

Review Article

REVIEW ON BARLERIA: A BOON TO THE FARMERS

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ABSTRACT

Barleria cristata, belonging to the family Acanthaceae, is an indigenous, widespread perennial shrub found throughout India. It is mainly propagated through seeds and other vegetative methods, such as semi-soft wood cuttings and layering. The plant holds a remarkable place in ayurvedic medicine in India due to its biological and pharmacological properties. The general use of the genus *Barleria* is for treating various ailments, including boils, bee bites, snake bites, asthma, leprosy, cough, jaundice, and toothaches.

Keywords: *Barleria cristata*, Indigenous, Perennial shrub, Ayurvedic medicine, Medicinal uses, Ethnomedicinal uses.

INTRODUCTION

Barleria cristata, known as the December flower due to its blooming season in December in Tamil Nadu, is a perennial plant belonging to the Acanthaceae family [Bhat (2013); Sajem and Gosai (2006)]. It is native to India and Southeast Asia, this vibrant species is not only admired for its ornamental qualities but also holds significance in traditional medicine [Sajem and Gosai (2006)]. In landscaping, *Barleria cristata* finds its place as an ornamental plant, adding beauty to gardens. Its versatility extends to hedge and border planting, contributing to the aesthetic appeal of landscapes. Beyond its visual allure, this plant has deep roots in traditional medicine, where it is employed across various ethnomedical systems for treating a diverse range of ailments. It is the third-largest genus in the Acanthaceae family, of around 300 species. However, the specific count in India varies among botanical reports. Balkwill *et al.*, reported 32 species [Balkwill and Balkwill (1998)], while Karthikeyan and colleagues specified 29 species, one subspecies, and six varieties [Karthikeyan (2009)]. This diversity underscores the rich botanical landscape of *Barleria* in India, contributing to the nation's biodiversity. Hence, it is potential loose flower crop of Tamil Nadu.

Botany

Barleria cristata L. stands as a robust botanical presence, manifesting as a sizable, extensively branched, unarmed, and erect perennial shrub. Flourishing in regions with fertile, well-drained soil, its stem showcases appressed trichomes with dense, hairy nodes, imparting a distinctive texture. The elliptic-lanceolate leaves, ranging from 2.5 to 10 cm in length, exhibit an attenuate base, ciliate borders, and an acute-acuminate apex. The midrib, adorned with hair on the upper side, bears 5–7 pairs of lateral veins. Leaves, featuring dark green upper surfaces and often pale green lower surfaces, boast 3–8 mm long petioles. The shrub's ethereal whitish-pink flowers,

approximately 2 cm in length, grace the tips of stems in funnel-shaped allure. The inflorescence, predominantly dense ovoid spikes, can be either axillary or terminal, devoid of bracts but adorned with variable, linear, ciliate bracteoles exhibiting toothed margins, acute apices, membranous texture, pubescence, and veining [Shendage and Yadav (2010)]. The persistent green calyx, 2 cm long, takes an ovate-lanceolate form with laciniately toothed edges. The corolla, 6–7 cm long, presents a slender-tubed, winged structure above, showcasing a violet or nearly white limb. The oblong corolla tube, adorned with glandular hairs, exhibits a pink, downy exterior with a two-lipped border. The upper lip, four-parted, contrasts with the broader yet shorter entire lower lip. Notably, each flower comprises four stamens, 2.5 cm long, with hairy anthers of 3 mm length, accompanied by staminodes measuring 5 mm with sterile anther cells [Ghosh (2009)]. The nectar, forming a two-lipped cup embracing the lower half of the germ, underscores the intricate reproductive features as reported by Kirtikar and Basu (1918). The ovary, housing two ovules per locule, features a terete style swollen at the apex and a hairy base. The stigma, with two pink lobed structures, is enlarged and perforated between two short, rounded lips as reported by Curtis and Sims (1827). The ovate, compressed seeds, adorned with silky-appressed-hairy textures culminate the plant's reproductive cycle [Roxburgh and Carey (1874)]. In the Indian subcontinent, the flowering and fruit-bearing season unfolds from September to February [Naidu (2003) and Pullaiah (2006)], encapsulating the captivating life cycle of *Barleria cristata* in its intricate botanical details.

TAXONOMY

Domain : Eukaryota
Kingdom : Plantae
Phylum : Spermatophyta
Subphylum : Angiospermae
Class : Dicotyledonae
Order : Scrophulariales
Family : Acanthaceae
Genus: *Barleria*
Species: *cristata*

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DISTRIBUTION

Barleria cristata commonly grows on hills and bushes, thriving along the forest margin in subtropical regions. The subspecies of *Barleria* are native to areas such as Southeast Asia, China, Pakistan, India, Vietnam, the Philippines, Peninsular Malaysia, Thailand, Bangladesh, Assam, Sri Lanka, and the Maldives [Mawla (2014)]. Some of the naturalized areas for *Barleria* include Nauru, Australia, the Andaman Islands, the Leeward Islands, and Jamaica. *Barleria*, which is naturalized or cultivated in certain regions, has left its mark in Kenya, Sudan, South Africa, Namibia, Angola, and Madagascar [Lavergne (2004)].

Soil and Climate

The soil should not be alkaline, and the shrub requires full sun or partial (2004). *B. cristata* prefers to grow in warm and humid area from sea level up to 2600m on sandy and loamy soil with pH ranging from 5.6 to 7.5 [Flora of China Editorial Committee (2015)]. It grows in well-drained soils and the plant is drought-tolerant. It requires annual rainfall of 800-2500mm [Fransis (2004)] and temperature of 10 – 26 °C. It requires little sunlight for proper flowering and bushy growth.

Propagation

Barleria cristata can be propagated through several propagation methods. First, using seeds, it's essential to collect them before dispersal when the seed capsules turn brown. These flat seeds are sown in trays filled with a well-drained medium, covered by soil or sand, and kept in a shaded area. During summer, take semi-soft wood cuttings from new growth and dip it in Serradix No. 2 hormone powder stimulate rapid root development, yielding successful results in approximately four weeks. Layering is another effective method. In autumn, choose a non-flowering long branch, prepare the soil with coarse sand, bend the branch into a small hole, remove leaves from the contact area with soil, score the underside of the naked stem, peg it into the hole, cover it with soil and coarse sand, stake the tip, and keep the spot moist until roots develop. This method allows for the multiplication of the plant with relative ease [Megan Isaacs Kirstenbosch (2001)].

USES OF BARLERIA

Barleria cristata serves a dual purpose in horticulture and traditional medicine. As hedging shrubs, they contribute to landscaping with their dense foliage and vibrant flowers, providing an effective barrier. Simultaneously, these plants yield a bitter, quinine-like extract, a key element in traditional medicine. This extract is notably employed in treating conditions such as whooping cough and tuberculosis, showcasing the plant's significance in folk remedies. Beyond its medicinal utility, *Barleria cristata* finds widespread appreciation for ornamental purposes. The lush greenery and colourful blossoms add a natural and visually appealing touch to various landscapes. Whether lining garden borders or accentuating open spaces, these plants contribute to the aesthetic beauty of outdoor environments.

Ethnomedicinal uses

The whole plant of *B. cristata* L. has deep-rooted traditional uses as a medicinal resource. It is a recognized remedy for various conditions such as inflammation, wounds, burns, gingivitis, nocturnal ejaculation, and diabetes in local traditional medicine. The plant holds significance in addressing common ailments like cough, skin infections, anemia, and tuberculosis [Quattrocchi (2012)]. The leaves are particularly valuable, known for their anti-inflammatory properties, and are

commonly chewed to alleviate toothache. Local communities leverage the accessibility and versatility of the plant for diverse health concerns. The plant's juice is employed for treating fever and phlegm, showcasing its role in managing respiratory conditions. A paste derived from the plant is skillfully applied to the feet during the rainy season to prevent cracking, revealing its practical use in skincare [Pullaiah (2006)]. The root of *B. cristata* is utilized in decoctions to address anemia and cough, demonstrating the plant's systemic applications. Additionally, a root infusion is applied topically to boils and sores, emphasizing its role in wound care and inflammation reduction [Naskar (1993)]. These ethnomedicinal practices highlight the integration of *B. cristata* into local healthcare traditions. The plant's versatility in treating a wide range of conditions showcases its adaptability to various health needs. Local communities have passed down knowledge of these traditional uses through generations, emphasizing their cultural significance. The plant's prevalence and accessibility make it a readily available resource for addressing health issues in local contexts. The ethnomedicinal uses of *B. cristata* underscore the valuable role of traditional knowledge in healthcare.

S.No.	Plantpart used	Type of preparation	Uses	Reference
1.	Seed	Extract	Sahariya communities in central India uses insnakebite woundsor antidote for snakebite.	Dey and De (2012)
2.	Root/root-leaves	Root decoction, Root & Leaves paste Root paste and warmed leaves	Bronchitisand pneumonia, cough and wound swelling Swelling, rheumatism	Pande (2007)
3.	Leaves & root	Extract or juice	Bronchitis, cough and cold	Sahu (1984)
4.	Stem	Juice	Mishing community of North East India utilizes in cough	Pullaia (2006)
5.	Aerial parts	Decoction 2-3 drops are used against skin infections by Jaintia tribes of the North Cachar Hills district of Assam	Anti-inflammatory and antibacterial	Francis (2004)

Ornamental uses

Barleria cristata is cherished as an ornamental gem, finding its place in the meticulously designed landscapes of gardens and parks. Its aesthetic versatility makes it an ideal choice as both a captivating background plant and an eye-catching specimen, adding visual interest to green spaces. Moreover, its suitability for mass planting allows for the creation of vibrant and cohesive displays. The plant's architectural form and dense growth make it particularly well-suited for hedge or border planting. When strategically arranged, *Barleria cristata* contributes to the formation of natural walls, imparting structure and delineation within gardens or larger landscapes. This creates an enchanting and well-defined environment, enhancing the overall appeal of the outdoor space. In the cultural context of Tamil Nadu, *Barleria cristata* takes on an additional role as a source of floral beauty. Traditionally strung into garlands, its flowers become a delightful accessory for women, adorning their hair with a touch of

natural elegance. This cultural application adds another layer of significance to the ornamental uses of *Barleria cristata*, blending practical landscaping with regional traditions and aesthetics. In essence, *Barleria cristata* transcends mere ornamental value; it becomes an integral part of the visual tapestry and cultural expression within the landscapes it graces.

CONCLUSION

Barleria cristata, commonly known as December flower, holds significant importance in India due to its widespread presence and traditional medicinal uses in ayurveda. As a perennial shrub belonging to the Acanthaceae family, it is cultivated for ornamental purposes and plays a vital role in treating various ailments in ethnomedical systems. With its distinctive botanic features, adaptability to diverse climates, and ease of propagation through seeds, cuttings, and layering, *Barleria cristata* remains versatile in both horticultural and medicinal contexts. Its dual role as an ornamental shrub and a source of medicinal extracts, particularly in the treatment of ailments such as asthma, tooth pain, and skin issues, underscores its multifaceted significance. Whether enhancing landscapes or contributing to traditional healing practices, *Barleria cristata* stands as a valuable and versatile botanical resource.

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