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PHYTOCHEMICAL SCREENING AND IN VITRO ANTI-OXIDANT ACTIVITY OF *Justicia gendarussa* LEAVES

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ABSTRACT

The objective of the present study was evaluating the phytochemical constituents of *Justicia gendarussa* leaves extracts and their antioxidant activities. The different extracts were monitored for phytochemical screening. Total phenolic (279.00±13.85 mg/gm) and flavonoid (40.09±7.98 mg/gm) contents were measured in *Justicia gendarussa* leaves. The antioxidant potential of tested extracts was evaluated using total antioxidant capacity, ferrous ion and nitric oxide radical scavenging assays. This study demonstrated that, *Justicia gendarussa* leaves is a good source of natural antioxidants.

Keywords: *Hemidesmus indicus*, qualitative, quantitative and anti-stress.

INTRODUCTION

Antioxidants act as a defense mechanism that protects against oxidative damage, and include compounds to remove or repair damaged molecules. It can prevent/retard the oxidation caused by free radicals and sufficient intake of antioxidants is supposed to protect against diseases (Celiktar *et al*., 2007). Oxidative stress occurs when there is excessive free radical production and/or low antioxidant defense, which leads to chemical alterations of biomolecules causing structural and functional modification(Hoake and Pastorino, 2002).

Oxidative damage causing plays a significant pathological role in human diseases such as cancer, inflammation arthritis, diabetes and atherosclerosis (Halliwell, 1991).Recently there has been an upsurge of interest in the therapeutic potential of medicinal plants as antioxidants in reducing free radical induced tissue injury. Also many other plant species have been investigated in the search of novel antioxidants (Omar *et al.*, 2009),

Natural products contain different valuable chemical components such as phenolic compounds, phthalates, phenylpropanoids, terpenoids, essential oils, aromatic compounds, alkaloids, sterols, polysaccharides, fatty acids, anthocyanin, tannins, etc. (Oksman-Caldentey and Inze 2004; Picot *et al.* 2017; Mollica *et al.*, 2015). They also have significant antioxidant activity (Embuscado 2015). Knowledge of these components in a plant not only helps for the quality control analysis of the plant but also manifests nature of the drug or formulation (Jain *et al.* 2011). To investigate the phytochemical screening and *in vitro* anti-oxidant activity of leaves *Justicia gendarussa*.

MATERIALS AND METHODS

Collection of plant materials

The *Justicia gendarussa* were collected from Kdukaval, Thanjavur district, Tamil Nadu, India during March 2022. The collected leaves were washed several times with distilled water to remove the traces of impurities from the leaves. Then examined carefully, old infected and fungus damaged portion of the leaves were removed. Healthy

leaves were dried in room temperature and grind using grinder mixture. The powder was stored for further analysis

Preparation of plant extract

1 gram of dried powder of *Justicia gendarussa* leaves were transferred in to different conical flask (250ml). The conical flask containing 50ml of different solution such as ethanol and water. The conical flask containing *Justicia gendarussa* leaves were shaken well for 30 minutes by free hand. After 24 hrs, the extracts were filtered using Whatman filter paper No.1 and filtrate is used for further analysis.

Phytochemical screening

Chemical tests were carried out on the extract using standard procedures to identify the constituents as described by Sofowara (1993), Trease and Evans (1989) and Harborne (1973 and 1984). Total phenols estimated by the method of Edeoga *et al*., (2005). Flavonoid determine by the method of Bohm and Kocipai-Abyazan (1994).

***In vitro* antioxidant activity**

The antioxidant activity of extract was evaluated by the phosphomolybdenum method according to the procedure of Prieto *et al.* (1999). The chelating activity of the extracts for ferrous ions Fe^{2+} was measured according to the method of Dinis *et al*. (1994). Nitric oxide radical scavenging activity was determined according to the method reported by Garrat (1964).

RESULTS AND DISCUSSION

Phytochemicals as well as medicinal plants, have remained the most abundant source of health care and life improvement since very long. Phytochemicals have great antioxidant potential and are of great interest due to their beneficial effects on health of human beings, and they give immense health benefits to the consumers. Epidemiological and animal trials suggest that the regular consumption of fruits and vegetables, and whole grains reduces the risk of various diseases linked with oxidative damage (Cieslik *et al.*, 2006; Scalbert *et al.*, 2005). In the present study was carried out on the *Justicia gendarussa* leaves extract revealed the presence of medicinally active constituents. *Justicia gendarussa* leaves extract showed that the presence of tannin, saponins, flavonoids, steroids, terpenoids, triterpenoids, polyphenol, glycoside, antroquinone and coumarins while alkaloids was absent in both aqueous and ethanolic extract. Significant amount of flavonoids (40.09±7.98 mg/gm) and total phenol (279.00±13.85 mg/gm) were observed in *Justicia gendarussa* leaves.

Table 1: Qualitative phytochemical analysis of *Justicia gendarussa* leaves extract

S. No	Phytochemicals	Ethanol extract	Aqueous extract
1	Tannin	++	+
2	Saponin	++	++
3	Flavonoids	++	+
4	Steroids	++	+
5	Terpenoids	++	+
6	Triterpeniods	++	+
7	Alkaloids	-	-
8	Antroquinone	+	+
9	Polyphenol	++	++
10	Glycosides	+	+
11	Coumarins	++	++

(+) Presence, (++) High concentrations and (–) Absences

Table 2: Quantitative estimation of *Justicia gendarussa* leaves powder

S. No	Phytochemicals	Results (mg/gm)
1	Flavonoids	40.09±7.98
2	Total phenol	279.00±13.85

Values are expressed as mean ± SD for triplicates

***In vitro* antioxidants activity**

In the present study anti-oxidant activity of *Justicia gendarussa* leaves extract, *In vitro* antioxidant activity of the *Justicia gendarussa* extracts was observed by Total antioxidant capacity (TAC), Iron chelating antioxidant assay and Nitric oxide antioxidant activity methods. It was, however, observed that the 100 µg/ml extract possesses significant total antioxidant capacity equivalent to ascorbic acid at higher concentration. The formation of the ferrozine– Fe^{2+} complex is interrupted in the presence of *Justicia gendarussa* leaves, indicating that have chelating activity with *Justicia gendarussa* leaves extract maximum observation at 100µg/ml of inhibitions nearest to Std. (Ascorbic acid). The nitric oxide scavenging capacity was dose dependent with 100 to 500µg/mL.

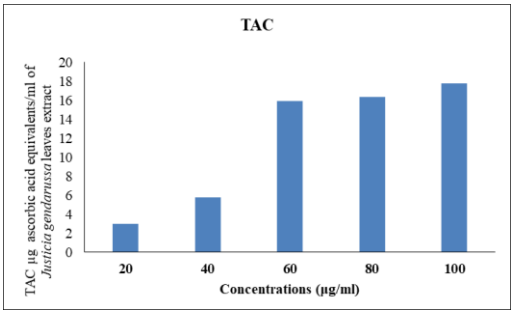

Figure 1: The total antioxidant capacity (TAC) of *Justicia gendarussa* leaves extract

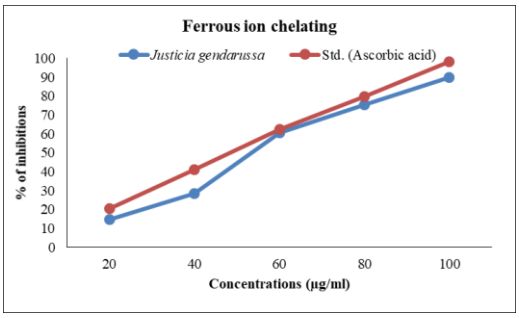

Figure 2: *In vitro* ant-oxidant ferrous ion chelating of *Justicia gendarussa* leaves extract

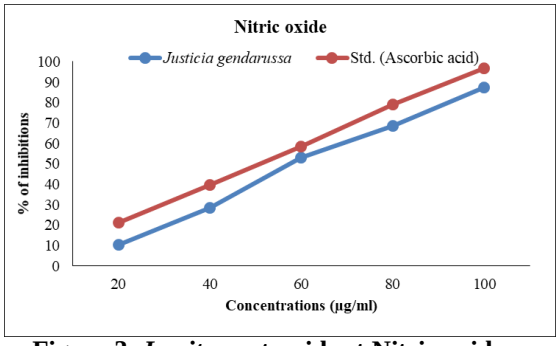

Figure 3: *In vitro* ant-oxidant Nitric oxide scavenging activity of *Justicia gendarussa* leaves

The total antioxidant capacity (TAC) was based on the reduction of Mo(VI) to Mo(V) by the extract and subsequent formation of green phosphate/Mo(V) complex at acid pH (Prieto *et al.* 1999). Ferrous iron can initiate lipid peroxidation by the Fenton reaction as well as accelerating peroxidation by decomposing lipid hydroperoxides into peroxyl and alkoxyl radicals (Halliwell, 1991; Fridovich, 1995).

CONCLUSION

This is a good study in which the authors have evaluated the *in-vitro* antioxidant activity of *Justicia gendarussa* leaves by TAC, ferrous ion and nitric oxide radical scavenging assay and the content of total phenolic and flavonoids. The antioxidant effect was plausibly due to the rich phytochemical contents.

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