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The Effect of Alcoholic Extract of Citrullus Colocynthis on The Structural Manifestations of The Parasite Fasciola Gigantica and Its Comparison with The Drug Pendazole

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Abstract. *The current study aims to find out the effect of alcoholic extracts of the fruit of the Citrullus colocynthis plant, as it was during the current study during the period from 12/2/2022 to 24/4/2023 and by 206 livers for cows, including (31) infected livers and 1348 livers for sheep that did not show infection. In the current study, the incidence of giant liver Fasciola gigantica cows was 15.04%, while sheep hadn't infection during the study period. The results of the current study show that there are different effects in the tissues of the treated worms if compared to the control group, which was showing the integrity of the tissues well after 6 hours, as it is observed the layers of the body wall, spines and muscle layers that cover the wall, as well as the parenchyma tissue in which the body systems are embedded, which did not notice any changes in those tissues and structures, which include (for intestinal backfilling, testicles, mules and uterus). As noted, the damages vary according to the concentration of separation and deformation in the longitudinal and circular muscles, and a few cells are seen in the tenderloin. The thorns are still present in the cover, and the effect of the drug albendazole is little practical Clearly.*

Keywords: *Citrullus Colocynthis, Alcoholic Extract, Fasciola Gigantica*

INTRODUCTION

Fasciolosis is caused by infection of one of the species of the genus (Fasciola hepatica and Fasciola gigantica.) It is a common parasitic disease in the tropics [1]. The life cycle includes two hosts, the final host is cows, sheep, goats and many other ruminants, while the middle host is the water shell [2], so this disease is prevalent in areas where grazing and irrigation are prevalent and water marshes where there is a high presence of snails belonging to the genus Lymnae [3]. This disease is found in different clinical patterns between chronic and acute and similar to Sub acute, this type of worms targets the bile ducts of the liver and the symptoms of the disease appear in the form of (edema) Edema, anemia, anorexia and general asthenia) leading to death if severe [4]. This disease is

zoonotic but is infected by humans accidentally, and the infection of this parasite to humans results in significant damage to the liver and thus causes liver dysfunction [5]. For several decades, health authorities have adopted the field of perforated liver disease control using chemical pesticides (triclabendazol), which is the main pillar of control and prevents the formation of parasitic microtubules. Its effect was extensive in eliminating perforated liver and reducing liver damage [1].

Although no vaccines exist, the following four antigens have been proposed as the main candidate vaccines for Fasciola gigantica infection namely leucine-aminopeptidase, fatty acid-binding protein (rFh15), glutathione S-transferase and cysteine protease (FhCL1/FhCL2), with protection rates ranging between (65 and 89.6%) [6].

However, the indiscriminate and excessive use of manufactured chemical pesticides caused pollution and damage in many environmental aspects, as well as the emergence of resistance against many pesticides and what requires the search for more toxic pesticides and more effective methods of control and this encouraged researchers to reduce reliance on chemical pesticides and search for new alternatives, so attention was directed to plants [7] and the use of plant extracts because plants contain effective and toxic compounds against parasites of medical importance [8].

The Citrullus colocynthis plant is one of the plants of medical importance because it contains many effective and bioactive compounds that made this plant an important medicinal plant that enters into many pharmaceutical industries in addition to being a good nutrient as it contains glycosides, alkaloids, flavonoids, oils, fatty acids, resins, sapons, pectin, choline, proteins and carbohydrates. Colocynthitin They are a mixture of glycosides, alkaloids and an alcoholic substance called citrollol [9],[10].

METHODS

A. Sample collection

In this study, 1554 cow and sheep livers were slaughtered outside the massacre in the city of Baqubah and the Kirkuk massacre, taking the private information of each infected animal. The samples were collected by 206 cow livers, of which 31 were infected livers and 1348 sheep livers were infected. 31 naturally infected livers were transferred to the animal laboratory Department of Life Sciences / College of Education for Pure Sciences / University of Diyala by plastic bags in a container containing Ice packs and was handled based on the method of Yap (2018), where the affected organs were washed well with water for the purpose of getting rid of blood, impurities and suspended materials resulting from the slaughter process and placing the liver in a sterile dish where the outer surface of the liver was sterilized and then the liver was dissected to investigate worms.

B. Isolation of worms

The worms were isolated from the infected livers by the autopsy process and the search for infection by opening the bile duct and investigating the worms and then calculating the

number of worms in one liver, and the measurements related to each worm were calculated using the ruler in the eyepiece lens, as the length and width of the worm were recorded. And then I put a section of the worms in the Hedon-fleigs nutrient solution The other section was distributed to aqueous and alcoholic plant extracts and Nano composites that were prepared in advance in order to study their effect on structural and histological manifestations over 6 hours the worms were taken and preserved in ethanol 70% until used in textile cutting.

C. Collection of botanical models

The fruits of the Citrullus colocynthis plant were collected from the central regions of Iraq (Mandali District - Diyala Governorate) during the autumn season 2022, as the fruits were washed with water well and then dried in shade after being placed in clean pots at laboratory temperature with continuous stirring to prevent rotting, then grinding well using an electric grinder, and kept in sterile and sealed containers, in moisture-free conditions until the plant extracts from it start working.

D. Preparation of Alcohol Extracts

75 g of the vegetable model was weighed and then placed in a glass flask containing 750 ml of ethanol, shake the flask in order to homogenize the mixture, leave the flask on the Shaker for 24 hours, then filter the mixture using several layers of medical gauze to remove the large plant parts stuck in it, filter again using Millipore filter papers with a diameter of 0.45mμ To prevent the passage of impurities with the filtrate. Then put the mixture in an electric oven at a temperature of 40°C until the entire evaporation of ethanol and the formation of dry powder deposited at the bottom, keep the dry extract in clean bottles sealed in the refrigerator at a temperature of 4°C until use.

RESULT AND DISCUSSIONS

Through the present study, the effect of alcoholic extract of bitter melon fruits on the tissues of the giant liver Fasciola gigantica was identified and compared with the drug albendazole based on the control group and using light microscopy.

Histological study of the control group: The cross section of the body wall of the Fasciola gigantica worm and the internal structures in the negative control group (distilled water) are observed the layers of the body wall, spines and muscle layers that cover the wall, as well as the parenchyma tissue in which the body systems are embedded, no change in these structures and tissues is observed. Part of the intestinal butt, its branches and cavity is observed as it is noted that these tissues have not changed and were in their normal form. All these structures and tissues were in their natural form and there was no change in them. As in Figure 1.

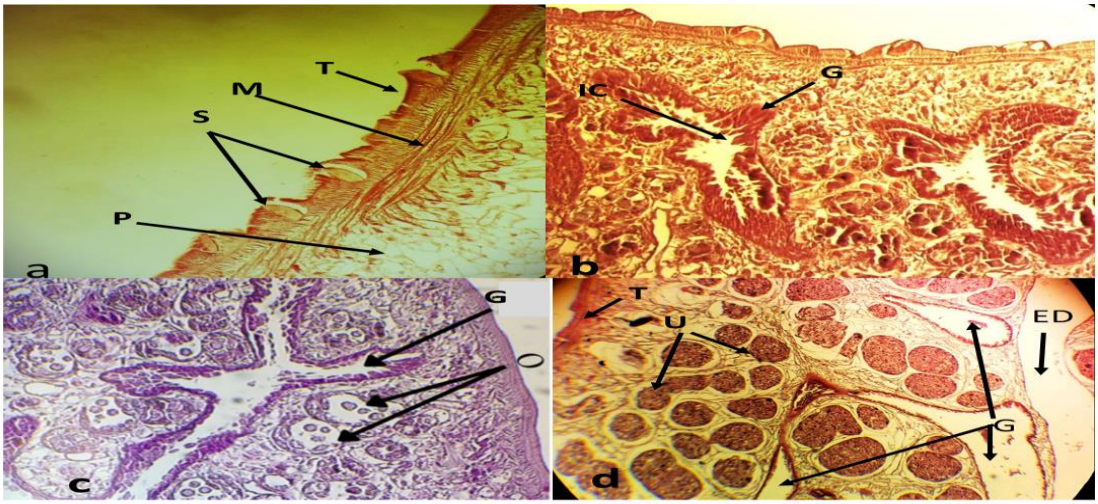

Figure 1. Wall tissue and inner tissues of the giant Fasciola gigantica of the control group

Histological study of the group treated with the drug Bandazole, it is noted in the transverse section of the tissue of the parasite F.gigantica of the group treated with the drug albendazole at concentrations of 1%, 25 thousand and 50 thousand and for a period of 6 hours, as it is noted that the damage varies according to the concentration of separation and deformation in the longitudinal and circular muscles and a few cells are seen in the body The thorns are still present in the cover and the effect of the drug albendazole is less effective as in Figure (2). The study of in vitro anthelmintic effects of medical cassia fistula extract on the body wall of giant liver openwork by light microscopy, as the result of the study showed fine damage and abnormalities in the longitudinal and circular muscles, in addition to the presence of small gaps in the parin cells [11]. The results of the current study are also consistent with [12] showed that the damage appeared in the form of many gaps in the cells of the tenderloin, in addition to that spines are still present at low concentrations and by 3 hours with the advanced time there was a general disorder in the cover and components of the tenderloin has been significantly damaged and muscle cells showed severe morphological changes [13].

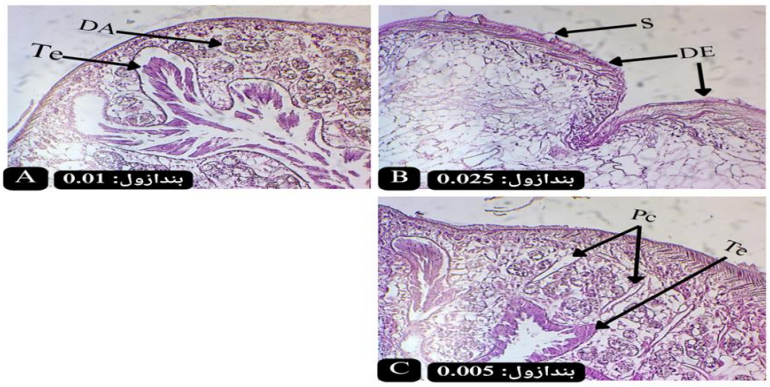

Figure 2. Transverse sectione of the wall and tissues of the giant liver *Fasciola gigantica* of the group working with the drug albendazole

Histological study of the group treated with alcoholic extract of *Citrullus colocynthis* plant: It is noted in the transverse section of the parasite tissues and laboratories with alcoholic extract of *Citrullus colocynthis* plant in different concentrations 25%, 50% and 100% for 6 hours that there is a significant defect in the skin from the breakage and separation in the surface structure of the parasite, which leaves empty areas, i.e. the disintegration of tissue cells is observed as in Figure 3. This is consistent with the study conducted by [11] which showed the presence of many gaps and partial disorders in the coat and with the loss of many spines, which led to thinning of the coat after 3 hours and with the progress of time the contents of the coat were disrupted and became much thinner with extensive destruction of skin cells and spines. The current study also agreed with [14], [15] which shows that the effect of the alcoholic extract of Nigella sativa was more dangerous in the body wall and less affected in the internal organs, as a slight disintegration of the cells of the genital organs was observed.

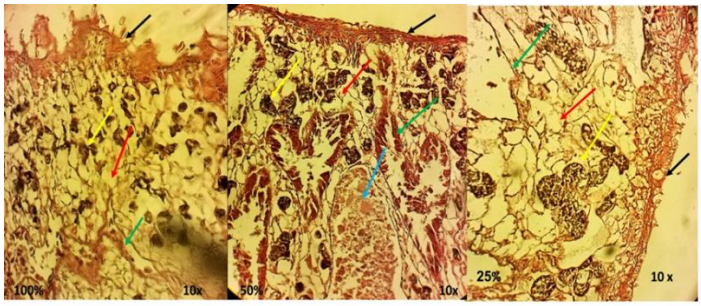

Figure 3. Sections of the body wall and internal tissues of the giant liver *Fasciola gigantica* of the group treated with alcoholic extract of the fruits of the *Citrullus colocynthis* plant.

CONCLUSION

This study concludes that the alcoholic extract of Citrullus colocynthis fruits has a significant effect on the tissues of the giant liver fluke, Fasciola gigantica. Histological results indicate that treatment with this alcoholic extract causes substantial damage to the parasite's surface structure and internal tissues, including cellular disintegration and the loss of spines. These effects are more pronounced compared to treatment with the drug albendazole, which, although causing damage to the longitudinal and circular muscles, does not result in as extensive tissue degradation as observed with the alcoholic extract of Citrullus colocynthis. This study aligns with previous research indicating that plant extracts have the potential to serve as effective anthelmintic agents, with greater destructive effects on the parasite's body structures. Overall, the results suggest that the alcoholic extract of Citrullus colocynthis fruits may offer a more potent alternative to albendazole in controlling Fasciola gigantica, with the potential to cause significant damage to the parasite's tissues.

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***Conflict of Interest Statement**:The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.*