

# Thanaka: Traditional Burmese Sun Protection

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## ABSTRACT

*Limonia acidissima* or *Hesperethusa crenulata* is a common tree in Southeast Asia. It is indigenous to the Republic of Myanmar (formerly Burma) as well as India, Sri Lanka, Java, and Pakistan. In English, the common names for *Limonia acidissima* are sandalwood, wood-apple, elephant-apple, monkey fruit, and curd fruit tree. The plant has a number of different names in different languages including bal or bael in Assamese, bael in Bengali, kaitha in Hindi, belingai in Malaysia, and thanaka in Burmese. Unique to the Burmese people, thanaka has been used as a cosmetic product for over 2000 years. Mention of thanaka has been traced back to ancient Burmese lyrics, and relics of equipment used by ancient royalty to grind thanaka can be found in museums.<sup>1</sup>

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## INTRODUCTION

*Limonia acidissima* or *Hesperethusa crenulata* is a common tree in Southeast Asia. It is indigenous to the Republic of Myanmar (formerly Burma) as well as India, Sri Lanka, Java, and Pakistan. In English, the common names for *Limonia acidissima* are sandalwood, wood-apple, elephant-apple, monkey fruit, and curd fruit tree. The plant has a number of different names in different languages including bal or bael in Assamese, bael in Bengali, kaitha in Hindi, belingai in Malaysia, and thanaka in Burmese. Unique to the Burmese people, thanaka has been used as a cosmetic product for over 2000 years. Mention of thanaka has been traced back to ancient Burmese lyrics, and relics of equipment used by ancient royalty to grind thanaka can be found in museums.<sup>1</sup>

Thanaka trees must age for at least 35 years prior to being harvested. Raw sandalwood is sold in markets in 10-18 cm long branches and logs (Figure 1). The wood and bark of the tree are ground into a powder on a flat and circular stone slab, known as a *kyauk pyin*.<sup>1</sup> The slab has a channel around the circumference to collect fluid during grinding. Smaller branches can be ground by hand with a pestle device yielding smaller amounts of the powder.

The thanaka powder (Figure 1) is mixed with water and applied immediately to the skin with fingers or a brush. The powder and skin absorb much of the diluting liquid, leaving a yellow crust with a floral fragrance. Thanaka is applied to the cheeks, nose, and arms in an informal smearing or a decorative fashion drawing swirls, leaves, flowers, or geometric

shapes. *Thanaka bé gya* refers to circular pattern with stripes on the cheeks (Figure 1). *Thanaka chi zoun gaung zoun* refers to application to the entire body, which provides a cooling sensation during hot weather. Thanaka application is more common among women, but is also applied by men.<sup>1</sup>

Thanaka paste is used as an astringent, antiseptic, antifungal, anti-aging, cosmetic and sun protective product. In recent years, some of these properties, which have been assumed for hundreds of years, have been substantiated. Thanaka contains two active ingredients, coumarin and marmesin. Coumarin accounts for the anti-bacterial, anti-fungal, phytochemical, anti-aging and anti-oxidant properties. Wangthong and colleagues performed a series of studies on thanaka bark. Thanaka was found to be a good scavenger of free radicals. This antioxidant activity was used as a proxy for anti-aging capacity. Thanaka was found to have mild anti-tyrosinase activity. In an assessment of antibacterial activity, thanaka showed only slight antibiotic activity against both Gram-negative *Escherichia coli* and Gram-positive *Staphylococcus aureus*. In comparison to a standard antibiotic dose of clindamycin, the activity was noted to be 10-20-fold less against *Escherichia coli* and 300-fold less against *Staphylococcus aureus*. Its anti-inflammatory activity was evaluated in vitro by measuring the ability to inhibit nitric oxide production in macrophages. Thanaka significantly reduced the release of nitric oxide, implying significant anti-inflammatory action.<sup>2</sup> Another study showed coumarin increases collagen and elastin production in the skin, retarding the cutaneous aging process as well.

**FIGURE 1.** **a)** Thanaka logs; **b)** Thanaka powder; **c)** Thanaka mixed with water to turn it into a paste; **d)** The thanaka paste applied to an arm of a female; **e)** The traditional decorative use of thanaka.<sup>5</sup>



**FIGURE 2.** Local school children with thanaka applied to their faces and necks.



Marmesin is the component of thanaka responsible for sun protection. In 2004, Joo and colleagues extracted marmesin from thanaka bark and determined its molecular structure. They found that marmesin contains UV-absorbing chromophores, with maximum absorption 335 nm, and concluded that marmesin could be a commercially useful UV-A filtering product.<sup>3</sup>

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Scientific understanding of the mechanism of action of thanaka has increased popularity of the product. It is no longer a secret of the native people of Myanmar (Figure 2). Cosmetic companies in Myanmar and Thailand are increasingly adding thanaka as a natural ingredient to their products and marketing these products internationally.

#### DISCLOSURES

None of the authors have disclosed any relevant conflicts of interest.

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