ANTI-DIABETIC POTENTIAL OF LEAF METHANOL EXTRACTS OF Mangifera indica AND Aegle marmelos

Perera A. K. B. D. and Rizvi E. M. J. M.*

Department of Biological Sciences, Faculty of Applied Sciences, South Eastern University of Sri Lanka, Sammanthurai, Sri Lanka *rizvijam@seu.ac.lk

Diabetes Mellitus is affecting hundreds of millions of people worldwide and the numbers are continuously increasing. The attention of disease management is turning to natural products due to various complications of the synthetic drugs used. Various chemical components present in plants are effective in controlling this disease. The plants Mangifera indica and Aegle marmelos are reported to be rich in bioactive components. This study was carried out to determine the anti-diabetic effects of the methanol extracts of mature leaves of these two plants using two in vitro methods i.e. the 'glucose uptake capacity by yeast cells (GUC)' and the 'glucose adsorption assay (GAA)'. The effect of different concentrations of the plant extract (1, 2, 3, 4 and 5 mg/ml) on glucose uptake by yeast cells in different initial concentrations of glucose (50, 100, 150, and 200 mg/dL) was determined after incubating with a 10 % v/v of yeast cell suspension for 60 minutes at 37 °C. The same procedure was followed for the standard diabetes drug Metformin (positive control). The glucose adsorption capacity was determined by incubating one gram of plant crude in 100 ml solutions of different glucose concentrations (50, 100, 150, and 200 mg/dL) for six hours at 37 °C. M. indica induced 85 % glucose uptake which was 13 % higher than Metformin while A. marmelos induced a 45 % glucose uptake which was 40 % less than Metformin. The glucose adsorption by *M. indica* was 18% in the highest glucose concentration while it was only 3.8 % by A. marmelos. Thus, M. indica apparently possesses a very high antidiabetic potential by the combined effect of both glucose uptake and adsorption while A. marmelos possesses a considerable level of antidiabetic effect mainly through glucose uptake. In addition, the glucose uptake was reduced by higher concentrations of Metformin probably due to some negative physiological impact on yeast. Such an effect was not shown by plant extracts indicating low or lack of negative impacts by natural products. Further studies may pave ways for effective use of both these plants in efficient management of diabetes.

Keywords: Aegle marmelos, Anti-diabetic effect, Glucose adsorption, Glucose uptake, Mangifera indica.