Sukayna Jabbar Mushattat et al /J. Pharm. Sci. & Res. Vol. 12(1), 2020, 186-190

ISSN:0975-1459
Journal of Pharmaceutical Sciences and Research
www.jpsr.pharmainfo.in

Effect of cold water extract Zingiber *officinale* on the Histological changes of the Experimental infection of domestic chickens with *Ascaridia galii*

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Abstract

The current study was conducted to investigate the effect of the cold water extract of *Zingiber officinale* at different concentrations on the reduction of the effects of *Ascaridia galii* parasites in domestic chickens. 100 domestic chicken were used in the experiment and were divided into 4 groups,G1 negative control ,G2 positive control,G 3 with cold water extract was added at 0.25% concentration and G4 with cold water extract was added at a concentration of 0.50%. After the age of 15 days, the experimental infection of the *Ascaridia galii* was established by the aggregation of 10,000 embryonated eggs oralay by a plastic pipette, except for the negative control group left without injury. Histological changes included degeneration and necrosis of endothelial cells with hyperglycemia also showed changes in the presence of acute blood congestion, damage to the patellar cells and changes in the cytoplasm of the cells resulting in degeneration of the intestinal tissue, thus negatively affecting the normal function of digestion and absorption, compared to negative control group. In the treated groups with the addition of cold water extract *Zingiber officinale*, the tissue effects were less than in the positive control group. This was due to the effect of food additives to enhanced immune response caused by the nutrients and vitamins contained by the cold water extract *Zingiber officinale* and their susceptibility to growth and repair the normal size of the intestinal glands and few lymphocyte infiltration. The results of the current study showed the effect of the cold water extract of cold water extract *Zingiber officinale* powder on reducing the severity of the infection of the parasites *Ascaridia galii* and to reduce the tissue damage in the lining of the intestines of infected chicken experimentally parasites laxars. The cold water extract *Zingiber officinale* powder concentration gave 0.25% better results than the cold water extract *Zingiber officinale* powder powder at a concentration of 0.50%.

INTRODUCTION

Poultry breeding is affected by many factors, including environmental and mismanagement and diseases, and the most important worms cylindrical that affect poultry is *Ascaridia galii*, its life cycle directly and do not need a central host, eggs need 12 days in the best conditions to grow and be a larval stage, Causing intestinal obstruction and affecting bird resistance in general to other infectious diseases[7]. as well as severe effects and bleeding in the intestines, imbalance in the hormonal level and lack of budget in the absorption of food[8]. The incidence of worms *Ascaridia galii*annually significant economic losses affect the provision of human needs That of the meat and eggs. So the attention of researchers at the time banned the use of plant products to treat the infection of worms *Ascaridia galii* Being rich in secondary materials distinguished by vital activity and physiological effect against this injury[13].

Zingiber officinale Ginger is a plant species that lives in the hot regions of the Gingerbread species. Its growing caterpillars, which contain flying oil, have a pungent odor and pungent taste, used throughout the world as a spice of food[19]; It may be found in desserts, in main meals and in side dishes, and not only in food; it has been used since ancient times in various treatments for the great benefits it contains; it is rich in vitamins such as vitamin A, vitamin B, vitamin C, (E), It also contains magnesium, phosphorus, sodium, potassium, calcium, iron, zinc, beta-carotene, the task of building the body and its ability to grow and disease resistance, and contains antifungal, inflammatory, bacteria and virus components[21]. All ginger parts can be used, but in some cases it is best to use the ground for ease of use and control. Ground ginger works to strengthen the immune system in the human body and thus resistance to many diseases. Also, because it contains antivirals and bacteria, it treats many diseases such as: Colds, and influenza, relieve symptoms such as fever, cough, and mucus aggregates in the lungs. It is a natural repellant of body toxins Which cause diseases and great harm to human health if stored in the body[22]. It maintains the health of the heart and protects it from diseases and strokes by regulating blood pressure and reducing the levels of harmful cholesterol in the blood, because it contains an excellent percentage of magnesium, potassium and manganese[25].

MATERIALS AND WORK METHODS

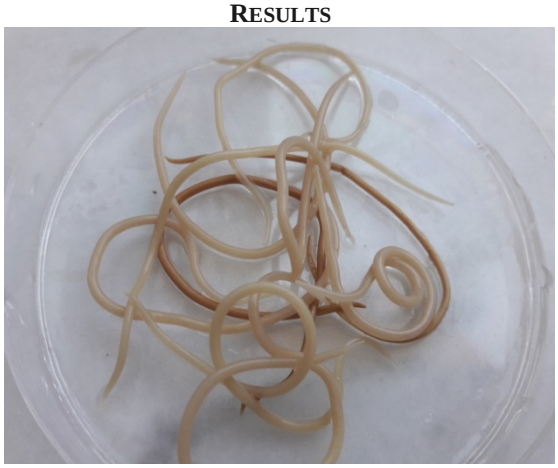
The larvae were obtained by dissecting the infected chicken with *Ascaridia galii* . After obtaining 16 worm of the *Ascaridia galii* , they were kept in a 0.9% neutral saline until they were transferred to the laboratory within 24 hours. The female worm was cut from both sides and the uterus was pulled out of the body[4]. The eggs were obtained in a flask containing 0.5% sodium hydroxide and placed on the magnetic vibrator for 10 minutes to dissolve the uterine membrane. After that, the solution containing The eggs are centrifuged at 3000 cycles per hour for 5 minutes, then poured the floating and took sediment and added to distilled water and the expulsion of central and repeated the process three times to remove the effect of

sodium hydroxide And then add diluted sulfuric acid 0.1 to eggs and 10 mg of penicillin and nystatin and put the solution in the incubator at 25 temperature for 10-14 days until it reached the second larval stage, the infectious phase and then kept in the refrigerator to a degree of 4 until use in the experiment, and for the purpose of calculating the number of eggs In the experimental infection, 5 µl of the egg-containing solution was removed and placed on a glass slide. The lid was covered with a 4x and 10x magnification microscope. The process was repeated five times and then averaged and multiplied by 200 to represent the number of eggs per 1 ml [11].

To prepare the cold water extract, [15] adopted the cold water extract of ground ginger, adding 20 g of ginger powder to 200 ml of cold water, And then leave a mixture (30 min) to cool down, and then sprayed with several layers of gauze and the use of filter paper, and neglected the deposit and dried leachate in the oven and a temperature of 45 m to obtain dry matter[10].(1) g of dry matter in 10 mL of Nacl solution, thus obtaining a solution of stock solution (0.1 g / mL). This process was repeated several times to obtain the required quantities. 20 mg / ml, equivalent to doses (400/200) mg / kg, and then centrifuged at 3000 cycles / min for 5 minutes to obtain a clear solution and to remove the insoluble materials 1 g of ginger extract and 10 ml (0.9% Nacl)[23]. Thus, a solution solution (0.1 g / ml) was obtained with the concentration concentration (0.25%, 0.50%) and mg / ml Y was towing potions by weight of the animal[14].

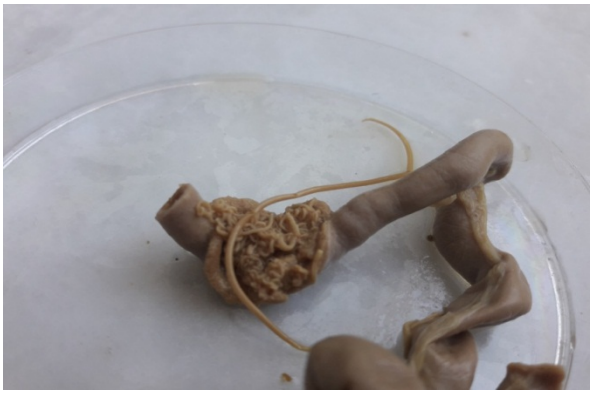
100 domestic chickens were randomly divided into four groups in each group 25 birds from 1 day to 15 days with the addition of ginger extract at different concentrations (G3 with ginger extract0.25% ,G4 with ginger extract 0.50 %) except control group (G1) nigative control and G2 posative control. After reaching the age of 15 days, Experimental injury of emberyonated eggs of *Ascaridia galii* parasites by grouping the group (G4, G3) 10000 egg container on the second larval stage of the parasite by plastic syringe,and two weeks after the introduction of the injury explained the animals laboratory and took samples of the bowel and was done sections of tissue for the study of the effects of parasitic tissues on them[11] .

RESULTS

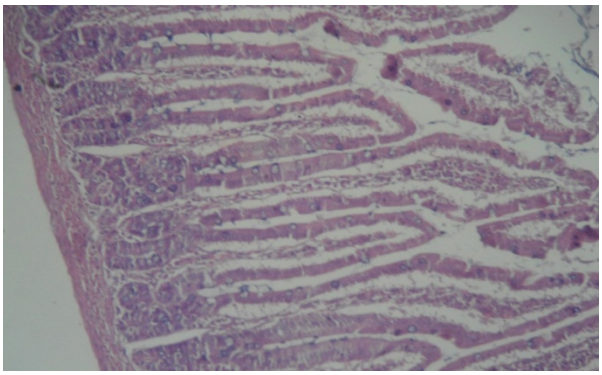


Fig(1):Adult *Ascaridia galii* worms used in the experiment

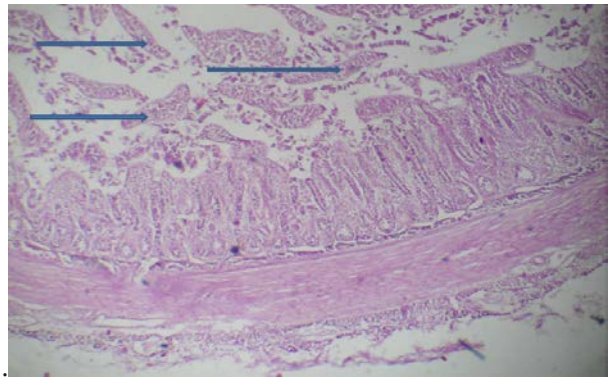
Fig(2):The emberyonatid eggs of *Ascaridia galii* containing the larval stage L2



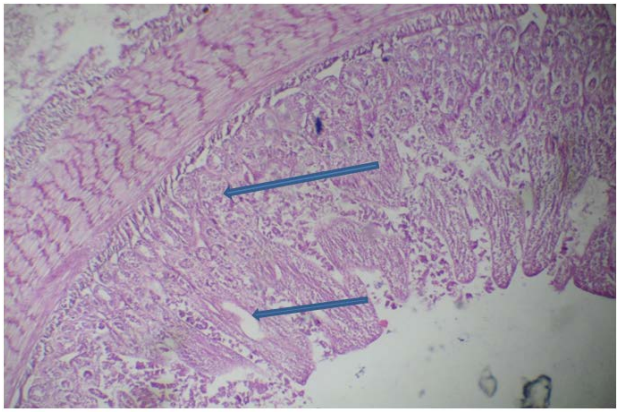
Fig(3):The Heavy injury of small intestin with *Ascaridia galii* in G2



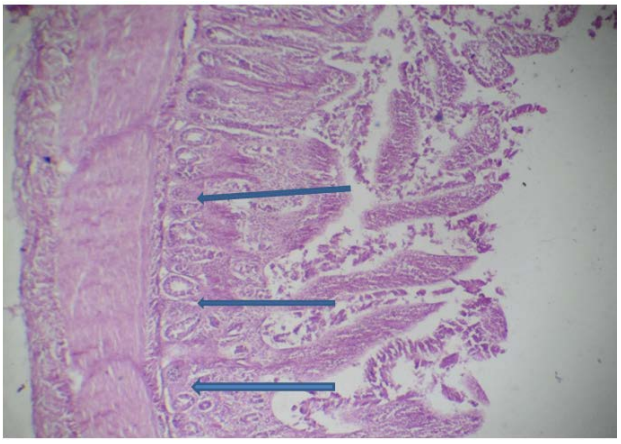
Fig(4):The normal structure of intestine in control group G1 H &E 40 x



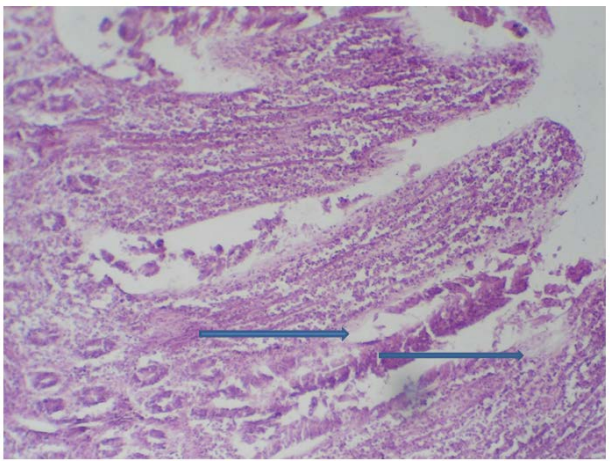
Fig(5):The histological section showed The Heavy injury of intestin and large number of L4 *Ascaridia galii* in G2



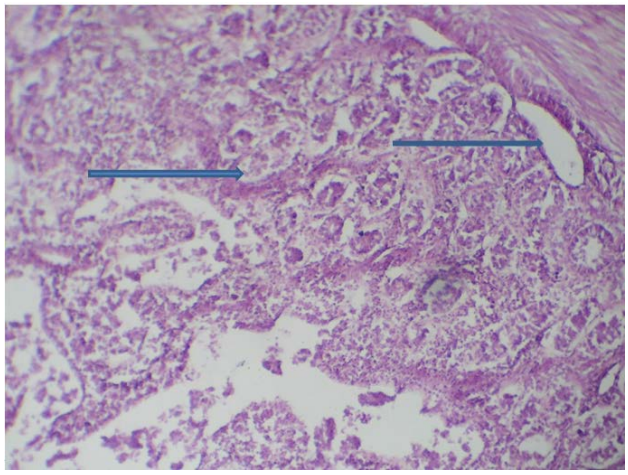
Fig(6):The histological section showed The Heavy injury of intestin and Tissue breakdown, fluid leakage, vesicle formation and inflammatory and damage of intestinal villi and the infiltration of inflammatory cells between the vesicles with *Ascaridia galii* in G2 .) H &E 40 x



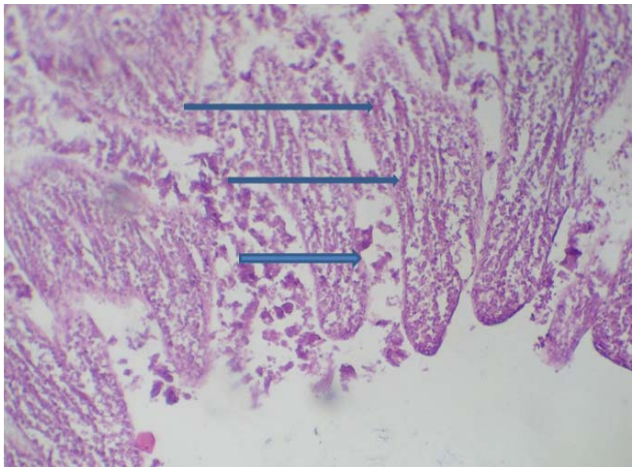
Fig(7):The penetration of the tissues by parasite larvae in addition to the infiltration of inflammatory cells within the intestinal folds in G2. H &E 40 x



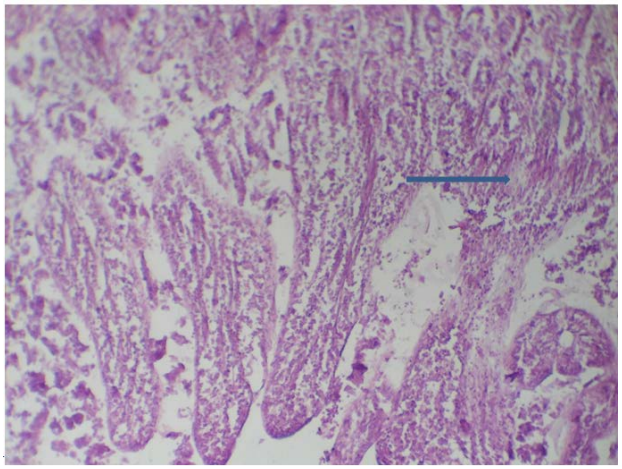
Fig(8):Histological section showing the repair of the tissue and reduce the severity of injury due to the addition of ginger extract in G4 H &E 40 x



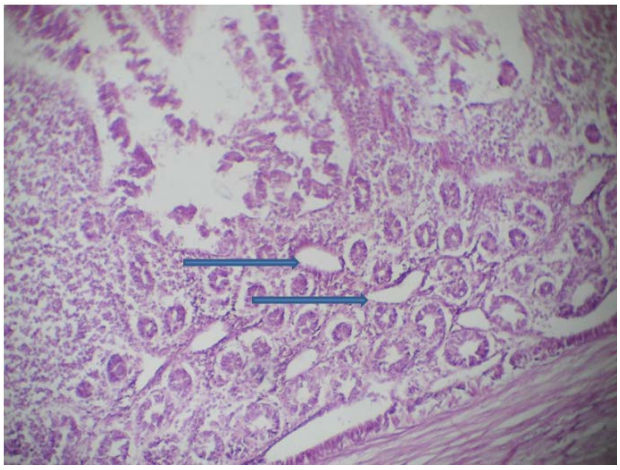
Fig(9):Histological section shows the small numbers of larvae in the bowel lining after 5 days of infection in G3 H &E 40 x



Fig(10):A histological section illustrates the reduction of injury and restoration of the tissue with the addition of a water extract of ginger inG4 H &E 40 x



Fig(11):Histological section showing the repair of damages due to the addition of cold water extract in G3 H &E 40 x



Fig(12):Histological section showing the infiltration of inflammatory cells and the formation of vesicles within the tissue with larval invasion of the tissue in G2 H &E 40 x

DISCUSSION

The results of the histological study of bowel sections showed that treatment with ginger extract had a high effect on the repair of damaged cells due to the parasitic parasitic infection. The histological images of the intestinal tract showed recombination in the intestinal flora, ie repair of the tissue, compared to the positive control group, Significantly in the vesicles due to penetration by parasite larvae as well as the infiltration of inflammatory cells within intestinal folds[3].

The incidence of intestinal parasites causes complications proportional to the severity of the injury and the length of survival of the parasite in the body, as well as the occurrence of necrosis in the infected parts attributed to the deterioration of the health of birds and the transformation of microorganisms beneficial to the neighborhoods of disease. That acute intestinal parasitic infection caused damage to the villains as well as the occurrence of necrosis in the lining of the intestine and the occurrence of acute hemorrhage acute[1].

Histological changes included degeneration and necrosis of endothelial cells with hyperglycemia compared to negative control group. In the treated groups with the addition of the extract, the tissue effects were less than in the positive control group. This was due to the effect of food additives and their susceptibility to growth and repair ,. The groups treated with the addition of the extract showed the size of the intestinal glands and lymphocyte infiltration. This was due to the enhanced immune response caused by the nutrients and vitamins contained by the ginger extractor[2].

The positive control group also showed changes in the presence of acute blood congestion, damage to the patellar cells and changes in the cytoplasm of the cells resulting in degeneration of the intestinal tissue, thus negatively affecting the normal function of digestion and absorption, compared with the negative control group. These effects were less in comparison with the positive control group, due to the food additives, the positive effects on the overall health of the birds and the reduction of the severity of the lesion resulting from the parasitic infection[5].

The use of the cold water extract of ginger powder at 0.25% gave better results than the use of the extract at a concentration of 0.50% in terms of reducing the effects of the parasite caused by the destruction of the tissue as well as re-spacing and repair of damaged tissue[24] as well as the effect of the extract on the general condition of birds and their resistance to injury Because of the substances contained in the extract of vitamins and antioxidants which positively reflected the resistance to injury[16]

Ginger is used in pain relief because it contains anti - inflammatory substances. It can also be used as a topical treatment for pain relief associated with arthritis, osteoarthritis and osteoporosis[17]. Used in the elimination of overweight and obesity treatment. Helps get rid of gas and bulges that infect the stomach and intestines[20]; it acts as a calming of the muscles of the stomach, causing them to relax, and address the disorders that may affect them[6]. Ginger helps diabetics; it works to lower blood sugar, regulates insulin action, and increases the effectiveness of medications taken to treat diabetes. It is used in the elimination of cancer cells in the ovary, and it protects the body from cancer in general, especially colon and rectum and ovaries[18].

Ginger is a very strong and effective antimicrobial agent against fungal and parasitic infections. Laboratory dystrophy confirmed that the root extract of ginger is a strong inhibitor for the growth and division of colonic bacteria that ferment undigested carbohydrates causing colic, flatulence and secondary infections. This extract also removes and excludes the body Of the bacterial toxins associated with the infection and thereby reduce the severity of the injury[24].

Ginger contains a wide range of powerful antioxidants, a lot of important minerals and oils, such as: Gingerol, Zingerone, and others. These oils mainly improve bowel movement, act as an anti-inflammatory, anti-fever, and analgesic, which mainly affect the nervous system[20].

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