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Research Article

# ANTIOXIDANT ACTIVITY OF *Acacia torta* (ROXB.) CRAIB

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**ABSTRACT**

The objective of this study was to investigate the *in vitro* antioxidant activity of hydro alcoholic extract of the stem *Acacia torta* (Roxb.) Craib using DPPH radical scavenging assay and concentration was being ($IC_{50}$ 135.9 µg/ml). Moreover, the saponins, steroids, triterpenes, alkaloids and tannins were also present in the hydro alcoholic extract of stem *Acacia torta*. The characterization of the extract was also performed by HPLC profiling with the standard, Quercetin. The present study demonstrated that *Acacia torta* (Roxb.) Craib stem extract exhibited potent antioxidants in DPPH free radical assay as compared to standard quercetin.

**Keywords**: *Acacia torta* (Roxb.) Craib, DPPH radical scavenging, Antioxidant.

## INTRODUCTION

The generation of reactive oxygen species (ROS) beyond the antioxidant capacity of the biological system gives rise to oxidative stress. Oxidative stress is an important risk factor in the pathogenesis of numerous chronic diseases. Free radicals and other reactive oxygen species are recognized as agents involved in the pathogenesis of sicknesses such as asthma, inflammatory arthropathies, diabetes, hypertension, inflammation, Parkinson's and Alzheimer's diseases, AIDS, cancers as well as atherosclerosis. ROS are also said to be responsible for the human aging [1-3].

An antioxidant can be broadly defined as any substance that delays or inhibits oxidative damage to a target molecule [4]. Antioxidants are a group of substances which, when present at low concentrations, in relation to oxidiziable substrates, significantly inhibit or delay oxidative processes, while often being oxidized themselves. Antioxidants may exert their effect on biological systems by different mechanisms including electron donation (as reducing agents), metal ion chelation (thereby eliminating potential free radicals), sparing of antioxidants (co-antioxidants) [5, 6].

Antioxidants lower the burden of free radicals and they have the ability to take up the free radicals and reduce the free radical and make it stable. The main characteristic of an antioxidant is its ability to trap free radicals [7]. Antioxidant compounds like phenolic acids, polyphenols and flavonoids scavenge free radicals such as peroxide, hydroperoxide or lipid peroxyl and thus inhibit the oxidative mechanisms that lead to degenerative diseases [8].

Herbal plants considered as good antioxidant since ancient times. With this background, the antioxidant assay i.e., DPPH scavenging assay was carried out in the laboratory which is a simple chemical experiment for the primary evaluation of any compound for its simplicity and low cost for free radical scavenging activity [9, 10].

DPPH [1,1-diphenyl-2-picryl hydrazyl] is a stable free radical with purple colour. Antioxidants reduces DPPH to 1,1-diphenyl-2-picryl hydrazine, colourless compound which is measured at an absorbance of 510 nm.

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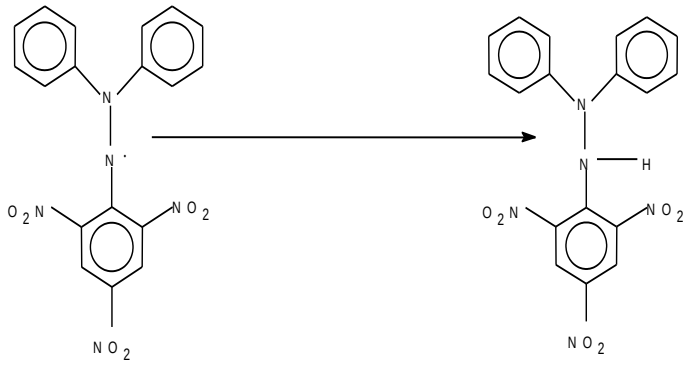


1, 1-diphenyl-2-picryl hydrazyl **(Purple coloured)**

1, 1-diphenyl-2-picryl hydrazine **(Colourless)**

## MATERIALS & METHOD

### Reagents

1. DPPH (EEC No. 217-591-8, Sigma, USA), store at less than 0°C.
2.Methanol, HPLC grade (Ranbaxy Chemicals).

### Inhibitor (reference standard)

Quercetin, is stored at room temperature.

### Preparation of working solutions

DPPH: 0.1428 mg/ml in HPLC grade methanol.
Quercetin: 1mg dissolved in 1 ml methanol.

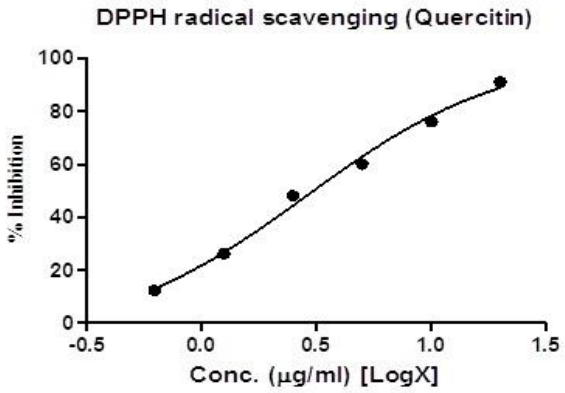
### Preliminary phytochemical screening

It was observed from the preliminary phytochemical screening of the stem that Carbohydrates and Flavonoids were absent in the extract of stem *Acacia torta*. Moreover it was found that Saponins, steroids, triterpenes, alkaloids and tannins were present in the hydro alcoholic extract of stem *Acacia torta*.

### Procedure

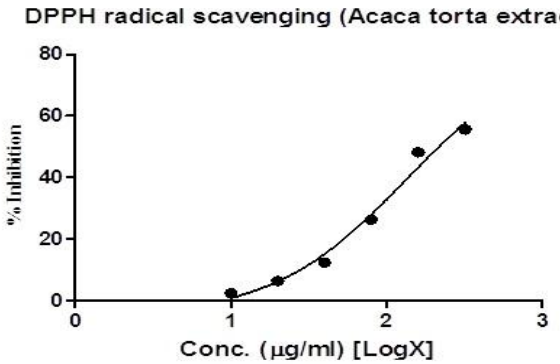
DPPH assay was carried out as per the method of Rajakumar *et al*. [11]. In brief, 75 µl of DPPH solution; various concentration of test solution and quantity sufficient to 3 ml with HPLC grade methanol. The different concentrations tested for reference standard are 0.625, 1.25, 2.5, 5, 10, 20µg/ ml. The reaction mixture is mixed and incubated at 25°C for 15 minutes. The absorbance is measured at 510 nm using semi-auto analyzer. A control reaction is carried out without the test sample.

**Fig 1. DPPH radical scavenging assay of Quercetin**




| | |
|---|---|
| BOTTOM | 102.6 |
| TOP | -6.471 |
| LOGIC50 | 0.4571 |
| IC50 | 2.865 |

**Fig 2. DPPH radical scavenging assay of *Acacia torta (Roxb.) Craib* extract**




| | |
|---|---|
| BOTTOM | 84.63 |
| TOP | -5.339 |
| LOGIC50 | 2.133 |
| IC50 | 135.9 |

## RESULTS

**Table 1. Concentration; Absorbance; % Inhibition of Quercetin**

| Sample Name | Concentration (µg/ml) | Absorbance 590nm | % Inhibition | $IC_{50}$ |
|---|---|---|---|---|
| *Standard (Quercitin)* | 0 | 0.50 | 0.00 | 2.865 µg/ml |
| | 0.625 | 0.44 | 12.35 | |
| | 1.25 | 0.37 | 26.29 | |
| | 2.5 | 0.26 | 48.21 | |
| | 5 | 0.20 | 60.16 | |
| | 10 | 0.12 | 76.10 | |
| | 20 | 0.04 | 91.10 | |

**Table 2. Concentration; Absorbance; % Inhibition of *Acacia torta* (Roxb.)Craib**

| Sample Name | Concentration (µg/ml) | Absorbance 590nm | % Inhibition | $IC_{50}$ |
|---|---|---|---|---|
| ***Acacia torta (Roxb.) Craib* extract** | 10 | 0.49 | 2.39 | **135.9 µg/ml** |
| | 20 | 0.47 | 6.37 | |
| | 40 | 0.44 | 12.35 | |
| | 80 | 0.37 | 26.29 | |
| | 160 | 0.26 | 48.21 | |
| | 320 | 0.22 | 55.64 | |

## DISCUSSION AND CONCLUSION

The $IC_{50}$ values are shown in table. Half maximal Inhibitory concentration ($IC_{50}$) was the concentration of the substance required to inhibit a biological process such as an enzyme, cell, cell receptor or microorganism by half. $IC_{(50)}$ value was calculated using Graph Prism software version 5.0 by non-linear regression analysis of % inhibition recorded for different concentrations of test substances/standard. For compounds showing <50% inhibition, $IC_{50}$ value was not calculated. The relative activity of the sample can be determined by comparing the $IC_{50}$ value of sample with standard. Higher the $IC_{50}$ value and lower was the relative activity in comparison to standard & vice-versa.

*Acacia torta* (Roxb.) Craib stem extract exhibited potent antioxidants in DPPH free radical assay as compared to standard quercetin.

## ACKNOWLEDGEMENT

Nil

## CONFLICT OF INTEREST

None.

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