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Individual Behavior Of Female Sumatran Orangutan (Pongo abelii L.) With Management System In Siantar Zoo

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Abstract. The Sumatran orangutan (*Pongo abelii*) is an endangered species due to the destruction of its forest habitat and deforestation. Various conservation efforts have been made to prevent the orangutan extinction,such as ex-situ conservation in Siantar Zoo.This study aims to determine the behavior of individual female orangutans at Siantar Zoo with a management system. The observatuons was conducted for 14 days in August with the focal animal sampling method and data recorded using the Instantaneous method.The results showed the overall frequency of individual female orangutan behavior were resting (40%), eating (35%), moving (14%), special (6%), self care (4%) and pooping (1%). The behavior of individual female orangutans is influenced by the number of visitors, namely the resting behavior of the crowded visitor category 39,15%, medium category 41.81% and quiet 39.68%. The eating behavior of the crowded visitor category is 37.80%, the medium category is 33.56% and the quiet category is 34.68%. The moving behavior in the quiet, medium and crowded categories is 14.18%; 12.85%; 11.67%. The specific behavior for the quiet, medium and crowded categories was 6.19%; 5.55%; 5.59%. Self-care behavior in the crowded visitor category is 4.34%, the medium category is 4.60% and the quiet category is 4.01%. The behavior of pooping in the crowded category is 1.45%, in the medium category is 1.62% and in the quiet category is 1.27%.The female orangutan management system at Siantar Zoo is analyzed as having a fairly good and regular system. The cage management has met the minimum requirements and the female orangutan has a good body weight and has never been infected with a serious disease.

Keyword: Individual behavior, Femanle sumatran orangutan, Siantar zoo

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1 Introduction

Orangutans are a type of great ape found in Asia and are only found in the interior of the forests of Sumatra and Kalimantan [1]. The orangutan's original habitat is currently shrinking due to the destruction of forest areas to a critical condition. The current forest destruction is due to forest fires, widespread forest propagation into settlements and plantations and human disturbances [2].

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This causes a decline in the orangutan population in its natural habitat. In addition, the rampant poaching has also caused the orangutan population to decline. This very alarming condition causes orangutans to be categorized as critical/critically endangered [3]in the [1] To preserve the orangutan population, strategic conservation efforts are needed. The best protection and preservation is through long-term conservation by maintaining orangutan species in their natural communities and habitats, known as in-situ conservation. However, in-situ conservation is also still less effective because it is caused by human activities that have a negative impact, such as excessive forest area encroachment and poaching that disturbs orangutans and threatens their survival. Therefore, other efforts are needed to prevent the extinction of this endemic animal by maintaining individuals naturally with good supervision and control outside their natural habitat, known as ex-situ conservation [4] Ex-situ conservation consists of various types which are basically to preserve wildlife outside their natural habitat. One of them is a zoo. Based on the regulation of the Minister of Forestry of the Republic of Indonesia Number P.31/Menhut-II/2012 concerning Conservation Institutions that zoos and other conservation institutions have the function of controlling the breeding of wild animals by maintaining their genetic purity. Article 2 (2) of the Minister of Forestry Regulation No. P.31/2012 states that the zoo functions as a place for education, demonstration, temporary care, a source of broodstock and genetic reserves to support in situ populations, healthy recreational facilities, as well as research and scientific development. Therefore, the zoo has good potential as a place to conduct research because the zoo manages various diversity of living things in a controlled manner. Animals that are conserved in a zoo will experience different conditions from their natural habitat. This condition will have an impact on the quality of life o f the animals in it, including orangutans. In addition, poor management of the zoo, such as feeding, type and size of cages and other facilities that are less supportive will cause orangutans to experience stress, this will affect the behavior of orangutans in the zoo so it is necessary to conduct research that focuses on the behavior of individual orangutans in conservation. ex-situ. The success of orangutans in adapting to zoos can be seen through individual behavior, such as playing, how to eat, and other behaviors they do[5]. The Siantar Zoo is one of the ex-situ conservation centers in North Sumatra. It has one adult female orangutan named Bonaria, who is ± 11 years old and has been at the Siantar Zoo since 2012 which was initially placed in a cage until the year 2012. 2017, then the Siantar Zoo changed the shape of the cage to a semi-open (enclosure) until now, this situation will affect the behavior of individual orangutans.

2. METHODS

The study was conducted in August 2020 for 14 days, with a period of 6 hours (10.00 to 16.00 WIB) per day at the Siantar Zoo, North Sumatra Province. The object of this research is an adult female Sumatran orangutan named Bonaria who is ± 11 years old. Bonaria has a height of ±144

cm and a weight of ±72 Kg. This research was conducted by using Focal Animal Sampling method. Observation of the behavior of individual orangutans in this study was carried out starting when the orangutan was released from the cage (in holding) by the keeper to the open cage (enclosure) which is around 10.00 WIB until 16.00 WIB before being put back into the holding (according to the routine schedule at Siantar Zoo). This research was conducted for 14 days, which was differentiated based on the number of visitors, namely the Quiet Category, ranging from 1 to 100 visitors; Medium Category, 101 to 1,000 visitors; and Crowded Category, more than 1,001 visitors. with the recording time of each individual behavior of two minutes. Individual behavioral data observed in female orangutans are recorded in tabulations with details and limitations as follows:

1. Eating Behavior, with sub categories: Choosing (Md), Taking (Mb), Processing (Mg), and eating from visitors (Mp).
2. Moving Behavior, with sub categories:
   - Switch places using all four locomotion tools (Quadrupedral)
   - Switch places using both locomotion (Bipedal)
   - Climbing with all four movement tools (Climb)
   - Swing (Branchiation)
3. Resting behavior, with sub categories: sitting (Id), lying down (Ib), dependent (Ig), and sleeping (Ir).
4. Disposing of feces, with sub categories: defecation (DF) and urination (UR)
5. Self-care behavior, with sub categories: body scratching (SB) and preening (BS).
6. Special Behavior, with sub categories: Marriage (Pk) and Making Nests (S).

The data on the behavior of the individual orangutans as the object of observation were then tabulated and the presentation determined using the formula used in the previous study by Williyanti (2010), as follows

$$\boldsymbol{Behaviour\ category} = \frac{\boldsymbol{Behaviour\ frequency}}{\boldsymbol{total\ frequency\ of\ all\ behaviour}} \boldsymbol{x\ 100} \quad \textbf{(1)}$$

3. Result and Discussion

3. 1. Female Orangutan Individual Behavior in General

The results of research that has been conducted on the individual behavior of the female orangutan Bonaria (11 years old) obtained six categories of individual behavior that

vary greatly. In general, the frequency of individual behavior of Bonaria can be seen in (Figure 1.)

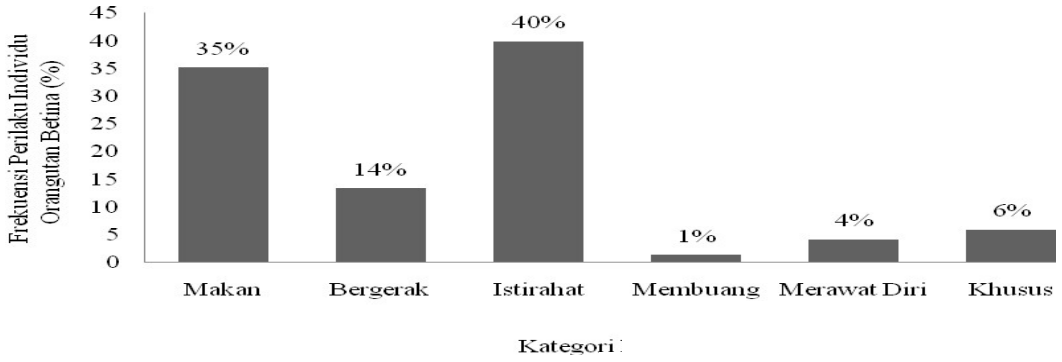

Figure 1. Graph of the frequency of individual female orangutan behavior in general

Based on **Figure 1**. it is known that the highest frequency of female orangutan behavior is obtained by resting behavior by 40%, then followed by eating behavior by 35% and moving behavior by 14%, while the lowest frequency of behavior is special behavior 6%, self-care behavior 4% and behavior to dispose of feces 1%. The high frequency of resting behavior was found by female orangutans at the Siantar Zoo, such as sitting, lying down, hanging and sleeping. This condition is higher when compared to the results of [7] in August 2018 observations which found the frequency of resting behavior of female orangutans at the Siantar Zoo was 36.89%. This shows an increase in the percentage of the frequency of resting behavior of female orangutans at the Siantar Zoo after ± 2 years. This percentage increase is due to the increasing age factor, and the increase in body weight of these orangutans. According to [8], the cause of the high percentage of resting behavior of adult female orangutans is due to their large body weight so that adult female orangutans do more resting activities than with other activities.

3.2.Resting Behavior

Orangutan resting behavior is a condition when the orangutan does not do any activity, such as sitting, lying down, sleeping and hanging for more than one minute. Generally, female orangutans do resting behavior at the Siantar Zoo during the day to save energy because during the research, the weather around the Siantar Zoo tends to be sunny and hot

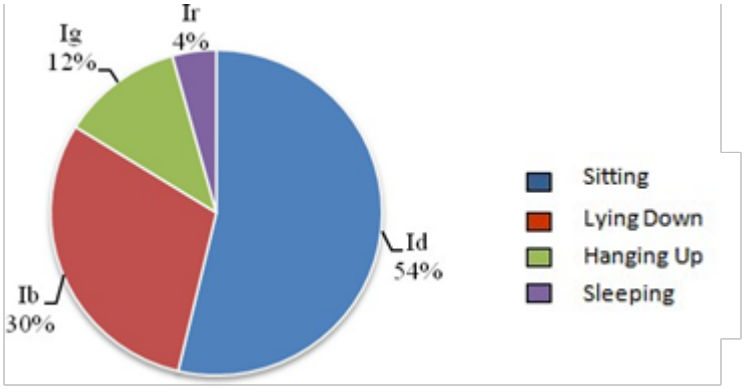

Figure 2. Percentage of the frequency of resting behavior of female orangutans

Based on Figure 2. it is known that the category of resting behavior of female orangutans is the highest at 54% in the sitting category, followed by the lying category at 30%, hanging 12% and sleeping at 4%. This is because female orangutans have a large weight so that orangutans tend to sit on artificial tree treads. The area of the artificial tree's footprint is not too large, so the orangutans feel uncomfortable lying down. If the orangutan wants to lie down, it will climb onto the roof of a wider artificial tree and occasionally an orangutan can be seen sleeping with its eyes closed. In the afternoon when the weather is not too hot, orangutans tend to rest by hanging their legs on ropes for a long period of time

Figure 3. (a) Hanging rest behavior (b) Sitting rest behavior

3.3. Eating Behavior

The eating behavior of female orangutans includes the movement of orangutans when eating, drinking and the length of time it takes for orangutans to finish their food. This eating behavior includes the behavior of choosing, taking, and processing (Figure 4.).

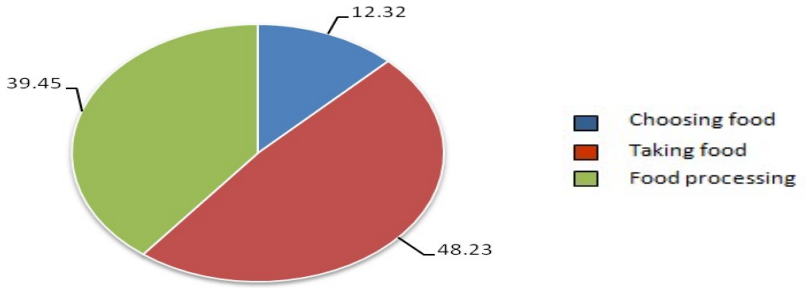

Figure 4. Percentage of the frequency of eating behavior of female orangutans

From Figure 4. it is known that the category of eating behavior of female orangutans is the highest category of taking food by 48.23%, followed by the category of processing food 39.45% and choosing food 12.32%. Female orangutans at the Siantar Zoo are active in eating behavior in the morning after the keeper spreads the feed at around 09.00-10.00 WIB. Generally, orangutans move to take feed quadrapedally and immediately take the available feed. [6] stated that primates have the ability to collect food with the ability to grip hands.

Figure 5. Feeding behavior of female orangutans

During the study, it was found that the type of feed given to orangutans varied every day such as vegetables (kale, papaya leaves, long beans, mustard greens) and fruits (papaya, banana, corn, sapodilla, tomato). Orangutans are also occasionally given additio nal food such as eggs, coconut and bean sprouts to enrich their nutrition. Then the orangutan was seen to have an unusual way of drinking water, namely by throwing a swing rope into the pond and then pulling it and sucking on the wet rope. This innovation in drinking methods is carried out to avoid the threat of predators in the river because orangutans are not good at swimming [7]

3.4. Movement Behavior

The behavior of orangutans moving from one location to another in open cages to look for and get food, around the area obtained during the study includes the sub-behavior of Quadrupedal, Bipedal, Climb, and Branchiasi.

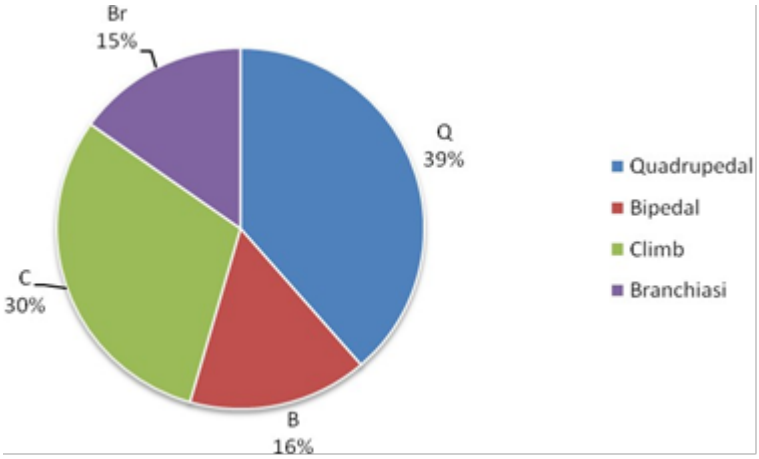

Figure 6. Percentage of the frequency of moving behavior of female orangutans

From Figure 6. it is known that the category of moving behavior of female orangutans is the highest in the Quadrupedal category at 39%, followed by the 30% climb category, 16% bipedal and 15% branchiation categories. The high quadrupedal category is because orangutan keepers tend to put food on the floor, so female orangutans move down from artificial trees and walk to fetch food quadrupedally. Then after taking the food, the female orangutan will climb up to the artificial tree to enjoy the food.

Figure 7. (a) Quadrupedal movement behavior (b) Climb . movement behavior

Figure 8. (a) Branchiasid locomotion (b) Bipedal locomotion

3.5. Special Behavior

The special behavior of female orangutans at the Siantar Zoo that was obtained during this study, namely pre-mating behavior and building nests, the emergence of this behavior was due to the instincts of female orangutans who had entered adulthood (11 years). LIPI (1982) said that female orangutans begin to mature when they are 10-12 years old, at this age orangutans have begun to show the formation of natural instincts as adult females, whichinclude nest building behavior and pre-marital behavior.

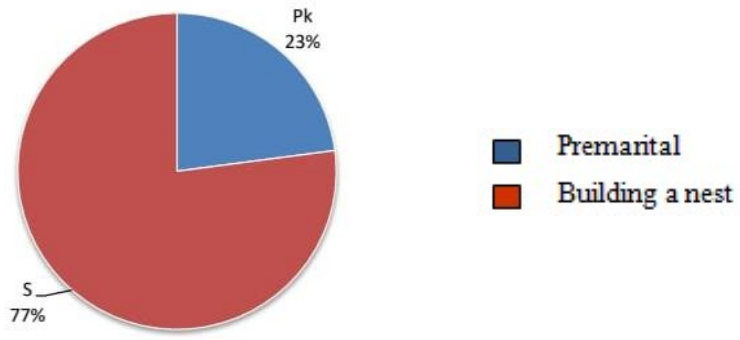

Figure 9. Percentage of the frequency of special behaviors of female orangutans

From Figure 9. it is known that the highest category of special behavior for female orangutans is the nest building category at 77%, followed by the premarital category at 23%. During the research, it was seen that the keeper gave enrichment in the form of tree branches into the orangutan cage. Then the female orangutan was seen enthusiastically and actively taking the branch, carrying it up to an artificial tree and then starting to break, string and arrange it into a nest (Figure 10).

Figure 10. Nest building behavior of female orangutans

In pre-marital behavior, female orangutans are seen to start seducing male orangutans by approaching, holding their faces, directing the male orangutan's hands towards the genitals and kissing the male orangutan's genitals. However, male orangutans refuse and try to avoid female orangutans, because male orangutans are immature and do not yet have the instinct to copulate.

3.6. Self-Care Behavior

Self-care behavior is a category of female orangutan behavior at the Siantar Zoo with the second lowest frequency percentage after the category of throwing feces. This behavior category consists of grooming and preening. After observing the results obtained as shown in Figure 11.

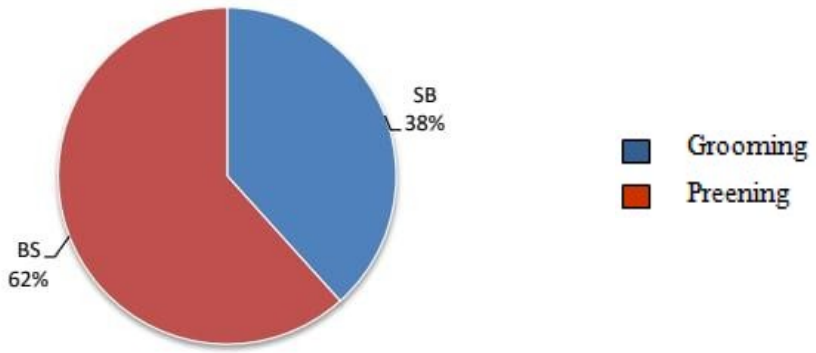

Figure 11. Percentage of frequency of female orangutan self-care behavior

From Figure 11. it can be seen that the category of self-care behavior of female orangutans is the highest in the preening sub-category, which is 62%, while the grooming category is 38% (Figure 12). In general, female orangutans perform self-care behavior when resting during hot weather and occasionally female orangutans can be seen taking care of themselves while playing with male orangutans. Self-care is a behavior that aims to pamper and cleanse oneselfof dirt or parasites on the body.

Figure 12. Self-care behavior of female orangutans

7. Disposal Behavior

The category of littering behavior is the category with the lowest percentage of frequency. The behavior of removing feces is divided into two, namely defecation and urination. The results of the observations can be seen in **Figure 13**.

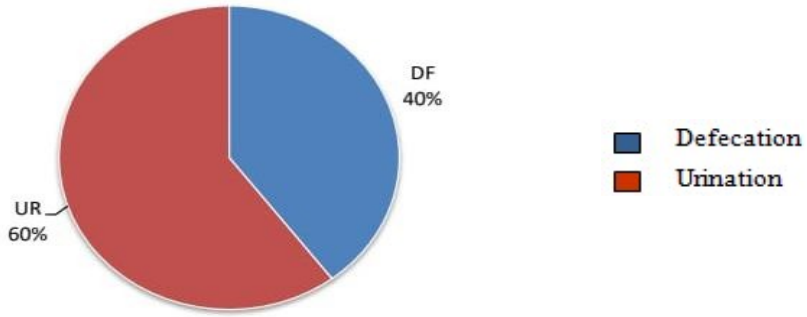

Figure 13. Percentage of frequency of female orangutan droppings behavior

From **Figure 13.** it is known that the subcategory of urination behavior subcategory is greater that is 60% than defecation which is 40%. During the observation, orangutans were often seen defecating and urinating simultaneously in the morning after leaving the holding cage. Usually female orangutans climb onto tree trunks to remove feces in a standing or squatting position. The average frequency of defecation and urination of female orangutans during observation was only 2 and 3 times per day.

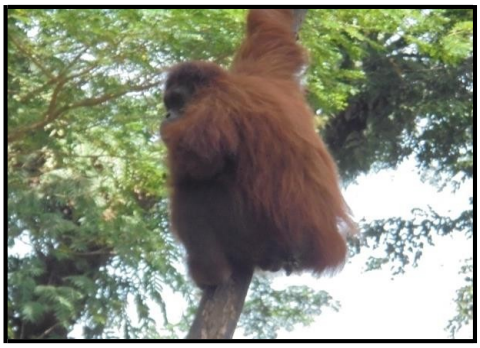

Figure 14. Female orangutan defecating

Conclusion

The result of research on the percentage of the frequency of individual behavior of female orangutans in Siantar Zoo is 40% resting behavior, eating behavior 35%, moving behavior 14%, special behavior 6%, self-care behavior 4% and pooping behavior 1 %.

Reference

[1] [Dephut]Departemen Kehutanan, 2007. Strategi dan Rencana Aksi KonservasiOrangutan [Dirjenbun]

[2] Fredriksson G, Indra M, 2007. Hutan Batang Toru Harta Karun Tapanuli. Tapanuli: Yayasan Ekosistem Lestari.

[3] .[IUCN], 2002. IUCN Red List of Threatened Species.http://www.redlist.org/.

[4] Noprianto A, 2004. Kajian Pengelolaan Orangutan (*Pongo pygmaeus pygmaeus,* L) di KebunBinatang Ragunan Jakarta. [Skripsi]. Bogor : Institut Pertanian Bogor.

[5] Shariman PSMA, Ruppert N, 2017. *Effect of Environmental Enrichment on Activies of Captive Orangutans at Taiping Zoo, Malaysia*. *Malayan Nature.* 69 (4):327-335

[6] Willyanti F, 2010. Perilaku Harian Anak Orangutan Sumatera (Pongo abelii) Akibat Adanya Aktivitas Manusia di Pusat Pengamatan Orangutan Sumatera, Bukit Lawang, Taman Nasional Gunung Leuser. [Skripsi]. Medan: Univeristas Sumatera Utara

[7] Naibaho E, 2019. Perilaku Harian Individu Orangutan Sumatera (*Pongo abelii* l.) Di Taman Hewan Pematangsiantar. [Skripsi]. Medan: Universitas Sumatera Utara

[8] Sirait F, 2018. Analisis Aktivitas Harian OrangutanSumatera (*Pongo abelii*) di KawasanTaman Nasional Gunung Leuser Sirait. [Skripsi]. Medan: Universitas Sumatera Utara

[9] LIPI. 1982. Beberapa Jenis Mammalia. Lembaga Biologi Nasional LIPI. Bogor.