Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(1): 946-949

Received: 19-11-2018
Accepted: 24-12-2018

Seyidli YM
Institute of Zoology of Azerbaijan National Academy of Sciences, Passage 1128, Block 504, Baku, Az.1073, Azerbaijan

Nasirov AM
Institute of Zoology of Azerbaijan National Academy of Sciences, Passage 1128, block 504, Baku, Az.1073, Azerbaijan

Correspondence
Seyidli YM
Institute of Zoology of Azerbaijan National Academy of Sciences, Passage 1128, block 504, Baku, Az.1073, Azerbaijan

The formation of the parasite fauna one-year white Amur, depending on their morphometric sizes

Seyidli YM and Nasirov AM

Abstract
The article provides information on the formation of parasitic fauna in annual White Amur fishes cultured in the lakes of Mingechevir Scientific Research Laboratories. Depending on the size of body the fishes were subdivided into 3 groups by months of study and changes in composition of the parasite species were studied. It was obvious that the first group of fishes which were at an early stage of development were infected with parasites that develop without an intermediate host. Parasites with a complex development cycle were prevailed after active feeding of White Amur fingerlings due to an increase in temperature. An increase in the variation in the composition of parasites was revealed due to increase in morphometric size of each of three groups of White Amur fishes. Quantitative and qualitative changes of parasites were observed with the growth of fishes.

Keywords: Fish, white Amur, parasites, lake fish farming

Introduction
Lake fish farming is wide spread to supply people with fresh fish. White Amur (*Ctenopharyngodon idella*) which cultured in the lakes for aquaculture is more favorable species for living condition and requirements for food, compared to other species of fish. The first introduction of White Amur was in 1962 to reservoirs of Azerbaijan. [1] Nowadays White Amur is also used at lake fish farming.

Parasitological condition should always be controlled to achieve high productiveness in aquaculture. The ichtiopathologic monitoring realized in artificially farmed fishes promotes to reveal more effective methods against the parasites. Investigation of need for environment and development cycle of parasites taking into a practice the beneficial methods against them allows to decrease the harm of an ailment. Because of the dependence on sizes of body of fish investigation of the formation of parasitic fauna is one of task which arouses interest.

Although a certain type of information was available about the parasitic fauna of white amur but only the fish belonging to the older group had been browsed here [2,3].

But there was almost no information about the formation of parasitic fauna in fingerlings. Considering all these depending on the morphometric sizes of yearlings which cultured at the ponds of Mingecevir Scientific-Research Laboratories variations of parasitic fauna were studied. Coordinates of area (40°46'54.6"N47°01'44.5"E)

Materials and Methods
Parasitologic material was obtained by yearlings of Grass carp. Catches of White Amur fingerlings and primarily examination of them carried out into a practice during April, May, June in 2017 at the pond reservoirs of Mingechevir Scientific–Research Laboratories. Catches for every Months were morphometrically analized and were divided into 3 groups depending on the total length of body for months.

The 1st group includes the fish with length per 2.5-4.4 cm average 3.1; 2nd group -4.5-9.8, average 8.3 cm; 3rd group -11.2 -15.3, (average 13.3 cm, 11 of them referring to 1st group, 13-2nd group,14-3rd group. Type and age of fish were determined by Kablitskaya's [4] Determinant(qualifier) of youth of fresh water fish " Guideline. Yearlings had been catched with nets and put in a container without using a hand for not to damage the ectoparasites on their surface. Most of fish were catched freshly, the rest of them were full parasitologically examined after fixing in a 4 % solution of formalin.

The parasites were examined by commonly accepted method [5-8] All tissues and organs were examined by the compressor method using a binocular microscope. From each organ, smears were made and examined under a microscope. The processing of parasitic ciliates was carried out by impregnation in a 2% solution of silver-sodium. Monogeneans were fixed and stored in 70% alcohol, and also myxosporidians glycerol-gelatin preparations without preliminary fixation have been prepared from them.

Trematodes and cestodes were fixed in a 70% solution of alcohol, were conducted through an alcohol battery at an ascending concentration, and were dyed with carmine. Nematodes consisted of Fora's fluid. For the diagnosis of all groups of parasites, measurements were taken and some of them were drawn using a RA-4 drawing device. Extensity and intensity had been studied to assess the parasite invasion. Identification of parasite species had also been determined by fresh materials, painted, embalmed glycerin-gelatin preparations. The identification of parasites are accomplished through magnifying glass (MBC-9), light microscope (Amplival) according to Guideline "Qualifier of parasites of freshwater fish of fauna of SSSR [9-11]. The extensity of infestation, intensity of infestation and Index of abundance proposing by V.N. Beklemishev [12] had been used to estimate the contamination level. The extensity of invasion or prevalence of parasites. It is a contamination percentage of certain hosts with parasite species or groups.

$$P = \frac{Np}{n} \times 100\%$$

Np – is a number of contaminated hosts

Intensity of invasion was expressed within the limits of the number of a certain type of parasites on all individuals of a certain type of fish.

$$İİ = \frac{Par}{Np}$$

Par- is a number of detected parasites, Np is a general number of contaminated hosts Index of abundance –average amount of certain types or groups of all hosts (including not infected species)

$$Bİ = \frac{Par}{n}$$

Par is a number of detected parasites, n is a number of investigated fish.

The results of the research

Catches of Amur fingerlings belonging to 1st group were carried out in April, 2017. (Table 1.) *Lernaea cyprinacea* (refers to Crustaceans) was revealed on the surface of 8 fishes and Myxobolus sp. (refers to Myxosporidea) in a gill rakes of one fish. Both of parasites develop without participation of an intermediate host. Because of not to carried out initial parasitological examination when White Amur fingerlings were released into the water the infestation of White Amur fingerlings in a pond reservoir or their transmission by parasites was unclear.

Table 1: Distrubution of parazites in the groups of White Amur.

The total length of the fish (cm)	The name of the parasite was found among the groups of fish	In how many fish were found	The extensity of infestation (%)	The intensity of infestation (specimen)	Index of abundance (specimen)
2,5-4,4 average- 3,1	*Lernaea cyprinacea*	8	72,7±13,4	2-3	0,21
	Myxobolus sp.	1	9,1±8,7		0,03
4,5-9,8 average- 8,3	*Trichodina sp.*	1	7.7±7.4		0,03
	Dactylogyrus ctenopharyngodonis	1	7.7±7.4	1	0,03
	Diplostomum chromatophorum	5	38.5±13.5	2-13	0,13
	Lernaea cyprinacea	3	23.1±11.7	1-2	0,08
	Contracaecum spiculigerum	1	7.7±7.4	2	0,03
11,2-15,3 average - 13,3	*Bothriocephalus gowkongensis*	1	7.1±6.9	1	0,03
	Diplostomum chromatophorum	3	21.4±11.0	2-4	0,08
	Dactylogyrus ctenopharyngodonis	1	7.1±6.9	2	0,03
	Dactylogyrus lamellatus	1	7.1±6.9	1	0,03
	Lernaea cyprinacea	4	28.6±12.1	1-2	0,11
	Contracaecum spiculigerum	5	35.7±12.8	2-3	0,13

But detection of similar species of parasites in other species of fish allows to suggest the infestation by these types of parasites.

The fishes belonging to 2nd group were catched in May, 2017 5 species of parasites were revealed in this group of fish. For instance some of parasites Trichodina sp and Dactylogyrus ctenopharyngodon us develop without participation of intermediate host. Trichodina sp (refers to Infuzoria) in the body of one fish, *Dactylogyrus ctenopharyngodonis* (refers to monogeneans) were detected/ in the gills of other fish. The major cause of infestation by these parasites is explained by thin skin cover of White Amur yearlings. This type of structure of skin is also favorable for the parasites with active cercarias. Thus White Amur fingerlings belonging to this group were more infestated by the larvaes of Trematodes as compared with the other parasites (38.5%).

Infestation by Crustaceans had also occurred among White Amur fingerlings belonging to 2nd group. A parasite was found on the surface of body of three fish.

Manifestation of *Lernaeae cyprinacea* (Crustaceans) reveals that there is also favorable condition for its development during this period. *Contracaecum spiculigerum* -larva of nematode was revealed in the intestine of a fish belonging to 2nd group. The first intermediate host of the parasite are Cyclops. Manifestation of parasite reveals that Crustaceans take part in nutrition of White Amur fishes.

Catches of fish belonging to 3rd group was realized in June, 2017. 6 species of parasites were identified in these fish. Cestode of *Bothriocephalus gowkongensis* developing by participation of an intermediate host was found in the gut of one fish. Manifestation of this parasite which the intermediate host is Crustaceans, also reveals the consumption from plant

and animal sources of White Amur fish during this period. Infestation by *Diplostomum chromatophorum* -larva of Trematodes had been lasted in accordance with rapid development of an intermediate hosts in consequence of favorable condition due to increase of temperature of weather. The fish are so-called 2nd intermediate hosts and are infected when float around aquatic plants. Dactylogyrus ctenopharyngodonis and *Dactylogyrus lamellatus* (Monogeneans) being the specific parasites of White Amur fish which develop without participation of an intermediate host had been revealed in the gills of various fish.

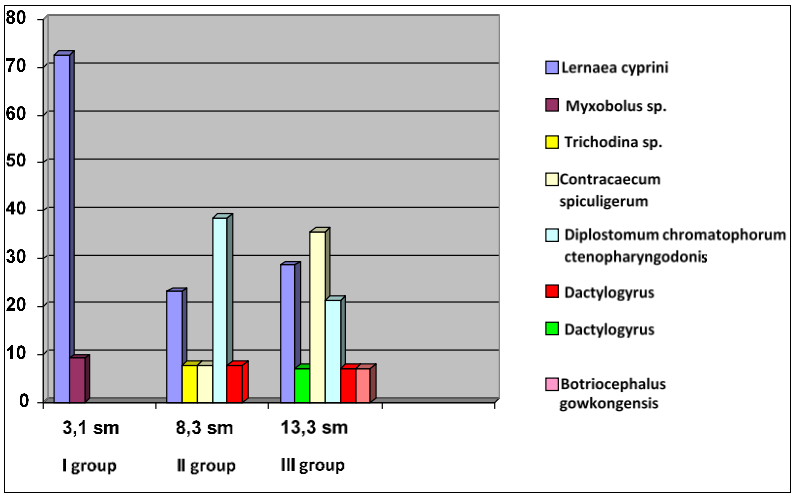
Lernaea cyprinacea (Crusteaceans) is also evidenced in this group. Manifestation of parasite in each of the 3 groups confirms the existence of favorable condition for its life cycle. The fishes belonging to 3rd group were more infected by *Contracaecum spiculigerum* -larva of Nematodes.

Infestation of White Amur fingerlings by larvaes occurs during the nutrition with Crustaceans which are the intermediate hosts of parasites.

Discussion of results

As it was shown by research results, infestation of White Amur fish by parasites usually occurs developing without participation of an intermediate host at early stage of life cycle. (Table1) Thus, due to increase of temperature in spring favorable condition occurs for the evolution of larvaes, nymphs, eggs of parasites which (Monogeneans, Protozoaes, Crustaceans) develop without participation an intermediate host. Thereby belonging to 1st group White Amur fingerlings which catched in April are infected by *Myxobolus sp.* and *Lernaea cyprinacea*, which develop without participation of an intermediate host.

There is not evidenced the contamination of White Amur fish belonging to 1st group by other species of parasites. Quantitative and qualitative changes of parasites occurs while increase of temperature and during the growth. As the result amount of species of parasites propogate in fish referred to II and III group which catched in May. Some organisms which playing a role as intermediate host multiply due to increase of temperature, in lake and intake of these by White Amur fingerlings can cause the infestation of them by the parasites with complex development cycle. Therefore only the parasites having complex development cycle manifest in the fish with active nutrition. Increasing in composition of species of parasites depends on age, and structure of the surface of skin cover. The skin of yearlings is still thin. Consequently thin type of skin is favorable for Infuzorias, Monogeneans, and Crustaceans during this period.



Scheme 1: The distribution of parasites in groups

Manifestation of Lernaea *cyprinacea* in each of 3 group and high incidence of infestations with diprostomum in both of 2 groups prove it. The occurrence of infestation around the aquatic plants are proposed due to the snails which being an intermediate hosts of *Diplostomum*, (refers to Trematodes) Evolution of parasites depending on increase of temperature during this time cercarias entirely leave the bodies of snails. The parasites penetrate actively to the body of fishes floating around aquatic plants and cause cataract on their lens. Hence these infected fish could not develop because of poor nutrition. Due the lack of leftover food in the intestines of fish which infected with *Diplostomum* also proves this. Despite the high temperature in June due to immaturity of immune system even under favorable circumstances for fish farming decrease of some parasites was poorly evidenced The species as *Lernea cyprinacea Diplostomum chromatophorum* and *Contracaecum spiculigerum* most prevailed at fish. Among the other parasites which subsist on mesentery and intestine, the prevalence of infestation by Nematodes occurs due to White Amur fish actively feed on the intermediate hosts of these parasites. Significant increase in the number of parasite species is observed in accordance with the growth of body sizes of fish.

Conclusion

The research reveals that:

1. Infestation of White Amur fish occurs by parasites which develop without participation of an intermediate host in early stages of life-cycle.
2. Due to high temperature, the organisms, playing a role as intermediate host of some parasites increase and while using of these in nutrition White Amur fingerlings had been infected by parasites having a complex development cycle.
3. Variation of parasites in quantity and quality occurs during the growth. Enhance of species of parasites in composition also manifest in fishes belonging to 3 groups depending on body size.

References

1. Seid-Rzaev MM, Yusibova SD. The dynamics of species diversity of cyclostomes and fish of the Mingachevir

reservoir // Works of Azerbaijan Zoological Society rolled. 2013; 5(1):176-181.
2. Mikayilov TK. Parasite fauna of fish of reservoirs of Azerbaijan (systematics, dynamics, origin) – Baku: elm., 1975, 299.
3. Suleymanova AV. Epizootic and epidemiologic situation of fish parasites of the Absheron fishing farms and lake Zabrat. Abstract. On competition of a scientific degree. academic step. Cand. Biol. sciences'. Baku, 2007, 20.
4. Koblitskaya AF. Determinant of freshwater fish fry. M: Light and food industry. 1981, 208.
5. Bykhovskaya-Pavlovskaya IE. Parasites of fish. Study guide. L.; Science, 1985, 122.
6. Gusev AB. The methodology of collecting and processing materials for monogenean, parasitic in fish. L. Science, 1983, 47.
7. Markevich AP. Methods and techniques of parasitological examination in fish. Kiev. Ed. Kiev. Univ. 1950, 24.
8. Klein B. Reaktion des Silberlinien-system auf Shadlichkeiten.1. – Ann.Ins.Sup.Arg. Milano, 1931; 4:71-73
9. Keys to parasites of freshwater fish of the USSR fauna. T1. The *Parasitic protozoa*. L. science, 1984, 428.
10. Keys to parasites of freshwater fish of the USSR fauna. T2. Parasitic multicellular. -L. science, 1985, 425.
11. Keys to parasites of freshwater fish of the USSR fauna. T3. Parasitic multicellular. L. Nauka, 1987, 583.
12. Beklemishev VN. Biocenological fundamentals of comparative Parasitology. M. Nauka, 1970, 502