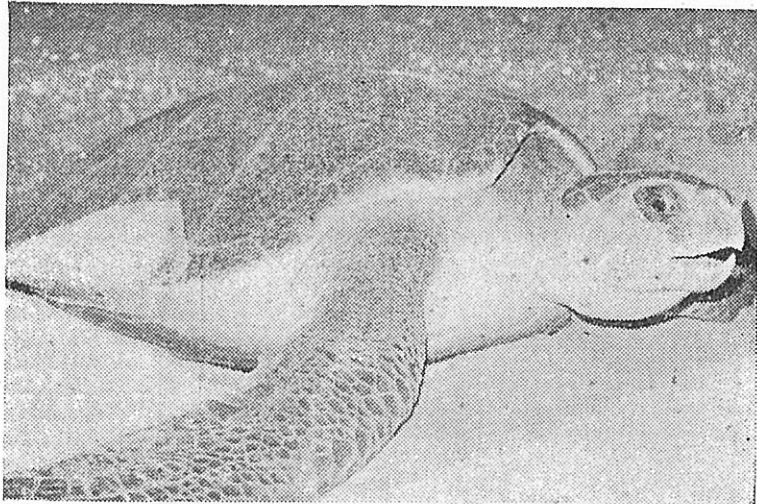


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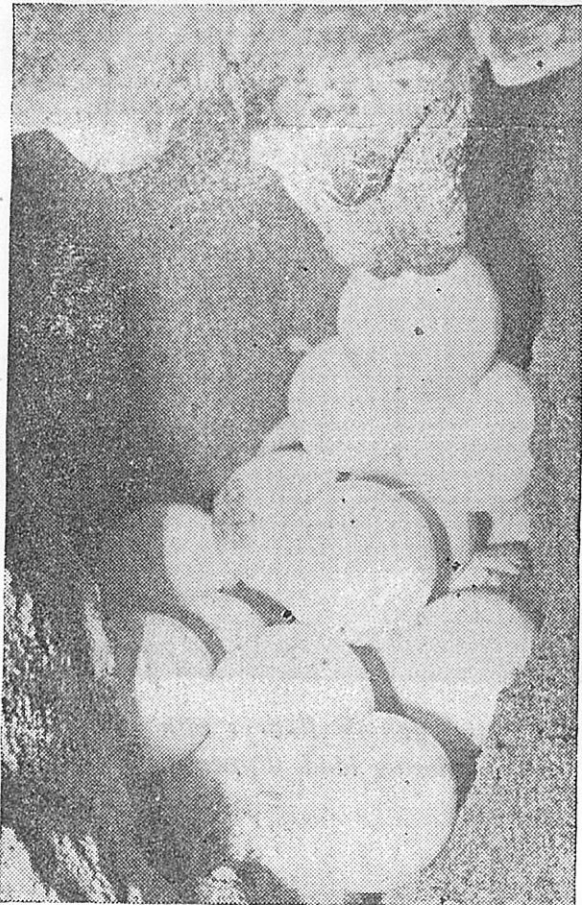
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Nesting female. *Lepidochelys olivacea*

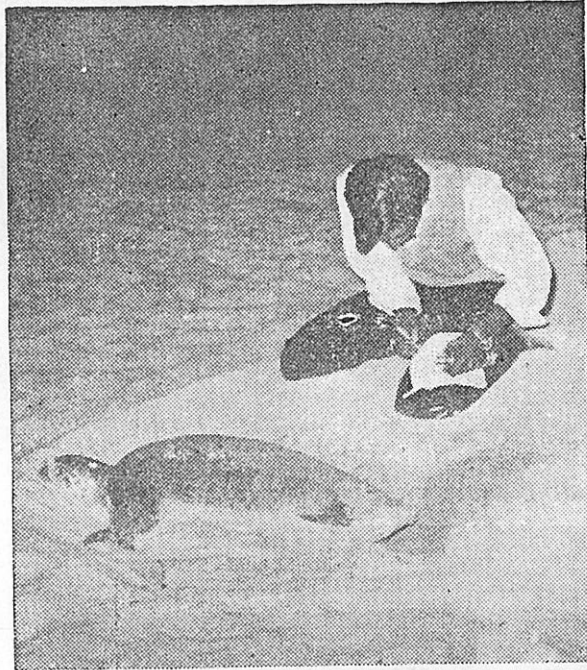


OLIVE RIDLEYS
ON THE
COROMANDEL
COAST

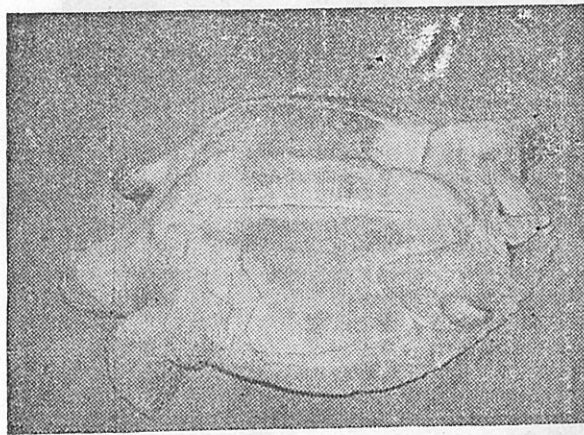
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Eggs falling into nest hole of
Ridleys sea turtle. Note extended cloaca.

MADRAS SNAKE PARK
GUINDY DEER PARK
MADRAS-600022



*Valliappan recording data of a nesting
Ridley's sea turtle*



*Adult female Ridleys with
missing hind flipper*

OLIVE RIDLEYS ON THE COROMANDEL COAST

S. Valliappan and

Romulus Whitaker

November 1: 1974

In winter '73 we did a survey of the Olive Ridleys on a part of the Coromandal coast. The time period was 10.12.'73 to 15.3.'74. The coastline covered extends from Marina-Madras to Kalpakkam, a distance of about 50 kms.

METHODS : Walking the beaches at night and observing Ridleys laying, interviewing fishermen along the way and looking out for the eggs in the market. During the 120 day study period, about 40 walks were carried out on alternate nights in the peak of the season and at intervals of 3-4 days in the beginning and end of the season. We covered 10-15 kms each night of study.

It was hoped that this season's work would provide a basis for further study and conservation efforts. Due to the difficulties we faced because of our newness to the subject we could not organize more details and statistics but we hope to achieve this in future.

FISHERMEN AND THE RIDLEYS : This sea turtle is a god, or "sami" of fishermen on this coast and this is a great advantage for the survival of this species here. Mostly, when caught in a fishing net they are released back into the sea. Fishermen do not eat and usually don't collect, eat or sell the eggs, except in times when fish are hard to come by. Sometimes, when nesting females crawl close to or inside fishermen's huts they are garlanded and a religious ritual is performed.

On three occasions we came by fishermen collecting eggs as their families were hungry at home. Even then they collected just what they needed and not more, and left some eggs in the nest to "keep the race going." They said that white people (velakads) love to eat turtle eggs and went to the beaches to buy them from villagers (castes other than fishermen).

The fishermen in this area seem to know quite a bit about the habits of the Ridleys and said that the nesting season extends from January 14th to March 14th. They said eggs are laid from 1 a.m. to 3 a.m. and get back to sea in about an hour. A few are seen nesting in the bright light of mid-morning. They were not able to differentiate between the 5 species of sea turtles but recognized the Olive Ridleys - *Lepidochelys olivacea* as the common one on this coast. They call it "kadal aamai" (sea turtle).

They also talked about a huge turtle seen 10-15 kms. from shore, which can cause serious damage to a fishing boat when it bangs against it - This is probably the Leatherback, (*Dermochelys coriacea*). They call it the "Boat turtle".

The fishermen also said that the female doesn't come up to lay when seas are very rough and that if they see a white or light coloured object while coming up they go back and come up at another place.

The fishermen are good friends of the Ridleys and could therefore play an important part in a conservation project on this coast.

RIDLEYS AND NON - FISHERMEN : "Kattukarans" (Jungle people) like the Harijans, Villis (Irulas) and Kurvikars, plus villagers living along the coast, collect eggs for personal consumption and sale. The Irulas, who call the Ridleys the "egg giving sea turtle" locate the eggs at the apex of the 'V' marking the coming and going of the female, and collect the eggs equipped with a gunny bag and a sharp wooden stick. They collect and sell them by the thousands. There is a legend about a turtle called "sea goddess" which lays two huge eggs (60 x 30 cm.) which a human can never see.

Beach Walk Observations :

Predators : Every night we found robbed nests, egg shells and dead turtles. On one walk from Pattipalam to Kovalam we found 40 robbed nests, out of which 34 were lost to jackals and dogs and the rest to humans. At times dogs harrass the females too; and sometimes they return to sea without laying. One crawl was found spotted with blood all the way to the sea and foot prints of dogs on the tracks. On another occasion we found 8 dead turtles - 3 males and 5 females - with blood around the mouths. Fishermen said that these had been caught and drowned during the dragging of nets by steam launches. During this season we found a total of seventeen dead Ridleys in our study area.

Nesting : The sand from Madras to Kovalam is of medium coarseness. There is a layer of broken shells at a depth of 15 - 18 cms. and this makes it difficult to dig in some spots. For the most part the beach is 30 - 40 m. wide and at some places 100 - 150 m. It is bordered mostly by Casuarina and thorny grasses.

The average distance of the nest from high water is generally 20 - 30 metres. (Some were found within 6 - 10 metres). The nest cavity is 46 - 51 cms. deep with the mouth 23 - 26 cms. wide. The widest portion near the belled out bottom is 28 - 31 cms. wide. The top layer of eggs is about 20 cms. below the surface.

An Average Nesting Sequence :

Leaving the surf : 10.27 p.m.

Smelling sand, digging : 10.30 p.m. (surf to nest 10 m.)

Body pit finished : 10.35 p.m.

Nest cavity finished : 10.45 p.m.

Egg laying finished : 11.05 p.m.

Nest covering finished : 11.07 p.m.

Nest packing finished : 11.13 p.m.

False nest making finished : 11.30 p.m.

Start back into sea : 11.30 p.m.

Most females come up shore between 9 p.m. and 1 a.m. They seemed to be influenced by the tides; when the tide had just turned high large numbers came up. When the sea was very rough or very calm we noticed a decline in numbers.

The female moves up from the surf to the beach with her determined thumping crawl, using alternate flippers in the standard reptilian way. She does not stop for long periods or very frequently, nor does she smell the sand on her way. After reaching flat beach she crawls up a few yards and presses her head down in the sand for as long as 10 - 20 seconds.

With front flippers working she flips sand backwards till the pit is 10 - 13 cms. deep. Then, using her hind flippers alternately she scoops out sand to make a nest cavity.

The body is shifted in a distinct two - step movement to bring each flipper into scooping position. A slap is heard when she flips sand and the flipper strikes against the shell in its upward and forward swing. The flipper scrapes sand from the opposite wall of the cavity by making a small circle inside, and then throws it out. Towards the end the flippers dangle in the cavity and then the cloaca is extended.

After the cloaca is extended the eggs start dropping rapidly in ones, twos, threes and rarely fours. Just before the eggs drop the cloaca swings forward. After each batch of eggs and sometimes simultaneously, clear mucus is exuded. The average time lapse between eggs is eight seconds.

During egg-laying the edge of the hind flippers curl up, the head is pulled inside and the body is raised momentarily on the front flippers. The eyes are covered with sand and tears help maintain vision. Throughout the egg-laying period the female breathes and heaves deeply, and once we heard a distinct whistle at the intake of breath.

After the egg-laying, the hind flippers alternately scoop sand up to the cloaca, wipe it, and drop the sand into the nest hole. This is repeated several times. We feel that is done to free the cloaca of the mucus smell, and thus lessen the chances of predators like jackals, dogs and monitor lizards scenting out the eggs from the "crawl". The fact that Olive Ridleys nest on mainland shores may account for this habit of cloaca wiping.

After covering the nest with sand, the female "packs" it with her plastron. The body is raised and brought down in an alternating left and right slant on the nest with a forceful thump. This goes on for 6 - 8 minutes, and sometimes longer. Nest packing again may be of some help against predators commonly found on the mainland.

After the packing, the female commences with making a false nest. With alternate flippers working in unison she throws sand around her, making the nest site look flat, and covers up the body pit dug before laying. She then crawls sea-wards and rides away on the surf.

One turtle (that laid 105 eggs) laid two very small premature eggs. Two turtles had stumped hind flippers and we helped one of them to dig a nest hole. But after the nest was completed she moved to two more spots before laying. The second one made five trial holes of 15 - 26 cms. depth and finally went back to sea without laying. Many other turtles too made 2 - 3 trial holes before laying.

Four turtles had barnacles (4 - 5) on the head, the joint of the front flipper and the shell, the posterior of the carapace and on the carapace centre. These were easy to remove but the spot was discoloured and had small inflamed pores. Deep scratches on the anterior of the carapace were evidently evidence of mating. Some turtles were covered with phosphorescent mud and would shine bright green when we rubbed the shell.

When distracted during egg-laying the turtles did react but did not stop laying. When we tried to measure the head it would be pulled in repeatedly. When turned to measure the plastron she flipped up sand incessantly, making it impossible to stand close by. One turtle that was turned just after she had covered the nest went through the whole process of false nest making and packing over again.

We tried to find out if the sea ward orientation of Ridleys too can be diverted by light. When the female moved toward the sea one of us held a black cloth in front of her to block out the horizon and the sea from her view while the other shone a bright light at her eyes. She would hesitate for a while and then move toward the light. Sometimes she would swing round in a circle, presumably trying to locate the horizon and the sea, and finally make for the light. We tried this with four females, and they all followed the light 20 m. up the beach and 100-150 m. parallel to it.

Hatching : On one beach walk we found the tracks of hatchlings heading toward the sea from a marked natural nest. We dug up the nest to find out the number of infertile eggs and compare the figures to our hatching record. We found 50 hatchlings which were unable to come out, along with some infertile eggs and some dead hatchlings. Some of the live ones were disfigured and all were very weak, probably due to the hot sun.

Visits to Other Sites :

Porto Novo (South Arcot District) : We visited this bay area during February '74 and found five fresh sea-turtle nests, four of which had been dug up by humans. One nest was located directly adjacent to the Central Marine Fisheries Research Station, officers of which reported no knowledge of sea-turtles nesting in the area. From the size of the tracks it is assumed that these nests were Ridleys'.

Point Calimere (Thanjavur District) : During a three day stay in February '74 we found seven nests determined to be Ridleys. Five were dug up by humans and jackals. Wild boar tracks and diggings were seen along this beach area which has a blackbuck and spotted deer sanctuary adjoining it (Kodiya Kadu). The sand here is dark, fine and hard packed. The beach

is covered with shells and there are mud banks close offshore in the shallow area. Several Ridleys skulls were found. Fishermen stated that in recent years boats from Ceylon (Jaffna area) had come to this coast caught and taken away large numbers of living turtles back with them.

The Turtle Hatchery : Our turtle hatchery - the first of its kind in India - was set up with the kind assistance of Mr. and Mrs. Delouche at their compound at Thiruvanniyur, which is about 300 m away from the sea. An area of 3 m. x 3 m. was fenced in with chicken wire mesh buried $\frac{1}{2}$ metre.

We transplanted just 10 clutches this season, mainly to see how successful a hatching programme would be and what difficulties we would have to face in the future. Ten nest holes were dug with measurements taken from natural nests. Details about the hatching are given in the appendix.

In eight nests out of the ten transplanted, we found hatchlings that had been unable to push their way up to the surface. Some of these were desiccated to death. We think that the reason may have been that the nests were too deep and packed too hard, making the sand pressure very heavy. As mentioned earlier, we found this happening in the wild nests too.

In three of the nests the hatchlings had dug under the fence. The young ones that couldn't make it up by themselves had to be helped. They kept rubbing their eyes with the front flippers, possibly in an effort to remove the sand. After the weak ones were put in a tub of shallow water and allowed to crawl around for some time, they revived and were let out into the sea.

During one of the releases we found ghost crabs trying to catch and eat the hatchlings coming very close to them and making sudden grabs.

Mrs. Delouche said that everytime a hatchling emerged she heard a mild buzz and a "pop". When the hatchlings were kept in a tub the activity was frenzied and clear pops and buzzes were heard, when they broke surface to breathe.

Sea Turtle Research Centre and Hatchery : One of the Madras Snake Park project, which we hope to establish in the near future is a "Croc Bank", for the breeding and eventual release of India's endangered crocodilians. We have brought 2½ acres of land on the beach for the purpose but have been unable to begin work as funds are short. This stretch of beach is one we covered in our walks and is a good turtle area. It is therefore an ideal site for our Turtle Research Centre, which will be an important part of the "Croc Bank" project.

Conservation Measures :

1. Further studies on sea-turtles and the sea-turtle industry in India.
2. Sea-turtles are not included in any schedule of the Wildlife Act of '72, and there are no laws against their export. Legislation and its implementation would be an important step toward securing the future of sea-turtles in India.
3. Studies in the Andamans, Nicobars, Laccadive and Minicoy Islands, which are good breeding and feeding grounds.
4. Publicity measures to point out the valuable protein resource that sea turtles mean to this country.

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APPENDIX
LEPIDOCHELYS OLIVACEA
HATCHLINGS—RANDOM AVERAGE SAMPLE OF 925

No	Carapace length Calipers cms	Carapace width Calipers cms	Plastron length cms
1	4.88	3.70	3.29
2	4.90	3.94	3.68
3	4.99	4.00	3.90
4	4.91	3.79	3.89
5	4.91	3.99	3.88
6	4.78	3.71	3.61
7	4.90	3.94	3.84
8	3.79	3.69	1.97
9	4.98	3.80	3.70
10	4.71	3.79	3.78

LEPIDOCHELYS OLIVACEA
NESTING—AVERAGE SAMPLING

No	Leaving surf mins	Body pit mins	Nest hole mins	Laying mins	Nest covering mins	Packing mins	False nest mins	Back to sea	No eggs
1	4	2	13	15	4	6	6	4	127
2	5	4,4,5,	12, 10	17	3	5	8	3	106
3	7	5	10	13	2	5	10	5	94
4	5	4	11	20	3	6	8	3	121
5	4	2	13	20	2	5	6	4	115
6	5	2	12	15	3	7	6	6	105
7	5	4	10	22	3	6	6	6	97
8	6	4	12	20	2	6	9	5	125
9	5	5	10	15	3	5	7	6	117
10	5	4,5,5,	8,15, 12	20	3	7	8	6	140

(Lepidochelys olivacea) EGG COLLECTION AND HATCHING DATA

No	Date of		Total No. of eggs	Live Hatchlings Released	Fully formed could not get out, dead	Infertile eggs	Days to Hatch
	Collection	Hatching					
1	22-12-73	21-2-74	135	96	8	31	60
2	25-12-73	26-2-74	43	24	8	11	63
3	28-12-73	26-2-74	134	74	35	25	60
4	5-1-74	3-3-74	139	125	8	6	57
5	9-1-74	5-3-74	128	82	10	36	55
6	25-1-74	17-3-74	105	84	16	5	50
7	25-1-74	19-3-74	85	62	7	16	52
8	29-1-74	21-3-74	127	89	24	14	51
9	29-1-74	21-3-74	116	97	10	9	51
10	29-1-74	21-3-74	140	102	27	11	51
WILD	9-1-74	7-3-74	120	90	12	18	57
			TOTALS	1272	165	182	

LEPIDOCHELYS OLIVACEA
AVERAGE SIZES OF NESTING FEMALES

No	Carapace length over the curve	Carapace width over the curve	Plastron length	Plastron width	Head width
1	68 cms	67 cms	51 cms	61 cms	11.5 cms
2	63 cms	63 cms	56 cms	65 cms	11 cms
3	74 cms	71.5 cms	55 cms	63 cms	12.5 cms
4	71 cms	71 cms	53 cms	62 cms	11 cms
5	70 cms	67 cms	51 cms	59 cms	11 cms
6	72 cms	70 cms	55 cms	66 cms	12 cm
7	71 cms	69 cms	53 cms	63 cms	11.5 cms
8	75 cms	76 cms	56 cms	68 cms	11.5 cms
9	72.5 cms	72 cms	53 cms	65 cms	12 cms
10	74 cms	74 cms	56 cms	66 cms	12 cms

Coastal Flora of the Study Area :

1. *Spinifex littoralis*
2. *Pandanus tectorius*
3. *Casuarina equisetifolia*
4. *Ipomoea pescaprae*