

# MEDICINE PLANTS IN THE LONTAR MANUSCRIPT TARU PRAMANA AND IT USES FOR COUGH MEDICINE

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# MEDICINE PLANTS IN THE *LONTAR* MANUSCRIPT "TARU PRAMANA" AND IT USES FOR COUGH MEDICINE

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The *lontar* manuscript "Taru Pramana" describes the use of plant species to treat various diseases according to the traditional Balinese medicine system. This study aims to identify plants in the *lontar* manuscript "Taru Pramana" which are used for cough medicine. The research uses the library method. The unit of analysis is the *lontar* manuscript "Taru Pramana". Data were analyzed descriptively. An emic approach combined with an ethical perspective is used in the analysis. A total of 11 species of plant were recorded to be used for cough medicine including; bilimbi (*Averrhoa bilimbi*), carambola (*Averrhoa carambola* L.), fig (*Ficus sp.*), yams (*Dioscorea sp.*), galangal (*Alpinia galanga*), calamus (*Acorus calamus*), garlic (*Allium sativum* L.), coriander (*Coriandrum sativum* L.), turmeric (*Curcuma domestica*), White Pepper (*Piper nigrum* L), *Temu tis* (*Curcuma purpurascens* Blume). In addition, other ingredients are also used, such as black chicken eggs, stingless bee honey. These materials are used singly or in the form of a mixture (Polyherbal). The herb is used by drinking or in scrub in the chest area. In conclusion, the practice of using plants as medicinal ingredients is based on knowledge and belief.

Keywords: Medicinal plants, Traditional Balinese Medicine, *Lontar* manuscript "Taru Pramana"

## INTRODUCTION

The emergence of a new virus known as Severe acute respiratory coronavirus-2 (SARS-Cov-2) and the sickness known as Coronavirus disease 2019 (COVID-19) shook the globe at the start of 2020. This virus first appeared in Wuhan, China, at the end of 2019. Currently (August 10, 2021), 223 countries have been infected with COVID-19 with a total of 202,144,929 confirmed cases and 4,285,421 have been declared dead [1]. Although the Covid-19 vaccine has been found and many countries have worked hard to contain it, the signs of the end of this pandemic are still unclear.

Efforts to prevent, treat, and treat COVID-19 using traditional medicine systems have also been carried out. China, the United States, Italy, and India are countries that apply a lot of traditional medicine systems. The types of treatment are very diverse, including using herbal ingredients. Consumption of supplements such as vitamins C, D, zinc, omega-3, and herbs such as garlic, ginger, turmeric tends to increase during a pandemic. The consumption is mainly for the reasons of increasing immunity [2].

The main clinical manifestations of SARS-Cov-2 infection are fever, shortness of breath, and cough. Coughing is also a symptom

of respiratory disease, shortness of breath, or wheezing due to a blockage in the respiratory tract, such as in the case of asthma. However, coughing is also needed to clean the respiratory tract from particles, dust, germs, and secretions that cover the airways.

Various types of plants to prevent and treat coughs have been known and used by traditional Balinese people. These various types of plants are recorded in ancient manuscripts known as *lontar*, one of which is *lontar* "Taru Pramana". These plants are made in the form of herbal concoctions consisting of various types of plants and used in various ways such as drinking (*loloh*) or a scrub (*boreh*). This study aims to identify the types of plants in the *lontar* manuscript "Taru Pramana" and its uses for cough medicine.

## METHOD

The research uses the library method. The unit of analysis is the *lontar* manuscript "Taru Pramana" which has been translated from Balinese script to Latin script. Several types of *lontar* manuscripts analyzed include; *lontar* manuscript from Bugbug Village, Karangasem District which was transliterated by I Dewa Ayu Puspita Padmini, typed on December 31, 1995;

*lontar* belongs to Wayan Catra from Pandak Gede, Kediri, Tabanan which was copied by AAKetut Rai, and typed on September 4, 1993; *lontar* manuscript belongs to I Ketut Sengod from Banjar Pidpid Kaler, Abang Subdistrict, Karangasem, which was copied by Ida I Dewa Catra and typed on December 10, 1990.

The types of plants used as cough medicine were recorded and identified to determine their scientific names. Data were analyzed descriptively. An emic approach combined with an ethical perspective is used in the analysis. The emic approach is a local community perspective related to the practice, knowledge, and belief in plants as cough medicine. The emic perspective is then combined with a scientific perspective based on scientific data according to published research results.

### RESULTS AND DISCUSSION

The results of the study found that as many as 11 plant species were used for cough medicine including; bilimbi (*Averrhoa bilimbi*), carambola (*Averrhoa carambola* L.), fig (*Ficus sp.*), yams (*Dioscorea sp.*), galangal (*Alpinia galanga*), calamus (*Acorus calamus*), garlic (*Allium sativum* L), coriander (*Coriandrum sativum* L), turmeric (*Curcuma domestica*), White Pepper (*Piper nigrum* L), *Temu tis* (*Curcuma purpurascens* Blume) as presented in Table 1. In addition, other ingredients are also used, such as black chicken eggs, stingless bee honey.

Table 1. Medicinal Plants in *Lontar* Manuscript "Taru Pramana" which is used for cough medicine

No	Species	Ways of making	How to use
1	Leaves of Bilimbi ( <i>Averrhoa bilimbi</i> ), galangal ( <i>Alpinia galanga</i> ) 3 slices.	chewed	Spout ( <i>sembar</i> )
2	The stem bark of Bilimbi ( <i>Averrhoa bilimbi</i> ), Coriander ( <i>Coriandrum sativum</i> L) 5 seeds, Temu tis ( <i>Curcuma purpurascens</i> Blume).	crushed and filtered	Drink ( <i>loloh</i> )

3	Carambola fruit ( <i>Averrhoa carambola</i> L.), White Pepper ( <i>Piper nigrum</i> L) 11 seeds	crushed and filtered	Drink ( <i>loloh</i> )
4	Carambola leaves ( <i>Averrhoa carambola</i> L.), galangal ( <i>Alpinia galanga</i> ), Turmeric ( <i>Curcuma domestica</i> ) 3 slices,	chewed	Spout ( <i>sembar</i> )
5	Stem bark of Carambola ( <i>Averrhoa carambola</i> L.), Coriander ( <i>Coriandrum sativum</i> L), 5 seeds	crushed and filtered	Drink ( <i>loloh</i> )
6	Leaf fig ( <i>Ficus sp.</i> ) 11 strands, garlic ( <i>Allium sativum</i> L), calamus ( <i>Acorus calamus</i> ),	chewed	Spout ( <i>sembar</i> )
7	The sap of Yams ( <i>Dioscorea sp.</i> ), black chicken eggs, stingless bee honey, temu tis ( <i>Curcuma purpurascens</i> Blume), Coriander ( <i>Coriandrum sativum</i> L) 15 seeds	crushed and filtered	Drink ( <i>loloh</i> )

From an emic perspective, the practice of using plants as medicinal ingredients is based on local community knowledge about plants. Plants with white, yellow, or green flowers have heat properties, plants with red or blue flowers have *tis* (cool) properties, and plants with colorful flowers have *dumalada* (moderate) properties. In addition, plants with reddish-white sap will have heat properties. Plants with yellowish-white sap are also hot, greenish-white sap is *dumalada* (medium), blackish white is *dumalada* (medium), green sap is *tis* (cool), black is *tis* (cool), blue gummy is also *tis* (cool).

From an emic perspective, there are only three pains, namely fever, cold, and moderate, therefore the treatment is related to the nature of the plant. Fever pain can be treated with plants that are efficacious *tis*, cold sick are treated with warm plants, and moderate are treated with plants that have *dumalada* (medium) properties.

The use of plants as medicinal ingredients is inseparable from the public trust. Local people believe that health-illness is a

combination of *stula sarira* (body)-*suksma sarira* (mind)-*antahkarana sarira* (spirit), in other words, that health-illness is a balance between body, mind, and soul (spirit). If there is no balance between body-mind-spirit then a person is said to be sick.

Meanwhile, from an ethical perspective, the practice of using plants is associated with the active compounds of the plant so it has many pharmacological effects. For example, *Averrhoa bilimbi* leaves are known to have saponins, tannins, steroids, flavonoids, and alkaloids, which function as very strong antioxidants and as anti-inflammatory [3]. Meanwhile, bilimbi fruit is known to have the ability as antidiabetic by reducing hyperglycemia and reducing oxidative stress due to the presence of the compound of quercetin [4], as an antibacterial, especially multi-drug resistant bacteria [5], as an antioxidant that can reduce the formation of free radicals so that it can be used in cardiotoxicity treatment [6].

*Averrhoa bilimbi* locally known as *belimbing buluh* is a member of the Oxalidaceae family which has fruit with a sour taste. Aside from being a medicinal ingredient, local people also use bilimbi fruit as a cooking mixture to get rid of the fishy smell of fish. The parts used as cough medicine are the leaves and bark.

*Averrhoa carambola* is locally known as *belimbing manis* because it has ripe fruit with a sweet taste. Besides being a medicinal ingredient, local people also use carambola leaves as *lawar* (traditional Balinese food). The parts used as cough medicine are the stem bark, fruit, and leaves.

Carambola leaves are known to contain several active compounds that play an important role in medicine, including; Butane, 1,1-diethoxy-3 methyl-(CAS) methyl; Dodecanoic acid, methyl ester (CAS); Octadecanoic acid methyl ester (CAS); Octadecanoic acid methyl ester; and 9-Octadecanoic acid ethyl ester [7]. Carambola leaf methanol extract has the potential as an antihyperlipidemic by preventing the accumulation of liver lipids and inhibiting the activity of HMG-CoA reductase and lipase enzymes, as well as antioxidants [8]. The HMG-CoA reductase enzyme plays a role in converting HMG-CoA into mevalonate, which is the first stage of cholesterol synthesis in cells,

thereby preventing the production of endogenous cholesterol. Low plasma cholesterol will trigger the expression of LDL receptors thereby increasing LDL uptake.

*Alpinia galanga* is a member of the Zingiberaceae family which is widespread in Asia and is used as a spice in cooking and as a medicinal ingredient. These medicinal ingredients are associated with compounds, especially the terpene and phenolic groups. Phenolic compounds and their derivatives include ferulic acid, apigenin, vanillic acid, kaempferol, kaempferol-3-O-methyl ether, luteolin, chrysin, 1'-acetoxyeugenol, acetic acid, and p-hydroxybenzoic acid. These compounds are mainly found in rhizomes. Meanwhile, the terpene group compounds include -pinene, terpineol, and 1,8-cineole. *Alpinia galanga* is used as an antimicrobial, antifungal, anti-inflammatory, anti-hepatotoxic, antioxidant, immunomodulatory, antidiabetic [9].

*Acorus calamus* is a member of the Acoraceae family. Local people call it by the name *Jangu* and it is used for various purposes such as cooking spices, Hindu religious rituals, ornamental plants, as well as medicinal ingredients. Rhizome calamus is known to contain neo-acorane A, acorid acid, and calamusin D compounds. These compounds have the potential to protect nerve cells [10]. The rhizome is also known to contain essential oils, especially  $\alpha$ -asarone, (E)-methyl isoeugenol, methyl eugenol,  $\beta$ -asarone,  $\alpha$ -cedrene, and camphor.

*Allium sativum* L by local people is referred to as *kesuna* and is used as a cooking spice, medicinal ingredient, and Hindu religious rituals. The main secondary metabolites contained in *Allium sativum* are mainly organosulfur compounds. These compounds are rich in sulfur so that *Allium sativum* has a distinctive smell and taste as well as pharmacological functions in health. Mainly organosulfur compounds are; alliin, alliin, allyl trisulfide, E1 propenyl allyl disulfide, 2 propenyl 1 propenyl disulfide, 2 phenyl 4H 1,3 dithiin, 3 vinyl 4H 1,2 dithiin, and ajoene [11]. Organosulfur compounds are known to act as immunomodulators so that they have the potential to prevent SARS-CoV-2 [12].

Coriander (*Coriandrum sativum* L) is locally known as coriander. The part of the plant that is used is the seed, used as a spice in cooking, in Hindu religious rituals, and as a medicinal ingredient. These medicinal ingredients are associated with the presence of secondary metabolites in the form of essential oils, including;  $\alpha$ -pinene, camphene, 1-Limonene, and Camphor. These compounds cause coriander to act as gram-negative and gram-positive antibacterials [13]. In addition, there are linalool, geraniol, terpinen-4-ol,  $\alpha$ -terpineol,  $\gamma$ -terpinene,  $\beta$ -cymene, camphene, myrcene, geranyl acetate, and linalyl acetate [14].

Turmeric (*Curcuma domestica* L) is locally known as *kunyit* and is used as a spice in cooking, in Hindu religious rituals, and as an ingredient in traditional medicine. These medicinal ingredients are associated with the presence of secondary metabolites including; saponins 3.73 %w/v, alkaloids 0.24 %w/v, steroids 1.55 %w/v, flavonoids 1.99 %w/v, tannin 41.33 %w/v, and phenol 1.71 %w/v. Turmeric also has good antioxidant activity, with an IC<sub>50</sub> of 363 g/ml at 1,1-diphenyl-2-picrylhydrazyl (DPPH).

Pepper (*Piper nigrum* L) has long been used as a spice in cooking to get a spicy taste. The taste comes from piperine compounds which reach 26% [15]. *Piper nigrum* has important pharmacological functions including treating colon cancer [16], inhibit bile duct cancer through the pathway of down-regulation of cell proliferation and induction of apoptosis [17], as an herbal medicine for anti-cancer and migratory activity through the mevalonate pathway [18], as an antibacterial in both gram-positive and gram-negative species [19], as an antioxidant [24], as a hepatoprotective against drugs [20], as an effective nutraceutical in overcoming oxidative stress and anti-inflammatory.

*Curcuma purpurascens* locally is known as *temu his*, used in traditional medicine and Hindu religious rituals. Essential oils found in rhizome include turmerone (13.5%), germacrone (13.2%), ar-turmerone (9.4%), germacrene-B (8.8%), curlone (6.2%), curzerene (5.8%), camphor (5.8%), and ar-turmerone (9.4%). (4%). The presence of these essential oils may act as a strong antiproliferative in human colon carcinoma cells (HT29) lines [21]. Hexane rhizome extract

[22]. C-elemene, 6-ethenyl-4,5,6,7-tetrahydro-3,6-dimethyl-5-isopropenyl, benzofuran, 3,7-cyclodecadiene-1-one, 3,7 dimethyl-10-(1-methylethylidene), turmerone, and curlone are among the active compounds found in *Curcuma purpurascens*. Because of the presence of these active substances, it can protect the stomach from harm.

These herbs were used in the mixed form (Table 1). Such mixed forms are known as polyherbal [23]. The polyherbal form is generally better than the single form because the compounds contained in a single plant are not sufficient to achieve the desired effect. Polyherbal forms will work synergistically to achieve a better effect [24]. For example, essential oil made in the form of a mixture of Caraway (*Carum carvi* L) with coriander produces antibacterial activity, as well as better antioxidant and antidiabetic activity than single form [25]. Ayurvedic polyherbal, *Dhanwantaram kashyam*, which consists of 40 kinds of herbal ingredients, can reduce free radicals and can restore normal lipid profiles in diabetic rats [26]

The polyherbal is used by drinking (*lolo*) or spout (*sembar*) on the chest area (Table 1). *Lolo* is a starch extract made by grinding all the ingredients and adding a little water, filtering it, then drinking it. *Sembar* is made by chewing all the ingredients and then spout it on the chest. However, due to the COVID-19 pandemic, the use in the form of *sembar* can be replaced with the form of *boreh*. *Boreh* is obtained by grinding all the ingredients until smooth using a mortar and use by scrub in the chest area.

## CONCLUSION

The practice of using plants as medicinal ingredients is based on knowledge and belief. A total of 11 species were recorded as being used for cough medicine, and this finding opens the opportunity to explore further to obtain scientific evidence so that it can be integrated into conventional medicine systems.

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# MEDICINE PLANTS IN THE LONTAR MANUSCRIPT TARU PRAMANA AND IT USES FOR COUGH MEDICINE

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PAGE 1

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