SOME INFORMATIONS ON DISTRIBUTION AND SEASONAL MOVEMENT OF THE GANGES DOLPHIN

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ABSTRACT

By analizing the data on the distribution of *Platanista gangetica* obtained in Nepal and East Pakistan in 1969 and 1970, following conclusion was obtained.

The upper range of the distribution in the Narayani River is at Dio Ghat, about 100 km north of the range reported before. In monsoon season, they extend the distribution to smaller streams, and go down to larger streams in dry season. The density is lower in the estuary. They were observed swimming mostly single or in couple in dry season. But they often assemble to special narrow area of waters, which is probably affected by the distribution of food.

INTRODUCTION

Though Anderson (1878) and Pilleri (1970) accomplished a intensive study on the distribution of the Indus and Ganges dolphins, their upper limit of the distribution in the Himalayan piedmont area, and the seasonal movements are not still clear.

Here, we report some informations on the distribution of the Ganges dolphin, *Platanista gangetica*, obtained by the Cetacean Research Expedition, University of Tokyo, directed by Prof. M. Nishiwaki.

The observation in Nepal was made in Feb. 1970, and that in East Pakistan, present Bangladesh, in the period from Oct. 1969 to May 1970.

DISTRIBUTION IN NEPAL

It is reported that the Ganges dolphin distributes in India up to near the boundary of Nepal along the Gandak (Anderson 1878). Present investigation was made at the Narayani River and its tributary, the Rapti River. They form one of the three large river systems in Nepal, and the lower stream of the Narayani River is called the Gandak which meet with the Ganges River at Patna, India.

On the Rapti River, the observation was made from Hitaura (85°02′E, 27°26′N) down to Jhawani in dry season on Feb. 2, 1970. The stream of this river was too shallow to expect the dolphin, and according to the informations obtained from the people in Jhawani and other several villages, the dolphin, which is called *Suongsu*, distributes not in the Rapti River but in the Narayani River.

Along the Narayani River, observation was made on the next 2 days with a small country boat from Dio Ghat to Bhwasara Ghat. The former situates at the confluence of the Kaligandaki and the Burigandaki. The water depth of this river was

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measured with a weight and a line, and the width of the stream was presumed by eye, which are shown in Fig. 1. Though we could not find the dolphin, following informations were obtained from the people who live in the valley.

1. Dio Ghat: The dolphin is seen at this spot both in dry and rainy seasons, but none in the upper streams.

2. Narayani Bazar: Dolphins are seen sometimes in summer season, usually 1 or 2 individuals, recently (winter) no sighting.

3. Pitonj Ghat: Dolphins are seen sometimes (from Nepalese people). A dolphin was observed once between Dec., 1963 and Jan., 1964 by Mr. T. Shimada a Japanese proprietor of a farm.

4. Bhwasara Ghat: No dolphin is seen in the dry season, but have been seen in August to October (rainy season).

5. Gola Ghat: No dolphin was seen by us.

6. Gola Ghat to Tribeni Ghat: A Japanese doctor Iwashita sighted the dolphins on several occasions in March, 1969.

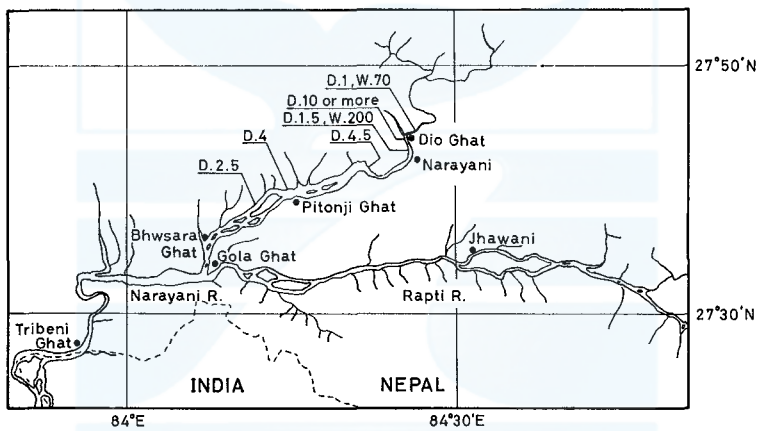

Fig. 1. Map showing the Narayani valley, Nepal. D indicates the depth of the water, and W width in m.

Among these informations, those obtained from Mr. Shimada and Dr. Iwashita are most reliable. Considering all of these informations it is concluded that the Ganges dolphin distributes in the Narayani River both in winter and summer seasons but the density between Gola Ghat and Dio Ghat will be lower in the winter season than in the summer season. Probably, most of the dolphins in the upper stream will move to the downstream in the winter. Though the stream with 10 m or more depth was found at Dio Ghat, most of the part of the stream between Dio Ghat and Gola Ghat was shallow and rapid. This environment will not be suitable for this species. But in the summer season, considering from the water mark on the rock, the water level at Dio Ghat seems to be about 3 m higher than in the winter.

The streams upper than Dio Ghat, or the Kaligandaki and Burigandaki are shallow and run in the rocky mountaineous area. So the migration of the dolphin is not expected. It will be safe to say that the upper limit of distribution along the

TABLE 1. WATER AND AIR TEMPERATURE AT NARAYANI VALLEY AND MYMENSINGH (BRAHMAPUTRA RIVER)

	Narayani valley	Mymensingh
Water	14.9°C (Dio Ghat, 09.00)	19.0–20.7°C (Morning)
	15.8°C (Pitonj Ghat, 10.55	—
Air	7.9°C (06.00)	10.5–13.3°C (06.00)
	21.3°C (13.30)	21 –23°C (14.00)

Narayani River will be at around Dio Ghat, which situates about 250 m above the sea level and about 100 km north from the uppermost range of the distribution confirmed by Anderson (1878).

The air and water temperature in the Narayani valley is shown in Table 1. The air temperature is nearly same with that at Mymensingh and Assam (Pilleri 1970), but the water temperature seems slightly lower than that at the Brahmaputra.

SEASONAL MOVEMENT

The seasonal movement of the Ganges dolphin was studied in East Pakistan, present Bangladesh. The observation was made at fixed stations on the Brahmaputra and the Meghna, or from the cruising ships in the Meghna and the Jamuna. In the case of the fixed stations, a half hour or one hour observation was repeated with the several days intervals. All the stations on the Brahmaputra River were placed around Mymensingh, and the distance from the uppermost station at Khagdahar to the lower station at Kalir Bazar is about 25 km along the river. All of these 8 stations are situated at the depths or at the confluence of a small river (Kewatkhali), where the dolphins are observed more numerously than the other places.

The Brahmaputra was once a main stream of the Brahmaputra river system, but in the present days it is only a branch of the main stream connecting the two big streams, or the Jamuna River and the Megha River. So in the winter season, its water depth is usually less than several meters except some deep spots. In January, the water depth near the station at Kalir Bazar was only about 1 m. The station at Sandarghat in Dacca is also on the relatively small branch of the Meghna River. Other observations were made at the main stream of the Meghna and the Jamuna.

Table 2 shows the seasonal fluctuation of the density of the dolphin considered from the frequency of the surfacing individuals. The density was classified into 4 categories of many, several, few, and none. In case when the number of individuals was estimated, it was also recorded. As seen in this table, the population of the dolphin in the Brahmaputra starts to decrease at the beginning of November. And in December and January, only few individuals seem to have remained in the observed area of the Brahmaputra near Mymensingh. Same tendency was also observed at the station at Sandarghat. Other information on the population density in the Brahmaputra was obtained from the result of " Jagatber " fishing, in which one net is set across the river and another net which is set in the upper stream is moved slowly day by day toward the down stream, finally to catch all the fish between the

TABLE 2. SEASONAL FLUCTUATION OF THE DENSITY OF THE GANGES DOLPHIN SIGHTED AT THE STATION OR ON THE SHIP

Month	Oct.		Nov.			Dec.			Jan.	
Decade	2	3	1	2	3	1	2	3	1	2
Brahmaputra										
Khagdahar		++	+	+	1	0	0	0	0, 1	
Govindapur	++	++	0	0			0	0	0	
Shambhuganj	++	++	++			0	0	0, 1, 2	0	
Kewatkhali	++	0		+	0, 1–2	0	0, 1	0		
Sutiakhali	++	+	+	1	0	0, 1	0	0	0	
Phulpur	++			1		0	0	0	0	
Bhabakhali	++	++	++			0	0	0	0	
Kalir Bazar		++	++			1–2	0	0		
Meghna										
Bhairab Bazar			+++	+++					+++	
Sandarghat, Dacca		+++						0		
Chandpur—Dacca										+++
Jamuna										
Tistamukhghat —Goalundoghat									+++	+++

two nets. The Jagatber operated in January at the Brahmaputra River near Jamalpur (see the map in Kasuya 1972) showed that there was 3 dolphins in the stream of 5 km length.

In Assam the rainy season lasts from May to September and there is very few rainfall in the remaining months (Pilleri 1970), as the result the water level of the Ganges-Brahmaputra river system is considered to decrease from October to April. So we consider that the most of the Ganges dolphin in the tributaries may have retreated to the main streams and will come back again in the rainy season. However, some individuals seem to be left in the tributaries in the dry season. They are mostly juvenile animals of about one year old (Kasuya 1972).

In the large stream of the Meghna and the Jamuna the dolphin is observed in both rainy and dry seasons.

The geographical variation of the density of the Ganges dolphin in dry season was observed from the cruising ship by one or two persons in 1970 in the following area (for the name of the place, see Kasuya 1972).

Jamuna River

2, Jan.; 2 persons, Jagannathganj Ghat—Sirajganj Ghat, Steamer.

14, Jan.; 2 persons, Bahadurabad Ghat—Tistamukh Ghat—Jagannathganj Ghat, Launch.

19, Jan.; 2 persons, Jagannathganj Ghat—Sirajganj Ghat—Goalundo Ghat, Launch.

20, Jan.; 2 persons, Chandpur—Narayanganj, Steamer.

27, Jan.; 1 person, Narayanganj—Chandpur—Barisal (to Sundarbans, continue to 28th), Steamer.

Sundarbans

28, Jan.; 1 person, (Barisal)—Tharacatti—Nalchiti—Mouth of Haringata R.—Chalna—Khulna, Steamer.

30, Jan.; 1 person, Khulna—Mouth of Pusur R.—Khulna, Launch.

Meghna river

30, Apr.–3, May; 1 person, Streams from Bhairab Bazar to Sunamganj, Several launches.

TABLE 3. GEOGRAPHICAL VARIATION OF THE DENSITY OF GANGES DOLPHIN BASED ON THE OBSERVATION ON THE SHIP

Distance from estuary[1)]	Locality	Number of sightings individuals	Number of individuals per 100 miles[1)]	Month
0– 30	lower Sundarbans	29	29	January
30– 60	up to Khulna (upper Sundarbans)	32	67	,,
	up to Chandpur (lower Meghna)	34	35	,,
60– 90	up to Dacca	95	191	,,
90–120	up of Goalundo Ghat	15	182	,,
120–150	up to Sirajganj Ghat	37	57	,,
150–180		37	69	,,
180–210	up to Tistamukh Ghat	4	16	,,
130<	Meghna, upper stream of Bhairab Bazar	540	229	April and May

[1)] in nautical miles.

Table 3 shows the total number of individuals sighted, and the relative density of the dolphin shown by the calculated number of sighted individuals per 100 nautical miles (186 km) of observation. In case of the Meghna, calculation was made assuming the speed of launch as 8 knot (15 km/hour).

According to this result the dolphin seems to distribute densely in the lower and upper Meghna, and lower Jamuna. But the density in the estuary is slightly low.

Other than the Ganges dolphin, 6 *Orcaella brevirostris*, which were identified by the dark colour and the pointed dorsal fin, were observed in 5 occasions at Mongla and Sundarbans.

SCHOOLING BEHAVIOR

Because of the turbidity of the water, the behavior of the dolphin under the water is not observable. In this study, dolphin or dolphins surfacing at close distance and swimming toward nearly same direction were considered to belong to one school.

Table 4 shows frequency distribution of the number of individuals constituting a school. This observation was made in the dry season in the same cruise mentioned in the preceding chapter. It is shown in the table that most of the schools, 90.0% of the total number of schools sighted or 80.4% of the dolphin of this species are single individual. The schools formed by 2 individuals are found in only 8.4% of all the schools, and the number of animals constituting these schools is 15.0%. So, it is con-

TABLE 4. SCHOOL SIZE OF THE GANGES DOLPHIN

Locality	Month	No. of individuals in a school								total	
		1		2		3		4			
		no.	%	no.	%	no.	%	no.	%	no.	%
Tistamukh Ghat to Golundo Ghat	Jan.	73	90.1	5	6.2	2	2.5	1	1.2	81	100.0
Lower Meghna and Sundarbans	Jan.	189	85.9	28	12.7	3	1.4	0	0.0	220	100.0
Upper Meghna	Apr., May	550	91.5	39	7.0	7	1.3	1	0.2	557	100.0
Total no. of schools	—	772	90.0	72	8.4	12	1.4	2	0.2	858	100.0
Total no. of individuals	—	772	80.4	144	15.0	36	3.8	8	0.8	960	100.0

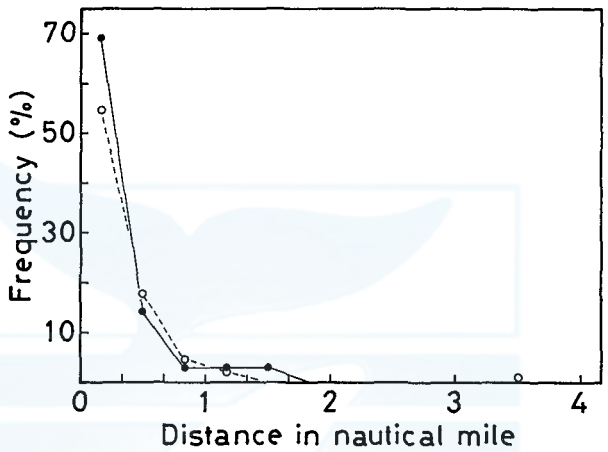

Fig. 2. Frequency distribution of the length of the course where the Ganges dolphin was sighted with the interval less than 1/3 nautical mile. Closed circle and solid line indicate the Jamuna River, and open circle and dotted line the lower Meghna and Sundarvans.

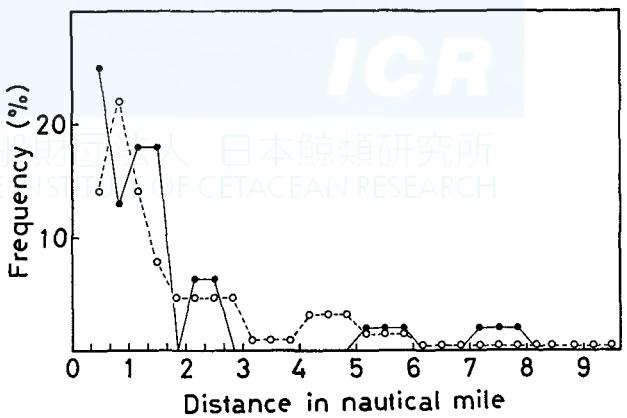

Fig. 3. Frequency distribution of the length of the course where the Ganges dolphin was not sighted. In case where the dolphin was sighted with the interval less than 1/3 miles, it is dealt as continuous. For other marks see Fig. 2.

sidered that the Ganges dolphin is not a gregarious species, at least in dry season, quite different from the other oceanic dolphins.

Fig. 2 shows the frequency distribution of the length of the course of the ship where the dolphins were observed with the intervals less than 1/3 nautical mile (620 m). This indicates that the dolphin assembles to some narrow placess in the river. We think that this will be related with the distribution of the food of the dolphin, because the dolphins were often observed at the confluence of a river or down streams of a shallow place. As seen in Fig. 3, the places where dolphin assembles are usually scattered with the distance less than 3 nautical miles (5.6 km), but sometimes with 4 miles or more distance.

The Ganges dolphin never comes to the bow of the ship, which is different from the usual oceanic dolphins.

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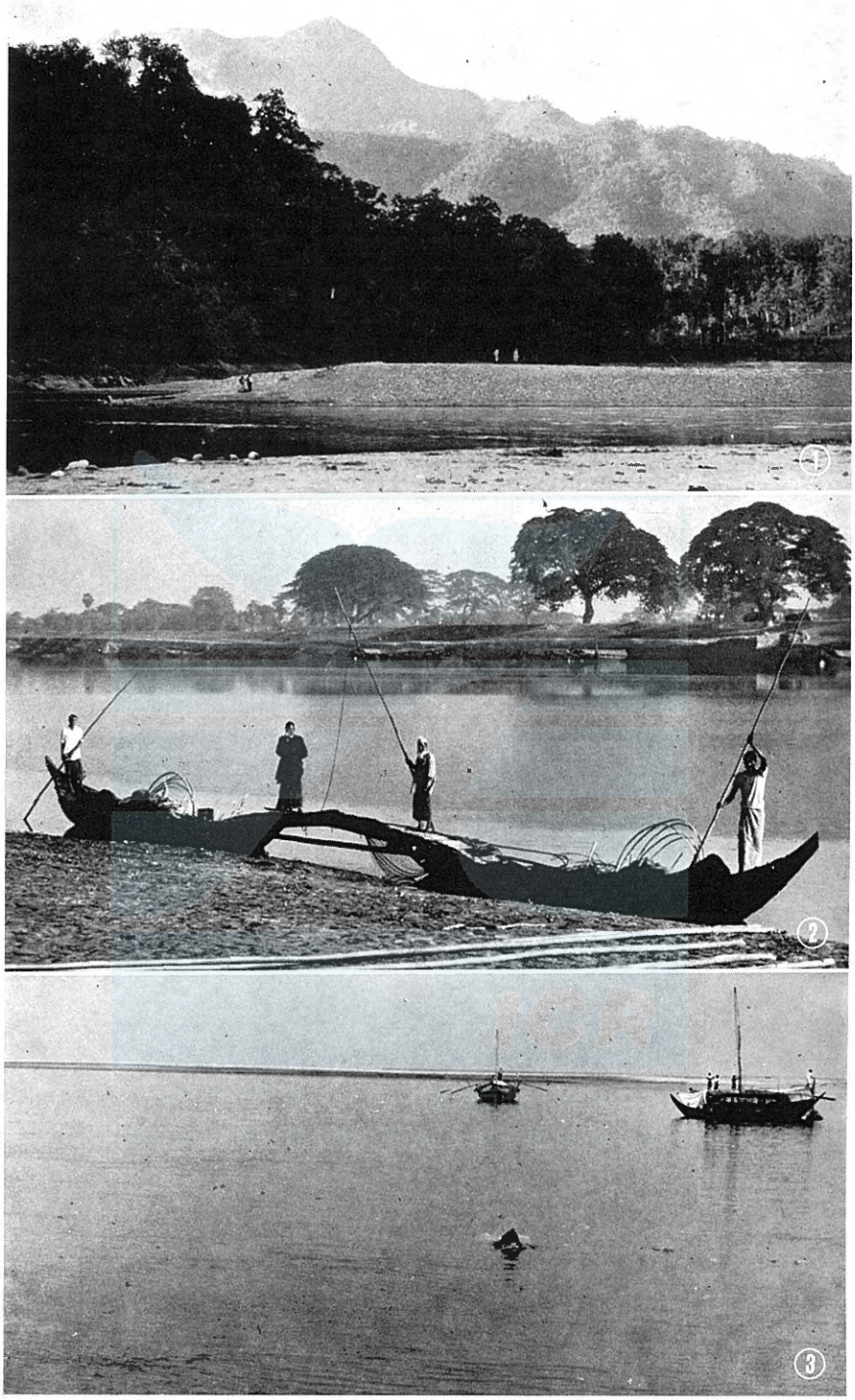
EXPLANATION OF PLATE

Fig. 1. Gola Ghat, the upper limit of distribution of *Platanista gangetica* on the Narayani River in Nepal. The stream of this side is the Burigandaki River, the other the Kali gandaki River, and the lower stream at the left.

Fig. 2. Fishing boats in the Brahmaputra River, at Samoganj near Mymensingh, Jan. 1970.

Fig. 3. The Meghna River at Bhairab Bazar, Jan. 1970.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