



RESEARCH ARTICLE

IN VIVO HYPERGLYCEMIC EFFECT OF *FAGONIA CRETICA LINN* ETHANOLIC EXTRACTS ON ALBINO RATSOmer Abbas Mohamad Jahala^{1*}, Omer Musa Izzeldin², Rashid Eltayeb Abdalla³¹ Faculty of Medical Laboratory science, Shendi University, Sudan.² Faculty of Science and Technology .Omdurman Islamic University, Sudan.³ Faculty of Medicine and Surgery, SHENDI UNIVERSTY, Sudan.³ Faculty of Pharmacy, Ahfad University for Women, Sudan.

Received 20 August 2014; Accepted 31 August 2014

ABSTRACT

The use of the plants as medicines is an ancient and reliable practice. *Fagonia Cretica linn* is well known herbal plant used in traditional medicine of Pakistan, India and Far East, it is reputed to obtain a profitable therapeutically, properties and it has been used in treatment of fever, thirst, vomiting, dysentery, asthma, urinary discharges, and liver troubles. Externally applied as a paste on tumors and other swellings of the neck. Reported to possess potent antibacterial properties against pathogenic organisms, also the scientific studies of the plant proved the presence of hematological, neurological, anticancer, and hepato- activity. The present study targeted study of the effect of the plant on blood glucose level, the study revealed a dose dependant effect on blood glucose level by *Fagonia cretica linn* starting from the dose (300 mg/kg body wt), The ethanolic extract of *Fagonia cretica linn* in doses of (100, 300 & 600 mg/kg/body weight) has an increasing effect on the fasting blood glucose.

Keywords: *Fagonia cretica linn*, extraction, hyperglycemia.**INTRODUCTION:**

Life and diseases go together: Where there is life, diseases are bound to exist. Dependency and sustainability of man and animal life has been revolving around plants through uses as foods, fibers and shelter, but also plants have been used to control and ease diseases, therefore the use of the plants as medicines is an ancient and reliable practice¹.

(Family: Zygophyllaceae**Botanical description:**

Is a small spiny under shrub, mostly found in dry calcareous rocks throughout Pakistan². It is reputed to be a medicinal plant in scientific and folkloric literature and its medicinal values are well documented³.

Vern names: (Ar) Umm Showeika, Sholib, UmmShok.

Family: Zygophyllaceae.**Habitat:** Sandy hills (Quos), low land plains.**Distribution:** In Sudan: ElMazroub, also widespread throughout Northern and central Sudan.⁴ It is present abundantly in Shendi region.

Universally: It is found in India, Pakistan, China, Bangladesh and Egypt

The medicinal properties of the plant:

Are attributed to its variety of active phytochemical constituents. In the last fifteen years, this plant and related species have been investigated mainly for the presence of flavonol and terpenoid glycosides. Most of the flavonol glycosides have been isolated from various Egyptian *Fagonia species* and their phylogenetic affinities have also been investigated⁵. Several saponin glycosides have been separated and characterized⁶. Other constituents, such as docosyl docosanoate from hexane extract and water soluble proteins from aqueous extract of air-dried *F. cretica* plants have been isolated. Furthermore nahagenin. (hederagnin, ursolic acid and pinitol from other *Fagonia species* have also been separated and characterized.⁷ antimicrobial activity of its flavonoid compounds has been explored previously . while the nutritive values of it and of other species growing wild in the Rajasthan region of India, have also been evaluated.⁸

MATERIALS AND METHODS:

Place of the study: This study was conducted in Omdurman Islamic University laboratories, Khartoum state, Sudan 2013.

Plant material collection, identification, extraction: The *Fagonia cretica* plants were collected from uncultivated and waste areas of Shendi town from near the Faculty of Medicine and Surgery, University of Shendi, Shendi town, River Nile state, Sudan in January/February 2011. These were authenticated by the Herbarium staff, Department of Botany, the Sudanese national centre for research, Khartoum, Sudan.

A voucher specimen was deposited in the Herbarium Department of Botany, the Sudanese national centre for research, Khartoum, Sudan for further reference. Extraction was carried out according to the method described by (Harborne) .⁹ 2000 g of plant sample was extracted successively with chloroform and 80 % ethanol using shaker apparatus; this was for about (72) hours for chloroform, and (5) days for ethanol. At last extracts were allowed to air till they were dried.

In vivo toxicological studies:

Experimental Animals and their care:

Experimental procedures involving the experimental animals and their care were conducted in compliance with the Guidelines for Care and Use of Laboratory Animals in Biomedical Research as promulgated by the Canadian Council of Animal Care (1984) and United States National Institutes of Health (1985). A total of thirty, young adult Wistar rats, weighting (42.6- 72.7) grams were obtained from the Sudanese National Centre for Research, Khartoum, Sudan. The rats were fed a standard rat food (a mixture of flour, oil, meat and some vegetables) and water ad libitum and were maintained at

standard laboratory conditions (12/12 hr dark/light cycle, 23 ± 1 °C temperature, and 55 ± 3 % humidity).

Oral doses administration of *Fagonia cretica*:

Before the experiment was beginning, rats were fasted overnight for (14 – 16) hours. Group C, which was the control group, received (10) ml/kg distilled water, orally, throughout the study period while Groups (1,2,3) were orally administered single, daily doses, (100, 300 and 600) mg/kg of body weight, respectively of the *Fagonia cretica* ethanolic extract dissolved in distilled water (1gm/10ml) for (14) days using acute oral toxicity (425) protocol.

General effects of *Fagonia cretica*:

Biochemical studies methods:

Blood glucose level evaluation:

At the day (15) of the experimental period, the fasted overnight rats were anesthetized using diethyl ether on a glass desiccators and about (3) ml of blood were collected in fluoride oxalate tubes from rat eyes by non - heparinized capillary tubes. Samples were centrifuged to separate the plasma from the blood cells. The pure sera were transferred carefully to plain tubes. Blood glucose was determined by using crescent diagnostic glucose enzymatic colorimetric god-pap method¹⁰

RESULTS:

Blood glucose:

The ethanolic extract of *Fagonia cretica* in doses of (100, 300 & 600 mg/kg/body weight) has an increasing effect on the fasting blood glucose (Fig 1)

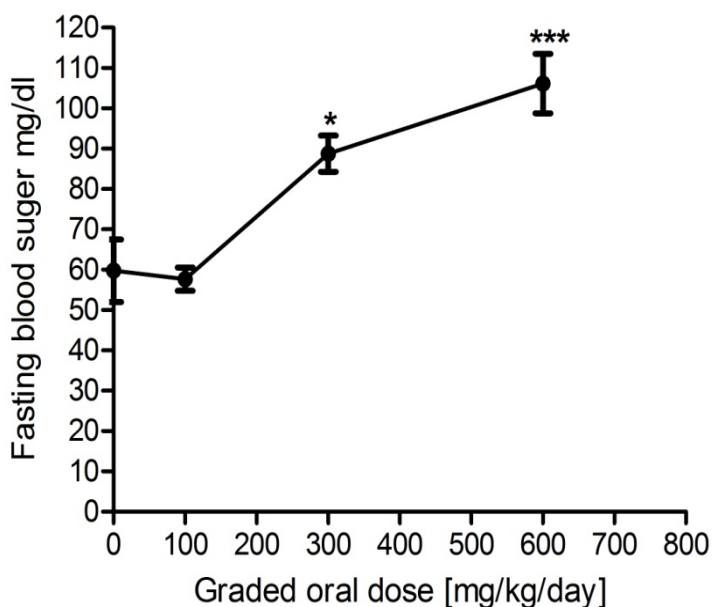


Figure 1: Rats glucose levels % after the study period day (15)

DISCUSSION:

The ethanolic extract increased the blood glucose level in a dose dependant manner significantly starting from the (300) mg/kg body weight dose, indicating the diabetogenic features of the plant which may be due to the increase of cortisol hormone by both the crude plant and saponin I and II, this result is in line with (Asif Saeed et al. 1999).¹¹ so the plant should be used with care for diabetic patients who are in need to use it, **these findings can be considered as totally new**, because no such informations were reported before.

CONCLUSION:

The study shows the diabetogenic features of the plant which may be *due to the increase of cortisol hormone by both the crude plant and saponin I and II*, this result is in line with (Asif Saeed et al. 1999)¹¹

RECOMMENDATION:

1. *Fagonia cretica linn* plant should be used with care for diabetic patients who are in need to use it; these findings can be considered as totally new, because no such informations were reported before
2. Further studies targeting the identification of the active phytochemical components of *Fagonia cretica* and their role of action are recommended.
3. Liver function tests (AST, ALT, Bilirubin, protein, and ALP) and renal function tests (Creatinine, ammonia, uria) were carried out to confirm the medical treatment efficacy of the plant as antimicrobial or anti-inflammatory and as anticancer.
4. Pharmaceutical formulation of *Fagonia cretica* as herbal medicine is highly recommended.
5. Further studies on the Sudanese *Fagonia cretica* as antioxidant, immune modulating agent, anticancerous, and anti-inflammatory is also recommended.

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