

## Gross and histopathological study on common carp *Cyprinus carpio* L. diseases in rearing culturing ponds in Kirkuk Province – Iraq

Saevan Saad Al-Mahmood<sup>1</sup>; Dlyna Wrya Bakir<sup>2</sup> and Soma Hillal Hussien<sup>2</sup>

<sup>1</sup>Department of Pathology and Poultry Diseases, College of Veterinary Medicine, Mosul University,

<sup>2</sup>Veterinary Doctor, Private Sector, Iraq.

E-mail: [saevan981@yahoo.com](mailto:saevan981@yahoo.com)

Received: 3/8/2016

Accepted: 25/10/2016

### Summary

The present study aimed to investigate the infection ratio and pathological lesions in common carp fish in Kirkuk province. To achieve these goals, a survey study was conducted from 01/12/2015 to 01/04/2016. Results of the survey study showed that the infection ratio of acidity and alkalinity of pond's water 27.88% (46/165), bacterial kidney infection 20% (33/165), water mold (*Saprolegniasis*) 12.12% (20/165), spring viremia of common carp 11.52% (19/165), Coccidiosis 11.52% (19/165), fungal gill rot infection 7.27% (12/165), hemorrhagic septicemia 6.67% (11/165) and enteric parasite infection 3.03% (3/165). The pathological study showed that lesions in acidic and alkaline of pond's water consisted from necrosis with sloughing of scales and intestinal mucinous degeneration as well as necrosis of intestinal villi. In bacterial kidney infection lesion consisted of diphtheric membrane covering abdominal cavity and presence of microorganisms in renal cortex and medulla. In *Saprolegnia* sp. infection the pathognomic lesions were recorded which consisted of fungal hyphae extended from fish body into water. In spring viremia of common carp lesions consist from exophthalmia and pinpoint hemorrhage on the fish body with presence of pseudodiphtheric membrane associated with hemorrhagic exudate as well as extensive necrosis of intestinal villi. In *Eimeria* sp. infection lesions were composed from presence of infective stages of coccidian parasites in enterocytes. In fungal gill rot infection the mosaic appearance lesion was observed consisted from necrotic area (white color) and health area (red color). In hemorrhagic septicemia infection lesions consisted from ulcers surrounded by areas of hyperemia with extensive necrosis of intestinal lining. In enteric parasites infection we noted the presence of large numbers of worms in intestinal lumen, also there is nodule in intestinal mucosa contain nematods of 2 cm in length, in other cases there is presence of worms inserted in intestinal mucosa of 30 cm length covered with fibrous membrane. It concluded from this study that the infection ratio with different diseases in common carp varied in compared with other countries and depends upon changes in climate and breeding habits as well as the gross and microscopic lesions are identical to that recorded worldwide.

**Keywords:** Common carp, Pathological lesions, Breeding Ponds, Kirkuk.

### Introduction

Animal welfare is considered important part of national economy of each country, as well fish industry form one of the important joints of animal welfare in Iraq which share about 3% of entire economic returns and produce up to 113 million tons of fish meat each year (1). Fish breeding sector in Iraq has recently a huge revolution in quality and quantity in breeding techniques represented by increasing numbers of investors who are interested in fish breeding industry with an increase in types of fish that are breed, these increase was accompanied by establishment of new fish ponds using new breeding techniques

such as cages and breeding equipment of foreign origin as well as increase in number of fish hatcheries in Iraq that provide fish fingerlings (2). Common carp (*Cyprinus carpio* L.) consider the most common type of fish cultured in Iraq, this fish species have many characteristics made it suitable for breeding in aquatic environment of Iraq included rapid increase in weight during short time as well as resistance to many pathogens in aquatic environment of Iraq (3). Increase in fish production in Iraq combined with increase in diseases occurrence in culture ponds, these diseases may be due to errors in ponds management (either feed or water quality issues) or due to infectious agent such as

viruses, bacteria, fungus and parasites (4). This study was designed to investigate the infection ratio of different diseases affect fish and their pathological lesions in rearing ponds in Kirkuk province.

### Materials and Methods

A survey study was conducted on diseased fish brought to Veterinary hospital in Kirkuk province for the period 1/12/2015-1/04/2016. Fish samples were subjected to gross and microscopic examination.

Tissue samples were obtained from affected organs; after, tissue fixed in 10% neutral buffered formalin for 72 days, dehydrated in increased concentration of ethyl alcohol, cleared by Xylene, infiltrated and embedded in paraffin wax, then sectioned at 4-6 microns using rotary microtome. Slides were stained by Harris hematoxylin, tissue Giemsa and Periodic acid Schiff reagent as described by (5).

### Results and Discussion

The results of current study showed that the highest infection ratio of diseases in common carp fish were recorded in acidity and alkaline of pond's water with total infection ratio as 27.88% (Table, 1). These cases are considered as management disease of common carp fish which resist a wide range of pH between 5.5 to 7. The acidity of pond's water occurs as a result of high quantities of feed fermentation in water leading to produce CO<sub>2</sub> gas. This gas is dissolved in water to form carbonic acid and leads to decrease in pH less than 5.5 (6), while alkaline of pond's water occur due to insufficient water drainage leading to accumulation of fish biological waste product that causes a release of nitrogen gas in water causing an increase in nitrogen ion concentration which leads to an increase in pH of water more than 8 (7). The results of current study agreed to studies (8-10) which pointed to that the main cause of this condition is high daily amount of unconsumed feed with bad drainage of pond water. Also the results showed that the main gross lesion was the damage to scales and gills. Later these lesions extend to fins. Microscopic lesions consisted from mucinous degeneration and hyperplasia of goblet cells (Fig. 1). In bacterial kidney

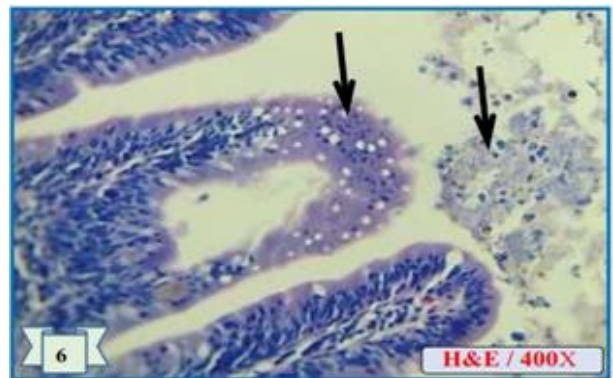
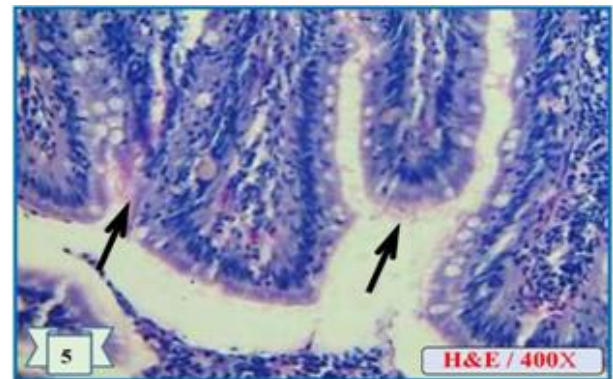
infection the results showed that the total infection ratio was 20% (Table, 1), the result of current study not agreed to the infection ratio of other studies (11-13), and this due to differences in survey period and change in temperature between winter and summer months lead to increase in stress that considered a predisposing factor for infection, also these studies agreed with current study in record presence of diphtheric membrane which considered a significant lesions in these cases with peritonitis and necrosis in the renal tubules in both posterior and anterior kidney (Fig. 2).

In water mold disease the results showed that the total infection ratio was 20% (Table, 1), these result is higher than other studies (14-16) due to endemic status of *Saprolegnia spp.* in Iraqi water especially northern area as well as the temperature of water less than 10 Celsius degree act as predisposing factor for infection (17), also result of saprolegniaiosis agreed with (18) which indicated that the gross lesion is pathognomic for *Saprolegnia sp.* infection which composed from fungal hyphae represented the infective stages form of *Saprolegnia spp.* which extended from head to dorsal fin, with time lesion reach the tail fin (19) (Fig. 3).

In spring viremia infection the results showed that the total infection ratio was 11.52% (Table, 1), these result were not agreed with (20 and 21) which they recorded higher infection ratio than our study, these may be due to epidemiology and endemic status of these viral pathogens, but these studies agreed with our study in describe the pathological lesion that composed from exophthalmia with pin point hemorrhage on dorsal part of fish body with pseudodiphtheric membrane cover abdominal cavity (22) (Fig. 4). The result of *Eimeria spp.* infection showed that the total infection ratio was 11.52% (Table, 1), which approach to result of (23-25) whom explained that the elevation in infection ratio increase during spring may be due to humidity and temperature which help in sporulation of coccidial oocyst the infective stage of *Eimeria spp.* The gross examination of current study described two form, the first form was hemorrhagic enteritis that observed in acute infection with *Eimeria spp.*, while the

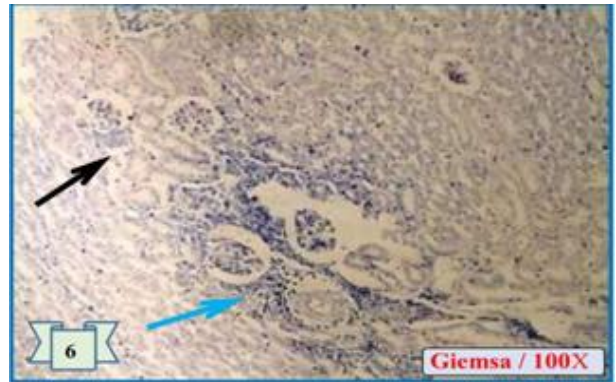
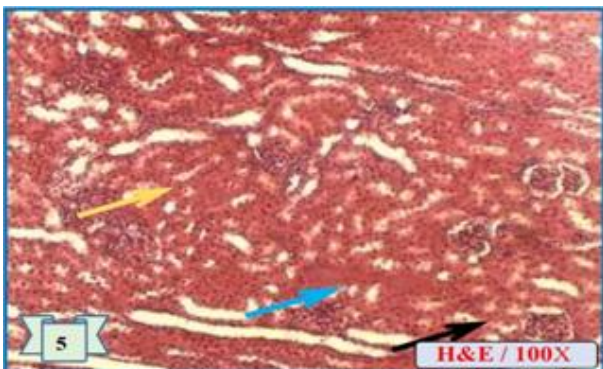
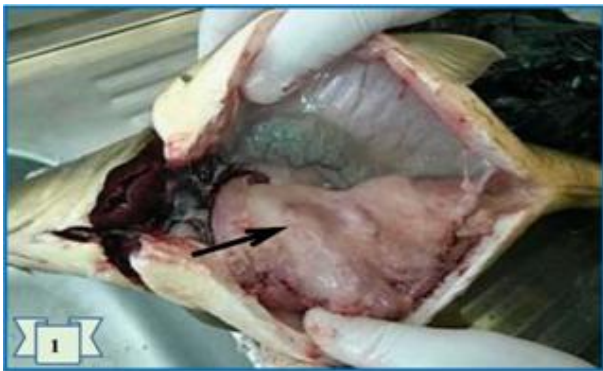
second form was nodular enteritis that composed from flat white nodular lesions in mucosal layer of intestines which observed in chronic infection with *Eimeria spp* (26) (Fig. 5).

The result of fungal gill rot showed that the total infection ratio was 7.27% (Table, 1), the result of this study were less than other studies (27-29) because these studies collect all type of gill rot (bacterial, viral and fugal) under one descriptive term “gill rot”, also agreed with our study in describe the gross pathognomic lesion known as mosaic appearance which composed from red normal gill filaments and white necrotic gill filaments may be due to ischemic necrosis of gill vessels by fungal emboli which lead to necrosis and death of affected areas (30) (Fig. 6).

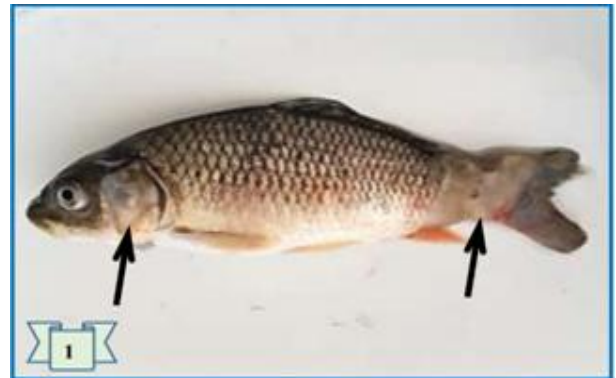


Figure, 1: Acidity and Alkaline of rearing pond of common carp. Grossly show [1] necrosis and destruction of scales behind the gills, and [2] extend to other body part, and [3] sever congestion of gills, [4] the intestines show mucinous exudate. Microscopically there is [5] mucinous degeneration in enterocytes lining the intestinal villi with hyperplasia of goblet cells (arrow), also [6] shows sloughing of cellular debris in the lumen (arrow).

In hemorrhagic septicemia infection the total infection ratio was 6.67% (Table, 1), These results are less than (31-33) which recorded highly infection ratio in summer months not included in our study. These increase in infection ratio during summer months may be related to the elevation in water temperature which act as predisposing factor to facilitate the infection with *Aeromonus hydrophilia*, the pathological changes recorded by this study agreed with study done by (34) in describe the gross lesions that composed from ulcerative lesion with necrotic center surrounded by red hyperemic area (Fig.7).

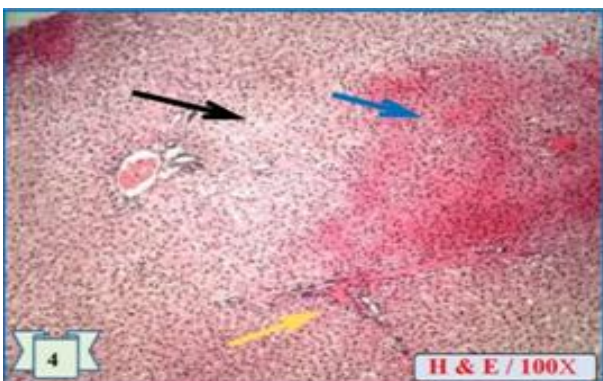
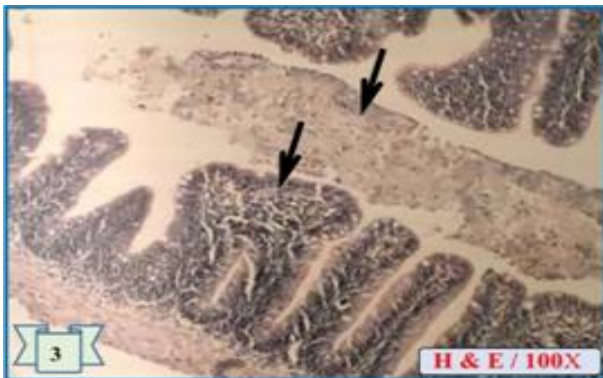


Figure, 2: Bacterial Kidney infection of common carp. Grossly show [1] present of diphtheric membrane which cover all internal organs (arrow), and [2] peritonitis and fibrinous enteritis (arrow), with [3] present of diphtheric membrane on anterior kidney (arrow), and [4] congestion of posterior kidney. Microscopically [5] there is sever hemorrhage (arrow) and congestion (arrow) in kidney tissue with coagulative necrosis (arrow), [6] microorganisms in kidney tissue (arrow) with infiltration of inflammatory cells (arrow).

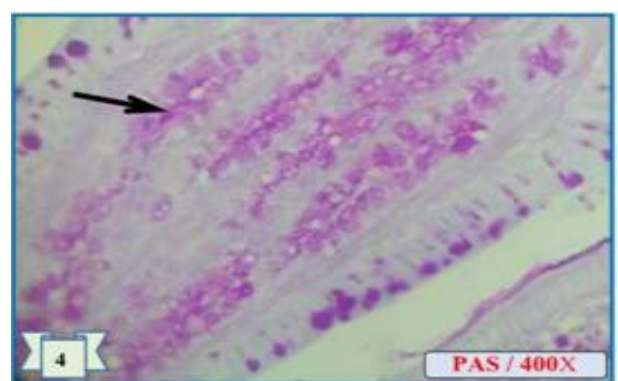
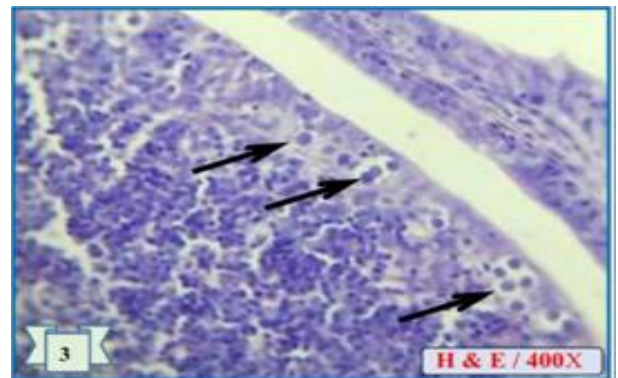


Figure, 3: Saprolegniasis (Water mold disease). Grossly [1] and [2] show presence of white cotton like lesions at gills, dorsal fin and extended to tail fin (arrows).

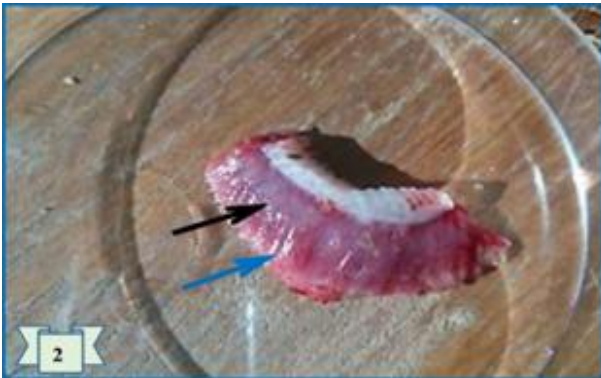
The result of enteric parasite infection showed that the total infection ratio was 3.02% (Table, 1), the result of current study was less than in Babylon province (35) Al-Qadisiya province (36) Nineveh province (37) and Basra province (38), this may be related to using of concentrated formalin by pond's owner in Kirkuk province to disinfecting the ponds that lead to destroyed many intermediated, final hosts and infective stages of these parasites (38) (Fig.8).



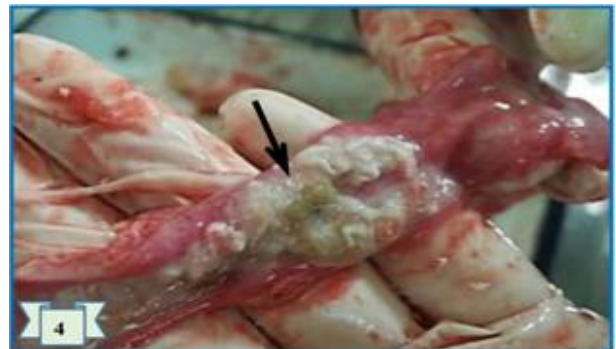
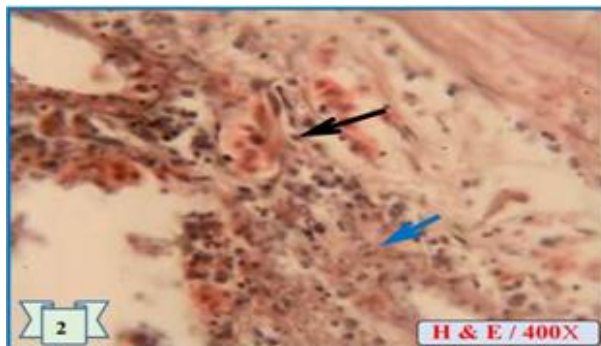
Figure, 4: Spring viremia of common carp. Grossly [1] there is exophthalmia (arrow) and pin point hemorrhage on fish body (arrow), also [2] there is pseudodiphtheric membrane in abdominal cavity with hemorrhagic exudate. Microscopically [3] there is necrosis, sloughing and fusion of intestinal villi (arrow), [4] there is vacuolar degeneration around central vein (arrow) with hemorrhage in hepatic tissue (arrow) and infiltration of inflammatory cells (arrow) in portal area.



Figure, 5: Coccidiosis in common carp. Grossly [1] there is congestion and severe hemorrhage in intestines (arrow) at first stages of infection, which converted with time into flat nodular white lesions in intestinal lumen known as nodular coccidiosis [2] (arrow). Microscopically [3] there is different reproductive stages of coccidian parasite in the enterocytes (arrow), [4] these reproductive stages of coccidian parasite present in submucosal layer of intestines (arrow).



Figure, 6: Fungal Gill rot infection in common carp. Gross examination [1] showed sever congestion of gills with present of normal congested area (arrow) and other necrotic area (blue arrow), which known as [2] mosaic lesions consisted from white necrotic area (arrow) and other red normal appearance of gills (blue arrow).



Figure, 7: Hemorrhagic septicemia in common carp. Grossly [1] there is ulcerative lesions surrounded by hemorrhagic area (arrow). Microscopically [2] there is hemorrhage (arrow) and necrosis (blue arrow) in intestines.

Figure, 8: Enteric Parasite infection in common carp. Grossly [1] there is huge number of tapeworms inside the intestines (arrow), which [2] its length reaches up to meter (arrow), in other cases [3] there is nodular lesion in intestine (arrow) contain trematodes of 2 centimeters in length, in other cases [4] there is lesions in intestines contains tapeworms covered with fibrous membrane (arrow).

Table 1: Diseases in common carp fish at different months of survey study.

Diseases	2015		2016		Total
	Dec.	Jan.	Feb.	Mar.	
1 Acidity and Alkaline of Water	5 (3.03)	4 (2.42)	12 (7.27)	25 (15.15)	46 (27.88)
2 Bacterial Kidney Infection	4 (2.42)	3 (1.83)	8 (4.85)	18 (10.91)	33 (20.00)
3 Saprolegniasis	7 (4.24)	8 (4.85)	3 (1.83)	2 (1.21)	20 (12.12)
4 Spring Viremia of Common carp	1 (0.61)	1 (0.61)	4 (2.42)	13 (7.88)	19 (11.52)
5 Coccidiosis	1 (0.61)	3 (1.83)	4 (2.42)	11 (6.67)	19 (11.52)
6 Fungal Gill Rot Infection	0 (0.00)	4 (2.42)	6 (3.64)	2 (1.21)	12 (7.27)
7 Hemorrhagic Septicemia Infection	1 (0.61)	2 (1.21)	2 (1.21)	6 (3.64)	11 (6.67)
8 Enteric Parasite Infection	0 (0.00)	0 (0.00)	1 (0.61)	4 (2.42)	5 (3.02)
Total	19 (11.52)	25 (15.15)	40 (24.24)	81 (49.09)	165 (100.00)

### References

- Waleed, G. K. (2004). The annual book of the Arab agricultural statistics. The Arab Organization for Agricultural Development. 24:253.
- Mamdoh, A. S. and Ismail, A. M. (2013). The basics of establishing a fish farm and comb. General Authority for Fisheries/ Iraq. Web site for Authority (internet).
- Kitto, M. R. Sadi, R. E. and Tabish, M. (2013). Aquaculture and Food Security in Iraq. Gulf International. 1(1):31-34.
- Al-Nasiri, F. S. (2013). Protozoan parasites of five fish species from the Tigris River in Salah Al-Deen province, Iraq. J. Tikrit Univ. Agri. Sci., 13(1):355-359.
- Luna, L.G. (1986). Manual of histological staining methods of the army forces institute of pathology division. McGraw-Hill Book Company. New York. ISBN: 978-0070015074.
- Sagar, T. P.; Singh, S.; Singh, V.; Baghel, S. R. and Dwivedi, A. K. (2012). Effect of water pH on growth and production of fish in the Coka Dam Papara Distt. Int. J. Pharm. Life Sci., 3(9): 120-123.
- Durborow, M.; Robert, M. and William A. (2002). Interactions of pH, Carbon Dioxide, Alkalinity and Hardness in Fish Ponds. Southern Regional Aquaculture Center. SRAC Publication, 464:109.
- Daye, R. G. (2000). Effect of pH on fish water. Canadian Techniques Reports. 2(10): 65-77.
- Inendino, K. R. (2005). Effects of factors related to water quality and population density on the sensitivity of juvenile largemouth bass to mortality induced by viral infection. J. Aquatic Anim. Health. 17:304-314.
- Gunnarsson, F. (2010). Sublethal effects of low pH in two fish species (*Gasterosteus aculeatus* and *Gadus morhua*). Degree project for Master of Science in Environmental Science Department of Plant and Environmental Sciences, University of Gothenburg, Pp:34-39.
- Rhodes, L. D.; Durkin, C.; Nance, S. L. and Rice, C. A. (2006). Prevalence and analysis of *Renibacterium salmoninarum* infection among juvenile Chinook salmon *Oncorhynchus tshawytscha* in North Puget Sound. Dis Aquat Organ. 2006 August 30 71(3):179-190. doi:10.3354/dao071179.
- Bullock, G. L.; Stuckey, H. M. and Mulcahy, D. (2008). Corynebacterial kidney disease: egg transmission following iodophore disinfection. Fish Health News. 7:51-52.
- Elliott, D. G. Pascho, R. J. and Bullock, G. L. (2009). Developments in the control of bacterial kidney disease of salmonid fishes. Diseases of Aquatic Organisms 6:201-215.
- Nwabueze, A. A. Olele, N. F. and Ekelemu, J. K. (2014). Saprolegniasis in Freshwater Catfishes Sold in Fish Markets in Asaba, Southern Nigeria. Agri. Sci., 1(2):10-17.
- Al-Duboon, A.; Al-Mukhtar, M. A. Jassim, A.A.R.; Badger, S.Q. and Al-Zwar, J.M. (2005). Saprolegniasis of *Barbus sharpeyi*, Gunther (Bunnei Fish) in Basrah/ Iraq. Iraq J. Aquaculture. 2:107-112.
- Durborow, R. M.; Wise, D. J. and Terhune, J. S. (2003). Saprolegniasis (Winter Fungus)

- and Branchiomycosis of commercially cultured channel catfish. Southern Regional Aquacultural Centre. SRAC Publication No. 4700. 1:1-4.
17. Roberts, R. J. (2013). Fish Pathology. Bailliere Tindall. London.
  18. Hoshina, T.; Sano, T. and Snayomo, M. (2000). Studies on the Saprolegniasis. J. Tokyo Univ. Fish. 47:59-79.
  19. Bangyeekhun, E. L.; Pylkkö, P.; Vennerström, P.; Kuronen, H. and Cerenius, L. (2003). Prevalence of a single fish-pathogenic Saprolegnia sp. clone in Finland and Sweden. Dis. Aquat. Organ. 2253(1):47-53.
  20. Ahne, W.; Bjorklund, H.V.; Essbauer, S.; Fijan, N.; Kurath, G. and Winton J.R. (2002). Spring viremia of common carp (SVC). Dis. aquat. Org. 52:261-272.
  21. Garver, K.A.; Dwilow, A.G.; Richard, J.; Booth, T.F.; Beniac, D.R. and Souter, B.W. (2007). First detection and confirmation of spring viraemia of common carp virus in common carp, *Cyprinus carpio* L., from Hamilton Harbour, Lake Ontario, Canada. J. Fish Dis., 30:665-671.
  22. Dixon, P.F. (2008). Virus diseases of cyprinids. In: Fish Diseases, Vol. 1. Eiras J.C., Segner H., Wahli, T. and Kapoor, B.G. eds. Science Publishers, Enfield, New Hampshire, USA, Pp:87-184.
  23. Belova, L.M. and Krylov, M.V. (2000). Distributions of coccidians (Sporozoa: Coccidia) in various systematic groups of fishes. Parazitologiya. 34:522-533.
  24. Davies, A. J. and Ball, S. J. (2003). The biology of fish coccidia. Adv. Parasitol., 32: 293-366.
  25. Molnar, K.; Ostoros, G.; Dunams-Morel, D. and Rosenthal, B.M. (2012). Eimeria that infect fish are diverse and are related to, but distinct from, those that infect terrestrial vertebrates. Infect. Genet. Evol., 12:1810-1815.
  26. Baska, F. (1997). Epicellular and nodular coccidiosis in the intestine of barbell *Barbus barbus*. Dis. Aquat. Org., 29:49-56.
  27. Daoust, P.Y.; Kaim, K.T. and Ferguson, H.W. (2005). Nodular gill disease-a unique form of proliferative gill disease in rainbow trout (*Salmo gairdneri* R.). J. Fis. Dis., 8:511-522.
  28. Daoust, P.Y.; Wazed, W. and Ferguson, H.W. (2003). Gill diseases of cultured salmonids in Ontario. Canadian J. Comp. Med., 47:358-362.
  29. Speare, D.J. and Ferguson, H.W. (2009). Clinical features of bacterial gill disease of salmonids in Ontario. Canadian Vet. J., 30: 882-887.
  30. Ferguson, H.W. (2009). Systemic Pathology of Fish: A text and atlas of comparative tissue responses in diseases of teleosts. Iowa State University Press, Ames. Second Printing. Pp:491.
  31. Ahmed, S.M. and Shoreit, A.A.M. (2001). Bacterial hemorrhagic septicemia in *Oreochromis niloticus* at Aswan fish hatcheries. Ass. Vet. Med. J., 45(89):27-34.
  32. Mohamed, G.A.; Moustafa, M.S. and Hussein S. (2002). *Aeromonas hydrophila* infection in male monosex *O. niloticus* fish reared in floating cages. 6<sup>th</sup> Vet. Med. Zag. Conference (7-9 Sept. 2002) Hurgada, Egypt.
  33. Skall, H.F.; Olesen, N.J. and Møllergaard, S. (2005). Prevalence of viral haemorrhagic septicaemia virus in Danish marine fishes and its occurrence in new host species. Dis. Aquat. Organ., 566(2):145-151.
  34. Shayo, S.D.; Mwita, C.J. and Hosea, K.M. (2012). Virulence of *Pseudomonas* and *Aeromonas* bacteria recovered from *Oreochromis niloticus* (Perege) from Mtera hydropower Dam Tanzania. Annal. Biol. Res., 3(11):5157-5161.
  35. Al-Jadoaa, N.A.A. (2002). The parasitic infections and pathological changes of some local and cultured fishes from Al-Qadisiya and Babylon provinces. Ph. D. Thesis, Coll. Educ., Al-Qadisiya Univ. Pp:158.
  36. Al-Oumashi, G.B. (2008). A study on common carp infection dynamics by worm (*Dactylogyrus*) in Al-Forat fish farm. Al-Qadisiya J. Pure Sci., 13(2):8-13.
  37. Al-Taee, A.F. and Zankana, M.G. (2011). Investigation of nematodes of some fresh water fish species in the Khazar River in the province of Nineveh. Iraqi J. Vet. Sci., 25(1): 28-29.
  38. Mhaisen, F.T.; Al-Niaeem, K.S. and Al-Zubaidy, A.B. (2012). Literature review on fish parasites of Al-Furat fish farm, Babylon province, Iraq. Iraqi J. Aquac., 9(1):95-122.



## دراسة عيانية ونسجية مرضية لأعراض أسماك الكارب الاعتيادي (*Cyprinus carpio* L.) في أحواض التربية في محافظة كركوك-العراق

سيفان سعد فاضل المحمود<sup>1</sup> و دلينا وريا بكر<sup>2</sup> و سوما هلال حسين<sup>2</sup>

<sup>1</sup> فرع الأمراض وأمراض الدواجن، كلية الطب البيطري، جامعة الموصل، <sup>2</sup> طبيب بيطري، قطاع خاص، العراق.

E-mail: [saevan981@yahoo.com](mailto:saevan981@yahoo.com)

### الخلاصة

هدفت الدراسة الحالية إلى التحري عن نسبة الإصابة بالأمراض المختلفة التي تصيب أسماك الكارب الاعتيادي وأفاتها المرضية في محافظة كركوك. أجريت دراسة مسحية للمدة من 2015/12/01 ولغاية 2016/04/01. أشارت نتائج الدراسة المسحية إلى أن نسبة الإصابة بمرض حموضة وقلوية الماء 27.88% ومرض بكتريا الكلية 20% ومرض عفن الماء الفطري 12.12% ومرض فيروسية دم أسماك الكارب الاعتيادي الربيعية 11.52% والإصابة بالكوكسيديا 11.52% وعفن الغلاصم 7.27% والسدمية النزفية 6.67% وطفيليات أمعاء أسماك الكارب الاعتيادي 3.03%. أظهرت نتائج الدراسة المرضية إلى أن آفات مرض حموضة وقلوية مياه الأحواض شملت على تنخر وأذى للقشور والغلاصم مع تنكس مخاطيني للأمعاء وتنخر قمع الزغابات المعوية، لوحظ في مرض الكلية البكتيرية آفات تمثلت بغشاء دفتيري في تجويف البطن واحتقان الكلية وتنخر تجلطي وتواجد المسببات المرضية في النسيج الخلالي للكلية، ولوحظ في مرض عفن الماء الفطري الآفة الواصمة للمرض بتواجد خيوط فطرية ممتدة في الماء من الراس وحتى الزعنفة الذيلية للسمة، كما لوحظ في حالة مرض فيروسية دم أسماك الكارب الاعتيادي الربيعية جحوظ العينين والنزف على الجسم وتواجد غشاء دفتيري كاذب ونضحة نزفية مع التنخر الواسع للزغابات المعوية ونسيج الكبد، وسجل عند الإصابة بالكوكسيديا الاحتقان الشديد في الأمعاء مع وجود تراكيب عقديّة في بطانة الأمعاء مع تواجد الاطوار التكاثرية للكوكسيديا في الخلايا المعوية والطبقة تحت المخاطية، ولوحظ في مرض عفن الغلاصم الآفة الواصمة للمرض المعروفة بأفة الموازيك التي تمثلت بمناطق متنخرة بيضاء اللون ومناطق سليمة حمراء اللون، وسجل في مرض السدمية النزفية آفات تقرحية محاطة بمناطق نزفية مع النزف والتنخر الواسع لبطانة الأمعاء، ولوحظ عن الإصابة بالطفيليات المعوية تواجد لديدان شريطية بطول يصل إلى عدة أمتار كما لوحظ في حالة أخرى عقيدات في بطانة الأمعاء حاوية على دودة اسطوانية بطول 2 سنمتر مدببة الطرفين وفي حالات أخرى وجود ديدان اسطوانية في بطانة مخاطية الأمعاء مغطاة بغشاء ليفي. نستنتج من هذه الدراسة أن نسبة الإصابة بالأمراض المختلفة في أسماك الكارب الاعتيادي متفاوتة مقارنة مع نسب الإصابة في الدول الأخرى وتعتمد بشكل أساس على التغير في المناخ كما أن الآفات العيانية والنسجية جاءت مطابقة للمسجلة عالمياً.

**الكلمات المفتاحية:** الكارب الاعتيادي، الآفات المرضية، أحواض التربية، كركوك.