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Review Article

An over view of Siddha Medicinal Plant *Cyperus rotundus* (Korai Kizhangu)

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Abstract

Siddha one of the age old medical system, has richest source of medicinal plants. In this present scenario medicinal plants play wide role in treating challengeable diseases. They have specific synergistic pharmacological active principles through which they exhibit considerable activities on human system. Korai kizhangu (*Cyperus rotundus*) which is being used in many Siddha formulations is taken for a short review to ascertain its recent pharmacological actions which are available through online sources.

Pharmacognosy & Chemistry

The C. rotundus have been reported to contain oils, alkaloids, glycosides, saponins, flavonoids, tannins, starch and carbohydrates. It also contains proteins and traces of Mg, Cr, Mn and Co. The rhizome oils of *C. rotundus* from India were reported to have α-copaene (11.4-12.1%), cyperene (8.4-11.7%), valerenal (8.7-9.8%), caryophyllene oxide (7.8-9.7%) and *trans*-pinocarveol (5.2-7.4%), some of which were absent in the species from other countries. The essential oil of *C. rotundus* from Germany, and found the oil to be dominated by cyprotene, α-copaene, cyperene, α-selinene, rotundene, cadalene and nootkatene, among others[1].

Pharmacologicl activities:

Antidiarrhoeal activity

Uddin et al, (2006) observed the anti-diarrhoeal activity of *C.rotundus*. The methanol extract of *C.rotundus* rhizome, given orally at the doses of 250 and 500 mg/kg body weight, showed significant anti-diarrhoeal activity in castor oil induced diarrhoea in mice among the fractions, tested at 250mg/kg, the petroleum ether fraction and residual methano fraction were found to retain the activity, the later being more active as compared to the control. The ethyl acetate fraction did not show any anti-diarrhoeal activity.[2]

Antioxidant property

Natarajan *et al*. (2006) reported the antioxidant activity of C.rotundus and other medicinal plant against free radical induction. A combination of species (piper nigram, piper longum and zingiber officinale), herbs (C.rotundus and plumbago zeylanicam) and salts makes up Amrita bindu . These result reveal that Amrita bindu , a salt –spice-herbal mixture exerts a promising antioxidant potential against free radical induced oxidative damage.[3]

Anti-candida activity

Duarte et al., (2005) reported the anti-candida activity of C.rotundus .[4]

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Anti-Inflammatory bowel disease

Jagtap et al., (2004) observed the effect of polyherbal formulation containing C.rotundus on experimental models of inflammatory bowel disease. The formulation showed significant inhibitory activity against inflammatory bowel disease induced in these experimental animal models. The activity was comparable with the standard drug prednisolone. The results obtained established the efficacy of this poly herbal formulation[5]

Neurotransmission activity

Ha et al. (2002) studied the four sesqui-terpenes, beta-selinene, isocurcumenol, mootkatone and aristolone and one triterpene, oleanolic acid were isolated from the ethyl acetate fraction of the rhizomes of C. rotundus and tested for their ability to modulate gamma- aminobutyric acid (GABA(A)-benzodiazepine receptor function by radio-ligand binding assays using rat cerebro cortical membranes. Among these compounds, only isocurunenol, one of the newly identified constituents of this plants, was found to inhibit (3H)Ro15-1788 binding and enhance (3H)flunitrazepam binding in the presence of GABA. These results suggest that isocurcunenol may serve as a benzodiazepine receptor agonist and allosterically modulate GABA argic neurotransimission via enhancement of endogenous receptor ligand binding.[6]

Anti-inflammatory activity

Seo et al. (2001) studied that rhizomes of C. rotundus have been used in oriental traditional medicines for the treatment of stomach and bowel disorders, and inflammatory diseases. Nitric oxide and super oxide are important mediators in the pathogenesis inflammatory diseases. This study was undertaken to address whether the methanol extracts of rhizomes of C. rotundus could modulate NO and O^{-2} productions by murine macrophsge cell line, RAW 264.7 cells. The MeOH extract of rhizomes of C. rotundus showed the inhibition of NO production in a dose-dependent manner by RAW 264.7 cells stimulated with interferon-gama plus lipo-polysaccharides. The inhibition of NO production by the extract was due to the suppression of iNOS protein, as well as iNOS mRNA expression, determined by western and northern blotting analysis, respectively. In addition the MeO of O^{2-} by phorbol ester-stimulated RAW 264.7 cells in dose- and time – dependent manners. Collectively, these results suggested that the MeOH extract of rhizomes of *C. rotundus* could be developed as anti-inflammatory candidate for the treatment of inflammatory diseases mediated by overproduction of NO and O^{2-}.[7]

Gupta et al. (1971) performed pharmacological studies to isolate the active constituents from c. rotundus possessing anti inflammatory, antipyretic and analgesic activities.[8]

Cognitive enhancing activity

Hsieh et al. (2000) investigated the ameliorating effects of the cognitive-enhancing Chinese herbs administrated orally for 1 week-panax ginseng (pg), panax notoginseng (PNG), Dioscorea opposite (DO). Gastrodia elata (GF), salvia miltiorrhiza (SM), acorus gramineus (AG), coptis chinensis (CC), Polygonum multiflorum(pm), cyperus rotundus (CR) and psoralea corylifolia(PC)- on the scopolamine(SCOP)- induced amnesia by using passive avoidance task in rats. Often Chinese herbs, only PG, PNG, GE and CC prolonged SCOP-shortened step-through latency (STL). These results revealed that PG, PNG, GE and CC administered orally for 1 week improved the SCOP-induced learning and memory deficit in rats.[9]

Anti-Malarial Activity

Thebtaranonth et al. (1995) performed activity – guided investigation of C.rotendus tubers led to the isolation of pactchoulenone, cariyophyllene-alpha-oxide, 10,12-paraoxycalamene and 4,7-di methyl-1-tetralone. The anti-malarial activity of these compounds are in the range of EC50 $10^{(-4)}$-$10^{(-6)}$ M, with the novel edoperoxide sesquiterpene ,10,12-peroxy calamenene, exhibiting the strongest effect at EC50 2.33 $10^{(-6)}$ M.[10]

Blood Stagnating activity

Xue et al. (1994) built the "blood stagnating" rat model with adrenalin and cold stimulation. Its hemorrhcological character was an increase in the viscosity, thickness of blood and its liability to coagulate. The experimental result showed that AM and TAS could decrease the whole blood specific viscosity, but at the same time increase the plasma specific viscosity. The Qi-regulating drug CR and two blood activating drug LC and PV could improve the hemorrhcological changes in "blood stagnated" rats'. The combination of qi-regulating drugs and blood-activating drugs had more favorable effect.[11]

Analgesic effect

Study on analgesic effect of C.stoloniferus Retz, was reported by VU and Mai (1994). The decocts of rhizomes of C.rotundus and C.stoloniferus and total alkaloids and essential oil

from C. stoloniferus showed analgesic effect in the acetic acid writhing test. The oral LD_{50} of essential oil of C.stoloniferus in mice was 12.1 ml./Kg.[12]

Diuretic effect

Akperoekova and abdullaev (1966) reported the diuretic effect of drug from and galenicals from the roots of cyperus rotundus growing in azerbaidzhan. The chemical composition of dry roots was as follows: alkaloids 0.21-0.24, heart glycosides 0.62-0.74 flavonoids 1.25, polyphenolic compounds 1.62, saccharides before hydrolysis 13.22, saccharides after hydrolysis 14.4, starch 9.2, pectins 3.72, ethereal oils 1.06, lipid compounds 2.98, resins 4.21, total acidity expressed as malic acid3.25% and vitamin c 8.8mg%. The water extract were nontoxic for white mice; the LD50 of the alcohol extract (2:1) was determined as 90g/kg. Both the drug form and galenicals increased diuresis was induced by administration of resins, alkaloids (39.6) polyphenolic compounds, flavonoids and ethereal oils and glycosides (11.6%) list and horhammer (1969-1979).[13]

Estrogenic activity

Indira et al. (1956) reported the occurrence of estrogenic substance in plants. L. estrogenic activity of cyperus rotundus. The oil of c. rotundus exhibits low order estrogenic activity. The hydrocarbon fraction is more active than other fractional distillates, but none of the components was found as active as the oil. The probability of these compounds being proestrogens is indicated by the ratio of systemically active to locally effective concentration. No correlation exists between antibacterial activity and estrogenic potency of the oil and its fraction.[14]

Conclusion:

The above pharmacological activities correlate with the Traditional Siddha literatures. These can be observed by introducing the formulations in general practice by the field of medicine.

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