
The effects of plastic pollution on the emergence of the loggerhead turtle hatchlings

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Abstract

Coastal urbanization, pollution and climate change are increasingly affecting marine turtles' nesting habitats. During the incubation and emergence periods on sandy beaches, marine turtles' offspring may face risks of mortality due to saltwater inundation, temperature fluctuations and predation. In addition to these threats, the current global crisis of plastic debris accumulation on beaches may also affect the embryos and hatchlings' survival probability. The evaluation of the impact of plastic pollution on biodiversity is a challenging topic, and no studies have analysed the effect on the turtle nesting environment. To address this knowledge gap, we designed a field experiment in a turtle hatchery of an important nesting beach of the loggerhead turtle (*Caretta caretta*) in Boa Vista Island (Cabo Verde). Our main objective was to analyse whether plastic pollution on turtle nests' surfaces decreases the embryos and hatchlings' survival odds. For that, we applied three treatments with distinct plastic levels on nests' surfaces (18 nests per treatment): control (no plastics), low density (24.5 g of plastics) and high density (49.0 g of plastics). Then, we evaluated the influence of the three treatments in 16 variables related to the incubation period, emergence period, and hatchlings' fitness. Our results suggest that plastic pollution might decrease the emergence success of hatchlings, with nests with high plastic density having a lower probability of successful emergence. Moreover, plastic might also affect the synchronized emergence of hatchlings, with more scattered and smaller groups emerging in nests with higher plastic accumulation, which might increase the predation risk and thus the hatchlings' probability of survival. Considering that turtle nesting habitats are becoming increasingly threatened, this additional threat can bring serious consequences to the species' survival. Future research is necessary to understand the factors that affect the emergence patterns in areas with high plastic pollution.

Keywords: Cabo Verde, *Caretta caretta*, marine debris, nesting environment, sandy beaches, sea turtles

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