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### STUDY ON THE EFFECT OF USING THE GEL OF *Aloe vera* LEAVES IN THE TREATMENT OF EAR SCABIES DISEASE IN RABBITS

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#### Abstract

The present study was aimed to determine the effectiveness of use the gels of *Aloe vera* leaves in the treatment of scabies ear disease in rabbits. Twenty local rabbits were used to transfer the ear infection from an infected rabbit. These rabbits were randomly distributed to five treatments with four rabbits in each treatment are as follows. T<sub>1</sub> - control group No (1) rabbits infected with ear scabies treated with sulfur + paraffin oil in the rate of 1:10; T<sub>2</sub> - Control group No. (2) rabbits infected with ear scabies and treated with ivermectin injection subcutaneous at the neck at dose of (0.1 cm<sup>3</sup>/kg of body weight); T<sub>3</sub> - A group infected with ear scabies and treated with gel of *Aloe vera* leaves; T<sub>4</sub> - A group infected with ear scabies and treated with gel of *Aloe vera* leaves + sulfur ointment and Paraffin oil in the rate of 1: 10 and T<sub>5</sub> - A group infected with ear scabies and was treated with gel of *Aloe vera* leaves + ivermectin Injection subcutaneous at the neck at dose of (0.1 cm<sup>3</sup>/kg of body weight). The results of the study showed that the fourth treatment rabbits (T<sub>4</sub>) which treated with gel of *Aloe vera* leaves + sulfur ointment and paraffin oil in the rate of (1:10) as well as the fifth treatment rabbits (T<sub>5</sub>) which treated with gel of *Aloe vera* leaves was healed faster than the rest of the experimental animals in other treatments, So they were the healing rates for these animals (50 % on the 5<sup>th</sup> day of treatment and 100 % on the 10<sup>th</sup> day of treatment) for fourth treatment animals and by rate (75 % on the 5<sup>th</sup> day of treatment and 100 % on the 10<sup>th</sup> day) for the fifth treatment animals respectively and thus they significant excellence below the level (P <0.05) on the rest of the treatments especially T<sub>1</sub> and T<sub>2</sub>. The results also showed a difference in the duration of healing to the third treatment animals compared to the duration of healing the animals in the first and second treatments. Therefore, we conclude from this study that the gel of *Aloe vera* leaves have effectiveness against the ear scabies parasite. And to make sure of the effectiveness of this substance, we recommend further studies on this subject.

**Key words:** Rabbits, Ear scabies, Ivermectin and *Aloe vera* gels.

#### 1. Introduction

As a result of the millions of victims who have lost their lives due to the side effects of drugs

and drugs made from chemicals, the World Health Organization (WHO) has since the 1980s raised the slogan of return to nature (plants and medical herbs) with the aim of returning to everything that is normal and not chemically manufactured (Al-Omri, 1993). The "plants and medical herbs term, herbal medicine, traditional medicine or popular all synonymous with the use of plants in the treatment of some diseases (Alfada *et al.*, 1989). The World Health Organization (WHO) has convened dozens of international and regional

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scientific conferences to inform citizens and scientific health institutions of the need to use natural materials as much as possible in medication and treatment, which was titled Saving Lives in Preserving Medicinal Plants (Arab Organization for Agricultural Development, 1988). The focus has been on the use of medical plants and herbs, and studies have shown that there is thousands of plant species used to treat various diseases. Therefore, it was necessary to know the plants and medical herbs used in traditional treatment and uncovering their secrets. Therefore, attention has been paid by doctors and pharmacists in these medical plants and established centers, institutes and institutions specialized in studying the effective medical plant components and producing the medicine. *Aloe vera* is one of the plants of the *Liliacea* sp. It is a perennial plant, cultivated in arid and semi-arid regions, but its native habitat is the African Continent and the Arabian Peninsula (Akinyele *et al.*, 2007; Bozzi *et al.*, 2007). It also grows in the tropics, southern Europe, Mexico and the United States of America (Ghasem *et al.*, 2011).

The Cactus was recorded in the historical records of ancient civilizations where it is mentioned in Iraq, Egypt, India and Greece and is now being widely cultivated worldwide as being a plant that bears harsh environmental conditions that other plant cannot grow (Van *et al.*, 1997). The cactus has many therapeutic properties, and it is known that humans have known these therapeutic properties for several centuries. The Sumerians have been deprived of a set of clay tablets for medicinal uses of cactus since 2100 B.C and evidence of its therapeutic use was found among the drawings in the antiquities of the pharaohs and on the papyrus in Ancient Egypt, as found in ancient manuscripts in India, and all these evidence point to the widespread use of this plant in ancient folk medicine (Rupali *et al.*, 2011). Roberts and Travis (1995); Williams *et al.* (1996); Jacobs (2002) reported that compounds in the aloe vera gels inhibit the effect of ultraviolet light on the skin and reduce skin scratching caused by hypersensitivity in mice and humans.

Recently, there has been increasing interest in the use of cactus in the pharmaceutical industry and has been studied by many researchers, pharmacists and doctors in different countries in the world to identify In order to identify what is reported in the popular circles of great benefits to the cactus in the treatment of some cases and the results of their research in favor of the cactus, researchers have known more 75 different nutrients, 20 kinds of mineral salts, 12 kinds of vitamins and 200 active chemicals extracted from the inner layer of cactus leaves (gel) have good therapeutic properties such as saponins, terpenoids, flavonoids, phenols, aloin and Barbaloin (Olsen *et al.*, 2001; Inan *et al.*, 2007). In the study of Lee *et al.* (2000) they found that the Aloin, which was found in leaves gel is useful in treating diarrhea and in the treatment of wrinkles in the skin by stimulating and accelerating the production of collagen in the skin, thereby removing wrinkles and reducing the appearance of other wrinkles. Also the *Aloe vera* cactus was found to contain a compound Aloe-emodin is a new type of anticancer agent with selective activity against neuroectodermal tumors (Pecere *et al.*, 2000) and because the *Aloe vera* has antimicrobial properties so has been used against many common bacteria such as *Staphylococcus* sp., *Streptococcus* sp., *Klebsiella* sp., *Pseudomonas* sp., *Escherichia coli*, *Salmonella* sp. (Lawrence *et al.*, 2005) and is used to treat parasitic and viral diseases and to enhance the immune system (Rabe *et al.*, 2005). It was also found that American Indians in USA use *Aloe vera* cactus to treat digestive disorders and treatment of burns (Biswas and Mukherjee, 2003).

Rabe *et al.* (2005) and Tessema *et al.* (2014) noted that *Aloe vera* cactus is used as a good antidote against many parasitic, bacterial and viral diseases and cactus extract has an important role in stimulating the immune system in the body. The study of Okoko *et al.* (2008) showed that the use of methanol extract for cactus seeds has a significant effect on body weight in white rat females, as it improves body weight. And in another study to see the effect of alcoholic extract of cactus on the hormonal efficacy of white rats



female, Rao (2009) he found that this extract has the same effectiveness of estrogen and progesterone hormones.

In a recent study, it was found that the use of alcohol extract of *Aloe vera* leaves in the treatment of rabbits with Alloxan induced diabetes can reduce the level of glucose in the blood of infected rabbits to normal levels and also reduce the concentration of Glutamic Oxaloacetic Transaminase (GOT) and Glutamic Pyruvic Transaminase (GPT) enzymes in the blood, which increases its concentration in the case of diabetes (Al - Ali *et al.*, 2016). The aim of this study was to find out the effectiveness of the *Aloe vera* gel in the treatment of ear scabies disease in local rabbits, which is a common disease between humans and animals, which is a parasitic disease caused by a bug (*Psoroptes communis cuniculi*) and the symptoms begin as inflammation, the Pinna extends to the external auditory canal due to the proliferation of the subcutaneous parasite with the accumulation of sticky brown fluid. The result of the rabbit's rubbing of the infected tissue consists of painful lesions of the rabbit with the tendency of the head to the affected ear. This is followed by severe wasting due to rabbits abstaining from eating and dying.

## 2. Materials and methods

The study was conducted during the period from 23/9/2016 to 23/11/2016. The study used 20 local rabbits aged 6 - 8 months and weight of 1700 - 2100 g. Rabbits were divided into five groups (treatment) with four rabbits in each treatment, as follows: T<sub>1</sub> - Control group No (1) rabbits infected with Ear Scabies treated with sulfur + paraffin oil in the rate of 1:10; T<sub>2</sub> - Control group No. (2) rabbits infected with Ear Scabies and treated with Ivermectin injection subcutaneous at the neck with a dose of 0.1 cm<sup>3</sup>/kg of body weight; T<sub>3</sub> - A group infected with Ear Scabies and treated with gel of *Aloe vera* leaves; T<sub>4</sub> - A group infected with Ear Scabies and treated with gel of *Aloe vera* leaves + sulfur ointment and Paraffin oil in the rate of 1: 10 and T<sub>5</sub> - A group infected with Ear Scabies and was treated using gel *Aloe vera* leaves + Ivermectin Injection subcutaneous at the neck with a dose of 0.1 cm<sup>3</sup> / kg of body weight. All

rabbits were subjected to the same conditions. They were placed in wire cages with dimensions of 80 × 70 × 50 cm. The rabbits were left for two weeks to adapt to the conditions of the breeding room before starting the experiment and during the trial period they gave a water and food freely.

### The development of Ear Scabies (Experimental injury with Ear Scabies)

An ear-infected rabbit was obtained from the local market, the diagnosis was made by a veterinarian by taking a sample of the ear by scraping the skin deeply by a scalpel moistened with glycerine and then put 10 % potassium hydroxide for 10 minutes then we examined the sample under the microscope and confirmed the infection. After confirming the infection, experimental animals mixed with the infected rabbit and developed an injury by scraping the skin of the affected rabbit's ear with a scalpel moistened with oil, and then injuring the ears of other rabbits using a clean and sterile scalpel, the scalpel, in which a sample of the infected rabbit was taken, was passed on the rabbit's proper ear for the purpose of transmitting the infection, this process was repeated on all rabbits. Three weeks later, symptoms of the infection began to appear, and then left another week to include infection the largest area of the ear, after full confirmation of the incidence of infection, the rabbits treatment was started as planned by the treatment method for each group,

### The Treatment

The groups with ear scabies were treated as follows: The first treatment rabbits control group No (1) was treated by (sulfur ointment + paraffin oil in the rate of 1:10.

The second treatment rabbits control group No (2) was treated with using (Ivermectin injection subcutaneous at the neck with dose of 0.1 cm<sup>3</sup>/kg of body weight). The third treatment rabbits were treated with (gel of *Aloe vera* leaves), which was used directly by bringing fresh leaves from the *Aloe vera*. And then, the outer layer of the leave was removed, the gel of leaves were scaled by a clean and sterile spatula, then the rabbit's ear was stained with gel. The fourth group rabbits were



treated with gel of *Aloe vera* + sulfur ointment and paraffin oil in the rate of 1:10. The fifth group rabbits were treated with gel of *Aloe vera* + Ivermectin injected subcutaneous at the neck with a dose of 0.1 cm<sup>3</sup>/kg of body weight.

### Statistical analysis

The descriptive statistics were used to extract the ratios, and then we calculate the value of the Chi square by use SPSS version 21.

### 3. Results and Discussion

The results in the table below indicate that the use the gel of *Aloe vera* + sulfur ointment and paraffin oil Treatment (T<sub>4</sub>) or use (Gel of *Aloe vera* leaves + Ivermectin) Treatment (T<sub>5</sub>) gave the best ratio in terms of the duration of healed as 50 % of the fourth treatment animals were healing within 5<sup>th</sup> days of the treatment period and 100 % during the 10<sup>th</sup> day of treatment. And in the fifth treatment was the rate of healing of experimental animals 75 % during the 5<sup>th</sup> day of treatment period and 100 % during the 10<sup>th</sup> day of treatment. Thus we observe significant superiority (P < 0.05) for the T<sub>4</sub> and T<sub>5</sub> treatment on the first control treatment (T<sub>1</sub>) in which (sulfur ointment + paraffin oil in rate of 1:10) was used for treatment, and the second control (T<sub>2</sub>), which used (Ivermectin injection subcutaneous at the neck at a dose of 0.1 cm<sup>3</sup>) for treatment. Also, we show from the results in the table below that the third treatment (T<sub>3</sub>) in which the (*Aloe vera* gel) was used in the treatment, also superior to control treatments T<sub>1</sub> and T<sub>2</sub> in healing ratios, where the healing rate for infected animals was 50 % on the 5<sup>th</sup> day of treatment period and 75 % on the 10<sup>th</sup> day of treatment and 100 % of infected animals on the 15<sup>th</sup> day of treatment.

The reason for the superiority of the treatment of the gel of *Aloe vera* leaves in increase the healing rates of animals which infected with ear scabies can be attributed to the containment of cactus gel on some active compounds such as Aloin, which have therapeutic properties of dermatological where the study of Lee *et al.* (2000) showed that the Aloin, which was found in the gel of cactus leaves is useful in treating wrinkles in the skin and building damaged parts by stimulating and accelerating the production of collagen in the skin and may be the *Aloe vera* leaves contain some antibiotics that inhibit bacteria and fungi and thus accelerate healing time.

Rabe *et al.* (2005) mentioned that the *Aloe vera* was used as a good antidote against many bacterial, fungal and viral diseases. The reason may be that the *Aloe vera* contains magnesium, the itchy inhibitor, this substance has been shown to prevent the formation of histamine (the substance that causes itching in the skin). So, the gel of *Aloe vera* leaves reduces the itching and inflammation. The cactus also contains Brady Keynes, is a substance that eliminates pain, itching and congestion, and has done a handle to the arteries, which reduces swelling and redness that occurs inflammation site. In addition to containing cactus on the antiprostaglandin and this article also relieves pain and inflammation, as do aspirin pills. Thus, these three substances work together to reduce inflammation. This explains its effectiveness in the treatment of ear disease and possibly because the *Aloe vera* is help to a generator of cell and has antimicrobial and fungal effects and work to activation the immune system (Tessema *et al.* 2014).



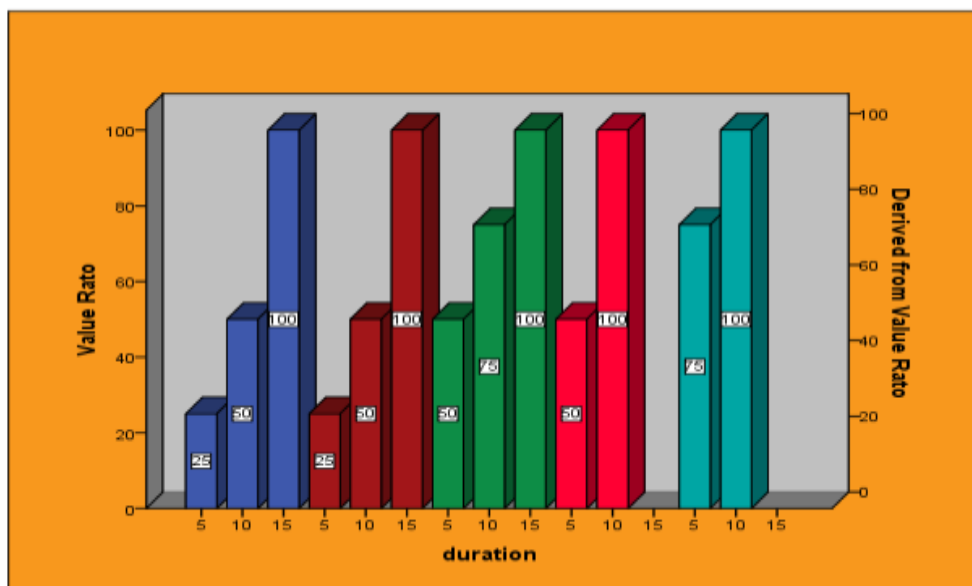


**Table - 1: The impact of the use the gel of *Aloe vera* leaves on the healing rates in Rabbits which infected with ear scabies**

Treatments	Healing Rates	Healing rates depending on days		
		5 days	10 days	15 days
T <sub>1</sub>		25 %	50 %	100 %
T <sub>2</sub>		25 %	50 %	100 %
T <sub>3</sub>		50 %	75 %	100 %
T <sub>4</sub>		50 %	100 %	-
T <sub>5</sub>		75 %	100 %	-
The Value of $\chi$ Square		37.5	18.75	122.7

T<sub>1</sub> - Control group No (1) infected rabbits with Ear Scabies was treated with sulfur + paraffin oil by 1:10; T<sub>2</sub> - Control group No (2) infected rabbits with Ear scabies was treated by (Ivermectin injection Subcutaneous of the neck at a Dose rate (0.1 cm<sup>3</sup>/kg of body weight); T<sub>3</sub> - Infected Rabbits with Ear scabies was treated with gel of *Aloe vera* leaves; T<sub>4</sub> - infected Rabbits with scab ear was treated with gel of *Aloe vera* leaves + sulfur ointment and paraffin oil by 1:10; T<sub>5</sub> - Infected Rabbits with Ear scabies was treated with gel of *Aloe vera* leaves + Ivermectin injection subcutaneous of the neck at a dose rate (0.1 cm<sup>3</sup>/kg of body weight).

**Figure shows the duration of treatment and the proportion of animals that healed the disease**



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