clutch size of Olive Ridleys in the Southern Nicoya Peninsula of Costa Rica and determine if there is a relationship between them. In this study we analyzed and compared the data collected during the 2019 nesting season for three consecutive beaches: Costa de Oro, San Miguel and Bejuco. Until 30 December 2019, a total of 288 nesting Olive Ridley females and clutches were encountered and measured. For each of these three nesting beaches, whenever a turtle was located, eggs were counted twice with a mechanical counter during nesting and relocation. Curved Carapace Length (CCL) measurements were taken using a flexible measuring tape. Each CCL measurement was taken three times and then averaged to ensure accuracy. The overall average CCL (n=288) was 64.6 - ± 3.4cm and the average clutch size (n=288) was 93 ± 19.6. An ANOVA test was conducted, for CCL (p=0.94 and f-ratio=0.06) and for clutch (p=0.41 and f-ratio=0.89), both showing no significant differences between projects. The comparisons from each project show an

upward trend in increasing carapace length and corresponding clutch, but without significant differences amongst them. Referring to the Manual for the Conservation of Marine Turtles in Costa Rica, with emphasis on the operation of projects in beach hatcheries, the Olive Ridley average CCL is 66cm and average clutch size is 110. Overall the results show slightly smaller turtles and clutch sizes in this region, but similar patterns with the nesting populations in the Eastern Pacific. The weak correlation between the two factors could be due to the small sample size, further research should be carried out in the future using data from past and future seasons. This preliminary study is the first assessment conducted in this specific area using data from three nesting beaches, representing an important description for the Olive Ridley population in the Southern Nicoya Peninsula. In turn, this supports the existing information about the nesting populations of the Eastern Pacific Ocean.

Keywords: Eastern Pacific Ocean, Lepidochelys olivacea, hatchery, conservation, solitary nesting