

Antidiabetic Effects of Essential Oils of some Selected Medicinal Lamiaceae Plants from Yemen against α -Glucosidase Enzyme**Ya'ni AA¹, Eldahshan OA^{2*}, Hassan SA¹, Elwan ZA¹ and Ibrahim HM³**

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Essential oils of four species used in traditional medicine in Bani Matar District in Yemen, family Lamiaceae were assessed chemically and biologically for their antidiabetic activity; *Leucas inflata*, *Marrubium vulgare*, *Salvia schimper* and *Origanum majorana*. The results indicated that *Salvia schimper* essential oil exhibited the most dose-dependent inhibitory activity against α -glucosidase enzyme with IC₅₀ of 14.26 μ L (nearly similar to acarbose of IC₅₀ 12.87 μ L) followed by *Marrubium vulgare* oil with IC₅₀ value at 35.47 μ L. *Leucas inflata* essential oil exhibited weak dose-dependent inhibitory activity against α -glucosidase enzyme with IC₅₀ of 159.66 μ L and no effect was observed with *Origanum majorana*. The antidiabetic activities observed was due to the presence of compounds such as caryophyllene, bisabolol and farnesene. Our results obviously cleared that essential oils of *Salvia schimper* and *Marrubium vulgare* exerted promising antidiabetic effects so; we recommended using such as oils as future natural antidiabetic. Traditional medicines are used by about 60% of the world's population. These are not only used for primary health care in rural areas in developing countries, but also in developed countries as well where modern medicines are predominantly used. The genera of *Leucas*, *Marrubium*, *Salvia* and *Origanum*, which belongs to the family Lamiaceae, play an important role in folk medicine, cosmetics, culinary, and for the commercial production of essential oils. It is considered as a significant resource for traditional medicine in Yemen which is used to cure diseases related to kidney disease, diabetes, cough, wounds, stomachache, dysentery, diarrhea etc.

Diabetes mellitus is a major and emerging public health problem all over the world. It is growing at an alarming rate and is considered as the fifth leading cause of death in the world. The first WHO Global report on diabetes demonstrates that the number of adults living with diabetes has almost quadrupled since 1980 to 422 million adults. This dramatic rise is largely due to the rise in type 2 diabetes and factors driving it include overweight and obesity. In 2012, diabetes caused 1.5 million deaths. Its complications can lead to heart attack, stroke, blindness, kidney failure and lower limb amputation. WHO estimates that, globally, 422 million adults aged over 18 years were living with diabetes in 2014. According to the World Health Organization (2016), 2% of the mortality percentage in Yemen is due to diabetes. Inhibition of α -glucosidase is an important factor to control postprandial hyperglycemia in type 2 diabetes mellitus and the uses of medicinal plants are recommended by World health organization, particularly for patient in rural regions of poor countries who are unable to purchase the synthetic medication. Therefore, extensive research has been directed toward the use of medicinal plants to control DM and its complications. Recently there has been some research works on the chemical composition, antioxidant and antimicrobial activities of essential oils of the four mentioned plants. However, to the best of our knowledge there is no information on the antidiabetic properties of these essential oils. So, this study was designed to investigate both the chemical constituents and the antidiabetic properties of the essential oils isolated from *Leucas*, *Marrubium*, *Salvia* and *Origanum* leaves.