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EFFECT OF *DAPHNE MUCRONATA* ON ALKALINE PHOSPHATASE ENZYME AND GLUCOSE IN DIABETIC RABBITS

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ABSTRACT

The present study was designed to evaluate the antidiuretic potential of the aqueous leaves extract of the *D. mucronata.* Anti- diabetic potential of *D. mucronata* extracts (methanol) has been assessed in alloxan monohydrate diabetic induced rabbits. The extracts were given orally by 8 hours. The dose rate was 12 mg, 125mg, 225 mg and 325mg/kg body weight respectively. At every 2 hours blood sample was collected, serum separated and glucose level was determined by kit method. The result suggests that the treatment of 325 mg/kg body weight significantly ($p<0.05$) decreased blood glucose and ALP level at 143 mg/dl and 242.66 mg/dl in the experimental group. Therefore, it is concluded that the *D. mucronata* possess significant anti-diabetic activity.

Keywords: Diabetic mellitus, *D. mucronata* alloxan monohydrate, glucose

Introduction

Diabetes mellitus is one of the most common chronic health problems in the world. As currently available antidiuretic medications have limitations in terms of safety, efficacy, and cost, it is an important research area to investigate medicinal plants for new antidiuretic compounds that can lead to effective, safe and less costly pharmacotherapy (Belayed et al., 2019). *Daphne mucronata* Royle is a plant belongs to the family Thymelaeaceae. Leaves of this plant are poisonous. The plant possesses insect repulsive abscesses for sore. The glue from leaves is used for muscular and nerve troubles. Plant poultice is applied for rheumatism and sweeping. The roots and shoots of *D. mucronata* Royle are anthelmintic. These are used in treatment of gonorrhea. Fruits are used for eating purposes, to treat eye problems, to cure skin. These are considered as remedy for face freckles, ticks and are also involved in coloring leather .Wood is used as firewood and used in preparation of gun powder charcoal (Ashraf et al., 2018). The present study was done to evaluate the antidiuretic and ALP reducing activities of methanolic extract of *Daphne mucronata* Royle in experimental rabbits.

Materials and methods

Selection of the plant:

D. mucronata is present throughout the mountainous areas of Khyber Pakhtunkhwa.

Collection of Plant:

D. mucronata was collected from Village Golain District Chitral.The plant extract was prepared in methanol solvent.

Selection of Animals for the experiment:

The animal group Rabbits (*Oryctolagus cuniculus*) were selected for the conduction of this experiment upon them. 20 numbers of rabbits were purchased by the local supplier. Rabbits were divided in to five groups after induction of diabetes with alloxan monohydrate beside the normal group.

Administration of Extract

Group A was kept as untreated group.i.e control group.

Group B was treated with glucophage at the dose rate of 12 mg/kg body weight.

Group C was treated with plant extract of *Vigna radiata* at dosage of 125 mg / kg body weight.

Group D was treated with *Vigna radiata* extract at dosage 225 mg/ kg body weight.

Group E was treated with *Vigna radiata* extract at dosage 325 mg/ kg body weight.

Blood Sample Collection

From the marginal veins at the back of ear, blood was obtained in Zero hours, Two hours, four hours, six hours and eight hours simultaneously and was analyzed through Double Beam UV Spectrophotometer.

Results

Group B was given Glucophage (Glibenclamide) for regular 8 hours at the interim of zero hrs, 2 hrs, 4hrs, 6 hrs and 8 hrs. At the last of the process of treatment, the glucose and ALP level of Group B was recorded as 185 mg/dl and 237 mg/dl respectively.

Table 1: Blood glucose level (mg/kg) in alloxan induced diabetic rabbits.

	0 hr Reading	**2 hr Reading**	**4 hr Reading**	**6 hr Reading**	**8 hr Reading**
Untreated Group	89.66	96.33	95.33	92	95
Diabetic Control + Glibenclimide (12 mg/kg)	288	288.33	265	207.33	185.66
Diabetic + Methanolic Extract (125 mg/kg)	378	342.66	312.66	305.33	315
Diabetic + Methanolic Extract (225mg/kg)	303.33	292	266.66	255	233.33
Diabetic + Methanolic Extract (325 mg/kg)	198.66	190.33	181	179.66	143

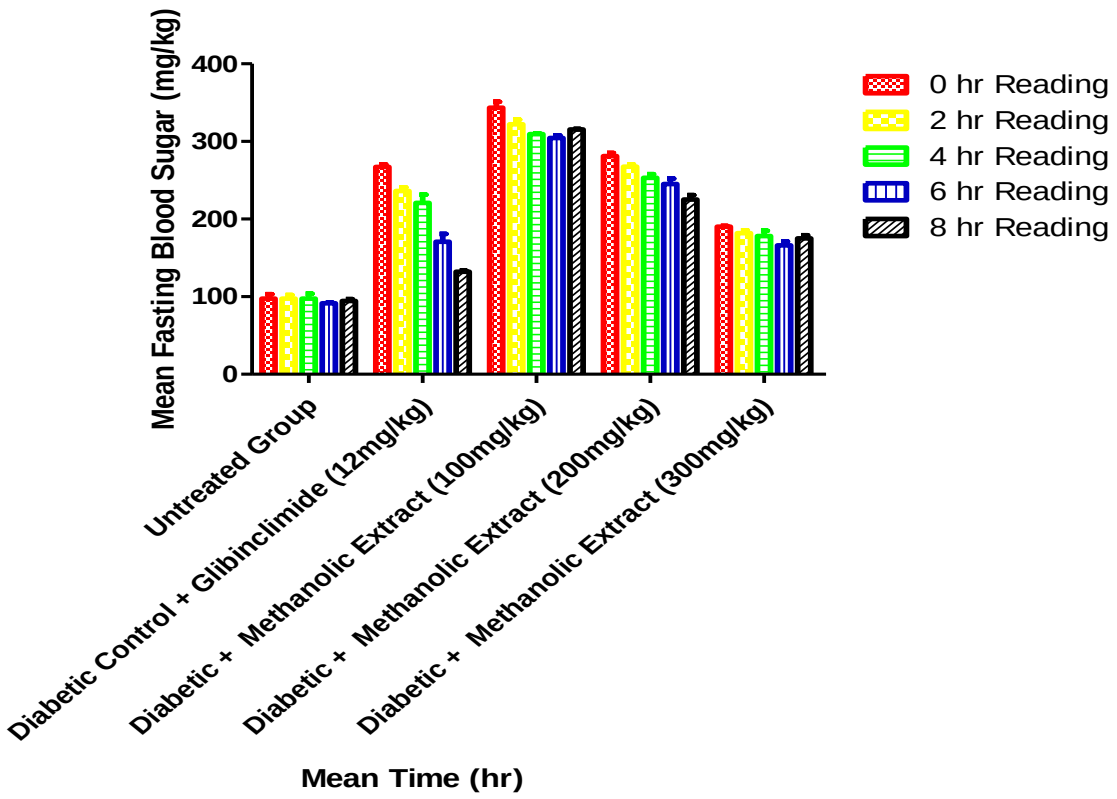

Figure-1.Blood glucose level of Rabbits

Table 2: Blood ALP (14/L) 1eve1 in alloxan induced diabetic rabbits.

	0 hr Reading	2 hr Reading	4 hr Reading	6 hr Reading	8 hr Reading
Untreated Group	51	51.66	51.33	49.33	49.66
Diabetic Control + Glibenclimide (12 mg/kg)	329.66	336.54	336	305.66	237
Diabetic + Methanolic Extract (125 mg/kg)	334.33	326.33	343.66	320	337.66
Diabetic + Methanolic Extract (225mg/kg)	313.66	316.66	329.66	317.33	322.66
Diabetic + Methanolic Extract (325 mg/kg)	305.33	311.66	267	256	242.66

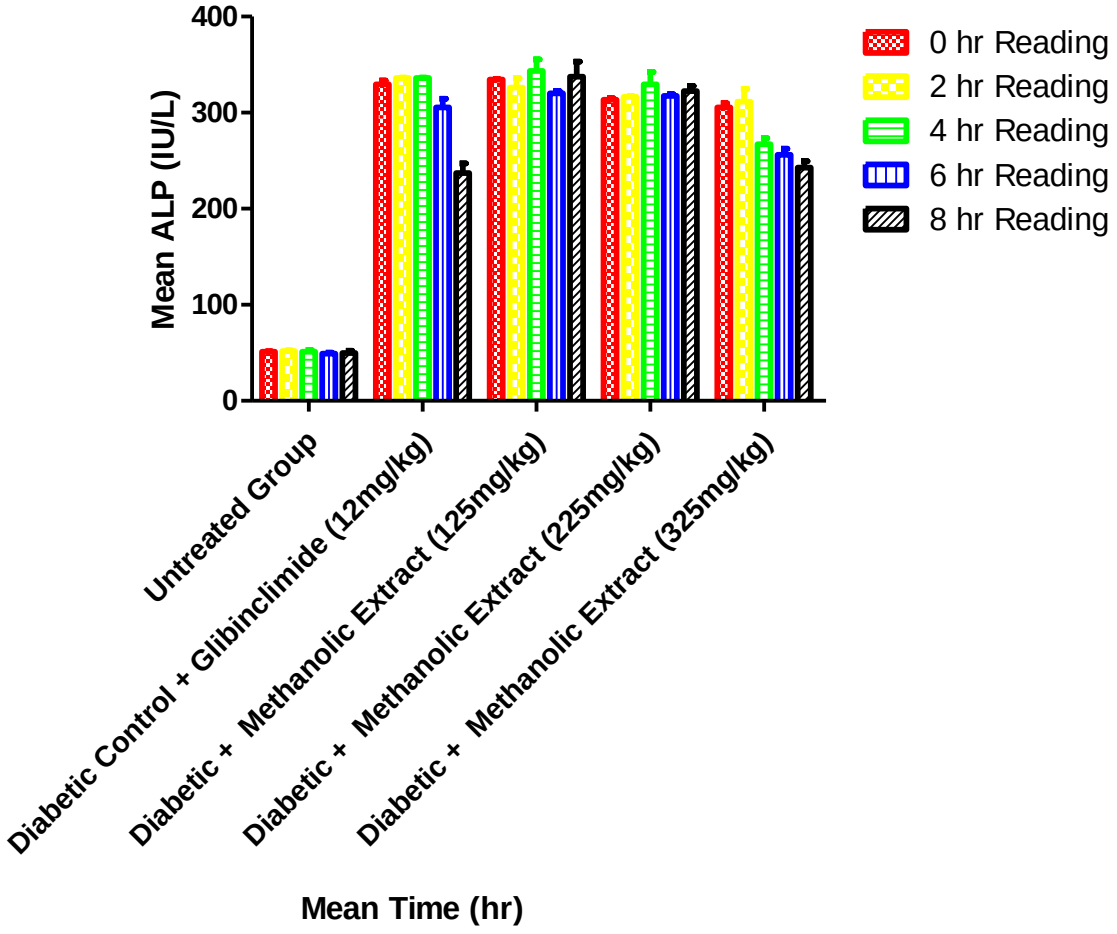

Figure-2. Showing b1ood ALP (14/L) 1eve1 of Rabbits.

Group C was kept on *Daphne mucronata* plant's extract at dosage of 125 mg/dl for continuous 8 hrs at the interim of zero hrs, 2hrs, 4hrs, 6hrs and 8 hrs. At the last of the process of treatment, the glucose and ALP level of Group C was recorded as 315 mg/dl and 337.66 mg/dl respectively.

Group D was treated with plant extract of *Daphne mucronata* at dosage of 225 mg/kg for continuous 8 hrs at the interim of zero hrs, 2 hrs, 4hrs, 6 hrs and 8 hrs. At the last of the process of treatment, the glucose level and ALP of Group D was recorded as 233 mg/dl and 322.66 mg/dl respectively.

Group E was treated with plant extract at the dose rate of 325 mg/kg for regular 8 hrs. It was given at the interval of zero hrs, 2 hrs, 4 hrs, 6 hrs and 8 hrs. At the last of the process of treatment, the glucose and ALP level of Group E was recorded as 143 mg/dl and 242.66 mg/dl respectively.

DISCUSSION

A1loxan monohydrate when induced to the rabbits, the pancreatic β cells become destroyed and the blood insu1in 1eve1 increase and glucose level also increase. After the treatment by the Daphne (extract) in Methanol, the new generati0n of the cell occurred hence after 70-80 hours the rate of the pancreatic cell formation reach to the maximum and observed to be functioning and producing insu1in. It you cleared that this extract have significant g1ucose lowering effect a long with lowering effect in inc1uded rabbits, a1so there we have mobi1ity of fats in their blood that and 1ames from the fat depots in the body. Serum g1ucose 1eve1 maintenance of p1ants hormone and human may tolerate the affection of maintenance. In *Daphne muconata* diabetes a1so disturbed the blood purifying 0rgans resu1ting blood urea leve1 moves ahead. The group observed to reduced urea 1eve1 treated with methanol extract. In such a patient suffering from diabetes have reduced uric acid level which is the important Antioxidant blood component, the extract act in this situation it increase the uric acid level. Different abnorma1 processes occurred due to diabetes and 1ead to weight loss so after the dosage of the extract (methanol) the weight gain is comes to the possibi1ity enhancing body metabolism correction after this experiment it can be stated that the *Daphne mucronata* methano1 extract has anti diabetic activity. Ashraf, I., Zubair, M., Rizwan, K., Rasool, N., Jamil, M., Khan, S. A., … Jaafar, H. Z. (2018).

Conclusion:

This study indicates that the *Daphne mucronata Roye1* extracts possess significant anti-hypocholestrolemic activity. It a1so has antioxidant potentia1 for oxidative stress produced by diabetes. Mainly the used for anima1s and p1ian area the active princip1e (s) in the extracts may have better performance in purified form.

Recommendations:

1. A p1ant is recommended for the medicina1 uses.

2. The p1ant is recommended for pharmaceutical industries to iso1ate pure compound.

3. The p1ant is recommended for further research work.

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