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Research Article

Antioxidant Activity of Some Common Medicinal Plants

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ABSTRACT
The present study is aimed at evaluating antioxidant effect of six traditionally used medicinally useful plants.In recent days there is an increased intrest for exploring plants containing powerful antioxidant activity.Plants have become an important source of a good amount of antioxidants that prevent oxidative stress caused by free radicals.Here an attempt is made to evaluate invitro antioxidant activity of six traditionally used plants by using three different methods.The activity was found to increase in a dose dependent manner for all the extracts. Natural compounds especially those that are derived from medicinal plants provide a large number of antioxidants useful for humans . The extracts of Ficus bengalensis, Hemidesmus indica, Sida retusa,,Ixora coccenia,Green tea and Terminalia chebula were screened invitro for their antioxidant activity. These plants have a wide use in traditional system of medicine. Soan attempt was made to evaluate their antioxidant activity.

Keywords: Antioxidant, Nitricoxide, Superoxide, Lipidperoxidase.

INTRODUCTION

Free radical reactions have been a major cause of pathology of many human disease conditions like atherosclerosis, ischaemic heart disease, ageing process, inflammation, diabetes etc.[1] Free radicals, reactive oxygen species (ROS) & reactive nitrogen species (RNS) are molecules or molecular fragments containing one or more unpaired electrons in atomic or molecular orbital that characterizes free radical with high activity. The most reactive ROS are super oxide anion & hydroxyl radical. RNS are generated from oxygen in the presence of nitric oxide synthetase (NOS's)[6,7].Production of free radicals takes place in the cell mainly through mitochondrial oxidative phosphorylation. ROS & RNS can be harmful as they damage cellular lipids, sugars, proteins & nucleic acids, thus inhibiting the normal function[2,3].

The present study, plants Ficus bengalensis, Hemidesmus indicus,Sida retusa, Ixora coccinea ,Green tea, Terminalia chebula were investigated for their antioxidant potential of super oxide radical scavenging activity, nitric oxide scavenging activity & lipid peroxidase scavenging activity. The purpose of the study was to evaluate the concentration of mitochondrial samples was adjusted to 5mg/Ml.FDifferent concentration of extract were incubated with reaction mixture that contained,300 ml basic medium(0.15M Tris-HCL buffer containing 1Mm KH_2PO_4,Ph 7.4), 100 µL mitochondrial sample (500 mcg protein),50 mcL $FeSO_4$(0.05Mm) and 50 mcL ascorbic acid (0.4Mm). The mixture was incubated for 1 h at 37.After incubation, the lipid peroxidation of mitochondrial samples was estimated as malonaldehyde (MDA) equivalents by keeping the samples in boiling water bath with 1ml thiobarbituric acid (TBA) reagent for 15 min.After cooling, the absorbance was measured at antioxidant property & the effectiveness of the activity with the natural antioxidant ascorbic acid.

MATERIALS AND METHODS

The plants were collected from local districts of Kerala & identified by Dr.Harindran Asst Professor Dept Of Botany,Payannur College.

Preparation of Extracts: Fresh parts (leaf, stem, bark, roots& whole plant) from all the plants were shade dried & milled separately to fine powder. The powder was then extracted with specified solvents in a soxhlet apparatus for 48 hours. The extract was then filtered using filter paper & concentrated to dryness under vacuums. The extract was then further dried under reduced pressure using Rota evaporator at 40°C. The concentrated extract was kept in a desiccator for further use.The extracts were screened for their phytoconstituents.The results are shown in table 1.

Evaluation of antioxidant activity: Lipid peroxidation inhibitory assay [4]: The effect of plant extracts on lipid peroxidation in mitochondrial samples was estimated by thiobarbituiric acid reactive substances (TBARS) method. . Protein 532nm using a uv -visible spectrophotometer .A control was run simultaneously without adding extracts. The lipid peroxidation inhibitory activity was calculated *as, inhibition (%) =Test\Control*100.*The results are shown in table 2.

Superoxide Radical Scavenging Activity[5:] Superoxide radical scavenging activity was determined by the method of Yen and Chen..To different concentrations of extract(50-1000 µg/ml),phenazine methosulfate (1ml,60 µl phosphate buffer PH 7.4) and NBT (1ml,300µM) were added and incubated at 25^0 C for 5 min. The

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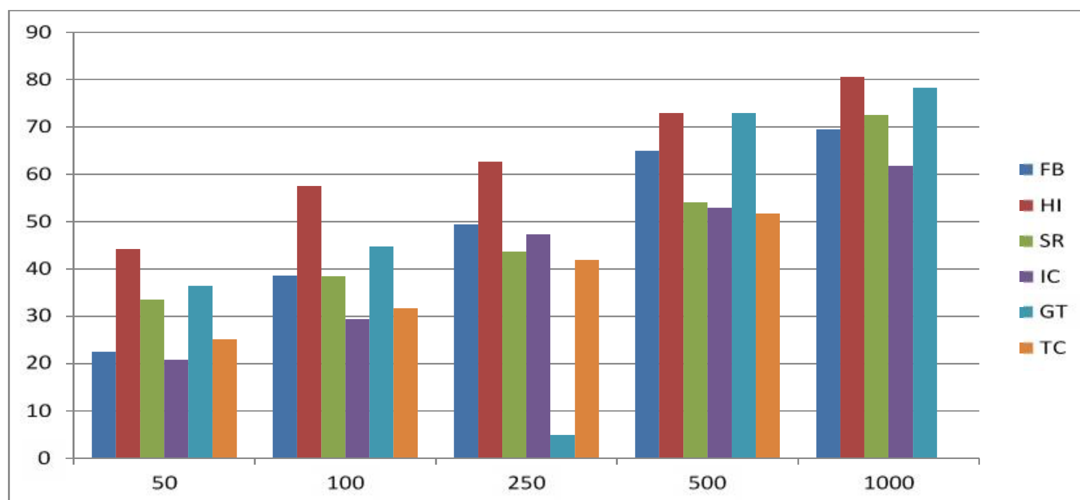
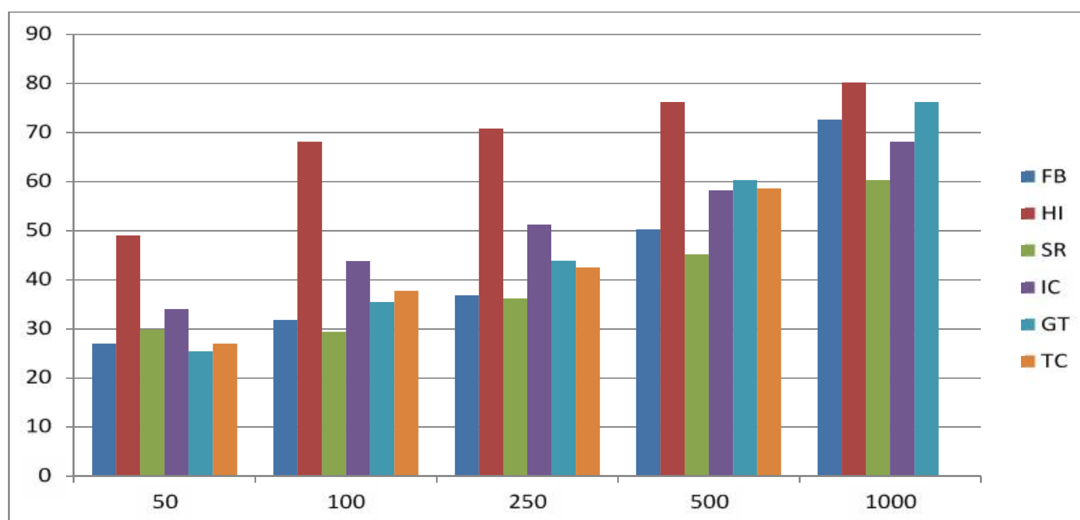
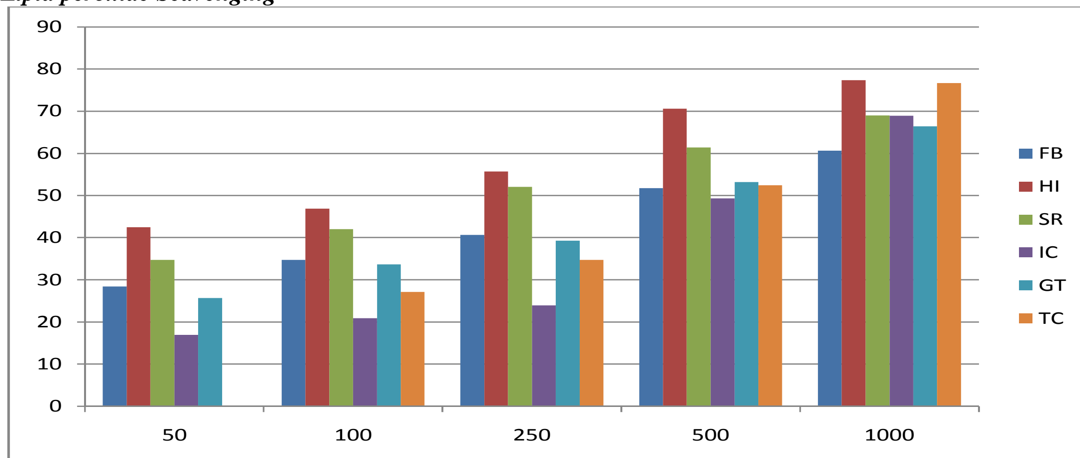


Nitric oxide Scavenging Activity



Lipid peroxide Scavenging



Superoxide Sacvenging Activity

absorbance was recorded at 560nm against blank. The percentage inhibition was calculated using the formula

Table 1: Phytochemical Screening

Drug	Alkaloid	Glycosides	Steroids	Tannins	Triterpenoids	Flavanoids	Phenolic compds	Saponins
F.B	+	+	+	+	+	-	-	
H.I	+	-	-	+	-	+	+	+
S.R	+	-	+	+	-	-		-
I.C	-	+	+	+	+	+	-	+
G.T	-	+	+	+	+	+	-	+
T.C	+	-	+	+	+	+	+	+

Table.2 Lipid peroxidase(%Scavenging)

Conc:μg/ml	F.B	H.I	S.R	I.C	G.T	T.C
50	26.917± 0.1185	49.063± 0.226	29.9± 0.979	34.063± 0.623	25.48± 0.051	26.983± 0.888
100	31.843± 0.073	68.14± 0.352	29.44± 0.496	43.87± 0.010	35.49± 0.541	37.8± 0.060
250	36.85± 0.062	70.833± 0.127	36.17± 0.280	51.273± 0.522	43.873± 0.105	42.52± 0.072
500	50.28± 0.128	76.24± 0.381	45.18± 0.128	58.264± 0.268	60.28± 0.124	58.66± 0.218
1000	72.61± 0.0668	80.24± 0.4518	60.28± 0.0358	68.148± 0.111	76.22± 0.184	72.16± 0.054

Table 3 Superoxide scavenging (% scavenging)

Con(μg /ml)	F.B	H.I	S.R	I.C	G.T	T.C
50	28.393± 0.338	42.446± 1.100	34.746± 1.623	16.937± 1.183	25.733± 0.482	22.826± 0.9882
100	34.767± 0.8803	46.893± 0.2969	41.97± 0.115	20.913± 0.35	33.727± 0.372	27.14± 0.72
250	40.66± 0.072	55.68± 0.4214	52.046± 0.212	23.96± 0.573	39.327±0.136	34.76± 0.7597
500	51.763± 0.608	70.55± 0.571	61.376± 0.486	49.336± 0.005	53.176± 0.679	52.47± 1.67
1000	60.68± 0.382	77.36± 0.4518	68.997± 0.484	68.963± 0.746	66.39± 0.997	76.66± 0.48

Table. 4: Nitricoxide Scavenging(%Scavenging)

Conμg/ml	F.B	H.I	S.R	I.C	G.T	T.C
50	22.547± 0.020	44.26± 0.036	33.437± 0.020	20.833± 0.030	36.467± 0.015	25.12± 0.010
100	38.613± 0.402	57.48± 1.038	38.436± 0.486	29.363± 0.035	44.74± 0.045	31.66± 0.036
250	49.406± 0.166	62.686± 0.127	43.696± 0.221	47.347± 0.481	47.963± 2.05	41.91± 0.591
500	64.983± 0.265	72.93± 0.817	54.717± 0.083	52.883± 0.140	72.907± 0.551	51.683± 0.066
1000	69.516± 0.389	80.56± 0.635	72.55± 0.105	61.753± 0.596	78.29± 0.121	67.79± 0.043

%inhibition =Test/control×100

The experiments were performed in triplicate. The results are shown in table 3.

Nitric Oxide Radical Scavenging Activity[8]:To different concentrations of the extracts (50-1000μg/ml) 0.6ml sodium nitroprusside in phosphate buffered saline was added.. The solution was incubated at 25^{0}C for 120min.To 1ml of the incubated solution 1ml Greiss reagent (1% sulphanilamide and 0.1% naphtyl ethylene diamine dihydrochloride in 2% phosphoric acid) was added and absorbance was measured at 546nm against blank solution..The results are shown in table 4.

RESULTS AND DISCUSSION.

The experimental data of these species reveal that all these extracts are likely to have the effect of scavenging free radical. We observed that a dose response relationship is found in the scavenging activity; the activity increased as the concentration increased for each sample.

In the present study we concluded that all the plants selected for the experiment showed moderate antioxidant activity, in different solvents. The results from various free radical scavenging systems reveal that the selected plants have shown significant antioxidant activity. The extracts were found to have different levels of antioxidant activity in all the systems tested. Further studies are warranted for the isolation and identification of individual phenolic compounds and in vivo studies are needed for better understanding their mechanism of action as an antioxidant.

CONCLUSION

The present study reveals that extracts are a good source of antioxidant property containg phytoconstituents.The presence of flavanoids,tannins,steroids and saponins present in extracts may be responsible for antioxidant activity.From this study it is observed that all the plants posses marked antioxidant effect.These antioxidant properties are responsible for the various pharmacological activities possed by them.From this study it can also be concluded that these plants will also posses marked nephroprotective activity due to its nitricoxide scavenging,superoxide scavenging and lipidperoxide scavenging properties.

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