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Pharmacological Study on Wild Variety of *Cocciniaindica*

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ABSTRACT

The current investigation dealt with pharmacological study of *Coccinia indica* (wild). For past several years, various medicinal plants were increasingly studied for the treatment of different ailments. The normal variety of *C. indica* was extensively used for home remedies and household purposes. But the wild variety of *C. indica* tastes bitter and showed good pharmacological activity. The current study revealed that ABTS assay was shown more scavenging activity than DPPH assay. The methanol extract of *C. indica* showed effective antioxidant activity than aqueous extract, but the property of anti inflammatory, aqueous extract of showed *C. indica* showed better anti inflammatory activity.

Keywords:*Coccinia indica* (wild), Pharmacology, Antioxidant, Anti Inflammatory, *Invitro*

I. INTRODUCTION

Natural phytochemicals obtained from the various medicinal plants are significant and recognised to have potential management of several human clinical conditions, including cancer. These range from the inhibition of genotoxic effects to increased antioxidants and anti-inflammatory activity, the inhibition of proteases and cell proliferation, protection of intracellular communications to modulate apoptosis and signal transduction pathways **(Nawab *et al.,* 2011)**. Thus the medicinal plants provide a rather useful and safe alternative means for treatment of diseases compared to the harmful synthetic drugs. The wild variety of *C. indica* is effective for its hypoglycemic and antidiabetic properties in Ayurvedic system of medicine. The previous research study was dealt with pharmacological property of *C. india*. But there was a lack of pharmacological investigation on wild variety of *C. india*. So, the current study was focussed to decipher the pharmaceutical activity of *C. india*.

II. METHODS AND MATERIAL

Collection of Plant Materials

The wild variety of *C.indica* was collected from the fields of EV palayam, Karanodai, Thiruvallur District, Tamil nadu. The fruits was washed thrice in running tap water and rinsed with distilled water. The fruits were sliced and shade dried. It was pulverized using an electrical blender and stored in airtight containers for further extraction.

Extraction of plant materials (Harborne, 1984)

The coarse powder of wild variety of *C. indica* were extracted with the aqueous and methanol solvents. The extract was concentrated in a rotary vacuum evaporator to yield crude extract which was used for pharmaceutical activity.

Qualitative phytochemical analysis

The preliminary phytochemical analysis of wild variety of *C. indica* was carried using the standard methods (**Harborne, 1984**)

***In vitro* Antioxidant assays**

The wild variety of *C. indica* was screened for scavenging activity by using assays such as DPPH and ABTS assay to assess the antioxidative property.

DPPHFree radical scavenging assay

The stable radical DPPH was used to measure the free radical scavenging activity according to literature (**Taskin and Bitis, 2016**). The DPPH solution (3.9 mL) was added to both methanol and aqueous extracts of plant and standards (BHT and ascorbic acid) (0.1 mL). After incubating at 25 °C for 30 min, the absorbance of the samples was read at 517 nm against the blank using a spectrophotometer.

ABTS scavenging assay

The ABTS scavenging activity of the extracts and synthetic antioxidant substances were determined in accordance with the literature (**Re *et al.*, 1999**). ABTS (3.96 mL) solution was added plant extracts (0.4 mL). After incubating at 25 °C for 6 min, absorbance of the mixture was recorded at 734 nm against a blank.

***In-vitro* anti-inflammatory activity**

Inhibition of protein denaturation

The reaction mixture (0.5 ml) consisted of 0.45 ml of bovine serum albumin (5% aqueous solution) and 0.05 ml of wild variety of *C. indica* was taken and the pH was adjusted at 6.3 using a small amount of 1N Hydrochloric acid. The samples were incubated at 37°C for 20 min and then heated at 57°C for 3 min. After cooling the sample, 2.5 ml of phosphate buffer solution was added into each test tube. Turbidity was measured spectrophotometrically at 600 nm for control tests, 0.05 ml of distilled water was used instead of extracts while product control tests lacked bovine serum albumin. The percentage inhibition of protein denaturation was calculated as follows [9].

$$\text{Percentage inhibition} = \frac{100 - (\text{O.D. of test} - \text{O.D. of product control}) \times 100}{\text{O.D. of Control}}$$

The Percentage protection from denaturation was calculated by using the formulae and tabulated.

III. RESULTS AND DISCUSSION

Antioxidant activity using crude extract and silver synthesis extract

DPPH Assay

DPPH radical scavenging activity of wild variety of*C. indica* was shown in the **Table-2,** the crude extract showed a concentration–dependent DPPH radical scavenging activity. The percentage inhibition of DPPH at low concentration of *C. indica* in aqueous and methanol were found to be 2.79% and 4.40% respectively. The methanol extract showed the best free radicle scavenging activity than aqueous.The antioxidant activity increased with the increase in the concentration of wild variety of *C. indica*

ABTS Assay

ABTS radical scavenging activity of *C. indica* was carried out in both the methanol and aqueous extract. Both different concentration (20µl, 40µl, 60µl, 80µl and 100µl) of samples were added to the ABTS solution. The percentage inhibition of ABTS for both the extract were revealed in the **Table -3**. The wild variety of *C. indica* showed a concentration–dependent ABTS radical scavenging activity. The methanol extract (24.6%) showed significantly higher free radical scavenging activity than aqueous (18.31%). The higher concentration showed high free radical scavenging in methanol (55.04%) than aqueous extract (45.26%). As a result, the methanol extract of *C. indica* showed best radicle scavenging activity**.** The decrease in absorbance caused by the antioxidants in the extracts might be due to the

hydrogen donating ability resulted in the scavenging of the radical **(Sreejamole and Radhakrishnan, 2016)**. ABTS free radical was relatively unstable radical that can be easily reduced by an antioxidant **(Miller *et al.,* 1993)**. ABTS radical scavenging activity of *C. indica* showed significant free radical scavenging activity. Other studies have compared the two assays, and the antioxidant capacity detected by the ABTS assay has been reported to be significantly higher for a variety of different foods compared to that of the DPPH assay, partially because the highly pigmented and hydrophilic antioxidants are better reflected by the ABTS assay than the DPPH assay (**Kim *et al.*, 2002; Floegel *et al.*, 2011**), suggesting that the ABTS assay may be better than the DPPH assay for detecting antioxidant capacity in a range of different foods.

In-vitro anti-inflammatory activity

Inhibition of protein denaturation

The extracts of *C. indica* were analyzed for its anti inflammatory activity and it is compared with that of the standard Diclofenac sodium. Proteins are denatured using anti-inflammatory activities by egg albumin denaturation assay. Both aqueous and methanol extract of wild variety of *C. indica* inhibited the denaturation of egg albumin. The prevention of albumin denaturation may results in preventing inflammatory conditions. The current study revealed the *in vitro* anti-inflammatory activity for different concentration (50µl, 100µl,150µl, 200µl, 250µl) of *C. indica.* This assay indicates that the percentage inhibition rate of protein denaturation increases with the concentration of sample increases. The present study revealed that the extracts of *C. indica* are effective in inhibiting heat induced albumin denaturation (Table-4)

IV. CONCLUSION

The present study results indicate that aqueous and methanol extracts of wild variety of C. indica possess antioxidant and anti-inflammatory properties. These activities may be due to the strong occurrence of polyphenolic compounds, such as flavonoids, alkaloids, aminoacids, tannins, terpenoids, phenols, and saponins. A detailed research on different pharmacological activities can be carried out such as Hepatoprotective activity, Analgesic activity, and Antipyretic activity in compounds isolated in wild variety of *Coccinia indica*.

Table-1. Preliminary phytochemical study of *Coccinia indica*

Phytoconstituents	Methanol	Aqueous
Alkaloids	+	+
Carbohydrates	-	-
Glycosides	+	+
Aminoacid	+	+
Phenol	+	+
Flavonoid	+	+
Terpenoid	+	+
Steroid	+	+
Saponin	+	+
Tannins	+	+
Gum and Mucilage	+	+

Table-2. Antioxidant Activity for wild variety of *C. indica* using DPPH Assay

S.No	CONCENTRATION (mg/ml)	% OF FREE RADICAL SCAVENGING ACTIVITY	
		METHANOL	AQUEOUS
1	20	31.55	33.33

2	40	40.63	43.77
3	60	49.75	52.45
4	80	57.83	64.53
5	100	69.45	72.68

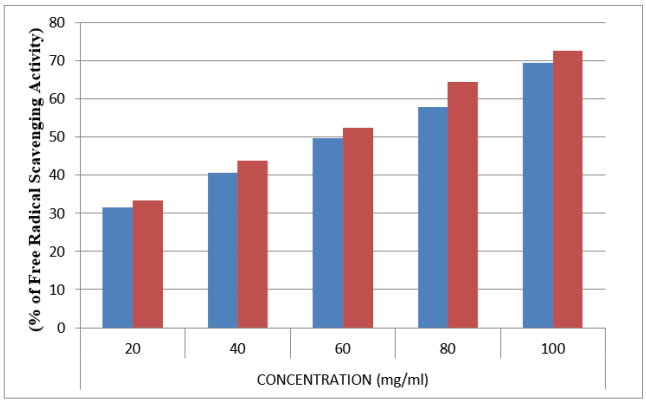

Figure-1. Antioxidant Activity for wild variety of *C. indica* using DPPH Assay

Table-3. Antioxidant Activity for wild variety of *C. indica* using ABTS Assay

S.No	CONCENTRATION (mg/ml)	% OF FREE RADICAL SCAVENGING ACTIVITY	
		METHANOL	AQUEOUS
1	20	33.67	35.77
2	40	42.32	46.33
3	60	53.89	57.45
4	80	66.33	71.95
5	100	77.45	82.33

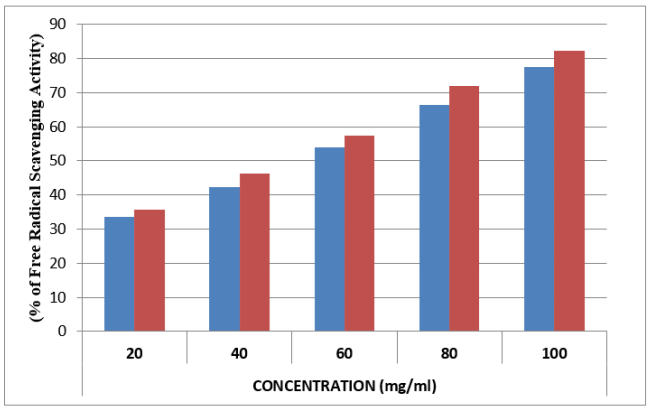

Figure-2. Antioxidant Activity for wild variety of C. indica using ABTS Assay

Table-4. Anti-inflammatory Activity for wild variety of *C. indica* using Egg albumin assay

S.No	CONCENTRATION (µl)	% PROTEIN DENATURATION	
		AQUEOUS	METHANOL
1	Diclofenac Sodium	75.0	75.0
2	50	20.33	22.85
3	100	27.99	29.75
4	150	36.45	41.63
5	200	44.68	49.66
6	250	54.87	58.33

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