VULNERABILITY OF TURTLE EGGS TO THE PRESENCE OF CLAY IN NESTING BEACHES

Adolfo Marco1, Elena Abella\ and Luis F. López-Jurado[2]

1 Estación Biológica de Doñana CSIC, Sevilla, Spain 2 Universidad de Las Palmas, Gran Canaria, Spain

Egg survival can be very low in non-predated nests. Environmental factors such as temperature or hydric potential have been shown to be detrimental to hatching success. In this study we document the negative impact of c1ay in embryonic development. Soil erosion from adjacent areas or the proximity of nesting beaches to silty substrates can cause the exposure of turtle eggs to significant levels of clay in their incubation substrates. In some Cabo Verde nesting beaches, a high variability on the amount of c1ay present on nesting substrates was found. Loggerheads did not avoid silty substrates to dig their nests. Apparently, hatching success in natural nests was highly *affected* by the presence of clay when compare with non-f1ooded nests in sand. A percentage of eggs incubated in silty substrates were partially or totally covered by clay that was firmly adhered to the eggshell. Many nests in silty areas did not hatched and survivors usually hatched extenuated and totally covered by clay that difficult their movement to the water. Traslocated nest with eggs covered by clay suffered a significant mortality compared to nests with clean eggs after incubation under standard conditions in the hatchery.

Experimental incubation of eggs with a variable surface covered by silt (O, 30, 50 and 80 of the shell surface) showed a strong effect of silt on egg water exchange. Silt-covered eggs suffered an acute water loss that in the most extreme cases was irreversible and caused embryo death. Quick dehydration was especially significant for eggs that had covered by silt the lower half of the egg while eggs that had covered by c1ay the upper part where the embryo develop where more tolerant to the silt. The high content of salt in the silt due to evaporation of sea water does not seem to be responsible of egg dehydration. Silt washed with fresh water caused similar egg dehydration than unwashed silt. 75% of eggs covered in the 80% of their surface die while only 25 % of controls die. Eggs profusely covered by clay also hatched an average of three days later than controls. Eggs that were covered only by 30 % of their surface produced slower hatchlings compared to controls. Substrates with more than 0.15 % of c1ay can cause a significant impairment of sea turtle embryonic development reducing hatching success. Physiological reasons to explain the negative impact of clay on eggs remain unknown. Even slightly argillaceous substrates should be actively avoided when selecting sites for nest relocation or creating hatcheries.