AIJPS
Academic International Publishers
Academic International Journal of Pure Science
Volume 02, Issue 02

The Effect of Capparis Spinosa Extract on Some Immunological and Physiological Variables of Mice

Intisar Masier Abd[1], Nuha Majeed Farhan[2], Lubab Mohammed Awad[3]
[1]General Directorate of Anbar Education, Ministry of Education, Iraq
intesarmasier@gmail.com
[2]Department of Pathological Analysis, College of Applied Sciences, University of Fallujah, Iraq
nuhaa.majeed.ext@uofallujah.edu.iq
[3]General Directorate of Anbar Education, Ministry of Education, Iraq
lubabmo373@gmail.com

(Received 28 June 2024, Revised 25 July 2024, Published 19 October 2024)

Abstract

Background The pungent taste and numerous health advantages of the caper plant are not to be overlooked. Thanks to its high vitamin content—including B12, niacin, vitamin K, vitamin A, vitamin E, and fiber—it finds widespread usage as both a culinary seasoning and a medicinal herb. Methodology The Soxhlet device was the most efficient and effective way to isolate the plant's active organic ingredient crude. I ground the plant into a powder using a blender. Then, I added 250 mL of ethanol and added 95% after extraction. I extracted the plant within 24 hours and concentrated the mixture using a rotary evaporator. Finally, I frozen it at -20 ° until I needed it. The mice were housed in sanitary cages that met their nutritional, thermal, and ventilation needs. The experiment did not begin until the mice had been allowed to acclimate for one week without treatment. Result The results presented here appear to be descriptive statistics for a number of physiological characteristics measured in mice treated with varying concentrations of Capparis spinosa extract (control, 10%, and 20%). Haemoglobin (Hb), packed cell volume (PCV), red blood cell count (RBC), white blood cell count (WBC), and the total count for each therapy group are the variables that are being considered. In order to compare the control group with the groups treated with varying doses of Capparis spinosa extract, this data sheds light on the central tendency and variability of physiological variables under different treatments. The results showed an increase in some blood variables compared to the control. There is also an increase in the number of white blood cells, which enhances the increase in the first line of defense against pathogenic organisms.

Keywords: Capparis spinosa, Caper plant extract, Soxhlet extraction, Ethanol extraction, Physiological effects, Haemoglobin (Hb)

How to cite: Intisar Masier Abd, Nuha Majeed Farhan, Lubab Mohammed Awad. The effect of Capparis spinosa extract on some immunological and physiological variables of mice. *Aca. Intl. J. P. Sci. 2024;02(2):32-36.* https://doi.org/10.59675/P224

Introduction:

A plant that has been used for thousands of years as medicine, food, and support—Capparis spinosa—is now all over the globe and has made its way to Iraq. [1, 2] Shefallah or kabbar in Spanish, capero in Italian, kapari in Turkey, and kapersy and kappertjes in Russian. Ancient civilizations like the Egyptians, Babylonians, Greeks, and Romans made use of trick plants for both culinary and medicinal purposes [3-6]. The Capparaceae family, to which plants belong, is known for its remarkable adaptability. It was used for medicinal benefits until the archeological age, which began

in China in 2800, when the link between trick and people became so strong [7-9]. The ruse takes into account aromatic plants with sharp spines, spherical leaves, green and delicate, white or pink flowers, and long stalks of silvery natural goods that contain black seeds with an unpleasant flavor and a red coagulated fluid with a sweet flavor [9-12]. The unique parts of C.spinosa were the subject of a controlled experiment that focused on a number of compound exacerbates, including glycocapperin, rutin, spermidine, quercetin, stigmasterol, carotenoids, tocopherols, and campesterol [13-15]. clear, impervious structure. (1) and (2)

Materials and Methods:

Preparation of ethanol extract of *Capparis spinosa* Plant.

The Soxhlet device was the most efficient and effective way to isolate the plant's active organic ingredient crude. I ground the plant into a powder using a blender. Then, I added 250 mL of ethanol and added 95% after extraction. I extracted the plant within 24 hours and concentrated the mixture using a rotary evaporator. Finally, I frozen it at -20 ° until I needed it.

Laboratory Animals.

This study employed Swiss white mice (mice Balb/c strain) at 6-7 weeks of age.

Immunization of mice.

The mice were housed in sanitary cages that met their nutritional, thermal, and ventilation needs. The experiment did not begin until the mice had been allowed to acclimate for one week without treatment.

There were a total of forty-two groups of ten mice in the experiment.

In Group A, there is a saline phosphate precipitate solution serving as the negative control (Tc).

Subgroup B: Caper plant extract (10% ethanol, T1)-treated mice

Mice in Group C were given 20% ethanol caper plant extract (T2) For 20 days, the mice were orally administered 0.1 ml of each treatment; after 21 days, each group was split into three equal halves. Blood and immune system testing were performed on the initial group.

Collect blood samples.

Heparinized capillary tubes and white tubes for further blood testing were used to collect blood samples from the punctured vein. After being chilled in the fridge at 4°C for half an hour, the serum was spun at 3,500 rpm to separate it. It was thereafter placed in a deep freezer at −70°C until the immunological tests were conducted.

Humoral immunity tests

Measurement of serum immunoglobulin and complement protein levels in mice As per the instructions given by the provided firm, the single-radial immunodiffusion method was applied to the gel using processing equipment from the Italian company LTA. The quantitative level of the computation was evaluated using this approach [15].

Results and discussion

Table 1 Effect of Capparis spinosa extract on, physiological variables of mice

Descriptive Statistics			
Dependent	Variable:	result	
treatment	parameters of blood	Mean	Std. Deviation
control	Hb	11.83	1.941
	PCV	33	4.336

Aca. Intl. J. P. Sci. 2024;02(2):32-36. https://doi.org/10.59675/P224

	RBC	4733333.33	225092.574
	WBC	5750	880.341
	Total	1184782.04	2095452.619
10% of plant extract	Hb	12	1
	PCV	32	6.557
	RBC	4733333.33	251661.148
	WBC	4933.33	1006.645
	Total	1184577.67	2142670.043
20% of plant extract	Hb	12.33	2.082
	PCV	34	1
	RBC	4833333.33	288675.135
	WBC	6000	1000
	Total	1209844.92	2188511.602

The results presented here appear to be descriptive statistics for a number of physiological characteristics measured in mice treated with varying concentrations of Capparis spinosa extract (control, 10%, and 20%). Haemoglobin (Hb), packed cell volume (PCV), red blood cell count (RBC), white blood cell count (WBC), and the total count for each therapy group are the variables that are being considered. In order to compare the control group with the groups treated with varying doses of Capparis spinosa extract, this data sheds light on the central tendency and variability of physiological variables under different treatments. The results showed an increase in some blood variables compared to the control. There is also an increase in the number of white blood cells, which enhances the increase in the first line of defense against pathogenic organisms.

Table 2 ANOVA table of effect of Capparis spinosa extract on, physiological variables of mice

Tests of Between-Subjects Effects					
Dependent Variable: result					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	203637005900000.000[a]	11	18512455080000.000	1219.095	.000
Intercept	61491387590000.000	1	61491387590000.000	4049.374	.000
treatment	5684438602.000	2	2842219301.000	.187	.830
parameters	183896946400000.000	3	61298982140000.000	4036.704	.000
treatment * parameters	16817508900.000	6	2802918151.000	.185	.979
Error	546674568500.000	36	15185404680.000		
Total	272270387300000.000	48			
Corrected Total	204183680400000.000	47			
a. R Squared = .997 (Adjusted R Squared = .997)					

Table 2 analysis of variance shows that there are significant differences between the treatments and control through the results obtained, where the sig value for the coefficients reached 0.00. There are significant differences between the intervention of the treatments with the variables used, where the value also reached 0.00.

Table 3 effect of Capparis spinosa extract on histological variables of mice

Dependent	Variable	result	
treatment	parameters of weight	Mean	Std. Deviation
control	The weight of the mouse	17.333	0.5774
	Liver weight	2.333	0.5774
	Liver weight In terms of inflation	10.667	0.5774

	weight spleen	0.533	0.0577
	Total	7.717	7.0537
10% of plant extract	The weight of the mouse	29	1
	Liver weight	2.333	0.1528
	Liver weight In terms of inflation	7.333	0.5774
	weight spleen	0.333	0.0577
	Total	9.75	11.9201
20% of plant extract	The weight of the mouse	23.667	0.5774
	Liver weight	2.3	0.1
	Liver weight In terms of inflation	7.667	0.5774
	weight spleen	0.4	0.1
	Total	8.508	9.5617

Table 3 shows the effect of the plant extract on some histological variables. The results showed that there was an increase in the weights of the treated mice compared to the control. The weight of the mice in the 10% treatment reached 29 kg compared to the control, which reached 17 kg. As for the liver weights, there were no clear differences between Treatments and control: As for the weight of the spleen, there was no clear increase between the treatments and control

Table 4 ANOVA table of theeffect of Capparis spinosa extract on histological variables of mice

Dependent Variable: result					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3135.067[a]	11	285.006	1121.336	.000
Intercept	2698.803	1	2698.803	10618.239	.000
treatment	25.212	2	12.606	49.597	.000
parameters	2910.114	3	970.038	3816.543	.000
treatment * parameters	199.742	6	33.290	130.978	.000
Error	6.100	24	.254		
Total	5839.970	36			
Corrected Total	3141.168	35			
a. R Squared = .998 (Adjusted R Squared = .997)					

Table 2 analysis of variance shows that there are significant differences between the treatments and control through the results obtained, where the sig value for the coefficients reached 0.00. There are significant differences between the intervention of the treatments with the variables used, where the value also reached 0.00. As shown in Figure 1

Figure (1) Effect of the caper extract on mice through the rate inflation liver and spleen

Aca. Intl. J. P. Sci. 2024;02(2):32-36. https://doi.org/10.59675/P224

References

1. ALGAHDALI, Elham H.; MAHASSNI, Sawsan H. The aqueous extract of Leptadenia pyrotechnica Decne enhances the innate immune response and inhibits the acquired immune response, while the aqueous extract of Capparis cartilaginea Decne does the exact opposite in Healthy Rats. *Journal of Ayurvedic and Herbal Medicine*, 2023, 9.2: 66-88.
2. YANG, Tao, et al. The protective effect of Capparis spinosa fruit on triptolide-induced acute liver injury: A metabolomics-based systematic study. *Journal of Functional Foods*, 2022, 90: 104989.
3. CELEPLI, Salih, et al. The effects of Capparis ovata seed oil on the healing of traumatic skin wounds. *Turkish Journal of Trauma & Emergency Surgery/Ulusal Travma ve Acil Cerrahi Dergisi*, 2022, 28.9.
4. HOSAWI, Maram Bakr. *Flavonoids of Capparis Cartilaginea Fruit Extract Effect on Wound Healing in Human Prostate Cancer Cell Line*. 2020. PhD Thesis. KING ABDULAZIZ UNIVERSITY JEDDAH.
5. NOUR EL IMÉNE, Boublata, et al. Undesired Effects of Bioinsecticides Molecules in Wistar Rats: Case of Spirotetramat, Citrulus Colocynthis and Cleome Arabica Extracts. *Journal of Bioresource Management*, 2021, 8.4: 2.
6. AYZA, Muluken Altaye, et al. Potential protective effects of antioxidants against cyclophosphamide-induced nephrotoxicity. *International Journal of Nephrology*, 2022, 2022.
7. FARAG, Mayada R., et al. Quercetin alleviates the immunotoxic impact mediated by oxidative stress and inflammation induced by doxorubicin exposure in rats. *Antioxidants*, 2021, 10.12: 1906.
8. GADHOUMI, Hamza, et al. Biochemical Composition, Antioxidant Capacity and Protective Effects of Three Fermented Plants Beverages on Hepatotoxicity and Nephrotoxicity Induced by Carbon Tetrachloride in Mice. *Indian Journal of Microbiology*, 2023, 1-15.
9. ESKANDRANI, Areej, et al. The potent synergistic effect of Brassica oleracea against congenital Toxoplasma infection in rat model. *Food Bioscience*, 2023, 55: 103059.
10. NOURBAKHSH, Fahimeh, et al. A promising impact of oral administration of noscapine against imiquimod-induced psoriasis-like skin lesions. *Avicenna Journal of Phytomedicine*, 2023, 13.4: 412.
11. SUN, Wenli; SHAHRAJABIAN, Mohamad Hesam. Therapeutic potential of phenolic compounds in medicinal plants—Natural health products for human health. *Molecules*, 2023, 28.4: 1845.
12. MUSA, Farkad Hawas, et al. Effect of some plant extracts on the Pyocyanin Production from Pseudomonas Aeruginosa which Isolated from clinical samples. In: *IOP Conference Series: Materials Science and Engineering*. IOP Publishing, 2020. p. 012041.
13. HUSSEIN, Najeeb Mohammed, et al. ISOLATION AND DIAGNOSIS OF BACTERIA CAUSING URINARY TRACT INFECTION IN CHILDREN. *Systematic Reviews in Pharmacy*, 2020, 11.1.
14. ABD SHARAD, Ali; ALMUHARIB, Omar; HUSSEIN, Najeeb Mohammed. Effect of Xanthium strumarium extract on some virulence factor of Proteus mirabilis isolated from patients in Ramadi Hospital. *Systematic Reviews in Pharmacy*, 2020, 11.9: 1122-1124.
15. FAYYADH, Mohammed Amer, et al. Molecular Study Using Real Time PCR to Detect Influenza Viruses (Flu A, Flu B and RSV) in Patients at Ramadi Hospital. *Indian Journal of Forensic Medicine & Toxicology*, 2022, 16.2.