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Potential of non-timber forest products as medicinal plant sources in the protected forest area of Enrekang Regency

Rusmiati A R¹, H Latifah², M Daud², Hasanuddin², Sultan²

¹College Student Faculty of Agriculture Forestry Study Program Muhammadiyah Makassar University, Makassar, Indonesia

²Lecturer Program Faculty of Agriculture Forestry Study Program Muhammadiyah Makassar University, Makassar, Indonesia

E-mail: husnahlatifah99@gmail.com

Abstract. This study aims to determine the types of plants, parts and potential of medicinal plant sources in protected forest areas of Enrekang Regency. Data were collected through observation, interviews, questionnaires, surveys and literature studies, and grouped into primary and secondary. The results show that there were 12 types of medicinal plants in the protected forest, namely candlenut, breadfruit, cinnamon, balsam, patikala, siri, laruna, suren, guava, kapok, lime and coffee. Furthermore, the medicinal plant parts used include seeds, roots, stems, leaves, fruit, bark, sap and flowers. The community uses medicinal plants in 7 ways, specifically burning, mashing, frying, drying, boiling, kneading and processing. There were eight methods of how to use of medicinal plants by the community, namely applying, drinking, gargling, inhaling, placing them on the wound, eating directly and washing the eyes.

1. Introduction

Various food and medicinal ingredients have been identified to originate from forest areas, both wild and cultivated species. Biodiversity is a potential that can be utilized to support food re-diversification and the procurement of medicinal raw materials. Through food re-diversification, it is expected that people's food consumption will be varied [1]. However, in the case of the procurement of medicinal raw materials, increased variation in plant types signify a corresponding increase in raw materials [2].

Apart from being a source of food, forests also have the potential to produce medicinal plants that can be used by the community as raw materials for traditional medicine. Currently, most raw materials procured from plants for medicine are harvested directly from nature, while the cultivation efforts carried out are still limited [3]. This causes the medicinal plants to become increasingly difficult to procure. The more variation in plant types known to possess medicinal potential, the more varied the raw materials will be.

Medicinal plants have been passed down from generation to generation from our ancestors and have become traditional recipes for curing diseases. However, some people do not know that it is not uncommon to find medicinal plants not used by the community [4]. The more plant types that are known to have medicinal potential, the more varied the raw materials will be. Therefore, it is necessary to research the potential of non-timber forest products as a source of medicine in the protected forest area of Enrekang Regency.



2. Methods

2.1. Research locations and objects

The location of this research was in the protected forest in Bungin Village, Bungin District, Enrekang Regency. Furthermore, research samples consisted of the people living around the Protected Forest.

2.2. Types of data

Data types collected were classified into primary and secondary. Primary data were obtained by conducting direct research at the research location, while secondary data were related to this research.

2.3. Data collection

Data collection mainly involved the method of observation, reviewing and peering directly in the field. Vegetation analysis was carried out by making 20×50 m plots on protected forest land in Bungin Village, Bungin District, Enrekang Regency.

3. Results and discussion

3.1. Potential and density of medicinal plants

According to Zuhud et al. [5], medicinal plants are all plant species known to have medicinal properties, which are grouped into:

- Traditional medicinal plants, namely species known or believed by the public to have medicinal properties, and have been used as raw materials for traditional medicines.
- Modern medicinal plants, namely species scientifically proven to contain bioactive compounds or materials and their use can be justified medically.
- Potential medicinal plants, namely species suspected of containing medicinal compounds or bioactive materials, but scientifically their use as traditional medicines is difficult to trace.

Medicinal plants are plants whose parts (roots, stems, leaves, tubers, fruit, seeds, and sap) have medicinal properties and are used as raw materials in the manufacture of modern medicine. The results of the density of medicinal plants are shown in table 1.

Table 1. Density and utilization of medicinal plants protected forest land in Bungin Village, Bungin District, Enrekang Regency.

Num	Types of plants	Scientific name	Amount	Habitus	Σ Plot (ha)	Density species/ha	Medicinal part	Processing method	Method of use
A. Medicinal Plant									
1	Candlenut	<i>Aleurites moluccana</i>	51	Tree	2	26	Seeds	Burned and smoothed	Smeared
2	Breadfruit	<i>Artocarpus communis</i>	7	Tree	2	4	Roots, stems, leaves and fruit	fried, dried and boiled	Smeared and drunk
3	Cinnamon	<i>Cinnamomum burmanii</i>	1	Tree	2	1	Bark	boiled	Drunk and gargled
4	Plant Balms	<i>Polygala. Paniculata</i> L.	69	Pole	2	35	Roots	Without processing	Inhaled
5	Patikala	<i>Etlingera elatior</i>	70	Pole	2	35	Stems and flowers	Burned and boiled	Drunk

6	Siri	<i>Piper betle</i>	35	Shrub	2	18	Roots	smoothed and squeezed	Smeared
7	Laruna	<i>Chromolaena odorata</i> L.	71	Shrub	2	36	Leaves	Smoothed and boiled	Drunk and stick to the wound
8	Suren	<i>Toona sinensis</i>	16	Tree	2	8	Bark	smoothed	Smeared
9	Guava	<i>Psidium guajava</i>	18	Tree	2	9	Leaves and fruits	boiled and Without processing	Drunk eaten directly
10	Kapok	<i>Ceiba petandra</i>	8	Tree	2	4	Roots, leaves, and resin	Boiled and smoothed	Drunk, smeared, gargled, and used to wash the eyes
11	Lime	<i>Citrus aurantifolia</i>	2	Tree	2	1	Fruits	Without processing	Drunk and eaten directly
Amount			348	174					
B. Medicinal Plant non Forest									
12	Coffee	<i>Coffea</i>	75	Tree	2	38	Leaves	Boiled	Drunk
Amount			75	38					
Total			423	212					

In table 1, it is observed that there are 12 types of medicinal, and only 1 type of non-forest medicinal plants. Number of 348 types of medicinal plants were obtained, with 75 non-forest medicinal plants. Furthermore, the density of medicinal plants was 174, while that of non-forest medicinal plants was 38. The total plant species obtained was 423, while the total density is 212 individuals/ha.

3.2. *Habitus* group

The medicinal plant species known to the Bungin Village community consists of three types of habitus, namely trees, herbs and shrubs. Medicinal plant species with tree habitus are more than that of pole, herbs and shrubs. The habitus group can be seen in table 2.

Table 2. Habitus group of medicinal plants in protected forest land in Bungin Village, Bungin District, Enrekang Regency.

Number	Habitus	Number of NTFP Medicinal Plant Species	Percentage (%)	Number of Non-Forestry Medicinal Plant Species	Percentage (%)
1	Tree	7	64	1	100
2	Herbs	2	18	-	-
3	Shrubs	2	18		
Total		11	100	1	100

NTFP= non timber forest product.

From table 2, the highest number of the habitus of medicinal plants in the protected forest in Bungin Village was tree. There were 7 species of the tree habitus (candlenut, breadfruit, cinnamon, suren, guava, lime, and kapok), 2 herb species (balm and patikala plants), 2 species of shrubs (siri and laruna), and 1 species (coffee) of non-forestry medicinal plant.

4. Conclusion

- In the protected forest in Bungin Village, Bungin District, Enrekang Regency, there are medicinal plants and non-forestry medicinal plants. The medicinal consist of 11 types, namely candlenut, breadfruit, cinnamon, balm plants, patikala, siri, laruna, suren, herbal seeds, kapok and lime, while non-forestry medicinal plants are coffee. Furthermore, the medicinal parts include fruit, flowers, seeds, leaves, shoots, roots, stems, bark, flowers, and sap.
- The potential of medicinal plants is that there are 12 species with a density of 212 individuals/ha. Most of these have been utilized by the community as medicinal ingredients.

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