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Anti-oxidant potential of *Dendrophthoe trigona* (Wt. and Arn.) Danser.

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Abstract

Dendrophthoe trigona parasitic on *Ficus racemosa* is an important medicinal plant belonging to family Loranthaceae. On the basis of optimization of extraction method, the 70% methanol extract of *D. trigona* contains higher amount of polyphenolics and flavonoids which shows IC_{50} values of 7.82µg/ml in DPPH and 8.7µg/ml in Nitric oxide scavenging activity. Thus, it can become an important natural source of antioxidant phenolics.

Key Words

Polyphenolics, antioxidant potential, Loranthaceae mistletoes, DPPH, Nitric oxide, IC_{50} value.

Introduction

Dendrophthoe trigona parasitic on *Ficus racemosa* is an important medicinal plant belonging to family Loranthaceae. *Dendrophthoe* is a genus of evergreen, shrubby, partial parasites, till recently include under Loranthus, distributed in the tropical and sub-tropical regions of the old world. It comprising some 30 species from tropical Africa to Australia with its center of diversity in W. Malaysia and 7 species of the genus found in India. Plants under genus are reported to have anti-oxidant (Hidalgo, 1994), anti-microbial (Daud, 2005), anticancer (Cerda, 2005), anti-diabetic (Osadebe, 2004) activities. The plant was reported to contain biologically active substances such as flavonoid (e.g. quercetin). However, practically no further progress has been made thereafter in order to establish their biological role. Therefore, this plant is selected for the pharmacological investigation.

Materials and methods

Plant material

The plant material of *Dendrophthoe trigona* (Wt. and Arn.) Danser was collected from Western Ghat region of Maharashtra (16° 41' 60N Latitude and 74° 13' 0E Longitude and 1000m Altitude) in November 2010**.** The plant specimen was authenticated by (Botanical Survey of India, Pune).

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Extraction

Accurately weighed 5 gm of sample of coarsely powdered leaves was macerated with 50 ml of methanol (50% v/v), methanol (70% v/v), methanol (90% v/v), and methanol (100% v/v) separately in a stoppered flask for 24 h with occasional shaking. After 24 h, the extract was filtered and this procedure was repeated twice time more. The extracts were concentrated under reduced pressure on rotary vacuum evaporator and further dried in vacuum dryer and weighed. On the basis of optimization of extraction method, the 70% methanol extract of *D. trigona* contains higher amount of polyphenolics and flavonoids was thus investigated for *in* vitro antioxidant potential.

Antioxidant activity

Determination of DPPH radical scavenging activity: The DPPH (1, 1-diphenyl-2-picryl-hydrazyl) radical scavenging activity of the methanol extract was performed using reported method with some modifications (Blois, 1958). Briefly, to 100 µl of extract (10-100µg/ml) in methanol were added 25µl of DPPH (1 mM in ethanol) and 75 µl of ethanol. Thirty minutes after maintaining at room temperature, the absorbance of reaction mixture was measured at 517 nm using Microtiter Plate Reader (Power Wave XS, Bio-tek, USA). The antioxidant activity of the extract was expressed as IC_{50}.

Determination of nitric oxide radical scavenging activity: The nitric oxide scavenging activity was determined according to method reported (Sreejayan,

1997). Sodium nitroprusside (1 ml, 10 mM) was mixed with 1ml extract (10-100µg/ml) in phosphate buffer (pH 7.4). The mixture was incubated at 25^0C for 150 min. To 1 ml of incubated solution, 1ml of Griess reagent (α-naphthyl-ethylenediamine dihydrochloride 0.1% in water and sulfanilamide 5% in H_3PO_4) was added and absorbance was read at 546 nm. The antioxidant activity of the extract was expressed as IC_{50} value was defined as concentration (in µg/ml) of extracts that inhibits the formation of DPPH radicals by 50 %.

Results and Discussion

The results of antioxidant activity in various *in vitro* models are as shown in Table 1, 2, 3. 70% methanol extract of *D. trigona* contains higher amount of polyphenolics and flavonoids which shows IC_{50} values of 7.82µg/ml in DPPH and 8.7µg/ml in nitric oxide scavenging activity. Thus extract showed significant radical scavenging as well as antioxidant activity comparable to standards.

Conclusion

From the results, it is concluded that *D.trigona* is an important natural source of antioxidant phenolics.

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Table 1: DPPH radical scavenging activity.

Sample	Conc.(µg/ml)	Mean Absorbance ± SEM	% inhibition
Ascorbic acid	10	0.1988 ± 0.0004	53.89%
	20	0.1765 ± 0.0003	59.06%
	40	0.1587 ± 0.0005	63.19%
	60	0.1239 ± 0.0009	71.26%
	80	0.0816 ± 0.004	91.07%
BHT	10	0.1580 ± 0.0003	63.35%
	20	0.142 ± 0.0007	67.06%
	40	0.1163 ± 0.0006	73.02%
	60	0.0669 ± 0.0003	84.48%
	80	0.0456 ± 0.0002	89.42%
D. trigona	10	0.1555 ± 0.0002	63.93%
	25	0.1226 ± 0.0004	71.56%
	50	0.0867 ± 0.0004	79.89%
	100	0.073 ± 0.0004	83.07%

Table 2: Nitric oxide scavenging activity.

Sample	Conc.(µg/ml)	Mean Absorbance ± SEM	% inhibition
Ascorbic acid	10	0.1988 ± 0.0019	56.30%
	20	0.1798 ± 0.0011	61.61%
	40	0.1710 ± 0.0006	65%
	60	0.1593 ± 0.0005	69.5%
	80	0.1386 ± 0.0003	77%
BHT	10	0.1868 ± 0.0003	58.92%
	20	0.1759 ± 0.0004	63.11%
	40	0.1686 ± 0.0005	65.92%
	60	0.1521 ± 0.0005	72.26%
	80	0.1329 ± 0.0002	79.65%
D. trigona	10	0.1906 ± 0.0002	57.46%
	25	0.1704 ± 0.0006	65.23%
	50	0.1611± 0.0005	68.80%
	100	0.151 ± 0.0009	72%

Table 3: DPPH and nitric oxide (NO) radical scavenging activity.

Sr. no.	Sample	IC_{50} value in DPPH (µg/ml)	IC_{50} value in Nitric oxide µg/ml)
1	Ascorbic acid	9.27	8.8
2	BHT	7.89	8.48
3	*D. trigona*	7.82	8.7

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