

Isolation and Identification of Parasites from *Lactuca Sativa*.

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Abstract

This investigation was designed to determine the occurrence of intestinal parasites in *Lactuca sativa* from November 2008 to April 2009 from Baghdad markets as a primary effort in Iraq. Twelve genera and species of intestinal parasites appear in lactuca were as follow: *Toxocara canis* 53.3%, *Echinococcus* sp. 41.6%, *Hymenolepis* sp. 26.6%, *Ascaris lumbricoides* 20%, *Anoplocephala* sp.15%, *Strongyloides stercoralis* 15%, *Parascaris equorum* 13.3%, *Taenia* sp.11.6%, *Toxocara vitulorum* 8.3%, *Strongyloides westeri* 6.6%, *Ancylostoma duodenale* 5%, *Stongylus* sp.5%. Unfortunately, the scarcity of fresh water has meant that urban gardeners are increasingly irrigating their plots with wastewater. This poses a threat to public health. The high rate of eggs in lactuca was recoded at April 60% temperatures between (30- 31c°) that mean this Optimum Temperatures for eggs; the law rate off eggs at January 13.3% temperature between (1-10c°); low temperatures inhibit complete development of the cells inside the eggs.

Keywords: *Lactuca sativa*, helminthes, intestinal parasites, wastewater, public health.

Introduction

Over the past 40 years, there has been a considerable revival of interest in the use of wastewater for crop irrigation in arid and semi-arid regions as a result of the scarcity of alternative water supplies and the need to increase local food production. Water resources planners have come to recognize the value of this practice, in terms of both water conservation and nutrient recycling and as a method of preventing the pollution of surface and ground water. The public has not objected such as Jordan, Peru and Saudi Arabia, it is government policy to reuse all effluents from sewage- treatment plants, mainly for crop irrigation, [1].

Factors that affect the occurrence and concentrations of helminth eggs and protozoan cysts observed in raw wastewater, include the endemicity of disease within the indigenous animal and human population, the size and socio- economic status of the population, the percentage of population sewerred, the percentage or wastewater contributed by industry, the volume of influent sampled and the recovery efficiency of the sampling method, [2].

The count of Nematode eggs in raw wastewater from arrange of different countries. The extremely high concentration of nematodes eggs found in Iranian (500-13000(eggs/l), [3] and Brazilian (550-

8900 (eggs/l), [4] cities raw sewage. The low concentration of nematodes eggs found in France 9 eggs/l, [5] is a direct result of the low socio-economic conditions of the country inhabitants. Partial sanitation throughout the community, poor housing and low per capita water consumption all contribute to a high level of incidence of parasitic infection in the community and to high concentrations of parasitic organisms, such as intestinal nematodes eggs, in the wastewater of such a community, [6].

In Iraq 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) [7]. This investigation (as primary effort) was designed to determine the occurrence of intestinal parasites in *Lactuca sativa* from different markets of Baghdad.

Material and Methods

A total of 60 samples of *Lactuca* each one weigh 500 gm. During study months (November 2008–April 2009) from different markets of Baghdad. The samples were tested as Bairden method, [8]. Generally, this method use sedimentation to concentrate the eggs on centrifugal force. It's particularly important to make measurements of eggs when starting identification. The color photographs were

taken for all eggs, then would be diagnosed with helpful some Profs.

Results

Twelve genera and species appear in lactuca constitute new records for Iraq. *Toxocara canis* was recorded the highest rate 53.3%(32) then *Echinococcus* sp.41.6%(25). Table (1).

April was recoded the high rate of eggs 60% in lactuca. The low rate of eggs at January 13.3%.Table (2).

Brief description of each helminthes is given below:

Toxocara canis : medium-sized worm egg: 75 μ -80 μ , nearly spherical, thick rough, pitted shell. Dark-brown to black granular contents, as shown in Fig.(1).

***Echinococcus* sp.** : small worm egg: 30 -36 μ , spherical, thick, smooth shell, with lamellar embryophore (striated radially). Contains hexacanth embryo, see Fig.(2).

***Hymenolepis* sp.** : small worm egg: 38 μ , round, grayish, transparent. Smooth, thin membranous shell, oncosphere is 24 μ by 16 μ , as shown in Fig.(3).

Ascaris lumbricoides :Figure 4 shows the medium sized worm egg: 55 μ in length - 45 μ in width, ellipse-shaped to round, golden brown.thick, rough albuminous outer wall, very thick colourless middle layer, inner layer contains a thin yolk membrane.contents : unsegmented cell with rough granules.

Strongyloides stercoralis: medium-sized worm egg: 58 μ in length, 35 μ in width, elliptical, greish green, very thin single wall. Contains a short, thick larva, See Fig.(5) .

***Taenia* sp.:** small worm egg : 40 μ in length , 35 μ in width .Round to allipsoied, pale yellow to brown .Think, smooth shell with radially striated embryophore, co ntains a hexacanth embryo, see Fig.(6).

Ancylostoma duodenale: medium-sized worm egg:60 μ in length -40 μ in width, ovoid, similar rounded poles, barrel-shaped side-walls, thin ,smooth colorless shell, 2 to 8 blastomeres, see Fig.(7).

***Anoplocephala* sp.** : medium-sized worm egg: 65-80 μ embryo diameter 16 μ . Nearly spherical, flattened at one side, thin, multilayer shell with greyish, smooth surface. Contains hexacanth embryo surrounded by a chitinous piriform apparatus, see Fig.(8).

Parascaris equorum: medium-sized worm egg: 95 μ in length, 90 μ in width, nearly spherical, brown yellowish. Thick albominous shell covered with fine dots. Contains one or two cells, see Fig.(9).

Strongyloides westeri : small worm egg: 45 μ in length, 30 μ in width, ovoid, side walls are symmetrical. Similar, wide poles. Thin shell with smooth surface, contains a short, thick larva, see Fig.(10).

***Stongylus* sp.** : medium-sized worm egg: 55 μ in length, 45 μ in width, ovoid, similar poles, similar strongly barrel-shaped side walls, small axis is longer than half the large axis. Thin shell with smooth surface.

Contains a morula with a small number of large blastomeres, see Fig.(11).

Toxocara vitulorum: medium-sized worm egg: 95 μ in length, 77 μ in width, nearly spherical. Thick, nearly alveolated, albuminous shell.

Granular contents, unsegmented and usually filing only part of the egg, see Fig.(12).

Table (1)
Genra & species of Parasites isolated from Lactuca 60/500mg.

<i>Parasites</i>	<i>No. of lactuca positive</i>	<i>% of total</i>	<i>No. of parasites</i>
<i>Toxocara canis</i>	32	53.3%	+++
<i>Echinococcus sp.</i>	25	41.6%	+++
<i>Hymenolepis sp.</i>	16	26.6%	++
<i>Ascaris lumbricoides</i>	12	20%	+
<i>Strongyloides stercoralis</i>	9	15%	+
<i>Taenia sp</i>	7	11.6%	+
<i>Ancylostoma duodenale</i>	3	5%	+
<i>Anoplocephala sp.</i>	9	15%	+
<i>Parascaris equorum</i>	8	13.3%	++
<i>Strongyloides westeri</i>	4	6.6%	+
<i>Stongylus sp.</i>	3	5%	+
<i>Toxocara vitulorum</i>	5	8.3%	+

Less than 10 = +

Less than 20 = ++

More than 30 = +++

Table (2)
Distribution of parasites isolated from Lactuca during months from November 2008 to April 2009.

<i>Parasites</i>	<i>Nov.10 specimens</i>	<i>Dec. 10 specimens</i>	<i>Jan. 10 specimens</i>	<i>Feb. 10 specimens</i>	<i>March. 10 specimens</i>	<i>April 10 specimens</i>
<i>Toxocara canis</i>	6	3	3	6	7	7
<i>Echinococcus sp.</i>	7	3	2	2	5	6
<i>Hymenolepis sp.</i>	4	-	-	2	5	5
<i>Ascaris lumbricoides</i>	2	1	1	2	3	3
<i>Strongyloides stercoralis</i>	2	1	1	1	2	2
<i>Taenia sp.</i>	-	-	-	2	2	3
<i>Ancylostoma duodenale</i>	1	-	-	-	1	1
<i>Anoplocephala sp.</i>	1	-	-	2	3	3
<i>Parascaris equorum</i>	1	1	1	1	2	2
<i>Strongyloides westeri</i>	1	-	-	1	1	1
<i>Stongylus sp.</i>	-	-	-	1	1	1
<i>Toxocara vitulorum</i>	-	-	-	1	2	2
Total	25 41.6%	9 15%	8 13.3%	21 35%	34 56.6%	36 60%

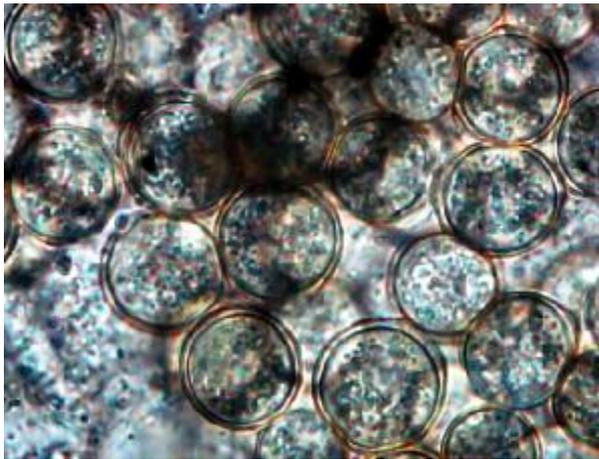


Fig.(1) Eggs of Toxocara canis.40X.



Fig.(4) Egg of Ascaris lumbricoides.40X.

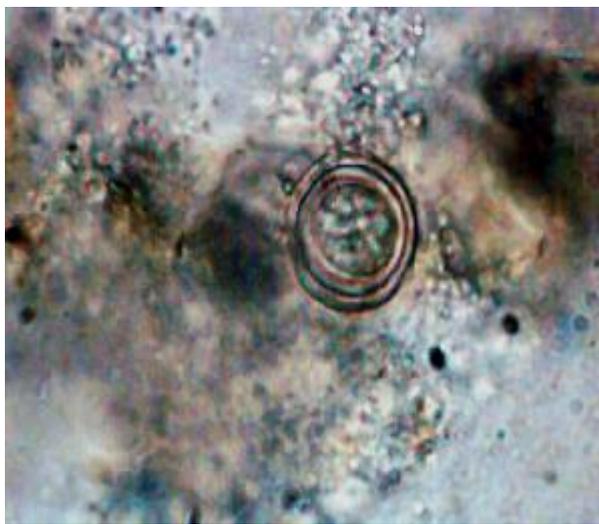


Fig.(2) Egg of Echinococcus sp.40X.

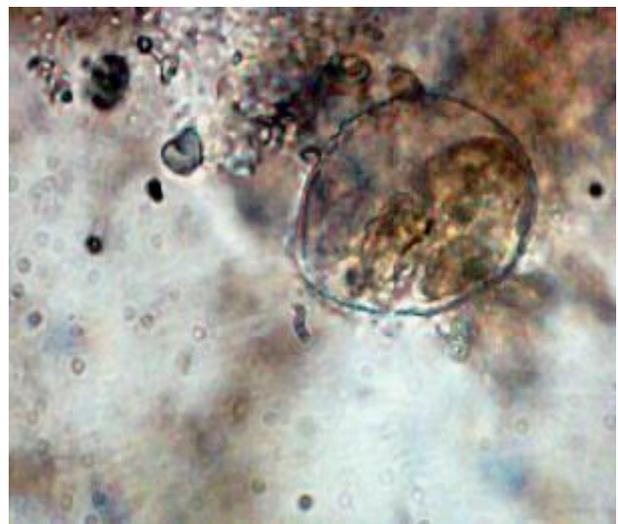


Fig.(5) Egg of Stroglyoides stercoralis .40X.

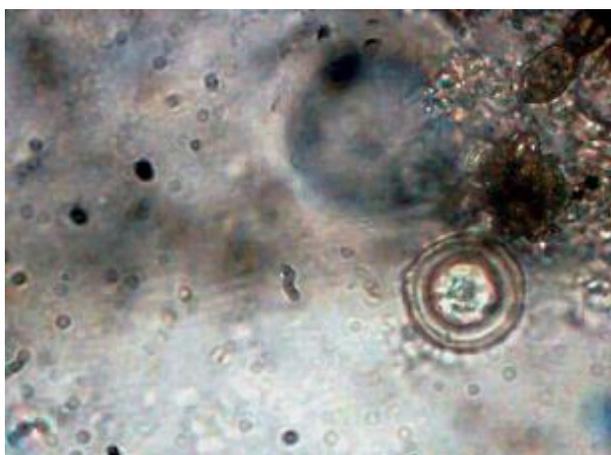


Fig.(3) Egg of Hymenlepid sp. 40X.

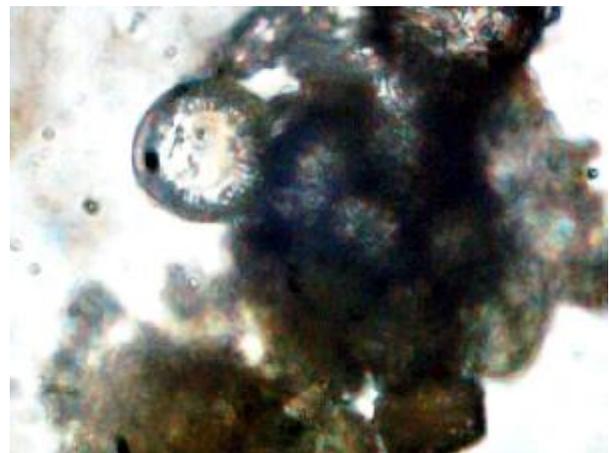


Fig.(6) Egg of Taenia sp.40X.

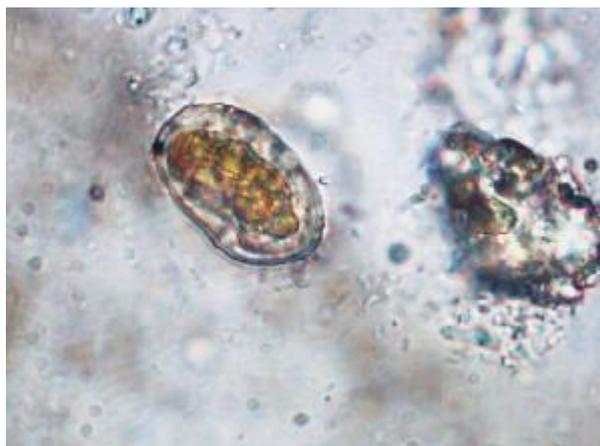


Fig.(7) Egg of Ancylostoma duodenal.40X.



Fig.(10) Egg of Stroglyoides westeri . 40X.

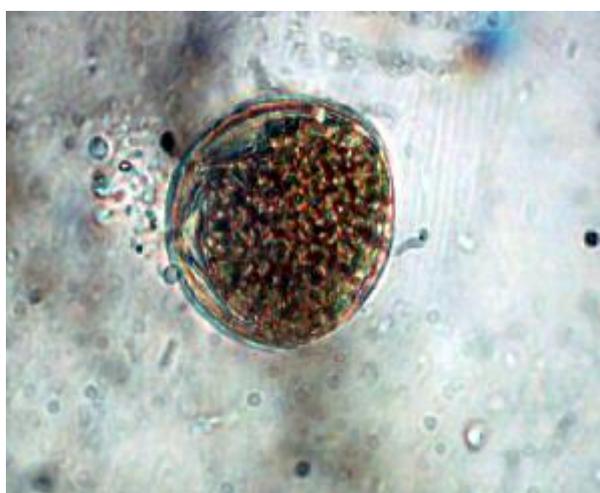


Fig.(8) Egg of Anoplocephala sp.40X.

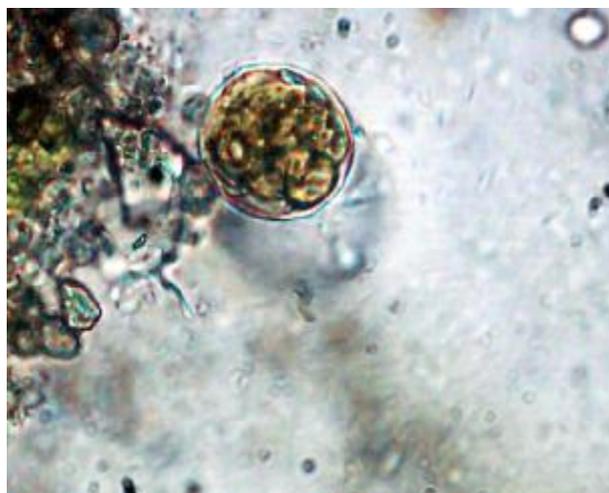


Fig.(11) Egg of Strongylus sp.40X.



Fig.(9) Egg of Parascaris equorum.40X.

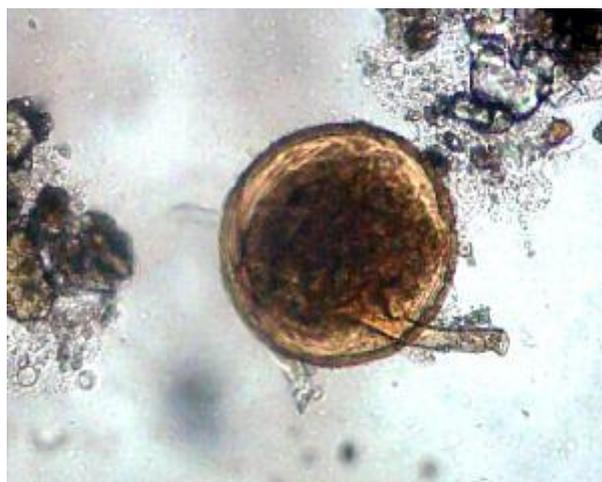


Fig.(12) Egg of Toxocara vitulorum .40X.

Discussion

Unfortunately, the scarcity of fresh water has meant that urban gardeners are increasingly irrigating their plots with wastewater. This poses a threat to public health. A fertilized egg can cause infection and such infective stages should be absent from irrigation .

The reporting of the large number of parasites (12) genera and species from lactuca are risk of health; all these parasites were recorded in Iraq previously in their hosts but in this study constitute new records in *Lactuca sativa*.

The nematode *Toxocara canis* was recorded the highest rate 53.3% then the cestode *Echinococcus sp.* 41.6%, both of them are worms of dogs and cats that may not only be most pathogenic to their specific host, they may also be the major causes of zoonosis.

Farms in Iraq opened (without fences); dogs, cats were rowing and defecation in farms that risk for health.

The presence of many parasitic tapeworms (*Hymenolepis sp.*, *Taenia sp.*) and round worms (*Ascaris lumbricoides*, *Strongylus stercorialis* and *Ancylostoma duodenale*) in lactuca that mean, 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.

The eggs of cestodes *Anoplocephala sp.* are expelled with the faeces of horses, the same applies to the eggs of horse Ascarids (*Parascaris equorum*), *Strongyloides westeri* and *Strongylus sp.*

In our regions nearly all horses are infected with nematode, [9]. Reuse of Equine faeces in farms due to re infection with these parasites for horses and unknown results when human ingested them!

Also the result found the nematode of ruminants *Toxocara vitulorum* in lactuca. All these parasites require a period of time after excretion to become infective to man, and this latency period is passed in soil, water, or an intermediate host. Most of them are environmentally persistent, with survival times usually ranging from several weeks to several years. Schemes for the use of excreta and

wastewater are important mechanisms of transmission of many of these diseases. A major environmental measure for their control is therefore the effective treatment of excreta, wastewater, and domestic sludge's prior to use.

The high rate of eggs in lactuca was recorded at April 60% temperatures between (30-31c°) that mean this Optimum Temperatures for eggs. The low rate of eggs at January 13.3% temperature between (1-10c°) low temperatures inhibit complete development of the cells inside the eggs. Some studies were explained the factors which affecting the development of eggs, which showed certain adaptations for survival and development as well as some of their limitations. The influence of temperature on the development, survival, size and infectivity of free living stages of a number of animal parasitic nematodes is well – documented, [10,11,12,13,14,15]

The results of this investigation are risk for health so Iraq need many applications like USEPA.[16] established pathogen reduction classes : Class A and Class B. The classes stipulate the detection level for pathogenic organisms that are not be exceeded in sludge. "Class A" criterion is for land application and using the sludge as a fertilizer.

This sludge could also be applied in bulk to agricultural land, forest, public contact sites, reclamation sites, lawns, or home gardens: or could be sold or given away in bags or other containers. Physical, biological, air drying or chemical addition methods, or storage for at least one day.

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الخلاصة

اهتمت هذه الدراسة بعزل وتشخيص الطفيليات من الخس للمدة من تشرين الثاني 2008 - نيسان 2009 من أسواق بغداد المختلفة ولأول مرة في العراق حيث أظهرت الدراسة اثنا عشر جنس ونوع من الطفيليات المعوية كما يلي :

Toxocara canis 53.3%, *Echinococcus* sp. 41.6%, *Hymenolepis* sp. 26.6%, *Ascaris lumbricoides* 20%, *Anoplocephala* sp. 15%, *Strongyloides stercoralis* 15%, *Parascaris equorum* 13.3%, *Taenia* sp. 11.6%, *Toxocara vitulorum* 8.3%, *Strongyloides westeri* 6.6%, *Ancylostoma duodenale* 5%, and *Stongylus* sp. 5%.

وهذا بسبب إعادة استعمال المخلفات السائلة في سقي المزروعات نتيجة النقص في مياه السقي وهذا يشكل خطرا جسيما على الصحة العامة. اظهر شهر نيسان أعلى نسبة لوجود البيوض 60% حيث تتراوح درجات الحرارة بين (30 - 31م) وهي الدرجة المثلى لنمو الأجنة في البيوض، أما اقل نسبة فقد سجل شهر كانون الثاني 13.3% حيث تتراوح درجات الحرارة بين (0 - 10 م) وهي الدرجة التي تثبط نمو الأجنة داخل البيوض.