

**Abstract No: BS-24**

**Investigation of antihyperglycaemic activity of hexane extract of polyherbal mixture in streptozotocin induced diabetic rats**

S. N. T. I. Sampath<sup>1</sup>, J. M. S. Jayasinghe<sup>2\*</sup>, A. P. Attanayake<sup>3</sup> and V. Karunaratne<sup>2</sup>

<sup>1</sup>Postgraduate Institute of Science, University of Peradeniya, Sri Lanka.

<sup>2</sup>Department of Chemistry, Faculty of Science, University of Peradeniya, Sri Lanka.

<sup>3</sup>Department of Biochemistry, Faculty of Medicine, University of Ruhuna, Sri Lanka.  
susanthij@pdn.ac.lk\*

A homemade Ayurvedic remedy made of cloves of *Allium sativum*, leaves of *Murraya koenigii*, seeds of *Piper nigrum* and dried fruit rinds of *Garcinia quaesita* is considered as an antidiabetic polyherbal mixture. This polyherbal mixture has been used for the treatment of diabetes mellitus and dyslipidaemia in Sri Lankan traditional medicine. The *in-vitro* antioxidant and *in-vivo* acute antihyperglycaemic screening of hexane, ethyl acetate and methanol extracts of the above polyherbal mixture were studied and the hexane extract showed a significant antioxidant and dose dependent antihyperglycaemic activity when compared with the two extracts. Hence, the present study was aimed to further investigate the effect of administration of the hexane extract of polyherbal mixture at the optimum effective therapeutic dose for 30 days on serum glycaemic parameters in streptozotocin induced diabetic rats. Diabetes was induced in male Wistar rats by injecting with streptozotocin at the single dose of 65 mgkg<sup>-1</sup>. Group one and two considered as the healthy untreated control, diabetic untreated control rats and received standard animal food and distilled water daily for 30 days (n = 6 /group). Group three and four were diabetic rats and were treated with the hexane extract (25 mgkg<sup>-1</sup>) and glibenclamide (positive control - 0.5 mgkg<sup>-1</sup>) daily for 30 days respectively (n = 6 /group). Body weight of treated and control group rats were measured on 1<sup>st</sup>, 7<sup>th</sup>, 14<sup>th</sup>, 21<sup>st</sup> and 28<sup>th</sup> day of the experiment. On the 30<sup>th</sup> day, all experimental rats were euthanized and blood was collected by cardiac puncture. The antihyperglycaemic activity was evaluated by determining the changes of fasting serum glucose concentration in each group using oral glucose tolerance test on 1<sup>st</sup>, 7<sup>th</sup>, 14<sup>th</sup>, 21<sup>st</sup> and 28<sup>th</sup> day and analyzed through total oral glucose tolerance curve (TAUC) values. Further, the percentage of glycated haemoglobin (HbA<sub>1C</sub>) and fasting serum glucose concentration were determined as glycaemic parameters in each group. The body weight was increased in healthy untreated control group and treated groups while the diabetic untreated control group showed a 10% reduction of body weight during the intervention period, indicating the treatment led to control loss of body weight. The oral administration of hexane extract and glibenclamide, lowered the TAUC values by 21% and 35% respectively and these values were statistically significant compared with TAUC value of diabetic untreated group (p < 0.05) on the 28<sup>th</sup> day of experiment. There was a statistically significant reduction in the HbA<sub>1C</sub> (27%, 33%) and the fasting serum glucose concentration (23%, 33%) in hexane extract and glibenclamide treated diabetic rats when compared to streptozotocin induced untreated diabetic rats (p < 0.05). The findings of the current study revealed that the hexane extract of the polyherbal mixture is a potential source to develop antidiabetic agent/s and further investigations are warranted to study the cellular antidiabetic mechanisms.

**Keywords:** Antidiabetic, Hexane extract, Glycated haemoglobin, TAUC

**Acknowledgment**

This work was supported by National Research Council under the research grant NRC/17/033