

MONITORING FOLLICLE SIZE WITH ULTRASOUND AS AN IMPORTANT TOOL TO DETERMINE A PROPER TIME FOR MATING IN THE SUMATRAN RHINOCEROS *Dicerorhinus sumatrensis* (FISCHER 1814) IN THE SUMATRAN RHINO SANCTUARY (SRS) WAY KAMBAS NATIONAL PARK, LAMPUNG

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Introduction and objective

The Sumatran rhinoceros is the most endangered mammal species, with only 300 rhinos surviving in native habitat and very high declining rate about 50% lost in the last decade. The Sumatran rhino is also a very slow breeder, and there is limited knowledge on the reproductive biology of the species (Roth 2001). Historically it has been difficult to pair Sumatran rhinos in order to provide appropriate and successful breeding because the animals are aggressive when not in estrous. Apart from failure to mate, these problems have resulted in a number of serious injuries and death on one occasion. Therefore, the objective of the research is to determine a proper time for mating in in a Sumatran rhino field sanctuary using ultrasound in order to predict dominant follicle size using methodologies previously described (Roth 2001).

Materials and methods

Two female Sumatran rhinos, Bina (Studbook No. 32, estimated age 25 years) and Ratu (Studbook No. 44, estimated age 7 years) were examined as describe below and by the same operator. Female Sumatran rhinoceroses in SRS Way Kambas were taught to cooperate for ultrasound examination, which allowed routine and repeatable examinations possible. The rhinos were trained to enter chute and to fix her in the chute with one entire side of the chute but could move laterally to minimize lateral movement of the rhino during the examination. The ultrasound machine was placed at the back of the rhino that allowed scanning through per rectal palpation. Prior to ultrasound scanning, faeces were removed from entire distal rectum through exploration rectally. Examinations were performed with an Aloka SSD 500 (Aloka Co. Ltd, Tokyo, Japan) using a 5 MHz curvilinear transducer, and connected to a Hi-8 video recorder (Radcliffe 2001). All images were recorded during the examination. During examination, the bladder, cervix, uterine body, uterine horns, and both ovaries were examined. Follicles > 10 mm in diameter were measured and the presence of corpus luteum was recorded. Ultrasonographic evaluation was conducted regularly 2-3 times a week without sedation in a chute if mating was not observed. When follicle ~ 18 mm in diameter observed, examinations were done in daily basis until the day of sexual behaviour or mating occurred. Ultrasound exam was performed again four days after mating to confirm an

ovulation, and continued with scanning on the day-14 to detect early pregnancy. Ultrasonography examinations were lasted 10 to 15 minutes for each monitoring. Study was conducted from January, 2005 till August, 2006.



Results

In both animals, mating occurred when the dominant follicle reached a diameter between 19mm up to 30mm (see Table). Follicle was shown in black color with clear border of follicle wall (fig. 1). Corpus luteum development could be observed by day-4 after mating with change in echogenicity (fig. 2). In case ovulation did not occur, follicles either enlarged and become luteinized (fig. 3) or regressed in size. Uterus was also observed change in echogenicity or patterns (less homogenous grey in image) when female was in oestrus (fig. 4).



Fig 1. Dominant follicle



Fig 2. Corpus luteum



Fig 3. Luteinized follicle



Fig 4. Enlarge uterus

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Results

Follicle Size	Number (n)	Mating		Remarks
		Failure	Success	
< Ø 19 mm	1	1	-	
19-25 x 18-25 mm (sxl)	6	-	6	
19-25 x 18-25 mm (sxl)	3	3	-	CL prominent
> Ø 25-30 mm	2	-	2	
> Ø 25-31 mm	4	4	-	CL prominent
≥ Ø 30 mm	2	2	-	

Discussion

When follicle reached 19mm in size, the keepers would begin introductions of the male and female. Animal behavior quickly would confirm receptivity or lack thereof with marked aggression and chasing observed if the female was not receptive. Observation on the courtship behavior was conducted during pairing, and observation on violent behavior display should be taken carefully. If animals show violent behavior, they must be separated immediately in order to minimize risks for injury. Successful pairings that culminated in mating occurred when the dominant follicle reached a size between 19mm up to 30mm. Mating was very seldom achieved when mixing female and male carried out after follicle size larger than 25mm. On the other hand, mating was never observed if pairing was conducted when follicle size was less than 19mm. The present of dominant follicle was always fit to the appearance of interest behaviour among the sex and culminated in courtship behaviour. In conclusion, follicle size could be used as the best parameter to determine a proper time for mating in the Sumatran rhino based on the experiences in the rhinos at SRS Way Kambas.

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