

## SOME HEALTH PROBLEMS OBSERVED IN THE HATCHLINGS AND JUVENILES OF SEA TURTLES IN CAPTIVITY

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### ABSTRACT

Some health problems of turtles encountered while rearing them (*Lepidochelys olivacea* and *Eretmochelys imbricata*) in captivity are recorded here. Most of the problems occurred in the group rearing of the hatchlings and were connected with water quality, availability of food, feed quality and stocking density. Successful treatment for some of the infections are also discussed.

### INTRODUCTION

A few of the olive ridley and hawksbill turtle hatchlings from Kovalam turtle hatchery and Tuticorin hatchery of the Central Marine Fisheries Research Institute were retained in order to study their behaviour in captivity as well as aspects of biology including food preference and growth. In the course of first hand observations on individual as well as group rearings a number of health problems were seen associated with the quality of water, degree of food intake, feed quality and stocking density. Although the field laboratories did not have adequate facilities for pathobiological investigations it was felt that a record of the finding would be an useful guide for the future. This account thus embodies only preliminary observations on the health problems in the olive ridley and hawksbill turtle hatchlings and juveniles in captivity.

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### OBSERVATIONS ON OLIVE RIDLEY

#### *Lepidochelys olivacea*

#### *Individual rearing*

No serious pathological conditions were encountered when the turtle hatchlings were reared individually and fed *ad libitum* on clam meat and good water quality was maintained. However, occasional mortality occurred due to the following problems: 1. Some hatchlings were choked to death when they tried to swallow large pieces of clam meat. 2. Post mortem examination of some dead hatchlings, which were found floating in water, showed full distention of the entire alimentary canal which was filled with gas. Lungs were either inflated or shrunken. Whether these changes happened before or after death could not be ascertained.

#### *Group rearing*

Group rearing posed many health problems in hatchlings, juveniles and sub adults of olive ridley. Major problems are listed below:

#### (a) Injury caused by infighting

When food is given *ad libitum* hatchlings were seen to chase and bite those with food in their mouth. When food was available in plenty, the chasing and biting stopped as soon as all the hatchlings were able to get a mouthful. Infighting was severe when food supply was restricted. Bitings caused deep wounds in the neck, flippers and along the margins of the carapace (Plate IA). Often the wounds got aggravated and the wounded hatchlings were unable to move freely. Such hatchlings

were sometimes attacked and completely eaten up by others thereby exhibiting cannibalistic behaviour. In most of the cases the wounds got infected and fungal growth was seen around the wounds and the infection spread to other areas also.

(b) Fungal and bacterial infections.

Three types of fungal and bacterial infections were noticed in the olive ridley hatchlings.

(i) In some hatchlings round or crescent-shaped yellow patches were observed around the neck and at the joints as well as on the flippers (Plate I B, C). These patches later spread to other areas also. Whitaker (1979) reported appearance of yellow patches in olive ridley reared in captivity and suggested that the yellow fungus may possibly be *Mucor* sp. Even though the occurrence of these patches did not prove fatal, the affected hatchlings were attacked by others in group rearing, causing greater injury which finally resulted in their death. When hatchlings with yellow patches were isolated and provided clean water and *ad libitum* food they recorded near normal growth rate and activities. Only in very few cases the infection was seen to spread

(ii) In some hatchlings white patches appeared around the eyes which later spread over the eye and sometimes formed a thin film over it. The infection slowly spread to other parts of the head and sometimes resulted in mortality. Such hatchlings were also attacked by others in the group.

(iii) White patches were observed on the carapace (Plate ID) and on the edge of the carapace and the flippers in some young turtles. These patches did not cause any serious health problem and disappeared later in almost all cases.

(c) Infection of the cloaca

In some hatchlings the cloaca became reddish, swollen and protruded. When isolated and reared separately providing clean water and adequate food these hatchlings were completely cured.

(d) Bulging of the alimentary canal

As reported in individual rearing, in group rearing also some dead hatchlings were found with greatly distended alimentary canal and shrunken lungs.

(e) Growth of algae on the shell

Dense algal growth on the carapace of some of the hatchlings was noticed both in laboratory reared and those reared in the Muttukadu lagoon. Mahmoud

and Klicka (1979) reported that under natural conditions this association appears to cause no harm to the turtle and even becomes beneficial since the algae provide a degree of camouflage. But in the laboratory condition the excessive algal growth may cause damage to the shell and even result in mortality (Mahmoud and Klicka, 1979). At Kovalam no mortality due to excessive algal growth was recorded in the laboratory, probably due to the periodical cleaning of the carapace. However, eight hatchlings reared in a shallow (2' deep) pen in the mariculture farm at Muttukadu died 10 days after introducing them in the pen due to excessive algal growth all over the body which completely hindered their movements.

Treatments

Some of the infected hatchlings such as the ones with cloacal protrusion got cured without any treatment but by segregating them individually and by maintaining good water quality and adequate food. But those with physical injury, which later became infected and those with fungal and bacterial infections had to be treated for complete cure. The treatments were :

1. dip treatment in 10 ppm Malachite green solution, 2. dip treatment in 5 ppm potassium permanganate solution and 3. application of fungicide, Tinaderm (tolnaphthate 1% solution). The first two treatments were found ineffective while the third, application of 'tinaderm', was extremely effective for curing physical injuries and yellow and white fungal patches.

Three experiments were conducted to study the effect of tinaderm treatment, on young infected *L. olivacea*. The hatchlings were reared individually in 10 litre aquaria and fed *ad libitum* on clam (*Meretrix casta*) meat. Measurements were taken initially and the condition of the animals was noted. Treatment was given daily in the morning. The hatchlings were removed from seawater and the affected portions were dried with clean cotton swab. Tinaderm was then applied on the entire affected area. The hatchlings were kept outside water for 1 hour after application of the medicine and then released back in the tank. Controls were maintained without treatment. Water quality was maintained throughout the experimental period, by changing twice a day, which lasted 10 to 14 days. The health conditions of the hatchlings were recorded daily. All the affected hatchlings were completely cured by 10-14 days of treatment while the controls were in the same conditions as at the start of the experiments. The final measurements of the hatchlings indicate atypical cases as given in foot note to Table 1. The paucity of number

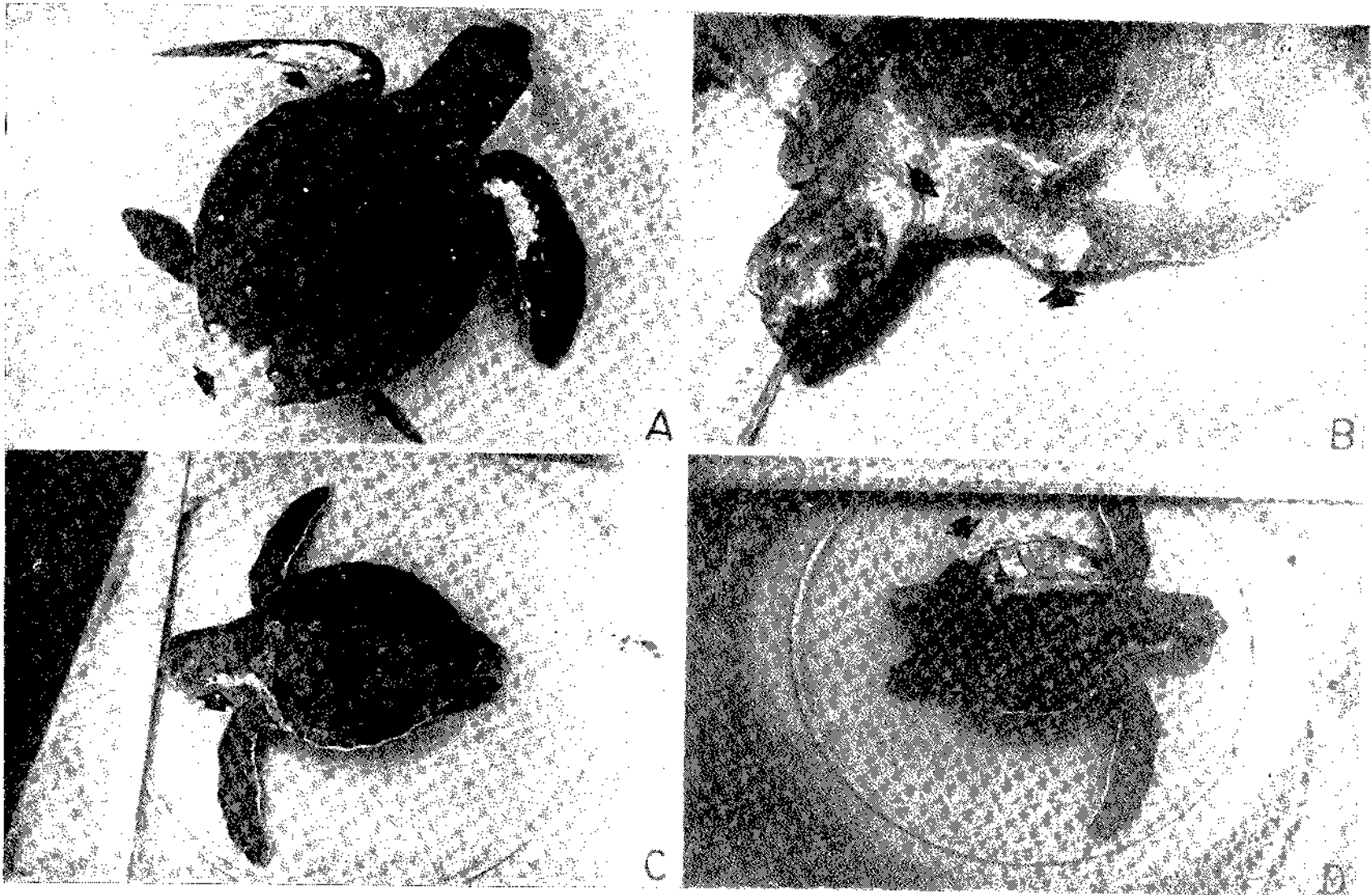


PLATE 1 *Lepidochelys olivacea*: A. Wounds on the flippers and margin of carapace caused by biting of other turtles, B & C. Round or crescent shaped yellow patches around the neck and on the flippers caused by fungal infection and D. White patches observed on the edge of the carapace.

TABLE 1. Growth of treated (with 'Tinaderm') and untreated hatchlings of *L. olivacea* after 14 days, when all the treated ones were cured of wounds and infection (Values in parenthesis indicate mean)

Parameter	Treated animals (N. 7)		Untreated Controls (N. 3)	
	Initial	Final	Initial	Final
Carapace length (mm)	.. 59.2-70.9 (63.5)	68.0-80.5 (72.9)	59.6-64.0 (61.9)	70.0-75.0 (72.0)
Carapace width (mm)	.. 49.5-55.0 (51.3)	61.0-67.5 (64.9)	48.6-52.0 (51.0)	62.5-64.0 (63.5)
Plastron length (mm)	.. 48.2-60.4 (54.3)	61.0-67.0 (63.1)	47.4-56.6 (53.3)	61.0-69.5 (65.8)
Plastron width (mm)	.. 46.2-55.4 (50.9)	56.5-64.5 (60.1)	38.8-52.6 (47.9)	57.7-65.5 (60.8)
Weight (g)	.. 48.0-94.0 (66.4)	67.0-96.0 (80.1)	53.0-71.0 (63.3)	71.0-81.0 (75.7)
Increase in weight (g)	.. ..	2.0-24.5* (13.7)		-4.0-26.0** (12.4)

\* In one hatchling the increase in weight was only 2 g; in all others it ranged from 11.5 to 24.5 g (15.75 g average).

\*\* Reduction in weight (-4 g) was observed in one hatchling while the others increased their weight by 15.0-26.0 g (Average 20.5 g).

of specimens in the sample does not permit us to give any conclusive result in the weight increment of treated and untreated hatchlings. After this trial, all the affected hatchlings were also treated and cured. In all cases the affected skin peeled off leaving no injury.

#### OBSERVATIONS ON HAWKSBILL TURTLE

##### *Eretmochelys imbricata*

During the 1981 season Fernando (1983) reported the hatching of a clutch of hawksbill turtle *Eretmochelys imbricata* collected along the Tirunelvely coast (Manapad). After releasing 32 hatchlings into sea remaining 31 hatchlings were retained at the field laboratory of Tuticorin Research Centre of Central Marine Fisheries Research Institute for rearing and observations and for conducting feeding and growth experiments. 31 hatchlings were group reared at the research centre. The hatchlings started taking food from the third day after emergence.

For the first two months the feed given *ad libitum* consisted of partially cooked and chopped meat of clam (*Donax* sp.), fresh lesser sardines and finely chopped meat of freshly caught prawn *Penaeus indicus*, oyster *Crassostrea madrasensis* and sea weed *Gracilaria* sp. The feed were given separately on a schedule viz., at 9 a.m., 12 p.m. and 5 p.m. After each feeding operation the water was completely changed. Upto this point of

time the hatchlings did not show any health problems. However, after two months the hatchlings were fed with minced meat of lesser sardines (*Sardinella albella*) and bye catch from trawlers (*Scolopsis* sp.). With this change to complete fish diet it was seen that the hatchlings developed symptoms of pathological conditions which are detailed below.

##### (a) Fungal infection

(i) In a few hatchlings fungal growth appeared as a yellow patch on the neck and gradually grew thicker forming practically a very thick rubbery covering around the entire neck region. Some of the affected hatchlings were segregated from the group and reared individually in plastic troughs of 10-litre capacity. It was seen that this extraordinary thickening of the neck region did not interfere with feeding and other activities.

(ii) Fungal infection of scutes : White fungal patches appeared on the head and carapace of 3 hatchlings. The affected areas were attacked by the healthy hatchlings which even ate off frontal and parietal scutes on the head.

(iii) Softening of scutes : In six of the hatchlings which had grown to 4 months (20 cm carapace length) the scutes on the head and carapace became soft. Some of the scutes began to peel off. One of the hatchlings thus affected died within a week.

(b) *Infection of the eyes*

A cheese-like cream coloured growth began to appear around the eye in as many as 11 hatchlings. It was seen that the unaffected hatchlings attacked the affected eye of the infected animals resulting in the loss of one eye followed by death of one animal. This ailment also did not interfere with the feeding of the turtles.

(c) *Infection of the cloaca*

In three of the hatchlings the area around the anus and a small portion of the cloaca was exposed.

*Treatment*

In fungal infection affecting the neck it was found that applying common salt and a daily injection of 100 I.U. of water soluble Vitamin A given intramuscularly resulted in the detachment of the fungal affected skin within a week leaving fresh and newly formed neck skin with no scar mark.

In the case of eye infection deficiency of Vitamin A was suspected and so a daily intramuscular injection of 100 I.U. of water soluble Vitamin A per 100 gm of body weight was administered. This was further supplemented by a feed consisting of common starch mixed with shark liver oil in the form of pellets. This

treatment resulted in complete cure. The cheese-like covering over the eye shed off and the closed eye gradually opened and the animal was normal after the 15th day.

In the case of white fungal patches on the scutes the specimens were exposed to direct sunlight in a shallow trough of water for an hour and were also given an intramuscular injection of vitamin A (100 I.U./100 gm body wt) per day. The affected scutes on the head shed off in 4 to 7 days and new scutes were formed very gradually.

In the case of softening of scutes the treatment was an administration of 100 I.U./100 gm of body weight of Macalvit (Vitamin A and D with calcium) manufactured by Sandoz India Ltd. This treatment was found to be very effective. It takes about a month for the turtle to recover. It was felt that the segregation of diseased animal was necessary as it prevents others from nibbling at the wounds or affected parts.

The above mentioned observations on olive ridley and hawksbill turtle are only indicative of the type of problems that may be encountered in captive rearing of hatchlings and early juveniles. Any programme for the development of mariculture of turtles will have to give serious consideration for the pathological aspects.

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