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Original Research Article

INVESTIGATION ON THE ANTIOXIDANT ACTIVITY OF *SESBANIA GRANDIFLORA* FLOWER EXTRACT

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Abstract
The present study was designed to check the antioxidant activity of *Sesbania Grandiflora*. The extraction of fruit of *Sesbania Grandiflora* was carried out by using solvent aqueous methanol. The antioxidant activity of plant *Sesbania Grandiflora* determined by using different *in vitro* antioxidant assays. The TP (Total Phenolic) and TF (Total Flavonoid) contents in extracts of the plant *Sesbania Grandiflora* were found to be in the range of 48.2±0.74 mcg/mg and 11.75±0.51 mcg/mg, respectively. The DPPH scavenging activity of extract was found to be in the range of 24.13-64.44%. In conclusion, the extract of *Sesbania Grandiflora* was found to have potent antioxidant activity which may be due the abundant of phenolic and flavonoid contents.

Key words: Antioxidant Activity, *Sesbania Grandiflora*, Total Phenolic Contents, Total Flavonoid Contents

Introduction:

Plants and vegetables are good source of phenolic components, ascorbic acids, tocopherols, glutathione, vitamin C and E, carotenoids, flavonoids that may contribute to protection against oxidative damage. These phytochemicals from plants have been shown to possess significant antioxidant capacities that may be associated with lower incidence and lower mortality rates of degenerative diseases in human beings such as anti-allergic, anti-artherogenic, anti-inflammatory, anti-microbial, antioxidant, anti-thrombotic, cardioprotective and vasodilatory effects[1].

Sesbania grandiflora, commonly known as Agati is a widely available plant; it is an open branching tree tall up to 15m and 39cm

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in diameter belongs to family Fabaceae[2]. It is native to India, Australia, Indonesia, Malaysia, Myanmar, Philippines. The chemical constituents found are galactommannans, linoleic acid, beta-sitosterol and carbohydrates[3]. The major contributors of phenolic substances in *S. grandiflora* are simple phenolics acids. Apart from this the other bioactive compounds reported in this plant are saponins[4]. Traditionally the plant has been used for the treatment of headache, in fever, as a tonic, in catarrh, as an astringent etc[5-6]. Some species of *Sesbania* are also used frequently and widely in traditional medicine to treat gastrointestinal infections, cardiovascular diseases and as antimicrobial agent[7-8].

The present research work aimed evaluation of antioxidant activity of *Sesbania grandiflora;* since suspected to have abundant of phenolic and flavonoid contents.

Material and Methods

Chemicals such as DPPH, Quercetin and Gallic acid were obtained from Sigma Ltd., all other reagents and solvents were of analytical grade.

Plant materials

The Plant materials were collected then washed with distilled water and dried under sun then ground into fine powder.

Extraction:

Ground sample (10g) was extracted separately with 100 mL of aqueous methanol (methanol: water, 80:20 v/v) and shaked for 24 h at room temperature. Extract was separated from the residues by filtering through Whattman No. 1 filter paper. The residues were extracted twice with the same manner and extracts combined. The combined extract were concentrated and freed of solvent under reduced pressure at 45°C, using a rotary evaporator. The dried, crude concentrated extract was stored.

Determination of Total Phenolics (TP):

Amount of TP was assessed using Folin–Ciocalteu reagent procedure as described earlier[9]. 50 mg of dry mass of extract was mixed with 0.5 mL of Folin–Ciocalteu reagent and 7.5 mL deionized water. The mixture was kept at room temperature for 10 min and then 1.5 mL of 20% $NaCO_3$ (w/v) was added. The mixture was then heated in a water bath at 40°C for 20 min and cooled in an ice bath; finally absorbance was measured at 755 nm (Shimadzu 2405 spectrophotometer). The results expressed as Gallic Acid Equivalents (GAE). All samples were analyzed in triplicate.

Determination of Total Flavonoids (TF):

Amount of TF was determined following the procedure as described earlier[10]. 1 mL of aqueous extract was placed in a 10 mL volumetric flask and then 5 mL of distilled water added followed by 0.3 mL of 5% $NaNO_2$. After 5 min, 0.6 mL of 10% $AlCl_3$ was added then after 5 min 2 mL of 1 M NaOH was added and volume was made up with distilled water. The solution was mixed and absorbance was measured at 510 nm (Shimadzu 2405 spectrophotometer). TF amount was expressed as Quercetin equivalents.

Determination of Reducing Power:

The reducing power of the extract was determined according to the procedure described earlier[11], with slight modification. Different concentrations of extract were mixed with sodium phosphate buffer (5.0 mL, 0.2 M, pH 6.6) and potassium ferricyanide (5.0 mL, 1.0%); the mixture was incubated at 50 °C for 20 min. Then 5 mL of 10% trichloroacetic acid was added and centrifuged at 980g for 10 min at 5°C in a refrigerated centrifuge. The upper layer of the solution (5.0 mL) was diluted with 5.0 mL of distilled water and ferric chloride (1.0 mL, 0.1%) and absorbance was measured at 700 nm (Shimadzu 2405

spectrophotometer). The measurement was performed in triplicate.

DPPH Radical Scavenging Assay:

Free radical scavenging activity of extract was measured by using procedure described earlier[12]. To different concentrations of extract, 5.0 mL of freshly prepared solution of 2, 2-diphenyl-1-picrylhydrazyl (DPPH) at concentration of 0.025 g/L was added, then absorbance was measured at 515 nm (Shimadzu 2405 spectrophotometer) after incubation period.

Results and Discussion

Total Phenolic and Total Flavonoid Contents:

The extract was evaluated quantitatively for the total phenolic and total flavonoid contents; since these two phytoconstituent considered responsible factor for the antioxidant activity. The TP (Total Phenolic) and TF (Total Flavonoid) contents in extract of the plant *Sesbania Grandiflora* were found to be in the range of 48.2±0.74 mcg/mg and 11.75±0.51 mcg/mg, respectively.

Free Radical Scavenging Activity:

Sesbania Grandiflora extract exhibited appreciable scavenging activity. Different concentration of extract exhibited the DPPH scavenging values in the range of 24.13-64.44%. The linear enhancement in scavenging power was observed with the elevation in concentration level **(Table 1)**, which suggested dose dependent relationship between extract concentration and scavenging power.

Table 1. Results of Reducing Power and DPPH Assay

S. No.	Concentration of Extract (mcg/ml)	% Reducing Power	% Radical Scavenging Activity
1.	100	0.612	24.13
2.	200	0.781	37.91
3.	300	0.891	49.82
4.	400	0.972	55.23
5.	500	1.122	64.44

Reducing Power:

The data of the reducing potential of different concentration of extract is presented in **Table 1**. The result of reducing potential showed general increase in activity when concentration increased. Reducing potential of different concentration of extract ranged from 0.612 to 1.122%.

The result also suggest that the extract has more enhancement in scavenging power than reducing potential with the increasing level of concentration **(Figure 1)**.

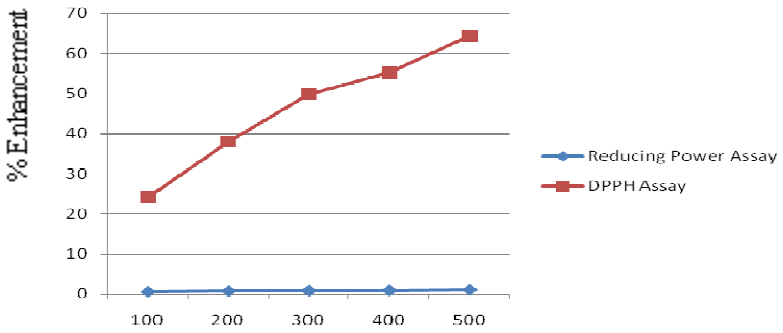

Figure 1. Effect of concentration on % enhancement of reducing power and radical scavenging activity.

Conclusion

The results of present study revealed that *Sesbania Grandiflora* extract having potent antioxidant activity, presence of polyphenolic contents may be contributed to the antioxidant potential of *Sesbania Grandiflora* extract; thus study concluded that *Sesbania Grandiflora* can be used as potential sources of antioxidant agent.

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