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ISOLATION AND IDENTIFICATION OF INTESTINAL PARASITES FROM VEGETABLES FROM DIFFERENT MARKETS OF IRAQ.

Afkar M. Hadi
Iraq Natural History Research Center and Museum.
University of Baghdad

ABSTRACT

This investigation was designed to determine the occurrence of intestinal parasites in fresh vegetables(*Apium graveolense*, *Lepidium aucheri* and *Allium porrum*), from different markets as a primary effort in Iraq. Eight genera and species of intestinal parasites appear in vegetables, they were as follow: *Echinococcus sp.* 50%,*Oxyuris equi* 45%,*Habronema* sp. 45%,*Parascaris equroum* 31.6%,*Strongyloides westrei* 30%,*Toxocara* sp. 18.3%,*Ascaris lumbricoides* 11.6% and *Hymenolepis sp.* 8.3% .The scarcity of fresh water has meant that urban gardeners are increasingly irrigating their plots with wastewater. This poses a threat to public health in addition of roaming dogs in open farms. All studied areas showed high rates of eggs .No significant difference noticed between total rates of north and middle of Iraq. There were highly significant differences in the species of parasites among areas.

INTRODUCTION

Since 1973, WHO considered reuse of wastewater is special health issue (WHO 1973).In investigations on pathogenic organisms in wastewater and sludge, parasites have received the least attention (WHO 2004). In Iraq, a few studies reported in the literature on parasites transmitted through wastewater and sludge. The total contamination rate with parasites in sewage water was 60% at five regions in Baghdad (Al-Dura, Hi-Al- Maalf, Hi-Al-Jehad, Al-Shabab, and Al-Baya'a) (Hadi . 2008)

This investigation (as primary effort) was designed to determine the occurrence of intestinal parasites in some vegetables which are eaten fresh together in Iraq(*Apium graveolense*, *Lepidium aucheri* and *Allium porrum*), from different markets of Iraq.

MATERIALS AND METHODS

A total of 60 sample of vegetable groups (*Apium graveolense*, *Lepidium aucheri* and *Allium porrum*) each one weigh 500 gm during study months (November 2009 – April 2010). The samples were collected from markets of north region (Arbil & Kirkuk) and middle region (Baghdad, Najif &Diwania). The samples were tested according to Bariden, (1980). Generally, this method use sedimentation to concentrate the eggs on centrifugal force. Photographs were taken for eggs, then they diagnosed with the help of some Professors.

RESULTS

Echinococcus sp. showed the highest rate 50% (30) then *Oxyuris equi* and *Habronema* sp. 45% (27) (Table 1).

Total rates of pollution with the eggs of parasites were 67.3%(97)in the middle area of Iraq compared with 32.6%(47) in the north area (Table 2). Brief description and measurements of each helminthes is given below (Table 3).

Table 1: Genera &species of parasites isolated from fresh vegetable groups 60/500mg.

Parasites	No. of veg. positive	% of total	Final host
Echinococcus sp	30	50%	Dog
Oxyuris equi	27	45%	Horse
Habronema sp.	27	45%	Horse
Parascaris equorum	19	31.3%	Horse
Strongyloides westeri	18	30%	Horse
Toxocara sp.	11	18.3%	Dog &cat
Ascaris lumbricoides	7	11.6%	Man
Hymenolepis sp	5	8.3%	Man

Table 2: Distribution of parasites in the north and middle of Iraq.

Parasites	North 20 specimens	middle 40 specimens
Echinococcus sp.	4	26
Oxyuris equi	12	15
Habronema sp.	12	15
Parascaris equorum	8	11
Strongyloides westeri	9	9
Toxocara sp.	2	9
Ascaris lumbricoides	0	7
Hymenolepis sp	0	5
Total	47 32.6%	97 67.3%

Table.3: Measurements and brief description of parasites eggs from vegetables.

Parasites eggs	measurements	Descriptions of eggs	contains
Echinococcus sp.	30 -36 µ	Spherical, thick, smooth shell. Fig.1	Hexacanth embryo.
Oxyuris equi	85 -45 µ	Ovoid, slightly asymmetrical, dissimilar side- walls. Fig.2	Larva
Habronema sp.	45 - 16 µ	Cylindrical, strongly elongated, thick shell. Fig.3	Larva
Parascaris equorum	95 -90 µ	Nearly spherical, brown yellowish. Thick albominous shell covered with fine dots.	One or two cells
Strongyloides westeri	45 -30 µ	Ovoid, side walls are symmetrical. Similar, wide poles.fig.5	Short thick larva
Toxocara sp.	75 -80 µ	Nearly spherical, thick rough, pitted shell.fig.6	brown to black granular contents

Ascaris lumbricoides	55 -45 µ	Ellipse to round , golden brown thick, rough albuminous outer wall.fig.7	thin yolk membrane
Hymenolepis sp.	38 µ	Round, grayish, transparent. Smooth, thin membranous shell. Fig.8	oncosphere is 24 µ by 16 µ

DISCUSSION

Factors affect the occurrence and concentrations of helminthes eggs and protozoan cysts observed in raw wastewater, include the endemicity of disease within the indigenous animal and human population (Grimason 1995). In current study, a large number of parasites 8 genera and species from fresh vegetable groups this result conjugated with level of incidence of parasitic infection in the community and concentrations of parasitic organisms, such as intestinal nematodes eggs, in the wastewater of such a community (Dixo 1993).

Study shows high rates of pollution with *Echinococcus* sp and *Toxocara* sp. eggs of dogs and cats which means high risk to community since Holly (2008) indicated that they may not only be most pathogenic to their specific host, they may also be the major causes of zoonosis. In Iraq, the agriculture of study vegetable groups in open farms where dogs and cats roaming there, which they really risk for human.

The presence of many species of horse helminthes (O*xyuris equi*, *Habronema sp.*, *Parascaris equorum* and *Strongyloides westeri*) in vegetable groups came probably as a result of reuse of feces of equine for manuring. This is accordance with Ram (2009) who found that the reuse of Equine feces in farms lead to re infection with these parasites for horses and unknown results when human ingested them!

In England nearly all horses are infected with nematodes. (Thienpont et. al.1986), while in Iraq Faraj & Shabban (2007) found that the total equine infection rate 50.45%.

The presence of round worms (*Ascaris lumbricoides*) and tapeworm (*Hymenolepis sp.*) in vegetable groups mean that, they are all readily transmitted by the agricultural use of raw or insufficiently treated excreta and wastewater, indeed, they are the excreted pathogens of greatest public health concern in agricultural reuse schemes.

There are highly significant differences $P<0.01$ among the species of parasites between the two studied areas , *Echinococus* sp. and *Toxocara* sp.of dogs were recorded high rates in middle, compared with north area , this result is conjugated with number of roaming dogs in farms. This is similar to Sultan (1997) who showed that infection rate with *Toxocara canis* 46% of dogs in Najif area. Moreover, in Basrha Al-Emara and Yakub (1999)found that total dogs infection 35.2% with three nematodes: *Toxocara canis*, *Toxocara leonine* and *Ancylostoma caninum*, thus contaminated soil 25% and contaminated gardens grasses 10% from funfair in Basrha. Aside from, infected rate in Mousel area (in north) 25.7% with same parasites (Al-Kalidi, 1983).

The study shows that infection with eggs of equine worms are high in the north of Iraq, this may be due to prevalence of Equines (horse and mules) in villages and mountains of north area. On the other hand, absence of human parasites (*Ascaris lumbricoides* and *Hymenolepis* sp.) in the north area may indicate decreased level of wastewater reuse. Finally, according to present results and in response to claim, WHO (2004) wastewater must use in irrigation of crops to be eaten cooked, sport field, public Parks; cereal crops; industrial crops; fodder and trees; not for crops eaten raw.

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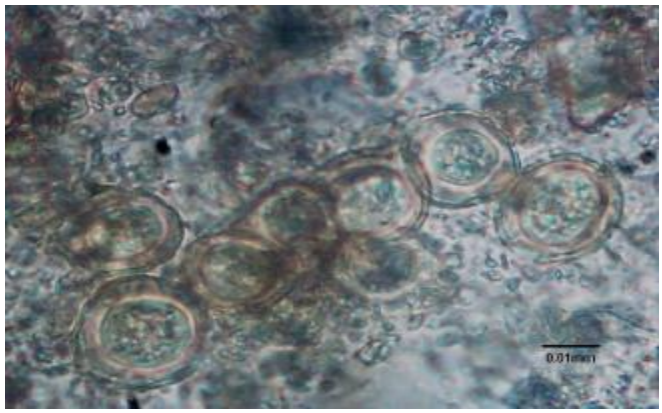

Fig.1: Eggs of *Echinococcus sp*

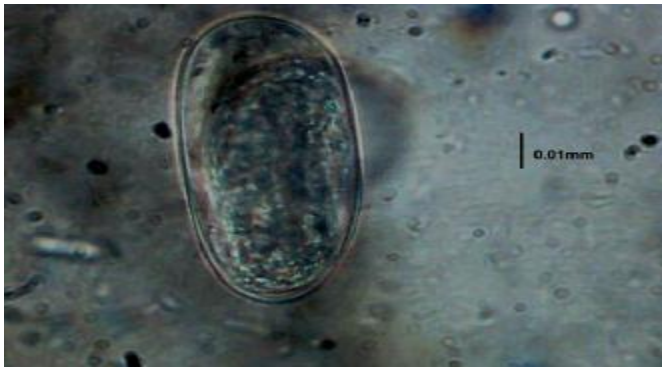

Fig.2: Egg of *Oxyuris equi.*

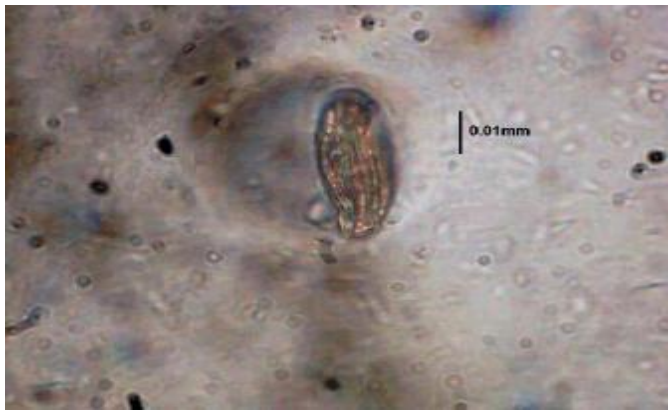

Fig.3: Egg of *Habronema* sp.

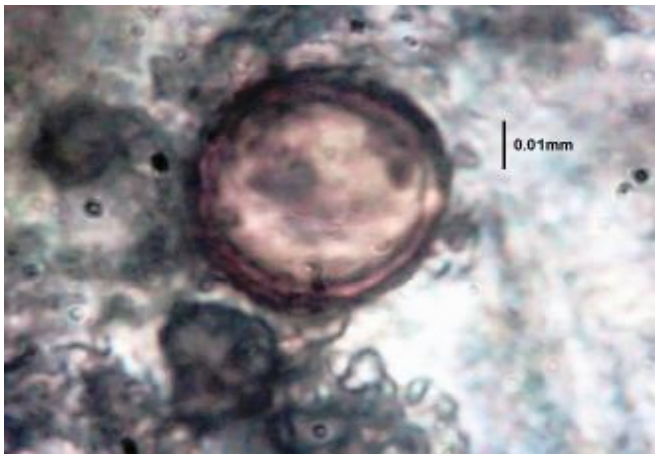

Fig.4: Egg of *Parascaris equorum*.

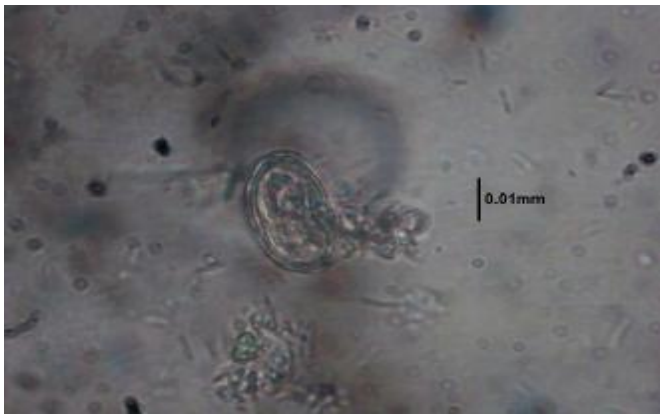

Fig. 5:*Strongyloides westeri*.

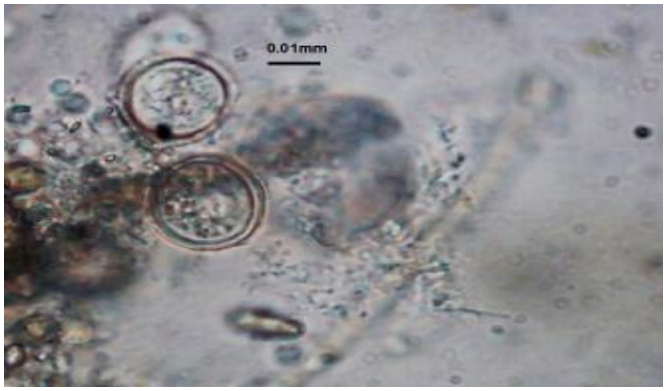

Fig.6: Egg of *Toxocara* sp.

Fig.7: Egg of *Ascaris lumbrecoides.*

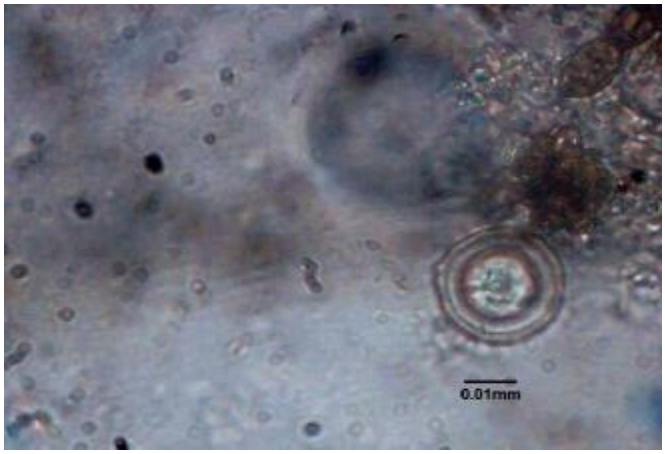

Fig.8: Egg of *Hymenlepois sp.*

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ضعبنم ةيومدلاتايليطالصيخ تولز عنم ةفلتخ قوسأن تولضلا قلرعلا.

يدهلسم لكف أ

يعيبلا خ راتلا فحتموثحب زكر م – دلدغب ةعماج

ةصلاخلا

لكوت لا لوطخا عبنتا يل يطالطرشخ ت لعب سا ردلا نذه محتها قلر لافي لعم(ثاركلا دلشرلااسفرك ا)ث ي قباع في ة م لو وة لمخقواس ن م ةفلتخا ةيوعلتايلفطلاا معوا نو انجأةيزا ا ةدلدا اترهظأيل يلمكو:

Echinococcus sp. 50%, *Oxyuris equi* 45%, *Habronema* sp. 45%, *Parascaris equroum* 31.6%, *Strongyloides westrei* 30%, *Toxocara* sp. 18.3%, *Ascaris lumbricoides* 11.6% and *Hymenolepis sp.* 8.3% .

ق ا ت م ب نبو ن سنلإاو ويلخاوب كلاا بصتتي للة وهذا بسبب الزراعة المفتوحة و تجوال لما ي ةفي ةلئاا لات ف لخ ا لمعتم ةداعإ علصف ا يف ةبئا ل بلا لاالحيتذ لعو رز ةبنع ل ايلاصقنلاا عرلم ا د ي س تا يأو ة لعا ل ةحصلى لعا سيحا اطخلك يذاهو بت ا ن ا يلحتلاصا ف.قارع لقطلم ضخاث لتلاد عفي اا ف تر سارد لترهظ أ ةيل لمثلاا يطو ل ا و) افلا خلا ضعبع مءا و دحىلعتت ا ي ليفطلا عونأين ة يئطلإا.