



Mini Review

Garcinia lanceifolia Roxb.: An under-utilized endemic horticultural and medicinal crop

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Abstract

This review attempts to present an account of documented utilities *vis-à-vis* prospective applications of *Garcinia lanceifolia*, a hitherto under-utilized and less abundant plant species. This plant is a prospective candidate for the pharmaceutical researchers who aim to bridge the gap between traditional knowledge and modern scientific breakthroughs.

Keywords botanical description, global distribution, medicinal plant, phyto-constituent analysis, plant usage

Introduction

The genus *Garcinia* included within the family Clusiaceae (Guttiferae) consists of ca. 250 species around the world (mostly in Southeast Asia) and 43 species in India [1-5]. In India, species of *Garcinia* is mostly found to occur mostly within the three phyto-geographical zones: (a) the Andaman and Nicobar Islands, which are regarded to be part of maritime South East Asia, as well as (b) North East India and (c) the Western Ghats [3]. *Garcinia lanceifolia* Roxb. is one fascinating endemic plant species placed under this genus. It is locally known as *Rupohi Thekera* in Assamese, *Rupohi Tekera* in Mising, *Chengkek* and *Pelh* or *Pelte* in Mizo, *Taktir* in Arunachali dialect, *Kengrapal* and *Thisuru* in Garo as well as *Dieng-soh-jadu* in Khasi [6-8, 5]. Botanists, ecologists, and traditional healers have all expressed interest in either its distinctive traits or prevalent uses and potential advantages.

The name "*lanceifolia*" refers to the lance-shaped leaves that are characteristic of this *Garcinia* species. The lustrous, dark green foliage stands out in contrast to its crimson coloured fruit. Rural populations have traditionally relied upon the therapeutic benefits attributed to different parts of the *G. lanceifolia* plant for traditional treatments. A side from its cultural value, this plant has piqued the scientific community's interest due to its potential as a source of bioactive compounds [6]. Researchers have been drawn to its potential pharmacological characteristics and chemical ingredients, adding to the body of knowledge regarding its potential applications in horticulture and pharmaceuticals.

G. lanceifolia, like many other tropical plant species, is subjected to a variety of threats, which include habitat loss and climate change, which could impair its distribution and survival in the wild. Understanding and protecting this botanical wealth is therefore critical for preserving biodiversity and potentially unleashing future contributions to human well-being. This review will attempt to provide the readers information on *Garcinia lanceifolia*, shedding light on its

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ecology, traditional usage, along with prospective contributions to human health and sustainable practices.

Distribution and botany

This plant is a tropical small tree or shrub native to South East Asia's lush rainforests in countries such as Myanmar, Cambodia, Indonesia, Laos, Malaysia, Philippines, Thailand, Vietnam, and India, which is located in the trans-regional areas between South Asia and South East Asia. It has also been reported from Bangladesh's Chittagong Hills [8]. Due to habitat loss and other environmental challenges posed by anthropogenic factors, *Garcinia lanceifolia* and its habitat conservation has grown to be a major issue, as it is with many other plant species. For the species to remain in its natural habitat and thereby contribute to significant benefits to human well-being, biodiversity must be preserved. It was originally widely distributed in the evergreen woods; currently, it is at risk of extinction in nature and is frequently found to be preferably grown in homestead gardens.

Taxonomic classification

Kingdom: Plantae

Phylum: Tracheophyta

Class: Equisetopsida

Order: Malphigiales

Family: Clusiaceae

Genus: *Garcinia*

Species: *G. lanceifolia* Roxb.

Morpho-taxonomic characterization, which can be utilized for identification of the said species, will be followed after Ngerensaengsaruy [8]. *G. lanceifolia* is a dioecious, rarely polygamodioecious, shrub or small tree, 1-6 m tall, with characteristic yellow latex; branchlets tetra-angular; inflorescences occurring either in fascicles of 2-3 flowers or as solitary; flowers relatively small, 5-8.5 mm in diameter, flowers fully opened with a small apical opening (resembling flower buds); sepals and petals orange to reddish in colour; stamens are many, joined in a central short column; fruits are depressed and globose or sub-globose, 2.2-3.5 × 2.3-4.5 cm, rather shallowly cut, green, orangish-yellow, turning orange or bright red when mature, glossy; leaves elliptic, narrowly elliptic, oblong-elliptic, or oval, 4.5-10 × 1.5-3 cm, shining; juvenile leaves shiny pale green and petiole red or greenish-red.

Ecology and phenology

Garcinia lanceifolia thrives largely in the wet tropical habitat, in evergreen dense forests at altitudes ranging from 300 to 700 meters. The flowering season lasts from October to April, and the fruiting season extends from January to June [7-8].

Propagation

Natural regeneration (through seeds) is widespread, while vegetative propagation methods such as cuttings and layerings are often used [7]. Kumar et al. [5] however disagreed, claiming that the species is spread through root suckers and dismissing the probability of natural regeneration or through seed propagation.

Phytochemical constituents

A study on the phytochemical characterization of *Garcinia lanceifolia* could be linked back to a larger study of *Garcinia* species by Parthasarathy and Nandakishore [9], which is listed in Tables 1-3 and Figure 1.

Table 1. Mineral composition of *Garcinia lanceifolia*

Minerals	Content (mg/100g)
Sodium	1.35
Potassium	52.30
Calcium	12.54
Magnesium	30.23
Iron	9.00
Phosphorous	36.40

Table 2. Vitamin composition of *Garcinia lanceifolia*

Vitamins	Content ($\mu\text{g}/100\text{g}$)
B1	52.00
B2	283.00
B3	45.00
B12	8.03
C	30.23

Table 3. Organic acid composition of *Garcinia lanceifolia*

Organic acids	Content (%)
Malic acid	10.02
Oxalic acid	1.70
Citric acid	1.45
Tartaric acid	0.23
Acetic acid	0.14
Hydroxycitric acid	1.93

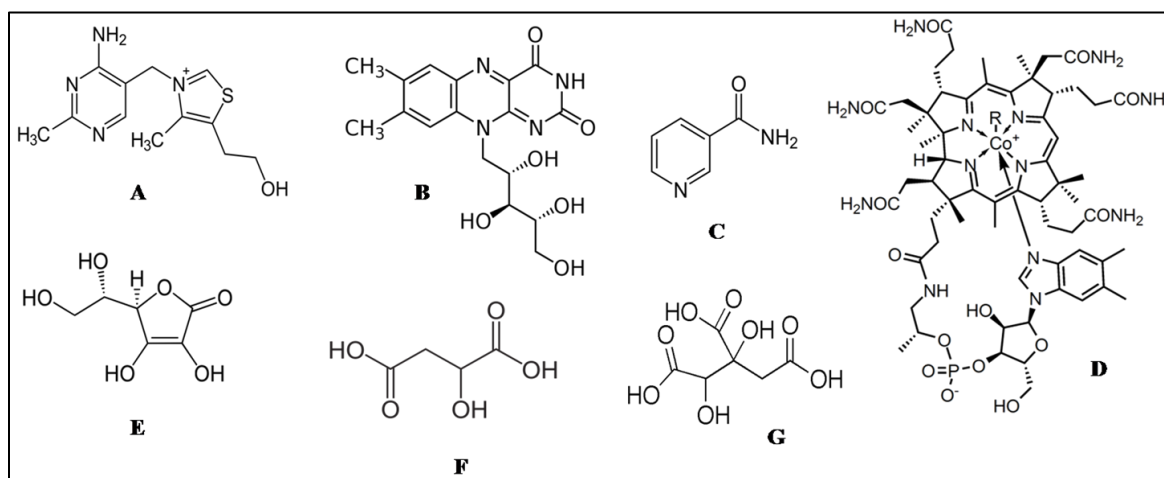


Figure 1. Phytochemical constituents of *Garcinia lanceifolia* - A: Vitamin B1, B: Vitamin B2, C: Vitamin B3, D: Vitamin B12, E: Vitamin C, F: Malic acid, G: Hydroxycitric acid

Garcinia lanceifolia as a culinary medicine

Culinary medicine enhances a patient's health by changing what she or he eats and drinks regularly. There is a strong emphasis on how food operates in the body, as well as the societal and epicurean aspects of eating and cooking. Culinary medicine seeks to enable patients to care for themselves in a safe, effective, and pleasant manner by utilizing food and beverage as a primary care method [10]. Throughout history, various *Garcinia* species have been prized for a variety of reasons, including medicinal benefits, culinary purposes, and spiritual or cultural significance. Regional populations in *G. lanceifolia*'s natural habitat have probably been using different portions of the tree for customary



reasons. The acidic fruits are eaten raw or used to make juices, pickles, and other dishes [11-12]. The sun dried ripe fruits are preserved well by the addition of salt and later used for seasoning curries [13]. The leaves are also used to make pickles and cooked as vegetables [11]. However, there is little specific historical evidence of *Garcinia lanceifolia* use, and additional research would be required to determine its entire history.

Medicinal properties of *Garcinia lanceifolia*

Garcinia lanceifolia and other *Garcinia* species have recently received increased interest for their possible pharmacological properties and bioactive components such as xanthenes, bioflavonoids, and triterpenes [6]. Biochemists and plant biologists are still investigating the myriad chemical components and potential applications of these plants, including their potential contribution to the pharmaceutical and nutraceutical sectors. Medicinal uses reported from different parts of *Garcinia lanceifolia* (Table 4)

Table 4. Medicinal uses reported from different parts of *Garcinia lanceifolia*

Plant Part	Uses	Source
Bark	Antibacterial	Bora et al.,[6]
	Antidiabetic	Bora et al., [14]
	Antihelminthic	Bora et al.[15]
	Antipyretic	Baruah [16]
	Anti-ulcerative	Bora et al.,[14]
	Analgesic	Bora et al., [16]
	Anti-inflammatory	
Fruit	Antibacterial	Choudhury and Handique [11]
	Antidiarrheal	
	Antidysenteric	
	Hepato-protective	Baruah and Borthakur [17]
	Uro-protective	
	Antipyretic	Baruah [18]
Leaves	Stomachic	Choudhury and Handique [11]
	Diuretic	

Research gaps and Future prospects

Garcinia lanceifolia emerges as a plant with extraordinary adaptability and potential in traditional medicine and medicinal uses. This review has shown a variety of uses for various components of the plant. From the stomachic and diuretic properties of the leaves to the fruit's significance in treating dysentery and diarrhoea, this plant's contributions to gastrointestinal health are significant. Furthermore, the bark's antibacterial activity, anthelmintic potential, and prospective antidiabetic and antiulcer capabilities highlight its importance in a larger medical context.

The wide applications of various plant components such as fruits, leaves, barks, and gum resin in controlling urinary issues, illustrate *G. lanceifolia*'s intricate pharmacological richness. Furthermore, its use in traditional practices to prevent dysentery and in culinary creations attests to its cultural significance. *G. lanceifolia*'s inclusion of bioactive components strengthens its role as a repository of medicinal agents. Its analgesic, anti-inflammatory, and antibacterial properties, as well as antioxidant potential, support its use in complementary medicine. While this analysis sheds light on the numerous benefits of *G. lanceifolia*, more research is required to fully understand and utilize its potential. We can uncover its latent medicinal treasures by researching its mechanisms of action, performing rigorous clinical trials, and studying synergistic benefits with modern medicine. *G.*



lanceifolia exemplifies the significance of traditional botanical knowledge and the promise it provides for modern medicinal endeavors.

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