BIOLOGICAL STUDY IN RELATIONSHIP BETWEEN FASCIOLIASIS, AND THEIR INTERMEDIATE HOST (*LYMNAEA* SP.), AND FINAL HOST RABBITS IN THE EGYPTIAN ENVIRONMENT

By

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B.Sc. of Agricultural Science, (Technology and Management of Agriculture Projects), Ain Sahms University, 2005

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ABSTRACT

Mohamed Saeid Mohamed Abdo. Biological Study in Relationship Between Fascioliasis, And Their Intermediate Host (*Lymnaea* Sp.), and Final Host Rabbits In The Egyptian Environment. Unpublished M.Sc. Agriculture and Desert Areas Affected By Salinity, Faculty of Agriculture, Ain Shams University.

Study on effect of water temperature and pH on longevity of *Fasciola* sp. meracidia and metacercariae and snails.

Study of impacts *F.*sp infection on productivity performance and immune response of rabbits. Estimation of lethal and un-lethal infections for rabbit herds.

Liver fluke are common parasites of herbivores in most of Middle East countries as Egypt. The chronic and acute infections with 10 & 20 metacercaria of this parasite cause biliary liver cirrhosis in rabbits that lead to huge economic losses. This cross-sectional study was carried out to determine the prevalence of fascioliosis in slaughtered rabbits in Giza governorate. In Egypt *Fasciola gigantica* was responsible for V-Line and Black Baladi rabbits total liver condemnations in infected groups. The infection impacts on female rabbits were more than males ($p<.0001$) in most groups for both strains.

Liver condemnations due to fascioliasis were more affected in body weight and feed consumption, feed conversion, heart, kidney and carcass characterestic, so it`s low economic efficiency. Blood parametars showed high significant ($p<.0001$) between treated groups of strains.

In this study, results indicated survival rate 86.7%, 100%, 20% and 6.7% in *Lymnaea natalensis* snails, when exposed to several temperatures 15, 20, 25 and 30°C, respectively.

The snails exposed to several pH 5, 7, 9 to measure of mortality acidic and alkaline for *Lymnaea natalensis*, showed that 100% died at 5th week, 100% survival rate, 7% at 9th week, respectively.

In our study include morphological describe to *Fasciola gigantica* eggs. Also, impact of temprature test for hatching *Fasciola* eggs at 15, 20, 25 and 30°C, indicate that the best of temp. dgree for infective stage hatching (miracidum) was 25°C, while the ova hatched 100% compared 15, 20 and 30°C. This after one day from ova incubation (embryo fully developed) with 4%, 18% and 47%, respectively.

Present work showed infection impact with *Fasciola gigantica* parasite on the rabbits non vaccination and the experiment period were 12th weeks post-infection.

Two strains of rabbits were used in this study includes, spanish V-Line and improved Black Baladi strains, each strain contains males and females and divided into 3 groups each of 3 rabbits, which where control, a chronic, an acute infected group.

The infection was done through the mouth with (10 Metacercaria each chronic infected rabbit - 20 Metacercaria each acute infected rabbit).

This study showed the impact of the acute and the chronic infection with *Fasciola gigantica* in rabbit on productivity measurements (ex; body weight, body weight gain and feed consumption..... *etc*.) after four weeks post-infection.

In this study, the samples indicate of carcass characteristic and body organs weight and edible patrs for both strain were high significant ($p<0.05$).

All groups were vivisect and taking blood sample, the liver enzyms proved high significant with AST, ALT, bilirubin ($p<0.05$) in chronic and acute compared with control for both strains.

The results show anti-oxidant (CAT, GSH, NO) for VL & BB in the acute infected groups were highly than chronic infected groups ($p<0.05$) compared with control. While, serum Glucose was non-significant ($p>0.05$) for chronic and acute infected groups compared with control.

Keywords: *Fasciola* infection, productive performance, carcass, rabbits.

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INTRODUCTION

Fasciola sp. is a trematode liver fluke that infects primarily sheep, goats and rabbits, operculated eggs are excreted in the faeces of infected animals and hatch into ciliated miracidia in water. To be infective, the miracidium must first find its intermediate host, which is a freshwater snail (*Lymnaea* sp.). Multiplication takes place within the snail, and cercariae with unforked tails emerge. The cercariae encyst on aquatic vegetation and develop into the metacercarial stage. The metacercaria are then ingested by either normal hosts (animal farm) or accidental hosts (humans). The metacercariae excyst in the intestine, perforate the intestinal wall, enter the peritoneum, and then pass through the liver capsule to enter the biliary tree. In the biliary tract, the mature fluke releases eggs, which are once again excreted in faeces to complete the life-cycle **(Hughes, 1985).** Human and other definitive hosts contract fascioliasis by consuming metacercariae contaminated water plants or drinking contaminated water **(Mas-coma *et al*., 2000).**

Fascioliasis is an important increasing public health problem in Egypt for both herbivore animals and human in the last few years **(Haridy *et al.*, 2002).** However, *Lymnaea* snails species, as intermediate hosts of *Fasciola* species, have an important role in completion of life cycle and the transmission of parasite to animals and human **(Ismail *et al.*, 2004).** The epizootiology of animal fascioliasis depends on a large extent of relative abundance of intermediate host snails. The prevalence of the infection, intensity , and cercarial shedding , represent parameters commonly used to measure the transmission of fascioliasis by intermediate host. This shows strong seasonal pattern and occurs mainly in spring **(Roberts and Suhardono, 1996).**

Fascioliasis is a hepatic parasitic infection caused by *Fasciola hepatica* or *Fasciola gigantica* that affects numerous mammalian species, mainly ruminants and occasionally human, in several countries of Europe, Asia, America and Africa, particularly in Egypt. The economic

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significance of fascioliasis is mainly due to either direct losses following decreased growth rate, low milking capacity and the confiscation of altered livers in slaughterhouse **(Gajewska, *et al.*, 2005).** In addition, fascioliasis caused by *F. hepatica* has been recently recognized as an emerging/re-emerging zoonotic disease in many countries including the highlands of Bolivia, Ecuador and Peru, the Nile Delta in Egypt, and central Viet Nam, with an estimated prevalence of up to 17 million people infected and 180 million at risk of infection worldwide. While normally an infection of cattle and sheep, environmental modifications and changes in human behaviors are defining new geographical limits and populations at risk for fascioliasis **(Haseeb *et al.*, 2002; Mass-Coma *et al.*, 2005 and Acosta *et al.*, 2008).**

Fascioliasis cause pathological and necrotic lesions, which result from the parasites migration through the liver parenchyma and the bile ducts causing hemorrhage **(Malek, 1980).** In Egypt, buffalo, cattle, goats, sheep, donkeys, horses, camels and rabbits were reported as hosts for *Fasciola* spp **(Lotfy & Hillyer , 2003).**

It affects livestock and causes heavy losses among them and is a major agricultural, economic and health problem in Egypt. Human fascioliasis is nearly recorded from all the Nile Delta governorates and certain districts of Upper Egypt as it affects adults **(Haseeb *et al.*, 2002)** as well as children and adolescents **(Curtale *et al.*, 2003a).** In Egypt, the snail *Lymnaea natalensis* is the intermediate host of *Fasciola gigantica*, the etiological agent of fascioliasis.

Moayad *et al.* (2011) stated that, the average number of cercariae produced from infected snails depends fundamentally on water temperature, and breeding conditions of these snails.

Rabbits are important as reservoir host of fascioliasis , suitable as experimental host for immunological and pathological studies **(Urquhart, 1956 and Pantelouris, 1965).**