



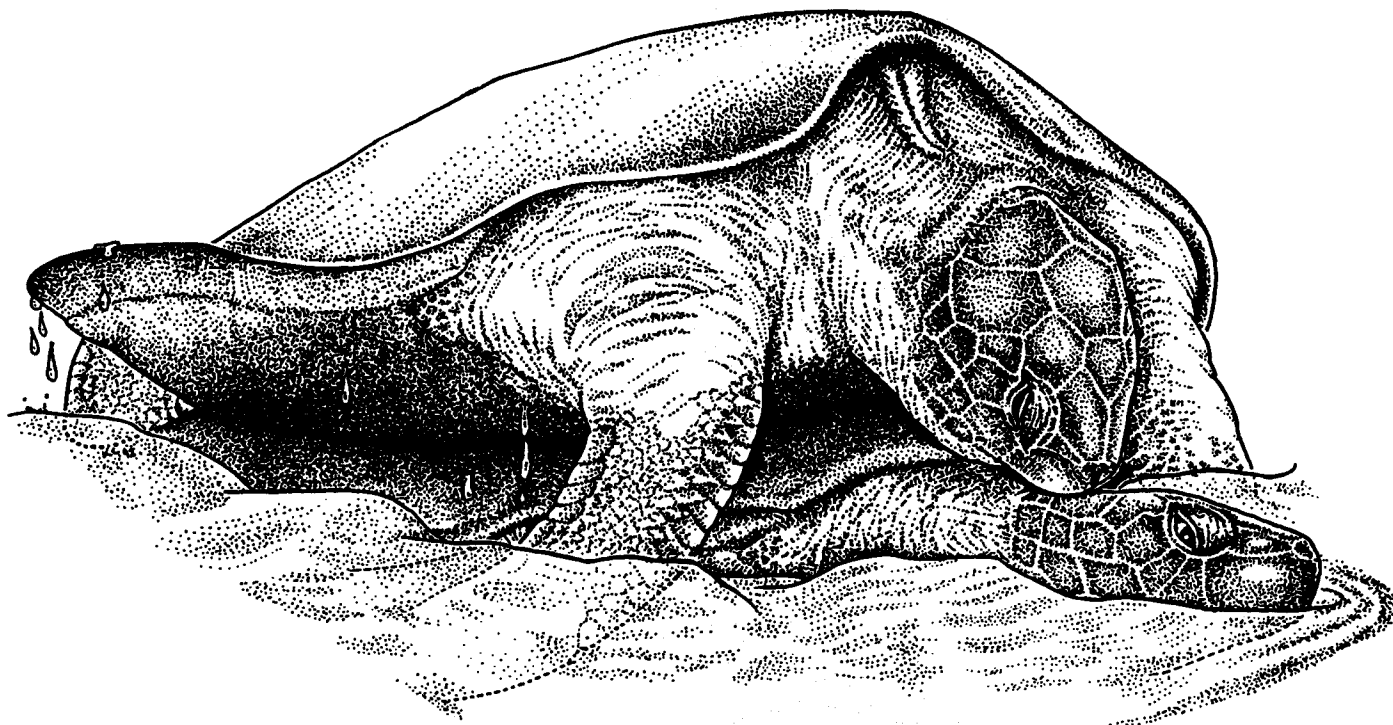
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HATCHING SUCCESS OF LEATHERBACK TURTLES (*Dermochelys coriacea*) IN THE LEATHERBACKS OF GUANACASTE MARINE NATIONAL PARK, COSTA RICA

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INTRODUCTION

In Costa Rica, important leatherback beaches have been documented on the North Pacific coast, such as Langosta, Grande, and Naranjo (Chaves et al., 1990). In spite of the fact that the colony that nests at Langosta and Grande is considered one of the most important of the world (Pritchard and Koberg, 1992), only recently have any protection measures or research efforts been directed toward the conservation of this nesting habitat.

This document presents the results of a hatching success study carried out from January to April, 1991, at The Leatherbacks of Guanacaste Marine National Park, Playa Grande, Santa Cruz, Guanacaste, in an effort to determine some of the basic parameters of this important population, such as hatching success, fate of eggs, and survival of nests.

MATERIALS AND METHODS

A total 72 nests were marked from January 8-31, 1992. The exact location of each nest was marked *in situ* with a 1.75 m stake which was driven into the sand at least 1.50 m and placed exactly 1.75 m due north.

For the following two months the destiny of the tagged nests was followed, recording nests lost to erosion, predation, and human factors. After 70 days the nests were dug up to study the fate of the eggs.

RESULTS AND DISCUSSION

Of the 72 nests marked, only the destinies of 39 are known. Table 1 presents the fate of the known destiny nests, of which 4 (10%) were poached, 2 (5%) were destroyed by turtles, 1 (2%) was lost to erosion, and 32 (82%) survived to the estimated hatching date.

Figure 1 presents the total amount of eggs analyzed ($n = 1912$) in the surviving 32 nests. The average hatching success was 31.4%. 15.4% of the eggs showed no embryonic development (fertility rate = 84.6%). In 6.4% of the eggs, embryonic development was obvious yet impossible to determine due to advanced decomposition. In 0.5% of the cases very small embryos were detected (< 3 cm). Advanced embryos accounted for the highest numbers (46.6%).

As observed in Figure 2, infection by fly larvae is low in eggs with no apparent development (1.1%), as well as in the unknown development category (0.1%). Nonetheless, 29.8% of the eggs corresponded to advanced embryos with larvae infections, against 16.6% advanced embryos with no larvae infections.

As may be observed in Figure 3, 91% of the hatchlings were able to emerge from the nest, while 9% were found dead or as stragglers, with very scarce chances of emergence.

Table 2 compares our results with other studies. Our 31.4% hatching success is low if compared with Hirth and Ogren, 1987 (70.2%), Guadamuz, 1990 (60.8%), and Basford et. al, 1990 (70.5%). Nonetheless, the fertility rate is high (84.6%), comparable with Hirth and Ogren, 1987 (80.3%). Embryonic mortality is high (53.5%), when compared with Guadamuz (1990) and Hirth and Ogren (1987) with 4% and 10.1% respectively. Our percentage of dead and straggled turtles (9%) compares with Hirth and Ogren's (8.6%), contrasting with Guadamuz's (43%).

In summary, we conclude that even though the fertility rate is normal in Playa Grande, high embryonic death occurs, specially during the most developed stages. Although infection of eggs by fly larvae is high, the exact cause of embryonic death is unknown. For a future study we recommend that other parameters be studied, such as nest temperature, oxygen consumption, and soil humidity.

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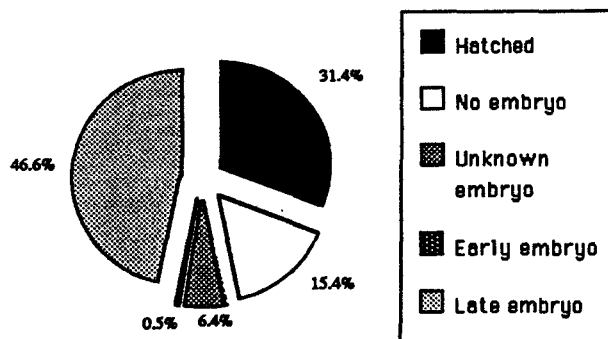


FIG. 1 Destiny of analysed eggs (n=1912) in 32 leatherback nests (*Dermochelys coriacea*). Playa Grande, Santa Cruz, Guanacaste 1992

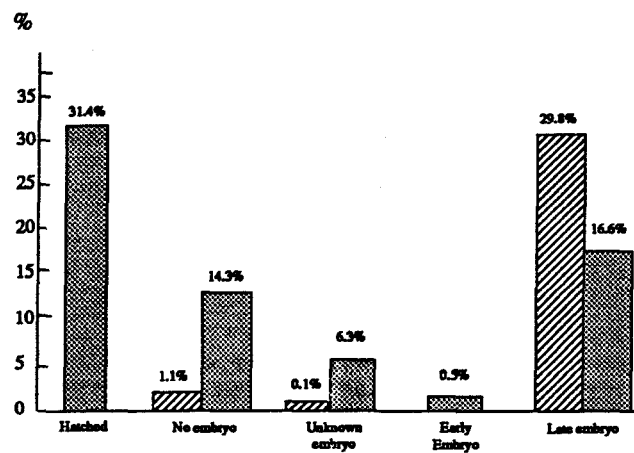


Fig. 2 Percentage of eggs infected by fly larvae by class. Playa Grande, Santa Cruz, Guanacaste

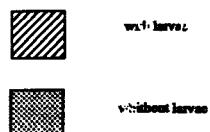


Table 1
Destiny of tagged leatherback nests (*Dermochelys coriacea*)
Playa Grande, Santa Cruz, Guanacaste 1992

Total tagged nests	Known Destiny	Poached	Destroyed by turtles	Eroded	Hatched
72	39	4 (10%)	2 (5%)	1 (2%)	32 (82%)

Table 2
Related Studies

Locality	# nests	Hatching success %	Fertility %	Embryonic mortality %	Dead and straggled hatchlings %	% poached	% eroded
Playa Grande, C.R. (Guadamuz, 1990)	10	60.8	-	4	43	42	-
Playa Grande, C.R. (Arauz y Naranjo, 1992)	32	31.4	84.6	53.5	9	10	2.6
Jalova, C.R. (Hirth & Ogra, 1987)	24	70.2	80.3	10.1	8.6	-	-
St. Croix, Islas Virgenes (Barford et al, 1990)	78	70.5	-	-	-	0	-

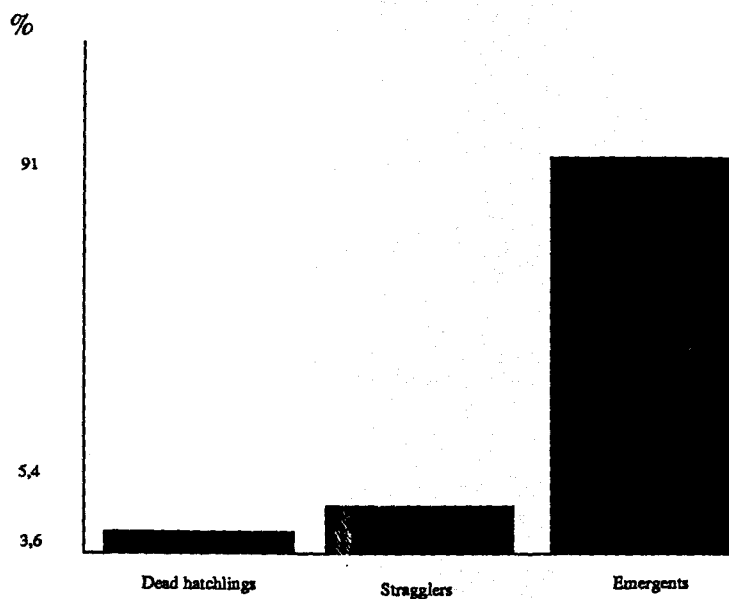


Fig. 3 Destiny of hatchlings to emergence.
Playa Grande, Santa Cruz, Guanacaste 1992