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In Vivo Anti-Inflammatory Potentials of Plantago ovata on Albino Male Mice

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Abstract:

The researches show that used of herbal medicine in the treatment of diseases increases every day. In the past, medicinal plants are believed traditionally to be a therapeutic agent for the treatment of a number of diseases such as typhoid, cholera, measles, etc.

A study was investigating the burn healing effect of aqueous extract of *Plantago ovate* "Isabgol" seeds. The extract was used as an ointment to cure the wound in briefest (shortest as it possible time with minimal pain), discomfort and scaring to the patients in comparison to standard Silverin ointment by Switzerland.

The result of burns healing effect indicated that the *Plantago ovata* possessed less day to recovery lesions in skin in comparison with positive control (silverin cream) and negative control (without any treatment) (15, 18, 24 day) respectively. All these effect due to the presence active chemical constituents in plant (flavonoid, caffeic acid derivatives, terpenoids, vitamins, iridoid glycosides, fatty acids, polysaccharide, alkaloid)

1. Introduction

Medicinal plants have used as a wound healing remedy for centuries in almost all regions of the world and in the treatment of a number of diseases apart from wound healing.

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Plantago ovata is a species of flowering plant in the *Plantaginaceae (plantain)* family (order Lamiales) with around 265 species, which little plants typically have a thick tuft of basal leaves and long, leafless stalks bearing a terminal spike of little blossoms [2,7].

This plant is a dietary fiber acquired from the seed husk of *Plantago ovata (Plantaginaceae)*. It is one of the most regularly utilized over-the-counter preparations worldwide, fundamentally used to control regulate bowel habits and clean the digestive tract. As of now, there is logical proof of the convenience of *Plantago ovata* for a several gastrointestinal sicknesses, namely constipation, diarrhea, irritable bowel syndrome, and ulcerative colitis [6].

It can likewise diminish the dangers of metabolic conditions by controlling glucose levels in diabetic patients, lessening lipid levels in hyperlipidemics, and supporting weight control [3].

It is also known by several common names such as; Isabgol, Psyllium, Psyllium husk, Dietary fiber, Indian Plantago, Blond Plantago, Blond Psyllium, Sand Plantain, Spogel Seeds, etc. [12,10].

Plant distribution in the all the world, for example, Spain, Tunisia, Algeria, Morocco, Georgia, Azerbaijan, China, India, Bahrain, Iraq, Jordan, US [4].

In view of this, the present studies focus on the knowledge on medicinal uses of plants and the scientific investigation to confirm their medicinal values.

2. Material and methods

2.1. Plant Collection and Identification

The seeds from *Plantago ovata* were prepared from the local markets of Baghdad during Sep. / 2020 and recognized by Dr. Ibrahim S. Al-Jubouri, College of Pharmacy, Al-Mustansiriyah University, Iraq.

2.2. Preparation of Plant Extract

Aqueous extract of *Plantago ovate* was prepared according to [14], with a weight of 10 grams of plant powder, it was placed in a clean flask filled by 250 ml of distilled water, and then it was placed in the shaking incubator at a temperature of 28 C° for a period of 30 minutes, then filtered using medical gauze, and then the filtrate was distributed on plates. Dried the water in the oven at 37 C° until the water evaporated completely to obtain the dry powder for the aqueous extract. Each sample was placed in sealed tubes, and placed in refrigerator at 4 C° until use [11].

2.3. Laboratory Animals

Mus musculus (Albino male mice) were the laboratory animals. They were provided by the Biotechnology Research Centre (Al-Nahrain University). At the start of experiments, their ages and weight were 8-10 weeks, and 23-27 grains, respectively. The animals were distributed into groups which each group was kept in a separate plastic cage (details of these groups are offered in the section of experimental design). They were maintained at room temperature, and had free excess to food (standard pellets) and water (*ad libitum*).

2.4. Experimental Design

Three groups were tested, which each group contain 3 animals' parameters; The total number of animals in this experiment was 9 mice, Details of these groups are summarized in Table 1.

Table 1. Laboratory tests and number of animals in the investigated groups of experiment number one

Group no.	Tested material	Laboratory tests and number of animals
Group I	Mice without any treatment (negative controls)	3
Group II	Mice were administrated with *Plantago ovate*	3
Group III	Mice were administrated with commercially cream of burns (silverin Switzerland)	3
The total number of mice in this stage was		9

2.5. Immunological parameters

2.5.1. Burns skin model in mice

In order to assess burn healing activity of *Plantago ovate* "Isabgol". Three mice groups were tested. Mice hair were removed hair and flame was used to induced burns of skin, then calculated the recovery days by determining number of days required to heal the wound [13,1].

3. Results

The outcomes showed that aqueous extract had altogether expanded the percent wound decrease prompting improved injury recuperating as in table 2.

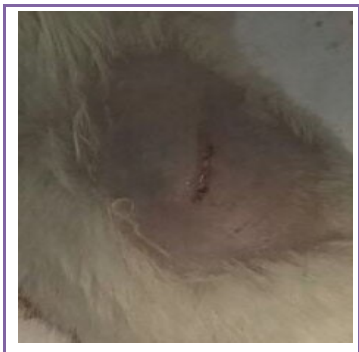
Table 2. Experimental result

2021-02-14 sun.	We removed the hair from the area zone to them for the burning and then measurement the period to recovery.
2021-02-15 Mon.	It was the first day of treatment, Where the ointment (*Plantago ovate* "Isabgol" ointment and silverin ointment) was put in the burn`s area.

2021-02-21 Sun. after one week	- The pus are increases in the control positive
	- Mice which used *Plantago ovate* "Isabgol" ointment to treated, we saw an improvement in the case, the surface area of the burn has shrunk and also hair has begun to grow again.
	- In contrast, mice which used silverin ointment to treated, only surface area of the burn has shrunk
2021-02-27 Sat. two weeks ago	- There is no improvement in the control positive, and one of mice in this group was died of his wounds.
	- Mice which used *Plantago ovate* "Isabgol" ointment to treated, almost complete recovery.
	- Mice which used silverin ointment to treated, hair has begun to grow again at these period.
Recovery day	- At 2021-03-10, Without any treatment reach to full recovery, so its need 24 days.
	- At 2021-03-01, Treatment with *Plantago ovate* reach to full recovery, so its need 15 days.
	- At 2021-03-03, Treatment with Silverin reach to full recovery, so its need 18 days to full recovery.

Table 3. The recovery of burn healing in albino male mice after different treatment.

Groups	Type of treatment	Period of recovery
1	**Without any treatment**	**At 2021-03-10, which need 24 days to full recovery**
2	**Treatment with *Plantago ovate* "Isabgol"**	**At 2021-03-01, which need 15 days to full recovery**
3	**Treatment with Silverin**	**At 2021-03-03, which need 18 days to full recovery**



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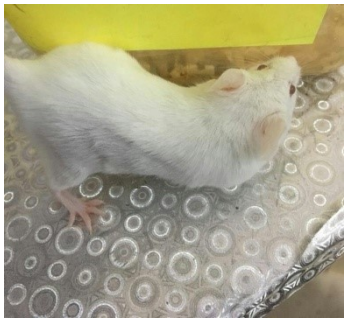

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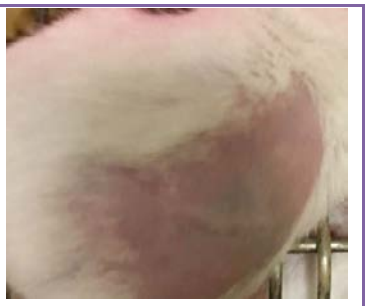

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Figure (3-6). At recovery day A) Group no.1 positive control, B) Group no.2 Plantago ovate "Isabgol", C) Group no.3 Silverin.

4. Discussion

The crushed forms of leaves are used in healing of chronic wounds. Recent ethno-pharmacological studies showed that *Plantago ovata* is used in many parts of the world, in the treatment of a number of diseases. where *plantago* leaves and seeds contain carbohydrates, lipids, vitamins, caffeic acid derivatives, flavonoids, iridoid glycosides, alkaloids and other organic substances led to its diverse medicinal properties. Each of the constituents has unique medicinal property [9].

Plantago ovata "Isabgol" has also tested for wound healing properties by assessing the proliferation and migration of oral epithelial cells in vitro and the results exhibited the extracts of *Plantago ovata* have a benefit effects on proliferation of epithelial cells suggesting its wound healing [5,8].

5. Conclusion

Isabgol (*Plantago ovata*) can act as treatment of burns by decreasing day require to recovery due to the presence of chemical constituent of plant (flavonoid, al-kaloide)

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