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Ethnomedicinal And Pharmacological Uses Of Curcuma Caesia

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Abstract

Curcuma caesiaRoxb.is a perennial rhizomatous grass having large leaves is commonly used as traditional medicine. The plant contains camphor, turmingone, ocimene, cineole, borneol, bornyl acetate, and curcumin as the main phytoconstituents. The C. caesia plant has been reported to possess high antifungal,anti-asthmatic,antimicrobial, antioxidant, analgesic, locomotive depressant, anticonvulsant and anti-inflammatory activities. Curcuma caesia is a valuable source of unique natural products for the therapeutics development against various diseases. This review provides describes the medical uses, photochemistry, and pharmacological actions of the Curcuma caesiaplant.

Key words: Curcuma caesia, Ethnomedicinal uses, Pharmacological activity.

1. Introduction

Curcuma Black (Curcuma CaesiaRoxb.) belongingto Zingiberaceae family, is a perennial grass with a bluish-black rhizome, that is of high economic importance attributed to its broad medicinal properties. The rhizome of this plant is claimed to be useful in the treatment of leprosy, bronchitis, asthma, cancer, epilepsy, fever, wounds, impotence, fertility, vomiting and pain [1]. The black Curcuma rhizome is of high economic importance because

of its medicinal properties. The black Curcuma was considered endangered by the central forest department of India due to organic piracy [2]. C. caesia is a wonder grass and contains the highest curcumin content that possessmany curative properties [3]. It is used for the treatment of menstrual disorders, batteries, impotence, and epilepsy. Externally, this plant has been used in the treatment of wounds, white spots over skin, and leprosy wounds of [4]. Plant is also capable to improve fertility levels. C. caesiais also used to treat the spleen expansion and different forms of tuberculosis. The C. caesia leaves and rhizomes are commonly used in themedical formulations [5].C. caesiais called with different names such as: Kali Haldi (India) and Blaugrauekurkuma in Germany [6].

2. Morphology of Curcumacaesia plant

The tuberous C. caesiarhizomes bearing sweet odor is usually 2-6 cm in diameter. Its size and shape are variable. C. caesiarhizome is sessile and covered with adventurous roots, root scars, and warts and laterally flattened. The leaves are found in 10-20 groups, that are widely oblong and glabrous. In the middle region, La Lamina shows deep ferruginous purple color clouds. Flower of C. caesiais smaller than bract with pale and reddish yellow border. The Calyx is 10-15 mm long, obtuse, 3 toothed; whereas corolla is long tubular with pale yellow lip - 3 lobed semi-elliptical (figure 1) [7].

Figure 1: Curcuma caesia, rhizome, flower and leaves, root.

3. Ethnomedical uses

The C. caesiarhizome paste is administered for the stomach problems such as stomach pain and dysentery. The C. caesia rhizome powder is mixed with water and consumed to relieve gastric stress. The C. caesia rhizome is known to control the bleeding and induce rapid recovery in case of cuts or wounds and snake bites. The topical administration of C. caesiapaste eases painful joints. C. caesia rhizome is known to possess strong antioxidant, antimicrobials and anti-fungal activity.It assists in easy digestion and proper functioning of liver and kidneys [2]. In different parts of the world, the rhizome and leaves ofC. caesia plants are used in various indications. It is commonly used as a tonic for heart and brain. Rhizomes of C. caesia rhizome are commonly used in the treatment of bronchitis, tuberculous glands of the neck, leucoderma, enlargement of spleen piles,asthma, and tumors[8].

4. Chemical Constituents of Curcuma Caesia

C. caesia rhizome is known to possess alkaloids, terpenes, amino acids, carbohydrates, tannins, flavors, flavonoids, steroids, reducing sugars, proteins, anthracene, glycosides, cardiac glycosides. Caesia curcuma rhizomes oil contains 30 chemical constituents that represents 97% of the oil, with camphor (28%), turmingone

(12%), Curcumin (7%,) ocimen (2%), Cineole (5%), Elemene (4%), Borneol (4%), nerylacetate (3%) and curcumen (3%) as the major chemical constituents [9].

5. Pharmacological response of Curcuma caesia

The use of C. caesiarhizomes for medicinal purposes emerges from various bioactive compounds. Previous reports suggests that due to phenolic and flavonoids constituents [10] C. Caesia exhibits numerous pharmacological effects given as follows.

5.1Antimicrobial response

Human body comprises a huge population of bacteria and human cells together in a hypothetical ratio of 1:1. An infinitesimal small disturbance in this ecosystem may lead to various infections or diseases [11-17].A large number of studies suggested extensive use of plants as antimicrobial agents. In recent years, there has been a renewed interest in the use of vegetable parts as antimicrobial agents, because some of the synthetic antibiotics can become ineffective due to the resistance of the human body [18-34]. A study reported that the essential oil of C. Caesiarhizome could inhibit the growth of mushrooms, CurvulariaOryzae, Aspergillus Niger, and A. Flavus[34]. Another study highlighted that oleoresins present in C. Caesia Rhizome essential oil are effective against Staphylococcus aureus, Bacillus subtilis, and Escherichia coli. The diameter of the inhibition zone was measured and it was found that it is very effective against B. subtilis. This can be linked to the traditional use of Caesie rhizome in the healing of infections and wounds [35]. Evidence suggestedC. Caesiacould prevent the growth ofS. Typhimuriumand S. Aureus, and fungus such as: A. Fumigatus, A. Niger, Saccharomyces cerevisiae, and Candida albicans. The tests were carried out using the disk diffusion method and the minimum inhibitory concentrations were determined, where C. Caesia Leaf essential oil showed maximum inhibition against S. aureus and A. Niger[10].

5.2 Antioxidant response

Plants are reported as rich source for antioxidants, attributed to their phytoconstituents such as phenols, polyphenols, alkaloids, flavonoids etc. [36-40]. The antioxidant properties of C. caesia have been determined by studying its free radical recovery activities. An investigation reported antioxidant potential C. Caesia rhizome extracts. Study involved DPPH test. Study reported that C. Caesiamethanolic extracts exhibited high antioxidant potential [41]. Several other latest studies also highlighted thehigh antioxidant potential of C. Caesiaplants [42,43]. One of the investigations reported that total phenolic content of C. Caesia and antioxidant activity were proportionate. A study reported that the total phenolic content (TPC) and antioxidant activity of the C. Caesia is greater than C. amada[44]. Study of Rajamma et al. (2012) reported a significant correlation between TPC and antioxidant activityof caesia isolated oleoresin [35].Another study on the antioxidant potential of Caesia leaf essential oil indicated that the radical scavenging activity frees and the reductive power activity of the essential oil of leaves increases with increasing concentration. The essential oil of the leaves is rich in flavonoids and phenol, which can make the properties antioxidants. The studies examined here showing in the silicon antioxidant tests are less pharmacological relevance. The non-specificity and potential sensitivity of chemical analyzes make the results unworthy. In vivo tests are needed to determine the clinical application of this plant. In addition, antioxidants derived from natural products are gaining importance in recent years. Some industries are trying to focus on replacing synthetic antioxidants with natural animals because people prefer to use

ecological and safe products to use. Thus, these plants such as C. caesia can be the source of natural antioxidants, which can be used in various cosmetics as well as pharmaceuticals [45].

5.3 Anticancer response

Cancer affects millions of populationacross the globe,hence there is persistentdemand for development of new drugs and therapies for its treatment.Development ofnatural therapeutics especially from plants source for the cancer treatment always withdraws the investigators attention [45,46]. A study performed evaluation of chemopraticresponse ofC. Caesia using mouse model. Study revealed that C. Caesiamethanolic extract can restore the diethyl nitrosamine structural anomalies. Additionally, the Caesiarhizome hexane extract exhibited its potential to inhibit the proliferation of the human liver adenocarcinoma (HEPG2) cell line [43].

5.4 Thrombolytic response

Recent study **response**thrombolytic activity of C. Caesia.This study involved analysis of percent clot activity of C. Caesia Rhizome ethanolic extract. Study revealed that C. Caesia Rhizome ethanolic extract exhibited 49.18% of barill lysis [47].

5.5Anthelmintic response

Reports suggest anthelmintic activity of C. Amada and C. Caesia. Study involved analysis of 04 extracts of C. caesiaand C. amadathat were prepared using petroleum ether, dichloromethane, ethanol, and water at three different concentrations. The study revealed that the ethanolic extract of C. Caesia paralyzed the earthworm, whereas ethanolic extracts of two plants effectively caused death of earthworms [48].

5.6 Anti-ulcer response

Although there exist several synthetic drugs that possess anti-ulcer potential, but these synthetic drugs are relatively more expensive and produces more side effects when compared with herbal drugs [49]. An invivo study was performed to evaluate the antiulcer potential of Caesia rhizome ethanolic extract using experimental animals. The study revealed that the Caesia rhizome ethanolic extract possess good antiulcer response [50].

5.7 Toxicology

As essential oils are reported to exhibit toxic nature, hence before its commercial applications the toxic nature of any compound must be evaluated prior to its commercial applications. One of the studywas performed to test the genotoxicity of Caesia leaves essential oil. Study revealed that essential oil exhibited no toxic effect overthe growth of A. Cepa roots and mitotic cell index. In the study, the cells were also evaluated for chromosomal aberrations. Study revealed no detrimental changes. For the study the parameters such as chromosome aberration test, chromosome casting, bridge, multipolarity, chromosomal key and chromosomal collecting were the considered [9]. Investigation reported that genotoxic effect of C. Caesiarhizome essential oil has a negative effect on A. Cepa roots and mitotic cell index [51].

5.8 Bronchial response

A study evaluated bronchial activity of Caesia extract. The study involved evaluation of bronchodilator response of Caesiaextract over histamine induced bronchospasm and dyspnea of pre-convulsion usingguinea pig model

[7]. Study revealed that treatment with C. Caesiamethanolicextract exhibited significant protection against histamine-induced bronchospasm[52].

5.9 Neuro pharmacological response

A study reported pharmacological response of C. Caesia. Study revealedrhizome to possess analgesic, anticonvulsant, muscle relaxant, and locomotor depressant effect, which revealed antidepressant potential of the central nervous system [53]. Study was done to evaluate the neuro pharmacological response of C. Caesiamethanolic extract in adult male albino swishes mice. C. Caesiamethanolic extract was evaluated for its analgesic potential at the dose of 50 and 100 mg/kg of body weight. Anticonvulsant response was evaluated in mice using Rota-Rod apparatus. Study revealed C. Caesiamethanolic extract to inhibit torturing dose-dependent and significant rise in reaction time of mouse tail, was not a dependent dose, the maximum analgesic effect has increased up to a maximum[43]. In respect to dose, the C. Caesiamethanolic extract expanded the locomotors activity in mice. The C. Caesia pre-treatment methanolic extract exhibited protection and dose-dependent on PTZ-induced convulsions in mice by slowing convulsions beginning. C. Caesiamethanolic extract demonstrated its muscle relaxing effect [53]. A study was performed to evaluate theantioxidant activity of non-enzymatic and enzymatic rhizome and leaves extracts of C. zedoary, C. Caesia, and C. angustifolia based on their free radical cleaning activity. The non enazymatic extract of C. Caesiaexhibited the DPPH cleaning activity of 55.32 ± 0.2 at 200 µg / ml concentration. The hydroxyl radical cleaning activity of Caesiawas 40.26 ± 0.01. Enzymatic extract of C. caesiaexhibited DPPH cleaning activity of 31.2 ± 0.8 at a concentration of 200 µg / ml. Where, highest antioxidant activity was exhibited with Catalase, superoxide dismutase, and peroxidase glutathione enzyme [54].

6. Conclusion

The plant appears to have a broad spectrum of activity on many ailments. Rhizomes of the plant were investigated for antifungal activity, anti-inflammatory activity, antiemetic anti-microbial activity, analgesic, anxiolytic and CNS activity and many other various activities. This study emphasizes the knowledge on the plant Curcuma CaesiaRoxb. The rhizomes of the plant have enough bioactive Properties as shown in the different animal models. The phyto-constituents are proven to be identified. The information provided in this review would assist in other investigations for different bioactive compounds of the plant Curcuma CaesiaRoxb.

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7. References

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