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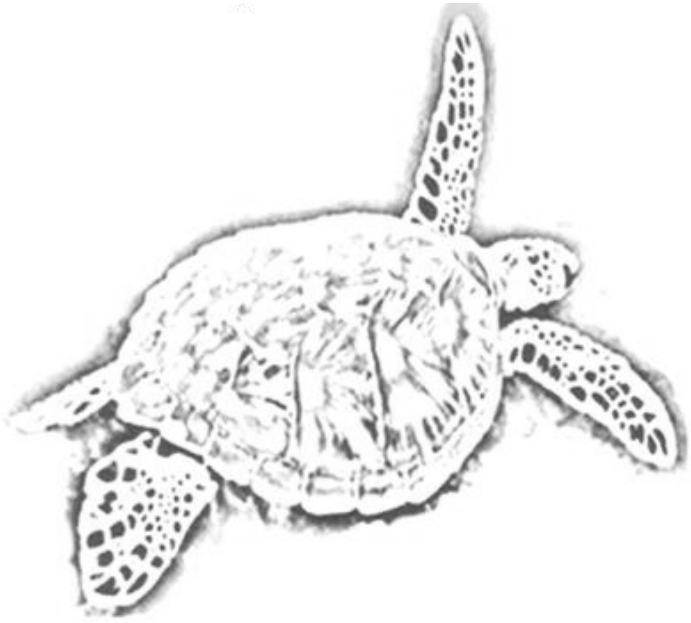

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CLUTCH SIZE AND HATCHING SUCCESS OF GREEN TURTLE NESTS IN SYRIA DURING 2004

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INTRODUCTION

Marine turtle nesting on Syria's beaches was reported from a spot survey in 1991. Only the 12.5km beach south of Lattakia City (35.440°N 35.895°E) was shown to have nesting at any significant level, with over 20 tracks attributed to loggerheads recorded (Kasparek 1995). A full re-survey of this beach in 2004 confirmed the presence of a small population of nesting loggerhead turtles but also discovered a regionally important nesting population of green turtles (Rees et al. in press). Data presented here are a product of this nesting survey, when nest fates were recorded and post-hatch nest excavations were undertaken in addition to counting adult turtle tracks.

METHODS

The southernmost 7.5km of Lattakia beach was surveyed daily for marine turtle nesting or hatching activity and evidence of nest predation was recorded from June 30 to August 27, 2004 (excluding July 1, 7 & 31 and August 1), the adjoining 5km beach to the north was surveyed weekly, a total of 10 times, as a continuation of the daily survey.

Freshly made nests were marked with labelled sticks and stones to confirm the identity of nests observed through hatching or predation. Nests discovered for the first time through hatching or predation, were labelled in a similar manner.

Nest excavations were undertaken on the morning of the second day after hatching on the daily monitored beach and upon observation of hatching on the weekly monitored stretch of beach. Nests that had been depredated, determined by evidence of digging at the nest site with scattered egg fragments on the beach, were not excavated and do not contribute to the clutch size or hatching success data.

Clutch size was calculated by averaging the number of eggs counted per nest from post-hatch nest excavation. This value was supplemented with egg counts made from relocated nests that needed to be moved as they were situated too near to the sea and would be destroyed during periods of high waves. Yolkless eggs were omitted from egg counts and multi yolked eggs treated as single eggs as per Miller (1999).

Hatching success was calculated as the percentage of the total eggs in a clutch which hatched (including eggs that were associated with live or dead pipped hatchlings). Overall hatching success was calculated in two ways: 1) as the mean of the hatching successes from individual nests and 2) by summing together nest contents and treating all excavations as a single nest.

This second method removes the bias created by large or small clutches that have exceptionally low or high hatching success.

RESULTS AND DISCUSSION

Mean clutch size derived from nest excavation was 108 eggs (SD=25.1, 72-164, N=29) however this rose to 112 eggs (SD=26.4, 72-164, N=33) when four egg counts from nest relocation were added. Broderick et al. (2003) found that clutch size for green turtles on Cyprus increased throughout the season. The limited data presented here, support this as the four relocated nests were late season nests and all had clutch size above that of the excavated nests which were early season nests (Fig. 1). In both instances clutch size is within the range of annual variation in mean clutch size found on Cyprus (Broderick and Godley 1996) and Turkey (Yerli and Demirayak 1996).

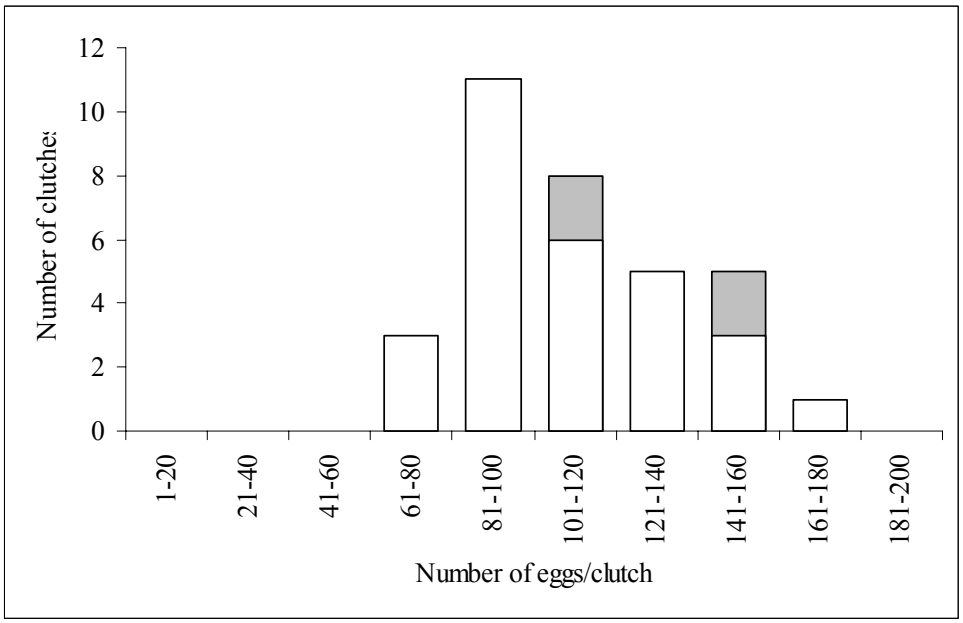

Fig. 1. Clutch size for green turtle nests in Syria, 2004. Shaded area are data derived from nest relocation (N=4), non shaded area are data from post-hatch nest excavation (N=29)

Overall hatching success for undisturbed nests was calculated to be 83.5 and 83.9% (for methods 1 and 2 respectively) which is in the lower range of yearly values for green turtle nests on Cyprus, as presented by Broderick and Godley (1996). This is probably due to a combination of the small sample size of the present dataset with one particular nest that had a hatching success of 40.2% (Fig. 2). Not all hatchlings had emerged from their nests; and on average 3.5% (SD=6.9, 0-37, N=29) of the eggs from each nest produced hatchlings that were present at excavation.

During the survey period 27% of the nests had been depredated by canid predators. This figure was expected to rise during the progress of the hatching season as nest predation normally occurs just before or during the hatching period and the maximum rate for green turtle nest predation was found to be August and September (Kaska 2000).

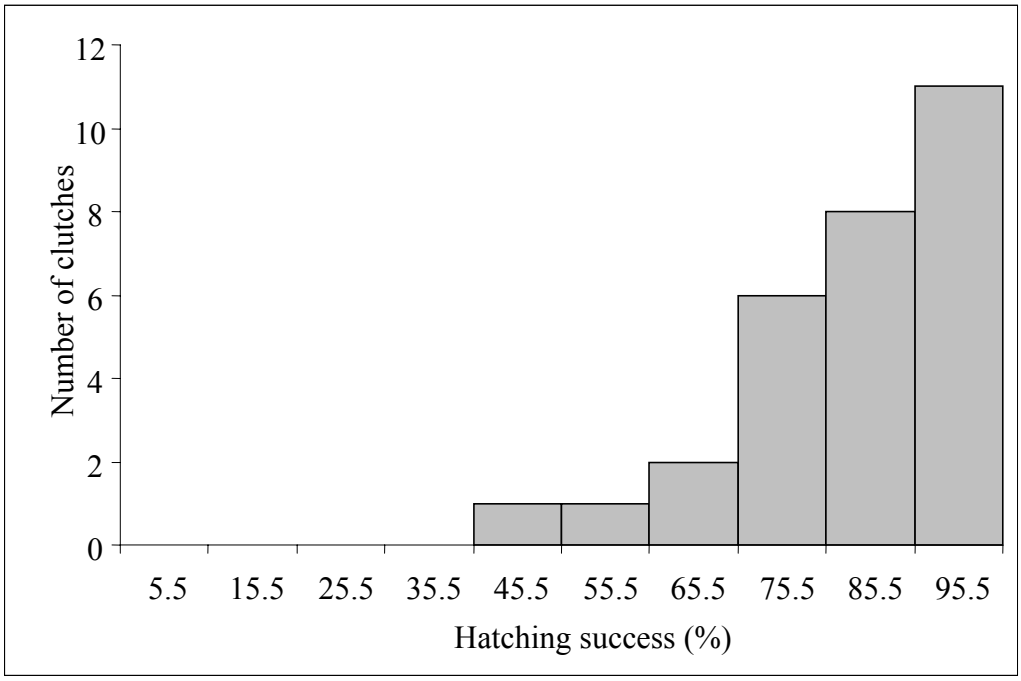

Fig. 2. Hatching success for green turtle nests in Syria, 2004 (N=29)

In addition to nest depredation other un-quantified important factors that affected hatchling survival in Syria were nest inundation by high waves and hatchling misorientation due to artificial lighting behind the nesting beach.

In conclusion, green turtle nests in Syria were found to be similar to those of the rookeries in Cyprus and Turkey with regard to clutch size and hatching success. The number of hatchlings that survive to reach the sea is estimated to be far lower than the 83% of hatched eggs. Hence nest management activities, such as nest screening to deter predators and nest relocation for those nests made at sub-optimal locations, would benefit the population. Increased hatchling production, would be one significant way to improve the survival chances in Syria for this critically endangered species.

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