

Investigation of some diseases of carp at Al-Shamiya city/Iraq

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Abstract:

The present study was conducted during (March, April, May, June, July and August-2009) months to investigate some diseases infected the carp fish at Al shamiya city/Diwaniya province, 715 samples of common carp, grass carp and silver carp were examined from local market and fish farms .

The diagnosis based on case history, clinical & necropsy findings , bacterial culture and wet mount .

Recorded results shows, there are 46(6.43%) cases of acute and chronic form of heamorrhagic septicemia , 57(7.97%) caeses of bacterial enteritis, 76 (10.63%) of anchor worms(*Lernaea*), 4 (0.56%) of lice infestation, 3 (0.4%) of cestodes and 65 (9%) cases of *Diplostomum* spp., the total infection are 251(35.1%) from 715 investigated samples.

The study showed there are diversity forms of diseases among carp spp. in which the percentage of parasitic infections is the most abundant form of diseases(20.7%) followed by diseases caused by bacterial infections (14.4%) .

التحري عن بعض الأمراض في اسماك الكارب في مدينة الشامية/العراق

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الخلاصة:

تم إجراء الدراسة خلال أشهر آذار، نيسان، مايس، حزيران، تموز وآب لسنة 2009 للكشف عن بعض أمراض الموجودة في اسماك الكارب لمدينة الشامية/محافظة الديوانية، إذ تم فحص 715 عينه من أنواع الكارب الثلاثة وهي الكارب الاعتيادي والعشبي والفضي من السوق المحلي ومن بعض أحواض التربية الأهلية خلال تلك المدة وتم تسجيل الحالات المرضية على أساس جمع ما يمكن من معلومات من أصحاب مزارع التربية وفق النماذج المفحوصة والعلامات الظاهرية والتشريحية وعلى الزرع الجرثومي والمسحات الرطبة.

تم تسجيل 251 (35.1%) حالة مرضية من مجموع العينات الكلية حيث شملت، 46 (6.43%) حالة مرض الانتان النزفي(الحاد والمزمن) البكتيري و57 (7.97%) حالة التهاب الأمعاء البكتيري و76 (10.63%) حالة الإصابة بالدودة الكلابية و4 (0.56%) حالات من قمل الأسماك و3 (0.4%) حالات من الديدان الشريطية و 65 (9%) حالة طفيلي الدبلوستوموم.

بينت نتائج الدراسة تنوع الإصابات المرضية في أسماك الكارب وان أكثر الإصابات المسجلة هي الإصابات الطفيلية بنسبة كلية تساوي 20.7% تلتها الإصابات الجرثومية بنسبة 14.4%.

Introduction:

Hemorrhagic septicemia is an acute or chronic infectious disease ,caused by *Aeromonas* bacteria, the main signs are skin lesion (areas of hemorrhages) ,exophthalmia ,distended abdomen with pinkish fluid ,loss scales ,in more advanced cases (chronic) there are more loss of scales and reddish or gray dermal ulcers, affected fish develop dermal ulcers primarily along the body walls and head, lesions also had been seen on the operculum, head and fins which may extend to the muscles ,the two forms of disease in carp had a substantial economical impact on the fish industry ,death are common sequel of both . (1,2).

The severity of bacterial enteritis disease in fish vary with the life stage, species, and dose ,the disease is speared during summer may cause an intestinal lesions and hemorrhage with significant mortality (3,4).

Anchor worms(*Lernaea*)are small crustaceans parasites that infect fish especially during the summer months and one of the main problems with them is that heavy infection can lead to debilitation and secondary bacterial or fungal diseases(5) ,so they increase the risk of attracting other diseases,the heavy infestation of anchor worms can cause serious damage to a fish and can kill the juvenile fish, although anchor worms are only seldom the cause of death in old fish (6,3,4).

Lice is another crustacean (branchiura) , there are about 140 species of branchiurans, the only encountered is *Argulus*, which may cause mechanical damage, spot redness (7) and help in transmitting of bacterial or viral diseases (8).

Cestodes or tape worms considered as the most serious worms that affect fish, adult cestodesoften segmented, can be easily found in the fish's intestines almost asymptotomally espically with low number, with heavy worms burdens it may cause emaciation ,fish can be act as intermediate or final host or both(9,3) ,while larvae (plerocercoids or metacestodes) are found in the liver peritoneal cavity and muscles but generally, the larval forms are not easily detectable as the adult stage,(10), and it transmit to fish by copepods(11).

Trematode parasites *Diplostomum* spp. (Digenea:Diplostomatidae) have a complex life-cycle with lymnaeid snails , fish act as intermediate hosts and piscivorous birds as final hosts, the *Diplostomum* spp. that locate in the eye lens of fish and cause cataracts, have been found to have the potential to increase mortality and reduce the growth of their hosts(12).

Diplostomum spp. that lodge in the fish eye lens are termed *Diplostomum cf.spathaceum* (13) the

gill region of the fish is the major site for cercarial penetration(14), it is suggested that the cercariae migrate from the site of penetration into the fish eye mostly through the subcutaneous tissue and muscles.

The purpose of this study is to determine the incidence of the most important infectious diseases of carp at Al-Shamiya city/Iraq.

Materials and Methods:

715 samples obtained from local market and commercial fish farm in Al-Shamiya city/Diwaniya province /IRAQ, were investigated for the period extended from March to August/2009. Hemorrhagic septicemia was diagnosed according to isolation of the bacteria and gills, kidney samples were cultured using nutrient agar NA containing (30 microgram/ml ampicillin) and sheep blood agar BA for 24-48 hr. at 25° C suspected colonies confirmed with Gram's stain, motility test and esculin hydrolysis test.

Bacterial enteritis diagnosed based on the case history and signs, while cestodes and anchor worms were grossly identified our diagnosis based on pathognomonic morphological appearance of mature worms (grossly visible, so no microscope is needed) anchor worms were hanged red or (pink) worm-like threads, while cestodes were yellow tape like appearance, Lice were diagnosed by morphological identification (wet mount), and Diplostomum infections were examined based on the opacity of

lens or cataract of eyes and presence of encysted metacercaria in eye lens, pictures for each case were taken as possible using Nokia mobile (Fig.1-10).

Results:

The table (1) showed infection ratios were (33.83%, 39.08%, 32.78%) for Common carp, Grass carp and Silver carp respectively, although, the higher percentage of infected fish was grass carp 77/197 (39.08%) followed by common carp 134/396 (33.83%), then silver carp 40/122 (32.78%), while the total infection ratio was 35.1%.

The recorded diseases were hemorrhagic septicemia (acute and chronic) 46 cases (6.43%), bacterial enteritis 57 cases (7.97%), then anchor worms 76 cases (10.63%), lice 4 cases (0.56%), 3 cases of Cestodes (0.42%) and finally Diplostomum 65 cases (9%), the higher infection ratio was attributed to parasitic infections 20.7% followed by bacterial infections 14.4%.

The kidney culture that recovered rounded creamy colonies on NA or tiny white (pale) colonies with beta hemolysis on BA were selected as suspected colonies, the selected colonies were G-, motile and positive for esculin which was suggested as *Aeromonas* like bacteria.

According to table (2), bacterial hemorrhagic septicemia acute and chronic form (ulcerative dermatitis) was high in March- April and May-June period, 4 of 5 cases of chronic

ulcer recognized in carp with few scales (semi scaled carp), while bacterial enteritis were at low level in March and April and increased at period May- June and July- August.

In the case of anchor worm(*Lernaea*) more number of infections were recorded in May, June, July, and August, while low rate of infection at March and April months

Diseases caused by cestode inf. Were 3 cases recorded during the period of May to June, while lice infestations were found at whole period of investigation (4cases).

Diplostomum were found along months of study with high ratio of inf. during May to June and July to August period.

Table (1) represent the type of fish and recorded disease

Fish type	No. of samples	Hemo.sep. (acute form)	Hemo .sep (chronic form) (Ulcerative dermatitis)	Enteritis	Anchor worm	Lice	Cestodes	Diplostomum	No. of infected fish	Total %
C.carp	396	20	1	27	46	3	0	37	134	33.83
G.carp	197	14	2	20	25	0	3	13	77	39.08
S.carp	122	7	2	10	5	1	0	15	40	32.78
Total	715	41(6.43%)*	5	57(7.97%)	76(10.63%)	4(0.56%)	3(0.4%)	65(9%)	251	35.1

*PERCENTAGE OF ACUTE AND CHRONIC FORM OF H.S.

Table (2) represents the diseases according to months

Months	H.s.	Ulcerative dermatitis	Bacterial Enteritis	Anchor worm	Lice	Cestodes	Diplostomum
March&April	19	-	10	5	1	-	15
May&June	18	4	27	32	1	3	24
July&August	4	1	20	39	2	-	26
total		46	57	76	4	3	65



Fig 1.H.S,with exophthalmos ,loosing scales ,redness area



Fig 2.Skin with hemorrhagic areas

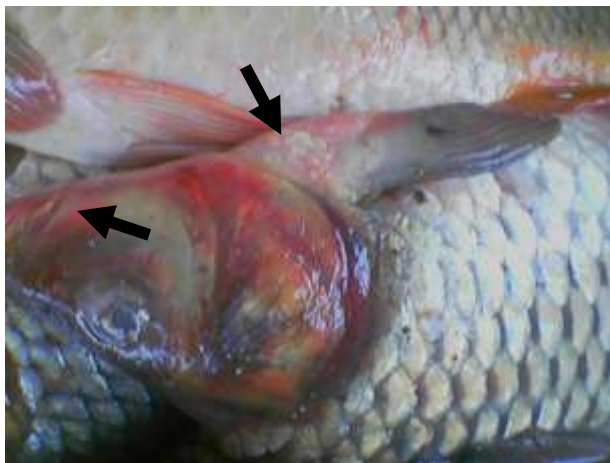


Fig .3.Grayish white area at base of pectoral fin and hemorrhage around mouth



Fig.4.bact.enteritis



Fig.5.swollen congested vent(bact.enteritis) bact.enteritis)



Fig.6. swollen anal area with clotted blood (



Fig.7.cataract



Fig.8 encysted metacercaria X40



Fig9..Argulus



Fig9..Argulus



Fig 10.cestode

Discussion:

The etiologic agent of hemorrhagic septicemia is documented within the scientific literatures (15), and may well have worldwide distribution, However, some doubt has been expressed over its precise role as primary fish pathogen (16).

A gram-negative rod was isolated from kidney of suspected fish with hemorrhagic septicemia, it seems to be *Aeromonas* species the colony type present on blood agar culture were slow growing, small colonies with beta hemolytic area.

The incidence of hemorrhagic septicemia were almost same in common carp and grass carp this may refer to the susceptibility of two species to the pathogen are equal, while chronic ulcer form found in carp with few scales, suggestion that complete scaled carp are refractory to chronic form or may be ulcers are easier to recognize in carp with few scales, higher incidence of bacterial enteritis were in grass carp may belong to the type of foods may have some effect on intestinal integrity (injuries, low movement, suitable gut environment for pathogen replications) with presence of heavy load of bacteria may related to increase disease susceptibility, the distinction between two diseases was made on the basis of the lack of intestinal lesions and intestinal bleeding or clotted blood after squeezing anal area of bacterial enteritis and absence of accompanied signs for hemorrhagic septicemia.

Depending our results the higher occurrence of hemorrhagic septicemia and bacterial enteritis or other parasitic diseases of cultured carp fish may be due to the limited or unsuitable environment conditions and bad management, no maintenance of optimal water quality parameters including temperatures, pH, ammonia, nitrate levels, overcrowding, overfeeding at very high or very low temperatures and organic contaminations.

Anchor worm (*Lernaea*) infect fresh water fish is thriving at summer months when reproduction usually occurs (3), anchor worms were high in common carp than other two species may be due to the high percentage of common carp in the local fish farms, as well as the high total percentage of lernaean infestation may be due to parasite is highly contagious or fish farms are endemic, anchor worm easy to find, because it doesn't move around on the body of the fish once it's attached unlike fish lice were low because lice difficult to find and can be found anywhere on the body of the fish or due to speed movement of carp, this explain the differences in the infection ratio of lice compared with high rate of anchor worms.

Cestodes are found only in heavy weight grass carp purchased from local market hunted from the river of Alshamiya city may be due to long lasting life of fish giving the opportunity of worm(s) to infect and developed in side fish with one or

many significant parasite loads, undetectable number of cestode worms in commercial fish farm in our study may due to the short period of fish life before harvesting, giving a little time to the worms for developing to adult visible form.

The occurrence of fish trematodes is primarily determined by temperature of environment (17), therefore the recorded cases of *Diplostomum* elevated from May to August comparing with March and April, i.e. infection of fishes with *Diplostomum* is temperature dependent and most affected fish are suffering from blindness due to the larvae of *Diplostomum* develop from cercariae into metacercariae, which cause the formation of a cataract in the eye lens by their movements and metabolic excretions (18), in another word changes in physiological condition i.e. stimulate pathological and immunological response.

Our study may revealed a problems facing carp fish cultivation due to diversity of parasitic and bacterial diseases ,its difficult to made a solutions at recent situation because of a huge movement of fish without control and uncontrolled fish markets or farms that take place in fish industry , improving water quality and disinfection bottom of the pond after each harvesting , proper identification of problem, and correct therapy for treatable infections/ infestations dramatically may improve the health and productivity of fish farms.

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