

Preference of Simpai (*Presbytis melalophos melalophos*) on Forage Plant Types in Bukit Daun Protected Forest of Taba Penanjung District, Central Bengkulu Regency

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ABSTRACT

Sumatran Simpai has a preference for certain forage plant varieties in their habitat. Preference is a result of all factors determining the animals' interest level in their food. Generally, the preferred food is affected by its taste, smell, and colour. The study aimed to find Sumatran Simpai's (*Presbytis melalophos melalophos*) preference on forage plant varieties and plants' organs eaten in Bukit Daun Protection Forest of Taba Penanjung District of Central Bengkulu Regency. This study was conducted from June to July 2020 in Bukit Daun Protection Forest of Taba Penanjung District of Central Bengkulu Regency. "Focal Animal Sampling" method was implemented to observe the monkeys' group activities and "Continues Sampling" was used to record the duration of monkeys' eating activity on certain plant varieties until they moved to another food. Data collected were analyzed quantitatively and qualitatively. There were 20 plant varieties as Sumatran Simpai's forage. The most preferred forage plants (many categories) were Bendo (*Artocarpus elasticus* Reinw. Ex. Blume) with a preference value of 14.1%, plant in the average category was Meranti (*Shorea leprosula* Miq.) (9.24%), and plants in a few categories were Balam (*Syzygium* sp.) (1.12%), Melung (*Azadirachta* sp.) (1.43%), Bayur (*Pterospermum javanicum*) (1,31%), and Balam (*Syzygium* sp.) (1.12%). The most liked plants' organs were leaflets (100%), fruit (25%), and flower (15%).

Keywords: Foraging preference, Sumatran Simpai (*Presbytis melalophos melalophos*), Bukit Daun Protection Forest.

1. INTRODUCTION

Sumatran Simpai (*Presbytis melalophos melalophos*) is a primate from cercopithecidae family living in a natural habitat, Sumatra tropical rain forest. This animal is a rare and endangered endemic Sumatra primate based on the red list of the International Union for Conservation of Nature version 3.1 [1]. In Bengkulu, there are two subspecies; they are *Presbytis melalophos melalophos* and *Presbytis melalophos bicolor*. *P. melalophos melalophos* species was spread in the Regency of Seluma, Central Bengkulu, Kepahiang, Rejang Lebong, and North Bengkulu, and Muko-

muko, meanwhile *P. melalophos bicolor* was spread in the regency of South Bengkulu and Kaur [2].

The threat status of the mammals mostly influenced by some interference in its natural habitat. The habitat is determined by the availability of forage plant varieties and appropriated environment [3]. Vegetation quality in a degraded habitat is reflected on low plant variety including forage plants. The degrading of vegetation and cover area's quantity and quality causes the wildlife is hard to earn forage plant varieties, habitat, and moving space [4]. Forest interference also affects forage source availability since it can be one of the habitat quality indicators.

High-quality habitat has more forage than low-quality habitat. Forage ability also gives an impact on group size and its population [2].

Sumatra Simpai's population may be reduced due to forest degradation and destruction. Besides, hunting sometimes is done by people near the forest to illegally sell or to pet the animal.

Bukit Daun Protection Forest at Taba Penanjung District of Central Bengkulu Regency is one of the main habitats for *P. melalophos melalophos*. The forest area is about 8,045 ha which the primary forest area is 1,038.11 ha and the secondary one is about 7.01 ha. Geographically, the research location, Bukit Daun Protection Forest, is at 03° 41' 100" – 03° 42' 772" S and 102° 31' 761" – 102° 32' 327" E [20]. Bukit Daun Protection Forest nowadays has been affected by people's activities such as illegal logging and land clearing for any needs. Deforestation is expected to give an impact on the primate's consumption activity especially on the availability of forage plant varieties. This study aimed to find Sumatran Simpai's preference for forage plant varieties at HLBD through direct observation. The objectives of this study are to find Sumatran Simpai's preference on forage plant varieties and plants' organs consumed by the primates in Bukit Daun Protection Forest at Taba Penanjung District of Central Bengkulu Regency.

2. MATERIALS AND METHOD

This study was conducted in Bukit Daun Protection Forest, Taba Penanjung village of Central Bengkulu Regency from June to July 2020. The observation of Sumatran Simpai's activities was done using a binocular and followed its movements. This study implemented a focal animal sampling method to observe *P. melalophos melalophos* activities at certain times and used a continued sampling method to recorder the duration of Simpai's activity to eat a certain plant in groups until they moved to another forage plant. Observation and data collection were obtained for a month (two times a week) according to Simpai's active time at 06.00-10.00 then continued at 14.00-18.00.

Data collected were analysed quantitatively and explained descriptively. The consumption preference was calculated using a modified formula by [5] and the preference category was based on frequency distribution analysis by implementing an interval formula by [6].

$$No = \left(\frac{ni}{N}\right) \times 100\% \tag{1}$$

Note:

No : Sumatran Simpai's consumption preference
 Ni : Duration for Simpai to consume out a certain forage plant variety

N : Total duration for Sumatran Simpai to consume out all forage plant varieties

$$\text{Interval} = \frac{\text{the biggest data} - \text{the smallest data}}{\text{the number of groups}} \tag{2}$$

Note:

Many Category (+++)

Average Category (++)

Few Category (+)

3. RESULTS AND DISCUSSION

3.1. Sumatran Simpai's Preference for Forage Plant Varieties

Sumatran Simpai's preference for natural forage plant varieties in Bukit Daun Protection Forest at Taba Penanjung Village of Central Bengkulu Regency is presented in Figure 1 and Table 1.

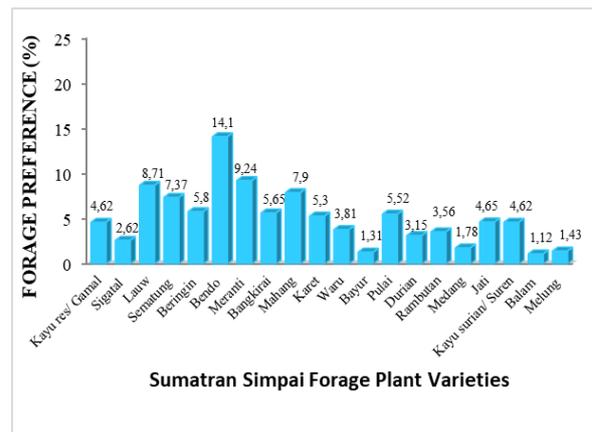


Figure 1. Sumatran Simpai's Preference for Simpai (*P. melalophos melalophos*) Forage Plant varieties.

There were 20 varieties of Sumatran Simpai's forage plants; they were from Moraceae, Dipterocarpaceae, Euphorbiaceae, Malvaceae, Apocynaceae, Sapidaceae, Laurraceae, Lamiaceae, Meliaceae and Myrtaceae (tree and pole shaped), Euphorbiaceae, Fabaceae and Meliaceae (shrub shaped). The most preferred forage (many categories) was Bendo (*Artocarpus elasticus*) with a preference value of 14.1%, Meranti (*Shores leprosula*) in average category (9.24%), and the least preferred forages (few categories) were Melung (*Azadirachta* sp.) with preference value of 1.43%, Bayur (*Pterospermum javanicum*) (1.31%), and Balam (*Syzygium* sp.) with a preference value of 1.12%.

Bendo was the most preferred by Sumatran Simpai since it had a wide leaflet and watery soft leaf blade and available for the whole year therefore it became a favourite forage source for folivorous primates like Sumatran Simpai. [7] stated that commonly leaflet has more protein and less tannin

has lower coarse fiber. [8] mentioned that the leaf, fruit, and stem's skin of *Artocarpus elasticus* saponin and polyphenol. Besides, its leaf and fruit also contain flavonoids. [9] added that forage plant varieties which are tree and pole shaped are also used for sleeping. Bendo (*Artocarpus elasticus*) in the field

Table 1. Foraging preference category based on frequency distribution analysis

No	Area Name	Plants Species	Family	Preference Category
1	Kayu res/ gamal	<i>Gliricidia sepium</i>	Fabaceae	+
2	Sigatal	<i>Ficus fulva</i>	Moraceae	+
3	Lauw	<i>Ficus variegata</i> Blume	Moraceae	++
4	Sematung	<i>Ficus padana</i>	Moraceae	++
5	Beringin	<i>Ficus caulocarpa</i>	Moraceae	++
6	Bendo	<i>Artocarpus elasticus</i>	Moraceae	+++
7	Meranti	<i>Shorea leprosula</i>	Dipterocarpaceae	++
8	Bangkirai	<i>Shorea leavis</i>	Dipterocarpaceae	++
9	Mahang	<i>Macaranga bacana</i>	Euphorbiaceae	++
10	Karet	<i>Hevea brasiliensis</i>	Euphorbiaceae	+
11	Waru	<i>Hibiscus tiliaceus</i>	Malvaceae	+
12	Bayur	<i>Pterospermum javanicum</i>	Malvaceae	+
13	Durian	<i>Durio zibethinus</i>	Malvaceae	+
14	Pulai	<i>Alstonia scholaris</i>	Apocynaceae	+
15	Rambutan	<i>Nephelium cusoidatum</i>	Sapindaceae	+
16	Medang	<i>Cinna momumporrectum</i>	Lauraceae	+
17	Jati	<i>Tectona grandis</i>	Lamiaceae	+
18	Kayu surian/ suren	<i>Toona ciliata</i>	Meliaceae	+
19	Balam	<i>Syzygium</i> sp	Myrtaceae	+
20	Melung	<i>Azadirachta</i> sp	Meliaceae	+

and lignin. The leaflet is also easily digested since it

Note:

+++ : Few

++ : Average

+ : Many

between tree is 3-5 meters, with dense crowns. From the observation, besides being a forage plant, it was also used by Summatran Simpai as a resting spot in the afternoon and sleeping place at night.

Merati (*Shorea leprosula*) was a loved forage plant by Sumatran Simpai after Bendo (average category). The Simpai liked Meranti leaflets and flowers since it smelled good and sweet and it was a big and tall tree with a wide crown. On Meranti, Sumatran Simpai seemed to move frequently from one branch to other branches to choose the leaflets and flowers. [10] stated that the primate is usually at the 16-24 m in height and branches (8-18). Sumatran Simpai is usually at the side of the tree where there are more leaflets. The monkeys are spread on the crow evenly. According to [11], the upper crown earns more sunlight for photosynthesis so that the

is 25-30 meters in height and the distance

leaves are rich in nitrogen and protein. The tree also has many bigger fruits.

The less preferred forage plants (few categories) were Melung (*Azadirachta* sp.) with a preference value of 1.43%, Bayur (*Pterospermum javanicum*) with a preference value of 1.31%, and Balam (*Syzygium* sp) with a value of 1.12%. These varieties were less preferred not only because they were less tasty and less nutritious, but also these varieties had to be shared with other primates like long-tail. Macaque (*Macaca fascicularis*), ape (*Macaca nemestrina*), gibbon (*Symphalangus syndactylus*), and agile gibbon (*Hylobates agilis*) as forage and resting spot. Sumatran Simpai (*Presbytis melalophos melalophos*). Observed was sensitive to other primate's existences especially related to forage and resting spot.

3.2. Plant Organs Consumed by Sumatran Simpai

Sumatran Simpai's preference for plant organs for consumption in Bukit Daun Protection Forest at Taba Penanjung Village of Central Bengkulu Regency is displayed in Tabel 2.

It can be seen that Sumatran Simpai liked leaflet organ from 20 recorder forage plant varieties (100%), followed by fruit organ from five *Ficus* genus (25%), and flower organ (15%). Simpai preferred leaflet because this organ contains high nutrition and water.

It is a folivorous primate that consumes leaflets (leaf monkeys), yet it also consumes other plant organs like fruit and flower. According to [12], Sumatran Simpai picks leaflet as main forage since it contains cellulose. Cellulose will be fermented by bacteria in the primate's digestive tract to be fatty acid that easily evaporates, just like Ruminantia digestive system. The digestive system is also found in high level primates like from Colobiane subfamily. Meanwhile, according to [7], a leaflet is preferred because it contains more protein and less tannin and lignin. Besides, the leaflet is also easily digested since it has less coarse fiber.

Table 2. Plant varieties and organs consumed by Sumatran Simpai (*Presbytis melalophos melalophos*)

No	Area Name	Plants Species	Family	Plants Organs Consumed		
				Leaflet	Flower	Fruit
1	Kayu res/gamal	<i>Gliricidia sepium</i> (Jack.) Walp.	Fabaceae	✓	✓	
2	Sigatal	<i>Ficus fulva</i> Reinw. ex Blume	Moraceae	✓		✓
3	Lauw	<i>Ficus variegata</i> Blume	Moraceae	✓		✓
4	Sematung	<i>Ficus padana</i> Burn F	Moraceae	✓		✓
5	Beringin	<i>Ficus caulocarpa</i> (Miq.) Miq	Moraceae	✓		✓
6	Bendo	<i>Artocarpus elasticus</i> Reinw. ex. Blume.	Moraceae	✓		
7	Meranti	<i>Shorea laprosula</i> Miq.	Dipterocarpaceae	✓	✓	
8	Bangkirai	<i>Shorea leavis</i>	Dipterocarpaceae	✓		
9	Mahang	<i>Macaranga bacana</i> (Miq.) Mull. Arg.	Euphorbiaceae	✓		
10	Karet	<i>Hevea brasiliensis</i> (Wild. ex A. Juss)	Euphorbiaceae	✓		
11	Waru	<i>Hibiscus tiliaceus</i>	Malvaceae	✓		
12	Bayur	<i>Pterospermum javanicum</i> Jungh	Malvaceae	✓		
13	Pulai	<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae	✓	✓	
14	Durian	<i>Durio zibethinus</i> L.	Bombaceae	✓		
15	Rambutan	<i>Nephelium cusoidatum</i> Blume	Sapidaeae	✓		
16	Medang	<i>Cinna momumporrectum</i> Roxb	Lauraceae	✓		
17	Jati	<i>Tectona grandis</i> L. f.	Lamiaceae	✓		
18	Kayu surian/suren	<i>Toona ciliata</i> M. Roem	Meliaceae	✓		
19	Balam	<i>Syzygium</i> sp	Sapotaceae	✓		
20	Melung	<i>Azadirachta</i> sp	Meliaceae	✓		
Total				20	3	5
Percentage (%)				100 %	15%	25%

Fruit choice is to fulfill the nutrition and water needs of Sumatran Simpai. [13] stated that fruit may give better nutrition than a leaf on Joja (*Presbytis potenziani*). Meanwhile, [14] stated that carbohydrate in fruit has an important role in animal's body because if the energy is fulfilled then protein, mineral, and vitamin will also be fulfilled. Besides the high carbohydrate content, animals also preferred fruit which has more water so that the fruit is easily digested [15]. On the Pulai (*Alstonia scholaris*), the most preferred organs by Sumatran Simpai were leaflet, flower, and fruit. The tree blooms and bears fruit from Mei to August. Its leaf has quite thick flesh and its flower has a good smell. According to [16], Sumatran Simpai did not choose bark on blackboard trees as it tastes bitter [17]. The blackboard tree is a

tolerant plant towards any soil and habitat [18], has scented light green to cream flowers, and its hair is dense [17]. [18] stated that this tree bark contains alkaloid detain, acitamin (ditamin), ektenin, ekitein, profirin, and triterpen (alpha amryn lupeol). The leaf contains ursolat acid and lupeol.

4. CONCLUSION

Based on the research on Sumatran Simpai (*Presbytis melalophos melalophos*) preference on forage plant varieties in Bukit Daun Protection Forest at Taba Penanjung District of Central Bengkulu Regency, it can be concluded from 20 varieties of Moraceae, Diptrocarpaceae, and Myrtaceae family, there were 3 Sumatran Simpai's forage preference categories; they were many, average, and few. In any

category, there was Bendo (*Artocarpus elasticus*) with a preference value of 14.1%. in average category, there was Meranti (*Shorea leprosula*) with a preference value of 9.24%. in a few categories, there was Balam (*Syzygium* sp.) with a preference value of 1.12%. the most organ plants consumed by Sumatran Simpai was leaflet (100%), followed by the flower organ (15%), and fruit (25%).

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