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EFFECT OF CURCUMA LONGA ON CARRAGEENANS INDUCED RAT

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Abstract: **Curcuma longa L. (Zingiberaceae), commonly known as turmeric, is native to Southwest India. Curcuma longa L. rhizomes being the source of a bright yellow spice with various medicinal applications. It is widely cultivated throughout the regions and similarly used for its valuable medicinal importance, in the cosmetic industry, and as a dye. Here in, the medicinal potentials of this plant this plant shows the important photochemical constituents as well as that of one of its bioactive constituents is curcumin, has been compiled. Turmeric can be regarded as a drug for the management of many diseases, such as cancer, microbial infections, diabetes, arthritic, muscular disorders, biliary disorders, anorexia, cough, diabetic wounds, hepatic disorders, sinusitis and inflammation. Curcumin also displayed various pharmacological activities, anti-inflammatory, antibacterial, antifungal, antidiabetic, anticoagulant, antifertility, cardiovascular, protective ,hepatoprotective, and immunostimulant activities in animals. This research article suggest that how Curcuma longa is effective in a carrageenans induced rat.**

Keywords: **Curcuma longa, medicinal importance, medicinal potentials, cancer, diabetes, arthritic, Curcuma longa.**

1. INTRODUCTION

The genus Curcuma L. (Zingiberaceae) represents a group of perennial rhizomatous herbs native to tropical and subtropical regions. Curcuma is extensively cultivated in tropical and subtropical regions of Asia, Australia, and South America (1). The genus is best known for being an

essential source of coloring and flavoring agents in the Asian countries, traditional medicines, spices, dyes, perfumes, cosmetics, and ornamental plants (2). *Curcuma longa* L. or a Turmeric is a spice that comes from the turmeric plant. It is commonly used in Asian food. Turmeric as the main spice in curry. It has a warm, bitter taste and is frequently used to flavor or color curry powders, mustards, butters, and cheeses. But the root of turmeric is also used widely to make medicine. It contains a yellow-colored chemical called curcumin, which is often used to color foods and cosmetics. Turmeric shows pharmacological importance in pain and inflammation, such as osteoarthritis, osteoporosis & rheumatoid arthritis. It is also used in hay fever, depression, high cholesterol, a type of liver disease, and itching. Some people use turmeric for heartburn, thinking and memory skills, inflammatory bowel disease, stress, and many other conditions (3). Other pharmacological importance like including for treating pneumonia, bronchial complaints, leucorrhea, diarrhea, dysentery, infectious wounds or abscesses, and insect bites (4,5). The rhizome is the most commonly used part of the plant. The main active components of the rhizome are the nonvolatile curcuminoids and the volatile oil (6–7) antioxidant, antineoplastic, antiviral etc.

2. DRUG PROFILE

HISTORY

Turmeric is native to Indonesia and southern India, where it has been harvested for more than 5,000 years. It has served an important role in many traditional cultures throughout the East, including being a revered member of the Ayurvedic pharmacopeia. While Arab traders introduced it into Europe in the 13th century, it has only recently become popular in Western cultures. Much of its recent popularity is owed to the recent research that has highlighted its therapeutic properties. The leading commercial producers of turmeric include India, Indonesia, China, the Philippines, Taiwan, Haiti and Jamaica. (8)

DESCRIPTION

Turmeric was traditionally called *Indian saffron* since its deep yellow-orange color is similar to that of the prized saffron. It has been used throughout history as a condiment, healing remedy and textile dye.

Turmeric comes from the root of the *Curcuma longa* plant and has a tough brown skin and a deep orange flesh. This herb has a very interesting taste and aroma. Its flavor is peppery, warm and bitter while its fragrance is mild yet slightly reminiscent of orange and ginger, to which it is related.To most people in India, from housewives to Himalyan hermits, Turmeric, affectionately called the "kitchen queen", is the main spice of the kitchen.

Botanical Name : Curcuma longa

Family : member of the Ginger family, Zingiberaceae

English Name: Termeric

Hindi: Haldi

Marathi: Halad

Sanskrit: Haridra, Aushadhi, Gouri, and Kanchani

Botany: It is a perennial plant, which grows 60 to 90 cm. in height and has tufted leaves. It is cultivated in India, China, Indonesia and other tropical countries.

LIFE CYCLE OF TURMERIC

CHEMICAL CONSTITUENTS

Turmeric has hundreds of molecular constituents, each with a variety of biological activities. For instance, there are at least 20 molecules that are anti-biotic, 14 that are known cancer preventatives, 12 that are anti-tumor, 12 are anti-inflammatory and there are at least 10 different anti-oxidants. The list goes on and on. Turmeric is a veritable pharmacy in its own right, with literally hundreds of molecules and activities on its shelves. This is also testimony to the use of whole herbs and not just isolated molecules. And speaking of molecules, by far the most researched in Turmeric are three gold-colored alkaloidal Curcuminoids Curcumin, Demethoxy-curcumin, and Bisdemethoxy-curcumin. Most of the research done is with a 95% Curcuminoid extract of Turmeric, though in its raw state Turmeric is only 3-5% Curcuminoids. The rhizome is 70% carbohydrates, 7% protein, 4% minerals, and at least 4% essential oils. It also has vitamins, other alkaloids, and is about 1% resin (9,10,11).

BIOLOGICAL ACTIVITIES TURMERIC:

Members of Zingiberaceae are known for containing terpenoids, flavonoids, phenypropanoids and sesquiterpenes, which have antitumor activities. Some Curcuma essential oils have remarkable antioxidant and antimicrobial activities that is used in pharmaceutical and cosmetic industries. antidiabetic and hypoglycemic, antiobesity, antioxidant, neuroprotective, antiplatelet and antithrombosis, cytotoxic, sedative and anesthetic, antivenom, antibacterial, antifungal, insecticidal, antibacterial antifungal and antiaflatoxigenic mosquitocidal, Larvicidal, Antimicrobial (12,13,14,15).

3. MATERIALS AND METHODS

Extraction of curcuminoids Fresh rhizomes were collected, cleaned, washed with deionsed water, sliced and dried in the sun for one week and again. Dried at 50˚c in a hot air oven for six hours. Dried rhizomes were cut in small pieces, powdered by electronic mill. 6 gm of sample were taken into a thimble and placed in a Soxhlet apparatus, were set up with various solvent from non polar to polar. 250 ml of solvent was added and extracted according to their boiling point for seven hours. The solvents used were chloroform (B.P. =61˚c).ethyl acetate (B.P. =77˚c), methanol (B.P. =65˚c) and acetone (B.P. =56.53˚c). After completion of extraction the dark brown extract was then cooled, concentrated using rotary evaporator get a crude dried extract which was black orange in colour. Each raw sample of turmeric was extracted by the same method and yield was calculated.

ANIMALS

Male female wistar rats (250-300g) were housed in groups of five under standard laboratory conditions of temperature, humidity and light. Animals had a free access to food and water. Each group consisted of six animals. All experiments were carried out during the light period (11-13 h). All the protocols were approved by the Institutional Animal Ethics Committee constituted for the purpose of control and supervision of experimental animals by Ministry of Environment and Forests, Government of India, New Delhi, India.

DRUG

Ethanolic extract of *Curcumin* (100, 200 and 400 mg/kg, p.o.) was dissolved in suspension of gum acacia (2 % w/v) in distilled water. All other chemicals were of analytical grade. Absolute ethanol was given orally with liquid diet in drinking water to make a different % w/v solution. Control animals received corresponding saline solution (0.9%) in all cases. Induction of ethanol dependence, In order to develop dependence, mice were individually housed in small cages (28 ×14 × 14 cm) and provided with a nutritionally balanced control liquid diet on day 0 as their sole nutrient source (600 kcal/l). From day 1 to day 4, ethanol

IN VIVO ANTI-INFLAMMATORY ACTIVITY

Paw oedema was induced on each rat by injecting 0.1 mL of carrageenan on physiological saline to the left hind paw[4].The extracts at different concentrations were administered orally 30 minutes prior to carrageenan administration. Paw volumes were measured at 60, 120, 180 and 240 minutes by mercury displacement method using plethysmograph. The percentage inhibition of paw volume in extract treated groups was compared with control. Diclofenac sodium (5 mg/kg) was used as the standard.

4. RESULT

Sr. no.	Dose (Mg/kg)	Carragenan induced oedema (Volume in ml)			
		60 min	120 min	180 min	240 min
1	5	0.39± 0.18	0.41±0.095	0.47±0.16	0.47±0.20
2	200	0.18± 0.31*	0.15±0.074*	0.13±0.25*	0.13±0.66*
3	300	0.30±0.33*	0.25±0.28*	0.23±0.064*	0.22±0.021*
4	400	0.18±0.47*[a]	0.14±0.54*[a]	0.16±0.24*[a]	0.10±0.73*[a]
5	200	0.27±0.75*[a]	0.23±0.093*[a]	0.22±0.17*[a]	0.17±0.35*
6	300	0.30±0.43*	0.25±0.66*	0.25±0.023*	0.24±0.16*
7	400	0.22±0.33*[a]	0.18±0.45*[a]	0.17±0.33*[a]	0.16±0.055*

Values are expressed in mean ± SEM (n=6); *- P<0.05 with control; a- P<0.05 with standard.

5. DISCUSSION

Inflammation is a common phenomenon and it is a reaction of living tissues towards injury. Steroidal anti-inflammatory agents will lyse and possibly induce the redistribution of lymphocytes, which cause rapid and transient decrease in peripheral blood lymphocyte counts to affect longer term response. The genus Curcuma L. (Zingiberaceae) represents a group of perennial rhizomatous herbs native to tropical and subtropical regions. Phytochemical evaluation of the various extracts of *curcuma l.* reveals the presence of flavonoids, glycosides, saponins, steroids, tannins and polyphenols. Carrageenan induced inflammation is a useful model for the estimation of anti-inflammatory effect. The development of

oedima in the paw of the rat after the injection of Carrageenan is due to the release of histamine, serotonin, prostaglandin. Extract of Curcuma L. showed significant anti inflamatory activity. This significant anti-inflammatory effect may be due to the inhibition of any inflammatory mediators by the glycosides or steroids[9] present in the extract. The present result indicates the efficacy of Curcuma L. as an effective therapeutic agent in the treatment of acute inflammations. The result of present study authentifies Curcuma L. information on the anti-inflammatory property of the extract. Further and detailed studies are in process for the isolation of active constituent responsible for this property and to idendification of the possible mechanism of its anti inflamatory property.

REFERENCES

[1] Ravindran, p.n.; babu, k.n.; shiva, k.n. Botany and crop improvement of tumeric. In turmeric the genus Curcuma; crc press: boca raton, fl, usa, 2007; pp. 15–70.

[2] Akarchariya, n.; sirilun, s.; julsrigival, j.; chansakaowa, s. Chemical profiling and antimicrobial activity of Essential oil from curcuma aeruginosa roxb., curcuma glans k. Larsen & j. Mood and curcuma cf. Xanthorrhiza Roxb. Collected in thailand. Asian pac. J. Trop. Biomed. **2017**, 7, 881–885.

[3] https://www.webmd.com/vitamins/ai/ingredientmono-662/turmeric

[4] Chuakul,w.; boonpleng, a. Ethnomedical uses of thai zingiberaceous plant (1). Thai. J. Phytopharm. **2003**,10, 33–39.

[5] Basaka, s.; sarma, g.c.; rangan, l. Ethnomedical uses of ingiberaceous plants of northeast india. J. Ethnopharmacol. **2010**, 132, 286–296.

[6] Jayaprakasha, G.K.; Jagan, L.; Rao, M.; Sakariah, K.K. Chemistry and biological activity of Curcuma longa.Trend Food Sci. Technol. **2005**, 16, 533–548.

[7] Lobo, R.; Prabhu, K.S.; Shirwaikar, A. Curcuma zedoaria Rosc (white turmeric): A review of its chemical,pharmacological and ethnomedicinal properties. J. Pharm. Pharmacol. **2009**, 61, 13–21.

[8] Abbey M, Noakes M, Belling GB, Nestel PJ. Partial replacement of saturated fatty acids with almonds or walnuts lowers total plasma cholesterol and low-density-lipoprotein cholesterol. Am J Clin Nutr 1994 May;59(5):995-9. 1994. PMID:16240.

[9] Aggarwal B. Paper presented at the U.S. Defense Department's 'Era of Hope' Breast Cancer Research Program meeting in Philadelphia, PA, October 5, 2005,. reported in NUTRAingredients.com/Europe "Turmeric slows breast cancer spread in mice.". 0.

[10] Ahsan H, Parveen N, Khan NU, Hadi SM. Pro-oxidant, anti-oxidant and cleavage activities on DNA of curcumin and its derivatives demethoxycurcumin and bisdemethoxycurcumin. Chem Biol Interact 1999 Jul 1;121(2):161-75. 1999. PMID:7690.

[11] Arbiser JL, Klauber N, Rohan R, et al. Curcumin is an in vivo inhibitor of angiogenesis. Mol Med 1998 Jun;4(6):376-83. 1998. PMID:7540.

[12] Lai, E.Y.C.; Chyau, C.-C.; Mau, J.-L.; Chen, C.-C.; Lai, Y.-J.; Shih, C.-F.; Lin, L.-L. Antimicrobial activity and cytotoxicity of the essential oil of Curcuma zedoaria. Am. J. Chin. Med. **2004**, 32, 281–290.

[13] Lakshmi, S.; Padmaja, G.; Remani, P. Antitumour effects of isocurcumenol isolated from Curcuma zedoaria rhizomes on human and murine cancer cells. Int. J. Med. Chem. **2011**, 1–13.

[14] Nishiyama, T.; Mae, T.; Kishida, H.; Tsukagawa, M.; Mimaki, Y.; Kuroda, M.; Sashida, Y.; Takahashi, K.; Kawada, T.; Nakagawa, K.; et al. Curcuminoids and sesquiterpenoids in turmeric (Curcuma longa L.) suppress an increase in blood glucose level in type 2 diabetic KK-Ay mice. J. Agric. Food Chem. **2005**, 53, 959–963.

[15] Sindhu, S.; Chempakam, B.; Leela, N.K.; Suseela Bhai, R. Chemoprevention by essential oil of turmeric leaves (Curcuma longa L.) on the growth of Aspergillus flavus and aflatoxin production. Food Chem. Toxicol. **2011**, 49, 1188–1192.