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Phytochemical and Pharmacological effect of Coccinia indica

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ABSTRACT:
The existing assessment highlights the Pharmacognosy phytochemistry and pharmacological learn about of Coccinia indica. There are many patented formulations derived from Coccinia indica are now allotted increasingly more all over the world. This has given upward thrust to a concomitant amplify in research on the phytochemical ingredients and organic activity of Coccinia indica. It is belongs to Cucurbitaceae family and it's widely used for hypoglycemic and antidiabetic things to do in ayurvedic system of medicine. Mainly in its fruit had wealthy value of antidiabetic properties comparatively other parts of plant of coccinia Indica, but the complete plant of Coccinia indica having pharmacological activities like analgesic, antipyretic, antiinflammatory, antimicrobial, antiulcer, antidiabetic, antioxidant, hypoglycemic, hepatoprotective, antimalarial, antidyslipidemic, anticancer, antitussive, mutagenic. The reason of evaluate on particular plant is many typical drug treatments in use are received from medicinal plants, minerals and organic matter. During the previous a number of years, there has been growing pastime amongst the makes use of of various medicinal plants from the normal device of medicinal drug for the cure of distinctive ailments. Coccinia indica has been used in standard medication as a household treatment for a number of diseases.

Keywords:Coccinia Indica; Phytochemistry; Pharmacology; hypoglycemic; antiulcer; antidiabetic; antioxidant;household remedy.

I. INTRODUCTION:

A great majority of the population, in particular these residing in rural areas depends generally on medicinal vegetation for cure of diseases. There are about 7000 plant species found in India.[1] The WHO estimates that about about 80-85 p.c of the populace residing in the developing countries relies almost on ordinary remedy for their predominant health care needs. Plants have played a enormous role in retaining human fitness and improving the fine of human life. Coccinia indica [2] (syn. Coccinia grandis, Coccinia cordifolia, Cephalandra indica) belonging to family Cucurbitaceae, Generally recognised asivy gourd/little gourd in English or kundru/kanduri in Hindi, and kovaangai in Tamil. It is indigenous to Tamilnadu and other parts of India. Coccinia indica grows plentifully all over India and at some point of the oriental countries. The plant has additionally been used widely in Ayurveda and Unani practice in the Indian subcontinent.These present evaluations impart requisite facts on Coccinia indica with recognize to its morphological characters, chemical material and pharmacological activity.[3]

Figure 1: Coccinia indica fruits

Coccinia Indica Wight & Arn:

A. Synonyms:

Cephalandra, Physedra, Staphylosyce

B. Scientific Classification:

Kingdom: Plantae Order: Cucurbitales Family: Cucurbitaceae
Sub family: Cucurbitoideae Tribe: Benincaseae
Sub tribe: Benincasinae Genus: Coccinia Wight & Arn**.** Species: Coccinia indica. [13]

The cucurbits are characterised by having 5-angled stem and coiled tendrils. The leaves are alternate and generally palmately 5-lobed or divided except stipules. The flower is actinomorphic and dioecious. The calyx bears 3-6 lobes and a 3-6 lobed sympetalous corolla is found. The androecium is noticeably variable, consisting of basically 5 awesome to definitely connate stamens that are twisted, folded or reduced in

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number. The gynoecium consists of a single compound pistil of 2-5 carpels. Generally with one style and many fashion branches. The ovary is inferior with one locule and generally severa ovules. The fruit is a type of berry called pepo.

Plant Part	Constituent Reported
Roots	Triterpenoid, saponin coccinioside – k(i). $C_{41}H_{66}O_{12.}$
	Flavonoid glycoside ombuin 3-o- arabinofuranoside.
	3- o- β- (α-l- arabinopyranosyl)-(1→2) –β-d-glucopyranosyl- (1→3)- β-hydroxylup – 20(29)- en-28- oic acid.
	Lupeol, β-amyrin, and β- sitosterol.
	Stigmast -7- en-3-one,
Fruits	Taraxerone, taraxerol, and (24R)-24- ethylcholest- 5- en- 3β- ol glucoside.
	B- carotene, lycopene, cryptoxanthin, and apo- 6'- lycopenal
	B-sitosterol and taraxerol
Aerial parts	Heptacosane
	Cephalandrol, C29H58O tritriacontane C33H68 B- sitosterol alkaloids Cephalandrine a and Cephalandrine b.
Whole plant	Aspartic acid, Glutamic Acid, Asparagine, Tyrosine, Histidine, Phenylalanine And Threonine Valine Arginine

Table 1: Phytochemical review of plant Coccinia indica [14-26]

Name of Variety	Synonym
Coccinia abyssinica (Lam.) Cogn.	Bryonia abyssinica Lam
Coccinia adoensis (A. Rich.) Cogn.	Coccinia parvifolia Cogn., Coccinia pubescens (Sond.) Eyles, Momordica adoensis A. Rich
Coccinia grandis (L.) J. Voigt	Coccinia cordifolia Wight, Coccinia indica, Coccinia cordifolia, Cephalandra indica, Bryonia cordifolia, Coccinia grandis (L.) Voig
Coccinia palmata (Sond.) Cogn.	Cephalandra palmata E. Mey. ex Sond.

Table 2: Different Variety of Coccinia.[3]

Nutrient	g/mg
Water	93.5 g
Protein	1.2g
Energy	75 KJ (18kCal)
Fibre	1.6 g
Carbohydrate	3.1 g
Fat	0.1 g
Fe	1.4 mg
Thiamin	0.07 mg
Ascorbic Acid	1.4 mg
Riboflavin	0.08 mg
Ca	40 mg
Niacin	0.7 mg

Table 3: Essential Nutrients

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Sr.No	Part(s) of Plants	Chemical constituent
1	Roots	Flavonoid glycoside ombuin 3-oarabinofuranoside Triterpenoid, saponin coccinioside - k (i). C41H66O12 ; Stigmast-7-en-3-one Lupeol, β- amyrin and β- sitosterol.
2	Aerial Parts	Heptacosane Cephalandrol, C29H58O tritriacontane C33H68 β-sitosterol alkaloids Cephalandrine a and Cephalandrine b.
3	Leaves & Stem	β- Sitosterol, Cephalandrol, Cephalandrine A & B, Heptacosane.
4	Fruits	Taraxerone, taraxerol, and (24R)-24- ethylcholest- 5- en- 3β- ol glucoside. β- Carotene, lycopene, cryptoxanthin, and apo- 6'-lycopenal. β- sitosterol and taraxerol
5	Whole Plant	Aspartic acid, Glutamic Acid, Asparagine, Tyrosine, Histidine, Phenylalanine and Threonine Valine Arginine

Table 4: List of Plant parts & Respective Phytochemical Constitutes.[3]

Sr.No	Activity	Model	Plant Part
1	Antidiabetic activity [9]	Alloxan diabetic albino rats	95% ethanolic extracts of root
2	Antidiabetic activity [9]	Streptozotocin included diabetic rats	n-hexane extract of leaves & Stem
3	Antidiabetic activity [7]	Normal and streptozotocin (STZ) diabetic rats.	Leaves
4	Hypoglycemic activity [11]	Normal rats	Pectin isolated from the fruit
5	Antidiabetic activity [8]	Dog	Dried extract of Whole plant
6	Antioxidant activity [12]	Streptozotocin- diabetic rats	Ethanolic extract of leaves
7	Anti-inflammatory activity [10]	Carrageenin and histamine induced paw edema	fruit juice powder
8	Analgesic activity [10]	Tail flick model in rats	Aqueous extract of fresh leaves
9	Hepatoprotective activitiy [12]	CCL4 induced hepatotoxicity in rats	Ethanolic extract of fruits
10	Antituberculosis activity [12]	Experimental tuberculosis in Guinea pigs	Extract of fruits

Table 5: Pharmacological review of plant Coccinia indica.

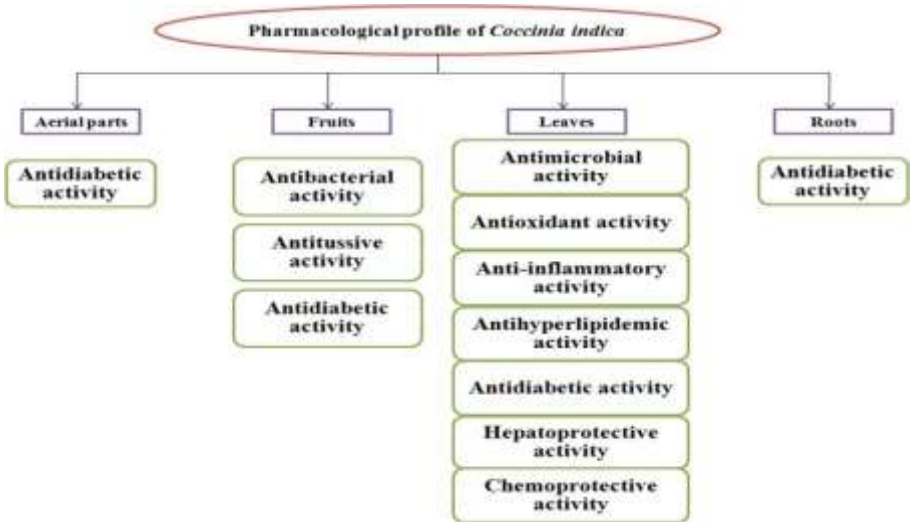

Figure 2: Pharmacological profile of various parts of Coccinia indica. [5]

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Anti-stress and free radical scavenging activity :

The 50% methanolic extract of entire plant of coccinia indica confirmed robust free radical scavenging recreation almost equal as that of Ginseng. The LD50 of 50% ethanolic extract of coccinia indica was 3163.28 mg/kg of body weight on oral administration4. The present study affords scientific help for the anti-stress and free radical scavenging exercise of coccinia indica extract.

Anti-hyperglycemic and hypolipidemic effect :

Coccinia Indica was once identified to be wealthy in β- carotene, a important precursor of vitamin A from plant sources. β-Carotene is a true supply of protein, fiber and moderate source of calcium. This plant has the greater efficiency of lowering serum triglycerides.

Anti – ulcer and anti-oxidant effect:

The effect of leaves powder extracted with water andmethanol was tested on aspirin induced gastric model in wistar rats. The leaf powder of plants showed extensive dose related decrease in ulcer with significant increase in mucous discharge and decrease in level of lipid peroxidation and superoxide dismutase activity.8 Methanol extract at a comparable dose to that of the powder also showed a significant decline in ulcer with important changes in mucous secretion, lipid peroxidation and superoxide dismutase.

Anti- microbial activity :

Anti-microbial exercise of eight extraordinary solvent extracts (petroleum ether, diethyl ether, chloroform, ethyl acetate, acetone, methanol, ethanol, aqueous extracts) of fruit of plant was tested towards six gram negative and gram superb bacteria. Petroleum ether extract used to be the most lively and showed big anti- bacterial activity against all examined gram fine and gram poor micro organism producing a maximum inhibition sector of 90mm against staphylococcus auerus. Other examined extracts also inhibited the boom of a number of test organisms but to a lesser extent and were lively against the gram- wonderful s. aureus11. The study also revealed that methanol extract was found to be active in opposition to Bacillus cereus and pseudomonas putida producing inhibition zones of 15 and thirteen mm respectively.

Larvicidal activity :

Leaf extracts of plant is fine against malaraial parasites. Plants are recognised to exert antiplasmodial activity either by means of causing RBC oxidation or by using inhibiting protein synthesis depending on their phytochemical materials.[4]

Figure 3: Coccinia indica Leaves

II. CONCLUSION :

Coccinia indica is a famous plant for its safe anti-diabetic property. It proved the insulin stimulatory effect of coccinia indica leaves from existing β- cells in diabetic rats. It possesses hypoglycemic, antidiabetic, hypolipidemic, hepatoprotective, larvicidal, anti- inflammatory, analgesics and antipyretic activities. It is found to be devoid of antituberculosis properties. Various phytoconstituents said are cephalandrol, triacontane, luperol, taraxerol etc. Terpenoids are observed to be accountable for antidiabetic activity. Despite the broad use of coccinia indica in traditional medicine, very few systematic pharmacological and phytochemical research are mentioned till date assessing its therapeutic properties.

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