PATHOGENIC EFFECT OF MICROORGANISMS ON LOGGERHEAD EGGS*

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Abstract

Different types of fungi and bacteria have been isolated from hatched and non-hatched as well as failed and non-failed eggs in natural sea turtles nests (Marco et al. 2006, Phillott and Parmenter, 2001, Phillott et al. 2001). Microbiota infections are common in artificial incubation activities and they seem to have an important negative impact on embryo development (Phillott, 2002). However, no clear evidences of their pathogenic effects have been described. The aim of this study was to investigate whether fungi and bacteria represent pathogenic agents to sea turtle eggs, and to assess whether there exists a specific period during incubation in which eggs are more susceptible to microorganisms. In 2006 and 2007, we carried out two experiments in Boavista (Cabo Verde) consisting in infecting loggerhead eggs at different embryo development stages with: 1) live non-hatched egg shells that showed fungal spots (caused by Fusarium solani and Fusarium oxysporum), and 2) with hyphae of F. oxysporum and F. solani isolated from live non-hatched loggerhead egg. Our results show that control eggs (non-infected) and eggs infected with Fusarium spp. hyphae had a minor mortality rate than eggs infected only with infected eggs shells or both treatments together (Fisher exact two-tailed, $p< 0.001$). We did not find differences in egg mortality at different incubation stages of infection (Chi-square two-tailed, $p> 0.5$). Newborns from different treatments of infection time or type of infection agent did not show differences in length, weight, or incubation duration and turn over effort proof (Univariate ANOVAs, $p>0.05$). Results suggest that Fusarium oxysporum and F. solani, despite being the most common fungi found in sea turtle eggs, is not the main microbiotic agent of egg death. It seems that sea turtle eggs have no susceptible period during incubation to be infected by microorganisms. Further investigations are necessary to isolate the microorganisms that functioned as pathogens in the experiments. Acknowledgements: We acknowledge all volunteers for their enthusiasm with field work, NGO Cabo Verde Natura 2000 for hosting and project support and Andalusian Environmental Service for funding us. We also thank Project GLOBAL, Disney Animal Kingdom, Western Pacific Regional Fisheries Management Council, U.S. National Marine Fisheries Service, U.S. Fish and Wildlife Service (Marine Turtle Conservation Fund), David and Lucille Packard Foundation, and the Sandler Family Foundation, as well as two generous individuals: Carlos Peralta Quintero and Robert N. Allen, Jr. for their donations in helping us to participate in the 2008 Symposium on Sea Turtle Biology and Conservation in Loreto, Mexico.