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Review Article

Begonia roxburghii: A Comprehensive Review of its Botanical, Phytochemical and Pharmacological Properties

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ABSTRACT

Begonia roxburghii is a lesser-known but important species in the Begoniaceae family. It is native to the humid subtropical areas of South and Southeast Asia, especially in northeastern India, Nepal, and Bangladesh. People have traditionally eaten it as a vegetable and used it in folk medicine. Recently, scientists have taken an interest in its various medicinal and nutritional benefits. This plant is easily recognisable due to its uneven leaves and red-dotted stems. B. roxburghii grows well in the shady understory of forests, near wet streambeds. Studies have shown that it has a rich variety of flavonoids, including rutin and luteolin, as well as phenolics, tannins, saponins, and essential minerals. These compounds are linked to its proven antioxidant, antidiarrheal, pain-relieving, and anti-arthritis effects in lab studies. Even though it has a wide range, disturbances in its habitat have caused local populations to decline, which calls for conservation efforts. This review gathers current information on the classification, ecology, chemical properties, traditional uses, and healing potential of Begonia roxburghii. It also points out areas where future research can focus on its pharmacological and agricultural possibilities as a health supplement and herbal treatment.

INTRODUCTION

Medicinal plants have been used by human civilisations for centuries as natural remedies for various ailments. These plants contain a wide range of biologically active compounds that can

influence physiological processes and support healing. Many cultures have developed rich traditions of herbal medicine, passing down knowledge through generations. Today, medicinal plants remain an important source for the development of modern pharmaceuticals and

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continue to be valued for their therapeutic potential.1. Medicinal plants have been used since the Vedic era. For thousands of years, they have been used to treat and prevent many types of diseases along with epidemics. Some medicinal plants are also utilised as pleasant condiments, for flavouring, for dyeing, for preserving food, etc. Almost every portion of the plant has its own medicinal properties. Different types of secondary metabolites are found in the medicinal plants, which play an important role in many kinds of diseases and are also used for manufacturing medicines. A large number of the plants are also reported to possess many other activities, like antioxidant, anti-inflammatory, anti-insecticidal, anti-parasitic, antibiotic, and anti-haemolytic properties.2. Over the past few decades, the use of traditional medicines has rapidly gained in popularity around the world, and it is estimated that almost 80% of the world's population rely on traditional medicines, particularly in developing countries that have limited access to essential medicines (Farnsworth et al., 1985). In China, the use of herbal preparations accounts for 30-40% of the total medicinal consumption, and in Africa, up to 80% of the population uses traditional medicine for primary healthcare (WHO, 2003). Today, more than 1500 herbal medicines are sold worldwide. The global market for herbal industries is approximately US \$62 billion annually and is showing strong growth. The world's economy in the pharmaceutical market has also increased dramatically over the years - in 2006, the pharmaceutical market reached a record high of US \$643 billion and is projected to approach US \$1.3 trillion by the year 2020.3 *Begonia roxburghii* (Miq.) A. DC. is a rhizomatous geophyte native to subtropical and tropical forested areas, specifically the Himalayas extending through Nepal, Bangladesh, northeast India, and Myanmar. It grows well in shaded, nutrient-rich soils at elevations of about 300 to 1,850 m. This species

has been recognized since 1864. It usually has one main stem with flowers coming from the leaf joints. The plant is mostly smooth, with only a few hairs on the flowers.4. *Begonia roxburghii* has been used for many years in South and Southeast Asia, especially in India, Nepal, Bangladesh, and Myanmar, for various medicinal purposes. Local communities use the leaves, roots, and sap of the plant to address gastrointestinal problems like diarrhea, dysentery, stomach pain, and gastritis. They apply leaf juice or paste to wounds, burns, bruises, and insect stings for its healing and anti-inflammatory properties. In tribal practices, particularly among the Khampti in Arunachal Pradesh, people use the plant to manage diabetes mellitus. It is also used to treat liver disorders, jaundice, urinary tract issues, fevers, and oral infections. These ethnomedicinal applications highlight the plant's potential as a source of bioactive compounds for further pharmacological research.5

Vernacular Names:6

Hindi	hathijhula
Bengali	paatpatya
Nepali	Patar chatto
Khasi [Meghalaya]	Ka mawpyntien
Mizo	Chal hmul
Manipuri	U-thum
Assamese	Pathar phula

Taxonomy:7

Kingdom	Plantae
Class	Magnoliopsida
Order	Cucurbitales
Family	Begoniaceae
Genus	<i>Begonia</i>
Species	<i>roxburghii</i>
Botanical name	<i>Begonia roxburghii</i>

Various Plants Of The Begoniaceae Family:5

The *Begonia* genus of the Begoniaceae family contains approximately 2000 species, and this Begoniaceae family can be classified on the basis



of various factors. Classification on the basis of their difference in the structure of root, leaves, etc.

Tuberous

The name tuberous was given due to the tuber like structure of their root. Grown from tubers, they have spectacular large flowers, are deciduous in winter, and are popular for bedding and hanging baskets.

Examples: *Begonia boliviensis*

Fibrous

Fibrous Begoniaceae are next in fame, followed by the tuberous Begoniaceae especially in America. Fibrous Begoniaceae are used to decorate houses in America. The root of this Begoniaceae resembles the structure of fibre.

Examples: *Begonia semperflorens-cultorum*

RHIZOMATOUS

Rhizomatous Begoniaceae is indigenous to Asia and America. The modern strain of Rex Begoniaceae is descended from this rhizomatous Begoniaceae. The name rhizome is apparently due to their property of rhizome, which is attached to soil like reptiles.

Examples: *Begonia masoniana*, *Begonia rex*.

BULB

Bulb Begoniaceae belongs to small classes of Begoniaceae, and the root structure is likely the structure of a bulb. This Begoniaceae was derived from an arid island in the Indian Ocean. Bulb Begoniaceae were first discovered in 1880.

Cane-Like

Cane like Begoniaceae is very close to the structure of bamboo and contains a long internode. These plants are very popular, as they are easy to grow and enhance the natural beauty with their various colourful heavy flowers. Bright red, orange, pink, white and all shades in between these colours are common of cane-like Begoniaceae.

Examples: *Begonia lucerne*, *Begonia aconitifolia*.

Thick Stem

The length of thick-stem Begoniaceae is five or six feet. These plants grow upward with a tall appearance. Sometimes they are branched and sometimes non-branched. Thick-stemmed Begoniaceae contains leaves surrounding the ascending axis of the plant.

Examples: *Begonia peltata*, *Begonia luxurians*.

Most Common Species Of The Begoniaceae Family:

Begonia malabarica

B. malabarica is a herb that contains a stem. They are usually 2 ft in length and are repetitively dividing, alongside numerous leaves. Leaves are 3-5 inches, heart-shaped usually uneven at the base.

Medicinal uses

B. malabarica is an essential medicinal plant, and its fundamental secondary metabolites are quercetin, luteolin, and β -sitosterol. The leaves are very effective for curing diarrhoea, blood cancer, as well as respiratory infections.

Begonia sparreana

Leaves of *B. sparreana* are 2-4 inches long. This plant contains a rhizome that is essential for the multiplication or reproduction of this plant.



Medicinal uses: Leaves are effective to cure gastrointestinal disorders like diarrhoea and jaundice.

Begonia peltatafolia

B. peltatafolia comprises juicy stems which are freely branched, and the ascending axis of the plant is twisted with a white-coloured substance. Leaves are usually 2-5 inches long (Otto & Dietrich, 1841).

Medicinal uses: Leaves are used in the treatment of stomach ulcers, stomach-aches, bilious dysentery, diarrhoea and respiratory infections, blood cancer and skin diseases.

Begonia roxburghii

B. roxburghii is a kind of herbal medicinal plant that belongs to Begoniaceae family. It is also known as East Himalayan Begonia, as they are highly available in the Himalayan region of India, Nepal and Indo-China. In Bangladesh, its common name is Khatredoi, and this name is derived from the Chakma language. *B. roxburghii* grows in the shady, moist places of the Chittagong hilly tracts region.

Distribution Of Plant:⁸

Begonia roxburghii is an annual dicot plant of the family Begoniaceae and is found in tropical and subtropical regions of the world. They are monoecious (have both male and female organs), and they are generally self-pollinated. Its parts are variously used in traditional practice for different health benefits. *Begonia roxburghii* is a kind of herbal medicinal plant that belongs to the Begoniaceae family. It is also known as East Himalayan Begonia, as they are highly available in the Himalayan region of India, Nepal and Indo-China. In Bangladesh, its common name is Khatredoi, and this name is derived from the

Chakma language. *B. roxburghii* grows in the shady, moist places of Chittagong hilly tracts region.

Phytochemical Constituents:⁹

The phytochemical constituents of *B. roxburghii* were extracted from the collection of leaves by standard procedures and showed the presence of flavonoids, alkaloids, glycosides, tannins, saponins, reducing sugars, steroids, resins, carbohydrates and phenols. The extraction of secondary phytochemical constituents revealed that flavonoids and alkaloids are present in a very high concentration, while other substances are present in an average amount. The methanolic extract from the leaf of *B. roxburghii* showed a considerable amount of percent inhibition against DPPH free radical, total phenolic content (TPC), total flavonoid content (TFC) and total antioxidant capacity (TAC), indicating a strong antioxidant potential of the plant. The methanolic extract is also used for different tests which show the activities of cytotoxic potential, analgesic, antiarthritis and thrombolysis.

Botanical Description:¹⁰

Plant: *Begonia roxburghii*. (Common name: East Himalayan begonia). an Individual plant can grow up to 35-80 cm in length, and is a small, perennial herbaceous plant belonging to the family Begoniaceae, it typically grows in moist, shaded habitats such as damp forest floors, stream banks, or on moss-covered rocks. This species is native to the eastern Himalayan region, including parts of India, Nepal, Bhutan, and the northeastern states, thriving in tropical and subtropical climates.

Leaves: Leaves are usually cordate, uneven and sharp at the base. The dimensions of the leaves are about 15-22.8 cm. having leathery leaves, with hairs on both surfaces or smooth, the leaves are



alternate in arrangement and are one of the most distinctive features of the plant, the upper surface is usually dark green, while the lower surface often has a reddish or purplish hue, and the petioles are long and often reddish in colour.

Flowers: Flowers are white in colour and have a yellow bunch at the centre. Flowers have four petals which show up with constrained space at the end. Fruits are usually subpyramidal, 4-celled and very succulent and divided into four roundish projections and those are encompassed by red dots. it is a monoecious species (male and female flowers occur on the same plant). the male flowers have four unequal perianth segments and numerous free stamens. the female flowers consists of five perianth segments an inferior ovary and three forked segments. Flowering occurs commonly during the monsoon and post-monsoon season from June to October.

Fruits and seeds: the fruit is a winged capsule, usually three-winged, and is dehiscent, meaning it splits open at maturity to release seeds. The seeds

are externally small, numerous and dust-like, the fruit period typically follows the flowering season, extending into late monsoon and early winter.

Stem: The juicy stem of the Begonia is about 10 cm long. It is non-woody, soft and green in texture.

Root: the root system arises from a rhizomatous or tuberous base, these underground structures help the plant store nutrients and water, allowing it to survive through dry or harsh periods. The roots are fibrous and spread laterally through the moist topsoil.



Figure 1: *Begonia Roxburghii* Plant



Figure 2: *Begonia roxburghii* stem



Figure 3: *Begonia roxburghii* leaves

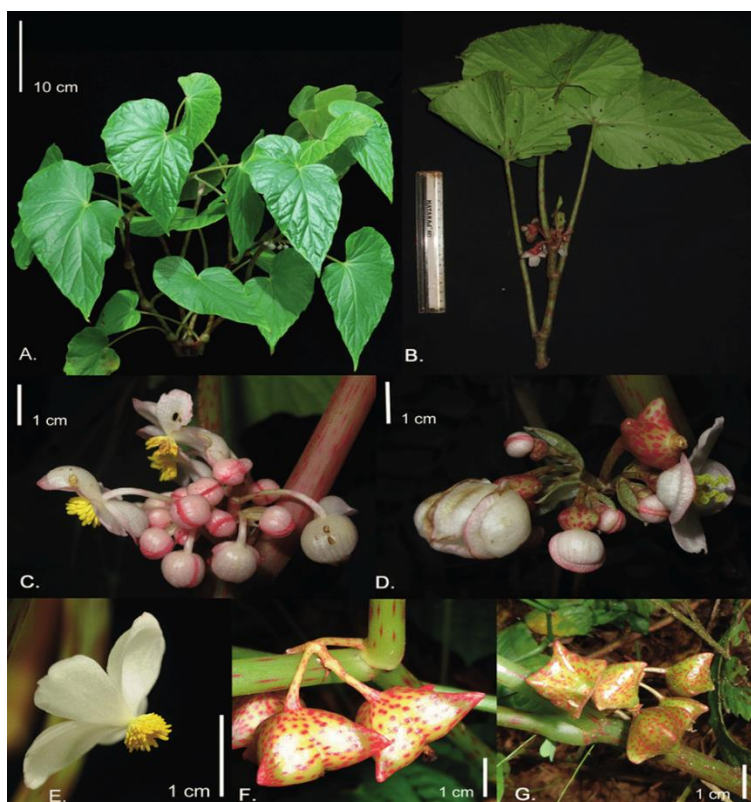


Figure 2: *Begonia roxburghii*. A-B. Plant habit. C. Male inflorescence. D. Female inflorescence. E. Male flower. F-G. Fruit.

Therapeutic Uses:

Antioxidant Activity:¹¹

Antioxidants are molecules or systems capable of inhibiting the oxidation process. They play a vital role in protecting cellular macromolecules from the oxidative damage caused by Reactive Oxygen Species (ROS). Antioxidants also enhance the activity of endogenous enzymes. *Begonia roxburghii* leaves contain active plant metabolites-alkaloids, carbohydrates, flavonoids, glycosides, saponin and tannin. Based on the findings of the current research work, it can be concluded that the methanolic extract of leaves of *Begonia roxburghii* is a potential source of antioxidants.

Cytotoxic (anticancer) activity:⁵

methanolic extract of *B. roxburghii* leaves devoid of weak cytotoxic potential. Therefore, this study

exhibited that there was no cell death at lower concentrations, whereas at the highest concentration of 25 mg/mL, a significant number of cell deaths occurred which is 80%. Therefore, it indicates that *Begonia roxburghii* leaf extract exhibits cytotoxic potential at the highest concentration.

Analgesic, anti-arthritis and thrombolytic activity:¹²

The results of this study discovered that the extract significantly showed both peripheral and central analgesic activity in established *in vivo* models. Then, the results obtained in this study may rationalise the potential anti-arthritis and thrombolytic activity with lower toxicity. The study corroborates traditional claims of the use of this medicinal plant in the management of pain, arthritis and thrombosis.

Anti-diarrhoeal activity:¹³

The results of the current investigation supported the traditional claims of the edible root *B. roxburghii* for the treatment of diarrhoea. From the overall observations, we can conclude that EBR was found to be more effective in the case of non-pathogenic diarrhoea. At the same time, rutin showed the best promising effect against pathogen-induced diarrhoea. This confirms the role of rutin as a major marker in *Begonia roxburghii* for the observed antidiarrheal potential.

Anti-diabetic activity:¹⁴

Begonia roxburghii, a relatively obscure medicinal plant found from Nepal to Arunachal Pradesh and some regions of Bangladesh in the Eastern Himalayas, has been identified to have antidiabetic properties. Tribal groups in Arunachal Pradesh have traditionally consumed the fresh leaf juice extract of a certain plant twice daily for 2 to 3 weeks as a diabetes treatment. Until now, there has been no scientific confirmation of how this plant's antidiabetic effects work. However, this study found that the methanolic leaf extract of *Begonia roxburghii* strongly inhibits α -glucosidase activity, even more so than the standard drug acarbose.

Medicinal benefits:¹⁰

The stem is a nutritious snack, and the juice is an anti-hemorrhoid and anti-infectious agent. It is used for the treatment of bee stings, skin infections, dysentery, diarrhea, gastric ulcers, oral infections, jaundice, and diabetes mellitus. Anti-nociceptive, thrombolytic, and anti-oxidant.

CONCLUSION:

Begonia roxburghii holds significant ethnopharmacological and therapeutic value, particularly in traditional medicine systems of

Northeast India. Scientific investigations have validated several of its medicinal properties, including antidiarrheal, antioxidant, cytotoxic, analgesic, anti-arthritic, and thrombolytic activities. These effects are largely attributed to its rich phytochemical profile, encompassing flavonoids, phenolic compounds, tannins, and alkaloids. Despite promising preclinical evidence, most studies remain limited to in vitro assays and animal models. There is a clear need for systematic clinical studies, toxicological assessments, and standardization of extracts to ensure efficacy and safety for human use. With further research, *Begonia roxburghii* may emerge as a valuable source of bioactive compounds for the development of novel herbal therapeutics.

REFERENCES

1. Gurib-Fakim A. Medicinal plants: traditions of yesterday and drugs of tomorrow. *Molecular aspects of Medicine*. 2006 1;27(1):1-93.
2. Bamola N, Verma P, Negi C. A review on some traditional medicinal plants. *International Journal of Life-Sciences Scientific Research*. 2018 1;4(1):1550-6.
3. Meyanungsang K. Documentation and biological and phytochemical analysis of *Chungtia* medicinal plants of Nagaland, India (Doctoral dissertation, Macquarie University).
4. Prasad RS, Dhaswadikar SR, Laloo D, Dhobi M, Itankar PR, Prasad SK. Quality control profiling, nutritional analysis and phytochemical standardization of a vegetable root *Begonia roxburghii*. *Vegetos*. 2023;36(3):842-50.
5. Chowdhury FA. Investigation of in-vitro antioxidant and cytotoxic potential of methanol extract of *Begonia roxburghii* leaves. *BracU*. 2013; 1-87.
6. Borah D, Dutta R, Majumdar S, Mili C. *Begonia* species: a review on its ethnobotany,



- phytochemicals, and biological activities. *Discover Plants*. 2025 10;2(1):182. Taxonomy.
7. Gyeltshen P, Hughes M, Zangpo P, et al. One new species and four new records of *Begonia* (Begoniaceae) from Bhutan. *Edinburgh Journal of Botany*. 2022 18;79:1-8.
 8. Rajbhandary S, Hughes M, Shrestha KK. Distribution patterns of *Begonia* species in the Nepal Himalaya. *Botanica Orientalis: J Plant Sci*. 2010; 7:73-8.
 9. Lalawmpuii L, Tlau L. *Begonia roxburghii*: A potentially important medicinal plant. *Sci Vis*. 2021; 21:22-5.
 10. Akter A. Phytochemical and biological evaluation of *begonia roxburghii*. *BracU*. 2016; (1);1- 60.
 11. Akter T, Nawar A, Alam MN, Rafiquzzaman M. In vitro antioxidant activity of the methanolic extract of leaves of a hill tract plant *Begonia roxburghii*. *Jahangirnagar Univ. J. Biol. Sci.*. 2020;9(1-2):79-89.
 12. Mobarak H, Meah MS, Sikder N, et al. Investigation of preliminary phytochemicals, analgesic, anti-arthritis, thrombolytic and Cytotoxic Activities of *Begonia Roxburghii* (Miq.) DC. Leaves. *Med One*. 2018 25;3(1).
 13. Prasad RS, Yenorkar NY, Dhaswadikar SR, et al. A systematic antidiarrhoeal evaluation of a vegetable root *Begonia roxburghii* and its marker flavonoids against nonpathogenic and pathogenic diarrhoea. *Food Biosci.*. 2023 1;53:102672.
 14. Singh KK, Singh SS, Sharma CL. Antidiabetic and Antioxidant Properties of Important Traditional Medicinal Plants From Northeastern India. *Int. J. Pharm. Sci. Res*. 2024;15(6):1728-36.

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