Identification of plant constituents for tapanuli orangutan (Pongo tapanuliensis) nest in Batang Toru North Tapanuli

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Abstract. Tapanuli orangutan is an endemic animal in North Sumatra that must be protected so that conservation efforts are needed to preserve it. Tapanuli Orangutan nests are the focus of this research. This research is aimed to know the variety of constituents plant the nests of tapanuli orangutan (Pongo tapanuliensis), to know the kind of the most dominant plant to construct the nests by Tapanuli orangutan (Pongo tapanuliensis), the composition of constituents the nests of tapanuli orangutan (Pongo tapanuliensis) in North Tapanuli. This research was primery forest Batang Toru National Park. This research using line transect method with 4 transects (transects I, II, III, IV) were used to observe the nest tree and the nest constituent of Tapanuli orangutan. This research results is there are 5 species of constituents plant the nests with quantity 14 nests. The most dominant tree nest is Syzygium sp (43%), Plant constituent orangutan nests also use the leaves of the Shorea hopeifolia (94.1%), as well as branches of Palaquium gutta (6.6%).

1. Introduction

Orangutans are the only surviving species of Asian ape. This makes the orangutan one of the protected animals both in terms of species and habitat which is getting closer and closer to extinction. One of the new orangutan species discovered in 2017 is the tapanuli orangutan. The Tapanuli Orangutan was previously considered the southernmost population of the Tapanuli orangutan. However, based on in-depth research by groups of Indonesian and foreign researchers in the fields of genetics, morphology, ecology, and behavior, it turns out that the Tapanuli Orangutan is taxonomically closer to the Bornean Orangutan (Pongo pygmaeus) so that must be separated into separate species. Research also indicates that the Tapanuli Orangutan is the ancestor of these three great apes [1].

Orangutans are very slow to reproduce: females have their first cubs at 15 years of age, with an interval of about 8 or 9 years between births, and they are divided into several forest blocks that are currently separated. Then the re-establishment of these populations will be very important for conservation and to avoid inbreeding. This small population size means that the Tapanuli Orangutan is the rarest and most threatened great ape species in the world. This typical species of Tapanuli is very vulnerable to disturbance so that the entire remaining habitat needs to be protected, currently the number of tapanili orangutans is around 800 individuals [2].
Orangutans are often used as symbols as "umbrella species" which have the meaning of balancing the ecosystem [3]. The conservation of orangutans affects the balance of the ecosystem in the forest. Although there are laws and institutions that are responsible for protecting the existence of orangutans, the orangutan population continues to decline due to various problems that occur such as poaching, illegal orangutan trade, illegal logging of trees that are the habitat of orangutans [4].

The Batang Toru Ecosystem, also called Harangan Tapanuli, with a total area of about 150,000 ha is located in the three regencies of Tapanuli, North Tapanuli Province. Of this area, nearly 142,000 ha is primary forest which appears dark green in satellite imagery on the map. The rest are degraded areas that need to be rehabilitated as well as to build corridors between separate forest blocks. Around 61.0% of primary forest is in North Tapanuli District, 29.7% in South Tapanuli, and 9.3% in Central Tapanuli.

Various efforts have been made to preserve the orangutans. One way is to restore a new habitat that is suitable for the needs of orangutans, orangutan habitat is generally in trees. Trees are one of the most important components for orangutans, trees can be used as a place to build their nests in the canopy. Orangutans build at least one nest per day [5]. Orangutans in constructing their nests use leaves, twigs, and lianas so that identification of the composition of orangutan nests is very important. To find out the factors that influence orangutans in making nests, so that information on the standardization of orangutans in nesting arrangements will be obtained [6].

The specific purpose of this research is to look at the trees that are often used as nests for the Tapanuli orangutans, and the composition of the nests so that efforts are needed to add trees that are often used as nesting trees. The urgency of this research is that the Tapanuli orangutan is a new species of orangutan that has just been discovered, so that new research is needed to support the survival of the Tapanuli orangutan.

2. Research methodology

2.1. Research site

Batang Toru Forest (HBT) has an area of about 136,000 ha and is divided into two blocks, namely the East block and the West block. Administratively, Batang Toru Forest is located in North Tapanuli, Central Tapanuli, and South Tapanuli Regencies, while geographically it is between 98° 53’ - 99° 26’ East Longitude and 02° 03’ - 01° 27’ North Latitude. The West Block Batang Toru Forest area has an altitude ranging from 50 meters above sea level to 1875 meters above sea level. The lowest point is on the Sihaporas River (near the town of Sibolga), and the highest point is at Dolok Lubuk Raya in the southern part of the Batang Toru Forest Area. The slope is between 16% to more than 60%, the terrain in the area is dominated by hilly and mountainous topography. Soil in Batang Toru Forest is sensitive to erosion.

2.2. Methods

Using line transects (straight line transects) for observation. The data is taken by making 4 transect lines with observation points (Transect I, II, III, IV). There is a transect line with a radius of 900 m field distance with the specified point, with a width of 50 m right and left. Each transect will be observed by walking slowly while observing each tree to see the nest. After the nest is found, then the way to take samples of the constituent plant of orangutan nests from the top of the tree is to climb the nest tree, then part of the plant is used as a constituent of Tapanuli orangutan nests (Pongo tapanuliensis). After the sample is obtained put in plastic packing. Then the nest compiler plant identification test is carried out with the help of the plant identification book with publisher Tjitrosoepomo, 2001; Van Steenis, 1978 [7,8]. Observation Parameters that are Types of plants that are often used as a place to make a nest and the part of a tree that is often used as a composition to arrange a nest (tree name, plant part).
3. Results and discussion

Making a nest is one of the daily behaviors of orangutans. The nest in question is a resting place for orangutans after carrying out their daily activities [9]. Daily activities are all orangutan activities that last from leaving the nest to sleep in the morning and ending until they re-enter the nest for the night [10]. All great apes, including orangutans, build nests that can be used both to rest during the day and to sleep at night [8]. Nests for orangutans can also function as a play area for young orangutans, shelters, childbirth, copulation, and feeding activities [11].

Based on interviews with guides in the field, wild Tapanuli orangutans do not repair old nests but semi-wild Tapanuli orangutans repair old nests by using fresh leaves and twigs for reuse [12]. Nesting activities for tapanuli orangutans include: breaking and bending tree branches, and taking leaves from trees to construct nests that will be used for resting (sleeping), mats for feeding, and protecting the body to withstand rain as shown in the image below [13]. Plants of the Tapanuli orangutan can be seen in Figure 1.

![Figure 1. Plants of the Tapanuli Orangutan Nest](image)

The number of plants that make up the nests of the Tapanuli orangutan found during the observation was 14 plants, consisting of 5 types of plants. The most widely used type of plant as a place to build nests is the Hayun dolok species in the local language, which is 6 trees (43%). Hayun dolok with the Latin name (*Syzygium sp*) from the Myrtaceae family, this cannot be separated from the morphology of *Syzygium sp.* which is more suited to the needs of orangutans in making nests. From the observations in the field, this type of tree has a hard wood texture, a height of up to 30 m, many branches, and leaves that are not very thick. So, the orangutans in this research location tend to choose *Syzygium sp.* compared to other trees, the behavior of selecting the part of the nest tree that will be used as a nesting place by orangutans is in tree branches [5].
Based on table 1, the Tapanuli orangutans in the Batang Toru Forest mostly make nests using leaves and twigs from the Shorea hopeifolia tree which are used for nesting. While the least on the Quercus gemelliflora tree. For example, in the nest of the Shorea hopeifolia tree, the nest of the Tapanuli orangutan uses leaves and twigs from Shorea hopeifolia. Orangutans in this area do not look for different types of trees from their nest trees, this is because most of the tree vegetation around the nest trees is very little. The tapanuli orangutan in the Batang Toru forest arranges their nests using leaves and tree branches used for nesting. nests are built from branches whose leaves are still fresh, most of the branches have medium-sized leaves.

Description Shorea hopeifolia has a single leaf, sitting alternately often 2 rows, flat leaf edges, and pinnate spines. Shorea hopeifolia flowers are bisexual flowers with radial symmetry and no epicalx. Meranti crown leaves are 5 and the contents of Shorea hopeifolia only contain 1 seed without endosperm. The tree is 20-60 m tall with a diameter of 150 cm and a branch-free trunk of 10-45 m. The shape of a straight cylindrical stem and buttress 3-6.5 m from the ground. Shorea hopeifolia grows on latosol soil, red yellow podzolic and yellow podzolic soil. Can grow to a height of 850 m in rainfall A and B. This tree begins to bear fruit at the age of 6-9 years and does not necessarily bear fruit every year because it is strongly influenced by the season. The fruiting season is in October-April [8].

4. Conclusion
The composition nest of the tapanuli orangutan in the Batang Toru Forest utilizes tree nests made from tree leaves and branches. Leaf percentages were Shorea hopeifolia (94.1%), Syzygium sp (94%), and Litsea brachystachys (93.9%) and Branches of Palaquium gutta (6.6%), Quercus gemelliflora (6.5%), and Litsea brachystachys (6.1%).

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