



Ethnobotany of Ciplukan Plant (*Physalis angulata* L.) Dayak Seruyan Tribe in the Village of Telaga Pulang, Seruyan Regency, Central Kalimantan

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ABSTRAK

Pemanfaatan tumbuhan ciplukan (*Physalis angulata* L.) sebagai obat tradisional untuk penyakit diabetes mellitus sudah dikenal sejak lama oleh masyarakat suku Dayak Seruyan, Kalimantan Tengah. Penelitian ini bertujuan untuk: (1) mengetahui kajian etnobotani dari tumbuhan ciplukan, (2) mengetahui organ tumbuhan ciplukan yang dimanfaatkan sebagai obat diabetes mellitus, dan (3) mengetahui teknik peramu organ tumbuhan ciplukan sebagai obat diabetes mellitus oleh masyarakat suku Dayak Seruyan. Penelitian dilaksanakan pada bulan April hingga Mei 2020. Jenis penelitian ini adalah deskriptif-eksploratif dengan pendekatan PEA (*Participatory Ethnobotanical Appraisal*) dengan metode wawancara dan observasi. Narasumber penelitian ini terdiri atas 7 orang antara lain 4 orang penderita diabetes mellitus, 2 orang peramu/batra, dan 1 sesepuh. Hasil penelitian menunjukkan bahwa organ Ciplukan yang digunakan sebagai obat diabetes mellitus adalah bagian akar dari tumbuhan ini. Teknik peramuannya dengan cara direbus dengan air sampai warna air akar ciplukan berwarna agak kemerahan. Akar Ciplukan dapat langsung diambil di alam dengan syarat menempatkan sesajen atau pekaras (beras, garam, dan paku) yang dibungkus dengan kain atau plastik, dengan mengucapkan izin untuk mengambil akar dari tanaman tersebut. Rebusan air akar ciplukan yang terasa sangat pahit oleh masyarakat sehingga dipercaya sebagai obat diabetes mellitus. Dengan adanya penelitian ini diharapkan masyarakat dapat mengembangkan pemanfaatan tumbuhan obat lainnya secara berkelanjutan sebagai inventarisasi daerah dan mengembangkan pengetahuan lokal daerah mengenai berbagai macam tumbuhan obat secara tradisional (herbal) agar dapat melestarikan berbagai macam tumbuhan obat.

Keywords: Etnobotani, Tumbuhan Ciplukan, Diabetes Mellitus

ABSTRACT

*The use of the Ciplukan plant (*Physalis angulata* L.) as a traditional medicine for diabetes mellitus diseases has been known for a long time by people of Dayak Seruyan tribe, Central Kalimantan. This study aims to determine: (1) the ethnobotanical study of Ciplukan plants, (2) the organs of Ciplukan plant as a medicine of diabetes mellitus, and (3) the technique of making Ciplukan plant organs by Dayak Seruyan people. The study was conducted from April to May 2020. The type of study is descriptive-exploratory with the approach of PEA (*Participatory Ethnobotanical Appraisal*) with data collection technique by interview and observation. The informants consisted of 7 people: 4 people with diabetes mellitus, 2 gatherers, and 1 elder. The results showed that the Ciplukan organs that used as medicine for diabetes mellitus is the root part of this plants. The herb technique used is by boiling the Ciplukan's root until color of water is slightly reddish. The Ciplukan's root can be directly taken in nature with the terms by placing offerings or Pekaras (rice, salt, and spike) that wrapped in a cloth or plastic with say permission to take the roots from that plant. The boiled water of the Ciplukan's root that feels very bitter by people is trusted as a medicine for diabetes mellitus diseases. We hope people can develop the use of other medicinal plants with sustainable as a regional inventory and develop local knowledge about various kinds of traditional medicinal plants (herbals) to preserve various kinds of medicinal plants.*

Keywords: Ethnobotany, Ciplukan Plant, Diabetes Mellitus

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Introduction

Indonesia is the largest archipelago country in the world, its has more than 17.000 islands inhabited by more than 400 different indigenous peoples [1] Indonesia has a high potential in the use of plants as traditional medicines. Due to Indonesia's high natural wealth, then combined with the diversity of ethnic groups, it will reveal various systems of knowledge about the natural environment. This knowledge will be different from one ethnicity to another because the difference in residence and influenced by customs, procedures and behaviors [2]. Ethnobotany is a science that studies the direct relationship between humans and plants in their traditional use. Ethnobotany's research is always combined with the exploration of plants, the centers of traditional knowledge are generally found in developing countries, that generally located in tropical regions. In those countries, ethnicity is the source of traditional knowledge [3].

In Indonesia, traditional ethnic groups have characteristics and cultural identities that are clearly defined, so that it is assumed that people's perceptions and conceptions of natural resources in the environment is different including the use of plants as traditional medicine. The use of traditional medicine can be the community's main choice because of the remote access to health facilities and the high price of synthetic drugs. Some people can use medicinal plants because the plant has certain efficacy properties [4]. The Dayak tribe is the original and the largest community inhabiting of Central Kalimantan. The Dayak tribe is divided into several sub-ethnicities that each of them has unity of languages, customs and cultures, like the Seruyan Dayak tribe which is a sub-tribe or family of the Dayak Ot Danum tribe in Central Kalimantan. The characteristics of Dayak Seruyan tribe in the field of using plants as medicine or ethnobotany are this tribal community have known the medicinal plants based on trials and opinions of ancient people which has been passed down from generation to the current generation of society, and recognize plants with morphological characteristics of these plants. For example the people use the Ciplukan plant to treat diabetes mellitus by using customs or beliefs of people by uprooting the Ciplukan plant with taking its roots to be boiled and replacing it with offerings, or often called the community with Pekaras (rice, salt and spike) that wrapped in cloth or plastic. People believe that the bitter taste of Ciplukan roots is what makes this plant able to treat diabetes mellitus.

Ciplukan's herb (*Physalis angulata* L.) is often used in traditional medicine [5]. The part of plants that commonly used as traditional medicines are the roots, rhizomes, stems, fruits, leaves, and flowers. Traditional medicines are beneficial for health, healing and prevention because basically traditional medicines are used easier, relatively cheap, easy to obtain the raw materials, and relatively safe [5]. The ciplukan plant usually grows wild, easy to find in a protected place, slightly humid soils, in gardens, fields, rice fields, roadsides, the edge of the forest is open in the hot sun and between the staple crops. The ciplukan plant grows in the lowlands up to 1800 meters above sea level (mdpl) [5]. Usually in village of Telaga Pulang, this ciplukan plant is found behind houses with moist soil and lots of grass and other wild plants.

In previous research is conducted by Sutjiatmo *et al.*, that was published with the title Antidiabetic Effects of Herba Ciplukan (*Physalis angulata* L.) in Diabetic Mice with Alloxan Induction proved that Ciplukan efficacious to treat diabetes [7]. Another study that has successful in proving the benefits of Ciplukan for diabetes is that conducted by Reza Berri Permana from Department of Biochemistry, Faculty of Mathematics and Natural Sciences, Bogor Agricultural University 2013, with the title Antidiabetic Activity of Ciplukan Fruit (*Physalis angulata* L.) in Rats to Prevent and Treat Diabetes [8]. Another study was also conducted by Rahmani (2016) with title Ethanol Extract 70% of Ciplukan Leaves (*Physalis angulata* L.) on Decreasing Blood Glucose Levels in Wistar Male White rats, showing that with a dose of 100mg/kgBB, it had the effect of reducing blood glucose levels in male of Wistar rats [9].

The potential of plant as traditional medicines is found in various regions. Each region has a medicinal plant utilization system that is unique and different from other regions and different customs and beliefs. Until now, knowledge of local people about medicinal plants in Danau Sembuluh sub-district, village of Telaga Pulang has not been documented and types of plants are used as traditional medicines have not been recorded naturally. Therefore, it is necessary to conduct research about the

types of plants as traditional medicines that are used by the people of Telaga Pulang village based on the customs and beliefs of the community. The purpose of this research was to determine the ethnobotany study of the use of Ciplukan plant (*Physalis angulata* L.) as a medicine from diabetes mellitus. It is hoped that the results of this research can develop the use of other medicinal plants in a sustainable manner as a regional inventory and develop local knowledge about various kinds of traditional medicinal plants to preserve various kinds of medicinal plants.

Materials and Methods

This research was conducted in village of Telaga Pulang, Danau Sembuluh sub-district, Seruyan regency (Fig. 1) from April to May 2020. The object of this research is medicinal plants (Ciplukan plant) that are trusted by the people of Telaga Pulang village with their customs as a medicine for diabetes mellitus.

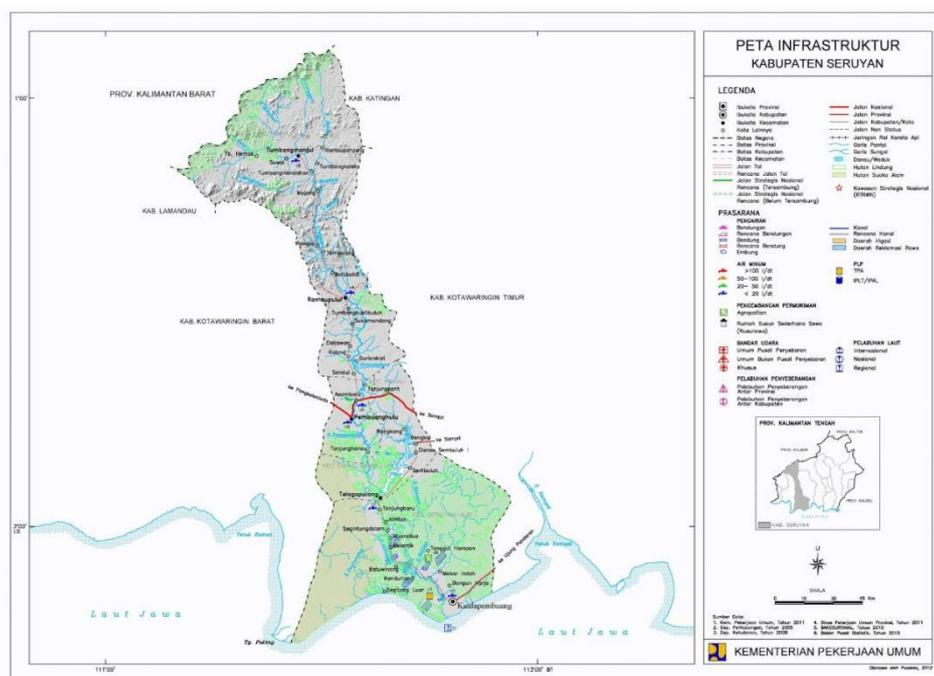


Fig. 1. Description area in village of Telaga Pulang, Danau Sembuluh sub-district, Seruyan regency

This research is a descriptive-exploratory research using the approach of PEA (Participatory Ethnobotanical Appraisal) by a survey method with interview techniques that are direct interviews to the environment where the plants are located, direct observations are made to determine plant morphology and ecology. Plant morphology including leaves, stems, flowers, fruits, vegetation, life forms and plant reproduction. The interviews were conducted with informants who are native of Telaga Pulang village that consisted of 7 people: 4 people who suffer diabetes mellitus, 2 gatherers, and 1 elder. The selection was made by purposive sampling method. Interviews were conducted to study plants that used as traditional medicine in the local area with customs or the community beliefs, both it is studying local plant names, how to make plants to be used as medicine, how to use plants as medicine, how to store plants as medicine, how to get plants, efforts to preserve plants, value ecosystems, the spread of the use of plants and the decline of knowledge.

The variables are observed in this study were botanical and ecological studies including the morphology of leaves, stems, flowers, fruits, roots, vegetation, life forms and plant reproduction. In

addition, ethnopharmacological, anthropological, economic and linguistic studies which include use method of manufacture, method of use, storage and form, supporting tools, methods of obtaining, conservation efforts, ecosystem values, distribution of use, and decreased knowledge of the types of medicinal plants found and used in Telaga Pulang village, Danau Sembuluh sub-district [5].

The tools that used in this research is stationery, book, handphone, and meter as measuring device. Meanwhile, the material that used is a structured interview questionnaire. Data analysis was carried out qualitatively. The data obtained from the interviews, were transcribed, coded, categorized and then triangulated the data.

Results and Discussion

Based on the interviews, the results showed that the Ciplukan plant (*Physalis angulata* L.) is trusted by the Dayak Seruyan people as a plant that used in the treatment of diabetes mellitus. The Ciplukan plant (*Physalis angulata* L.) is a wild plant that grows in the lowlands to an altitude of 1550 meter above sea level in dry land or dry rice fields (Fig. 2).



Fig. 2. The picture of the Ciplukan plant (*Physalis angulata* L.)

The classification of the Ciplukan plant (*Physalis angulata* L.) is:

- Division : Spermatophyta
- Class : Dicotyledonae
- Ordo : Solanales
- Famili : Solanaceae
- Genus : *Physalis*
- Species : *Physalis angulata* L.

Physalis angulata L. is an annual herb plant with a height of 0,1-1 m. Ciplukan plant's vegetation is a monocot plant that lives in annuals and grows wild. Based on the results of the analysis of Ciplukan plants in Telaga Pulang village, the stem height is 84.5 cm, stem diameter is 3.3 cm, leaf length is 7 cm, and leaf width is 3 cm. Hair of stem is called Gundul/green part with short hair. The main stem is not obvious, the branching is sharp, has sharp edges, ribbed, hollow, the green part has short hair or can be called Gundul. The leaves are single, stemmed, the underside is scattered, above in pairs, strands are ovoid-round elongated-lanceolate with pointed tip, unequal tips (pointed-blunt-rounded-tapered), flat edge or wavy tooth, 5-15x2.5-10.5 cm. The surface on the leaf is the green leaf, and the lower surface of the leaf is green and smells fine. Single flower, leaf tip or axillary, flower stalk erect with nodding tip, slender, violet, 8-23 mm, then grow to 3 cm. The clapper shaped petals, 5 pointed lobes, shared, green with lavender ribs. The crown is wide bell shaped, high of 6-10 mm, bright yellow with brown spots or yellow brown, under each of spot there are clusters of short hairs that shape of V. Corollas in Ciplukan are found in the rainy season. Number of stamens are 5, pale yellow stalks of the stamen, anthers entirely light blue. Bald pistil, the head of pistil shaped button, 2 ovules of leaf fruit, many ovules. The Ciplukan fruit is egg-shaped, with length up to 14 mm, green to yellow color when fruit is ripe, has violet veins, has fruit petals. The roots of the Ciplukan plant are taproots that will grow branch roots



and fiber roots. This root's shape is round and have white color. The roots of the Ciplukan are not intense, spread and not go deep into the soil. The root of Ciplukan has a bitter taste.

The reproduction method of this Ciplukan plant is by vegetative (plant propagation material using vegetative parts such as roots, stems, or leaves), this propagation will produce the same fruit as its parent and more fruitful, and generative propagation is the propagation of plants through the seeds, and once sowing of one Ciplukan fruit it can produce several plants [10]. Ciplukan plant contains various phytochemicals, including alkaloids, flavonoids, saponins, fisalin A, fisalin B, witafigalin A, witafigalin B, terpenes and citric acid [7]. The content of phytochemical compounds in ciplukan plants affects the B cells of insulin prangkeas. This is known based on a trial conducted by Sutjiatmo *et al* (2011) which showed that blood glucose levels decreased after being given ciplukan herbal water extract at a dose of 10 mg / kgbb and 20 mg / kgbb.

The Ciplukan plant in Telaga Pulang village is called the Kecaplekan plant which means the fruit skin can be sound, because this Ciplukan plant has fruit that wrapped in bubbling petals, so when opened the fruit petals can make a sound, that is why people calls it Kecaplekan. The plant organs that used to treat diabetes are the roots that are taken to be boiled and the water to be drunk as a potion to treat diabetes mellitus. The roots of the Ciplukan plant can be boiled and can also be soaked in ½ cup of water until the color of the boiling water and the water from the Ciplukan roots becomes a slightly reddish color. The public's belief of this Ciplukan plant is to be used as a medicine of diabetes mellitus. For the storage of medicinal ingredients from Ciplukan roots is to be stored in bottles and soaked with water about ¼ cup for drink, and the medicine from the root of this Ciplukan because it is boiled or soaked so it is stored in liquid form.

The community calls the ciplukan plant in Telaga Pulang village with a tired plant because of the fruit skin that can sound. The Ciplukan plant fruit is wrapped in bubble petals, which when opened the fruit petal can make a sound. This is the basis for the name of the Kecaplekan plant. According to Dharmono (2007), the name of plants by the local community is due to the similarity of meaning, not from plant kinship [11].

The Ciplukan plant is based on the results of interviews with elders, that the way to get Ciplukan plants is to take it directly in nature, according to the customs and beliefs of the people in Telaga Pulang village before removing or taking the roots of the Ciplukan plant, with making offerings first or the regional language is called Pekaras in the form of (rice, salt, and spike) that wrapped in cloth or plastic. When taking the roots of the Ciplukan plant, it must be entitled or express permission to take the root as a medicine for diabetes mellitus. After removing the roots of the Ciplukan plant, it must be replaced with offerings or Pekaras (rice, salt, and spike) that have been previously made. The Ciplukan plant in Telaga Pulang village is not cultivated, however, the Ciplukan plant can grow by itself, such as on the edge of rice fields, on roadsides, in fields, and so on. The ecosystem value of the Ciplukan plant is often considered as a weed plant by farmers in the rice fields because the presence of weeds is often considered as nuisance plant, because it can reduce the output of the agricultural production. So the Ciplukan plant is often considered as a wild plant.

The spread of the use of the Ciplukan plant in Telaga Pulang village is used by the local community as a medicinal plant that is used to treat diabetes mellitus, that is the root of Ciplukan. The spread of the use of this Ciplukan is spread by elders from ancient times to people in this present times. The Ciplukan plant is known to the public as a medicinal plant not only in the area of Telaga Pulang village, but also in other areas. However, in each region, the benefits of Ciplukan plants are different. In the area of Telaga Pulang village, the Ciplukan plant with its root is believed by the local community to treat disease of diabetes mellitus with trusted customs because the taste of Ciplukan's root is very bitter.

Human and plants are closely related in life. There are so many beneficial values that obtained from plants, but there are still many plants around us whose benefits are not yet known. The existence of plants is a blessing and gift from Allah swt that given to all His creatures as His words in QS. An-Nahl verse 11: "He grows for you with rain for plants; olives, dates, grapes and all kinds of fruits. Indeed in that there is a sign (of Allah's power) for a people whose think about it." This verse is a form of Allah's grace and power who creates plants that can be useful for His creatures. One of that is as



medicinal plants, where the treatment system in Islam has long been exemplified by the Prophet Muhammad through several methods of the Prophet's treatment such as using medication with natural medicine (herbs). Basically, traditional medicine that is permitted in Islam will not harm oneself and others, and most importantly doesn't lead to shirk because Islam means upholding the rational and non-mystical monotheism.

Conclusion

Ciplukan plant is a potential plants that grows around the Dayak Seruyan people that it can be used as a traditional medicine for diabetes mellitus. The results showed that the ciplukan plant's organ that used as a medicine was the root part of this plant. The concoction technique is done by boiling the roots with water until they are slightly reddish in color. Then, in this root-taking process, it is also necessary to use the customs and beliefs of the Dayak Seruyan tribe such as by placing offerings and saying permission.

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