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Study the Effect of Eruca Sativa Leaves Extract on Serum Total protein, Sodium & Potassium Ions in Male Rats.

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ABSTRCT

This work was designed to determine the effect of Eruca sativa leaves extract on total protein, sodium and potassium electrolytes. The methanol -aqueous leaves extract of E.sativa was prepared and them chemical detection done. Results revealed that glycosides, flavonoids, submarines, alkaloids, tannis saponins and phenolic compounds were present in E.sativa extraxt.Total protein, sodium and potassium ions effect was carried out by treating rats with two doses(250 and 500mg/kg of extract). The results showed a significant ($p \leq 0.05$) in total protein level in G3 (treated with 500 mg/kg BW) as compared to control group and a significant increased between two groups (G2&G3),while the results showed no significant ($p \leq 0.05$) increased in serum sodium and potassium ions as compared to control group.

Keywords: E.sativa extract. Total protein, Sodium, potassium.

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INTRODUCTION

All the societies of the word have always had behaving of using herbs to promote healing. Plants still remain the basis for development of medical plants and modern drugs have been used for years in daily life to treat diseases all over the world [1]. Exactly to their chemical and medicinal contents found in natural from. Their secondary metabolites represent a large reservoir relating to the structure of moieties which work together exhibiting a wide range of biological activities [2]. Eruca sativa, also known as arugula or rocket is called ˝ Jar jeer˝ in Arabic, is an edible plant[3]. Rocket is considered an extremely good source of antioxidants, as it includes phenolic compounds, carotenoids and degradation products, such as isothiocyanates [4]. It is rich source of health promoting agents such as magnesium, iron, magnesium, potassium, sodium, calcium, dietary fiber, beta-carotene, vitamins B, A, C and E [5],Furthermore, it is used as astringent, diuretic, digestive, tonic, depurative, emollient, laxative, and antioxidants effects[6,7,8], Rocket and other Cruciferous vegetables include a group of anticancer drugs known as glucosinolates, these compounds exert antioxidant activity ,and a drug addict who is being detoxified in the body ,such compound anti-ulcer exert , cytoprotective and anti-secretary properties in the ethanolic extract of the plant in rats [9]. The plant also has antifungal activity due to the presence of antioxidant constituents: flavonoids, glucosinolate, carotenoids in addition to the volatile fractions [10], indicated that E. Sativa seeds and leaves possessed protected against oxidative damage and a potent free radical scavenging antioxidants by increasing maintaining the levels of antioxidant enzymes and antioxidant molecules [11]. This study was therefor designed to determinate qualitative and quantitative compounds in methanol-aqueous extract of Eruca sativa and investigated the effects of methanol- aqueous extract of E. sativa leaves on sodium and potassium ion and total protein in serum rats.

MATERIALS AND METHODS

Plant was bought from a local market. The leaves were air- dried, and then powered using a coffee grinder. Fifty gram of the leaf powder were extracted for one hour in 300ml of (80% D.W-20%methanol) using the soxhlet apparatus. The leaf extract solution was then evaporated at 45 ^{0}C using a rotary evaporator, and the resultant extract was ferzon at (-20^0 C) until use to prepare the required doses [12].

Quantitive analysis of secondary materials in the plant extract:

In this study, I detected some active compounds in the plant extract by using chemical reagents. Benedict reagent [13] was used for detection of glycosides. Mayer regent [14] was used for detection of alkaloids. Ferric chloride solution 1% was used for the detection of phenolic compound [15]. The method of Jaffer [16] was used to detect the presence of flavonoids, While Saponin compounds were detected by mercuric chloride 1% solution [15]. Lead acetate 1% [15] was used for detection of Tannis. Resin, terpens, coumarines and steroids[2].

Animal and Dosing:

(15) Male rats approximately of the same age weighing (25-27) were divided into three groups designated, as G1, G2, and G3. Each group consisted of (5) rats.

Group1: rats treated with 1ml of physiological saline.
Group2: rats treated with 1ml extract at dose of 250mg/kg body weight.
Group3: rats treated with 1ml extract at dose of 500mg/kg body weight.

Two doses of(250 and 500 mg/kg B.W) were given orally by using a micropipette for (30days).

Serum Total Protein estimation by Biuret method [17,18]:

Colorimetric method described by Gornall and al. The peptide bonds of proteins react with Cu^{2+} in alkaline solution to form a colored complex are measured at 550nm. The biuret reagent includs sodium potassium tartrate to complex cupric ions and maintain their solubility in alkaline solution.

Serum Sodium estimation [19]:

Colorimetric method is based on reaction of sodium with a selective chromogen producing a chromophere whose absorbance varies directly as the conc. Of sodium in the test specimen.

Serum Potassium estimation by Turbidimetric Tetraphenyl borate(TPB) [19]:

At an alkaline pH Potassium ion and TPB form a turbid emulsion, the increase of which can be measured quantitatively in a photometer at 578nm.

Statistical Analysis

Values are given as (mean±SD) by SPSS. Data were analyzed by using one way analysis of variance (ANOVA) followed by student's test [20].

RESULTS AND DISCUSSION

The methanol- aqueous extract of E. sativa leaves was subjected to chemical analysis and results indicated that flavonoids, saponins , glycosides , tannis ,coumarone and alkaloids were present in the extract table(1). Similar results were obtained by [21].

Table (1) Active compounds in the methanol- aqueous extract of Eruca sativa leaves.

Active compound	*Results*
Alkaloids	**+ White or precipitate**
Glycosides	**Red pellet +**
Phenolic compound	**+ Green- Blush color**
Saponins	**White color+**
Tannis	**+ White gelatinous pellets**
Coumarines	**Yellow greenish color+**
Resins	**-**
Terpens and Steroids	**-**

+ ve: indicates the presence of Secondary metabolites.
-ve indicates the absence of Secondary metabolites.

Effect of The Methanol- Aqueous Extract of Rocket (Eruca sativa L.) Leaves on the some biochemical (Serum Total protein, Sodium and potassium ion) in male rats.

Data in table (2) showed the daily oral demonstration of methanol-aqueous extract (E.sativa) leaves for 30 days, caused significant ($p<0.05$) increased in serum levels of total protein in group 3(G3 : treated with 1 ml extract of 500mg/kg B.W) as compared with control group (G1:normal diet). Significant increase ($p<0.05$) was also found between two groups treated (250 and 500mg/kg BW) compare to control group. As well as the agreed results with [22] who observed the increased significantly when the dosage of several concentrations of extract Eruca sativa leaves in total protein, this fact due to increase effectiveness metabolic in animal treated then increase total protein because of presence of the active compounds in extract instead to capability of these materials to increase white blood cells, particularly lymphocytes which are the focus of the organization of the immune response of quality through the excretion of some chemical which lead to strengthen the effectiveness of the immune system elements such as stimulate β- cells to produce antibodies[23].

Table (2): Serum total protein (g/dl) in male rats

Groups(control & treated)	Mean ±SD	p-value
G1 : control group	0.667±0.0857	**0.407**
		0.010*
G2: treated with 250mg/kg B.W	0.799±0.0687	**0.407**
		0.047*
G3: treated with 500 mg/kg B.W	1.1385±0.30	**0.010***
		0.047*

The mean difference is significant at ($p<0.05$) level.*

Results exhibited that rocket leaves extract caused increased (no significance in serum Na+ and K+ electrolytes in groups (treated with 250 and 500 mg/kg BW) as compared to control group.
Results indicated that there were no significance between two groups(G&G3) as shown in table (2) and table(3).

This fact can be used as diuretic as well as in this study [24] who reported that oral administration of aqueous extract of Petroselinum sativum, Eruca sativa and Curcuma longa herbs and their mixture concomitantly with normalized the decrease the levels of Na+ and K+ ions in serum when compared with GM-intoxicated rats.
Concerning Eruca sativa, it is widely used in folklore medicine and has a good reputation as a remedy of renal ailments. It was reported that Eruca sativa produced potent antioxidant and renal protective activities and precluded oxidative damage.

Table 3: Serum sodium (Na+)(mEq/l) level in male rats

Groups(control & treated)	Mean ±SD	p-value
G1 : control group	132±16.97	0.88
G2: treated with 250mg/kg B.W	136±2.56	
G3: treated with 500 mg/kg B.W	140±7.55	

Mean ±SD: is no significant at ($p<0.05$) level.

Table 3: Serum potassium (K+)(mmole/l) level in male rats

Groups(control & treated)	Mean ±SD	p-value
G1 : control group	8.7±1.0	0.3.06
G2: treated with 250mg/kg B.W	15.6±4.3	
G3: treated with 500 mg/kg B.W	15.7±3.9	

Mean ±SD: is no significant at ($p<0.05$) level.

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