

## STUDY OF PARTURITION IN GREAT INDIAN RHINOCEROS

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Among mammals rhinoceros is placed in the order *Perissodactyla*, the odd-toed ungulates. This order is divided into three families; *Equidae*, *Tapiridae* and *Rhinocerotidae*. All the equines fall under *Equidae* family and tapirs under *Tapiridae* family, while in family *Rhinocerotidae* today there are four genera with five species of Rhinoceros (Klos and Lang, 1976). Two species, black and white rhinoceros are confined to Africa while among the three Asiatic species, Javan rhinoceros and Sumatran rhinoceros are almost extinct (Prater, 1965). The third Asiatic species, the Great Indian one horned rhinoceros, is one of the largest of all existing species. Formerly it was extensively distributed in the Gangetic plain but today it is restricted to Assam & parts of Nepal & West Bengal. Recently they have also been rehabilitated at Dudhwa National Park in District Lakhimpur-Kheri in Uttar Pradesh. The first group of these rhinos had been translocated from Kazi Ranga, Assam in March, 1984 and the second from Nepal in March, 1985.

All species of rhinoceros are threatened with extinction and are therefore especially valued in any Zoological collection (Klos and Lang, loc. cit.) Until recently births of Indian rhinoceros were rare in Zoological Gardens. The first recorded birth is reported from Calcutta Zoological Garden on 9th Oct. 1985 but the premature calf lived only few hours (Ali, 1927). No further breeding occurred until 1956, when on September 14th a male calf was born in Zoological Garden of Basel (Lang, 1957). A female calf was born later at Whipsnade Zoo in 1957 (Tong, 1958). As many as 13 births have been recorded at Basel Zoo (Geigy, 1959; Klos and Lang, loc. cit.). Among Indian Zoos, Indian rhinoceros has been bred in the Zoological Gardens of Calcutta, Mysore, Gauhati, Delhi (Bhatia and Desai, 1976) and Kanpur etc.

Parturition or act of delivery of off-spring is well understood and studied in domestic animals. Although the various stages of birth are similar in all mammals, there are slight variations and modifications at various stages in different families and species. In Zoological classification, rhinoceros is nearest to horse among domestic animals. Its digestive system is similar to equines, with a simple stomach, small intestines and very large caecum and colon, but its kidneys are lobulated and more closely resemble those of bovines (Fowler, 1978). In the act of parturition also it has not been found quite the same as that of the horse. Some variation from horse and resemblance to bovine parturition has been noted in the present study when parturition in two normal deliveries at Kanpur Zoological Park and one stillbirth with

dystokia in one of the transported wild rhinoceros at Dudhwa National Park were attended by the author.

Kanpur Zoological park is quite a new zoo in onset. Its construction was started from the year 1968. The rhinoceros enclosure had two indoor enclosures and a common open run of about  $90 \times 125'$  size, surrounded by a dry moat 6' deep and 4' wide. One pair of Indian rhinoceros was brought from Assam State Zoo, Gauhati on March 4, 1977 and settled in this enclosure. The male named 'LACHIT' was zoo born at Gauhati zoo on May 23, 1974 out of the male 'SHIVAJI' and female 'PADMINI'. The female named 'MAYUNG KUMARI' was wild caught when 4 month old with date of birth as November 11, 1973. Both lived together until the birth of first female calf on October 1, 1982. Female was again mixed with male on August 3, 1983 and both again lived together for about one month. On December 6, 1984 she gave birth to another calf, this time a male. Both the calves were well reared by mother in the zoo.

Under the Rhinoceros Rehabilitation Project, five rhinos were brought from Kazi-Ranga, Assam to Dudhwa National Park on March 31, 1984. Before release in the forest, they were settled in barricades at Kakraha area. One pregnant female rhinoceros named 'SUHELI' was heavily injured in the long journey by road and by Air. She was being treated when on April 7, 1984, she delivered a dead calf which had to be removed after correction of the position (Dystokia).

All these three births were attended and all details of parturition were observed at Kanpur Zoological Park and Dudhwa National Park. The details of each are outlined below:—

*1st Birth:* The pair of rhinoceros was living together since their arrival in the zoo. No actual mating was observed, although heat periods were noted at irregular intervals from October, 1979 when fighting and chasing were seen. The last fighting and chasing period was observed between 28th to 30th May, 1981. Mating, though not observed was thought to have occurred on May 30, 1981 night. External signs of pregnancy were visible from late August 1982. By the middle of Sept. 1982, marked abdominal enlargement and teat development was noticed. As delivery was expected only in 1st week of Oct. 1982, the male was not separated.

It was from Sep. 25, 1982 that some change in behaviour of female was noticed towards the male, when she did not allow him to approach and chased him away. At 9.00 hr on 1st Oct. 1982, she pushed the male into the dry moat in a rage. The male remained in the moat and the female then exhibited signs of labour pain with copious flow of mucus from her vaginal orifice. Intensity, duration and frequency of pain increased and at 11.30 hr the water bag appeared at the mouth of the vulva. Two hind legs appeared inside the water bag at 11.40 hours and the whole of hind portion wrapped in water bag was hanging out by 11.55 hours. There was a pause and with an intense straining gesture in lying position the chest and head

also came out in a jerk, exactly at 12.00 hr. Foetus was born wrapped in the water bag. Suddenly the mother stood up and the water bag ruptured by the traction of naval cord attached to placenta hanging from her vulva. The mother smelt the baby calf for few seconds and then moved away without paying any attention. The calf started breathing first in jerks and later regularly. It was approached and rubbed with clean cloth. Sex was determined as female and weight taken as 60 kg (Lang, 1961). No attention was paid by mother but the calf was kept immediately near her at a dry place. The mother appeared restless till 15.00 hr when the placenta was expelled. The placenta was found to have cotyledons like that of bovine placenta. The calf by that time was standing and started moving slowly towards the mother. At 15.20 hr the calf was seen suckling for the first time. By 16.30 hr the mother appeared much attached to the calf, not allowing any outside approach and taking greens. At 18.00 hr mother and calf were moved to separate enclosure and male taken out of the moat in the larger enclosure. The female calf named 'RASHMI' was reared with utmost care and affection by mother 'MAYUNG'.

*2nd Birth:* After first birth the female appeared in heat for the first time in last week of June, 1983. For mating in next heat, she was separated from her calf 'RASHMI' and mixed with male 'LACHIT' on Aug. 3, 1983. On 10th and 11th Aug., 1983 the pair appeared chasing and fighting and heat symptoms were noticed in female. Mating was not seen in this case also, but was expected to have occurred in the night of Aug. 11, 12/1983. She was separated from male after about one month and again kept in separate enclosure with her calf 'RASHMI'. External signs of pregnancy were marked by Nov. 1, 1984. On Nov. 27, 1984 the keeper reported that female 'MAYUNG' did not want the company of her own calf 'RASHMI' and hurting her to keep her away. Her similar behaviour was noted one week before 1st. birth towards the male companion. Therefore 'RASHMI' was separated and kept in the adjacent small run separated by a small iron gate. It was at about 22.30 hr in the night of Dec. 5, 1984 when the watchman reported that the female 'MAYUNG' was very much excited, had broken open the iron gate and severely injured her calf 'RASHMI'. By the time of reaching, she was cornered in her enclosure by supervising staff. The middle gate was immediately secured tightly and 'RASHMI' was attended. Her body was scratched and wounded superficially. Female 'MAYUNG' had entered the inner enclosure and was trying to break open the gate of run of male 'LACHIT' in excitation. On examination by torch light she appeared in labour pain in the process of parturition. The water bag appeared at 23.30 hr and whole foetus in posterior presentation delivered at 00.10 hr in standing posture. Foetus was in the water bag which ruptured while falling on ground. The mother first smelt and later licked the calf and appeared quite attached. Placenta was expelled after about  $2\frac{1}{2}$  hr at 2.45. Next morning at 8.00 hr, the calf was found suckling. The sex of calf was male and it was named as 'LOHIT'. (Fig. 1)

*3rd Birth:* Five rhinoceros were captured from Kazi-Ranga National Park in March, 1984. They were transported on to Gauhati by truck, from Gauhati to Delhi by specially chartered Russian plane and from Delhi to Dudhwa National Park again by truck, reaching



Fig. 1. Rhinoceros "Mayung" of Kanpur Zoo with her new born Calf "Lohit."

there on March 31, 1984. They were settled in specially constructed wooden barricades separately at Kakraha area. All the five were injured due to hazards of capture and transport and treated in preparation of release in the forest. One female named 'SUHELI' was injured most. She was in great distress and agony more so on account of full term pregnancy. Her hind and fore legs were deeply wounded, horn broken and infested with maggots. She appeared very dull in the morning of April 7, 1984 and was passing blood-tinged mucous discharge from vaginal orifice. Her food intake had also declined considerably in the past 12 hours. She was attended up to 14.00 hr and no sign of parturition were exhibited till then.

At 17.00 hr. a wireless message reached Dudhwa that the condition of rhino has further deteriorated. On reaching barricades at 17.45 hr. rhino 'SUHELI' was found in labour pains. She was reported in stress since 15.30 hours, frequently rising, sitting and taking excess of water. While straining, copious blood mixed mucus was discharging from her vaginal

orifice. Some membrane appeared protruding from vagina but did not show signs of further expulsion till 18.00 hr. when decision to handle it manually was taken. On examination the posterior of foetus was found tucked in pelvic brim and both hind legs retained in abdominal cavity. Due to exhaustion, the rhino was not difficult to handle. With great exploring and handling, the hind legs were pulled one by one in pelvic cavity and expulsion of foetus accomplished with gentle and steady pulls at 18.20 hr. The foetus was dead and putrefied, it was swollen at the belly region. The sex of the dead calf was male. Mother 'SUHELI' was lying quietly, exhausted and tired with hanging placenta. Necessary treatment was provided to her. She took some water and expelled placenta at 22.00 hr. She did not recoup and died of exhaustion and toxæmia on April 11, 1984.

In the study of three births of Indian rhinoceros attended at Kanpur Zoological Park, Kanpur and Dudhwa National Park, it is quite evident that parturition in them has some distinctive features from allied domestic species horse and cattle. Although the main stages of parturition are the same, following outlined features are worth mentioning.

1. On account of their large size and heavy weight the external signs of pregnancy are not apparent until 1 to 1½ month before the birth (Fowler, loc. cit.).
2. There is remarkable change of behaviour and excitation in the preparatory stage of parturition (Fowler, loc. cit., Rajkonwar and Baishya, 1985). In the present study in 1st birth, the female injured her male companion six days before and in 2nd birth, her own calf 9 days before the birth.
3. The mother is extremely violent 3 to 4 hours prior to delivery and does not tolerate any proximity of her usual companion. In both normal births this behaviour was noticed.
4. Delivery in posterior presentation is quite rare in domestic animals but in the present study in Indian rhinoceros, all the three births were in posterior presentation. Although further studies are necessary to confirm, it appears that deliveries in posterior presentation are common and normal feature in Indian rhinoceros probably due to their short legs and heavy body.
5. Among domestic animals like horse, the foetus is expelled in water bag which ruptures outside soon after, while in cattle the water bag ruptures during passage just before the expulsion of foetus. Indian rhinoceros resembled the horse in this feature of parturition. Foetus was delivered with intact water bag in both the normal births which ruptured soon on pulling of naval cord by mother or falling on ground in the present study.
6. In all the births in the present study of Indian rhinos, placenta or after-birth was retained and expelled after 2 to 4 hr of delivery like that of cattle in

domestic animals. The placenta had cotyledons where it is closely attached to uterine wall. While in case of horses, owing to diffuse adherence of placental membrane, it is expelled with or soon after the production of the young.

More to mention in the present study is that the captive rhino 'MAYUNG' was seen to come in heat for the first time at the age of about six years and her age at first calving was about 9 years. In the first birth, taking date of mating as May 30, 1981, gestation period comes to 480 days, while in second birth with date of mating as Aug. 12, 1983 it is 482 days. The inter-calving period found is 2 years 2 month. The weight of calf at birth in one case was 60 kg.

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