

# Biochemical Screening Of Unani Herbal Product “Arq-E-Gulab” For Its Chronic Effects On Serum Creatinine Levels

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## Abstract

Consumption and utilization of natural products as medicines is not uncommon all over the world. Due to their easy accessibility and low cost, people often opt for these herbal remedies to deal with their ailments. Also majority of the people thinks that these herbal remedies are 100 % safe and contain no adverse or side effects. This belief is thought to be developed due to under reporting of adverse events associated with the use of herbal products. There is a dire need to investigate these products for their safety in different disease states and different population and age groups. Arq-e-Gulab (AG) is a famous Unani herbal product which is commonly known as Rose Water prepared by water-distillation of rose petals of *Rosa damascena* Mill. flower. It is frequently used in Unani traditional medicine system in treating various eye diseases specially eye allergies and inflammatory conditions. It is also used as a condiment in Asian region in various sweets and meat recipes. This study is planned to evaluate the impact of chronic dosing of AG on serum creatinine to evaluate its effect on kidneys. This study was carried out on albino rabbits. AG was given at two different doses for 60 days for evaluation of biochemical effects. Our study reveals that AG does not possess any nephrotoxic effects.

**KEYWORDS:** - Nephroprotective, nephrotoxic, serum creatinine, *Rosa damascena* Mill, Hydro-distillation

## INTRODUCTION

Interest of humans in plants and herbs was developed while fulfilling their basic needs of food and shelter [1]. In ancient era, a big portion of population was dependent on natural substances of mineral, plant and animal origins for maintenance of physical and mental health and to deal with unhealthy conditions [2]. Plants are considered as the most primitive kind of health care [3]. The history of consuming natural

substances is extremely old, probably as ancient as human civilizations [4]. Few evidences indicates that the history of using plants as medicines is about 60,000 old [5]. Various literatures of Roman, Greek, Egyptian, Chinese, Indian and Syrian books, confirmed and validated that these evidences of natural remedies are 5000 years old [6]. The trend of consuming natural substances has been increasing day by day all over the world. Some people often go for natural remedies when their prescribed conventional regimen fails to cure their chronic illnesses [7]. Generally, public opt for natural remedies in management of their chronic diseases, or to manage undesirable effects of conventional medicines [8]. Also there is a common belief regarding natural substances that they are safe, free from adverse effects, are cheap and easily accessible [9].

Among the flowering plants, members of Rosaceae family are recognized as one of the world's most distinguished ornamental plants due to their unique fragrances and visual beauty. Till date above 100 species of rose have been discovered and identified. [10]. *Rosa damascena* Mill. commonly known as Gul-e-Muhammadi and Damask rose is one of the major member of Rosaceae family [11].

Arq-e-Gulab (AG); is a well-known Unani herbal product also known as Rose Water. It is water distillate of rose prepared by hydro-distillation process. Studies have reported the chemical composition of AG claiming that it is an excellent source of polyphenols, flavonoids, terpenes and other volatile components. AG is widely used as a flavoring agent in sweet and meat recipes [12]. Traditionally in Unani traditional system, it is used as an anti-septic agent effective in eye washing and for mouth disinfecting purpose. It is also used in the preparation of herbal mouthwashes to treat and heal stomatitis and mouth ulcers. It is used along with other medicinal herbs in ophthalmic preparations used to treat dry eyes and conjunctivitis. It also exhibits anti-pyretic action. It possesses anti-spasmodic activity and is effective in relieving abdominal pain, chest and bronchial congestion [13]. It also possesses mild laxative activity [14].

The perception of safety in natural remedies is often based on subjective evidence or tradition knowledge. The underreporting of adverse effects of natural products is a global issue. This study investigates the impact of chronic daily dosing of AG on kidneys by estimating serum creatinine levels in white albino rabbits.

## **MATERIALS AND METHODS**

### ***Preparation of Arq-e-Gulab***

Arq-e-Gulab was prepared by water distillation process. Fresh flowers of *Rosa damascena* Mill. were plucked from the botanical garden of University of Karachi which were identified and authenticated by Department of Pharmacognosy, Faculty of Pharmacy & Pharmaceutical Sciences, University of Karachi [Voucher no: RDF-01- 16/17]. Petals were separated from flower and allowed to dry at room temperature. The distillation apparatus comprises of a stainless steel tank, a cohobation column, a condenser and a receiver. Dried petals with distilled water was added in the distillation apparatus in the ratio of 1:2. 4 kg of air dried rose petals along with 8 liters of water was added in the distillation apparatus. Air vents were closed after complete removal of air and the apparatus was then operated as a closed system to distill the rose petals under maintained high temperature and pressure. The vapors were generated in cohobated column which were then condensed with circulating chilled water in a condenser and finally received in the receiver. The process of distillation was completed after collection of 1450 ml of distillate. The water distillate of *Rosa damascena* Mill. flower received was of concentration 0.5gm/ml [15][16][17].

### ***Selection of experimental animals***

Male albino rabbits weighing between 1900 to 2100 grams were separated from the breeding area of animal house of Pharmacology Department of University of Karachi. Animals were provided normal room temperature of  $25 \pm 3^{\circ}\text{C}$  and humidity 54 to 64% under 12 hour light (09:15 a.m. to 09:15 p.m.) and dark (09:15 p.m. to 09:15 a.m.) cycle with 24/7 free access to standard food and pure water. Animals were treated as per the specifications of National Research Council (NRC) [18]. This study was conducted after the approval of BASR (Board of Advanced Studies and Research), University of Karachi [BASR/No./03460/ Pharm. Resol.No. 10(P) 04].

**Animal grouping and dosing protocol**

3 groups of 10 rabbits were set for biochemical screening. Group I was control and was given 1ml distilled water, Group II and III were test groups and were given AG in the doses of 250mg/kg and 500mg/kg respectively [19][20]. The dosing was done by oral route for 60 consecutive days and blood was withdrawn for biochemical testing on day 61 to observe the effect of AG on serum creatinine levels.

**Biochemical Investigation**

For biochemical testing, blue capped siliconized glass tubes were used in which the blood samples were taken. After blood withdrawal, these tubes were centrifuged for 700 to 950 seconds at 3000 RPM to get the pure plasma which was then analyzed using Humalyzer- 3000 (Human-Germany) for the estimation of renal function including serum creatinine. For estimation of these tests, standard kits were used which were purchased from the Human company [21].

**STATISTICAL ANALYSIS**

Statistical analysis was carried out using SPSS software version 22. Values were presented as Mean ± Standard Deviation (S.D). One-way ANOVA followed by multiple comparison post hoc Tukey’s test was performed for statistical calculations. All p-values less than 0.05 were considered significant where \* $p < 0.05$ , \*\* $p < 0.01$  and \*\*\* $p < 0.001$  represents level of significance i.e. significant, very significant and highly significant difference in comparison to control and 250mg/kg dose group respectively.

**RESULTS**

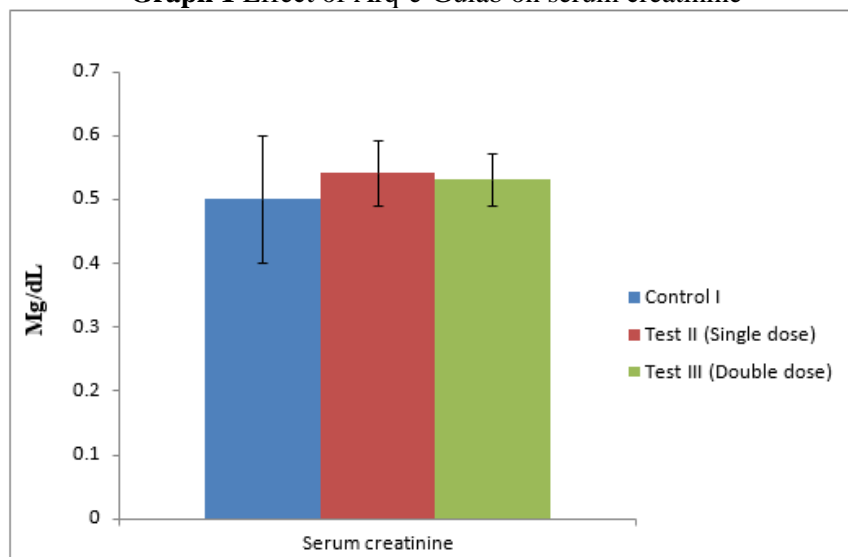
Table 1 and Graph 1 represents the effect of AG on serum creatinine. Data analysis and statistical calculations showed that in comparison to control, both single and double dose treated groups have insignificant effect on serum creatinine level. No statistical significant difference was observed between the two treated groups.

**Table 1** Effect of Arq-e-Gulab on Serum creatinine

Groups	Serum creatinine (mg/dL) X ± S.D
Control I	0.5±0.1
Test II (Single dose)	0.54±0.05
Test III (Double dose)	0.53±0.04

n=10, Values are presented as Mean (X) ± Standard Deviation (S.D).

**Graph 1** Effect of Arq-e-Gulab on serum creatinine



## DISCUSSION

World Health Organization in 2005 states that safety & efficacy evaluation of herbal remedies is worrisome and needs critical scientific methodologies and research. Safety is considered to be an essential aspect of any drug which is expected to cause no unwanted and harmful effects under the labelled use. The literature available on toxicity, adverse effects and safety of natural therapies is very confined and required more detailed screening which will aid in identifying the safety profile of medicinally active compounds in a plant [22][23][24][25].

To evaluate the effect of chronic dosing of AG on kidneys, serum creatinine level was checked. Serum creatinine is a useful diagnostic tool for assessing the renal function in human body. An elevated serum creatinine value indicates various pathological conditions including shock, diarrhea, renal damage, congestive heart failure (CHF), uncontrolled diabetes mellitus, etc. [26]. Our findings revealed that AG at both doses does not show any nephro-toxicity and does not affect the serum creatinine levels. Reno-protective potential of AG might be due to its anti-oxidant nature and its constituents such as quercetin, kaempferol and ellagic acid. Presence of kaempferol, quercetin and ellagic acid in AG has been reported by a study conducted in 2016 [27]. According to study nephroprotective potential of AG is due to its potent anti-oxidant and free radicle scavenging potential [28]. In a study of 2015, quercetin showed reno-protective action against valproic acid induced nephro-toxicity [29]. Another study reported reno-protective significance of kaempferol against mercuric chloride induced nephro-toxicity [30]. Nephroprotective potential of ellagic acid against cisplatin-induced nephro-toxicity has also been established [31]. Hence these findings suggest reno-protective action of AG. However more detailed research is required in future to evaluate its efficacy.

## CONCLUSION

As per the findings of this study, it is concluded that Unani Herbal product "Arq-e-Gulab" is safe to be used chronically as it does not has any unhealthy and hazardous effects on kidneys. More detailed research is required in future to evaluate its efficacy in drug induced nephrotoxicity and acute and chronic kidney disease states.

### Conflict Of Interest

There is no conflict of interest.

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