

Pre-Hatching Mortality in Gharials (*Gavialis gangeticus*)

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Abstract

The objective of this study was to identify and understand the causes of pre hatching mortality in gharials (*Gavialis gangeticus*) in order to take steps to prevent it during subsequent egg collection. Total 200 eggs belonging to 8 nests were harvested and brought at the Gharial Rearing Centre and incubated. Out of 200 eggs 188 eggs hatched with a 94 % hatching success rate. Twelve eggs which failed to hatch were either damaged during transportation, infertile or underwent partial embryogenesis only.

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1. Introduction

Gharial (*Gavialis gangeticus*), is a prominent critically endangered species of the Gangetic and Mahanadi river systems, belonging to Schedule I of the Indian Wildlife Protection Act, 1972 (IUCN, 2007). To conserve this species a captive breeding and restocking programme was initiated in India (Bustard and Maharana, 1983) during 1975, along with other conservation measures. As a part of this programme, captive-reared crocodiles were reintroduced into newly created protected wetland areas to augment the wild populations. During the current study the causes of pre hatching mortality were investigated to prevent loss of individuals during subsequent egg collection.

2. Material and Methods

Nesting sites were identified along with the field staff of the Madhya Pradesh Forest Department during their annual surveys at National Chambal Sanctuary, Morena (NCS) for population estimation of gharial and other aquatic fauna. For the current study the nesting site at Baroli, NCS was visited during the nesting season and suspected nest locations were probed with a metal probe along with the field staff. As a part of the conservation and restocking programme of Madhya Pradesh Forest Department, 8 nests were harvested along with the field staff of NCS without disturbing their natural orientation. The eggs from each nest were then moved to incubation tanks at the Gharial Rearing Centre (GRC), NCS, Morena and incubated until they hatched. Number of unfertile eggs, eggs showing early

embryonic death, percent of hatching, Pre-hatching were recorded for all the harvested eggs at the GRC the study period.

3. Results

Total 200 eggs belonging to 8 nests were harvested and brought at the Gharial Rearing Centre and incubated. Out of 200 eggs 188 eggs hatched with a 94 % hatching success rate. Twelve eggs which failed to hatch were either damaged during transportation, infertile or underwent partial embryogenesis only. When these eggs didn't hatch after normal incubation period, the eggs were opened up to examine their contents. When the eggs were opened it was observed that out of twelve, in eight eggs the embryo was fully formed, inactive entangled in a network of blood vessels and was present directly under the yolk. The other four eggs had putrid contents with embryonic remnants.

4. Discussion

The hatching percentage reported in the current study was higher as compared to that reported in earlier on gharials by Chowdhary *et al.* (1983). The causes of early embryonic deaths in crocodilian eggs were found to be linked to, and probably caused by, low shell porosity, thought to interfere with gas exchange and inadvertent turning of banded eggs during collection or inspection, dislodging the embryo from its attachment to the shell and letting it sink into the yolk sac (Wink *et al.*, 1990; Blake, 1992 and Huchzermeyer, 2003) as in other species of crocodilians. Chowdhary *et al.* (1983)

also stressed the importance of maintenance the egg position as it may cause the yolk to lie on top of the embryo leading to its death. Similar situation was observed in the eggs showing embryonic mortality during the study period. Presence of putrid contents was suggestive of contamination penetrating into the egg and dissolving the dead embryo altogether (Huchzermeyer, 2003). The embryonic death may have also resulted due to dislodging of the embryo because of mechanical shocks to the eggs while being transported through rough roads in a later stage of ovipositioning (Chowdhury et al., 1983).

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5. Conclusion

Early embryonic mortality can be caused due to a variety of reasons but it can be reduced by proper positioning of the eggs to prevent dislodging of the embryo especially during transportation.

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