

**THE PERCENTAGE OF INFECTION OF *Fasciolagigantica* (ADULT AND OVA) IN
BUFFALO AT BASRAH PROVINCE (A COMPARATIVE STUDY)**

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ABSTRACT

Digenean trematodes of *Fasciola spp.* are liver flukes of purview of animals with an economical geographical circulation. A weekly visited to the slaughter house at Basrah province from the period between September 2014 to April 2015, with total number of examined Buffalo was (85) divided into (40) males and (45) females. The isolated worms from gall bladder and liver of infected buffalo measured (17-60) mm long and identify as *F. gigantica*. While, the bile liquids of infected Buffalo revealed filled with eggs, with measured from (1.7 - 2)mm. The total percentage of infection with fascioliasis is in Buffalo under this study is (6.3 and 19.1%) for males and females respectively, but, the total number of worms and ova which found in infected Buffalo with *F. gigantica* varied between (12-1417) and (0-40100) for worms and ova respectively under months study, while, the intensity of infection for both ova (26.3, 79.1) and worms (22.2, 22.7). There was no significant differences found between gall bladder PH and number of ova and worms that found under this study.

KEYWORDS: Gall Bladder, Buffalo, Percentage of Infection, PH.

INTRODUCTION

Digenean trematodes of *Fasciola spp.* are liver flukes of purview of animals with an economical geographical circulation (Mas-Coma *et al.*, 1997). Previous studies were explained that *F. hepatica* found in temperate zones, while, *F. gigantica* found in tropical areas, and both species may intersected in subtropical zones (Mas-Coma *et al.*, 2005).

Two major species, *Fasciola hepatica* Linnaeus, 1758 and *Fasciola gigantica* Cobbold, 1855 are the causative agents of fascioliasis in ruminants and in human worldwide (Soliman, 2008). *F. hepatica* has a wider range than its tropical counterpart, *F. gigantica*, but their geographical distribution overlaps in many African and Asian countries and some times in the same country, although in such cases the ecological requirement of the flukes and their snail host are distinct (Pantelouris, 1965; Malek, 1980; Mas-Coma *et al.*, 2005; Megarry *et al.*, 2007). *F. hepatica* typically occurs worldwide in temperate regions, except Oceania. *F. gigantica* causes outbreaks in tropical areas of southern Asia, Southeast Asia, and Africa,

infection is most prevalent in regions with intensive sheep and cattle production (WHO,2007).

F. gigantica is the most prevalent in the tropics, such as parts of Africa, the Indian subcontinent, and certain Islands in the Pacific (Gunn, and Jane, 2012). *F. hepatica* has a widespread distribution and is found in Europe, Africa, Asia, Australia, and North and South America. In some parts of the world the two parasites co-exist but it is not certain to what extent competition between them occurs. The prevalence rates for fascioliasis can be as high as 30% to 90% and it is often considered to be the most important cattle helminth infection (Gunn and Jane, 2012).

Fascioliasis was a disease caused by the genus *Fasciola* (Platyhelminthes : Trematoda : Digenea) which is regarded the most significant helminth infection of ruminants in tropical and subtropical countries , and it is shared in big social and economic problems (Mas –Coma *et al .*, 2005). It was a major livestock problem and yearly an appraises US\$ 2 billion are missed due to weight loss , debiting milk yield and fertility in produce animals (Schweizer *et al .*, 2005; McManus and Dalton , 2006) .

The zoonotic fascioliasis , causative by the liver flukes *F. hepatica* and *F. gigantica* which was a large public health problems in different countries, like; Bolivia , Cuba , Egypt , the Islamic Republic of Iran , Peru and Vietnam , and a total of 91 million people are at dangers and 2.4-17 million people are sick (WHO ,1995; Keiser *et al.*, 2005).

A number of snail species of the genus *Lymnaea* valeting as intermediate host , while, mammals of different species valeting as definitive host , with ruminants being the most significant ones (Urquhart *et al .*, 1996). While, animals gets infected with *Fasciola* pursuing the swallowing of grass which contaminated with the infectious metacercaria . The parasite excyst and get through the intestinal wall and transience to the liver triggering perforations in the capsule and inclusive hemorrhage to the parenchyma . The adult trematodes stabilize in the bile duct of injured animals (Urquhart *et al.*, 1996).

The aims of this study were to find the relationship between the ova numbers in gall bladder and compared with number of worms in both gall bladder and liver in Buffalo at Basrah province/ southern Iraq.

MATERIALS AND METHODS

A weekly visited to the slaughter house at Basrah province varied between (1-6) time per week, from the period between September 2014 to April 2015. The total number of examined buffalo was (85) divided into (40) males and (45) females.

The livers and gall bladders of each examined buffalo were bring it to the laboratory of Veterinary Parasitology at College of Veterinary Medicine and examined carefully, then, the isolated *Fasciola* was washing many times in normal saline 9% then putted each one between two clean microscopic slides (Jeyathilakan, 2010), and rinsed in container with 70% ethyl alcohol at room temperature.

The gall bladder liquid for each examined buffalo was putted in clean container and measured the total amount and PH, after that using the method by (Al-Azizz, 2005) to enumerate the ova that found in gall bladder.

The parasitological terms used under this study were used on the terminology of Margolis *et al.* (1982):

Number of infected animals

Prevalence (%) = $\frac{\text{Number of infected animals}}{\text{Number of examined animals}} \times 100$

Number of examined animals

Number of Parasite species

Mean Intensity of Infection = $\frac{\text{Number of Infected animals}}{\text{Number of examined animals}}$

Number of Infected animals

The data under current study were analyzed by using analysis of variance (ANOVA) to indicate the groups, which were significantly different at $P \leq 0.05$ by one way ANOVA with post-hoc LSD multiple comparison test using SPSS software statistical program (SPSS for windows ver.17.00).

RESULTS

In this study, the worms which isolated and collected from gall bladder and liver of infected Buffalo with measurement (17-60) mm long and identify as *F. gigantica*. Furthermore, bile liquids of examined Buffalo under the microscope revealed filled with brown eggs, with measured from (1.7 - 2) mm.

The total number of examined and infected Buffalo with *F. gigantica* with percentage of infection were recorded as in table (1) which found that the highest percentage infection at female Buffalo in September (50%), while, the lowest percentage infection at males Buffalo in March (1.6%). Generally the percentage of infection in females Buffalo was higher than

males (19.1%). The statistical analysis of variance showed that there were a significant differences under probability ($P \leq 0.05 = \text{sig. } 0.038$).

Table (1): Show the total number of examined, infected Buffalo with *Fasciola gigantica* with percentage of infection.

Month	No. of Exam.		No. of Inf.		Percentage of Inf. %	
	Male	Female	Male	Female	Male	Female
September	97	48	10	24	10.3	50
October	93	46	7	8	7.5	17.3
November	92	45	8	6	8.7	13.3
December	68	34	6	7	8.8	20.5
January	103	51	4	2	3.9	3.9
February	87	43	2	0	2.3	0
March	54	27	1	1	1.6	3.7
Total	594	251	38	48	6.3	19.1
$P \leq 0.05$, sig = 0.038 (Percentage of Inf., male and female).						

The total number of worms and ova which found in infected Buffalo with *F. gigantica* varied between (12-1417) and (0-40100) for worms and ova respectively under months study (table, 2). The intensity of worms in males Buffalo was the highest at November (36.8), while, the lowest at February (11) as compared with females which found the highest intensity at October (40.25) and the lowest at February (0). The statistical analysis found that there were a significant differences under ($P \leq 0.05 = \text{sig. } 0.041$).

The intensity of ova in infected males Buffalo was highest at November (97.1) and the lowest at March and January (0), while, the females Buffalo showed a highest number at December (84.3) and the lowest at November, February and March (0). A significant differences found between both intensity of worms and ova and males and females under ($P \leq 0.05 = \text{sig. } 0.03$).

Table (2): Show the total number of worms and ova of infected Buffalo with *Fasciola gigantica* with intensity of infection.

Month	No. of Worm		No. of Ova		Intensity of Worm		Intensity of Ova	
	Male	Female	Male	Female	Male	Female	Male	Female
September	195	949	3760	40100	19.5	39.5	37.6	16.7
October	287	322	790	7300	41	40.2	11.2	9.1
November	295	1417	77685	0	36.8	23.6	97.1	0
December	134	941	1795	59015	22.3	13.4	29.9	84.3
January	55	149	0	2745	13.75	7.4	0	13.7
February	22	0	330	0	11	0	1.6	0
March	12	23	0	0	12	23	0	0
Total	1000	3801	84360	109160	26.3	79.1	22.2	22.7
$P \leq 0.05$, sig = 0.041 (Intensity of Inf. of Worm, male and female). $P \leq 0.05$, sig = 0.03 (Intensity of Inf. of Ova, male and female).								

The mean number of gall bladder PH of infected Buffalo with *F. gigantica* showed that there were no significant differences between each of them under all months study (table, 3).

Table (3): Show the mean number of gall bladder PH of infected Buffalo with *Fasciola gigantica*.

Month	No. of Exam.		No. of Inf.		Gall bladder PH of Exam.		Gall bladder PH of Inf.	
	Male	Female	Male	Female	Male	Female	Male	Female
September	7	15	7	15	7.5-8.0 (7.75)	7.5-8.0 (7.75)	6.2-7.1 (6.7)	6.3-7.1 (7.0)
October	6	2	6	2	7.5-8.0 (7.75)	7.5-8.0 (7.75)	7.1-7.3 (7.17)	7.1-7.5 (7.33)
November	5	0	5	0	7.5-8.0 (7.75)	0	7.1-7.5 (7.2)	0
December	3	5	3	5	7.5-8.0 (7.75)	7.5-8.0 (7.75)	7.5-7.8 (7.6)	7.2-7.6 (7.4)
January	4	1	4	1	7.5-8.0 (7.75)	7.5-8.0 (7.75)	7.68-8.1 (7.8)	7.29
February	1	0	1	0	7.5-8.0 (7.75)	0	7.7	0
March	0	0	0	0	0	0	0	0
Total	26	24	26	24				
P ≥ 0.05, (Gall bladder PH of Inf., male and female).								

DISCUSSION

F. hepatica and *F. gigantica* has a global, worldwide circulation initially in mild and subtropical climates and with many notarized human infections. *F. gigantica* slanted to be of the tropic and subtropical areas of Africa, Asia, and Southeast Asia areas with relatively much less notarized human infections (M a s – C o m a and Bargues, 1997; Spithillet *al.*, 1999).

B o r a y (1982) reported that *F. hepatica* from Australia as leaf shaped, 18 to 32 mm long and 7 to 14 mm wide. It is grayish brown in color when fresh. The anterior end of the parasite forms a conical projection that broadens at the shoulders and then gradually narrows towards the posterior end. While, *F. gigantica* has a morphology similar to *F. hepatica* but is much larger, measuring 24 to 76 mm and the anterior conical structure is similar, but the widening of the body is not as distinct as *F. hepatica*.

In Egypt some researchers disbelieved the presence of *F. hepatica* among local breeds of animals and reported its presence only in imported animals (E l – A z a z y and S c h i l l h o r n, 1983; A b d - R a b o and A b o u – R a w a s h, 1998). In flukes obtained from

Egyptian cattle and buffalo, Lotfy *et al.*, (2002) found both *Fasciola* species to be about at the same width but each species shorter than that reported by Boray (1982). Different range of egg measurement were reported for each species of *Fasciola* by different authors like; (Malek, 1980; Watanabe, 1965; Soulsby, 1978). In Egyptian cattle and buffalo, *F. hepatica* eggs measured 96-169 and those of *F. Gigantic* measured 130-175 (Lotfy *et al.*, 2001).

A strain of *F. hepatica* was described from the Netherlands and Germany that can be distinguished by its markedly large eggs. The large eggs of this strain of *F. hepatica* are similar in size both in cattle and sheep with following measurement: 146-179 and 143-180 in cattle and sheep respectively.

Fascioliasis is considered one of the most important helminth infections of ruminants in the world. Prevalence and intensities of fascioliasis in animals are extremely high, mainly in farm animals like cattle, sheep, swine and horses, but also in wild animals (Okewoleet *et al.*, 2000). Unfortunately, the few existent epidemiological surveys do not cover the entire geographical distribution of this disease and, therefore, the values of fascioliasis prevalence in animals are still inaccurate (Mas-Coma *et al.*, 2005).

In the study, the percentage infection with fascioliasis in buffalo is (6.3 and 19.1%) for males and females respectively, this may be related to that these animals more contact with water because of their behavior so this contact make the buffalo take the infection from water grass by eaten and swim.

The most affected countries with animal fascioliasis are located in Asia and Africa where fascioliasis is currently the single most prevalent helminth infection of ruminants. African countries, like Morocco, Egypt, Tunisia and Ethiopia reported prevalence rates of 30-90% in Goats and Cattle. Concerning Asia, the prevalence of *F. hepatica* reaches 100% in some regions of India, up to 27-91% in Iran, up to 85% in north-east Thailand and 25-90% in Indonesia (Togerson and Claxton, 1999).

In Saudi Arabia, several research works have been published about incidence and prevalence of *Fasciola* (Magzoub and Kasim, 1978; Banaja and Ghandour, 1994; Haseeb *et al.*, 2002; Abou-Zinadah and Fouad, 2005; Sanad and Al-Megrin, 2005; Al-Megrin, 2010; Eligail *et al.*, 2010). Fascioliasis among local and imported sheep in Saudi Arabia was studied by Sanad and Al-Megrin (2005). Their results showed that, the detection of eggs revealed 13.5% infection rate compared with 21.9% by detection of worms ($p < 0.001$). Also, the infection rate

was significantly higher ($p < 0.001$) among the imported sheep (15.1%) than among the local ones (4.96%).

Khuzestan Province is located in South western Iran, is specific field for the snail host (Mansoorian, 2001) and endemic for the infection with *F. hepatica* and *F. gigantica* which previous studies have been reported high infection rates with fascioliasis 91.4%, 49.2%, 29% and 11.2% in buffaloes, cattle, sheep and goats, respectively (Sabbaghian *et al.*, 1964; Sahba *et al.*, 1972). The highest percentage of infection in Thailand was in the North (23.4%), while, the lowest one was found in the South (4%) (Sukhapesna *et al.*, 1990).

The current study found that the intensity of infection for both ova (26.3, 79.1) and worms (22.2, 22.7) respectively, this variation depended on many factors like sex, strain of animal and parasites. But there was no significant differences found between gall bladder PH and number of ova and worms that found under this study.

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