

Executive Summary of UGC Minor Research Project

Title: Evaluation of Ethyl 2-[5-(acetyloxy) pentyl] benzoate Isolated from *Origanum majorana* Linn in the Treatment of Diabetes-Induced Hyperlipidemia and Obesity

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SUMMARY

The present study aimed at treatment of Diabetes-Induced Hyperlipidemia and Obesity. Ethyl 2-[5-(acetyloxy) pentyl] benzoate was isolated from the leaves of *Origanum majorana* Linn (Family: Lamiaceae). The isolated compound was purified and characterized using advanced analytical instruments. The leaves of *O. majorana* are proven exhibit potent antidiabetic, antiulcer and antioxidant effect in rats. Diabetes is commonly associated with hyperlipidemia and cardiovascular complications.

Ethyl acetate fraction of *O. majorana* was subjected to chromatographic separation for isolation of ethyl 2-[5-(acetyloxy) pentyl] benzoate. The isolated compound was studied for its antidiabetic properties and found to reduce the STZ-nicotinamide induced elevation in blood glucose level. Subsequently, the compound was also tested for its glucose uptake potential in comparison with pioglitazone. The glucose uptake was significantly elevated in the isolated rat hemidiaphragm compared to pioglitazone. Moreover, the molecular docking studies of isolated ethyl 2-[5-(acetyloxy) pentyl] benzoate revealed similar ligand-amino acids interactions as that of pioglitazone and PPAR- γ receptor. The compound ethyl 2-[5-(acetyloxy) pentyl] benzoate could be exerting its effect by modulating the PPAR- γ receptors.

The antihyperlipidemic property was assessed by comparing various serum triglyceride levels and their proportions. Our studies revealed that ethyl 2-[5-(acetyloxy) pentyl] benzoate exhibited moderate antihyperlipidemic property when compared against statins.

The molecular properties of ethyl 2-[5-(acetyloxy)pentyl] benzoate such as; molecular weight (278.3 Da), molar refractivity (77.14 cm³), log P (3.15), number of hydrogen bond Donors (0), number of hydrogen bond acceptors (4) are all in accordance with the "Lipinski's

rule of five". These parameters strongly suggest the 'druglikeness' of ethyl 2-[5-(acetyloxy)pentyl] benzoate.

However, detailed SAR studies of ethyl 2-[5-(acetyloxy) pentyl] benzoate can prove to be beneficial in generation of a potent hypolipidemic drug and minimize the adverse effects associated with statins.