



PROCEEDINGS OF 13TH ANNUAL SCIENTIFIC SESSIONS AND INTERNATIONAL CONFERENCE 2025/2026

***Ethics, Collaboration & Popularization:
Shaping Future of Laboratory Animal
Research***



24th & 25th January 2026



@ Renuka City Hotel Colombo, Sri Lanka



slalas.lk

SRI LANKA ASSOCIATION FOR LABORATORY ANIMAL SCIENCE



SRI LANKA ASSOCIATION FOR LABORATORY ANIMAL SCIENCE

***“Ethics, Collaboration and Popularization:
Shaping the Future of Animal Research”***

13th Annual Scientific Sessions and International Conference 2025/2026

24th and 25th January 2026

Renuka City Hotel Colombo, Sri Lanka

EXPERIMENTAL VALIDATION OF THE ANTIDIABETIC POTENTIAL OF A HERBAL DECOCTION USING *IN VITRO* YEAST CELL MODEL AND *IN VIVO* ZEBRAFISH (*DANIO RERIO*) MODEL

Rasanjula, L.^{1,2}, Karunathilaka, G.A.R.D.¹, Manthila, K.D.M.^{1*}, Chamodya, Y.V.A.C.¹, Rathnayaka, R.M.T.S.¹, Silva, R.D.¹, Herath, H.M.L.P.B.³, Kavindra, H.C.R.²

¹*Department of Biomedical Science, Faculty of Health Science, KIU, Sri Lanka*

²*Faculty of Medicine, University of Ruhuna, Sri Lanka*

³*Center for Advanced Materials and Devices (CAMD), Department of Chemistry, Faculty of Science, University of Colombo, Sri Lanka*

*manthilamashi@gmail.com

Diabetes mellitus is a major global health concern, and limitations of current therapies have renewed interest in traditional remedies. In traditional Sri Lankan medicine, a combination of four plants named *Terminalia arjuna* (Arjun tree), *Syzygium cumini* (Java plum), *Ficus benghalensis* (Bayan tree), and *Salacia reticulata* (Kothala himbutu) is widely used for diabetes management, but experimental evidence remains limited. This study evaluated the antidiabetic potential of this traditional four-plant combination using *in vitro* and *in vivo* models. Authenticated barks were prepared as aqueous decoctions using equal proportions following traditional methods according to the Ola leaf manuscripts. Safety was assessed via zebrafish embryo toxicity assay according to OECD 236 guidelines. *In vitro* activity was evaluated through glucose uptake in *Saccharomyces cerevisiae* (yeast). Type 2 diabetes was induced in adult zebrafish by graded glucose immersion (20 → 111 mM over four weeks). Diabetic fish were treated with the decoction, metformin (positive control), and left untreated (negative control) for 14 days. Fasting blood glucose was measured using a glucometer. All adult zebrafish procedures were conducted under ethical approval. Data were analysed using one-way ANOVA followed by post-hoc multiple comparisons. The zebrafish embryo toxicity assay revealed an LC₅₀ of 1000 µg mL⁻¹. In the yeast glucose uptake assay, the decoction significantly reduced uptake, and the uptake percentage is 58.77%, compared with 88.16% in the negative control and 33.19% in the metformin-treated sample. In adult zebrafish, fasting glucose rose from 57.10 ± 4.6 mg dL⁻¹ (non-diabetic) to 206.75 ± 5.1 mg dL⁻¹ after diabetes induction. Treatment with the decoction lowered glucose to 58.2 ± 3.0 mg dL⁻¹ while the positive control (metformin) lowered to 58.0 ± 1.9 mg dL⁻¹ (p < 0.01). The decoction demonstrated potent antidiabetic activity *in vitro* and *in vivo*, with low toxicity, validating its traditional use and highlighting it as a safe and promising alternative for type 2 diabetes. Further studies in mammalian models are required to explore mechanisms and therapeutic value.

Keywords: Antidiabetic activity, Glucose uptake assay, Herbal decoction, Traditional medicine validation, Zebrafish (*Danio rerio*) model