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BLACK TURMERIC- *CURCUMA CAESIA* ROXB, AND ITS MEDICINAL PROPERTIES: A REVIEW

Sapan Tamang

PhD Research scholar, Department of Plantation Spices,
Medicinal and Aromatic crops, Faculty of Horticulture, Bidhan Chandra
Krishi Viswavidyalaya, Mohanpur- 741252, Nadia, West Bengal

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ABSTRACT

Curcuma caesia Roxb., commonly known as black turmeric is an important medicinal plant belonging to the family Zingiberaceae. It is a perennial crop with bluish-black rhizome. The rhizome in inner part is bluish-black in colour and emits a characteristic sweet smell due to the presence of essential oil. It contains: alkaloids, terpenes, amino acids, carbohydrates, tannins, flavones, flavonoids, steroids, reducing sugars, proteins, anthraquinones, glycosides, cardiac glycosides. The rhizomes have a high value because of its putative medicinal properties. The rhizomes are used in carminative properties (Gantait *et al*., 2011), treatment of smooth muscle relaxant activity, haemorrhoids, leprosy, asthma, cancer, epilepsy, fever, wound, vomiting, menstrual disorder, anthelmentic, aphrodisiac, gonorrhoeal discharges and inflammation (Arulmozhi *et al*., 2006 and Sasikumar, 2005).

Keywords: alkaloids, *Curcuma caesia,* essential oil, economical importance, flavonoids

INTRODUCTION

Curcuma caesia Roxb., commonly known as black turmeric is an important medicinal plant belonging to the family Zingiberaceae. *C. caesia* or Black Turmeric is a perennial crop with bluish-black rhizome. The rhizome is bluish-black in colour in inner part and emits a characteristic pungent smell due to the presence of essential oil (Pandey *et al*., 2003; Das *et al.,* 2013). It is native to North East India and central India, relatively unexplored medicinal plant valued all over Asia for its therapeutic efficacy. It flourishes good at moist deciduous forest areas with rich humid and clayey soils. In India, it thrives well states like-Chhattisgarh, Madhya Pradesh, Odisha, Uttar Pradesh and West Bengal (Nadkarni, 1976). The rhizomes have a high

ISSN: 2455-6939

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value because of its putative medicinal properties. The rhizomes are used in carminative properties (Gantait *et al*., 2011), treatment of smooth muscle relaxant activity, haemorrhoids, leprosy, asthma, cancer, epilepsy, fever, wound, vomiting, menstrual disorder, anthelmentic, aphrodisiac, gonorrhoeal discharges and inflammation (Arulmozhi *et al*., 2006 and Sasikumar, 2005). The rhizomes are aromatic and contain an essential oil. A paste made from the crop is used to cure blood dysentery and as poultice in rheumatic pain. The leaves both fresh and dry are used as a wrapping material and fuel respectively by Bengalis in Bangladesh (Yusuf et al., 2002). Northern tribes use Black Turmeric as a talisman to keep the evil spirits away, while in West Bengal it is an important place in traditional system of medicine and is also used as a substitute for turmeric in state of Madhya Pradesh also the plant is regarded as very auspicious and it is stated that a person who possesses it will never encounter the shortage of cereals and food (Pandey and Chowdhury, 2003). This clear that this crop is not only important medicinally but also important socially as well as spiritually. The National Medicinal Plant Board of India has listed more than 112 plants as crucially important species circulated by Ministry of Environment in year 1997 and according to this, export of these species is illegal without the permission of the legal competent authorities and this notification includes *Curcuma caesia* (Black Turmeric) as well. These plants is in great demand in Central India and due to indiscriminate exploitation the plant has been categorized as an endangered species (Kumar et al., 1998) .While turmeric species have been growing all over the tropics, some species have also been reported from Australia, China, and South Pacific. More than 110 species of turmeric have been reported from the tropical Asia with greatest diversity from India, Myanmar and Thailand. About 40 species are indigenous to India, and black turmeric *Curcuma caesia* is one of the economically important species along with *C. aromatica, C. amada, C. aeruginosa, C. longa*, and *C. zanthorrizha* (Ravindran 2007; Nair 2013).

BOTANICAL DESCRIPTION

Kingdom: Plantae

Subkingdom: Viridaeplantae

Phylum: Tracheophyta Sinnott

Subphylum: Euphyllophytina

Class: Magnoliopsida “monocotyledons” “commelinids”

Order: Zingiberales

Family: Zingiberaceae

ISSN: 2455-6939

Volume: 08, Issue: 01 "January-February 2022"

Subfamily: Zingiberoideae

Tribe: Hedychieae

Genus: Curcuma

Species: C. caesia Roxb

Vernacular Names in different parts of India C. caesia is known by different names

Hindi: Kali Haldi, Nar Kachura Krishna Kedar

Bengali: Kala Haldi

Mizo: Aihang, Ailaihang

Telugu: Nalla Pasupu

Assamese: Kala Haladhi

Nepalese: Kaal Hardi

Fig 1: Black Turmeric

ISSN: 2455-6939

Volume: 08, Issue: 01 "January-February 2022"

The plant height ranging from 0.5 to 1.0 m with normally erects. It is divided into underground large ovoid tuberous rhizome, often called rootstock, and aerial shoot along with the leaves. The leaves are usually in the groups of 10–20, each leaf is broad oblong lanceolate and glabrous. A deep farraginous purple colour is present in the middle region of the lamina the petiole is ivory in colour. The variation is parallel in nature. The flowering bracts are green with a ferruginous tinge. Flower petals may be deep pink or red in colour.

Fig 2: Flower of Black Turmeric

CONSTITUENTS

It contains: amino acids, anthraquinones, alkaloids, carbohydrates, flavones, flavonoids, terpenes, tannins, steroids, reducing sugars, proteins, glycosides, cardiac glycosides.

The volatile rhizomes oil of *Curcuma caesia* contains of 30 components, representing 97.48% of the oil, with camphor (28.3%), ar-turmerone (12.3%), (Z) ocimene (8.2%), 1,8 cineole (5.3%), elemene (4.8%), borneol (4.4%), bornylacetate (3.3%) and curcumen (2.82%), ar- curcumene (6.8%) as the major constituents.

ISSN: 2455-6939

Volume: 08, Issue: 01 "January-February 2022"

Fig 3: Black Turmeric rhizomes

MEDICINAL USES

1. The multiple phtyo-constituents like curcumminoids, flavonoids, phenolics, amino acids, protein and high alkaloids, found in the rhizome are responsible for the antimicrobial, antioxidant activities, anti-tumor, anxiolytic, anti-inflammatory, anti-ulcer, and CNS depressant (Devi *et al.*, 2015; Karmakar *et al*., 2013; Vineela *et al.*, 2017).

2. Bronchodilating activity

The bronchodilating activity of extracts of Black turmeric . Bronchodilator activity of the extract was studied on the histamine aerosol induced Bronchospasm and preconvulsion dyspnoea in guinea pigs was reported by Pritesh Paliwal *et al*. (2011)

3. Anthelmintic Activity

Gill Randeep *et al*. (2011) studies two popular species of genus Curcuma, *C. amada* and *C. caesia* were proved for their anthelmintic activity. In this study, 4 extracts viz. aqueous extract of rhizomes, Dichloromethane, ethanol and Petroleum ether of *Curcuma amada* and *Curcuma caesia* were investigated for anthelmintic activity at three different concentrations. 50 mg/ml, 100 mg/ml and 150 mg/ml, three concentrations of each extract were studied the determination of paralysis time and time of death of earthworms The results proved that ethanol extract (150 mg/ml) of Black turmeric was most effective in causing paralysis of earthworms, while the

ISSN: 2455-6939

Volume: 08, Issue: 01 "January-February 2022"

Dichloromethane extract (150 mg/ml) and ethanol extract (150 mg/ml) of both *C. caesia* and *C. amada* were very effective in causing death of earthworms.

4. Anti-bacterial Activity

Angel Gabriel Rajamma *et al*. (2012) investigated antibacterial and antioxidant of oleoresins isolated from nine Curcuma species. Oleoresins were extracted from rhizomes of nine Curcuma species such as *C. aeruginosa, C. amada, C.aromatica, C. brog, Curcuma caesia, Curcuma malabarica, C.rakthakanta, C.sylvatica and Curcuma zedoaria*

5. Anti-ulcerogenic activity

The anti-ulcer activity of the ethanolic extract of the rhizome of Curcuma caesia was experimented on four groups of albino rats and revealed that there is significant reduction of gastric acid volume, pepsin, ulcer index, free and total acidity along with increased production of gastric mucus. Pranab KR Bordoloi *et al*. (2012)

6. Smooth Muscle Relaxant and Anti-asthmatic Activity: Arulmozhi *et al*. (2006) evaluated anti-asthmatic property of *Curcuma caesia.*

7. Anti-fungal Activity

Banerjee and Nigam, 1976 reported that the antifungal activity in *C. caesia* rhizomes. Essential oil of rhizomes of *Curcuma caesia* has been known for its antifungal activity.

8. Black turmeric, used in traditional and folk medicine, seems to be a promising source of active therapeutic agents. Further studies on isolation of active principle agents may play vital role in increasing its pharmaceutical and industrial significance. Curcuma, known for its antimicrobial potential since immortal, it's an important source of plant based antimicrobials. Such species provide safer alternates to the microbe-based antimicrobials which are increasingly reported for their side effects and drug resistance (Pandey *et al*., 2015)

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ISSN: 2455-6939

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