

Baccaurea Lour. (Phyllanthaceae): An Ethnobotanical Review of Its Importance and Traditional Uses

Baccaurea Lour. (Phyllanthaceae): Tinjauan Etnobotani Mengenai Arti Penting dan Pemanfaatan Tradisionalnya

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Abstract	Article Information	
<i>Baccaurea Lour. (Phyllanthaceae) is a genus of tropical forest plants that has long been associated with the livelihoods and cultural traditions of local communities across South and Southeast Asia. Although numerous studies have documented the taxonomy, phytochemistry, and biological activities of individual species, information regarding their ethnobotanical importance remains fragmented. This review aims to synthesize current knowledge on the taxonomy, diversity, geographical distribution, and ethnobotanical significance of Baccaurea. The review indicates that approximately 50 accepted Baccaurea species occur predominantly in tropical forests of South and Southeast Asia, with Indonesia representing one of the major centers of diversity. Various species produce edible fruits rich in bioactive compounds, which contribute to their nutritional and antioxidant values. In addition, several species provide durable timber for local construction and bark-derived natural dyes for traditional handicrafts. Collectively, these findings highlight Baccaurea as a multipurpose forest genus with considerable ethnobotanical, nutritional, medicinal, and socio-economic value.</i>	Keywords: Baccaurea, ethnobotany, traditional knowledge, phytochemistry, wild edible fruits.	Kata kunci: <i>Baccaurea</i> , etnobotani, pengetahuan tradisional, fitokimia, buah hutan liar.
Baccaurea Lour. (Phyllanthaceae) merupakan genus tumbuhan hutan tropis yang telah lama dikaitkan dengan mata pencaharian dan tradisi budaya masyarakat lokal di seluruh Asia Selatan dan Asia Tenggara. Meskipun berbagai penelitian telah mendokumentasikan taksonomi, fitokimia, dan aktivitas biologis masing-masing spesies, informasi mengenai pentingnya Baccaurea dari perspektif etnobotani masih belum terintegrasi. Artikel tinjauan ini bertujuan untuk mensintesis pengetahuan terkini mengenai taksonomi, keanekaragaman, persebaran geografis, dan signifikansi etnobotani Baccaurea. Hasil kajian menunjukkan bahwa terdapat sekitar 50 spesies Baccaurea yang diterima, yang sebagian besar tersebar di hutan tropis Asia Selatan dan Asia Tenggara, dengan Indonesia sebagai salah satu pusat keanekaragaman utamanya. Berbagai spesies menghasilkan buah yang dapat dimakan dan kaya akan senyawa bioaktif, yang berkontribusi terhadap nilai gizi dan aktivitas antioksidannya. Selain itu, beberapa spesies menghasilkan kayu yang tahan lama untuk konstruksi lokal serta pewarna alami yang berasal dari kulit batang untuk kerajinan tradisional. Secara keseluruhan, temuan-temuan ini menunjukkan bahwa Baccaurea merupakan genus tumbuhan hutan multiguna dengan nilai etnobotani, gizi, pengobatan, dan sosial-ekonomi yang tinggi.	History Manuscript received : 15/07/2026 Revised : 15/10/2026 Accepted : 20/10/2026 Published : 31/10/2026	

A. INTRODUCTION

The genus *Baccaurea* Lour. has become increasingly important scientifically because of its ecological, nutritional, medicinal, and socio-economic values in tropical Asia (Charu et al., 2021; Prodhon & Mridu, 2021; Gogoi, 2017; Gunawan et al., 2016). *Baccaurea* spp. is a diverse group of forest plants that have been tightly linked with local communities for generations, as valuable biological resources and integral to traditional ecological knowledge (Navia et al., 2022b; Munawaroh & Astuti, 2018; Gunawan et al., 2016). Although it is important, information on this genus is still scattered in taxonomic, phytochemical, nutritional and ethnobotanical studies, highlighting the need for a comprehensive synthesis from an ethnobotanical perspective.

The relationship between humans and *Baccaurea* species represents a valuable component of ethnobotanical knowledge. Ethnobotany is an interdisciplinary field that examines the relationships between people and plants, encompassing traditional knowledge, cultural practices, plant utilization, and the interactions between human societies and plant resources (Albuquerque & Júnior, 2023). Ethnobotany not only documents plant uses but also provides important insights into the role that traditional knowledge plays in food security, healthcare, sustainable livelihoods, and the conservation of biocultural diversity (Abreu et al., 2023). This knowledge has been gathered over generations and forms an important part of cultural heritage, particularly for indigenous communities whose livelihoods remain closely connected to forest ecosystems.

The local health care and food security provided by traditional knowledge as well as the conservation of biodiversity through sustainable harvesting and resource management practices (Jitpromma et al., 2026). Traditional ethnobotanical knowledge is the result of generations of observations and experiences that have enabled local communities to recognise useful plant species, to develop techniques for harvesting and processing them, and to use them for food, medicine, construction and diverse cultural practices (Inta et al., 2025; Phumthum et al., 2025). Besides documenting plant uses, ethnobotanical studies contribute to the preservation of indigenous knowledge, support sustainable resource management, and identify plant species with potential applications in agriculture, nutrition, pharmacology and biotechnology (Albuquerque et al., 2019).

The genus *Baccaurea* is an important but comparatively under-studied ethnobotanical resource in Southeast Asia due to its wide distribution and close association with the tropical forest communities. Indigenous and rural communities have known and used innumerable species for a long time. This is a reflection of a vast body of traditional ecological knowledge that has evolved through continuous interactions of humans and forest ecosystems (Sharifian et al., 2022). Nevertheless, the existing *Baccaurea* literature is still fragmented in the sense of taxonomic, ecological, phytochemical, nutritional and ethnopharmacological research with relatively few publications combining these topics into a thorough ethnobotanical framework.

B. METHOD

This study employed a narrative literature review supported by a structured literature search to synthesize knowledge on the ethnobotanical significance of the genus *Baccaurea*. Literature was searched using Google Scholar, Scopus, Web of Science, PubMed, and other relevant academic and online sources. Additional information was obtained from conference proceedings and authoritative botanical databases and websites, including Plants of the World Online (POWO) and the Global Biodiversity Information Facility (GBIF), particularly for taxonomic, distributional, and biodiversity-related information.

The literature search was conducted in July 2026 using *Baccaurea* as the primary search term and combinations of related terms, including ethnobotany, medicinal plants, edible fruits, ecological, and socio-economic. No formal publication-year restriction was applied; however, more recent publications were prioritized when relevant, while older seminal or

taxonomically important sources were retained when necessary. The search focused on literature addressing the taxonomy, geographical distribution, traditional uses, nutritional value, phytochemical composition, ecological relevance, and biological activities of *Baccaurea*. Potentially relevant publications and sources were initially assessed based on their titles. The abstracts or available summaries of the identified publications were then examined, with particular attention to their reported results and findings, to determine their relevance to the objectives of this review.

C. RESULTS AND DISCUSSION

Taxonomy and Botanical Characteristics

Baccaurea Lour. is a genus of woody plants in the family Phyllanthaceae and the order Malpighiales. Initially, this genus was included in the family Euphorbiaceae based on morphological characteristics (Haegens, 2000). However, advances in molecular phylogenetic studies have led to its reclassification into Phyllanthaceae according to the Angiosperm Phylogeny Group (APG) system (Hoffmann et al., 2006). According to Plants of the World Online (POWO), *Baccaurea* comprises 50 accepted species, and its native distribution extends from southern China across tropical Asia to the southwestern Pacific (POWO, 2026). According to Haegens (2000), *Baccaurea* comprises shrubs to trees, with plants reaching heights of up to 25 m in New Guinea. The plants are dioecious, and their bark is finely fissured. The indumentum consists of simple and often stellate hairs. Leaves are simple, alternate, and spirally arranged, sometimes crowded at the distal ends of branches. The inflorescences range from axillary to cauline and are described as reduced thyrses. Flowers lack petals, while fruits range from berries to fleshy capsules that dehisce late. The seeds are completely enclosed by an arillode. Fruits vary from indehiscent berries to late-dehiscing fleshy capsules, depending on the species (POWO, 2026; Flora of Thailand, 2005; Haegens, 2000). Most fruits contain one to several seeds enclosed by translucent, juicy arils that are edible and often exhibit sweet, sour, or sweet-sour flavors (Lim, 2012; Haegens, 2000).

Diversity and Geographical Distribution

The genus *Baccaurea* is predominantly distributed throughout tropical Asia (Figure 1), extending from northeastern India and southern China through Southeast countries, and several Pacific islands (POWO 2026; Haegens, 2000). The center of species diversity is located within the Malesian biogeographical region, particularly Borneo, Sumatra, and the Malay Peninsula, where favorable climatic conditions and extensive tropical rainforests promote high levels of species richness (Awang et al., 2018). Ecologically, *Baccaurea* species occur in primary and secondary rainforests, including freshwater swamp, kerangas, and peat-swamp forests, on various soil types and at elevations from sea level to approximately 1,800 m, although they are generally more common in lowland habitats (Haegens, 2000; Idris, 1998).

Indonesia represents one of the principal centers of *Baccaurea* diversity. Species occur across Sumatra, Java, Kalimantan, Sulawesi, Maluku, and Papua, with particularly high richness reported from Sumatra and Kalimantan (Sofiyanti et al., 2022; Munawaroh & Astuti, 2018). Many species exhibit relatively restricted geographical distributions and narrow habitat preferences, resulting in localized endemism. For example, *B. macrocarpa*, *B. angulata*, and *B. lanceolata* are primarily associated with the forests of Borneo, whereas *B. motleyana* and *B. racemosa* are more widely distributed across western Indonesia and Peninsular Malaysia.



**Figure 1. Geographical distribution of *Baccaurea* species (POWO, 2026).
The green-shaded areas indicate the geographical distribution of the genus *Baccaurea***

Ethnobotanical Importance of *Baccaurea*

Baccaurea species have considerable ethnobotanical importance, particularly in communities where these plants are traditionally utilized for food, medicine, and other daily needs. The various uses of *Baccaurea* reflect the cultural and practical value of these plants and involve different plant parts and applications (Navia et al., 2022b; Munawaroh & Astuti, 2018). The detailed utilization of *Baccaurea* species is presented in **Table 1**.

***Baccaurea* as an Edible Fruit**

Among the various ethnobotanical values of *Baccaurea*, its edible fruits represent the most important and widely documented utilization. Numerous species are harvested directly from natural forests or home gardens and consumed fresh by local communities throughout Southeast Asia. The fruits are generally characterized by a juicy aril surrounding one to several seeds, with flavors ranging from sweet to sweet-sour depending on the species and maturity stage (Haegens, 2000).

Ecologically, the fruits of *Baccaurea* also serve as an important food source for wildlife, including birds, rodent, monkeys, deer, and orangutans (Gunawan et al., 2016; Ramayani & Fitmawati, 2020). Several species have gained particular importance because of their palatable fruits (Figure 2). *Baccaurea macrocarpa* (tampoi), *B. motleyana* (rambai), *B. angulata* (belimbing dayak), *B. lanceolata* (limpasu), *B. racemosa*, and *B. polyneura* are among the most frequently consumed species in Indonesia, Malaysia, and Brunei (Munawaroh & Astuti, 2018; Navia et al., 2022a). Besides being eaten fresh, their fruits are processed into juices, jams, syrups, pickles, fermented beverages, candies, and traditional desserts, thereby increasing their economic value and shelf life (Salma et al., 2006; Suwardi et al., 2022). *Baccaurea* fruits are also used as a vegetable, seasoning, souring agent, and culinary ingredient in Southeast Asian cuisine (Sohag et al., 2026).

In many rural communities, seasonal fruit harvesting also contributes to household income through local markets (Derebe et al., 2023). Although commercial cultivation remains limited, several species have considerable potential as underutilized tropical fruit crops because of their distinctive taste and attractive fruit colors.

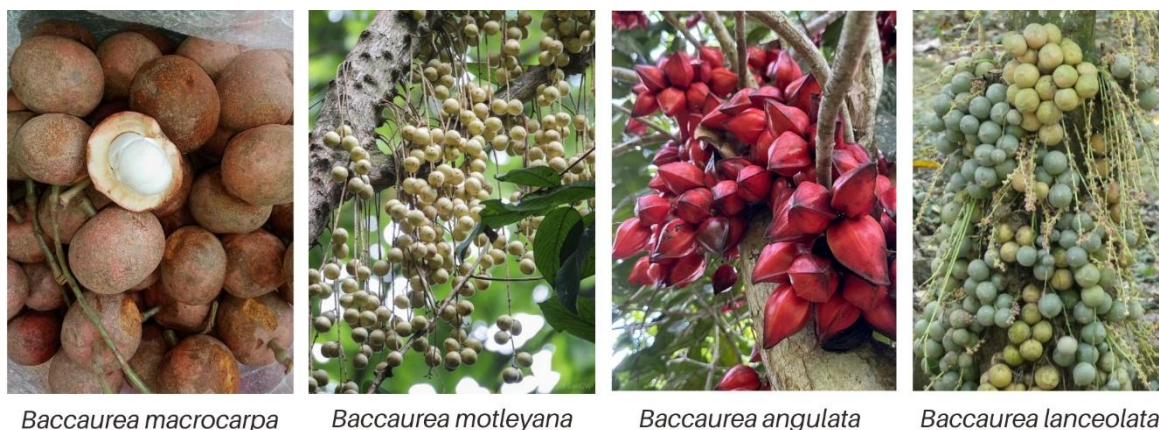


Figure 2. Fruits of four *Baccaurea* species: *B. macrocarpa*, *B. motleyana*, *B. angulata*, and *B. lanceolata*. The photographs were obtained from iNaturalist via GBIF. *B. macrocarpa* (Hutan90, 2025; GBIF ID: 6399149805); *B. motleyana* (Gan, 2018; GBIF ID: 1913170057); *B. angulata* (Kofang, 2024; GBIF ID: 4852807024); *B. lanceolata* (Kirschey, 2022; GBIF ID: 5062543595)

Nutritionally, *Baccaurea* fruits contain carbohydrates, dietary fiber, vitamins, minerals, and diverse secondary metabolites. Particularly noteworthy are their high concentrations of phenolic compounds, flavonoids, anthocyanins, carotenoids, and vitamin C, all of which contribute to strong antioxidant capacity (Awang et al., 2018; Lim, 2012). For example, *B. angulata* fruits exhibit exceptionally high total phenolic content and antioxidant activity compared with many other tropical fruits. Anthocyanins present in the reddish pericarp have been associated with free radical scavenging activity, suggesting potential applications as functional foods and natural antioxidants (Ahmed et al., 2015).

Table 1. The Detailed Utilization of *Baccaurea* Species

No	Species	Food Uses	Traditional Medicinal Uses	Construction Uses
1	<i>Baccaurea bracteata</i> Müll.Arg.	Fruit	Treatment of stomachache; leaves are boiled and the decoction is consumed	Wood used for house frames, posts, and beams, as well as for making boats and boxes
2	<i>Baccaurea dulcis</i> (Jack) Müll.Arg.	Fruit	Regulation of menstruation and relief of difficulty in urination; leaves are boiled and the decoction is consumed	Wood used for house frames
3	<i>Baccaurea edulis</i> Merr.	Fruit	Treatment of stomachache; leaves are boiled and the decoction is consumed	Wood used for house frames and posts
4	<i>Baccaurea javanica</i> (Blume) Müll.Arg.	Fruit	-	Wood used for roof frames
5	<i>Baccaurea lanceolata</i> (Miq.) Müll.Arg.	Fruit (also used as an ingredient in candied fruit preparations)	Treatment of stomachache (leaves boiled and decoction consumed); headache (fruit pounded into a paste and applied to the head); acne (pounded fruit applied to the affected skin); skin care (fruit boiled and the water used for bathing); fever	Wood used for roof frames
6	<i>Baccaurea macrocarpa</i> (Miq.) Müll.Arg.	Fruit (also used as an ingredient in candied fruit preparations)	Diabetes (fruit crushed and the juice consumed); fungal itching (crushed fruit applied to affected areas); skin care (fruit prepared as a syrup)	Wood used for roof frames, posts, boxes, and door and window frames
7	<i>Baccaurea javanica</i> (Blume) Müll.Arg.	Fruit	-	Wood used for house posts and frames
8	<i>Baccaurea motleyana</i> (Müll.Arg.) Müll.Arg.	Fruit	Eye inflammation (inner stem tissue boiled and the decoction used to wash the eyes); skin care (bark pounded and applied to sun-exposed skin)	Wood used for boards, including house walls, windows, and doors
9	<i>Baccaurea multiflora</i> Burck ex J.J.Sm.	Fruit	-	Wood used for boards, including walls, doors, and windows

10	<i>Baccaurea parviflora</i> (Müll.Arg.) Müll.Arg.	Fruit	Antioxidant; treatment of fungal infections of the skin (fruit crushed and applied to affected areas)	Wood used for roof frames, supporting posts, and boxes
11	<i>Baccaurea pyriformis</i> Gage	Fruit	-	Wood used for roof frames, supporting posts, and boxes
12	<i>Baccaurea racemosa</i> (Reinw.) Müll.Arg.	Fruit (also used as a natural dye for silk with yields brown, cream-orange, and brownish-orange)	-	Wood used for roof frames and supporting posts
13	<i>Baccaurea ramiflora</i> Lour	Fruit (As a natural colorant with producing orange to reddish)	Treatment of constipation; fruit is boiled and the decoction is consumed	Wood used for boards, including house walls, doors, and windows
14	<i>Baccaurea reticulata</i> Hook.f.	Fruit	Skin care (bark is pounded and applied to sun-exposed skin); seed oil applied to the skin	Wood used for making boxes and house posts
15	<i>Baccaurea sapida</i> (Roxb.) Müll.Arg. The synonym of <i>Baccaurea ramiflora</i>	Fruit	Treatment of arthritis/joint inflammation; fruit is boiled and the decoction is consumed	Wood used for roof frames

Traditional Medicinal Uses

Traditional medicinal applications constitute another important aspect of *Baccaurea* ethnobotany. Throughout Southeast Asia, different plant parts—including fruits, leaves, bark, roots, and stems—have been employed to treat various illnesses. Such traditional knowledge has been transmitted across generations and remains particularly important in rural communities where access to modern healthcare may be limited (Munawaroh & Astuti, 2018).

Among the medicinally important species, *Baccaurea macrocarpa* is potentially a good source of nutrition (Masriani & Fadly, 2022) and has traditionally been used as a remedy for diabetes mellitus and fungal infections (Munawaroh & Astuti, 2018). Extracts prepared from the bark and leaves are commonly applied to reduce blood glucose levels or treat skin diseases. Likewise, *B. edulis* has long been utilized for relieving stomachache and gastrointestinal discomfort, whereas *B. lanceolata* is traditionally used to alleviate headaches, abdominal pain, acne, and inflammatory conditions (Munawaroh & Astuti, 2018; Navia et al., 2022a).

Several species are also recognized for women's health. *Baccaurea dulcis* is traditionally consumed to regulate menstruation and facilitate urination. Meanwhile, leaves and bark of *B. motleyana* are applied externally to reduce eye inflammation and improve skin health (Munawaroh & Astuti, 2018; Navia et al., 2022a). Other species, including *B. polyneura* and *B. racemosa*, are valued because of their antioxidant properties and are believed to enhance general health and physical endurance (Navia et al., 2022a).

Timber and Other Traditional Uses

Besides their edible fruits and medicinal value, *Baccaurea* species also provide important timber and other forest products for local communities. The wood is generally hard, durable, and resistant to moderate environmental conditions, making it suitable for various construction purposes (Dayadi & Ridho, 2026; Haegens, 2000). Traditionally, trunks of mature *Baccaurea* trees are utilized as house pillars, wall frames, roofing supports, doors, windows, fences, furniture, and agricultural tools. The timber is also employed for small boats and household utensils because of its strength and relatively long service life (Munawaroh & Astuti, 2018; Navia et al., 2022a). Although the genus is not considered a major commercial timber resource, its wood remains valuable for subsistence use in rural areas.

Beyond timber, several *Baccaurea* species—*B. ramiflora* and *B. racemosa*—provide natural dyes obtained from bark extracts, producing brown pigments traditionally used for coloring woven textiles, handicrafts, and natural fibers life. The increasing interest in environmentally friendly dyes has renewed attention to these traditional applications, particularly within sustainable textile production (Munawaroh & Astuti, 2018).

Socioeconomic Benefits of *Baccaurea*

Beyond their ecological roles, *Baccaurea* species also provide important socioeconomic and cultural benefits to local communities, highlighting their economic contribution to rural livelihoods (Navia et al., 2022a). Several local fruit species, including *Baccaurea* species, have been reported to provide additional household income in Aceh (Navia et al., 2019, 2020; Suwardi et al., 2020), Riau (Nurnatasya & Titisari, 2023; Sofiyanti et al., 2022), and Bogor Botanic Gardens (Munawaroh & Astuti, 2018).

The cultural importance of *Baccaurea* is also reflected in the transmission of traditional knowledge across generations (Pilgrim et al., 2008; Suwardi et al., 2022). Local conservation practices aim to maintain the availability of these plants for future use. These findings suggest that traditional knowledge and community-based cultivation practices may contribute to the conservation and sustainable management of *Baccaurea* species. Community-based

conservation practices include replanting and maintaining fruit trees in plantations and household yards (Nurnatasya & Titisari, 2023).

D. CONCLUSION

Baccaurea is an underutilized tropical forest genus with significant ethnobotanical value across South and Southeast Asia. Its species provide diverse resources, including edible fruits, traditional medicines, timber, and natural dyes, highlighting their importance for local livelihoods and cultural traditions. Recent phytochemical and pharmacological studies have supported many traditional uses by identifying bioactive compounds and demonstrating various biological activities. Despite these advances, ethnobotanical and scientific information remains limited for many *Baccaurea* species. Future studies integrating ethnobotany, phytochemistry, nutrition, and pharmacology are needed to fully explore the genus and promote its sustainable utilization. Such efforts will enhance the value of *Baccaurea* as a source of functional foods, medicinal resources, and other plant-based products while preserving traditional knowledge for future generations.

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