

WALLOWING BEHAVIOUR AND WALLOWES USED BY
GREAT INDIAN ONE-HORNED RHINOCEROS AT GARUMARA
AND JALDAPARA WILDLIFE SANCTUARIES,
WEST BENGAL, INDIA

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ONE TEXT-FIGURE

ABSTRACT

Detailed observations were made on wallowing behaviour of rhinos at wallows of different depths at Garumara and Jaldapara Wildlife Sanctuaries. Rhinos were observed to wallow most in the hot season. Wallowing frequency was highest during the hot hours of midday. Larger animals visited the wallows more often than the younger ones. Average area and depth of 42 perennial wallows measured 22 m² and 19 cm respectively in the hot season, which increased considerably in the wet season.

INTRODUCTION

Wallowing is a prominent activity of the Great Indian one-horned rhinoceros (*Rhinoceros unicornis* L.) specially during the hot season, i.e. from March to May. Similar activities have been reported in a few other large mammals such as bison (McHugh, 1958), (water) buffalo (Prater, 1971), sambar (Brander, 1923; Schaller, 1967). The rhinos probably wallow to cool off and to get rid of ectoparasites. This paper, a part of a broader field study on rhinos, started in 1980 at Jaldapara and Garumara Wildlife Sanctuaries in the district of Jalpaiguri, West Bengal, presents data on wallowing behaviour of known individuals in different seasons and various types of wallows used by the animals.

STUDY SITES

Jaldapara (26°40'N, 89°30'E) and Garumara (26°40'N, 89°00'E) Wildlife Sanctuaries extend over an area of 115 km² and 8.63 km² respectively. The sanctuaries lie at the foothills of the eastern Himalayan region close to Bhutan, in the district of Jalpaiguri. Jaldapara is located in the moist tropical zone (Spillet, 1967) and in the flood plains of the rivers Torsa and Malangi. Garumara, 80 km west of Jaldapara lies at the junction of the rivers Jaldhaka and Murti and is situated within a vast stretch of reserve forest extending from Lataguri to Bhutan. Both the sanctuaries consist of at least three habitats such as riverine grasslands, reedy swamps and riverine forest where a large number of animals including rhinos inhabit. Sal forest is dominant at Garumara whereas it is completely absent in Jaldapara except at an isolated pocket at Salkumar beat.

MATERIAL AND METHODS

It has been shown in a previous work (Bhattacharyya and Pal, in press) that wallowing frequency increases as the diurnal temperature rises. Longer times were spent in midday near the wallows for observations on wallowing behaviour. Most observations were made from tree top 'Machans'. Some of the observations were made from elephant back at Jaldapara and Garumara, particularly in the wet season. Besides, early morning and late afternoon hours were regularly spent on walking along the 'fire lines' and 'Rhino-paths'. Duration of observations varied from brief glimpses of a few seconds up to over half an hour. The rhinos were sighted with the aid of a pair of 8×30 binoculars. Pictures were taken with an Asahi Pentax ME camera (lens 1 : 1.4, with a tele, 80-200 zoom attachment). At Garumara, intensive observations were made in the eastern part of the Sanctuary and at Jaldapara in the Moiradanga beat area of the western leg. Rhinos were found more often in these areas.

Data were taken on wallowing behaviour at different types of wallows. The size and total number of footprints and body impressions on or close to the wallows were recorded and rubbed off afterwards. Besides, fresh mud cover on the body of the individuals of known age and sex were also considered as an index of wallowing in three different seasons. The locations of the typical perennial wallows were recorded on maps of the areas. The frequency of wallowing at different times of the day were also recorded. Data were also taken on total area, the area of watery portion, and depth of mud and water of 42 perennial wallows in three different seasons.

TABLE 1—*Wallowing of the Great Indian One-horned Rhinoceros at different types of wallows in Garumara and Jaldapara Sanctuaries.*

Nature of wallows	Average depth of water (cm)	Average area/width	Orientation of the body during wallowing
Wallows with Shallow water	20	25 m ²	Lied on sternum with the chin and throat touching the mud or lied on either side of the body.
Narrow stream	65	5 m	Lied on the sternum or crouch on the knees, raising the nostril, horn, eyes, ears and dorsal spine above the water.
Bigger pool	Above 100	120 m ²	Mostly float and swam and stood up from time to time. Nostril kept above water level. Head submerged occasionally into water.

RESULTS AND DISCUSSION

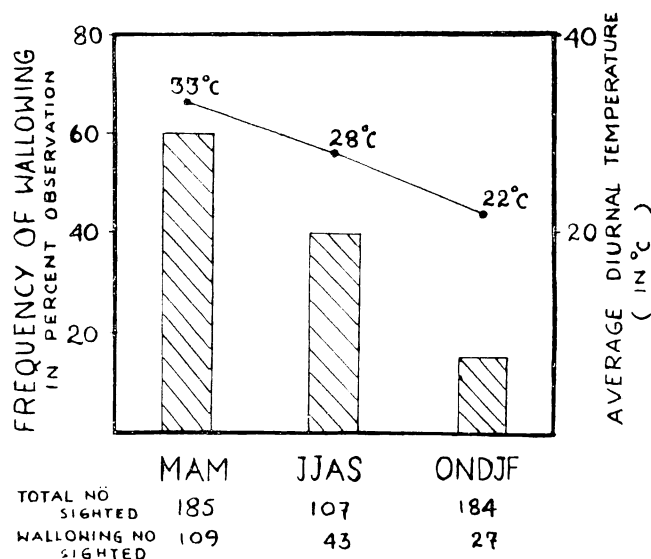
A typical perennial wallow contains a pool of water, either in the centre or at one end and the rest of the area is covered with fine grain soft mud. When a rhino approached a wallow without water it always selected the softest part of the mud. Some wallows dried up in the hot season. Usually the rhinos selected wallows with a water pool. The difference in wallowing behaviour at wallows with different depths of water is shown in Table 1. While wallowing in narrow streams rhinos lied on the sternum with most of the body submerged and from time to time dipped the head down into the water. The rhinos changed the orientation of the body at irregular intervals. Sometimes they changed positions and water pool, possibly to select the better places. Occasionally rhinos were seen to roll over on to their backs with legs of one side in the air, and in so doing coated one flank with mud. Rhinos never rolled completely over.

Wallowing rhinos frequently disclosed their presence by characteristic deep breathing sound. During wallowing their eyes were usually closed and ear movements were less frequent, and in a prolonged one, the rhinos seemed to be in a state of light drowsiness and their latency to interaction was considerably high. As such one could get close to them on tiptoes. They, however, came to alertness by any noise.

Absence of shade did not appear to affect the rhinos adversely. Rhinos had been observed wallowing under direct hot sun less than 25 metres away from cool shade of Sissoo (*Dalbergia sisso* Roxb.) and Shimul (*Bombax ceiba* L.) trees. It may be assumed that the rhinos preferred wallows more than cover. Goddard (1967) made similar observations on resting black rhinoceros in northern Tanzania, E. Africa.

Wallowing frequency in different seasons

Wallowing was most frequent in summer and least in winter (Text-fig. 1). Most rhinos encountered during the months from March to May had a fresh mud cover on the body, whereas rhinos encountered during the cooler months hardly had any such cover. Laurie (1978), however, found that wallowing was most frequent during the monsoon.



TEXT-FIGURE 1. Frequency of wallowing of Great Indian one-horned Rhinoceros in three different seasons.

Wallowing at different hours of the day

It is clear that rhinos wallowed most in the hot hours of midday and least during the night. The frequency of wallowing was lower on cool, overcast days

during the late summer and monsoon. Most observations on wallowing were recorded between 8.30 and 17.00 hours when the animals were rather inactive particularly between 9.30 and 15.00 hours. Laurie (1973), on the contrary, found that the Indian rhinos wallowed most in the early morning. In case of black rhinoceros, Goddard (1967) recorded 90% observations of wallowing between 16.00 and 18.00 hours in northern Tanzania, E. Africa. A wounded rhino was, however, observed to wallow at night. The fresh mud cover on their bodies was seen most frequently in late afternoon. This indicated that at midday the rhinos were engaged in wallowing. Besides, at afternoon the vegetation along the rhino trails leading out from the wallows were found typically smeared with wet mud which probably dripped from the rhino's skin.

Effect of age and sex on wallowing

Larger animals tended to visit the wallows more often than smaller ones. At Jaldapara and Garumara the large bulls and cows were observed to visit the wallows more frequently than the juveniles of either sex and weaned calves. The juvenile males and females never visited the wallows during the cool season. The calves, however, were observed to visit the wallows more frequently than the juveniles in the dry season. This probably was due to the fact that the calves during that time always accompanied the mother.

TABLE 2—Average area and depth of 42 perennial rhinoceros wallows in Garumara and Jaldapara Sanctuaries.

Seasons	AREA (In M ²)		DEPTH (In cm)	
	Average total area	Average area of watery portion	Average depth of mud	Average depth of water
HOT March to May	22 ± 3.2	15 ± 2.6	10 ± 1.0	9 ± 0.8
WET June to Sept.	28 ± 3.4	25 ± 3.0	20 ± 1.1	15 ± 0.6
COOL Oct. to Feb.	23 ± 2.9	17 ± 2.7	14 ± 0.9	11 ± 0.6

Average area and depth of wallows

The total area of the wallows and its watery portion, the depth of water and soft mud of 42 perennial wallows were measured in dry, wet and cool seasons (Table 2). The area and depth of wallows increased considerably in the wet season. Talbot (1960) reported that a wallow used by Sumatran rhino (*Didermocerus sumatrensis*) measured 183 cm to 3 m or 3.5 m long and 92 cm to 1.5 m wide

while the Javan species (*R. sondaicus*) used slightly bigger wallows measuring 3.5 m by 180 cm. But the wallows used by Indian rhinos are much bigger than the wallows used by Sumatran and Javan species. It may be mentioned that Indian rhinos are also bigger in size.

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