

## Kakoli (*Roscea purpurea*) An Endangered plant species of Asthavarga- Mentioned in Jivaniya Gana

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**Abstract-** According to the World Health Organization (WHO), more than 80% of the world's population relies on traditional medicine, especially plant-based drugs, for their basic medical needs. Since ancient times, many traditional medicines have been based on plants. In India, particularly, the science of Ayurveda has continued to offer treatments to people through these plant-based products. Numerous plants are employed in Ayurveda as remedies for a variety of illnesses. *Kakoli* and *Ksheerkakoli* is the one of them. *Kakoli* (*Roscea purpurea* Wall.) of Family Zingiberaceae, are mentioned as drugs of Astavarga, but the botanical identity of the species are controversial and different drugs are sold/ used in the name of *Kakoli*. Acharya Charak described these plants under jivaniya Mahakashaya, and Acharya Sarangdhara also mentioned these drugs under the Asthavarga group.

**Keywords-** Ayurveda, Asthvarga, Kakoli, *Roscea procera*

**Introduction-** *Kakoli* (*Roscea procera* Wall.) of Family are mentioned as plants of Kakolyadi varga By Acharya Sushruta, in jivaniya mahaashaya by Acharya Charaka, and in Asthvarga by Acharya Sarangdhara, and also described in dhanvantari nighantu, Bhavprakash nighantu, Kaideva nighantu, Raj nighantu & Madanpal nighantu. *Roscea purpurea*, known by the common name of *Kakoli*, is a large lush green perennial rhizomatous herb between 15-30 cm in height. It is a significant species belonging to the "Ashtavarga" group, whose clan members are Jivaka-Rishabhak, Mahameda-Meda, Riddhi-Vridhhi, and *Kakoli-Kshirakakoli*. It is stated that these plants can mend and treat broken bones, weakness, pyrexia, obesity, and diabetic regulation. The Astavarga group has a long history of use in traditional indigenous medicine. In cases of chyawanprash, it acts as a revitalizer and health promoter. However, there isn't any systematic or rigorous research to back up the allegation. Consequently, the immunomodulatory effects of *Roscea purpurea* (*kakoli*) plants were investigated for delayed type hypersensitivity reaction, lymphoid organ weight, and haematological parameters in mice. The extraction of *kakoli* with alcohol led to a considerable increase in the delayed type hypersensitive reaction. This has resulted in concerning issues currently with regard to the quality, safety, and stability of raw ingredients as well as their intended therapeutic efficacy. Efforts have been made to establish pharmacopoeial traits and ascertain the botanical identification of market samples by comparison with authentic drugs.

### Scientific Classification: <sup>6</sup>

Kingdom- Plantae

Clade-Tracheophytes

Clade- Angiosperms

Clade- Monocots

Order- Zingiberales

Family- Zingiberaceae

Genus- *Roscea*

Species- *R. purpurea*

English Name: Roscoe's Lily

Sanskrit/ Hindi Name: *Kakoli*

**Habit-** a rhizomatous perennial herb that grows to a height of 15–30 cm.

**Habitat:** It is found worldwide between 1500 and 3100 meters in Tibet, Bhutan, and Pakistan. found in the Central and Eastern Himalayas of India, ranging from Uttarakhand to Assam and Sikkim, and reaching heights of 3300 meters in alpine grasslands, moist gullies, steep hillside, and stony terrain.<sup>7</sup>

**Botanical characteristic features:** An elongate, strong, purple-colored leafy stem; 5–6 lanceolate leaves, 15 cm long by 1.2–2.5 cm wide; broad, purple or reddish, imbricated sheaths; a few orchid-like blooms on a sessile spike; oblong bracts concealed in the sheaths of the top leaves; green calyx that is 3.8 cm long and has a deep slit on one side as the bloom enlarges; corolla tube: around 2.5 cm long, obovatecuneate, lower lanceolate, decurved, lip broad, deeply bifid, limb purple, seldom pale lilac or white; not longer than the calyx, dilated upwards; Fruits: capsule cylindric, 2.5–3.8 cm long; seeds: ovoid, minute, arillate; rhizomes: thick, fleshy, fascicled; staminode: oblanceolate, unguiculate, half as long as the upper segment; fertile stamen: as long as the staminode, anther tails 0.4 cm long, lip 2.5–3.8 cm, deflexed.<sup>8</sup>

**Flowering:** June-July.

**Fruiting:** August-September.

**Active principles:** Its rhizome is rich in tannins, glycosides, flavonoids, alkaloids, saponins, and phenolic compounds.

**Pharmacological properties & Action:** These include antirheumatic, febrifuge, galactagogue, expectorant, haemostatic, diuretic, tonic, sweet, bitter, and cooling properties. In mice, the rhizome ethanolic extract demonstrated immunostimulant potential.<sup>9</sup>

**Part used:** Rhizome.

**Formulations:** Astavarga churna, Chyavanprash rasayan, Vachadi taila, Chitrakadi taila, Mahakalyan ghrita, Mahamayura ghrita, Jivaniya ghrita, Nagabala sarpi, Vajikaran ghrita, Brahini gutika and Jivaniya gana churna.<sup>10</sup>

**Ayurvedic Properties of Kakoli-<sup>11</sup>**

Properties	Kakoli
<i>Roscoea purpurea</i> Wall.	
Family	Zingiberaceae
Rasa	Madhur, Tikta
Guna	Guru, Snigdha
Veerya	Sheeta
Vipaka	Katu
Dosa Karma	Kaph-pitta Shamaka
Karma	Jivaniya, Brighaniya, shukrajanana, Balya

**Medicinal uses of Kakoli (*Roscoea purpurea* Wall.) in Ayurvedic Text-<sup>12</sup>**

1. When combined with appropriate amounts of honey and crystal sugar, kakoli powder and other herbs can be used to treat heart conditions and cough.
2. When used in appropriate dosages, clarified butter processed with kakoli and other medicinal herbs strengthens and increases virility.
3. Rhizome powder is used internally in the treatment of sexual debility.
4. When consumed in the recommended amounts and manner, chavanprasha made with kakoli and other medicinal plants has rejuvenating properties.
5. To treat child emaciation, consume clarified butter that has been treated with kakoli and other therapeutic herbs in the right amounts.
6. When taken in the recommended dosages, a tablet made with kakoli and other herbs aids in achieving physical potency and strength while enhancing virility.
7. When combined with orange rind powder, kakoli rhizome powder works well to treat bronchitis and asthma.
8. Gout, sciatica, kyphosis, and urinary diseases are all treated with oil that has been prepared with kakoli and other herbs.

**Substitutes:** Aswagandha (*Withania somnifera* (Linn.) Dunal) and Kali musali (*Curculigo orchioides* Gaertn.). The literature includes screening of classical *Ayurvedic* literature, contemporary literature, modern literatures, journals and internet sources etc. to collect adequate data for the study purpose. The properties of *Kakoli* (*Roscea procera* Wall.)<sup>13</sup> is mentioned in Dhanwantari Nighantu, Raja Nighantu and Kaiyadeva Nighantu, Madanpal nighantu & Bhavaprakash nighantu.

There is a lot of disagreement on the identification of Kakoli; some authors have identified *Fritillaria roylei* Hook. as Kakoli<sup>14</sup>, while others have identified *Fritillaria cirrhosa* D. Don. However, The Plant List states that *Fritillaria cirrhosa* D. Don is the species' original name, and *Fritillaria roylei* Hook. is a synonym for it.<sup>15</sup> thought of Wall as *Roscoea procera*. Additionally, *Roscoea alpina* Royle is referred to as Kakoli; however, Acharya Balkrishna (2012)<sup>16</sup> states that *Roscoea purpurea* Smith is the true species of Kakoli due to its purple-colored, sturdy stem and purple blossoms, which are documented in ancient texts by Shaligram and Bhav Prakash Nighantus. Three other species of *Roscoea*, which differ somewhat from the aforementioned species and are utilised as a replacement in Uttarakhand, are as follows:

1. ***Roscoea capitata* Smith-** A perennial rhizomatous herb with an elongated stem, numerous linear leaves, a dense spike of oblong, peduncled flowers, a corolla-tube that is not longer than the calyx, pale blue limbs, an upper segment that is oblong-cuneate, and a lip that is narrow-emarginate.

2. ***Roscoea alpina* Royle-** A perennial rhizomatous herb upto 15-25 cm in height; leaves several, leaf blade linear, rarely lanceolate 15-25 cm long and 1-2.8 cm wide, strongly keeled, base narrow, apex acuminate; inflorescence capitate, densely flowered; peduncle 5-10 cm long; flower blue in colour; calyx 2.5 cm in diameter, pubescent especially along veins, split on one side, apex 2-toothed; corolla-tube shorter than calyx; limb pale blue, upper segment oblong -cuneate, lip narrow emarginated.

3. ***Roscoea purpurea* Smith var. *procera* (Wall.) Baker-** Compared to *Roscoea capitata* Smith, the stem is taller, greener, more robust, and has broader leaf-sheaths. The flowers at the apex are larger and purple in colour.

**Discussion-** One of the most significant Asthvarga plants, kakoli is also very endangered. Kakoli is also mentioned by Acharya Sushrut in Kakoliyadi Gana, and Acharya Charak in Jivajiya and Balya Mahakashaya. Dhanwantari Nighantu, Raja Nighantu, Kaiyadeva Nighantu, Madanpal Nighantu, and Bhavaprakash Nighantu all highlight the qualities of Kakoli. Rhizomes and tubers from *R. purpurea* are frequently utilised in a variety of Ayurvedic remedies. This review covers the most recent data on the chemical composition, pharmacological investigation, therapeutic applications, and Ayurvedic importance of the plant together with its different formulations. It also discusses the various methods for cultivating and conserving it, which is an urgent requirement.

**Conclusion-** In numerous Ayurvedic books and literatures, the rhizomes, tubers, and other portions of *R. purpurea* are well-described as an analeptic that is frequently used to treat a variety of medical conditions in India. Based on the evidence provided above, we have determined that there have long been disagreements about the botanical origin of kakoli. Unfortunately, many species are now named and used as Kakoli in different parts of our country due to a lack of knowledge about plant identification. However, three species- *Roscoea purpurea* Sm., *Roscoea capitata* Sm., and *Roscoea alpina* Royle are typically used in place of Kakoli and are widely accepted as such.

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