Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 06, Issue: 03 (MAY-JUNE, 2026)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Kokum (*Garcinia indica*): A Climate-Resilient Superfruit of the Western Ghats

*Sreevidhya Soman
Dept. of Forest Biology and Tree Improvement, College of Forestry, Sirsi, Karnataka
*Corresponding Author's email: sreevidhyasoman18@gmail.com

Kokum (*Garcinia indica*), an indigenous fruit species of the Western Ghats, is gaining attention as a climate-resilient and economically important non-timber forest product (NTFP). This article highlights the distribution, botanical characteristics and phenology of kokum, along with its wide range of uses in culinary, pharmaceutical and cosmetic sectors. The fruit is valued for its rind, seeds and kokum butter, which support diverse value-added products such as syrups, beverages and skincare formulations. The paper also outlines processing techniques, marketing potential and livelihood opportunities, particularly in regions like Uttara Kannada and Sindhudurg. Despite its importance, kokum remains underutilized due to constraints such as unorganized cultivation, limited processing infrastructure and low market awareness. The article emphasizes the need for improved cultivation practices, technological interventions and stronger market linkages to enhance its commercial potential. With appropriate strategies, kokum can play a significant role in sustainable agriculture, rural income generation and biodiversity conservation in the Western Ghats.

Keywords: Kokum, *Garcinia indica*, NTFP, value addition, Western Ghats, kokum butter

Introduction

Kokum (*Garcinia indica*), commonly known as wild mangosteen, is an indigenous and underutilized fruit tree species of India belonging to the family Clusiaceae. It is widely distributed along the Western Ghats, particularly in the Konkan region of Maharashtra, Goa and coastal Karnataka. Kokum is an important non-timber forest product (NTFP) with immense ecological, nutritional and economic significance. Unlike many commercial crops, kokum thrives under rainfed conditions and requires minimal inputs such as fertilizers and pesticides, making it a climate-resilient and sustainable species. Despite its multiple uses in culinary, pharmaceutical and cosmetic industries, kokum remains largely underexploited. Enhancing its cultivation, processing and marketing can significantly improve rural livelihoods while promoting biodiversity conservation.

Distribution and Production Status

Garcinia indica is indigenous to the tropical forest regions of India. Of the 35 *Garcinia* species found in India, 17 are endemic. Of these, seven are endemic to the Western Ghats, six in the Andaman and Nicobar Islands and four in the northeastern region of India. The Sindhudurg and Ratnagiri Kokum variety from the Ratnagiri and Sindhudurg districts from the coastal Konkan region of the state of Maharashtra in India has received the GI tag. *Garcinia indica* is predominantly found in the humid tropical regions of the Western Ghats at altitudes ranging from 100 to 800 m. Baseline surveys indicate that around 1000 ha area in the Konkan region is under kokum cultivation, producing approximately 4500 MT of fruits annually. In Maharashtra alone, a large proportion of

kokum trees are concentrated in Ratnagiri and Sindhudurg districts, highlighting its regional importance.

Botanical Description and Phenology

Kokum is a medium-sized evergreen tree attaining a height of 10–20 m with dense foliage. The leaves are dark green, glossy and elliptic, while the flowers are small, fleshy and dark pink in colour. The species is polygamodioecious, exhibiting male, female and bisexual flowers on different plants. Flowering occurs from November to February, while fruiting takes place during April to June. Seedlings begin bearing after 7–8 years, whereas grafted plants start yielding within 3–4 years, making vegetative propagation advantageous for cultivation.

The flowers are small, fleshy, and dark pink

Fruits are spherical, Fleshy

Uses and Value Addition

Kokum is a highly versatile species, and almost all parts of the plant are utilized:

- Fruits: The Fruit is used in culinary, pharmaceutical and industrial applications.
- Seed: They are compressed and embedded in an acidic pulp. The fruit contains five to eight seeds, 20-23% of the fruits weight.
- Kernel contributes to about 61% of seeds weight and contain 44% of its oil.
- Seed oil: Seed yield 23-26% of oil. The oil contains 85% free lipid. Valuable edible oil known in commerce as Kokum butter.

A wide range of value-added products are prepared from kokum, including:

- Kokum syrup and juice
- Kokum agal (salted extract)
- Dried kokum rind powder
- Pickles, candies and sauces
- Kokum butter-based cosmetic products
- Kokum beverages and herbal teas

These products not only enhance shelf life but also increase the economic value of the crop.

Processing of Kokum

Processing plays a crucial role in value addition and involves the following steps:

1. Harvesting of ripe fruits
2. Sorting and grading
3. Washing and rind extraction
4. Drying of rind
5. Separation of seeds
6. Extraction of kokum butter through roasting, grinding and decantation

Efficient processing techniques can significantly improve product quality and market value.

Marketing and Livelihood Opportunities

Kokum has considerable potential for income generation, especially in rural areas. Case studies from Uttara Kannada (Karnataka) and Sindhudurg (Maharashtra) indicate that kokum processing provides employment opportunities at the household level. However, marketing constraints such as lack of organized supply chains, limited processing facilities and high transportation costs affect profitability. Regions with better organization and processing infrastructure show improved market performance and price realization. Strengthening farmer cooperatives, promoting value addition and improving market linkages can enhance income and sustainability.

Challenges in Kokum Development

Despite its potential, kokum cultivation and utilization face several challenges:

- Unorganized and scattered plantations
- Limited processing (only a small portion of production is utilized)
- Short harvesting period coinciding with monsoon
- Lack of post-harvest technologies
- Low awareness about medicinal and nutritional benefits
- Limited market expansion

Addressing these challenges is essential for the development of the kokum sector.

Future Prospects

Kokum has great potential as a commercial and medicinal crop. Future strategies should focus on:

- Development of improved cultivation practices
- Developing pre- and post-harvest techniques
- Standardization of processing technologies
- Promotion through farmer organizations and self-help groups
- Establishment of collection and processing centers
- Linkages with Ayurvedic and cosmetic industries
- Awareness creation about its health benefits
- Patenting for Geographical Indication

With proper interventions, kokum can emerge as an important climate-resilient crop contributing to sustainable livelihoods and conservation of Western Ghats biodiversity.

Conclusion

Kokum is a promising underutilized fruit species with significant ecological, economic and medicinal value. Its adaptability to low-input conditions makes it suitable for sustainable agriculture and agroforestry systems. Enhancing its cultivation, processing and marketing can not only improve rural livelihoods but also contribute to biodiversity conservation. Strategic efforts are needed to unlock its full potential and establish kokum as a commercially viable and widely recognized “superfruit” of India.

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