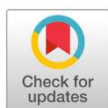


From fences to medicine: a short review on ethnobotanical study of *Lannea coromandelica* (Houtt.) Merr. (Family Anacardiaceae) in Indonesia

Reza Raihandhany^{1*}

¹Master in Biology Study Program, Faculty of Biology, Universitas Gadjah Mada, Yogyakarta, Indonesia

*Correspondence: rezaraihan11@gmail.com



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Abstract

Lannea coromandelica (Houtt.) Merr. is a deciduous tropical tree that originates and is native to India. This species belongs to the family Anacardiaceae. *L. coromandelica* is also found in Indonesia and is known as kayu jawa. Indonesian people often utilize *L. coromandelica* for medicinal purposes and as natural fences. Almost all parts of the plant, including the bark, leaves, sap, and trunk, can be utilized for medicinal purposes. This paper review aims to gather information regarding ethnobotanical studies conducted by traditional communities in Indonesia that use *L. coromandelica* in their daily lives. A literature review for this paper was conducted in October 2023 using scientific articles available online, including papers from various journal websites, undergraduate theses in college repositories, accessible e-books, and conference proceedings related to *Lannea coromandelica* through google scholar. The results indicate that *L. coromandelica* is widely utilized throughout Indonesia, including Sumatera, Java, Kalimantan, West and East Nusa Tenggara, Sulawesi, and North Maluku. Most of the usage of *L. coromandelica* is for medicinal purposes, treating various diseases such as cough, stomach ulcers, sore eyes, fever, diabetes, and post-partum care. Almost all parts of the plant are useful, including the bark, leaves, trunk, twigs, and the entire plant. Thus, bark is the most utilized plant part. However, besides its medicinal uses, *L. coromandelica* has numerous other utilizations, including firewood, natural fences, natural dyes, cosmetics, and materials for building and boat hulls. The conservation aspect of *L. coromandelica* must be considered since in several utilization trunk is used for medicinal purposes.

Keywords: Anacardiaceae, Ethnobotany, Kayu jawa, Medicine, *Lannea coromandelica*



Introduction

Lannea coromandelica (Houtt.) Merr. (Family: Anacardiaceae) is a deciduous tropical tree that originates from India and is native to Bangladesh, Cambodia, China, Laos, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, and Vietnam¹. This species is also distributed in Indonesia. Indonesian people often utilize *L. coromandelica* traditionally for medicinal purposes to treat various diseases. This species is known as kayu jawa for its vernacular name. Furthermore, almost all of the plant parts, such as bark, leaves, sap, and trunk, are useful and possess pharmacological properties for health benefits². In Indonesia, particularly in the West Sulawesi province, bark decoction of *L. coromandelica* is used to treat post-partum hemorrhage³. The bark of *L. coromandelica* contains several secondary metabolites, such as flavonoids, tannins, and saponins⁴. *L. coromandelica* also exhibits antioxidant properties⁵, anti-inflammatory activities⁶, and antidiabetic effects⁷. Besides, this species also shows antimicrobial⁸ and antifungal⁹ activities. In Indonesia, this species is often planted as natural fences¹⁰. This paper review aims to gather all information about the utilization of *L. coromandelica* by several traditional communities in Indonesia, both as food and medicinal plants. The objective of this paper review is to collect comprehensive information on the utilization of *L. coromandelica* through an ethnobotanical approach by various traditional communities in Indonesia, encompassing its uses both as a medicinal plant and in other uses.

Materials and methods

A literature review for this paper was conducted in October 2023 using scientific articles available online, including papers from various journal websites, undergraduate theses in college repositories, accessible e-books, and conference proceedings related to *Lannea coromandelica*. Keywords such as "ethnobotany *Lannea coromandelica*" and "ethnobotany kayu jawa" were employed in Google Scholar to gather relevant information. The findings from these sources were compiled and analyzed to elucidate the traditional uses of *L. coromandelica* as a medicinal plant and its other utilizations by traditional communities in Indonesia.

Results and Discussion

Lannea coromandelica is a well-known plant species that is used as a medicinal remedy for various diseases by Indonesian people especially the traditional communities. For instance, Ernilasari et al.¹¹ discovered that the Blang Bungong society in the Tangse Sub-district of Pidie Regency, Aceh, utilizes *L. coromandelica* (kuda-kuda) bark as one of the ingredients in making post-partum concoctions. Nadya¹² exploration found that the Aneuk Jamee ethnic in the Samadua Sub-district of South Aceh Regency, Aceh, employs *L. coromandelica* (kayu jawa) for post-partum treatments. The process involves pounding *L. coromandelica* (kayu jawa) and *Averrhoa carambola* (belimbing) leaves, wrapping them in *Musa x paradisiaca* (pisang) leaves, smoking them, and then applying the leaves to the stomach which is tied with a post-maternity corset, twice daily for three days. A study by Fathiya et al.¹³ in the Blang Crum community of Muara Dua Subdistrict, Lhokseumawe Regency, Aceh, recorded the use of *L. coromandelica* (kuda-kuda) to treat ailments such as coughs and stomach ulcers.

Raihandhany¹⁴ reported that in Banceuy Traditional Village, Subang Regency, West Java, the bark of *L. coromandelica* (kalijaran) is used as one of the ingredients for making a special dish called sambal papagan. The bark of *L. coromandelica* (kalijaran) is washed and then pounded. After that, other ingredients such as *Piper retrofractum* (cabe areuy), *Allium cepa var. aggregatum* (bawang merah), *A. sativum* (bawang putih), *Ocimum basilicum* (kemangi), *P. nigrum* (merica), *Kaempferia galanga* (kencur), and *Zingiber officinale* (jahe) are added and pounded as well. Sambal papagan is served to post-partum

mother and it is believed to relieve the uterine contractions and warm the body after a mother giving birth to a newborn baby. According to Ramadhani¹⁵, the Osing community in Banyuwangi Regency, East Java, utilizes *L. coromandelica* (santan) as a medicinal plant for treating skin diseases. Similarly, Akmalia¹⁶ found that the Osing community uses *L. coromandelica* (santan) to treat sore eyes by applying the sap from the twigs. A study by Destryana & Ismawati¹⁷ revealed that the Madurese community in Sumenep Regency, Madura Island, East Java, employs the young leaf twigs of *L. coromandelica* (kaju jaran) to cure sore eyes by applying the sap to the eyes. Recent study from Hasanah¹⁸ in the Aengdake village, Sumenep Regency, Madura Island, East Java, found that leaves and sap from *L. coromandelica* (khaju jeren) are used to treat fever and sore eyes. The plant materials are pounded, boiled, and consumed to reduce fever, and the sap is applied to the eyes. According to Susiarti et al.¹⁹ survey in Sumenep Regency, Madura Island, East Java, categorizing *L. coromandelica* (palembheng) as one of the medicinal plants, with the trunk being the utilized part.

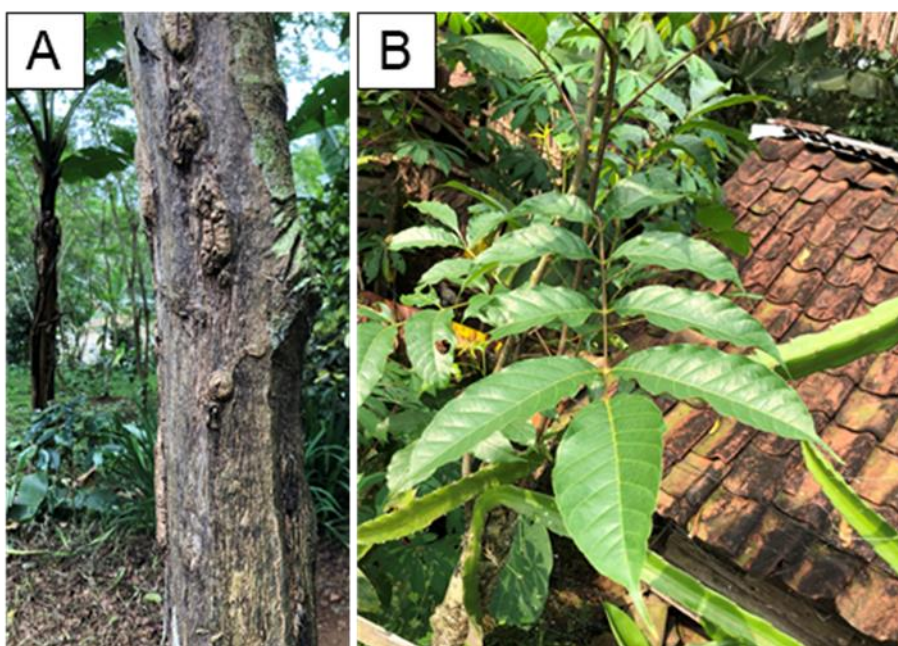


Figure 1. *L. coromandelica* (Houtt.) Merr.: A. trunk when its bark already removed; B. odd-pinnate leaves (Personal Documentation).

According to Eni et al.²⁰, the Hindu community in Jagaraga Village, West Lombok Regency, West Nusa Tenggara, uses *L. coromandelica* (banten) leaves that is planted in their yard to treat fever and headache. However, the specific method of using it was not mentioned clearly in the paper. Research conducted by Jannaturrayyan et al.²¹ in Beleq Hamlet, Gumantar Village, North Lombok Regency, West Nusa Tenggara, found that people there utilize *L. coromandelica* (bantenan) leaves to treat fever. Next, a study by Tima et al.²² in Nangapanda Sub-district, Ende Regency, East Nusa Tenggara, noted that people there utilize *L. coromandelica* (reo) sap to treat toothache. Unfortunately, the specific method of use was not mentioned.

Sundari et al.²³ discovered that people of Ranggagata Village, Southwest Praya Sub-district, Central Lombok Regency, West Nusa Tenggara, utilize sap from *L. coromandelica* (daun jaran) trunk to treat sore eyes. A study by Damayanti et al.²⁴ showed that the Sasak tribe in each village in North, West, East, and Central Lombok Regency utilize *L. coromandelica* (banten) to cure sore eyes and fever. The ingredients are pounded and the resulting liquid is squeezed and dripped into the eyes. The sap from the trunk is dripped into the eyes for 2-3 days. Research conducted by Beis et al.²⁵ in Teas Village,

Noebeba Sub-District, Timor Tengah Selatan Regency, East Nusa Tenggara, showed that *L. coromandelica* (pohon ende) is utilized to treat low back pain by boiling its bark, and the decoction is used for bathing.

An ethnobotanical study conducted by Rifandi et al.²⁶ discovered that the people of Muara Pagatan, Village Kusan Hilir, Sub-District, Tanah Bumbu Regency, South Kalimantan, utilize *L. coromandelica* (aju jawa) to cure hematemesis by consuming the trunk decoction. A palm-sized trunk is boiled with three glasses of water, reduced to a glass or until the water turns reddish-brown, and then consumed once a day in the morning. Exploration by Handayani et al.²⁷ found that the Bugis Pagatan ethnic group in South Kalimantan also utilizes *L. coromandelica* (aju jawa) to treat internal diseases by drinking its bark decoction.

Royyani and Rahayu²⁸ exploration in Dampo-Dampo Jaya Village, Wawonii Island, Southeast Sulawesi, noted that people there utilize *L. coromandelica* (kayu jawa) bark to cover open wounds by heating the bark and applying it to the wounded area. A study carried out by Herawati and Yuniati²⁹ in Tomini Village, Parigi Moutong Sub-district, Central Sulawesi, showed that the Lauje ethnic group uses *L. coromandelica* (kayu jawa) to treat tuberculosis by consuming its trunk decoction, which is added with honey and egg. Megawati et al.³⁰ reported that the Tribal Peoples Kaili Ija in Bora Village, Biromaru Sigi Sub-district, Central Sulawesi, utilize the trunk of *L. coromandelica* (kai jawa) to cure sore eyes and wounds by dripping its sap into the eyes and applying the sap on the wounded part.

According to Zubair et al.³¹, the Kaili Rai ethnic group in Wombo Village, Tanantovea Sub-district, Donggala Regency, Central Sulawesi, uses it to treat hematochezia. The bark of *L. coromandelica* (kayu cina) is first pounded, and then squeezed, and the fluid is consumed. Furthermore, the fluid can be applied to cure cuts. Anam et al.³² studied in Ogodeide District, Tolitoli Regency, Central Sulawesi, recorded that the Dondo Tribe utilizes *L. coromandelica* (ayu jawa) bark to cure diarrhea. After removing the outer layer of bark, it is pounded and boiled with three glasses of water. It is consumed twice a day for five days. Research conducted by Rahmawati et al.³³ found that the To Manui ethnic group of Central Sulawesi uses small pieces of *L. coromandelica* (keu jawa) leaves and *Areca catechu* (pinang) roots to treat fertility disorders and diabetes. All the ingredients are boiled in sufficient water and allowed to cool for a moment, and a glass of the mixture is consumed twice a day. Angraeni³⁴ found that *L. coromandelica* (kayu jawa) leaves are used to treat diabetes and hypertension in Bambapuang Village, Enrekang Regency, South Sulawesi. According to Wijaya and Dewi³⁵, the Gebe Tribes in North Maluku utilize *L. coromandelica* (pasha) as one of the medicinal plants for postpartum treatment.

Other Traditional Uses of *L. coromandelica*

Other than being utilized as medicinal plants, *L. coromandelica* has various other uses. For example, a recent study by Ervilita et al.³⁶ found that *L. coromandelica* (kedondong pagar) is planted as natural fences plant by the people in Aceh Jaya Regency. Research carried out by Sulastri et al.³⁷ in Koba Sub-district, Central Bangka Regency, Bangka Belitung Island, utilized *L. coromandelica* (jaranan) bark, which is steamed for use as an eco-print motif. Hidayat et al.³⁸ discovered that the people of Dukuh Cultural Village, Garut Regency, West Java, use *L. coromandelica* (kalujaran) bark as a natural black dye by boiling its bark. Umami et al.³⁹ noted that the Osing Tribe in Banyuwangi Regency also uses *L. coromandelica* (santen) wood as a building material. Recent research carried out by Ikbali et al.⁴⁰ discovered that *L. coromandelica* is used as one of the plants for wellness tourism in Kalipuro-Gombengsari Village, Banyuwangi Regency.

A study by Adawiyah et al.⁴¹ showed that the Madurese on Gili Ketapang Island, Probolinggo Regency, East Java, utilize *L. coromandelica* (kijaran) wood for boat hulls. Setiani et al.⁴² discovered that Madurese people utilize *L. coromandelica* (ki jaran) as natural fences and for firewood. A study conducted by Rahayu et al.⁴³ found that *L. coromandelica* (kayu makasar) bark is used as dyes and a natural color binder in weaving fabric in Pringgasela, East Lombok, West Nusa Tenggara, to achieve a chocolate color. Marwa⁴⁴ recorded that the villagers of Tanjung Luar, East Lombok Regency, utilize *L. coromandelica* as

one of their plant-based cosmetics. Rahayu et al.⁴⁵ discovered that the people of Songak Village, East Lombok Regency, West Nusa Tenggara, utilize *L. coromandelica* wood as firewood. The reason for using this wood species due to its odorless trait, which ensures it does not affect during cooking process of herbal oils that is made by the people of Songak Village.

Conclusions

L. coromandelica, or known as kayu jawa for its vernacular name is a popular species in Indonesia due to its beneficial medicinal plants to treat various diseases such as cough, stomach ulcers, sore eyes, fever, diabetes, and treatment for post-partum. Despite being named kayu jawa, actually, the utilization of this species is widely utilized across Indonesia, not only on Java Island but also on others, namely, Sumatera, Kalimantan, West and East Nusa Tenggara, Sulawesi, and North Maluku. The bark is the most used part for medicinal purposes to treat various diseases. Moreover, other parts are also used as well such as leaves, twigs, trunks, and whole plants. Other than being utilized as medicinal plants, *L. coromandelica* also has various other uses, including firewood, natural fences, natural dyes, cosmetics, and materials for building and boat hulls. This fact has shown that despite not being native to Indonesia, *L. coromandelica* is widely used by the Indonesian people for medicinal purposes. The conservation aspect of *L. coromandelica* must be considered as well since in several utilizations trunk is quite used for medicinal purposes.

Acknowledgments

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Conflicts of Interest

The authors declare no conflict of interest in any capacity, including competing or financial.

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