JOURNAL OF TROPICAL ETHNOBIOLOGY

Vol. IV No. 2 July 2021 P-ISSN 1693-6892
E-ISSN 2722-0257

The Ethnobiological Society of Indonesia

The Utilization of Tokulo (*Kleinhovia hospita* L.) as Traditional Medicine by Wawonii Community in Lampeapi Village, Wawonii Island, Southeast Sulawesi

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ABSTRACT

Tokulo (*Kleinhovia hospita* L.) is an herbal plant, it is widely used as a vegetable and alternative drink for tea by Wawonii community. Tokulo has various benefits to support body health. This plant, especially its leaves have active compounds that is used as ingredients in traditional medicine. This study aims to determine the utilization of this plant as traditional medicine by Wawonii community, the origin of cultivation process and its uses as herbal medicine, as well as it can be used as a basis for policy making by local government for increasing local people's income.

Keywords: *Kleimhovia hospita*, Southeast Sulawesi, Tokulo, traditional medicine, Wawoni Island

INTRODUCTION

Indonesia is a country with the second largest biodiversity in the world after Brazil, with an estimated 30.000 species of flowering plants (Widjaja *et al.*, 2014). Indonesia's biodiversity stores quite a lot of medicinal plants. A report from the Ministry of Health (2019) more than 30.000 species of flowering plants live in Indonesia, around 9.600 species are listed as useful plants and 3.000 species are used as raw materials for traditional medicines. However, from the results of an inventory conducted by PT. Eisai in 1986, it was recorded that around 7,000 species of plants in Indonesia can be used by the public as medicine, especially for the herbal medicine industry. Purwaningsih (2013) stated that from the Basic Health Research (RISKESDAS) in 2007, it was known that the use of *jamu* (traditional herbal drink) by Indonesian people was 35.7% and more than 85% admitted that *jamu* (traditional herbal drink) has beneficial for health (Sujarwo *et al*., 2015). Additionally, RISKESDAS 2010 reported it make the use of herbal medicine increased to 59.12%,

One species of medicinal plant that should be preserved is *tokulo* (local name) *Kleinhovia hospita* L. The geographical distribution of this species, apart from Indonesia, is mainly found in China, Taiwan, India, Myanmar, Thailand, Malaysia, Papua New Guinea,

Philippines, Fiji, Polynesia, and France (Efloras, 2016). Tokulo is one of 200 species of useful plants on Wawonii Island, Southeast Sulawesi (Rahayu and Rugayah, 2007); and it is one of plants species that are cultivated in the yard (Rahayu *et al.*, 2004). This species grows wild naturally in Lampeapi village, Wawonii Island, Southeast Sulawesi. Its natural habitat is mainly in riverside. However, at this time, it has begun to be cultivated and planted in the yard of people's house. This study aims to determine the role of this plant in health of local community, the origin of cultivation process and its uses as herbal medicine.

METHODS

Lampeapi Village, Central Wawonii District, Konawe Islands Regency, Southeast Sulawesi is one of villages located on the island of Wawonii, Southeast Sulawesi province (Figure 1). This village is located at an altitude of 100-150 m above sea level (asl). Lampeapi village is divided into 3 hamlets. Most of population comes from original ethnic group, it is known as the Wawonii ethnic group and immigrants from Bugis, Flores and Java. The main livelihood of Wawonii ethnic group is shifting cultivation, which is planted with secondary crops, vegetables and perennials. An additional livelihood is taking forest products such as wood for making boats and rotan.

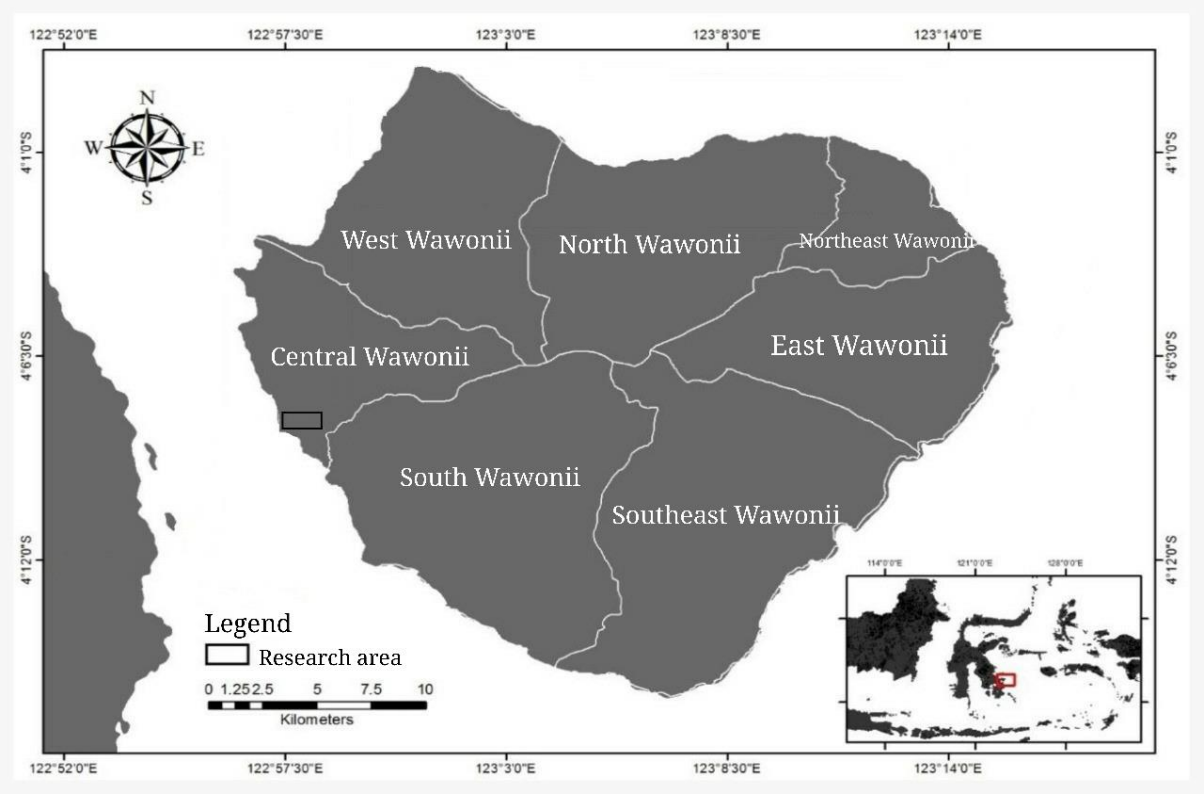

Figure 1. The location of the study area

This ethnobotanical research was conducted referring to Volgt *et al.* (2004) and Nolan and Turner (2011) with non-structured and open-ended interviews and direct observations in the field. Interviews were aimed at local people with criteria that they were indigenous Wawonii ethnic groups and had lived in Lampeapi village for at least 25 years. The selected respondents were taken randomly around 20 people who work as traditional leaders and local

communities who can provide accurate information and have knowledge about useful plants (Table 1).

Table 1. Classification of respondents to useful plants knowledge

Respondents Classification		Total
Gender	Male	17
	Female	3
Age (years)	35 – 45	3
	46 – 55	12
	Above 56	5
Occupation	Traditional figures	2
	Farmer	15
	Housewife	3
Education	Graduated from Elementary School	8
	Graduated from Junior High School	12

RESULTS AND DISCUSSION

Tukolo, scientifically known as *Kleinhovia hospita*, is the only species of *Kleinhovia* genus, *Sterculiaceae* family. Synonyms of this plant are *Cattimarus hospitus* (L.) Kuntze and *Grewia meyeniana* Walp. The origin of this species is thought to be from Indonesia, Malaysia and Papua New Guinea (Syahid and Sugandi, 2019). Species distribution is presented based on herbarium specimens at Herbarium Bogoriense (BO), it is known that this species grows in Indonesia (Borneo, Celebes, Java, Lesser Sunda Islands, Moluccas, Papua New Guinea and Sumatera). Additionally, the distribution of this species is known in Wungkolo, Lampeapi and Lansilowo on the Wawonii island, Southeast Sulawesi (Rugayah, *et al.*, 2015), but only in Lampeapi, it has been cultivated in the yard of their house. In Indonesia, *K. hospita* is known by several local names, such as *katimahar, tangkele, kayu tahun, timanga, katimahan, nundang, biintangar, kayu paliasa, bitini, ayu pali, rene, mgededo, weu, dedoro, binak, kelembauan, kana*, and *timoho* (Heyne, 1987).

The characteristics of this species are shrub or small tree, grow to 5 - 20 m in high, trunk are sometimes grooved and dark brown. Crowns are slightly rounded and not wide. Single leaf is scattered or alternate; long-stemmed; leaf blade shaped like a heart, they are 4.5–27 cm long and 3-24 cm wide, palmately compound leaf. Upright pink sprays of flowers are fuzzy, panicle, and long; bractea shape oblong; red perianthium. The shape of fruit is squared or box-like shapes, divided into 5 grooves, pink-coloured and brown-coloured when dry. The cultivated plants have 1.5 m in high and rarely flower (Rahayu *et al.*, 2004) (figure 2). The results showed that there was a slight difference in characteristics between natural and cultivated species about tree height, color and leaf shape.

In Lampeapi Village, this species is growing wild along the riverside and secondary forest around the village. The origin of this species began to be cultivated and planted in the yard of their house, based on the advice of a doctor from Kendari around 15 years ago. Before being cultivated, the use of this species was only as firewood, but it was ineffective, because this energy is usually in the form of low-level energy. It seems that the local traditional healer (*Sando*) did not recognize the use of this species as an ingredient in traditional medicine before the recommendation for its cultivation by medical personnel from the Kendari Health Office. Local people generally consume young tokulo leaves as a vegetable, while yellow-coloured and old leaves are brewed with hot water and drunk like

tea. Its use in traditional medicine is as a medicine for hepatitis. Tea products derived from leaves *K. hospita* and known as *Paliasa tea.* It has been developed on an industrial scale by the Faculty of Pharmacy, Hasanudin University (Paramita, 2016). Based on research conducted by Tayeb (2012), it was found that there were no pathological abnormalities in liver, kidneys, heart and stomach in experimental animals who were given *Paliasa Tea* in all doses. Thus, it can be concluded *Paliasa Tea* is safe for consumption.

Figure 2. *Kleinhovia hospita* L.

In Papua New Guinea and Solomon Islands, inside of tokulo stem is used to treat pneumonia, while leaf juice is used as an eyewash. Its leaves can also be used in shampooing to remove head lice (Latiff, 1997). In East Kalimantan, this species is known by the local name *tohongai*; its use as an antioxidant, antidiabetic, anticancer and hepatoprotective (Paramita, 2016). Local people in South Kalimantan, use this leaves to prevent gray hair growth (bleaching color) by shampooing (Yunita *et al.*, 2009).

Leaves of *K. hospita* contain saponins, cardenolin, bufadienol and anthraquinones which have hepatoprotective effect (Raflizar and Sihombing, 2009). Leaf extract of *K. hospita* showed moderate cytotoxicity on hepatocellular carcinoma cells. The cytotoxic effect of leaf extract increased with increasing concentration; In addition, this leaf extract also shows strong antioxidant activity (Arung *et al.*, 2009). Furthermore, Paramita (2016) reported that bark extract of *K. hospita* can inhibit murine leukemia cells; this is supported by research conducted by Soekamto *et al.* (2009) which stated that oleanen compound is contained in bark and root extract, it has antitumor activity. Triterpenoid compound is contained in leaf extract of *K. hospita*, it can regulate glucose translocation that facilitating glucose into cells, thus having antidiabetic activity (Yuliana *et al*., 2013).

The results of interviews with local community of Lampeapi village showed that the suggestion to tokulo was enthusiastically accepted. They stated that they can feel benefits by consuming the leaves as vegetables or drinks. They think that their stamina as farmers remains energetic even though their energy expended in managing their farming land is quite hard. Generally, young leaves are processed and consumed as vegetables twice a week. While, steeping some old leaves as a substitute for tea depends on people. It is estimated by consuming tokulo leaf, they do not have problem with their liver function, especially farmers of Wawonii community. In addition, they said that there were no patients with liver disease or hepatitis in local community of Lampeapi village. It is hoped that the Ministry of Health needs to conduct research to determine the role of *Kleinhovia hospita* in people, especially people who live in rural areas, so the use of this species as a vegetable and substitute for tea leaves *Camelia sinensis* can be increased.

Based on observations, it was found 17 house yards were planted with tokulo plants, while it can be found in their gardens. This species is one of 40 species of plants that are cultivated in the yard in Lampeapi village (Rahayu and Prawiroatmodjo, 2005). Around 3 takulo plants are found in 4 of 17 yards, while only 1 takulo tree in others. According to the local community, plant propagation by stem cutting, which are made from young stems that are starting to mature, large enough (about 2-3 cm in diameter) and around 50 cm long. Its growth requires full sunlight. Harvesting its first leaves can be done about 2 years after planting and only for personal use, not for traded.

The description above shows tokulo has several pharmacological potentials, especially as a hepatoprotector agent. Eventhough it is a new thing for Waonii people in Lampeapi village to use *K. hospita* as herbal medicine, but they have felt the benefits. The local government needs to conduct counseling to expand and multiply planting of tokulo not only in yard of house, but also on farm land. It is hoped to provide both of young leaves for vegetable and old leaves as a substitute for tea, which can be traded to traditional markets around Wawonii island or Kendari, which will have an impact to increase local people income.

CONCLUSION

The use of tokulo as an ingredient of traditional medicine has only been recognized by the local Wawonii community in Lampeapi village. Its young leaves are processed as vegetables, while its old leaves are used as alternative drink for tea. Further research is needed to uncover other potentials of tokulo as a medicinal plant in Southeast Sulawesi, to be developed into a source of phytochemical in Indonesia.

The use of its leaves as a substitute for tea leaves (*Camellia sinensis*) needs to developed on an industrial scale. The role of local government is needed to promote the uses of tokulo tea which is also efficacious as herbal medicine as well as it can be assessed to improve people's health and local communities' income and as a real program economic equity.

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P-ISSN 1693-6892
E-ISSN 2722-0257

Journal of Tropical Ethnobiology

VOLUME IV NUMBER 2 JULY 2021

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