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LITERATURE REVIEW ON COCCINIA INDICA

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Abstract

The present study was based on the literature review on Coccinia Indica. Crude extracts of Coccinia Indica from different fractions of leaf, fruit, stem, roots was found to have biological activities. This traditional medicine has been used for the treatment of various diseases as anti-inflammatory, anti pyretic and analgesics. Anti-stress and free radical scavenging activity substantiates the traditional claims for the usage of coccinia indica in stress induced disorders. Coccinia Indica was found to have antihyperglycemic, hypolipidemic effect, anti-ulcer and anti-oxidant effect, anti-microbial activity, larvicidal activity anti-bacterial activity, antidyslipidemic activity. Thus, we can conclude that this medicinal plant is of great economical value all over the world.

Key Words: Anti-stress and free radical scavenging activity, Coccinia Indica.

Introduction

The use of plants and plant products as medicines could be traced as far back as the beginning of human civilization. Medicinal plants are a source of great economic value all over the world. Nature has bestowed on us a very rich botanical wealth and large number of diverse types of plants grown in different parts of the country.¹(Table:1).

Table-1: Taxonomical studies.

Kingdom	Plantae
Order	Cucurbitales

Family	Cucurbitaceae
Genus	Coccinia
Species	Coccinia indica

According to the WHO 1998, the macroscopic and microscopic description of a medicinal plant is the first step towards establishing the identity and degree of purity of such materials and should be carried out before any test are undertaken.² The rich knowledge of countries like India in medicinal plants and healthcare has lead to the keen interest by pharmaceutical companies. Several plants are used in India in the form of crude extracts with scientific evidence of efficacy.(Fig:1).



Fig-1: Coccinia Indica

Pharmacological Actions of Coccinia Indica

The aqueous extracts of fresh leaves was effective against carrageenin- induced paw oedema in wistar rats and swiss mice.The effect was equivalent to diclofenac 20mg/kg at 50mg/kg but it is significantly pronounced at high doses. Antipyretic reduction in hyperphyrexia was observed with all doses of extract with maximum effect at 300mg/kg comparable to paracetamol.³ The extract produced marked analgesic activity comparable to morphine which suggest the involvement of central nervous system. Fractionation of bioactive crude ethanolic extracts led to isolation of three pure fractions from which one was characterized as 4- hydroxyl 3- methoxy benzaldehyde by IR, H- NMR, C-NMR, DEPT, HSQC and mass spectral analysis. The isolated constituents was found to be

significantly active in above mentioned animal models suggesting it to be one of the bioactive constituents.(Fig:2)(Table:2).

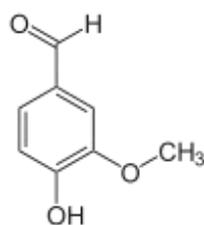


Fig-2: Vanillin.

Table-2: Activities of various parts of coccinia Indica.

Plant part	Medicinal uses
Leaf	- Antidiabetic, oxidant, larvicidal, GI disturbances, Cooling effect to the eye, hypolipidemic, skin diseases, urinary tract infection. Gonorrhoea
Fruit	-Hypoglycemic, analgesic, antipyretic, Hepatoprotective, tuberculosis, eczema. anti-inflammatory
Stem	- Expectorant, antispasmodic, asthma, bronchitis, GIT disturbances, urinary tract infection, skin diseases
Root	- Hypoglycemic, antidiabetic, skin diseases, removes pain in joint, urinary tract infection

Anti-stress and free radical scavenging activity

The 50% methanolic extract of whole plant of coccinia indica showed strong free radical scavenging activity almost same 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 provides scientific support for the anti-stress and free radical scavenging activity of coccinia indica extracts.

Anti-hyperglycemic and hypolipidemic effect

Coccinia Indica was identified to be rich in β - carotene, a major precursor of vitaminA from plant sources. β - carotene is a good source of protein, fibre and moderate source of calcium.⁵ This plant has the higher efficiency of lowering serum triglycerides.⁶

Anti - ulcer and anti-oxidant effect

The effect of leaves powder extracted with water and methanol was tested on aspirin induced gastric model in wistar rats⁷. 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 activity of eight different solvent extracts(petroleum ether, diethyl ether, chloroform, ethyl acetate, acetone, methanol, ethanol, aqueous extracts) of fruit of plant was tested against six gram negative and gram positive bacteria⁹. Petroleum ether extract was the most active and showed considerable anti- bacterial activity against all tested gram positive and gram negative bacteria producing a maximum inhibition zone of 90mm against staphylococcus aureus¹⁰. Other tested extracts also inhibited the growth of a number of test organisms but to a lesser extent and were active against the gram- positive s. aureus¹¹. The study also revealed that methanol extract was found to be active against Bacillus cereus and pseudomonas putida producing an inhibition zones of 15 and 13 mm respectively¹².

Larvicidal activity

Leaf extracts of plant is effective against malarial parasites. Plants are known to exert antiparasitic activity either by causing RBC oxidation or by inhibiting protein synthesis depending on their phytochemical constituents.¹³

Antidyslipidemic activity of polyphenol from coccinia indica

Ethanol extract of coccinia indica showed significant triglyceride (TG) and cholesterol lowering effects in dyslipidemic hamster model¹⁴. Ethanolic extract was fractionated into chloroform, n-butanol and water soluble fractions and were evaluated. Activity was provided to be concentrated in chloroform- soluble fraction¹⁵.

This fraction was subjected to frequency column chromatography prepared and polyphenol characterized as 60-polyphenol was isolated. It significantly decreased serum triglyceride, total cholesterol and glycerol. Based on these investigations, it was concluded that the compound polyphenol secluded from leaves of coccinia indica acquired marked antidyslipidemic activity.

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 possess hypoglycemic, antidiabetic, hypolipidemic, hepatoprotective, larvicidal, anti-inflammatory, analgesics and antipyretic activities. It is found to be devoid of anti-tuberculosis properties. Various phytoconstituents reported are cephalandrol, triacontane, luperol, taraxerol etc. Terpenoids are found to be responsible for anti-diabetic activity. Despite the broad use of coccinia indica in traditional medicine, very few systematic pharmacological and phytochemical studies are reported till date assessing its therapeutic properties.

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