New parasites of local duck recorded in Iraq with histopathological study

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Abstract

This study was conducted to determine endoparasites in local ducks in Al-Diwaniya province. A total of 80 birds were collected from different areas of Al-Diwaniya city. Examination of the internal organs and fecal samples revealed the infection of (47.5%) of total examined birds with parasites. These parasites involved three specieses recorded as first time in Iraq which were the nematode *Hystrichis tricolour* with percentage of infection (10%), trematode *Tracheophilus cymbium* with prevalence (7.5%) and protozoa *Wenyonella philiplevinei* (3.75%). Many histopathological changes were noticed in the internal organs due to parasitic infections. The histological sections from proventriculas show irregular arrangement of cells and increase the empty spaces among the cells of glands, also sections from lung show caseous necrosis and cellular oedema full most alveoli in the lung with infiltration of inflammatory cells and mucous discharge in the lumen of bronchioles, in cecum histological section reveal destruction of villi with desquamation of epithelial cells lining villi and infiltration of inflammatory cells (eosinophil) in sub mucosa.

Key Word: Local duck, new parasites, histopathological.

Introduction

Class Aves contains about 9700 species distributed among thirty orders of living birds. Birds are an important source of animal protein which humans depend on (1), which is the form of meat or eggs at a time the search for alternative sources. Birds contribute in biological control by feeding some of the neighborhoods insects and act to transfer of many pathogens like virus specially cause of bird flu ,bacteria and parasites to birds, domestic animals and other fish and humans when they are close to each other (2). Most birds (wild and domestic) are consider a reservoir hosts for many parasites which are important to cause many diseases and can be transmitted from one country to another and from area to another (3).

The living of birds in very large groups and mixing during flight and nutrition in addition to multiple sources of nutrition, which depends mainly on what is available in the environment of invertebrates such as beetles, snails, grasshopper as well as earthworm, ants, crustaceans which are intermediate host for many of the worm specially tapeworm, exposes birds to infection with many of these worms (4).

In Iraq begun to interest in the study and diagnosis of parasitic infections in birds in the late twentieth century, specially in southern Iraq such as (5) and (6). Ducks are mostly aquatic birds which may be found in both fresh water and sea water. Breeding duck comes in the second division after poultry in terms of importance as a source of meat and eggs. Family Anatidae include species of Iraqi duck and gees that consist of 27 species in Iraq which contain two types of duck, diving duck like *Netta rufina* and non diving duck (surface-feeding duck) like *Anas crecca* (7).

Materials and Methods

Methods

Samples Collection

The study includes a collection of 80 duck of different species which were (44) sample of male and (36) sample of female, then bring to the lab of parasite in Vet. College which were examined and recorded the weight and sex of each duck in special form which made specially for each sample that include the number of sample, date of sacrificing, sex, weight and type of parasite (endoparasite and ectoparasite) if it is found. Then made dissection to the birds and collect the fecal samples for diagnosis the type of protozoa and parasite, also isolation the helminthes from the internal organs.

Dissecting of duck

After external inspection the ducks were sacrificed and wetted by water to prevent dust, then opening the body of bird longitudinally from abdomen region by use of large scissor and blade from the head to the cloca after remove of feather. The internal organs were examined grossly for any pathological changes due to parasite and recorded any damage on the surface of these organs which include digestive tract, liver, trachea, and lung.

Isolation and staining of helminthes

The large helminthes washed with water after remove the mucous materials by a special brush, then parasites put in normal saline after taken the length of them by use of ruler while the small one taken the length done by use of ocular, after that they preservate in plastic containers that

contain ethanol 70% with some drops of glycerin to fix them and staining later. Cestodes and trematodes fixed and stained by using of Semichon's acid carmine stain according to (8), while nematodes they fixed in hot ethyl alcohol 70% with adding of some drops of glycerine for preservation of tenderness of helminthes (9).

Fecal examination methods

Fresh fecal samples were collected directly from the ducks and kept in plastic containers or stored in the containers with formalin 10% for preservation to long time. The containers were marked with the date and sex of animal. Direct smear method was used according to (10), sedimentation method (11) and flotation method (12).

Histopathological study

many histological specimens were taken from the proventriculas, small and large intestine, trachea and lung. After washed these specimens, each one laid in labeled glass container contains 100 ml of 10% neutral buffered formalin at room temperature for fixation. Then, dehydration with ascending series of ethanol (50%, 60%, 70%, 80%, 90% and 100%) to remove water from the histological specimen then clearing with xylene and embedding in paraffin wax. Cuts into sections measured 5 micrometer thickness by using Rotary microtome, clearing by melting wax in incubator 40c° then washed in xylol, finally stained with Eosin and Hematoxylin stain. Mounting by using Canada balsam, examined with microscope 40X and 100X (13).

Results

Results of research recorded infection of local ducks with three species of parasites recorded as first time in Iraq.

1- *Hystrichis tricolour* :- Dujardin, 1845

This genus of nematodes isolated from proventriculus of duck. This parasite recorded as first time in Iraq with percentage (10%). The anterior end of parasite is expanded and contain many regularly positioned spines fig. (1-2), while the posterior end is rounded. The adult worm is slender in shape and the length of females about 3.5-4cm. The vulva is located near the posterior end of the worm and the uterus was full with large numbers of eggs which is oval in shape and have thick-shelled, measuring about 85×50 µm. fig. (3).

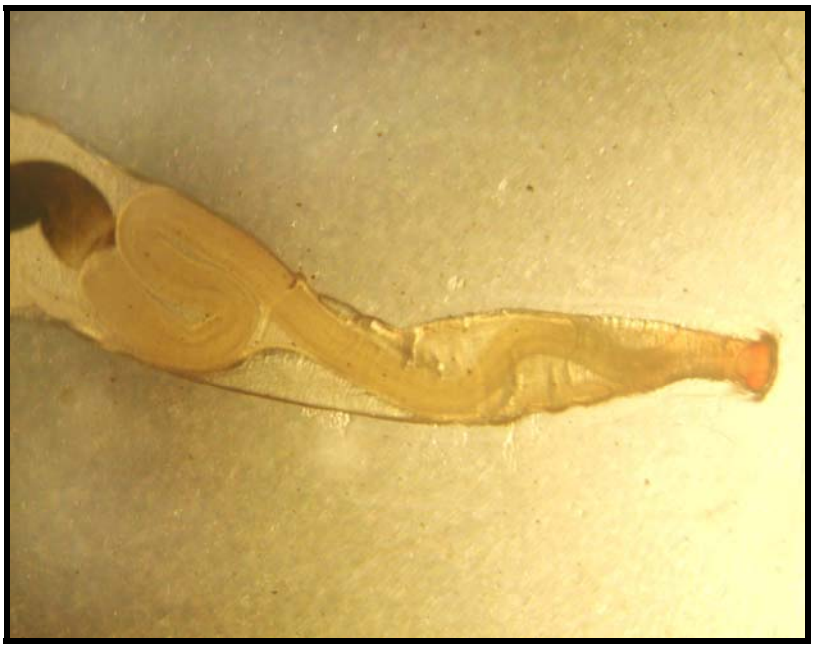

Figure (1) anterior end of *Hystrichis tricolour*

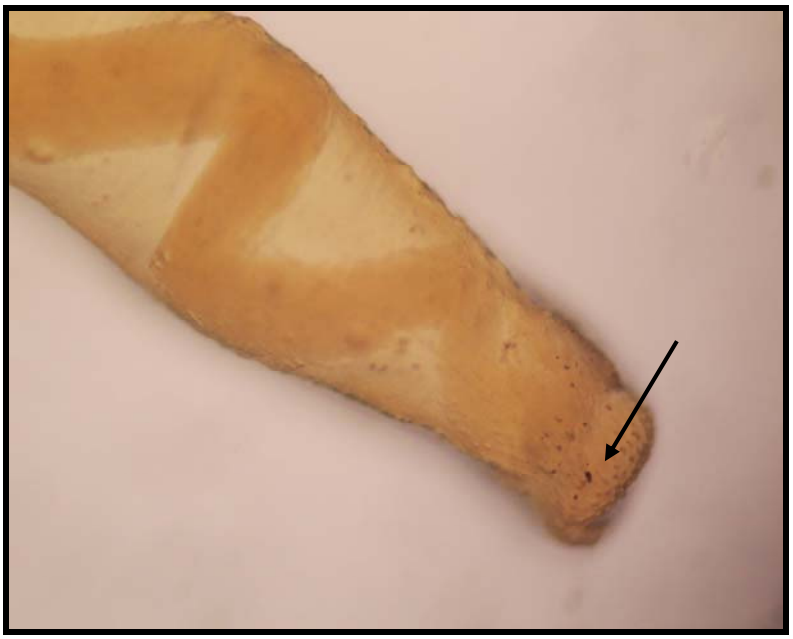

Figure (2) anterior end of *Hystrichis tricolour* show spines of head 4X

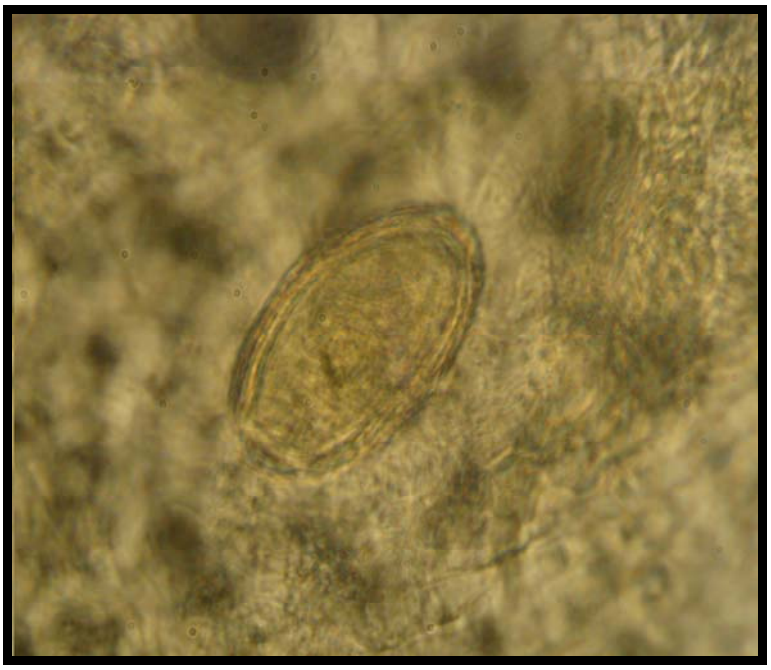

Figure (3) egg of *Hystrichis tricolour* 40X

2- *Tracheophilus cymbium* :- (Diesing, 1850)

Tracheophilus cymbium is a trematode parasite recorded for first time in ducks in Iraq in this study with percentage (7.5%), the worm found in trachea of ducks. The body is oval in shape, the range of length is 9-11 mm and width is 4 mm. the mouth is terminal, not surround by muscular

sucker, the oral sucker is absent. The ovary and testes are in the posterior part of the body, the testes are rounded in shape. The uterus is greatly convoluted nearly in the median part. The eggs measure 130×60µ. Fig. (4).

Figure (4) the trematode *Tracheophilus cymbium*

3- *Wenyonella philiplevinei* Leibovitz, 1968

This species of protozoa was found in intestinal content of 3 ducks with percentage (3.75%), also recorded for firs time in Iraq. The oocyst consists of three layered walls, yellowish blue middle wall and green inner wall. Fig. (5).

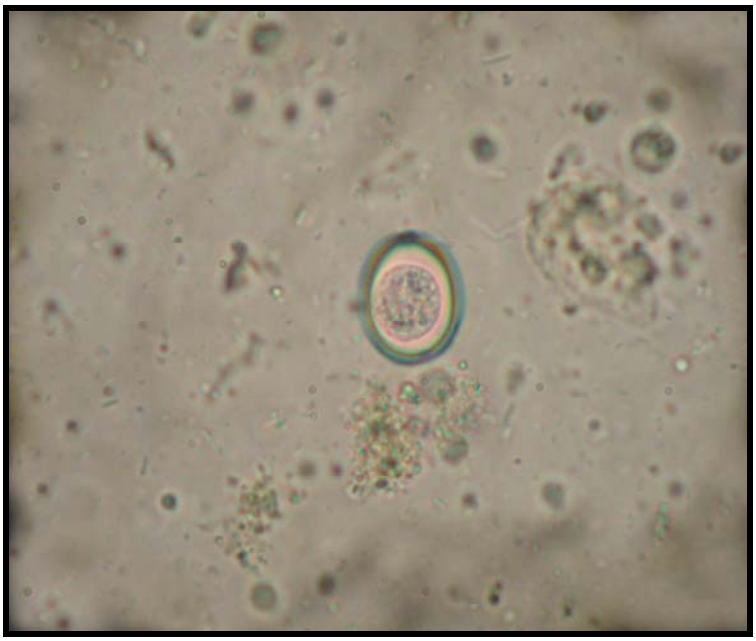

Figure (5) Oocyst of *Wenyonella philiplevinei* 40X

Microscopic Pathological Changes

The histological sections from proventriculas show irregular arrangement of cells and increase the empty spaces among the cells of glands, fig. (6) accompanied with non infected proventriculas, fig. (7). Fig. (8) show across section of the parasite embedded in the wall of proventriculas surrounded with fibrous tissue. The histological section of trachea revealed cellular mucous discharge present in the lumen of trachea, fig. (9). Also sections from lung show caseous necrosis and cellular oedema full most alveoli in the lung with infiltration of inflammatory cells and mucous discharge in the lumen of bronchioles, fig. (10). In cecum histological section revealed destruction of villi with desquamation of epithelial cells lining villi and infiltration of inflammatory cells (eosinophil) in sub mucosa, fig. (11).

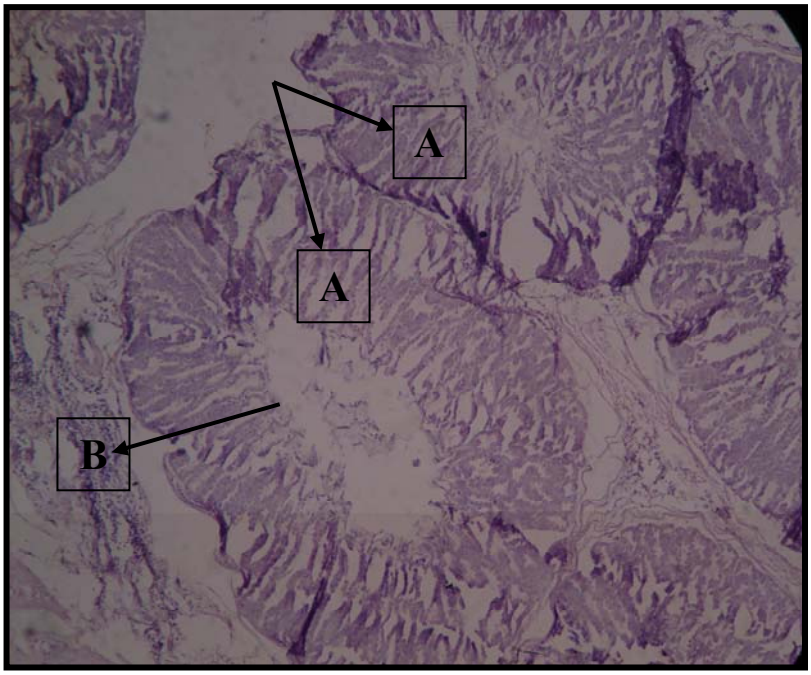

Figure (6) cross section of infected proventriculas with *Hystrichis tricolour*, notice irregular arrangement of cells (A) with infiltration of inflammatory cells (B). H & E stain. 10X

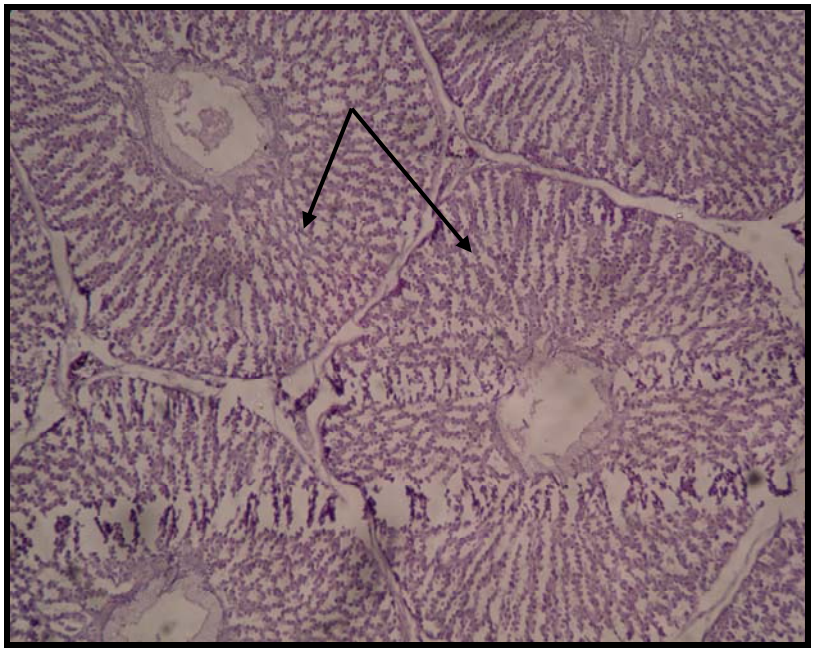

Figure (7) cross section of normal proventriculas from non infected duck show normal glands and regular arrangement of cells. H & E stain. 10X

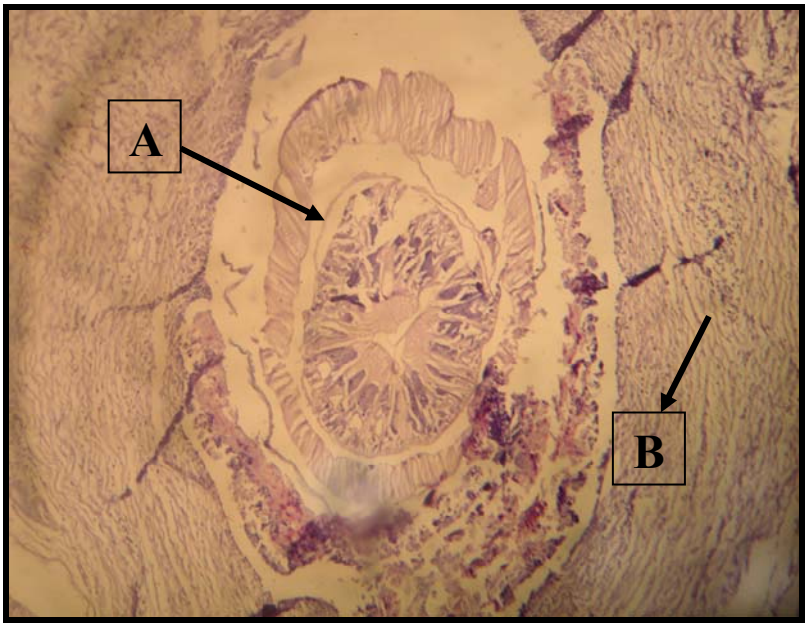

Figure (8) cross section of *Hystrichis tricolour* embedded in the wall of proventriculas (A) surrounding with fibrous tissue (B) H & E stain. 40X

Figure (9) cross section of trachea infected with *Tracheophilus cymbium*, show cellular mucous discharge present in the lumen of trachea. H & E stain. 10X

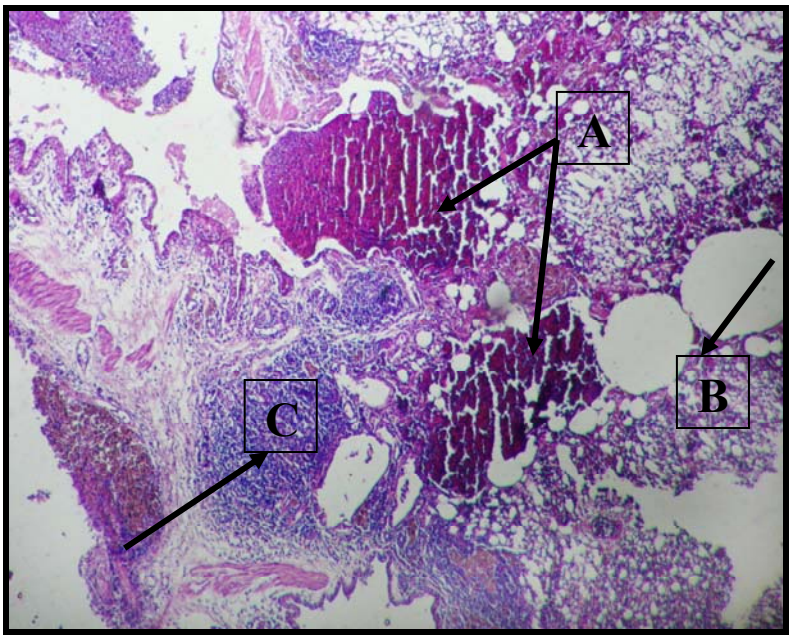

Figure (10) show caseous necrosis (A) and cellular oedema full most alveoli in the lung of duck infected with *T. cymbium* (B) with infiltration of inflammatory cells (C). H & E stain. 10X

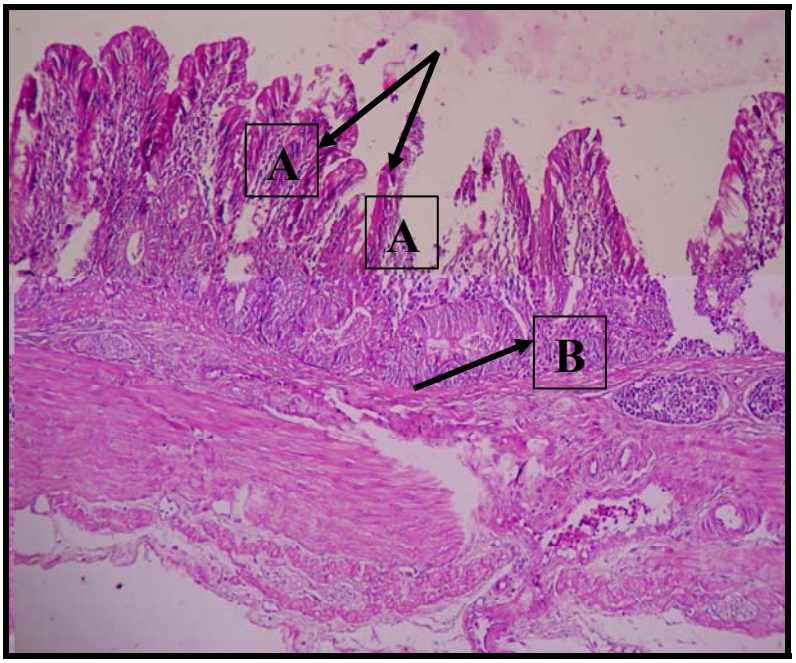

Figure (11) reveal destruction of villi in cecum of duck infected with *Wenyonella philiplevinei* with desquamation of epithelial cells lining villi (A) and infiltration of eosinophil cells in sub mucosa (B). H & E stain. 10X

Discussion

The parasitic infection as general causes many gross and microscopic changes specially in gastro-intestinal tract and respiratory tract.

Hystrichis tricolour is a common nematode in farm and wild ducks, geese and swan in many Palearctic countries (14), but it is scarce in other countries (15). In Northwestern Poland (16) found *H. tricolour* in wild ducks (subfamily Anatinae) with percentage (0.7%).

This study revealed infection of local ducks with *Tracheophilus cymbium* in bronchi of duck. (17) recorded *T. cymbium* in wild Anatides, percent of infection was (16.7%) in *Anas platyrhynchos* and (12.5%) in *Anas acuta.*

Few studies about *Wenyonella* were done on duck. (18) isolated *W. philiplevinei* from duck. (2) mentioned that *Wenyonella* cause sever inflammation of the ileum and rectum. (19) described *W. columbae* in pigeon. In present study *W. philiplevinei* isolated from ceca of duck.

The cross section of proventriculas, *H. tricolour* was found embedded in the wall of it surrounded with fibrous tissue and inflammatory cells due to chronic irritation by parasites.

The histological section of trachea revealed mucous mixed with inflammatory cells due to infection by *Tracheophilus cymbium* while the lung suffered from caseous necrosis may be due to bacterial secondary infection.

In the cecum of duck the histopathological changes revealed destruction of villi and desquamation of epithelial cells due to intracellular infection with *W. philiplevinei*.

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تسجيل جديد للطفيليات في البط المحلي في العراق مع دراسة التغيرات النسيجية لها

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الخلاصة

شملت هذه الدراسة تشخيص الطفيليات الداخلية في البط المحلي في محافظة الديوانية. تم جمع ٨٠ طائر بط من مناطق مختلفة في الديوانية. تم فحص الأعضاء الداخلية والبراز للطيور وقد أظهر الفحص أن (٤٧،٥%) من المجموع الكلي مصاب بالطفيليات. هذه الطفيليات اشتملت على ثلاث أنواع سجلت لأول مرة في العراق وهي الدودة الخيطية *Hystrichis tricolour* وبنسبة اصابة (١٠%) والمثقوبة *Tracheophilus cymbium* وبنسبة (٧،٥%) أما الأوالي *Wenyonella philiplevinei* فكانت النسبة (٣،٧٥%). لوحظ العديد من التغيرات المرضية المجهرية في الأعضاء الداخلية نتيجة الإصابة الطفيلية. المقاطع النسجية من المعدة الحقيقية أظهرت عدم انتظام أشكال الخلايا وزيادة الفراغات مابين الخلايا داخل غدد المعدة، أما المقاطع النسجية المأخوذة من الرئة فقد أظهرت وجود نضحة متجبنة مع وذمة تملأ معظم الأسناخ فى الرئة، أما المقاطع النسجية للأعورين فقد بينت تحطم الزغابات مع توسف الخلايا الطلائية المبطنة للزغابات وأرتشاح الخلايا الألتهابية (الحمضات) في الطبقة تحت المخاطية.

Key Word : البط المحلي، الطفيليات الجديدة، النسيجية