

# The Useful Plants In *Nepenthes* Spp Community Of Customary Forest Of Lingkat Lake Kerinci

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**Abstract:** One of the plant communities that many have encountered in the Customary Forest of Lingkat Lake Kerinci is the *Nepenthes* spp community. *Nepenthes* spp lives in a nutrient-poor place, propagate on trees, on sharp cliffs and coexist with other plants such as pteridophyta, *Glichenia linearis* (resam nails), *Melastoma malabatricum* (senduduk), *Clidemia hirta* (senduduk bulu) and other plants. The method used in this research is Participatory Rural Appraisal (PRA) and purposive sampling techniques to interview people who were selected based on their understanding of plants useful and used to support people's lives that were tailored to the needs of researchers during the research process. The data analysis was done qualitatively and quantitatively. The qualitative analysis was done by describing the society knowledge on the use of plants and the conservation of the natural resources. The quantitative analysis was done by calculating the significance and usage of the plants. The results of the study found 3 types of *Nepenthes* Spp, namely *Nepenthes ampullaria* Jack, *Nepenthes mirabilis* Druce and *Nepenthes gracilis* Korth. The category of useful plants in *Nepenthes* spp community are : vegetables to consume, cattle's food, medical or traditional remedies, building structure, craft, farming tools, ropes, coloring essence, magic, ornament plants and food wrap used in traditional events that take place in Kerinci.

**Index Terms:** customary forest, lingkat lake kerinci, *nepenthes* spp, the useful plants.

## 1. INTRODUCTION

Customary forests are forests that are controlled by the alliance of indigenous peoples and in their management are regulated according to customary rules. Local communities have a very important existence to realize forest management in order to remain sustainable, because local communities depend on forest resources and are fully responsible for managing forests, local communities have their own wisdom that is in accordance with the conditions of the forest biophysics and local communities have diverse characteristics that demand serious attention (Oktoyoki, Suhajito, & Saharuddin, 2016). Past studies show that local communities succeed in managing forests because of the strength of values and norms that have taken root, are accepted and passed down inherently by society [(Agrawal, 2001) (Alemayehu, 2007); (R & H, 2005)] One of the most pleasant forests in Jambi Province can be found in Kerinci which is located in the mountain valley of Bukit Barisan, has an area of 420,000 hectares, 51.19% or 215,000 hectares of protected forest and conservation forest in the Kerinci Seblat National Park area. As a conservation area, the Kerinci Government supports efforts to conserve Biodiversity, and recognition of the Existence and status of Indigenous Forest Areas / People's Management Areas, but Customary Forests in Kerinci are not State Forests but customary rights so that they should be called Customary Forests that still hold wealth plant species but not yet widely disclosed, one of them is Lingkat Kerinci Lake Customary Forest. The area is a friendly forest which is very important in maintaining water use because it acts as a catchment area and water catchment in Jambi Province. Lingkat Lake is a large volcanic lake, besides Lake Kerinci, Lake Kaco and Lake Gunung Tujuh in Kerinci District, Jambi Province. The pristine Lake of Lingkat is located on the edge

of the forest of Kerinci Seblat National Park which is adjacent to the Lempur Mudik Village. The area is approximately 11 ha at an altitude of 1,100 m above sea level. Indigenous peoples enforce customary rules and sanctions for violations in forest use. Forests that are controlled and regulated and supervised directly by their existence by the traditional institution Lekuk 50 tumbi (Communal Property). The area is in the form of high hills with steep topography which becomes the catchment area. This area should not have management activities in it. The community's belief has been passed from generation to generation that if the forest is destroyed, the guardian spirit of this region will be angry and there will be a drought for their fields (Oktoyoki, Suhajito, & Saharuddin, 2016).

Useful plants mean plants that have been or can be consumed and used by humans to meet certain needs. One of the many plant communities encountered in the Lingkat Kerinci Lake Indigenous Forest is the *Nepenthes* community where these plants live in nutrient-poor places, propagate on trees, on sharp cliffs and coexist with other plants such as ferns, ferns (*Glichenia linearis*), sores (*Melastoma malabatricum*), feathers (*Clidemia hirta*) and other plants. For example *Nepenthes maxima* can stick to any tree, the important thing is that there is a layer of lichen or leaf litter as water storage and keep moisture, even in the dead tree *Nepenthes maxima* can stick. Dead tree bark has a lot of moss, because weathering that occurs provides good moisture for the growth of moss [Susanti, 2012]. *Nepenthes* is a unique plant because at the end of the leaf there is a bag containing extrafloral nectaria which can attract and digest various insects so that the plant is known as carnivorous plants. Insects are used by these plants to meet nutritional needs not obtained from the soil and the main nitrogen sources (Gorb et al., 2004). In addition to its unique abilities, *Nepenthes* has a variety of shapes, sizes and patterns. This makes *Nepenthes* its own attraction as an exotic ornamental plant of economic value and traditional medicine for the Kerinci ethnic community (Susanti & Kencanawati, 2017) Based on the present explanation and phenomena, and the potential possessed by the Lingkat Lake Customary Forest of Kerinci Regency, the authors are interested in raising the title: "the useful plants in *Nepenthes* spp community of Customary forest of lingkat lake kerinci".

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## 2 LITERATURE REVIEW

### 2.1 The History of The Usefulness of *Nepenthes* spp community Customary Forest of Lingkat Lake Kerinci

The people of Kerinci also know that the species *Nepenthes* as the main material for making ropes. The stem of three species is found to be useful for making ropes. Earlier Handayani (2001) had noted that in West Sumatra the stem of *Nepenthes gracilis* were used as a tighter. As stated by the informant, there are two versions in naming those species, firstly because the pocket looks like monkey's abdomen, secondly because it was noticed that monkeys used to drinking from the plants' pocket. *Nepenthes* which was found at the cultural forest of Lingkat lake were three species, those are *Nepenthes ampularia* (piuk beruk), *Nepenthes gracilis* (kancung beruk), and *Nepenthes mirabilis* (kancung beruk). Generally, the villagers of Lempur have the same knowledge about *Nepenthes*. *Nepenthes* species are used for ornament plants, food wraps/plates, medicines, and ropes.

### 2.2 Theoretical Framework

This study utilized the theoretical framework from (Martin 1995; Gerique 2006) to identify plant species which include the local name and their using semi-structured interview to the informant about *Nepenthes* spp community in customary forest of Lingkat Lake Kerinci.

### 2.3 Related Studies

There are many previous studies done in dealing with useful plant in *Nepenthes* community. The first study by Handayani (2001) had noted that in West Sumatra the stem of *N. gracilis* were used as a tighter. The second research was conducted by Heyne (1987b) explained that in Bangka, the upright-stem of *N. ampularia* has longer endurance that it was chosen to tighten fence and to lift heavy stuff. The local society in Lempur (Kerinci) used *Nepenthes* for ornament plants, food wraps/plates, medicines, and ropes.

## 3 METHODS

The study was conducted by using Participatory Rural Appraisal (PRA) and purposive sampling techniques to interview people who were selected based on their understanding of plants useful and used to support people's lives that were tailored to the needs of researchers during the research process.. This chapter also discusses the research design, research site, sampling procedures, and participants, data collection method, and data analysis.

### 3.1 Research Design

In addition, the Explorative Survey method is also used to obtain plant species used by the community (Martin, 1995). The study was conducted in three stages, namely observation, interviews and documentation. Qualitative analysis is carried out by describing people's knowledge about the use of plants in daily life and in community life. The tools used during this study were a set of stationery, digital cameras, GPS, crop scissors, machetes, small shovels, soil and water pH gauges, deep and ground water measuring steel wire rods, plastic sacks, rubber bands, plastic collections, bottle collection (15ml), measuring cup, hanging label, newsprint, raffia rope, duct tape, oven, herbarium label, identification book. This study uses research instruments in the form of species

observation sheets. Species observation sheets are used to record *Nepenthes* species, and plant species in the *Nepenthes* community in the Lingkat lake Kerinci in customary forest area. Besides research instruments, researchers also conducted semi-structured interviews which were then confirmed to other informants with an aim to reveal the significance of the plant species. After that, each recognized plant would be discussed in a Focused Group Discussion (Sheil 2004). All participants in FGD were 20 people who were selected by using purposive sampling technique based on the criteria of gender and age (> 15 years old and < 60 years old). The researcher involved directly on the daily activities of the society being observed (Yuliati et al., 2009).

### 3.2 Time and Location

This study was conducted from February to December 2016. The participants were local society in customary forest of Lingkat Lake Kerinci.

### 3.3 Research Site, Sampling Procedures and Participants

The site for this study was at Kerinci in Jambi Province. This study was conducted from February to December 2016. The participants were The data of this research were botany and ethno-botany. The botany data was gathered through ecology research method using the point intercept technique. The ethno-botany was gathered by using an approach of Participatory Rural Appraisal (PRA) and purposive sampling techniques to interview people who were selected based on their understanding of plants useful and used to support people's lives that were tailored to the needs of researchers during the research process using a semi-structured interview to the informant (Martin 1995; Gerique 2006) to identify plant species which include the local name and their use.

### 3.4 Research Instruments

The main data procedure in this study was interview. We interviewed people who were selected based on their understanding of plants useful and used to support people's lives that were tailored to the needs of researchers during the research process.

### 3.5 Data Collection Procedures

In collecting the data, interview as the main instrument was used. The interview was utilized in order to get the in depth information on the local society customary forest in Lingkat Lake Kerinci. We used semi-structured interview techniques and recorded it in the audiotape. Each participant was interviewed about 15 - 30 minutes. The information were transcribed in order to make us easier to use the information.

### 3.6 Data Analysis

The data analysis was done qualitatively and quantitatively. The qualitative analysis was done by describing the society knowledge on the use of plants and the conservation of the natural resources. The quantitative analysis was done by calculating the significance and usage of the plants. The value of plant significance was calculated by Index Cultural Significance (ICS) (Sheil 2004) using the formula:

$$ICS = \frac{1}{n} \sum_{i=1}^n (q_i \times e_i)$$

Notes :

ICS = Index Cultural Significance, the score of significance value of a plant from 1 to certain n, where n shows the last significance of the plant.

q = quality score

i = intensity value, shows score 1 to certain order

e = exclusivity score

## 4 FINDINGS AND DISCUSSIONS

The useful plants in *Nepenthes* spp community of customary forest of lingkak lake kerinci :

No	Nama Spesies	Local Name	Useful
1	<i>Nepenthes mirabilis</i> (Lour.) Druce	Kancung beruk	Food wrap, Ornament plants, ropes, eye drops, treatment for stomachache
2	<i>Nepenthes ampullaria</i> Jack	Piuk beruk	Food wrap, Ornament plants, ropes
3	<i>Nepenthes gracilis</i> (Korth.)	Kancung beruk	Food wrap, Ornament plants, eye drops
4	<i>Melastoma affine</i>	Senduduk	Fruits, Medical or Traditional remedies, Coloring essence (blue)
5	<i>Rhaphidophora acuminata</i>	Ampisang	-
6	<i>Paspalum longifolium</i> Roxb	Boukou/rumput australi	Medical or Traditional remedies
7	<i>Diplazium esculentum</i> (Retz) Sw.	Pakis sayur /Paku ayay/paku ayik	Vegetables to consume
8	<i>Nephrolepis hirsuta</i> (C. Forst.)	pakis larat/pedang	Vegetables to consume, Ornament plants, Farming tools
9	<i>Mussaenda cf. frondosa</i> L.	Mussaenda/ Golang-galing	Ornament plants
10	<i>Rhododendron javanicum</i> Benn.	Rhododendron	-
11	<i>Paspalum conjugatum</i> P.J Bergius	Rumput gajah	Cattle's food

12	<i>Schefflera elliptica</i> (Blume) Harms	Cakar biwak	Cattle's food
13	<i>Davalia repens</i> (L.f.) Kuhn	Pakis mukut	Treatment for stomachache
14	<i>Paspalum</i> sp	rumput gajah	Medical or Traditional remedies
15	<i>Microsorium commutatum</i> Copel	pakis simpai	Ornament plants
16	<i>Syzygium pycnanthum</i> Merrill & Perry	Kayu kelat putaih	Building structure
17	<i>Syzygium zeylanicum</i> (L.) DC	Kayu kelat nasi	Building structure
18	<i>Costus speciosus</i> (J.Koenig) C. Specht	Pacing tawar	Magic, Medical or Traditional remedies
19	<i>Nephrolepis falcata</i> (Cav) C. Chr	Pakis	Vegetables to consume
20	<i>Eleocharis dulcis</i> (Burm.f.)	Bigau	Craft
21	<i>Cyclosorus heterocarpus</i> (Blume)	Paku kunyit-kunyit	Medical or Traditional remedies
22	<i>Impatiens platypetala</i> Lindl	Inay	Coloring essence
23	<i>Colocasia esculenta</i> (L.) Schott	Knumu Payo	Vegetables to consume
24	<i>Gliechenia linearis</i>	Resam	Craft
25	<i>Leerseia hexandra</i>	Rumput banto	Cattle's food
26	<i>Imperata cylindrica</i>	Ilalang/lalaw	Cattle's food, Medical or Traditional remedies, craft
27	<i>Medinilla speciosa</i> Blume	Parijoto	Ornament plants
28	<i>Hydrocotyle sibthorpioides</i> Lam	Semanggi gunung	Ornament plants
29	<i>Ficus hispida</i> Linn. F	kayu semantung	Building structure, craft

The plant community that is encountered in the lingkak lake Kerinci in customary forest is the *Nepenthes* spp community consisting of 3 types of *Nepenthes* Spp are *Nepenthes ampullaria* Jack, *Nepenthes mirabilis* Druce and *Nepenthes gracilis* Korth. In addition to its potential as an ornamental plant, *Nepenthes* is also useful as follows:

1. As a Climate Indicator; If in an area or area covered by *Nepenthes gymnamphora*, this area means that the rainfall level is quite high, humidity is above 75%, the soil is also poor in nutrients.
2. Traditional medicinal plants; The liquid from the bag that is still closed from *Nepenthes khasiana*, is used as a cough medicine, for eye drops, cataracts, itching, inflammation of the digestive tract (Kumar & Rao, 1980). The decoction of *Nepenthes ampullaria* and *Nepenthes gracilis* roots is used to treat abdominal pain, *Nepenthes reinwardtiana* is used for healing inflammation of the skin, heat medication in children and children who wet the bed (Heyne, 1987), while in Irian Jaya and Kalimantan the roots are used as astrigens (Cheek & Jebb, 2001: (Irawanto, 2009) Meanwhile, the protein content (protease enzyme which is most likely *Nepenthesin I* and

Nepenthes II) in the Nepenthes pouch has the potential to develop protein farming (Witarto, 2006).

3. Source of drinking water for Adventurers; For mountain climbers who wear Nepenthes type semar bags, gymnamphora is a source of drinking water that is feasible because the pH is neutral (6-7), but the bag is still closed, because the open bag is contaminated with the insects entering into, and pH it's 3 while it's sour.
4. As a replacement for the rope, the stem from Nepenthes reinwardtiana can be used instead of a rope for fastening goods ((Anonim, 1995); (Irawanto, 2009); (Sari, 2009)) whereas Teysmann in Bangka found Nepenthes ampularia stem useful as a substitute for rattan because it was clay and durable, used to tie fences and carry goods (Heyne, Indonesian Useful Plants II, 1987a).
5. Bags that are grown up are used for containers / places to make and cook "rice pot" foods such as lamang, godah (Heyne, Indonesian Useful Plants II, 1987a); (Sari, 2009)

Similar research has also been conducted in several other places in Indonesia. Setyowati and Rahayu (2005), managed to record that there are 253 types of plants that grow in settlements and in the forest have been used by the community on Nusakambangan Island for various purposes. The number of plant species used by the people on Nusakambangan Island is far more than the use of plants by the people in Seulawah Valley. Sunesi and Wiryono (2007), reported that the people of Kandang Village, Kepahiang Regency, Bengkulu Province only used 113 types of plants in settlements and in the surrounding forests for various purposes. (Rahayu, Susiarti, & Purwanto, 2007), also reported the number of plants used by communities around the Tapa River Conservation Area, Jambi Province is far fewer than 100 plants, when compared to useful plants in the Seulawah Valley (Oktoyoki, Suharijito, & Saharuddin, 2016)

## 6 CONCLUSIONS

Based on the results of research conducted in the lingkak lake Kerinci in customary forest, it can be concluded:

1. The community of plants that are often found in the lingkak lake Kerinci in customary forest is the Nepenthes sp community consisting of 3 types of Nepenthes Spp, namely Nepenthes ampullaria Jack, Nepenthes mirabilis Druce and Nepenthes gracilis Korth.
2. The composition of Nepenthes found in the lingkak lake Kerinci in customary forest is as many as 18 familiy of 29 species of plants present in the Nepenthes Spp community.
3. The catagory of useful plants in Nepenthes spp community are : vegetables to consume, cattle's food, medical or traditional remedies, building structure, craft, farming toos, ropes, coloring essence, magic, ornament plants and food wrap used in traditional events that take place in Kerinci.

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