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ANTI-HYPERGLYCEMIC EFFECT OF THE EXTRACTS OF ALLIUM SATIVUM BULBS GROWING IN SUDAN: WITH AND WITHOUT METFORMIN DRUG IN DIABETES TREATMENT

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Statement of the Problem: Diabetes is now one of the major health problems prevailing in the world. Diabetic people have been treated with conventional synthetic drugs for a long time result in many side effects. Therefore, the search for more effective and safer anti-diabetic agents derived from plants has become an interest area of active research. Today millions of people use herbs either with prescription and non-prescription medications; the increasing use means that there is potential for more interactions between herbal products and conventional medicines; causing either potentially dangerous side effects and/or reduced benefits from the medication. As the incidence and severity of herb-drug interactions is increasing due to a worldwide rise in the use of herbal preparations, more research regarding herb-drug interactions are needed. The purpose of this study is to investigate the hypoglycemic effect of *Allium sativum* bulbs growing in Sudan, and to determine their interaction with metformin drug used in diabetes treatment.

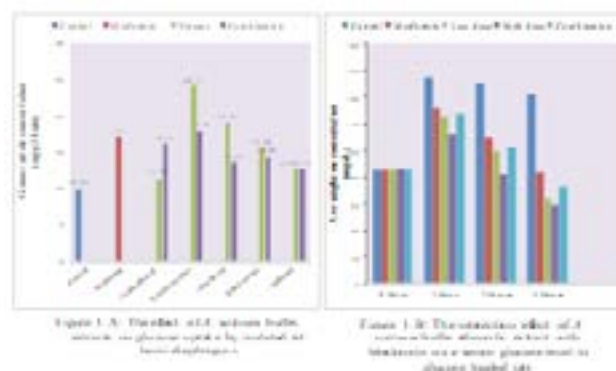
Methodology: The Soxhlet apparatus was utilized during extractions. The hypoglycemic effects were evaluated *in vitro* and *in vivo* by glucose reuptake using isolated rats hemi-diaphragms tissue and by estimate glucose tolerance in glucose-loaded Wistar rats. GC-MS was used for chemical analysis.

Findings: The *A. sativum* extracts in this study have *in vitro* hypoglycemic effect on rat's hemi-diaphragms tissue. Petroleum ether extract has the highest effect, even more than metformin due to the presence of well-known anti-diabetic compounds; its

effect was reduced following metformin combination. Chloroform extract has activity less than petroleum ether, but still more than metformin; its combination also showed an antagonistic action. The ethyl acetate extract effect is less than chloroform and was reduced with combination. Methanolic extract has less activity than ethyl acetate and was not affected with combination. The lowest effect was obtained when ethanoic crude extract was used; combination potentiates its effect but is still less than metformin. Petroleum ether extract has *in vivo* hypoglycemic effect greater than metformin drug; decreased with metformin combination.

Conclusion & Significance: The extract alone was significantly anti-diabetic agent; the effectiveness was decreased with Metformin combination.

Recommendations: Further studies are required to elucidate the mechanisms of interactions.



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Medicinal Plants****Recent Publications**

1. Sandhya Mamindla, Prasad K V S R G and Bharathi Koganti (2016) Herb-drug interactions: an overview of mechanisms and clinical aspects. *International Journal of Pharmaceutical Sciences and Research* 7(9):3576–86.
2. Hayder Elthaheer T E, Wahab Hassan Hamed, Ahmed Saeed Kabbashi and Mohammed Ahmed Abass (2015) The effect of *Maerua pseudopetalosa* ethanolic extract on glucose tolerance and glucose uptake in rat hemidiaphragm. *International Journal of Multidisciplinary Research and Development* 2(11):359–62.
3. Abas H J Hussin (2001) Adverse effects of herbs and drug-herbal interactions. *Malaysian Journal of Pharmacy* 2:39–44.
4. Awad Mohamed Ahmed and Nada Hassan Ahmed (2001) Diabetes mellitus in Sudan: the size of the problem and the possibilities of efficient care. *Practical Diabetes Int* 18(9):324–327.
5. Williamson E (2001) Synergy and other interactions in phytomedicines. *Phytomedicine* 8:401–409.

Biography

Ikram Mohamed Eltayeb has her expertise in evaluation and passion in research, search and discovery of natural drugs from plant origin. Her open and contextual evaluation model based on responsive constructivists creates new drugs for improving and treating of chronic diseases. She has built this model after years of experience in research, evaluation and teaching of medicinal plants in universities.

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