Daily Behavior of Sambar Deer (Cervus Unicolor) within Ex-Situ Conservation Areas in Deer Parks

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Abstract: Research has been conducted on "Daily Behavior of Sambar Deer (Cervus unicolor) in Ex-situ Conservation Area in Deer Park, Desa Lamtanjong, Kabupaten Aceh Besar". This study aims to determine the daily behavior of sambar deer in the conservation area in deer park Desa Lamtanjong, Kabupaten Aceh Besar, and the most dominant behavior carried out by sambar deer, as well as the feasibility of the results of research on the daily behavior of sambar deer (Cervus unicolor) in Deer park Desa Lamtanjong, Kabupaten Aceh Besar. The approach used in this study is quantitative, the type of research used is descriptive. The sample in this study was 6 sambar deer consisting of 2 males and 4 females. Data on the daily behavior of sambar deer were obtained through direct observation using the animal sampling scan method for 14 days of observation. Based on the results of the study, it is known that the behavior carried out is in the form of eating behavior, shifting behavior, resting behavior, grooming behavior, and reproduction. The dominant behaviors were eating (47%), moving (20%), resting (29%), grooming (3%), and reproduction (1%). The dominant behavior that deer perform is feeding behavior. The use of the results of this research is applied in the form of a practicum guide for the Animal Ecology course, to conduct practicum directly at the deer park Desa Lamtanjong, Kabupaten Aceh Besar.

Keywords: Daily behavior; Deer Park; Ex-situ conservation; Sambar Deer

Introduction

Tourism in National Parks is the best gift for nature lovers because they see large and diverse vegetation, dense forests, riverside areas, seasonal rivers, sot nature, small hilly areas, large chour (grasslands) and the bravest is to see wild animals in their natural habitat, their different activities and behaviors. This motivates tourists for the conservation of wild animals (Shalini et al., 2023).

The rapid growth of the industrial economy has affected the survival of wildlife, and the decline in wildlife resources will in turn have a negative impact on the industrial economy (Du et al., 2023) as well as adaptation patterns to daily and seasonal variations in environmental factors (Ordiz et al., 2017). Documenting activity patterns has important implications for understanding niche theory, community assemblage, and animal behavior (Frey et al., 2017). In addition, such knowledge can inform conservation management decisions, a number of studies have noted changes in wildlife activity patterns in response to human presence (Gaynor et al., 2018; Ordiz et al., 2017).

Abundant deer can have significant unintended impacts on native biodiversity, primary industries, and human health (Carpio et al., 2021; Martin et al., 2020; Spake et al., 2020). Sambar deer (unicolor deer) is a nationally protected animal (Category II) (He et al., 2019). Sambar deer was included in the list of Least Concern to Vulnerable by IUCN Red list in 2015 (Selvarajah et al., 2022). Sambar deer (Deer unicolor) is a hoofed animal defined as a hoofed placental mammal distributed across Afro-Eurasia and the New World (Hendrix et al., 2019). The population of sambar deer (Deer unicolor) declined and was categorized as vulnerable by the International Union for Conservation

of Nature and Natural Resources in 2014 (Khodri et al., 2023).

Indonesia has several species of deer, namely sambar deer (Cervus Unicolor Kerr.), Timor deer (Cervus Timorensis), Bawean deer (Axis Kuhlii) and Muncak deer (Muntiacus Muntjak), Totol (Axis Axis) which according to its history are considered native animals with the term indigenous, species or native species from various islands in Indonesia. The deer come from mainland Asia, but after being in Indonesia for hundreds of years, the deer adapt to local environmental conditions in various regions in Indonesia (Fauzi et al., 2023).

The development of the industrial economy affects the survival and development of wildlife, while wildlife resources and the industrial economy interact with each other (Wilkinson, 2023), and the protection of wildlife resources is an important link in promoting the sustainable development of the industrial economy and can give a new impetus to the industrial economy (Dong et al., 2022). With the implementation of comprehensive sustainable development strategies and the deepening of the concept of sustainable development, wildlife protection has attracted widespread attention. The development of wildlife protection is one of the important symbols of the degree of scientific culture and spiritual civilization around the world today. Wildlife is a very valuable natural resource, an important part of biodiversity and natural ecosystems, mountains, water, forests, lakes, and grasses. Therefore, we can say that it is the key to the community of life.

One of the native deer in Indonesia is the Sambar deer (Cervus unicolor) (Susanty, 2018). This species is a protected species based on the decree of the Government Regulation of the Republic of Indonesia No. 7/1999 and the Minister of Forestry No. 305/Kpts-11/1991. This species has been categorized as a low-risk species in 2006. This is because the population of this species is declining as a result of forest destruction, poaching, and limited reproductive capacity of Sambar deer (Gholib et al., 2021).

Deer breeding is one of the ex-situ conservation efforts for deer which are protected animals. Deer breeding management at this time in addition to conservation purposes also aims at sustainable use, its management covers various aspects, especially the provision of feed which greatly affects the production and reproduction of deer (Fauzi et al., 2023). One form of ex situ conservation efforts in Aceh is in Deer Park Desa Lamtanjong Kabupaten Aceh Besar which is a tourist attraction visited by many Acehnese people. One of them is knowledge about the behavior of these animals as basic knowledge to support further research, such as feed, reproduction, habitat ecology, and so on.

Excessive and uncontrolled use of deer can result in a decrease in animal populations in nature. However, sambar deer are wild animals that tend to stay away from humans, other studies have also observed through camera trap data and analysis of activity patterns that sambar deer are cathemeral (Tan et al., 2018). In addition, sambar deer have been recorded in the wild as solitary and rarely in herds (Wong et al., 2019), so it is difficult to get it directly in nature, so to study this animal can be done in captivity.

Captive breeding is one of the commodities that can provide. Benefits to the surrounding community through involvement as a workforce. In relation to food security, it can be interpreted as the availability of access to existing food sources such as captive-bred venison so that it can meet basic needs (Pangestuti et al., 2023).

Based on this background, the researcher wanted to conduct a study entitled "Study of Daily Behavior of Sambar Deer (Cervus unicolor) in Ex-situ Conservation Areas in Deer Park Desa Lamtanjong Kabupaten Aceh Besar".

The purpose of this study is to determine the daily behavior of sambar deer (Cervus unicolor) in ex-situ habitat in Deer Park, Lamtanjong Village, Aceh Besar Regency. To find out the most dominant behavior carried out by sambar deer (Cervus unicolor) in Deer Park Desa Lamtanjong Kabupaten Aceh Besar.

Method

This research was conducted in ex-situ captivity at Lamtanjong Village Deer Park, Aceh Besar Regency for 14 days starting from 07.00-18.00 WIB. This study was conducted on October 24 to November 6. The tools used in this study were mobile phone cameras, stationery, observation sheets and practicum guides, mobile phone stop watches. The material used is sambar deer (Cervus unicolor) found in ex-situ captivity, Lamtanjong Village Deer Park, Aceh Besar Regency. Land is the foundation of socio-economic growth and an integral member of the ecological system because it is an important resource for human life and development. This study used a quantitative approach. The population in this study is the entire sambar deer (Cervus unicolor) found in Lamtanjong Village Deer Park, Aceh Besar Regency. While the sample in this study was 6 sambar deer consisting of 2 males and 4 females. Data obtained during the two weeks of observation will be analyzed descriptively, averaged and percentage to determine the percentage of daily behavior each day. Observations made in this study include eating behavior, shifting behavior, resting behavior, grooming, and reproduction. To estimate the activity curve, the number of activities is aggregated for all individuals and the average number

per hour period is calculated. As with movement rates, the amount of activity per hour over a 24-hour period is aggregated for all individuals and the average amount of activity per hour is calculated. The average activity count was then converted into a continuous variable following Lashley et al. (2018). Calculation of the percentage of daily behavior (Lashley et al., 2018).

$$\% \text{ Behaviour} = \frac{\text{Duration of activity (minutes)}}{\text{Total observations (minutes)}} \; x \; 100\% \qquad (1)$$

Result and Discussion

The daily behavior of sambar deer is an activity carried out by sambar deer, the activity itself aims to meet a need. Deer breeding is one of the ex-situ conservation efforts that can be done to maintain the deer population which from year to year is declining due to hunting, habitat destruction and the increasing urgency of wildlife such as deer looking for other habitats to sustain life (Fauzi et al., 2023).

The daily behavior of sambar deer (Cervus unicolor) in Lamtanjong Village Deer Park, Aceh Besar Regency was observed on October 24 to November 6, 2020 for 14 days of observation from 07.00 to 18.00 WIB. Based on research and data analysis that has been carried out on sambar deer in Lamtanjong Village Deer Park, Aceh Besar Regency, there are five types of daily behaviors including eating, moving, resting, grooming, and reproductive behavior, can be seen in the following picture.
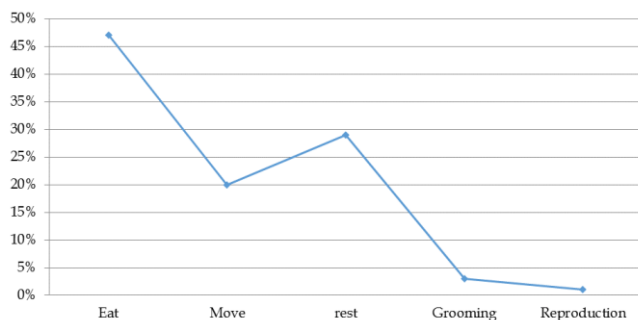

Figure 1. Daily behavior percentage of Sambar Deer (*Cervus unicolor*)

From the figure above, it can be seen that the most widely carried out behavior is eating behavior, followed by resting behavior, shifting behavior, grooming behavior, and the least behavior, namely reproduction. Feeding is a behavior in which deer breed and put food in their mouths.

According to Fauzi et al. (2023), the daily activity of sambar deer is an activity carried out by sambar deer, the activity itself aims to meet a need. Deer breeding is one of the ex-situ conservation efforts that can be done

to maintain the deer population which from year to year is declining due to hunting, habitat destruction and increasingly urgent wildlife such as deer looking for other habitats to sustain life. Avoiding extinction and at the same time utilizing deer optimally and sustainably can be done through ex-situ conservation captivity. Deer breeding has prospects because deer easily adapt to environments outside their natural habitat, have high production and reproduction rates. In the development of captive breeding there are several things that need to be considered, namely the habitant component consisting of feed, water, shade, and space. Deer have a high adaptation to the surrounding environment so they are easy to breed (Elfrida et al., 2019).

The feeding behavior of a deer will differ based on the composition of the feed and differences in habitat types, the main feed of deer is grass and leaves that contain protein and energy. Body size also affects the feeding factor in sambar deer, in male deer the metabolic process of body cells runs higher so that to be able to meet the needs of body cells in the metabolism of male deer consume more food. This is in accordance with the results of Fauzi et al. (2023) research because adult male sambar deer and adult female sambar deer are more powerful and focus on feeding behavior during feeding by captive breeding officers, so that adult male sambar deer and adult female sambar deer.

From the observation data, it was also found that sambar deer also choose younger grass to eat, this is because digesting young grass is more effective for existing energy use. According to Hombing et al. (2018), the staple food of deer is forage in the form of leaves and grasses whose availability is sometimes limited in captivity, so additional feed (drop in) is needed.

Walking or moving sambar deer generally occurs in the morning, afternoon and evening where this walking activity is carried out to find food in captivity or visit food given by rooting officers, while during the day it is usually done to find shelter or shelter and to drink (Fauzi et al., 2023). This is in accordance with Sofyan et al. (2018) who stated that walking behavior in nature is usually carried out by deer to move from one place to another, generally from one vegetation area to another to find food or to find a safer shelter due to disturbances. Deer sambar saplings carry out walking activities as an environmental adaptation. From the results of the study, it was found that the highest resting behavior of deer occurred in hot weather. Conditions in captivity with many trees and deer houses as protection so that deer are in groups to carry out resting behaviors (Fauzi et al., 2023).

Grooming is a social activity in the form of touch carried out by mammal groups. This behavior can be done singly or in pairs. Individual touch behavior is

called autogrooming while touch behavior carried out in pairs is called allogrooming (Hilabi et al., 2019). Grooming activity is a way of interacting with other individuals and the manifestation of affection shown from one individual animal to another animal, usually done by a mother to her child or to the same type of species, and also done by male deer towards female deer and vice versa by licking generally done by deer during resting activities and in feeding activities. The behavior patterns of deer interacting with grooming are usually carried out by mothers to children or to partners Fauzi et al., 2023). Grooming behavior is a manifestation of affection shown from one individual animal to another, usually carried out by individuals to children or to the same type of species (Sofyan et al., 2018). This behavior is done to fight for food and drive other deer away from the food source. During the observations, it was seen that adult male Timorese deer were most dominant in the fight for food. This is in accordance with the statement of Gusmalinda et al. (2018) that fighting by rubbing horns is carried out between male deer to fight for females or fight for feed.
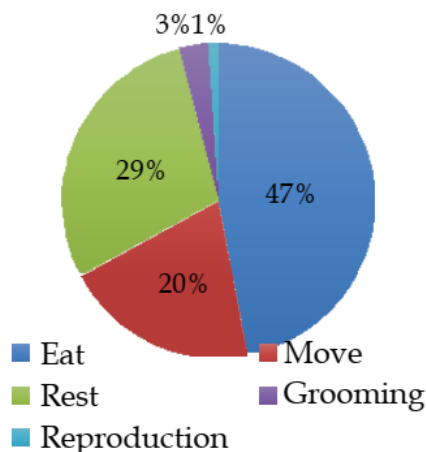

Figure 2. Diagram of average daily behavior of Sambar Deer (Cervus unicolor) in Deer Park, Lamtanjong Village, Aceh Besar Regency

From the observations, it is known that the percentage difference in daily behavior carried out by sambar deer, where eating behavior as much as 47%, moving behavior as much as 20%, resting behavior as much as 29%, grooming 3%, and reproduction 1%. Based on these percentages, eating behavior has the highest percentage.

Based on the results of the study, the difference in the percentage of daily behavior of sambar deer per hour. The difference in the length of deer eating is also influenced by the different types of feed ingredients given and the area of residence. Ruminant behavior is the removal of food from the rumen regurgitated into the mouth. Based on the results of observations made for

14 days, it can be seen that the feeding behavior of sambar deer in Deer Park Desa Lamtanjong Kabupaten Aceh Besar Not limited by time, because eating activities can be done randomly without any specific times. While there is also a statement that says that eating activities are centered in the morning and repeat in the afternoon.

Conclusion

Eating behavior is the most important behavior in the survival of living things. Eating behavior is the behavior of animals in obtaining food. The feeding activities observed in this study were in the form of grazing, ruminants, and eating feed given by guards. The feeding behavior of sambar deer in Lamtanjong Village Deer Park, Aceh Besar Regency has the highest percentage compared to other activities observed, this is because the available habitat area is smaller than its natural habitat, in addition to that because food is available in the young and eats the tops of the fence kedondong leaves planted around the fence. Sambar deer get food supply from the handler manager, sambar deer choose to eat young leaves first and leave old leaves. The grass eaten by sambar deer is elephant grass (Pennisetum purpureum), deer are animals that have a high body weight, so they require a lot of food intake. When the deer starve, the deer's fur will wake up and reveal a restless atmosphere. The pattern of mahing in deer, as in cattle and sheep, has to do with the absence of upper incisors. The way to graze a deer is to wrap the tongue around the grass in its mouth, then jerk its head forward so that the grass is cut by the lower incisors just like a cow.

Conflicts of Interest
No Conflicts of interest.

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