

## PHYSIOLOGICAL CHARACTERISTICS OF MOUSE DEERS AND THEIR REPRODUCTION IN CAPTIVITY

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### ABSTRACT

Mouse deers (*Tragulus javanicus*) used in this experiment were originated from the wild individuals captured in Central Java region. They were bred and maintained in captivity. Observations on behaviour and reproductive performance were carried out for a period of 24 months. The behaviour of mouse deer was unique. Although mouse deer are primitive ruminant, their behaviour was different in many aspects from that of domestic ruminant, and was more similar to that of a dog, cat or rabbit. Morphologically, the rumen, reticulum and abomasums of mouse deer were similar with those ruminants, except omasum was vestigial. The captured mouse deer reproduced quite well. Breeding occurred in all the year, estrous cycle was estimated to be 14-16 days. The sexual maturities were 170 days in male and 130 days in female. Estimated gestation period was 130-136 days with litter size 1. Mortality the young until weaning was 10%.

*Keywords: Mouse deer, Tragulus javanicus, physiological characteristic, behaviour, reproduction*

### INTRODUCTION

Mouse deer or chevrotain (*Tragilidae*) is believed to be the smallest and the most primitive *Ungulata* in existence (1977). There are four type of mouse deer (Makita, *et al.* 1995):

1. African water chevrotain (*Hyemoschus aquaticus*)
2. Indian chevrotainos spotted mouse deer (*Tragulus meminna*)
3. Larger mouse deer (*Tragulus napu*)
4. Lesser mouse deer (*Tragulus javanicus*)

Of these four mouse deer, Lesser mouse deer (*Tragulus Javanicus*) is the smallest in body size. This animal inhabits the tropical rain forest in the southern parts of Myanmar and Thailand, in Malayan peninsular and in Indonesian archipelago (Lekagul & McNeely, 1977).

Mouse deers are attacked by snakes, alligators and other carnivorous including dog. The protection of them as wildlife is urgent. Therefore, the objective of this study is to know the physiological characteristics and reproduction in captivity of this endangered species. Such information is a necessary prerequisite for design of effective conservation strategies.

## MATERIALS AND METHODS

Six young adults (three females and three males) mouse deers (*Tragulus javanicus*) used in this experiment were originated from the wild individuals captured in Central Java region. They were kept in individually wood cages measuring 50 cm (H), 65 cm (W) and 45 cm (D). However, the individually wood cage of a pair was placed in a same area (100 cm x 150 cm), and this area is separated with other pair's area using bamboo fence.

Water spinach (*Ipomoea aquatica*) and water were given freely *ad libitum*. Sweet potato, carrot, bananas were fed in the morning once a day. The eating, drinking and other habits were observed regularly at feeding (morning) and resting (afternoon) times, while the reproductive performance and survival rates of the animals were monitored daily in a period of 24 months.

During the observation, one of male mouse deer was dead because of diarrhea. This mouse deer was sampled, the abdominal muscles were incised on the right and left flank. The gastrointestinal parts were observed from both the left and the right sides. The stomach was removed by cutting above the abdominal part of the oesophagus and below the proximal end of the duodenum. This sample was fixed in 10% neutral buffered formalin. Observation on the fixed materials was done with the naked eyes and with binocular microscope.

## RESULTS AND DISCUSSION

### Physiological Characteristic

Lesser mouse deer (*Tragulus javanicus*) also called 'Kancil' is the smallest among mouse deer. Their colour is rich brown with longitudinal rows of white stripes in ventrolateral edge of neck as well as ventral surface of tail and chest. The body length is 30 - 45 cm, tail length is 2.5 - 12.5 cm, height at the shoulder is 20 - 25 cm, and the body weight is 1 - 2 kg. There are no horns or antlers, but there are canine teeth in both jaws. The upper canines are especially well developed and are enlarged into tusk in males. Males have *preputial gland* dan *anal gland*, females have four mammae (Novak, 1999).

Morphologically, mouse deer have large stomach with 3 compartments, such as rumen, reticulum and abomasums, similar with those ruminants, except omasum was vestigial. The reticulo-rumen volume was larger than that of domestic ruminants. Appearance of rumen was S-shaped, the reticulum was larger than the abomasum, which reconfirmed the findings of Agungpriyono *et al.* (1992) and Vidyadaran *et al.* (1982). This results also agrees with Hofmann (1988) stating that a few primitive ruminant species have the reticulum which is larger than the abomasum.

### Behaviour

Although lesser mouse deer belongs to the family *Tragulidae* and is a ruminant, its behaviour is quite different from the domestic ruminants. This finding agrees with Fukuta (1991) and Kudo *et al.* (1995). The differences in behaviour of lesser mouse deer from domestic ruminants are present in Table 1. It can be seen that the animal behaves more like a cat or a dog rather than domestic ruminants.



*Table 1. Behaviour of lesser mouse deer (Tragulus javanicus)*

Activity	Behaviour
Drinking	Uses tongue
Eating	Does not use tongue to draw food into the mouth
Ruminate	In standing position
Sitting	First drop hip and then bent the forelegs, the forelegs are tucked in under its belly
Stamping	Moves legs rapidly
Head scratching	Uses hind legs in a standing position

Lesser mouse deer are extremely nervous when captured. Therefore, it is necessary to cover cage and keep dark. However, Kudo *et al.* (1995) reported that the animals tended to be more nervous in completely darkness. They preferred semi-dark condition. Proper handling right after captured was crucial to the animals's survival later in the captivity.

### Reproduction

Estrous term of female was difficult to identify by watching. Copulation which lasted about 5 minutes was often observed during daytime, especially in the early morning. The reproduction performance of lesser mouse deer in the captivity was summarized in Table 2. The results of this reproduction performance was similar with the findings of Fukuta (1991), Kudo *et al.* (1995) and Fukuta & Kudo (1996).

*Table 2. Reproduction performance of lesser mouse deer (Tragulus javanicus) in the captivity*

Parameters	Observation
Breeding time	All the year round
Estrous cycle	14 – 16 days
Earliest age of copulation of male	167 days
Earliest age of conception of female	124 days
Gestation period	132 – 134 days
Post partum estrous	30 minutes
Litter size	1
Infant mortality until weaning	10 %

There was no distinct breeding season of the lesser mouse deer in captivity. The results also showed that the lesser mouse deer were very productive in the captivity. It means that reproduction of lesser mouse deer in captivity was not adversely affected in this study. This high reproductivity probably could ensure their survival in the jungle and prevent early extinction.

### CONCLUSION

Lesser mouse deer has unique physiology characteristics, behaviour and reproduction. It is urgent to understand their characteristics, behaviour and reproduction in order to design strategies for conservation efforts.

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