

**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. Follicle size was performed using a ALOKA SSD-500 ultrasound device (ALOKA Co., Japan). Investigations were performed using a 5 MHz convex probe via transrectal ultrasonographic techniques (Radcliffe 2001). Ultrasonographic evaluation was conducted regularly 2-3 times a week without sedation in a chute if mating was not observed. However, the scanning frequency was increased to daily examination when follicle size reached 17mm until mating or until the dominant follicle stopped growing. 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. 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 24mm. 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 a 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).



Figure 1. Dominant follicle



Figure 2. Corpus luteum



Figure 3. Luteinized follicle



Figure 4. Enlarge uterus

**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 24mm. Mating was very seldom achieved when mixing female and male carried out after follicle size larger than 24mm. On the other hand, mating was never observed if pairing was conducted when follicle size was less than 19mm. 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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