



Review Article

A COMPREHENSIVE REVIEW OF *KACHUR (CURCUMA ZEDOARIA ROSC.)*: A POTENT HERBAL DRUG FOR VARIOUS AILMENTS

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ABSTRACT

**Background:** *Kachur (Curcuma Zedoaria Rviosc.)* is a perennial herb found in tropical and sub-tropical countries such as India, Thailand and Japan. Various parts of this plant are used in Ayurveda having properties like *Rochan*, *Deepana*, *Krumigna*, *Yakurit uttejaka*, *Anulomak*, *Raktashodhaka*, *Sothaharah*, etc. and other folk medicines for the treatment of different ailments such as diarrhea, flatulence and dyspepsia and many more. **Aim:** To review comprehensive literature on *Kachur (Curcuma Zedoaria Rosc.)* w.s.r. to its ethnomedicinal uses and pharmacological activities. **Material And Methods:** The literature review was compiled from available Ayurvedic literatures and various published articles relevant to *Kachur*. **Conclusion:** *Kachur* contains complex range of phytoconstituents due to which it has been reported for its diverse biological activities. It has been studied for various therapeutic activities like anti-microbial activity, anti-oxidant activity, anti-inflammatory activity, antipyretic, etc. It is widely used for treatment of various diseases like worm infestation, leucorrhoea, gonorrhoea, flatulence, dyspepsia, dropsy, etc.

INTRODUCTION

In present time, we all are well aware with the clinical importance of yellow turmeric mentioned as *Haridra (Curcuma longa Linn.)* of Zingiberaceae family in Ayurvedic texts. Its use is widely seen in every household and is seen as an effective medicinal herb used traditionally since ancient times in various diseases. The medicinal properties of white turmeric which belongs to the same family as *Haridra*, are almost similar to yellow turmeric. *Curcuma Zedoaria* also goes by the name *Kachur* in Ayurvedic texts has been used from ancient times globally in both Ayurvedic and Unani system of medicine. It is native to tropical and sub-tropical humid forests along with eastern Himalayas and can be both wild or cultivated.<sup>[1,2]</sup>

It is also a major ingredient of extensively used formulation- *Chandrapravati*.<sup>[3]</sup>

It has been used traditionally for various therapeutic purposes such as menstrual disorders, dyspepsia, vomiting and as stimulant, carminative, demulcent, etc.<sup>[1,2,4]</sup> In this article, *Kachur* has been explained in detail by including its habitat, morphology, classical categorization, pharmacological and therapeutic properties, parts used, doses, adverse effects, etc.

MATERIALS AND METHODS

The literature review was compiled from available Ayurvedic texts such as *Samhitas (Charaka Samhita, Sushruta Samhita, Astanga Hridaya)*, *Chikitsagrantha (Bhaisajya ratnavali)*, online source of *e-Nighantu*. Using the key words – *Kachur, Curcuma zedoaria*, etc., various published articles were searched on different search engine such as PubMed, Google Scholar, Research Gate.

Table 1: Vernacular Names <sup>[4,5,6]</sup>

Language	Vernacular Name
Sanskrit	<i>Kaccura, Dravida, Sati, Gandhamula, Vedmukhi, Durlabha, Karsha</i>
English	Round Zedoary
Hindi	Kacura, Gandamasti
Bengali	Sali, Ekangi, Sari, Kachura

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Malayalam	Kachalam
Tamil	Kichili, Kizhangu, Kitchiliki Zhangu, Padam Kizhangu
Telugu	Kachoramu, Kichili Gadda
Oriya	Gandha Sunthi, Karchura
Persian	Jadwar
Urdu	Zaranbad
Assamese	Katuri
Gujrati	Kachuro, Shatakachuro
Marathi	Kachora

flower. Capsules ovoid, trigonous, smooth; vernal spikes; Calyx obtusely toothed, whitish and half as long as the funnel-shaped Corolla tube.

**Fruit:** Triangular, elliptical, smooth with 3-valved capsules.

**Seed:** White, oblong, arillate.



Figure 1: Flower of *Kachur*



Figure 2: Rhizome of *Kachur*



Figure 3: Leaves of *Kachur*

### Geographical Distribution [1,2]

- *C. zedoaria* is indigenous to tropical and subtropical humid regions of countries like India, China, Bangladesh, Thailand, Indonesia, Japan (South-east Asia).
- It can also grow up to an altitude of 900m with a humid climate having 100-120cm of rainfall. It generally requires loam or red soil to grow. Flowering can be seen in summers and later on fruits start to grow.
- In India, it grows wild in Eastern Himalayas, moist deciduous forests of the Coastal tract of Kanara and hilly regions of Orissa. Also, it is widely cultivated throughout India especially in Bengal for its tuber which is a source of Shoti starch, given as a substitute for barley and arrowroot.

### Botanical Description [2,7]

*C. zedoaria* is a tuberous herb which generally grows to a height of 45cm and closely resembles to *Curcuma longa* (Yellow Turmeric) but has a less intense aroma ranging in between turmeric and mango.

**Rootstock:** Large and ovoid with many sessile tubers pale yellow or whitish from inside and 1 inch diameter.

**Leaves:** Large, 30-60cm long, oblong, glabrous, acuminate, narrow at the bottom, with purple from the middle. The petiole is green and longer than the blade.

**Flower:** Pale yellow and shorter than bracts of the coma which is bright red in color overlapping the

### Phytochemical Constituents [4,8]

It consists of essential oil yellowish (1-2%), starch (82.6%), curcumin arabins, protein (14.6%), bitter soft resin, organic acids, gum, sugar, ethyl p-methoxycinnamate,  $\beta$ -turmerone and  $\beta$ -eudesmol, zingiberene, dihydrocurcumin, furanodiene,  $\alpha$ -phellandrene, 1, 8cineole,  $\beta$ -elemene and germacrone.

Table 2: Chemical Constituents and their Action

Action	Chemical Constituents
Analgesic Antinociceptive [9]	Curcumenol
	Dihydrocurdione
Anti-allergic effect [10]	Curcumin
	Dihydrocurcumin
	Tetrahydrodemethoxycurcumin
	Tetrahydrobismethoxycurcumin
Cytotoxic effect [11,12]	A-Curcumene
	b-tumerone
	Zerumbone

	Zerumbone epoxide
	Diferuloylmethane
	Di-p-coumaroylmethane
Anticancer effect <sup>[13]</sup>	Curcumin
	Demothxycurcumin
	Bisdemothxycurcumin
Hepatoprotective <sup>[14]</sup>	Furanodiene
	Germacrone
	Curdione
	Neocurdione
	Curcumenol
	Isocurcumenol
	Aerugidiol
	Zedoarondiol
	Curcumenone
	Curcumin
Anti-inflammatory effect <sup>[15]</sup>	Curzenone
	Dehydrocurdione

### Classical Categorization

- **Bhavaprakasha Nighantu** – *Kapuradi varga* <sup>[16]</sup>
- **Dhanvantari Nighantu** – *Chandanadi varga* <sup>[17]</sup>
- **Raja Nighantu** – *Pippalyadi varga, Mishrakaadi varga* <sup>[18]</sup>
- **Kaiyadeva Nighantu** – *Aushadi varga* <sup>[19]</sup>
- **Saraswati Nighantu** – *Chandanadi varga* <sup>[20]</sup>
- **Sodal Nighantu** – *Chandanadi varga* <sup>[21]</sup>
- **Amarkosha Nighantu** – *Vanaushdhi varga* <sup>[22]</sup>
- **Hridyadeepak Nighantu** – *Dwipaad varga* <sup>[23]</sup>
- **Siddhamantra Nighantu** – *Kaphavataghna varga* <sup>[24]</sup>
- **Nighantushesh Nighantu** – *Gulmakanda* <sup>[25]</sup>
- **Charak Samhita** – *Sutrasthana 27, Phal varga* <sup>[26]</sup>

**Table 3: Ayurvedic Pharmacodynamics <sup>[5]</sup>**

<b>Dravya</b>	<i>Kachur</i>
<b>Rasa</b>	<i>Katu, Tikta</i>
<b>Guna</b>	<i>Laghu, Teekshna</i>
<b>Virya</b>	<i>Ushna</i>
<b>Vipaka</b>	<i>Katu</i>
<b>Karma</b>	<i>Deepana, Ruchya, Kapha-Vata shamaka, Mukhavaisadyakara</i>

**Table 4: Medicinal Qualities and Rogaghanta <sup>[16,26,27,28,29]</sup>**

<b>Digestive system</b>	<i>Rochan, Deepana, Krumigna, Yakurit uttejaka, Anulomak</i>	<i>Aruchi, Agnimandya, Shoola, Adhaman, Gulma, Arsha, Krimiroga</i>
<b>Circulatory system</b>	<i>Uttejaka, Raktashodhaka, Sothaharah</i>	<i>Hridyadaurbalya, Shotha, Raktavikara</i>
<b>Respiratory system</b>	<i>Kaphaghna, shvashhar</i>	<i>Kasa, Shavasa, Hikka</i>

<b>Reproductive system</b>	<i>Aartavajanan and Vajikaran</i>	<i>Rajorodha, Kasthaartava, Dhvajabhanga</i>
<b>Urinary system</b>	<i>Mutrajanan</i>	<i>Pooyaameha, Mootrakricha</i>
<b>Skin</b>	<i>Kusthaghna</i>	<i>Twakvikara, Kushta</i>
<b>Temperature</b>	<i>Jwarahgna</i>	<i>Jwara</i>

**Doses:** 1-3gm in powder form.<sup>[5]</sup>

**Table 5: Therapeutic uses according to Part Used**

<b>Part Used</b>	<b>Uses</b>
<b>Rhizome</b> [1,30,31]	1. Have aromatic, stomachic, carminative, stimulant, cooling and diuretic properties.
	2. Powder is used for culinary purposes because of its unique smell.
	3. Rhizomes are chewed to soothe cough.
<b>Tuber</b> [2,4]	1. Source of <i>Shoti</i> starch used as a substitute of arrowroot.
	2. Fresh juice is given to children for worm infestation.
<b>Root</b> [4,31]	1. Contain camphoraceous smell and have cooling, diuretic properties.
	2. Fresh root effectively regulates the discharge in case of leucorrhoea and gonorrhoea.
	3. Gives relief in flatulence, dyspepsia.
	4. Used as a tonic for the heart and brain.
<b>Leaves</b> [4,31]	1. Juice is given for treating dropsy.
	2. Used in cosmetics to treat chronic skin diseases.
<b>Whole plant</b> [4,32,33,34]	1. Have stimulant, carminative, expectorant, demulcent, diuretic and rubefacient properties.
	2. It tones the uterus and acts as an aphrodisiac.
	3. Used as anti-venom for the Indian cobra.
	4. Used in juice form to treat urinary tract infections.
	5. Used to improve digestion and liver function.
	6. Helps to regulate menstruation.

**Table 6 : Traditional uses by Locals**

<b>Part Used</b>	<b>Form</b>	<b>Traditional uses</b>	<b>Route of Administration</b>	<b>Reference</b>
Rhizome	Decoction	Beneficial in cold when taken with cinnamon, black pepper and honey.	Orally	[1]
Fresh Rhizome	Decoction	Used as a blood purifier	Orally	[2]
Fresh Rhizome	Juice	Rubbed in mother's milk and given to infants suffering from diarrhea due to teething or exposure to cold.	Orally	[2]
Fresh Rhizome	Whole	Chewed to correct a sticky taste in mouth and cleaning the throat especially by the singers.	Orally	[4]
Tuber	Starch	Source of <i>Shoti</i> starch which resembles closely to arrowroot starch and is used as a baby food and convalescents, especially those recovering from chronic stomatitis.	Orally	[2]

Leaf	Paste	Used as plasters in lymphangitis, boils	Local	[35]
Fresh Root	Decoction	Treatment of leucorrhea discharge	Local	[36]
Leaf	Juice	Used in treatment of dropsy	Oral	[4]

**Formulations** [3,5]

- *Kachuradi churnam*
- *Kachuradi lepa*
- *Chandraprabhavati* (as a substitute of *Shati*)
- *Sutshekhar rasa*
- *Karpuradyarka*

**Substitute**

- It is used as a substitute of Arrowroot.[39]
- In Ayurveda texts, it is used as a *Pratinidhi dravya* (substitute) of *Shati* (*Hedychium spicatum* Buch-Ham).[16]

**Toxic Effect**

- **Cardiovascular disorders** – Overdose of *C. zedoaria* extract may cause Hypotension and Bradycardia.[40]
- **Toxic effect on rats and chicks** – A flour from rhizomes of *C. zedoaria* was prepared in which most of the protein was retained. In comparison to approximately 10g/kg crude protein (nitrogen ¥6.25) content of commercial *C. zedoaria* flour, crude protein content in this product was 155g/kg. When given at 320g/kg diet, this high-protein flour caused 100% mortality within six days in 5-week-old rats and thus proved to be highly toxic. A meal of minced and dried fresh rhizomes of *C. zedoaria* was given to weanling rats at 400g/kg diet, causing rapid weight loss in all rats with death of two of the five rats within 4 days. At 100 and 200g/kg diet, this same *C. zedoaria* meal was given to one-day-old chicks. Though, all the chicks survived the test period of 20 days, but there was a decrease in their body weight, food intake and efficiency of food conversion with increase in the level of *C. zedoaria* meal in the diet.[41]

**Table 7: Pharmacognostical Properties** [5]

<b>Macroscopic</b>	i) Kachur is 2 to 6cm long, cylindrical with transversely cut pieces up to 2 to 3.5cm in diameter.
	ii) Its surface is rough due to longitudinal wrinkles and occasional protuberances.
	iii) Have distinct nodes and internodes with few pieces bearing thin root and root scars at places.
	iv) External color is greyish-buff and internal cream with camphoraceous odor and slightly bitter taste.
<b>Microscopic</b>	i) It shows a thin zone of cork which is composed of 4 to 7 layers of thin-walled, tangentially elongated, rectangular cells.
	ii) Ground tissue consists of thin walled, circular, oval or polygonal, parenchymatous cells which is mostly filled with simple starch grains but some cells also contain yellow oleo-resin.
	iii) Stellar region is demarked from cortex by somewhat collapsed cells of endodermis and consists of rounded and oval to polygonal cells mostly filled with starch grains but some have yellow masses of oleo-resin also.
	iv) Vascular bundles are closed and collateral, found in the form of a ring in the cortical and the stellar region, just below endodermis and consists of a few xylem and phloem elements.
	v) Number of vessels in each bundle varies from 2 to 10.
	vi) Starch grains are round to oval in shape and numerous in number.
	vii) Powder – It is greyish-yellow in color and aromatic; shows fragments of cork and oleo-resin cells, contain abundant starch grains measuring 20 to 70µ in length and 15 to 35 µ in width.
	i) Foreign matter - Not more than 2%
	ii) Total Ash - Not more than 7%

<b>Physical constants</b>	iii) Acid-insoluble ash - Not more than 2% iv) Alcohol-soluble extractive - Not less than 4% v) Water-soluble extractive - Not less than 10% vi) Volatile oil - Not less than 2%
<b>Thin Layer Chromatography</b>	T.L.C. of alcoholic extract on Silica gel 'G' plate using Toluene Ethylacetate (93:7) v/v shows under U.V. (366nm) five fluorescent zones at Rf. 0.25, 0.47, 0.76 (all light blue), 0.83 (blue) and 0.97 (light blue). On exposure to Iodine vapors eight spots appear at Rf. 0.25, 0.34, 0.47, 0.58, 0.67, 0.76, 0.83 and 0.97 (all yellow). On spraying with Vanillin Sulphuric acid reagent and heating the plate for ten minutes at 110°C eight spots appear at Rf. 0.25 (violet), 0.34 (light violet), 0.47 (violet), 0.58 (violet), 0.67 (light brown), 0.76 (bluish grey), 0.83 (violet) and 0.97 (light brown).

## Pharmacological Properties

### Anti-microbial and Anti-fungal activity

On testing the antimicrobial activity of extracts of *C. zedoaria* tuber by using the agar well diffusion and broth dilution methods against six bacterial and two fungal strains it is found that petroleum ether, hexane, chloroform, acetone and ethanol extracts exhibited antibacterial as well as antifungal activity.<sup>[40]</sup>

Alcoholic extract of fresh rhizomes of the plant showed anti-fungal activity against *Candida albicans* and also against the strains of fungi which are resistant to the anti-fungal such as Amphotericin B and Ketoconazole.<sup>[41]</sup>

### Anti-mutagenic activity

*C. zedoaria* was studied by using the Salmonella/microsomal system in the presence of picronic acid or benzo[a]pyrene for its antimutagenic activity and it found to possess moderate activity against benzo[a]pyrene.<sup>[42]</sup>

### Anti-inflammatory activity

At a dose of 1µmol application, Curzenone and Dehydrocurdione compounds obtained from methanolic extract of the *C. zedoaria* rhizome suppressed 12-Otetradecanoylphorbol-13-acetate (TPA) by 75% and 53% respectively and thus showed promising anti-inflammatory activity.<sup>[15]</sup>

### Platelet activating activity

Freeze-dried form of aqueous extract of *C. zedoaria* was studied using a radio-ligand and found to inhibit 50.60% platelet activating factor binding to rabbit platelets at a concentration of 200 µg/ml.<sup>[43]</sup>

### Hepatoprotective activity

Sesquiterpenes and curcumin isolated from 80% aqueous acetone extract of *C. zedoaria* rhizome showed hepatoprotective effect against D-galactosamine/lipopolysaccharide induced acute liver injury in mice.<sup>[14]</sup>

As proliferation of hMF (Human hepatic myofibroblast cells) is known to be centre for the development of fibrosis during liver injury, water extract of *C. zedoaria* rhizome was evaluated for its anti-proliferative effect on the growth inhibition of

hMF. It markedly reduced serum-driven cell proliferation which was assessed by nuclear autoradiography experiments and measurement of actual cell growth. Thus, anti-proliferative and antifibrogenic effects shown by *C. zedoaria* toward hMF indicates that it can be used for therapeutic purpose in chronic liver disease.<sup>[44]</sup>

### Anti-ulcerogenic activity

The root powder of *C. zedoaria* at a dose level of 200mg/kg significantly reduced the gastric pH, free acid, total acid and ulcer index in pyloric-ligated rats and the results were comparable to that of standard drug omeprazole (30mg/kg, i.p.).<sup>[45]</sup>

### Anti-cancer activity

Intake of water extract of *C. zedoaria* at doses of 250 and 500mg/kg from 14 days before tumour inoculation for 42 days extended the life span by significantly reducing the number of metastatic surface nodules in the lung. This showed the inhibitory effect of water extract of *C. zedoaria* on experimental pulmonary metastasis of B16 melanoma cells.<sup>[46]</sup>

### Anti-oxidant activity

The ethanolic, ethyl and water extracts of *C. zedoaria* showed promising antioxidant activity. The essential oil of *C. zedoaria* was moderate to good in anti-oxidant activity on 1, 1-diphenyl-2-picrylhy-drazyl radical at 20mg/ml.<sup>[47]</sup>

### Anti-nociceptive activity

Using the acetic acid-induced abdominal constriction model in mice, the dichloromethane extracts from root, mother rhizome and rugous rhizome of *C. zedoaria* were collected in different seasons for studying its antinociceptive activity. At doses of 10mg/kg, the extracts obtained in autumn and winter season from mother rhizome caused considerable antinociceptive activity intraperitoneally inhibiting 91.1 and 93.4% of the abdominal constrictions, respectively. Also, curcumenol and dihydrocurdione compounds of *C. zedoaria* caused inhibitions of 64.0 and 46.0%, respectively, thus confirming that both compounds contribute towards antinociceptive and analgesic activity.<sup>[48]</sup>

### Anti-allergic activity

The 80% aqueous acetone extract of zedoaria rhizome cultivated in Thailand was found to inhibit the release of beta-hexosaminidase, as a marker of antigen-IgE-mediated degranulation in RBL-2H3 cells and passive cutaneous anaphylaxis reaction in mice. Four curcuminoids (curcumin, dihydrocurcumin, tetrahydrodemethoxycurcumin and tetrahydrobisdemethoxycurcumin) along with two bisabolane-type sesquiterpenes were isolated from the active fraction to study for degranulation. With a 50% inhibitory concentration (IC50) of 5.3mM, curcumin showed the highest activity against beta-hexosaminidase release followed by bisdemethoxycurcumin (IC50 11 mM).<sup>[10]</sup>

### Analgesic activity

From hydroalcoholic extract of rhizomes of *C. zedoaria* grown in Brazil different fractions like dichloromethane, ethyl acetate, methanol and curcumenol were prepared and tested for analgesic activity using several models of pain in mice in which Aspirin and dipyron were used as standard drugs. Curcumenol showed promising analgesic effect as it came out to be several times more potent than the reference drugs when evaluated in the same experimental models. When given by the intraperitoneal route, dichloromethane extract presented a dose-dependent analgesic effect by inhibiting acetic acid induced writhing responses in mice.<sup>[49]</sup>

### Anti-venom activity

On binding of anti-cobra venom antibody to antigen of cobra venom by using the 96-well plate enzyme linked immunosorbent assay (ELISA) method, aqueous extract of *C. zedoaria* showed inhibitory activity by targeting neurotoxin and protein-degrading enzyme present in cobra venom, thus suggesting its anti-venom activity.<sup>[50]</sup>

### Anti-amoebic activity

At a concentration of 1-10mg/ml, alcoholic extract of rhizome of *C. zedoaria* inhibited the growth of entamoebahistolytica.<sup>[51]</sup>

### Larvicidal activity

Essential oil in *C. zedoaria* showed potential larvicidal activity against dengue vector- *Aedes aegypti* mosquito with a 50% and 99% lethal dose (LD50 and LD99, respectively) of 33.45 and 83.39ppm, respectively when compared with standard drug Abate (temephos).<sup>[45]</sup>

### Hemagglutinating activity

By Mg/NP-40 extraction from Curcuma species, Crude protein was obtained which showed significant agglutination activity against rabbit erythrocytes.<sup>[52]</sup>

### Anti-fertility activity

Ethanol extract of *C. zedoaria* showed anti-fertility activity when tested on seminiferous tubule cells of rat testis. A decrease in number of spermatogenic cell layer and mitosis count was observed on administration of white turmeric rhizome with p value<0.05.<sup>[53]</sup>

### Hypotensive activity

*C. zedoaria* showed hypotensive effect when tested on endothelium in hypertensive rats. Captopril was used as standard drug.<sup>[54]</sup>

### Anti-hyperglycemic activity

Antihyperglycemic activity of methanol extract of *C. zedoaria* leaf was reported in dose-dependent manner in glucose-loaded mice. Serum glucose concentration was significantly reduced in mice.<sup>[54]</sup>

### Anti-pyretic activity

Using the Brewers yeast administered fever inducing method, the ethanol extract of white turmeric was studied for its antipyretic effect whose result suggested that extract showed good antipyretic effect.<sup>[57]</sup>

### Cardiotonic activity

Cardioprotective effect was reported of isolated compound of *C. zedoaria*. Isolation of Zingiberene, 1,8 cineole, camphor, camphene and borneol investigation for potent cardiotonic effect was done.<sup>[55]</sup>

### Anti-viral activity

Germacrone and Curcumin were isolated from *C. zedoaria* rhizome to study for antiviral activity against H1N1, HSV-1 and it showed good antiviral potential.<sup>[57]</sup>

### DISCUSSION

In Ayurveda, *Kachur* is considered *Shothahar*, *Vedanasthapana*, *Kusthaghna*, *Rochan*, *Deepan*, *Anuloman krimighna*, *Yakrut uttejaka*, *Kaphaghna*, *Rakta shodhaka*, *Shvashar*, *Aartavajanana*, *Vajikaran* & *Mootrajanana*. Majority of its phytoconstituents contain starch which is seen to be used as a food for babies. Various experiments are conducted to establish its antimicrobial, antifungal, anti-inflammatory, hepatoprotective activity, antioxidant properties. It is used locally in different regions due to its easy availability. Thus, it can be considered as ethnomedicine as it is well practiced for the healing of different body systems. Although, it still requires research in the area of its role as *Shvashar*. In Ayurvedic text it is said to be *Aartvajanana* and *Vajikaran*. Anti-fertility activity was conducted from ethanol extract of *C. zedoaria* on seminiferous tubule cells in rat testis. They have observed decreases in number of spermatogenic cell layer and mitosis count in administration of white turmeric rhizome with p value <0.05. Study has reported rhizome containing

curcumin has good anti-fertility effects in rats. This research is somewhat contradictory to its *Aartavajanana* and *Vajikaran* property.

**Table 8: Evidence based pharmacological actions**

S. No.	Ayurvedic Properties	Modern Properties
1.	<i>Kusthaghna</i>	Anti-fungal
2.	<i>Sothaharah</i>	Anti-inflammatory, anti-allergic, anti-ulcerogenic
3.	<i>Vedanasthapana</i>	Analgesic
4.	<i>Krimighna</i>	Anti-microbial, anti-fungal, larvicidal, insecticidal
5.	<i>Yakrut uttejaka</i>	Hepatoprotective
6.	<i>Rakta shodhaka</i>	Anti-oxidant, platelet activating activity, hemagglutinating activity
7.	<i>Hridayadaurbalya</i>	Cardiotonic activity
8.	<i>Jwarahgna</i>	Antipyretic activity, antiviral activity

## CONCLUSION

The present review article contains collective valuable information on chemical constituents, pharmacology and biological effects of *Curcuma zedoaria* which will be very helpful for researchers and readers. The literary study of *Kachur* according to ayurveda and modern researches concludes that *Kachur* i.e., *Curcuma zedoaria* has following properties according to Ayurveda - *Shothahar*, *Vedanasthapana*, *Kusthaghna*, *Rochan*, *Deepan*, *Anuloman Krimighna*, *Yakrut uttejaka*, *Kaphaghna*, *Rakta shodhaka*, *Shvashar*, *Aartavajanana*, *Vajikaran* and *Mootrajanana* respectively and according to modern it has antimicrobial, antifungal, anti-inflammatory, hepatoprotective activity, antioxidant, anti-cancer, insecticidal, anti-allergic, anti-ulcer, immunomodulatory, wound healing properties. This is the reason it is one of the widely used ethnomedicine. *C. zedoaria* contains complex range of phytoconstituents due to which it has been reported for its diverse biological activities.

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