

## Review Olive Leaves as Anti-diabetic

Rabyah B. Ali<sup>1\*</sup>, Jeffrey Victorino de Jesus<sup>2</sup>, Safya Abdulhamid Ammer<sup>1</sup>

<sup>1</sup>Faculty of Nursing Surman, Sabratha University, Libya

<sup>2</sup>Masters Degree - University of La Salée

Asian Journal of Complementary and Alternative Medicine. Volume 07 Issue 1

Published on: 10/09/2019

\*Author for Correspondence: Rabyah B. Ali<sup>1</sup>, Faculty of Nursing Surman, Sabratha University, Libya, Tel: +971501603171 E-mail: rabyah2010@yahoo.com.

Cite this article as: Ali RB, de Jesus JV, Ammer SA. *Review Olive Leaves as Anti-diabetic*. Asian Journal of Complementary and Alternative Medicine, Vol 7 (1), 9-11:2019.

### INTRODUCTION

As a normal person, one would eat a regular meal consisting of bread (carbohydrate), meat (protein), oil (fat) and some vegetable and fruit full of vitamins and minerals would do. The food would be digested into its building blocks in alimentary tract to be able to be absorbed by small intestine's absorptive tips into the blood stream so that cells can use it properly. Food's building blocks are glucose for carbohydrate, amino acids for protein and fatty acids for fat.

Once in the blood stream and its level are raised, glucose in particular would be taken by the different cells of the body as it constitutes the main source of energy. Sugar alone though cannot go in the cells directly, instead, postprandial elevated blood glucose level represents an excellent signal by which pancreas releases the hormone insulin to the blood stream. Insulin will then attach themselves to the cell and signals it to absorb sugar. Without the message of insulin, cells would not be able to open up and let sugar enter the cell. Excess glucose is to be stored in the form of polymer (glycogen) in liver, muscles also store up glycogen while excess carbohydrates which was consumed by the body but is over what the liver and muscles can store are then converted to and stored as fat.

What would happen if insulin is not there after meal or if it is not effective enough to direct glucose to its supposed destination? Simply, glucose would accumulate (hyperglycaemia) in the blood without being used by cells (no, or not effective insulin to tell about it), cells would look for another source of energy. Cells would convert fat from lipid-rich tissues and protein from muscles into glucose, thinking that there is no glucose in the blood, cells will catabolize the body for no point for the fact that they would not be able to take up the converted glucose (remember, no active insulin) and things keep getting worse with subsequent loss of body weight and general fatigue [1].

Diabetes mellitus is one of the oldest and common chronic diseases in all countries. The number of people increase as a consequence of life style changes involving the lack of physical activities and directly mirrors the increase in obesity [2].

It is a complex disease which can affect most of the body's organs and also cause renal failure, blindness, premature mortality, stroke, cardiovascular disease, peripheral vascular disease, perinatal mortality, congenital malformation and disability [3].

India, Korea, Japan and China are Asian countries where traditional herbal medicines and remedies have been recognized [4]. Some parts of plants have been used as traditional medicine in treating diabetes mellitus; one of them are Olive leaves.

### OLIVE LEAVES

It is a part of Olive trees (Saidun) as is known commonly, is native to the Mediterranean. Their leaves are narrow and elongated, dusty-green on top and silvery-white underneath.

They have several bioactive compounds; extracts of methanol contain flavonoids which include kaempferol, apigenin and luteolin, phenolic such as tyrosol, caffeic acid and hydroxytyrosol [5] and also contain secoiridoids such as ligostroside, dimethyl oleuropein, oleuropein and oleoside [6]. Due to these compounds, they may have antihypertensive, [7-9] hypocholesterolemic [10] hypothyroidism [11], antimicrobial [12,13,14], Antiarrhythmic [15] antiviral [16,17], anti-inflammatory effects on a person [18].

Olive leaves have been used in traditional medicine as hypoglycemic agent in many countries. In 2012 researchers reported that water decoction of Olive Leaf reduces blood glucose in normal and Alloxan diabetic rats [19]. The university of Egypt researchers reported that Olive and

Morus Alba Leaves extracts improved the blood glucose level, albumin, total protein and creatinine of diabetes rats [20] and this study supported by researchers who investigated that the doses of 16 and 32 mg/kg decreased blood glucose level and increased peripheral uptake of glucose as the same dose [21]. Furthermore, another study reported that luteoin and oleanolic acid compounds have been shown to have inhibitory effect on postprandial glucose increase in diabetic rats [22]. Like the other tests, Eidi, A et al [23], reported that *Olea europaea* L have antidiabetic activity in normal and diabetic rats and their extract also decreased lipids, uric acid, creatinine, and liver enzymes. Jemai H et al. [24] also reported that hydroxytyrosol and Oleuropein from Olive leaves have antidiabetic and antioxidant activity while Wainstein, J et al [25]. Evaluated the effect on glucose metabolism in diabetic human subjects and the mechanism in animal of olive leaf extract.

In 2011 some researchers reported the most abundant polyphenol in olive leaves is oleuropein, which accounts for approximately 20% of phenolic compounds in the olive leaf, which has been shown to suppress improved insulin secretion in H<sub>2</sub>O<sub>2</sub>-exposed cells [26]. Al-Azzawie and Alhamdani [27], likewise, reported that oleuropein has antioxidant and hypoglycemic activity in alloxan – diabetic rabbits.

## CONCLUSION

The current reviews of olive leaves on diabetic activity, for the toxicity on the animal showed researchers investigated no toxicity and appear to be quite safe at 1g/kg body weight (Petkov and Manolov [13] and on the human cells showed that no toxicity at 1mg/ml of the extract [15]. From most of the studies that have been mentioned it is appear to have antidiabetic activity.

## REFERENCES

1. Sonksen, P. H., Fox, C. & Judd, S. *Diabetes: The at Your Fingertips Guide*, Class Publishing (London) Ltd. pp,2003; 62-96.
2. Shaw, J. E., Sicree, R. A. & Zimmet, P. Z. Global estimates of the prevalence of diabetes for 2010 and 2030. *Diabetes Research and Clinical Practice*, 2010;87, 4-14.
3. Michael, M.L and Linda, S.G. 2000. The Burden of Diabetes Mellitus. Marcel Dekker, Inc. New Yourk 1-3
4. Dzulkifi, A.R., Aishah, A.L., Rahmat, A.M., Isa, A.M., Abas, H.H. and Abu baker, M., Development of a plant information system. Present at the international conference on the use of traditional medicine and other natural products in health-care, Penang, Malaysia,1993; 8-11.
5. Chiou A, Salta FN, Kalogeropoulos N, Mylona A, Ntalla I, Andrikopoulos NK. Retention and distribution of polyphenols after pan-frying of French fries in oils enriched with olive leaf extract. *Food Science*. 2007;72:S574-84.
6. EI SN, Karakaya S. Olive tree (*Olea europaea*) leaves: potential beneficial effects on human health. *Nutrition Review*. 2009;67:632-8.
7. Susalit, E.; Agus, N.; Effendi, I.; Tjandrawinata, R.R.; Nofiarny, D.; Perrinjaquet-Moccetti, T.; Verbruggen, M. Olive (*olea europaea*) leaf extract effective in patients with stage-1 hypertension: Comparison with captopril. *Phytomedicine* **2011**, *18*, 251-258.
8. Zhao, Y.Y.; Wang, J.K.; Balleve, O.; Luo, H.L.; Zhang, W.G. Antihypertensive effects and mechanisms of chlorogenic acids. *Hypertens. Res.* **2012**, *35*, 370-374.
9. Khayyal MT, el-Ghazaly MA, Abdallah DM, Nassar NN, Okpanyi SN, Kreuter MH. Blood pressure lowering effect of an olive leaf extract (*Olea europaea*) in L-NAME induced hypertension in rats. *Arzneimittelforschung*.2002; 52:797-802.
10. Fki I, Bouaziz M, Sahnoun Z, Sayadi S. Hypocholesterolemic effects of phenolic-rich extracts of Chemlali olive cultivar in rats fed a cholesterolrich diet. *Bioorganic & Medicinal Chemistry*. 2005;13:5362-70.
11. Al-Qarawi A A, Al-Damegh MA, ElMougy SA. Effect of freeze dried extract of *Olea europaea* on the pituitary-thyroid axis in rats. *Phytother Res* 2002;16:286-287.
12. Markin D, Duek L, Berdicevsky I (2003). 19. In vitro antimicrobial activity of olive leaves. *Mycoses*. 46:132-136.
13. Petkov V, Manolov P. Pharmacological analysis 42. of the iridoid oleuropein. *Arzneimittel forschung* 1972;22:1476-1486.
14. Somova L.I, Shode F.O, Ramnanan P, Nadar A. Antihypertensive ,antiatherosclerotic and antioxidant activity of triterpenoids isolated from *olea europaea*, subspecies *Africana* leaves. *Journal of Ethnopharmacology*.2003; 84:299-305.
15. Lee-Huang S, Zhang L, Huang PL, et al. Anti-HIV 16 activity of olive leaf extract (OLE) and modulation of host cell gene expression by HIV-1 infection and OLE treatment. *Biochem Biophys Reserch Commun* 2003. 307:1029-1037.
16. Micol V. Caturla N, Perrz-Fons L, et al. The olive leaf extract exhibits antiviral activity against viral haemorrhagic septicaemia rhabdovirus (VHSV) *Antiviral Res* 2005;66:129.136.
17. Pereira A.P, Ferreira I.C.F.R, Marcelino F, Valentao P, Andrade P.B, Seabra R, Estevinho L, Bento A, Pereira J.A. Phenolic Compound and Antimicrobial Activity of Olive (*Olea europaea* L.Cv.*Cobrançosa*) leaves. *Journal of Molecules*2007. 12, 1153-1162.

18. Ahmed Abu-zaiton, Mariam Abu-Albasal. Water Decoction of Olive Leaf Reduces Blood Glucose in Normal and Alloxan Diabetic Rats. *International Conference on Medical, Biological and Pharmaceutical Sciences* 2012.
19. Omer S.L. Al-Janabi, Amer M.S, Khayri M.H. Effects of the extracts of Olive and Morus Alba Leaves on Experimentally STZ Induced Diabetes in Male Rats. *International Journal of Science and Research* 2013.
20. Gonzalez M. Zarzuelo A, Gamez MJ, et al. Hypohlycemic activity of olive leaf. *Planta Med* 1992;58:513-515.
21. Komaki E, Yamaguchi S, Maru I, et al. Identification of ant-alpha-amylase compounds from olive extracts. *Food sci Technol Res* 2003;9:35-39.
22. EI SN, Karakaya S. Olive tree (*Olea europaea*) leaves: potential beneficial effects on human health. *Nutrition Review* 2009. 67:632-8.
23. Jemai H, Bouaziz M, Fki I, El Feki A, Sayadi S. Hypolipidimic and antioxidant activities of oleuropein and its hydrolysis derivative-rich extracts from Chemlali olive leaves. *Chemico- Biological Interactions* 2008. 176:88-98.
24. Julio W, Tali G, Mona B, Yosef B D, et al. Olive Leaf Extract as a Hypoglycemic Agent in Both Human Diabetic Subjects and in Rat. *Journal of Medical Food* 2012.
25. Cumaoglu A, Rackova L, et al. Effects of olive leaf polyphenols against H<sub>2</sub>O<sub>2</sub> toxicity in insulin secreting  $\beta$ -cells. *Acta Biochim Pol* 2011; 58:45-50.
26. Al-Azzawie HF, Alhamdani MS. Hypoglycemic and antioxidant effect of oleuropein in alloxandiabetic rabbits. *Life Science*.2006;78:1371-7.
27. Petkov V, Manolov P. Pharmacological analysis 42. of the iridoid oleuropein. *Arzneimittel forschung* 1972;22:1476-1486.