THE EXPERIMENT
INTERNATIONAL JOURNAL OF SCIENCE AND TECHNOLOGY

ISSN 2319-2119

RESEARCH ARTICLE

Madhu Babu Kasimala et al, The *Experiment, JULY.2012 Vol.1 (1), 37-42*

EVALUATION OF ANTI DIABETIC ACTIVITY, CNS ACTIVITY AND ANTIOXIDENT ACTIVITY OF METHANOLIC EXTRACT OF MIMUSOPS ELENGI

ABSTRACT

Objective: We evaluated the Antidiabetic activity, CNS activity, Antioxident activity of Methanolic extract of Mimusops elengi.

Materials & Methods: Male white Albino strain rats weighing 250–300 g were used for the experiment. Chemicals and reagents were purchased from local market.

Results: The results of antidiabetic activity, CNS activity and antioxidant activity of Methanolic extract of Mimusops elengi were significantly compared with the standard compounds. The extract show decreasing the blood glucose levels of diabetic induced rats. It shows better resulys on the CNS stimulating activity and DPPH free radical activity.

Conclusion: The result of our study indicates that the Methanolic extract of Mimusops elengi significantly decreased serum glucose level in hyperglycaemic animals. CNS activity, high DPPH free radical antioxident activity. In this context, Mimusops elengi can rightly be mentioned as a plant of considerable interest.

KEY WORDS: Mimusops elengi, Methanolic extract, Antidiabetic activity, CNS activity, Antioxident activity.

INTRODUCTION

Mimusops elengi is a medium-sized evergreen tree found in tropical forests in South Asia, Southeast Asia, and Northern Australia. English common names include Spanish cherry, Medlar, and Bullet wood. Its timber is valuable, the fruit is edible, and it has traditional medicinal uses.

Kingdom: Plantae,

Order: Ericales,

Family: Sapotaceae,

Genus: Mimusops,

Species: M. elengi L.

Binomial name: Mimusops elengi

THE EXPERIMENT
INTERNATIONAL JOURNAL OF SCIENCE AND TECHNOLOGY

ISSN 2319-2119

RESEARCH ARTICLE

Bullet wood is an evergreen tree reaching a height of about 16 m. It flowers in April, and fruiting occurs in June. Leaves are glossy, dark green, oval shaped, 5–14 cm long and 2.5–6 cm wide. Flowers are cream, hairy and scented. Bark is thick and appears dark brownish black or grayish black in colour, with striations and a few cracks on the surface. The tree may reach up to a height of 9-18 m with about 1 m in circumference.

The bark, flowers, fruits and seeds are astringent, cooling, anthelmintic, tonic, and febrifuge. It is mainly used in dental ailments like bleeding gums, pyorrhea, dental caries and loose teeth.

Extract of flowers used against heart diseases, leucorrhoea, menorrhagia and act as antiduretic in polyuria and antitoxin. The snuff made from the dried and powdered flowers used in a disease called Ahwa in which strong fever, headache and pain in the neck, shoulders and other parts of the body occurs.

Ripened fruits facilitates in burning urination. The ripe fruit pounded and mixed with water is given to promote delivery in childbirth. Powder of dried flowers is a brain tonic and useful as a snuff to relieve cephalalgia. Decoction of bark is used to wash the wounds.

Several researches works are going on for the investigation of phytochemical screening Pharmacognostic, phytochemical, physiochemical studies [(2)], cognitive enhancing activity [(3)], antioxidant and hyperglycemic potential [(4)] of different extracts of Mimusops elengi.

Extract Preparation [(5)]:

Areal parts of the plant Mimusops elengi was collected, washed and dried in an oven dryer at 40 °C for 48 h. The dried plant parts were then ground into powder, stored in dark glass bottles and kept at low temperatures until further analyses. The finely ground Mimusops elengi powder (20 g) were extracted with methanol using Saxlet apparatus. After filtration with Whatman filter paper No 1 using vacuum pump, the residue was re-extracted. The solvent was completely removed using a rotary vacuum evaporator at 40 °C. The concentrated extract was then kept in dark bottles at 4 °C until used.

Animals, drug and chemicals

Male white Albino strain rats weighing 250–300 g were used for the experiment. They were housed in polypropylene cages in air-conditioned room and were allowed free access to drinking water and basal diet. All the animal experiments were approved by Institutional Animal Ethics Committee and were done as per their guidelines.

Anti diabetic activity:

The animals (Rats) were fasted for 16 hour prior to the induction of diabetes. STZ freshly prepared in citrate buffer (pH 4.5) was administered i.p. at a single dose of 50 mg/kg. Development of diabetes was confirmed by measuring blood glucose concentrations 72 hour after injection of STZ. Rats with blood glucose level of 250 mg/dl or higher were considered to be diabetic and selected for experiment. Diabetic animals were randomly assigned to groups. Group I contained normal animals and served as normal control. Group II and III served as diabetic. Groups II receive the synthesized nano particle of the methanolic extract of the during the experiments, while the Group III received the reference standard drug glimeperide (0.1 mg/kg).

Estimation of Blood Glucose

Initial, 8th 14th and 21st day non fasting blood glucose levels were determined just before administering the drugs. On the last day of experiment, blood samples were collected from each animal. The blood glucose level was estimated with One Touch Basic Glucometer (Accu Chek Active, Roche, Germany).

CNS activity by rota rod method [6]:

For this study 24rats were selected and are divided into 4 groups. Each group contain 6 rats. Group 1receive the Standard Diazepam induced mice 4mg/kg, Group 2 were Control. Control receives 1% sodium corboxy methyl cellulose (SCMC) 10mg/kg. Group 3 receive SCMC and Methanol extract 100mg/kg, Group 4 receive SCMC + Methanol extract 500 mg/kg.

Preparation of the drug for the experimental study:
Standard: Diazepam (Dosage-4mg/kg)
Suspending Agent: Sodium Carboxy Methyl Cellulose (SCMC)
Test length: 900sec.
Sample: methanol Extract (Dosage-100, 500mg/kg)

Diazepam (standard), Methanol extracts are administered in the form of suspension in water with 1% Sodium Carboxy Methyl Cellulose (SCMC) as suspending agent. After the administration of the drugs 1 hr later the animals placed one by one on the rotating rod. Note down the fall of time. When the mouse falls from the rotating rod, Compare the fall off time of control animals and drug treated animals.

Rota rod Settings:

Test length	900 sec
Ramp speed	20 rpm
Start speed	30 rpm

Total Antioxidant Activity

DPPH Radical Scavenging Assay:
The effect of methanolic extract of Mimusops elengi on DPPH radical was estimated using the method of Liyana-Pathirana and Shahidi [7]. A solution of 0.135 mM DPPH (2,2-diphenyl-1-picrylhydrazyl) in methanol was prepared and 1.0 ml of this solution was mixed with 1.0 ml of the plant extract of Mimusops elengi. The reaction mixture was vortexed thoroughly and left in the dark at room

temperature for 30 min. The absorbance of the mixture was measured spectrophotometrically at 517 nm. Ascorbic acid and BHT were used as references.
The ability to scavenge DPPH radical was calculated by the following equation: DPPH radical scavenging activity (%) = [(Abs control – Abs sample)]/(Abs control)] x 100 where Abs control is the absorbance of DPPH radical + methanol; Abs sample is the absorbance of DPPH radical + methanolic extract of Mimusops elengi.

Result and discussion:
Anti diabetic activity:
The data reveals that the Methanolic extract of Mimusops elengi decreases the blood glucose levels statistically significant. The activity of the solution was compared with the standard drug Glimipride. The plant extract show comparatively similar effect on decreasing the blood glucose levels of albino rats. Whereas control doesn't diabetic positive response. Results shown in figure 2.

THE EXPERIMENT
INTERNATIONAL JOURNAL OF SCIENCE AND TECHNOLOGY

ISSN 2319-2119

RESEARCH ARTICLE

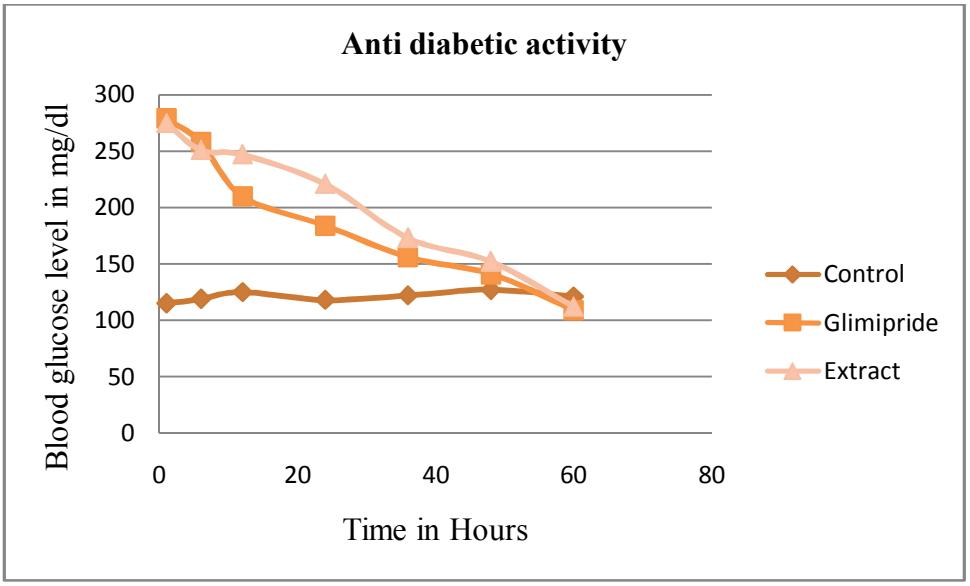

Figure 2: Anti Diabetic activity of Methanolic extract of *Mimusops elengi*

CNS Activity:
Before Treatment:

Group	Fall of Time in Seconds					
	Mice 1	Mice 2	Mice 3	Mice 4	Mice 5	Mice 6
1	811	803	815	821	836	819
2	817	836	844	819	808	803
3	843	833	819	826	860	815
4	835	827	847	831	832	806

After Treatment:

Group	Fall of Time in Seconds					
	Mice 1	Mice 2	Mice 3	Mice 4	Mice 5	Mice 6
1	39	46	51	44	55	36
2	798	830	808	793	841	8288
3	726	770	781	744	791	772
4	504	483	537	526	545	516

THE EXPERIMENT
INTERNATIONAL JOURNAL OF SCIENCE AND TECHNOLOGY

ISSN 2319-2119

RESEARCH ARTICLE

The plant extract at a concentration of 100mg/kg show very negligible effect on rats but at a concentration 500mg/kg works effectively on CNS activity of Rats.

DPPH Radical Scavenging Assay:

Methanolic extract of Mimusops elengi show high DPPH free radical activity. Results obtained were compared with the ascorbic acid as a standard compound and results shown in figure 3.

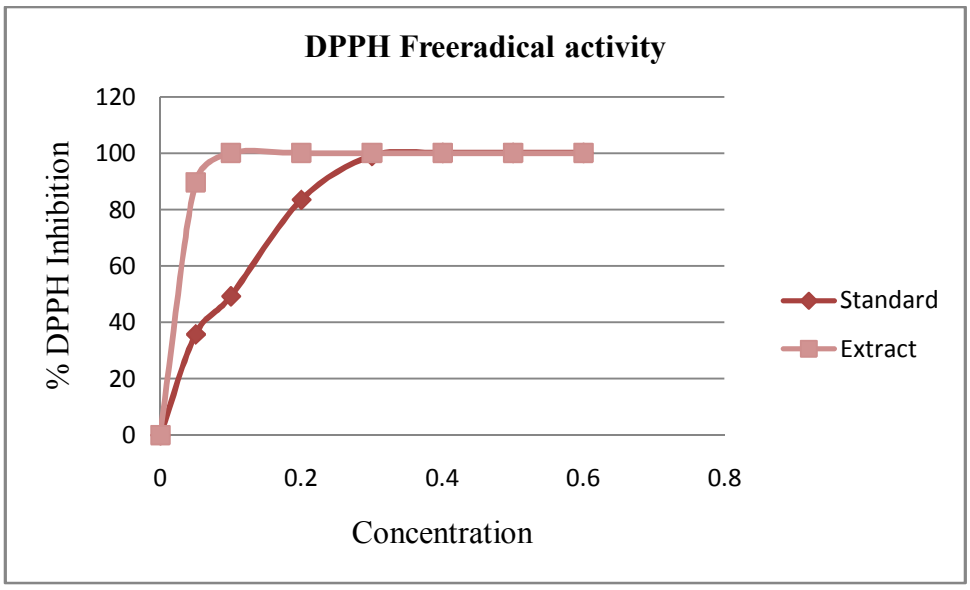

Figure 3: DPPH radical scavenging activity of Methanolic extract of Mimusops elengi

CONCLUSION:

Present study indicates that the Methanolic extract of Mimusops elengi significantly decreases the serum glucose level in hyperglycaemic animals. Alloxan administration produced, CNS activity, high DPPH free radical antioxident activity. The significant decline in the concentration of these constituents in the liver tissue and serum of Mimusops elengi treated diabetic animals indicate that Mimusops elengi extract effectively increased antioxidant potential in vivo.

Natural antioxidants strengthen the endogenous antioxidant defenses from reactive oxygen species (ROS) and restore and optimal balance by neutralizing the reactive species. They are gaining immense importance by virtue of their critical role in disease prevention. In this context, Mimusops elengi can rightly be mentioned as a plant of considerable interest.

THE EXPERIMENT
INTERNATIONAL JOURNAL OF SCIENCE AND TECHNOLOGY

ISSN 2319-2119

RESEARCH ARTICLE

REFERENCES:

1. Bailey, L.H.; Bailey, E.Z.; the staff of the Liberty Hyde Bailey Hortorium. 1976. Hortus third: A concise dictionary of plants cultivated in the United States and Canada. Macmillan, New York.Brock, J., Top End Native Plants, 1988.
2. Prasad V. Kadam, Ramesh S. Deoda, Rakesh S. Shivatare, Kavita N. Yadav and Manohar J. Patil, Pharmacognostic, phytochemical and physiochemical studies of Mimusops Elengi Linn stem bark (Sapotaceae), Der Pharmacia Lettre, 2012, 4 (2):607-613.
3. Tikare v p, evolution of cognitive enhancing activity of Mimusops elengi , on albino rats, 2010, 1(2), 484-492.
4. Ganu GP, Jadhav SS, Deshpande AD, antioxidant and antihyperglycemic potential of methanolic extract of bark of mimusops elengi l. In mice, 2010, Volume 1 Issue 3, 67- 77.
5. Katasani Damodar, Srinu Bhogineni, Bala Ramanjaneyulu, Phytochemical screening, quantitative estimation of total phenolic, flavanoids and antimicrobial evaluation of Trachyspermum ammi, J. Atoms and Molecules, 2011,1(1), 1-8.
6. Nagarjun, N.S., P.G. Soundari and P.T. Kumaresan, 2003. CNS depressant activity of Dalbergia malaberica, Indian Drugs, 40: 716-717.
7. Yen, G.C.; Duh, P.D. Scavenging Effect of Methanolic Extracts of Peanut Hulls on Free Radical and Active Oxygen Species. J. Agric. Food Chem. 1994, 42, 629-632.

Bikshal Babu Kasimala [(1)], Shalini Bandhi [(2)], Madhu Babu Kasimala [(3)*]

1. Department of Chemistry, Hindu college pg courses, Guntur, AP, India.
2. Department of Biotechnology, Hindu college pg courses, Guntur, AP, India.
3. Department of Allied Sciences, College of Marine Science and Technology, Massawa, Eritrea

Email: madhu_lucky09@yahoo.co.in