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ANTIOXIDANT ACTIVITY OF FLAVONOIDAL CONTENT OF BUTEA MONOSPERMA

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ABSTRACT

In present study, *in vitro* methods were selected to test and compare the antioxidant activity at different levels involving formation and scavenging of free radical by extract of Butea monosperma flowers (EBMF). The total phenolic content of EBMF was found to be 19.09 mg (equivalent to gallic acid) per gram of extract. In addition, reducing power was found to be increase with the increasing concentration of extract. The extract exhibited concentration dependant radical scavenging activity in DPPH with IC50 value- 47. 2 µg/ml. All the above in vitro studies clearly indicate that the EBMF posses a significant antioxidant activity.

INTRODUCTION: Flavonoids are polyphenolic compounds that are ubiquitous in nature and are categorized according to chemical structure into flavonols, flavanones, isoflavones, catechins, anthocyanidins and chalcones. Antioxidants are compounds that protect cells against the damaging effects of reactive oxygen species (ROS). An imbalance between antioxidants and ROS results in oxidative stress, leading to cellular damage. Oxidative stress has been linked to cancer, aging, atherosclerosis and neurodegenerative diseases. Flavonoids may help to protection against these diseases[1]. *Butea monosperma* is also known as Palash. It belongs to family *Fabaceae*[2-4]. Various chemical constituent present in different part of the plant like butin, butein, butrin, isobutrin, palasitrin and palasonin[5]. *Butea monosperma* is used as Anti-inflammatory, Antifertility, Antifungal, Antihelmintic, Anti hepatotoxic, Antimicrobial, Anti-convulsive, wound healingl, Anti-diarrhoeal, diuretic and leucorrhoea[2-4].

MATERIAL AND METHODS:

Plant material: Flowers of *Butea monosperma* (Family Fabaceae) were collected in the month of September from the local market of Bhopal. Plant was identified and authenticated in the Dept. of Pharmacy, Barkatula University, Bhopal (MP). A voucher specimen 'BUPH-4034 B' was deposited in the herbarium of the department for future reference.

Preparation of extract: The extract was prepared by using hydro-alcoholic solvent (70:30) by double maceration process and after filtration extract was concentrated at low pressure by distillation and finally air-dried.

Antioxidant activity by Total Phenolic content: For the determination of the total phenolic content, extract (0.2 ml) was mixed with 0.5 ml Folin–Ciocalteu reagent which was previously diluted with 7 ml deionized water. The solution was allowed to stand for 3 min. at 25^0C before adding 0.2 ml of saturated sodium carbonate solution. The mixed solution was allowed to stand for another 120 min. and the absorbance was measured at 725 nm. Gallic acid was used as standard antioxidant compound[6].

Antioxidant activity by reducing power method: For the determination of the reducing power, 1.0 ml of the extract (different conc.20-100µg/ml) suspended in distilled water, 2.5 ml of 0.2 M-phosphate buffer (pH6.6), and 2.5 ml of $K_3Fe(CN)_6$ (1% w/v) were added. The mixture was incubated at 50°C for 20 min. followed by addition of 2.5ml of TCA (10% w/v). The mixture was centrifuged at 3000 rpm for 10 min. The upper layer of the solution (2.5 ml) was mixed with distilled water (2.5 ml) and 0.5 ml $FeCl_3$ (0.1% w/v), and the absorbance was measured at 700 nm against blank sample. The ascorbic acid is used as standard antioxidant compound[7].

Antioxidant activity by diphenyl picryl hydrazyl (DPPH): Different conc. of extract were prepared in methanol ranging from 25-250 µg/ml. Standard DPPH solution containing 400 micromole DPPH was prepared in methanol. Extract and standard DPPH solution was then mixed at a ratio 1:3 in different properly closed containers. The mixture was kept in the dark at a room temperature for 90 minutes. Absorbance of resulting solution measured using Jasco V-530 Germany double beam spectrophotometer at 517 nm. The antioxidant activity is expressed as IC_{50} [1].

RESULT:

Antioxidant activity by Total Phenolic Content: The level of total phenolic content was found to be 19.0904 mg of Gallic acid equivalent / gm of EBMF.

Antioxidant activity by reducing power method: The reducing power of EBMF was indicate in graph 1. The increasing value of absorbance with increasing amount of sample and ascorbic acid.

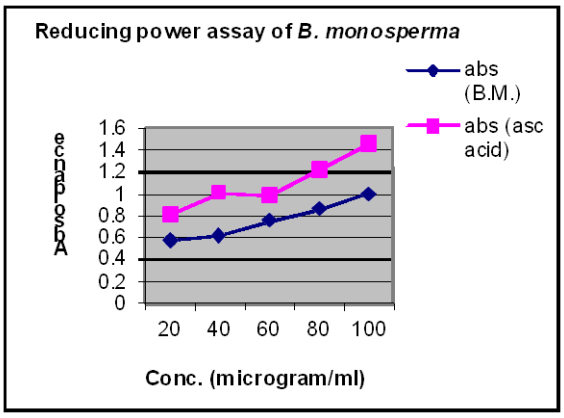

Fig. 1

Antioxidant activity by DPPH: The IC_{50} value for EBMF and ascorbic acid respectively show in following table 1.

Drug	Inhibitory conc. (IC_{50} µg/ml)
	DPPH
EBMF	47.2
Ascorbic acid	25.8

DISCUSSION: Phenolic compound are known as powerful chain breaking antioxidants. Phenols are very important plant metabolites because of their free radical scavenging activity due to their hydroxyl groups. The phenolic compounds may contribute directly to antioxidant action [8]. For the measurement of the reducing ability, Fe3+ to Fe2+ trance formation has been investigated. The reducing capacity of an extract may serve as a significant indicator of its potential antioxidant activity [9]. The reducing power of EBMF increase with increase amount of sample. DPPH is a stable free radical at room temperature and accepts an electron or hydrogen radical to become a stable diamagnetic molecule. The reduction capacity of DPPH radicals was determined from the decreasing its absorbance at 517 nm with the increasing conc., which is induced by antioxidants present in the extract [10]. The EBMF exhibited potent antioxidant activity by inhibiting DPPH and reducing power activity. In addition, extract contain a noticeable amount of total phenolic content which play important role in antioxidant activity.

CONCLUSION: On the basis of literature survey and result of above antioxidant activity, it confirm that Butea monosperma plant have potentially used as natural antioxidant plant. It is widely assessable source and it need further research on isolation of responsible phytoconstituents for a lead molecule which have more potent pharmacologically and therapeutically activity.

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