

WHY ARE EGG FERTILIZATION RATES NOT CORRELATED WITH HATCHING SUCCESS IN SEA TURTLES?

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Abstract

The relative number of developing eggs is directly affected by fertilization rate, and unfertile eggs may indirectly negatively affect development of viable eggs within the nest. Thus, the number of viable eggs at laying should influence hatching success. We have studied both parameters in a nesting population of loggerhead turtles from Boavista Island (Republic of Cabo Verde). Fertility was estimated based on eggs excavated from nests within the first 96 hours after deposition. Our results confirm a high egg fertilization rate for the species, which exceeded an average of 94% fertility (95% confidence limits: 91.9 and 96.2%, N=43 nests). The minimum was 75%, and 100% fertility was observed in 11.5% of the clutches. We did not detect a temporal variation within the season ($F(2,40) = 0.583$, $P = 0.563$) or spatial variation when comparing nests from different beaches ($F(2,40) = 0.532$, $P = 0.592$). Female body size ($r = 0.054$, $P = 0.760$) and clutch size ($r = -0.094$, $P = 0.549$) did not influence our estimation of egg fertilization rate. Mean hatch rate of 50 clutches incubated in a hatchery was 52.37 % and ranged from 0 to 94.57%. When we compared the number of live embryos at deposition with the hatching success (in the 29 clutches where both parameters were measured), we did not detect a significant correlation ($r = 0.097$, $t = 0.504$, $P = 0.618$, $N = 29$). This lack of correlation could be caused by the high fertilization rates and high variability of hatching success. Unfertilized eggs in the nest may experience decomposition and fungus growth but they do not seem to have a negative impact on the development of contiguous viable eggs within the nest.

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