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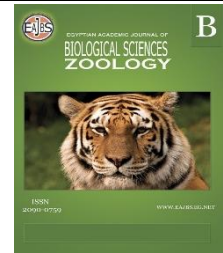


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## The Physiological Effect of *Artemisia herba alba* Extracts on Sperm Activity in Male Rabbits

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### ABSTRACT

*Artemisia herba alba* plant is spread in forests and desert, cold areas, especially in the Green Mountain region, and it is considered as one of the important medicinal plants in Libya. This study aimed of investigating the stimulating effects of the aqueous extracts of the leaves, seeds and roots of the wormwood plant. The doses (10, 20, 30 mg / kg) effect on testosterone, movement and concentration of sperm for male rabbits were leaded. The results showed that there were highly significant differences with an increase in blood flow, speed and movement of sperm, and level of testosterone compared with the control group at  $P < 0.05$ . The excessive intake of extract leads to excessive activity of the reproductive system cells, leading to severe deficiency and insufficiency of testicular function due to the cells enlargement and their transformation into cancerous tumors, which affects the production of testosterone hormone.

### INTRODUCTION

*Artemisia herba alba* is an evergreen plant, its height ranges (30-150 cm), and branches multi- intensive, its end is green colour or white (*Dellillelucienne, 2007*). The period of its life about (3-4) years. The roots and cruel characterized by vehicle or spherical and sheets theatre Aromatic (*Abou El-Hamd et al., 2010*), Turkey is the original home to him, it presents in North Africa, Pakistan, the Maghreb Mountain, Syria, Libya, Iran, and areas of Saudi Arabia (*Vernin, et al., 1995; Preeti and Jaspal, 2013*). *Artemisia herba alba* plants are the medical plants which inter for much scientific research used in the treatment of worms and gastrointestinal has been used to expel the snakes (*Twaij and Al-Badr, 1988*). It has different effects infertility, whether male or female as is one of the antibiotic or antioxidants (*Oomme, et al., 2004*). Also, it plays a role in the Elimination of cancer cells (*Harborne, et al., 1993*), and exhibits ability to address the back and joints and inflammation rheumatic and strengthens the immune system and the reproductive system diseases (*Jacquelin and longe, 2005*). It's used in the treatment of infections and effects of the liver reduces blood pressure concentration of blood sugar (*Al-waili, 1986*). The *Artemisia herba albatonic* contains the compound (thujone) which has the ability to alert the central nervous system (*Perez Gutierrez and Perez, 2004*). In addition, it alert operations vital heart through the pacemaker, lungs, and muscles (*Bézanger - Beauquesne, et al., 1980*), as that contains Sheih material Which is atoxic substance. So, the high doses of the herb wormwood may turn to the material fatal as mentioned (*Boaretoa, 2008*).

Also, overdose cause abortion for pregnant women fact that the herb stimulates the Adrar menstrual and cause uterine contraction (*Almasad, et al., 2007*). It is of herbs and aperitifs contain the volatile oils that alert the secretions of the digestive system, as used to treat and improve the airways sacs pulBrunet (*Bruneton, 1993*). This study aimed of investigating thestimulating effects of the aqueous extracts of the wormwood plant on the speed and movement of sperm, and level of testosterone.

## MATERIALS AND METHODS

### Collection of the Plant:

Thestudy was carried out in laboratory in the Zoology Department/ Faculty of Arts Science/ University of Omar Mukhtar/ Al-Gubba/ Libya, to test the effects of plant extracts of *Artemisia herba alba* using different concentrations on the male rabbits, the samples (seeds and twigs, edible roots) were collected from the area of the intermediate mountain green north of white/Libya, washed by distilled water and dried for 15 days. Taking into account the appropriate conditions for drying, the drying sample willed and concerted until used (*Dafaallah, 2019*).

### Preparation of the Aqueous Extract:

The aqueous extractis prepared by mixing 50 gm of powder in an aqueous solution diluted with ethanol 70% and mixed by the electric mixer at room temperature away from the light for 24 hours been nominated for the mixture, and collected for 72 hours, The solution in the centrifugefor15minuts quickly 2000c/minute, considered the essential solution concentration 100% (*Masoud, et al., 2018*), and from attended the concentrations used 10, 20, 30%, preserved in the glasses of the flask opaque in the refrigerator until the use. The animal's laboratory study was conducted on the male rabbits. The study was conducted on 12 adult males between the ages of 5 to 7 months, weight between (228 - 2925 grams). where it was the provision of all appropriate conditions in the metal cages for ranges from its dimensions (45 x55cm).

### Experimental Design:

The animals were divided to 4 groups, 3 for each:

**First Group:** The control group, which didn't treat and feed daily on naturally balanced diet.

**Second Group:** The rabbits were treated with the plant extract with a dose of 30 mg for 30 days.

**The Third Group:** The rabbits treated with the plant extract with a dose of 20 mg.

**TheFourthGroup:** The rabbits were treatedwith the plant extract with a dose of 10mg for 30 days.

**Blood serum:** After 30 days of treatment and before the slaughtering process directly taken blood samples with a situation in the tubes test with the material-proof anticoagulant, and then we conducted a process on the speedof4000cycles in the minute for an hour was the transfer of plasma to the laboratory blood to analyze the testosterone.

**TheEradic:** Directly, after the slaughtering process installs the animal on the Panel anatomy, using scissors and cause slot lower abdomen to the chest area, then extract the testicles with the epididymis, and then cleaning eradicated organs by distilled water.

**The study of semen:** To see the physical properties of semen by opening the epididymis by the events of a small incision by a sharp blade, and then we take adrop of semen and put them in the small tubes with 1 ml of water and physiological with a focus 0. 9% in order to ease semen, used to this solution in the study of each of the movement speed.

**Speed of Sperm:** Take the drop of fluid diluted and put them over the cell Malassez, and then put cover slide is the examination microscope optical zoom in X40, and then calculate the time lump10-sperm with the movement of equity front between two lines parallel lines of Malassez

the application of the relationship the following: -

Speed (mm/s)= Distance (ml/s) /Time( seconds).

**The Movement of Sperm:** In order to know the movement of sperm put a drop of semen diluted in the slice normal and covered by cover slide, thane amine under the optical microscopeX40, then calculate the sperm count animated compared by the number of animals college in the 3groupsof vision has been calculated the arithmetic average of the Group.

**The Concentration of Sperm:** When observing the concentration, take the drop of semen diluted and put them FOV network count Malassez has been covering the cover slide and examine under the microscope optical zoom in 400X manner methodology, from left to the right When the highest to the bottom, and the calculated number of the sperms of 5 boxes wide range of network count to the application of the relationship the following

concentration of sperms:

$$C=D.V. N/n$$

where:

D: coefficient of mitigation.

V: fever network count(1\_3mm) (2. 5 mm) length of (2 mm) View.(0.2 mm) high.

n: number of sperms. that have been calculated in 5 boxes.

N: Number of small squares 100 squassta

**The Statistical Analysis:**

It is designed to experiences of the study in accordance with the design and full random (CRD), carried out of statistical analysis using the program (Minitab 17) tables variance analysis ANOVA, were compared to averages by using the test (Tukey' s) when P<0. 05.

## RESULTS AND DISCUSSION

The results of the present study showed that the aqueous extracts of the wormwood plant. *Artemisia herba alba* possesses a high stimulating activity that led to an increase in testosterone concentration, as the results showed a significant increase in the group treated with a dose of 20 mg/kg compared to the control (Table 1). On the contrary, a significant decrease was noted in the second group compared to the control, while the results in the fourth group were close to the third.

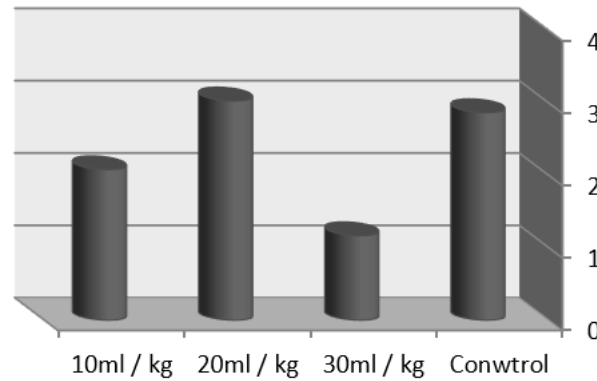
**Table 1.** The impact of plant extract on testosterone, speed and concentration of the movement of sperm in the male rabbits.

Group	Control	10ml/kg	20ml/kg	30ml/kg
<b>Testosterone concentration</b> Nano gm/ml SD±X	1.775±2.878	0.78±2.09	0.74±3.04	1.76±1.178
<b>Sperm velocity</b> Mm / sec SD±X	0.007±0.036	0.008±0.033	0.005±0.039	0.003±0.019
<b>Sperm motility%</b> SD±X	6.70±98.16	3.89±94.11	6.198±107.64	2.60±94.48
<b>Sperm concentration</b> 10 <sup>6</sup> mm <sup>3</sup> SD±X	6.132±225.14	19.348±219.51	21.67±315.88	45.46±209.17

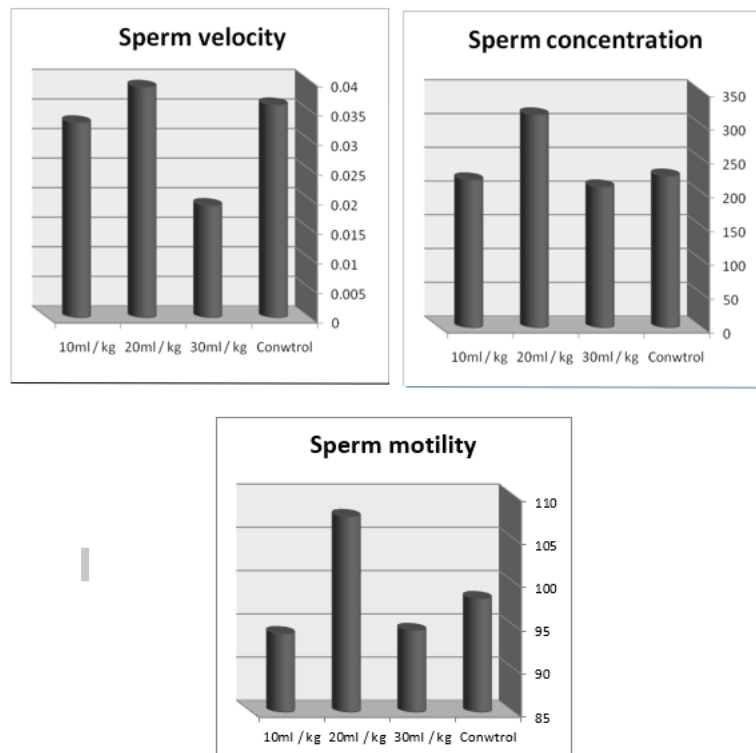
The data recorded in table,1 indicated that the effect of the water extract of the wormwood plant at a dose of (10, 20, 30 mg / kg) affected the speed, movement and concentration of sperm, where the third dose of 20 mg / kg recorded the highest rates in

increasing the speed, movement and concentration of sperm compared to the control. The same result for the group treated with the fourth dose 30 mg/kg with a significant decrease for the second group compared to the control, and the increase in sperm concentration was not limited to the third group only, but exceeded it to the fourth group treated with 30 mg/kg compared to the control. The second and fourth groups also showed a significant decrease compared to the control group congeners.

### Testosterone concentration



**Fig. 1:** The concentration of testosterone hormone in domestic male rabbits treated with different doses of *Artemisia herba alba*.



**Fig. 2:** The speed, movement and concentration of domestic male rabbits' spermatozoa treated with different doses of *Artemisia herba alba* extract.

*Artemisia herba alba* has the effectiveness of stimulation lead to increase the speed of the concentration and movement of sperms. Showed decrease compared between a control group with the second group. When compared with the first and fourth groups, shown in table 1, Where observe the second group highest level in the increased speed of sperms and

compared with the control group and the same result with the fourth group treated by dose 30mg/Kg but showed decrease significantly of the second group. The impact of the aqueous extract plant the movement of sperm: As results show in the table1, the movement of sperm were affected, all the same as the impact of the second group treated by 20mg/Kg dose, the largest rates somewhat of the fourth group treated by 30mg/Kg dose, but the results were convergent between doses the second and fourth groups compared to the control group. The impact of the aqueous extract plant concentration of sperm, as indicated in table1, the concentration of sperms showed a clear increase when the second group treated by 20mg/Kg, compared with the control group. No increase in the concentration of sperms with the third groups, as in the fourth groups treated by 30mg/Kg dose compared with the control group. The second and fourth group exhibited a decrease significant compared with the control group. The impact on testosterone showed an increasingly significant effect in the second group treated by 20mg/Kg dose compared with the control group. The opposite was observed the fourth group and the same with the third group. Results indicated that semen analysis proved to actually increase activity of testicular thereby increasing fertility. The results show a clear increase in the speed and movement and concentration of sperm when the second group treated by dose 20mg/Kg. This is due to the effect on testosterone, which stimulates in increase the divisions of the, concentration of sperms. This is consistent with Goyal (*Goyal, et al., 1994*). Also works hormone on the differentiation and the final maturity of sperms. As well as, the certoil cells and sex cells are distorted, which improves the quality of sperms, that observed by increasing the concentration of sperms and antioxidants, which improves the speed of the movement of sperms (*Grasse, 1955*). As for the concentration of testosterone in the plasma has been observed to increase, when the second group treated by dose was 20mg/Kg where are considered cells Ledge. the main source of the production of testosterone is linked to its focus on the number of cell activities. That's characteristics led to an increase and large the number of cells Ledge which contributed to the increase its focus in the blood as increased nutrition through the increase the number of vessels in the aggregates interfaces cells Ledge, as that the results of third dose plant Extract treated by dose 20mg/Kg have given the positive effects on components of antioxidants plant. The side effect of this plant showed toxic effect on the various indicators fertility of the second group, it is through the study of semen analysis and hormone testosterone was noted the tall results convergent with the results of the treatment group by dose 30mg/ Kg, but with low simple, although the high value of the dose and thus the high concentration of antioxidants by the plant, but the results were negative compared to the third group has come back reason for this too high concentration of toxic substances in the plant wormwood and increase its impact on the antioxidants(*Akour, 2016*), The study conducted proved, the use plant of the type *Artemisia herba alba* from kinds used in the study, that has the effects of reduced fertility may lead to infertility and thus concluded that the *Artemisia herba alba* the opposite effect on productive and fertility(*Almasad,2007*).some studies confirmed that eating too much plant lead at the beginning of it to high Activity system cells proliferative a private cells Ledge, and thus increase the quality of semen, as increase the concentration of testosterone in the plasma. At the end of it leads hyperactivity cells device proliferative to the deficit and palaces a sharp in testicular function injury cells inflation and converts it to tumours, which the impact on the production of testosterone, as that the study conducted by *Kalfonet al., 1999*; confirmed that inflation cells lead to its transformation to cancerous. Sometimes the production of a decrease in testosterone and decrease infertility or non-existent due to increasing the compounds estradiol, as mentioned by some studies reported the impact of toxic plant wormwood due to the presence of a compound thuyone(*Kalfon, et al., 1999; Boaretoa, et al., 2008*).

**Conclusion:** This study revealed that the aqueous extract leads to an increase in semen and thus a clear increase in the speed, movementand concentration of sperm, this is due to the effect

of the hormone testosterone, which stimulates an increase in the number of divisions, which increases the concentration of sperms, on the other hand, antioxidants work to eliminate of the free radicals produced during the movement of sperm, which improves the speed and movement of sperms. This study recommends reducing over-eat eating of wormwood because it leads to an increase in the activity of the cells of the reproductive system, especially Ledge cells, and thus increase the quality of semen, and also increase the concentration of hormone testosterone in the plasma, in turn, the excessive activity of the cells of the reproductive system leads to a deficit and severe testicular function. Because the cells become enlarged and turned into cancerous tumours.

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