



Scientific Papers

AN ALTERNATIVE METHOD TO SAND-PACKED INCUBATION OF SEA TURTLE EGGS

*KIM H. CRITCHLEY, JAMES A. WOOD, FERN E. WOOD**

Herpes Review 14(2) 1983

*Cayman Turtle Farm Ltd, Box 645. Grand Cayman. BWI

Current practice for the artificial incubation of sea turtle eggs, widely used in conservation practices, employs sand-packed styrofoam boxes which can be transported to hatcheries or locations other than the turtles' nesting beach. Temperature and oxygen levels in sand-packed styrofoam boxes have been previously summarized with an expected temperature rise during incubation of up to 5 ° C. depending upon hatchability of the clutch (Wood and Wood, 1979). Oxygen levels in both artificially and naturally incubated nests generally decrease from 21% to 16-12% (Ackerman, 1975). The effect of artificial incubation of eggs, particularly the temperature effects on sex ratio, has been reviewed (Mrosovsky and Yntema, 1980).

At a sea turtle farm in the Cayman Islands, over 40,000 eggs from a captive breeding population of *Chelonia mydas* are artificially incubated annually. Hatchery conditions and incubation techniques have been previously described (Wood and Wood, 1979). Briefly, all eggs are collected as laid, transferred to a hatchery maintained at 27.5 ° C. and incubated in sand-packed styrofoam boxes. The quantity of eggs handled and the desire to maintain a high degree of cleanliness have indicated the need for an alternative to sand for packing the eggs.

During the 1979 season nine clutches were divided and incubated in sand or foam. For foam-packed eggs, a layer of polyethylene foam 3.8cm thick was placed inside the styrofoam box (36 x 21 x 23cm, perforated with an ice pick approximately every four cm). The eggs were layered directly on the foam (28-32 eggs, maximum three layers). another layer of foam was placed snugly over the eggs, and then the perforated lid of the styrofoam box was put on. Each box contained 56-97 eggs. Percentages of undeveloped eggs, developing eggs not hatching, and hatched eggs for sand-packed boxes were 20.2%, 31.3%, and 48.4%, respectively. Percentages for foam-packed boxes were 15.2%, 27.2%, and 57.7%, respectively. Following this trial, the remaining 4,400 eggs collected in 1979 were incubated in foam-packed boxes with a resulting hatch of 29.8% compared to 26.2% for the other 42,000 eggs packed in sand during the season. Temperature levels in the foam-packed boxes were similar to those in sand-packed boxes. Oxygen levels tended to decrease less in foam-packed boxes than in the sand-packed boxes. In sand-packed boxes, oxygen levels decrease from 21% to as low as 14%, in foam-packed boxes, the minimum level recorded was 17%. Oxygen levels in the nests begin to decrease and temperature levels begin to increase on approximately day 30 of incubation. Both oxygen and temperature levels are dependent upon the number of developing eggs in the nests. The sex ratio of 800 hatchlings which died during a period of 12 months after hatching was 1.0 (3 females/males).

Foam-packed boxes are currently used for the incubation of all eggs collected at Cayman Turtle Farm's breeding facilities. The ease with which foam can be handled as compared to sand simplifies the large scale handling of sea turtle eggs with no apparent adverse effects when incubated at an ambient temperature of 27.5 ° C

LITERATURE CITED

- Ackerman, R A 1975 Diffusion and the gas exchange of sea turtle eggs. Ph D. Dissertation. University of Florida 124 pp.
- Mrosnvsy, N. and C. L Ynlema. 1980. Temperature dependence of sexual differentiation in sea turtles implications for conservation practices Biol Conservation 18~271-280
- Wood, J R and F. E. Wood. 1979. Artificial incubation of green sea turtle eggs (*Chelonia mydas*). Proc. World Maricul. Soc.10:215-221