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## Effect of Alchemilla Vulgaris Herb Extract on Some Hematological Parameters in Rats with Ulcerative Colitis

تأثير مستخلص عشب رجل الأسد على بعض المؤشرات الدموية في الجرذان المصابة بالتهاب القولون التقرحي

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موبايل :

## Effect of Alchemilla Vulgaris Herb Extract on Some Hematological Parameters in Rats Induced Inflammation

### Ulcerative Colitis

#### Abstract

study was conducted to evaluate Alchemilla vulgaris extract in reducing the symptoms of inflammation and ulceration in rats with injury ulcerative colitis. The study was conducted on twenty five males rats, which were divided into five groups, each group of five rats. As follow :Group ١ (negative control group (-ve ), Group ٢ (positive control group (+ve), Group ٣ rats treated with drug at a ١ cm of sulfazine, Group ٤; rats treated with ١٥٠ mg Alchemilla vulgaris herb extract, and Group ٥; it was given ٢٠٠ mg from Alchemilla vulgaris herb extract.. Groups (٢, ٣, ٤, and ٥) were injected with ٢ cm of acetic acid at a concentration of ٤% into the rectum and left for three days to confirm the occurrence of the disease. The treatment with Alchemilla vulgaris herb extract and sulfazine was daily for a month. The results showed that the in blood samples decrease in the average value of (WBCs, ESR, MCV, Neutrophil) while the average values of (RBCs, Hct, HB, MCH, Lymph) increased ,in(٣, ٤, and ٥ groups) . When comparing group (٢) with groups (٣ and ٥) in some hematological parameters(RBCs, Hct, HB, MCH, Lymph) and(WBCs, ESR, MCV, Neutrophil), the P.value were ( $P \leq ٠,٠١$ ). When comparing group (٢) with group (٤) in some hematological parameters of (RBCs, Hct, HB, MCH, Lymph) and(WBCs, ESR, MCV, Neutrophil) the P.value were ( $P \leq ٠,٠٥$ ) . Our results showed that the treated group with ١٥٠ mg and ٢٠٠ mg of Alchemilla vulgaris and the drug (sulfazine) showed improvement in some hematological parameters.

#### Keywords:

Ulcerative colitis- Alchemilla vulgaris-sulfazine- Acetic acid

Blood samples

## Introduction

Ulcerative colitis (UC) is one of two types of inflammatory bowel disease (IBD). It is a long-term condition that leads to inflammation and ulcers of the colon and rectum (**Moayyedi and Hanauer, ٢٠١٣**). The main symptoms of active disease are abdominal pain, diarrhea mixed with blood (bloody stool), weight loss, fever and anemia. Symptoms often come on slowly and can range from mild to severe. It's usually occur intermittently with periods of no symptoms between attacks. Complications may include abnormal colon dilatation (megacolon), inflammation of the eyes, joints, or liver, and colon cancer. The causes of ulcerative colitis are unknown; theories include immune system dysfunction,, genetic factors, changes in normal gut bacteria, and environmental factors. Rates tend to be higher in the developed world, with some suggesting this may be the result of less exposure to intestinal infections, or diet. Removing the appendix at an early age may be preventive. Diagnosis is usually made by colonoscopy.

Ulcerative colitis can be treated with a number of medications, including ٥-aminosalicylic acid (٥-ASA) drugs such as sulfasalazine and mesalazine. Cortisone, such as prednisone, can also be used due to its immunosuppressive properties and short-term ability to provide recovery, but because its risks outweigh its benefits, it is not used in long-term treatment (**Axelrad et al., ٢٠١٦**).

The use of complementary medicine among patients with IBD, particularly in the form of herbal therapies, is widespread in the Western world as well as in many Asian countries including China and India( **D'Inca et al .,٢٠٠٧**). It seems that the use is continuously increasing despite the fact that only a small number of controlled trials dealing with either efficacy or safety of these natural products exist. So far, : there is limited controlled evidence indicating the efficacy of traditional chinese medicine, such as aloe vera gel, wheat grass juice, Boswellia serrata, and bovine colostrum enemas in the management of patients with UC. Herbal medicine has always been considered to be preeminent among the various methods of healing within TCM, which is practiced extensively throughout clinics and hospitals in China alongside Western medicine( **Langmead and Rampton, ٢٠٠٦**).

Alchemilla vulgaris herb was first described by Linnaeus (١٧٥٣) and it contains species represented by more than ١٠٠٠ species (**Kaya et al., ٢٠١٢**). Alchemilla is an uncommon herbaceous member of The Rosaceae family of insignificant flowers. The Alchemilla plant grows

on wet meadows in Europe, Western Asia and North America. Alchemilla herbs, are officially recognized as a pharmaceutical drugs in the European Pharmacopoeia (Duckstein et al., ٢٠١٢). It can be easily distinguished from the Alchemilla herb by its leaves that radiate from a common point or with a fan shape and it has a small flower without petals. (Sarina et al., ٢٠١٤). The present investigation aimed to determine the effect of Alchemilla Vulgaris herb extract on some hematological parameters in rats induced with inflammation ulcerative colitis.

## Aim of the study

- The effect of Alchemilla vulgaris on colon ulcers
- Determine the rate of improvement in colon and ulcers end of experiment

## Materials and Methods:

### Materials

**Alchemilla vulgaris** was gained kilo from the Agricultural Research Center in Cairo.

**Acetic acid ٠,٤% and sulfasalazine** was purchased from Al-Gomhouria Pharmaceutical Company, Assiut.

### Experimental animals

In this study Twenty five males adult albino rats (weighing ٢٥٠-٣٠٠ g) were gained from the Animal House of the Faculty of Assiut Medicine University. The animals were housed in cages, kept at room temperature with a normal ١٢h light/١٢h dark cycle. Rats were allowed free access to standard commercial pellets for feeding and tap water ad libitum.

### Experimental design

Rats were randomly divided into five groups, with five rats in each group, and each group was housed separately.

**Group ١:** Negative control group (-ve) they were not given any medications.

**Group ٢:** Positive control group (+ve) they received ٢ ml for each rat of acetic acid rectally through a lubricated tube. The tube was inserted through the rectum into the colon to a distance of ٦ cm. The acetic acid was retained in the colon for ٣٠ s after which the fluid was withdrawn, and rats heads were kept in a downward position for another ٣٠ s then returned to cages.

**Group ٣:** rats treated with (sulfazine) they received acetic acid rectally, and then were left for three days to confirm the occurrence of the disease, and then treatment began by giving them ١ cm of Sulfasalazine orally for ١٤ days.

**Group ٤:** rats treated *Alchemilla vulgaris* (١٥٠ mg) they received acetic acid rectally, and then left it for three days to confirm the occurrence of the disease, and then treatment began by giving those ١٥٠ mg of *Alchemilla* herb extract orally for ١٤ day.

**Group ٥:** rats treated *Alchemilla vulgaris* (٢٠٠ mg) they received acetic acid rectally, and then left it for three days to confirm the occurrence of the disease, and then treatment began by giving those ٢٠٠ mg of herb *Alchemilla* extract orally for ١٤ days.

## Methods

### Preparation of the *Alchemilla vulgaris* extract

*Alchemilla Vulgaris* herb aerial parts and roots were washed in water several times to remove any adhering flesh, then dried then graining to get powdered powdered plant materials were extracted with a methanol-water (٨٠:٢٠) mixture by continuous stirring at room temperature for eight hours. After filtration, extract was concentrated to dryness under reduced pressure and low temperature (٤٠-٥٠°C) on a rotary evaporator to give crude extract (El-Hadidy et al., ٢٠١٩).

### Determination of antioxidant in *Alchemilla vulgaris* herb extract

#### Determination phenols content in *Alchemilla vulgaris* herb extract:

Phenols were determined colormetrically. Samples (five grams) were mixed with ٥٠ ml of ٨٠% ethanol in a dark bottle at ٥٠°C for ٢٢ h. Extracts were obtained by changing the ethanol every ٢٤h. The extracts were collected after filtration and the color developed by Folin-Ciocalteu reagents (FCR) was measured spectrophotometrically at ٧٦٠ nm using a spectrophotometer as described by (kujala et al., ٢٠٠٠).

#### Determination lycopene content in *Alchemilla vulgaris* herb extract:

Minimum five grams of dried samples were placed in cellulose extraction thimbles, covered with wool, and placed in the soxlet apparatus. After the placing, extraction was running and utilizing twenty hours and below two hundred milliliters of any kind of solvent,. After the extraction process the solvent evaporated by a vacuum rotating evaporator and extracted lycopene can be collected in a concentrated dried state and weighed (Haroon, ٢٠١٤) .

## Blood sampling

At the end of the experiment period, the rats were anesthetized with ether (one from each cage randomly), the blood was put in a clean, dry tube containing an anticoagulant ( $1 \text{ mg EDTA}/\text{ml}$  of blood) and it was immediately used for estimations of some blood images using an automated blood meter device. Another part of the blood was serum. They are carefully separated into clean, dry gelatinous tubes and kept frozen until analysis at  $-20^{\circ}\text{C}$ .

## Measurement of Hematological parameters in rats:

The hematocrit (HCT), hemoglobin (HB) concentration, red blood cell (RBC) count, mean corpuscular volume (MCV), mean corpuscular hemoglobin concentration (MCHC), white blood cells (WBC) counts, neutrophil (NEU) and lymphocytes (LYMP) percentages were measured using an auto-analyzer machine (SFRI blood cell counter, H<sup>1</sup> light, Franc (Kehinde, 2018).

## Measurement of Erythrocyte sedimentation rate :

The blood was diluted  $1:1$  with sodium citrate solution, then the marked sedimentation container was filled and the ratio was read after an hour, (Hashemi et al., 2015).

## Statistical Analysis

All obtained data were subjected to statistical analysis of variance and treatment means were compared for significant differences using the least significant difference's "LSD" at  $p=0.05$  and  $p=0.01$  according to the MSTAT-C statistical software (Russell, 2013). A computer program was used to perform all the analysis of variance in accordance with the procedure outlined by (Duncan, 2015).

## Results and Discussion

### Antioxidant Contents

Table (1) Antioxidant contents in *Alchemilla vulgaris* extract ( $\text{mg}/100 \text{ g}$ ).

Sample	Total phenols $\text{mg}/100 \text{ g}$	Total lycopene $\text{mg}/100 \text{ g}$
<i>Alchemilla vulgaris</i>	18686.97	2.84

The data in **Table (١)** indicated that *Alchemilla vulgaris* extract has a high percentage of total phenol and lycopene content (١٨٦٨٦,٩٧ and ٢,٨٤ mg/١٠٠ g.). **Yin et al.** (٢٠٢٢) reported that *Alchemilla vulgaris* consists of many bioactive compounds with anti-inflammatory capabilities. Among these compounds are flavonoids that belong to a rich group of polyphenolic compounds found in the plant kingdom. Many data confirm its strong impact on human health. Members of the flavonol subclass, phenols, polyphenols, quercetin, rutin, and isoquercetin, either in the form of glycosides or aglycones, have shown antioxidant, anti-inflammatory, and anti-anemia and ulcer effects.

Our results are in agreement with **Tasić-Kostov et al.** (٢٠١٩) who reported that maceration prepared with (water, ethanol, and propylene glycol) is the most abundant ethanol in terms of total phenols, total flavonoids, and total tannins and at the same time possesses the strongest antioxidant activity as well as the most obvious effect. of fibroblast migration and the highest extent of wound closure. Hence, wound healing with *Alchemilla vulgaris* extract is attributed to phenolic compounds and their antioxidant activity. (ellagic acid, isoquercetin, and morin) were found in all examined extracts, suggesting that their high content is partly responsible for the observed wound healing properties of the extracts.

**Table (٢): Effect of *Alchemilla vulgaris* on(RBCs HB., WBCs count, Neutrophil, and Lymphocytes percentages) in rats.**

Parameters Groups	RBCs	HB.	WBCs	Neutrophil(%)	Lymphocytes(%)
Group (-ve)	٧,٢٠ ± ٠,٨١	١٤.٧ ± ١,٢٠	٥,٩٨ ± ٣,١١	١٣,٥٧ ± ٨,٥٧	٧٨,٩٥ ± ٨,٦٨
Group (+ve)	٤,١٧ ± ١,٠٤	١٠,٣٣ ± ١,٥٣	١٠,٢٩ ± ٠,٦١	٢٠,٦٧ ± ١,٥٣	٦٥.٧ ± ٥,٢٩
P. value between groups -ve & +ve	(P ≤ ٠,٠١)				
(١ cm sulfazine)	٦,٣٠ ± ٢,٣٨	١٣,٢٠ ± ٢,٨٤	٧,٨٠ ± ٢,١٦	١٦,٣ ± ٢,٥١	٧٤,١٤ ± ٠,٨٩

P. value between groups +ve & Drug	(P ≤ ٠,٠١)				
P. value between groups -ve & Drug	n.s (P ≥ ٠,٠٥)				
Alchemilla vulgaris (١٥٠ mg)	٥,٨٣ ± ٠,٧٦	١١,٨ ± ١,٥٣	٨,٨ ± ٠,٨	١٨,٣ ± ٢,٠٨	٧٣,٨١ ± ١,٦٤
P. value between groups +ve & ١٥٠ mg	(P ≤ ٠,٠٥)				
P. value between groups -ve & ١٥٠ mg	n.s (P ≥ ٠,٠٥)				
Alchemilla vulgaris (٢٠٠ mg)	٦,٩١ ± ٠,٦٣	١٤,٧٧ ± ٠,٥٥	٨,٠٧ ± ٠,١٢	١٧,٧ ± ٢,٠٨	٧٥,١٤ ± ١,١٠
P. value between groups +ve & ٢٠٠ mg	(P ≤ ٠,٠١)				
P. value between groups -ve & ٢٠٠ mg	n.s (P ≥ ٠,٠٥)				

(١) The effect of ulcerative colitis on red blood cells(RBCs) count in rats.

Table (٢) showed the effect of Alchemilla vulgaris herb extract on RBCs count in rats injury ulcerative colitis. The RBCs values were (٧,٢٠±٠,٨١), (٤,١٧±١,٠٤), (٦,٣٠±٢,٣٨), (٥,٨٣±٠,٧٦), and (٦,٩١±٠,٦٣) respectively) all groups. The RBCs increase in groups (٣), (٤) and (٥) in rats with ulcerative colitis. When comparing RBCs average in the +ve group with drug group and ٢٠٠mg was P.value (P ≤ ٠,٠١). When comparing RBCs average in the +ve group with ١٥٠mg group was P.value (P ≤ ٠,٠٥). When comparing the RBCs average in the negative control group with the three treatment groups(drug, ١٥٠mg, ٢٠٠mg) was P. value (P ≥ ٠,٠٥). Such data are in agreement with Gancarcikova et al., (٢٠٢٠) who found that there severe bleeding in mice with



ulcerative colitis led to anemia, which led to decrease in the red blood cells.

#### (٢) The effect of ulcerative colitis on serum hemoglobin(HB) in rats.

**Table (٢)** showed the the effect of *Alchemilla vulgaris* herb extract on HB in rats injury ulcerative colitis. The HB values were ( $14.7 \pm 1.2$ ,  $10.33 \pm 1.03$ ,  $13.20 \pm 2.84$ ,  $11.8 \pm 1.03$  , and  $14.77 \pm 0.00$  respectively) for the negative and positive control groups and the three treatment groups. The HB increased in groups (٣), (٤) and (٥) in rats with ulcerative colitis. There was significant statistical difference ( $P \leq 0.01$ ) between group (١), (٣) and (٥) in HB. When comparing HB average in the (٢) and (٣) group, there was a significant statistical difference ( $p \leq 0.05$ ). When comparing the HB average in the group (١) and the three treatment groups, it was not significant statistically ( $p \geq 0.05$ ). Our results are similar to those obtained by **Newman et al., (٢٠١٩)** who reported that colitis resulted in a decrease hemoglobin compared with rats without colitis. While **Shaimaa and Kasem, (٢٠٢٠)** reported that treatment with *Alchemilla vulgaris* powder increased hemoglobin in rats.

#### (٣) Effect of ulcerative colitis on white blood cells (WBC) count in rats.

**Table (٢)** showed that the effect of *Alchemilla vulgaris* herb extract on WBC count in rats with ulcerative colitis. The average of WBC values between the negative group , positive control group, durg group  $200\text{ mg}$  and  $100\text{ mg}$  , groups was ( $5.98 \pm 3.11$ ,  $10.29 \pm 0.61$ ,  $7.80 \pm 2.16$ ,  $8.8 \pm 0.8$ ,  $8.07 \pm 0.12$  respectively). There was an increase in white blood cells in the (٢) group when compared with the (٣,٤ and ٥) groups. When comparing group(٢) with (٣,٥) group was P. value ( $P \leq 0.01$ ). There was a significant statistically ( $p \leq 0.05$ ) between group(٢,٤) and group in WBC average. While P. value was not significant statistically ( $p \geq 0.05$ ) between the group(١) and the three treatment groups in WBC average. The data is in agreement with **Sanja, (٢٠٢٤)** who reported that decrease in white blood cell analysis after treating mice with *Alchemilla vulgaris*. **Hartmann et al, (٢٠١٢)** reported that the acetic acid -induced colitis model causes vasodilatation and accumulation of white blood cells, in addition to increased blood flow, which leads to increased oxygen production and thus excessive generation of free radicals and reactive oxygen species.

#### (٤) The effect of ulcerative colitis on Neutrophil in rats .

**Table (٢)** showed that the effect of *Alchemilla vulgaris* herb extract on neutrophil in rats with ulcerative colitis. The average of neutrophil values was ( $13.07 \pm 8.07$  ,  $20.67 \pm 1.03$  ,  $16.3 \pm 2.01$  ,  $18.3 \pm 2.08$  ,  $17.7 \pm 2.08$  respectively) for the negative group , positive control group, durg group,  $100 \text{ mg}$  and groups. The group with the high increase in neutrophil average was group(٢) compared with the three treated groups. When comparing group(٢) with (٣,٥) group in neutrophil average there was highly significant statistically ( $p \leq 0.01$ ). When comparing the group(٢) with the (٤) group in neutrophil average was significant statistically ( $p \leq 0.05$ ). When comparing the (١) group with the three treatment groups in neutrophil average was p.value ( $p \geq 0.05$ ). Our results are similar to those obtained by **Chen et al.** (٢٠٢٣) they reported that flow cytometric analysis neutrophils increased as colitis progressed. Also, **Byelinska et al.** (٢٠١٨) found that the number of neutrophil granulocytes turned down compared with the colitis group.

#### (٥) The effect of ulcerative colitis on lymphocytes in rats.

**Table (٢)** showed the effect of *Alchemilla vulgaris* herb extract on lymphocytes in rats with ulcerative colitis. The data revealed the average lymphocytes values of the negative group, positive group, durg group,  $100 \text{ mg}$  and  $100$  groups ( $78.90 \pm 8.68$  ,  $70.7 \pm 0.29$  ,  $74.14 \pm 0.89$  ,  $73.81 \pm 1.64$  , and  $70.14 \pm 1.10$  respectively). The lymphocytes increased (٣,٤ and ٥) in rats with ulcerative colitis. When comparing between group(١) and (٤,٥) group in lymphocytes average was ( $P \leq 0.01$ ). When comparing between (٢ and ٤) group in lymphocytes average was P. value ( $p \leq 0.05$ ). When comparing group(١) with (٤,٥) groups in lymphocytes average was not significant statistically ( $p \geq 0.05$ ). These results were in agreement with those obtained by **Sezgi et al.** (٢٠١٤) they reported that the synergistic effects of *Alchemilla vulgaris* herb extract on wound healing, which works by stimulating cell and lymphocyte growth.

**Almeida**, (٢٠٠٩) and **Condrat et al.**, (٢٠١٠) reported that the aerial parts of the *Alchemilla vulgaris* herb possess antioxidant activity. Thought to this activity has been arise from the phenolic compounds of the extract such as flavonoids. The plant contains polyphenol compounds that showed close behavior of antioxidant activity relevant in the study, which are rutin, quercetin, chlorogenic acid and synaptic acid. While, chlorogenic acid (CGA) is polyphenolic component associated with free radical scavenging and antioxidant activities towards hydrogen peroxide and amyloid beta **Jimenez**, (٢٠١١). The present of synaptic acid present has also radical scavenging properties beside the behavior or anti-apoptotic and anti-inflammation **Lee** (٢٠١٢).

**Table (٣): Effect of *Alchemilla vulgaris* herb extract on some hematological parameters (Hct, MCV, MCH, ESR) in rats.**

Groups	Hct	MCV.	MCH	ESR	
				١ <sup>st</sup>	٢ <sup>nd</sup>
C-	٤٨,٥ ± ٢,٢٩	٦٨,٩١ ±٤,٤٩	٢٦,٨٤ ± ١,٠٤	٤,٣٣ ± ٠,٥٨	٨,٣٣ ±٠,٥٨
C+	٤١,٩٣ ±١,٨٩	٧٦,١٠ ±٠,٨٥	٢٢,٢٠ ± ١,٨٤	٧,١٨ ±٠,٢٧٦	٩,٢٩ ± ٠,٦١
P. value between groups C+ & C-	P ≤ ٠,٠١				
Drug	٤٤,٢٦ ± ٠,٦٥	٧٣,٣٣ ± ١,٥٣	٢٤,٦٧ ± ١,١٥	٤,٦٧ ± ٠,٣٣	٧,٦٧ ± ٠,٥٨
P. value between groups C+ & Drug	P ≤ ٠,٠١				
P. value between groups C- & Drug	n.s (P ≥ ٠,٠٥)				
<i>Alchemilla vulgaris</i> (١٥٠ mg)	٤٣,٩٣ ± ٠,١٣	٧٤,١ ± ٣,٨٥	٢٣,٧ ± ٢,٥٣	٥,٠٧ ± ٠,٠٧	٧,٨٠ ± ٠,٥٤
P. value between groups C+ & ١٥٠ mg	P ≤ ٠,٠٥				
P. value between groups C- & ١٥٠ mg	n.s (P ≥ ٠,٠٥)				
<i>Alchemilla vulgaris</i> )٢٠٠ mg(	٤٤,٥٩ ± ٠,٧٠	٧٣,٦٧ ± ١,٥٣	٢٧,٢٩ ± ٢,٠٦	٤,٥٩ ± ٠,٤١	٧,٣٣ ± ١,١٥
P. value between groups C+ & ٢٠٠ mg	P ≤ ٠,٠١				
P. value between groups C- & ٢٠٠ mg	n.s (P ≥ ٠,٠٥)				

(٦) The effect of ulcerative colitis on hematocrit (Hct) in rats.

**Table (٣)** showed the effect of *Alchemilla vulgaris* herb extract on Hct in rats injury ulcerative colitis . The results revealed that the Hct average in al groups was ( $48.0 \pm 2.29$ ,  $41.93 \pm 1.89$ ,  $44.26 \pm 0.76$ ,  $43.93 \pm 0.13$ ,  $44.09 \pm 0.70$  respectively). Hct decreased in group(٢) compared with (٣,٤,٥) groups. When comparing group(٢) with the (٣,٥)groups was P. value ( $p \leq 0.01$ ). When comparing between the group(٢) with the group(٤) in Hct average was P. value ( $p \leq 0.05$ ). When comparing Hct average in the group(٢) with the three treatment groups was P. value ( $p \geq 0.05$ ). Hct increased in treated groups(٤,٥) and this may be due to the positive effects found in *Alchemilla vulgaris* herb. These results were in agreement with **Roghani**, (٢٠٠٤) who reported that the positive effects of polyphenolic compounds and flavonoids found in the *Alchemilla vulgaris* herb extract in terms of antioxidants and anti-inflammatory effects. **Ehsan et al**, (٢٠١٧) reported that hematocrit decreased in rats with ulcerative colitis. **Li et al.**, (٢٠١٨) reported that the several studies have recently shown that compounds derived from natural products have great potential in inhibiting the production of inflammatory mediators. For example,, it has been suggested that phytochemical compounds including phenols, flavonoids, are able to modulate the expression of pro-inflammatory genes.

#### (٧) The effect of ulcerative colitis on MCV in rats.

**Table (٣)** showed the effect of *Alchemilla vulgaris* herb extract on MCV in rats injury ulcerative colitis. The data given in table and figure showed the MCV average values of the negative group , positive group, durg groupmg٢٠٠mg and ١٥٠ groups ( $78.91 \pm 4.49$ ,  $76.10 \pm 0.80$ ,  $73.33 \pm 1.03$ ,  $74.1 \pm 3.80$ ,  $73.77 \pm 1.03$  respectively).The MCV average increased in the group(١) compared with The three treatment groups. When comparing group(٢) with group (٣,٥)in MCV average there was highly significant statistically( $p \leq 0.01$ ). there was significant statistically( $p \leq 0.05$ ) in MCV average when comparing between the group(٢) and (٤) group. When comparing the group(١) with the three treatment groups was notsignificant statistically( $p \geq 0.05$ ). Our results are similar to those obtained by **Vijaya et al.**, (٢٠٢٣) they reported that was a decrease in the MCV in rats with ulcerative colitis.

**Sánchez et al**, (٢٠٠٢) and **Dai et al.**, (٢٠١٢) reported that colonic mucus plays an important protective role against chemical-induced ulcerations which may also facilitate repair of damaged epithelium. Although several drug therapies have been proposed to treat ulcerative colitis, the side effects or toxicity of these drugs constitute a major clinical problem. For this reason, natural products that contain

antioxidants such as flavonoids are now being proposed as an alternative option alongside traditional treatments. In fact, previous experimental studies have shown that flavonoids such as quercetin, cochine, lycopene, kaempferol, and baicalein promote healing of ulcerative colitis.

**Michel**, (٢٠٢١) observed that MCV increased significantly ( $P < 0.01$ ) in the control group with ulcerative colitis compared with the normal group.

These results were in agreement with **Kaya**, (٢٠١٣) who reported that the lower blood MCV, and levels in stressed quails supplemented with *Alchemilla vulgaris* suggest that *Alchemilla vulgaris* supplementation may affect red blood cell profiles.

#### (٨) The effect of ulcerative colitis on mean corpuscular hemoglobin (MCH) in rats.

**Table (٣)** showed the effect of *Alchemilla vulgaris* herb extract on MCH in rats injury ulcerative colitis. The MCH average values were ( $26.84 \pm 1.04$ ,  $22.20 \pm 1.84$ ,  $24.67 \pm 1.10$ ,  $23.7 \pm 2.53$ ,  $27.29 \pm 2.06$  respectively) for all groups. there was an increase in MCH in the group (١), group (٢), and the three treatment groups compared with the negative group. When comparing group (٢) with group (٥,٣) in MCH average was P. value ( $p \leq 0.01$ ). When comparing the group (٢) with the group (٤) in MCH average was P. value ( $p \leq 0.05$ ). When comparing the group (١) with the three treatment groups in MCH average was P. value ( $p \geq 0.05$ ). These results were in agreement with those obtained by **Maryam et al.**, (٢٠٢٣) they reported that flavonoids and polyphenols are natural compounds that have significant effects in improving colitis, due to their antioxidant and anti-inflammatory properties. **Zhishen, et al.**, (١٩٩٩) reported that Phenolic compounds like flavonoids act as antioxidant activity and their effects on health and human nutrition are considerable. The mechanisms of action of flavonoids are through chelating process or scavenging and which act as free radical terminators. Our results are similar to those obtained by **Saravanan et al.**, (٢٠١٤) and **Shanmugam et al.**, (٢٠١٦) they reported that subpeltata leaves extract reduced the Inflammation and increased the protection percentage. The obtained statistically significant ( $p < 0.001$ ) results clearly proved that the higher dose of the plant extract have various combination of the polyphenolic groups. The synergistic effects of these compounds might be main reason for the reduction of the lesion

### (٩) The effect of ulcerative colitis on erythrocyte sedimentation rate on 1<sup>st</sup> hour in rats.

**Table (٣)** showed the effect of *Alchemilla vulgaris* herb extract on ESR in 1<sup>st</sup> hour in rats injury ulcerative colitis. The average of ESR values in the 1<sup>st</sup> hour in all groups ( $4,33 \pm 0,08$ ,  $7,18 \pm 0,27$ ,  $4,67 \pm 0,33$ ,  $0,07 \pm 0,07$ ,  $4,09 \pm 0,41$  respectively). ESR increased in 1<sup>st</sup> hour in group (٢) compared with the three treatment groups. There was highly significant statistically ( $p \leq 0,01$ ) in ESR average in 1<sup>st</sup> hour when comparing group (٢) with (٣,٥) groups. When comparing ESR average in 1<sup>st</sup> hour in the group (٢) with the group (٣) was P. value ( $p \leq 0,05$ ). While ESR average in 1<sup>st</sup> hour in the group (١) compared with the three treatment groups was P. value ( $p \geq 0,05$ ). Such data are in agreement with **Mashaal** (٢٠٢٢) who reported that the highest value of  $7,16 \pm 0,333$  mm / first hour was observed in the positive control group of mice with ulcerative colitis, and the amount of ESR gradually decreased with the decrease in inflammation.

**Boruga et al.** (٢٠١٤) reported that they analyzed the antioxidant activity of a methanol extract from the aerial parts of *A. vulgaris* and they found that the studied extract possessed DPPH inhibitory. The same author evaluated the antioxidant efficacy of extracts from roots and aerial parts of *A. vulgaris* as total antioxidant capacity, metal chelating and energy reducing capacity, lipid peroxidation inhibition, as well as their ability to neutralize DPPH, ABTS, and OH radicals.

### (١٠) The effect of ulcerative colitis on erythrocyte sedimentation rate on 2<sup>nd</sup> hour in rats.

**Table (٣)** showed the effect of *Alchemilla vulgaris* herb extract on ESR in 2<sup>nd</sup> hour in rats injury ulcerative colitis. The results in this table and figure showed the average of ESR values in 2<sup>nd</sup> hour in negative group, positive group, drug group 100, 200 mg and mg groups was ( $8,33 \pm 0,08$ ,  $9,29 \pm 0,61$ ,  $7,67 \pm 0,08$ ,  $7,80 \pm 0,04$ ,  $7,33 \pm 1,10$  respectively). ESR in 2<sup>nd</sup> hour in group (٢) decrease (0 and ٣,٤) in rats with ulcerative colitis. When comparing ESR average in 2<sup>nd</sup> hour in group (٢) with (٣,٥) groups was P. value ( $p \leq 0,01$ ). When comparing the group (٢) with group (٣) was P. value ( $p \leq 0,05$ ). When comparing the negative control group with the three treatment groups was P. value ( $p \geq 0,05$ ). Our results are similar to obtained by **Stankovic et al.** (٢٠٢٠) who reported that the *Alchemilla vulgaris* plant possesses a high percentage of various phenolic compounds, and a high antioxidant capacity of the extracts of the aerial parts and roots

*Alchemilla vulgaris* contains lycopene, which acts as an antioxidant According to the **table(١)**.

Our results are similar to those obtained by **Susanne** (٢٠٠٩) who reported that lycopene used as a food supplement in products in which it is found lycopene provides specific value (antioxidants or other purported health benefits). It can also be used as an antioxidant in nutritional supplements.

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## تأثير مستخلص عشب رجل الأسد على بعض المؤشرات الدموية في الجرذان المصابة بالتهاب القولون التقرحي

### المستخلص :

اجريت هذه الدراسة لتقييم تأثير مستخلص عشبة رجل الاسد في تقليل اعراض الالتهاب والتقرح لدي الجرذان المصابة بالقولون التقرحي زاجريت الدراسة علي ٢٥ فأر ،تم تقسيمهم الى خمسة مجموعات كل مجموعة تضم خمسة فئران المجموعة (١) السيطرة السلبية ،المجموعة (٢) السيطرة الايجابية،المجموعة (٣)مجموعة الدواء اعطيت اسم من السلفازين ،المجموعة (٤) اعطيت ١٥٠ ملغ من مستخلص عشب رجل الاسد،المجموعة (٥) اعطيت ٢٠٠ ملغ من مستخلص عشبة رجل الاسد وكان العلاج بمستخلص عشب رجل الاسد والسلفازين لمدة شهر يوميا. أظهرت النتائج في المعايير الدموية المختلفة انخفاضاً في متوسط قيم (العدلات ،كرات الدم البيضاء ،سرعة الترسيب، متوسط حجم خلايا الدم الحمراء) في حين ارتفع متوسط قيم (الهيموجلوبين ،الهيموترأكت ،كرات الدم الحمراء ،الخلايا اللعفاوية،متوسط الهيموجلوبين الجسيمي) . عند مقارنة (P ≥ ٠,٠١) Value.P المجموعة (٢) مع المجموعتين (٣) و (٥) في متغيرات الدم المختلفة كانت قيمة Value.P اظهرت الدراسة ان المجموعة المعالجة ٢٠٠ ملغ و (P ≥ ٠,٠١) . Value.P المجموعة (٢) مع المجموعة (٤) كانت ١٥٠ ملغ من مستخلص عشب رجل الاسد و دواء السلفيلازين سجلوا تحسناً في مؤشرات الدم المختلفة .

### الكلمات المفتاحية:

التهاب القولون التقرحي- رجل الاسد- سلفازين - حمض الخليك - عينات الدم