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Treatment of HFD induced diabetes mellitus by Metformin and natural products in rats

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Background & Aim: *Asphodelus microcarpus* widely distributed over the coastal Mediterranean region. Traditionally used in the treatment of diabetic conditions. The aim of the present investigation was to evaluate the antioxidant, anti-hyperlipidemic and anti-diabetic activity of ethyl acetate extract taken from *Asphodelus microcarpus* (Asphodelaceae).

Methods: Ethyl acetate extract taken from *Asphodelus microcarpus* tubers used for the study. Chemical tests of different extract, diabetic profile, lipid profile, kidney and liver functions, anti-oxidant and anti-inflammatory parameters were performed. Diabetes was induced in rat by HFD feed for 10 weeks. The rats were divided into following groups: Group-I: Normal control, Group-II (Vehicle): Diabetic control, Group-III: Diabetic rats (AM 10 mg/kg), Group-IV: Diabetic rats (AM 10 mg/kg+MET 100 mg/kg), Group-V: Diabetic rats (AM 20 mg/kg), Group-VI: Diabetic rats (AM 20 mg/kg+MET 100 mg/kg), and Group-VII: Diabetic rats (MET 100 mg/kg). Bodyweight of each rat in the different groups was recorded daily. Biochemical and antioxidant enzyme parameters were determined on day 16.

Results: The ethyl acetate extract of AM shown better glucose utilization and insulin resistance improvement. Oral treatment of different doses of AM tubers extract alone and/or with metformin decreased the level of serum glucose, activity of liver alpha glucosidase, activity of pancreatic alpha amylase, MDA, CRP and leptin. Treatment showed increased level of plasma insulin, Catalase, glutathione peroxidase, liver GSH, total antioxidant capacity. HFD induced diabetes groups rat treated with different doses of AM tubers extract and metformin significantly increased muscle glucose transporter 4 (GLUT4) and remarked regenerative effect on the liver, kidney and pancreas.

Conclusion: The antioxidant, anti-hyperlipidemic and anti-diabetic effect of ethyl acetate extract from *Asphodelus microcarpus* suggests a potential therapeutic treatment to anti-diabetic conditions.

Biography

Gamal Mostafa Mahmoud has completed his Diploma in Analytical Chemistry, Bachelor's degree in Biochemistry Sciences and Master's degree in treatment for diabetes by combination therapy from Alexandria University, Egypt.

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