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Research Article

Studies on Phytochemical Screening and Antioxidant Potential of *Trichodesma indicum*

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ABSTRACT
The current study is focused on investigating the antioxidant effect of *Trichodesma indicum*. The plant leaves were shade dried powdered and extracted serially using solvents of increasing polarity such as hexane, ethyl acetate and methanol. The antioxidant potential of obtained extracts was studied using DPPH assay, phosphomolybdenum assay, metal chelating assay and Hydroxyl Radical Scavenging Assay. The extracts are then subjected to phytochemical screening which showed the presence of flavonoids, terpenoids and tannins in ethyl acetate extract of the plant. Since the results are promising, this work forms a firm base for the further researches to explore the antiproliferative characteristic of the selected plant to discover a potent herbal drug for cancer.

Keywords: *Trichodesma indicum*, DPPH, phosphomolybdenum assay, metal chelating assay and HRSA

INTRODUCTION

Antioxidants are compounds that protect cells against the damaging effects of reactive oxygen species, such as singlet oxygen, superoxide, peroxyl radicals, hydroxyl radicals and peroxynitrite. An imbalance between antioxidants and reactive oxygen species results in oxidative stress, leading to cellular damage linked to cancer and aging.Natural compounds, extracted from plants such as Flavonoids provide protection against cancer (Okuda *et al.*, 1993).*In the present study Trichodesma indicum* selected for the study to screen the anti oxidant a weed distributed in tropical and subtropical regions of Africa, Asia and Australia. (Perianayagam *et al*., 2005, 2006 and 2011).In view of the above said facts, the current study is designed to assess the antioxidant potential of *Trichodesma indicum* using various in vitro assays.

MATERIALS AND METHODS

Shade dried leaves of *Trichodesma indicum* were milled to a fine powder extracted using hexane, ethyl acetate .The extracts were filtered through filter paper and the filtrates concentrated using Condenser (Mokgotho *et al*., 2013).Radical scavenging studies were carried out using Dot plot assay (Rapid screening process) (Jayachitra *et al*., 2012), Hydroxyl radical scavenging assay (Jeetendra *et al*., 2010). and DPPH Radical scavenging assay The inhibition % was calculated using the following formula.Inhibition % = Ac-As/Ac×100 [Where Ac is the absorbance of the control; As is the absorbance of the sample].Hence the Total Antioxidant Capacity is determined by Phosphomolybdenum method (Shyma *et al*., 2013).Since the results were quite compromising hence Phytochemical analysis were studied using standard techniques as mentioned by Tiwari *et al*., (2011).

RESULTS AND DISCUSSIONS

DPPH Radical Scavenging Assay: DPPH radical scavenging activity is one of the most widely used method for screening the antioxidant activity of plant extract. The Table.1 shows the antioxidant activities of the hexane, ethyl acetate and methanol extracts of *Trichodesma indicum.* The IC_{50} values for the hexane, ethyl acetate and methanol extracts were observed to be 171.65, 140.57 and 156.56µg/ml, respectively. Based on the results obtained, the ethyl acetate extract possessed significant radical scavenging potential when compared to the hexane and methanol extracts and hence chosen for further study.

Dot plot assay: The results of dot plot assay as shown in Figure 2 confirmed that the maximum DPPH scavenging activity was possessed by the ethyl acetate extract.

Phosphomolybdenum assay: Total quantitative determination of antioxidant capacity of the sample extracts were evaluated by phosphomolybdenum method. The assay is based on the reduction of Mo (VI) to Mo (V) by the extract and subsequent formation of a green phosphate/Mo (V) complex at acid pH (Shyma *et al*., 2013). The measurement of absorbance of the extract at 695nm showed significant values as represented in Table 2.

Hydroxyl radical scavenging Assay: Hydroxyl radical scavenging activities of the ethyl acetate extract was assayed by generating hydroxyl radicals using ascorbic acid-iron-EDTA (Jeetendra *et al*., 2010). The hydroxyl

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Table 1: Radical scavenging activity of *T. indicum* extracts

S.No	Concentration (µg/ml)	% RSA		
		Hexane	Ethyl acetate	Methanol
1	50	66.29	71.95	70.66
2	100	67.88	75.69	72.95
3	150	69.32	79.60	73.97
4	200	71.07	83.42	79.08
5	250	72.82	88.92	79.84

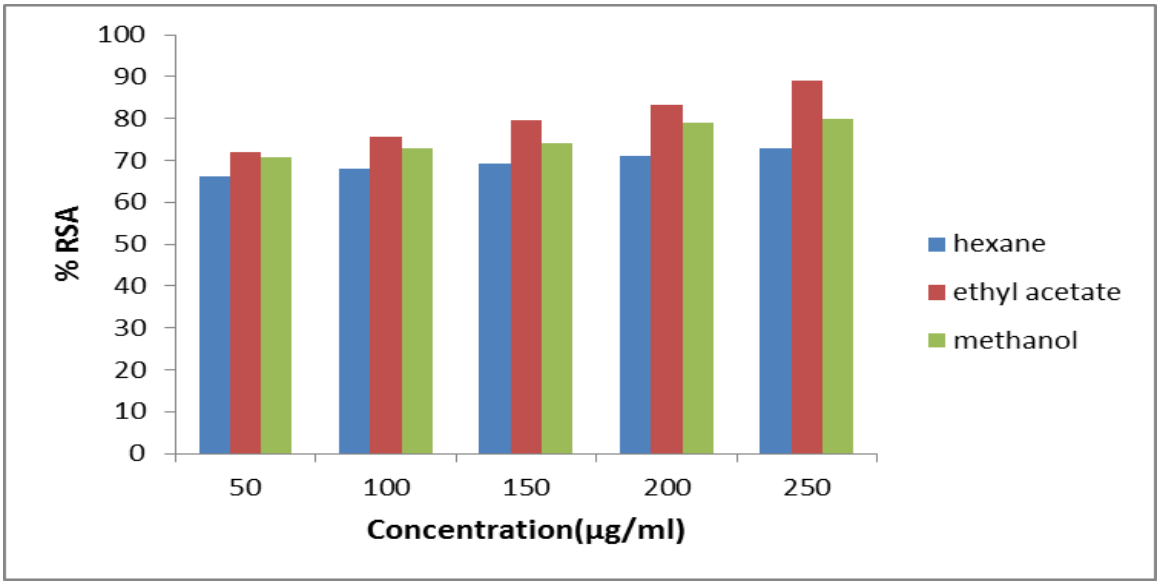

Fig. 1: Radical scavenging activity of T. indicum extracts

Table 2: Phosphomolybdenum activity of *T. indicum*

S.No	Concentration(µg/ml)	% PMA
1	50	0.346
2	100	0.450
3	150	0.542
4	200	0.623
5	250	0.763

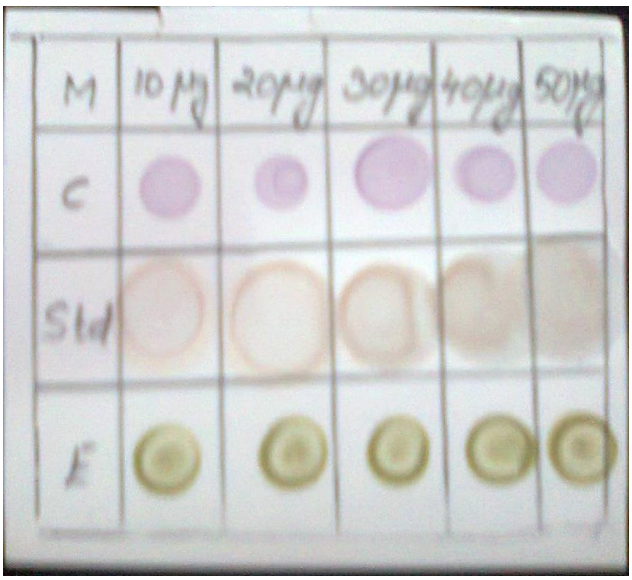

Fig. 2: Dot plot assay

radical formed by the oxidation react with DMSO to yield formaldehyde. The formaldehyde production from DMSO provides a convenient method to detect hydroxyl radicals formed during oxidation of DMSO by Fe^{3+}/ ascorbic acid system which was used to detect hydroxyl radical (Table.3).

Phytochemical Screening: Phytochemical analysis was performed for ethyl acetate extract of *Trichodesma indicum*. The results depicted in Table.4 indicate that ethyl acetate extract showed the presence of phytochemicals viz., flavonoids, phenols, tannins, terpenoids and steroids. Alkaloids and saponins are not contained in the extract.

Quantitative estimation of total phenols and flavonoids: The total phenols and flavonoids were recorded to be 524.72 GAE/g and 277.78 QE/g, respectively (Table.5).

CONCLUSION

The data obtained in the study suggest that the selected plant *Trichodesma indicum* could be considered as a significant source of natural antioxidants.

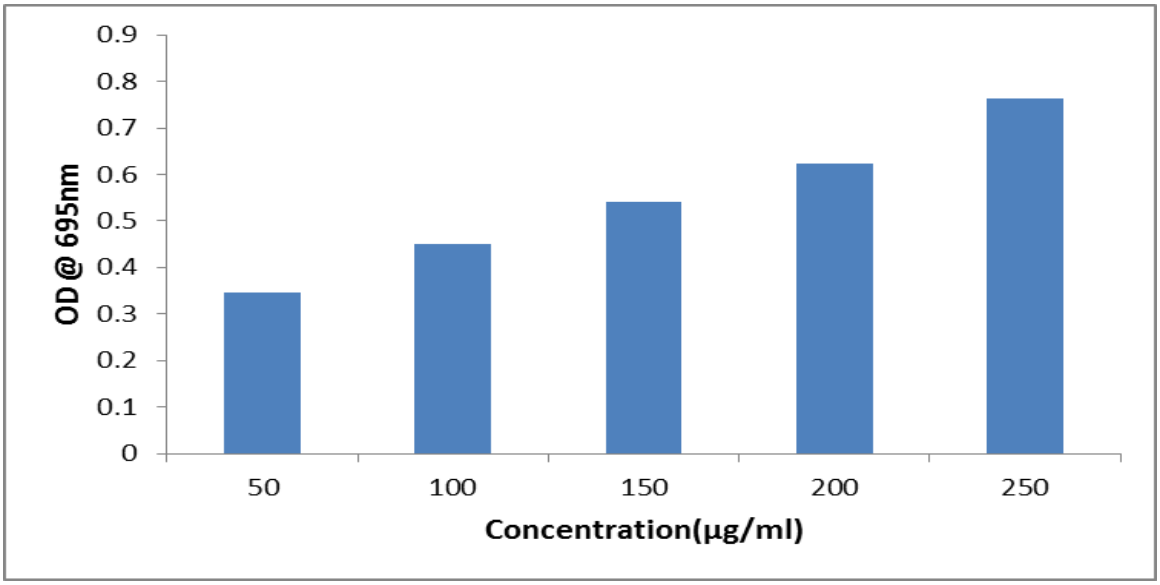

Fig. 3: Phosphomolybdenum activity of ethyl acetate extract of T. indicum

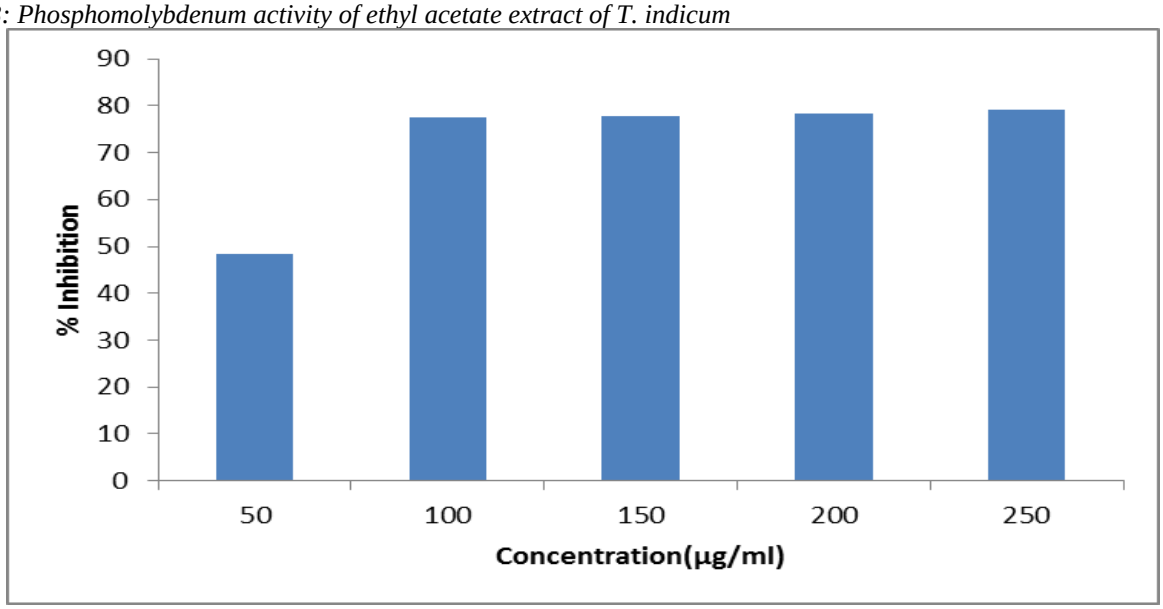

Fig. 4: Hydroxyl Radical Scavenging potential of T. indicum

Table 3: Hydroxyl Radical Scavenging potential of *T. indicum*

S.No	Concentration(µg/ml)	% HRSA
1	50	48.49
2	100	77.41
3	150	77.71
4	200	78.31
5	250	79.22

Table 4: Phytochemical profile of ethyl acetate extract of *T. indicum*

S.No	Compounds	Tests	Result
1	Alkaloids	Mayer's test	-
2	Flavonoids	Alkaline reagent test	+++
3	Terpenoids	Salkowski's test	+++
4	Saponins	Foam test	-
5	Tannins	Ferric chloride test	+
6	Phenol	Ferric chloride test	+
7	Steroids	Salkowski's test	+++

Table 5: The total phenols and flavonoids

S.No	Compounds	Amount
1	Flavonoids	277.78 QE/g
2	Phenol	524.72 GAE/g

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