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Helminth fauna of waterfowl poultry in the territory of babek region of Nakhchivan AR

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Abstract
The helminth fauna of waterfowl poultry has not been studied in Nakhchivan AR. For the first time in the territory of Babek region of Nakhchivan AR during 2014-2017 years *Anas platyrhynchos dom.* və *Anser anser dom.* has been studied and 6 species of helminths (*Fimbriaria fasciolaris, Amidostomum anseris, Trichostrongylus tenius, Capillaria obsignata, Ganguleterakis dispar, Tetrameres fissispina*) has been identified. 4 species (*A. anseris, T. tenius C. obsignata, G.dispar*) and 6 species were found in domestic goose (*A. anseris, T. tenuis C. obsignata, G.dispar*) and in domestic ducks respectively. Total infection with parasites in Babak region was 31.2%. Chesmebasar (E.I.-66.7%; 5 species) and Goshadiz (E.I.-58.3%; 5 species) villages were prevailed according to both parasites infection rate and species number. Among the discovered helminths, *A. anseris* and *G. dispar* nematodes were more commonly found in the research areas (*G.dispar* - 8 out of 14, *A.anseris* - 9 out of 14).

Keywords: nakhchivan ar, waterfowl poultry, helminth fauna, systematic review, ecological features

1. Introduction
One of the important issues facing the state is to meet the demand for food and agricultural products in the country, as well as bird meat. Therefore, it is important to develop the productive domestic ducks (*Anas platherhynchos* dom.) and domestic goose (*Anser anser* dom.) on farms, in addition, to study the types of helminthiasis and to combat them [1-6]. The domestic goose is the domesticated form of waterfowl originating from the gray goose (*Anser anser*) and from the cygnoides (*A. cygnoides*). As a rule, domestic geese are incapable of flying. Diluted for meat, fat, feathers and liver. Domestic geese bear 15-30 eggs a year. A well-fed goose weighs up to 13 -14 kg; It has 41% of the live weight of meat, 32% of fat, 6% of bones and 21% of feathers and guts. Litters, like fertilizers, could have an annual 12,7 kg. Important feather products include feathers, feathers, down skins. Goose fat is considered a good remedy for frostbite. Domestic duck is one of the numerous and widespread species of poultry. Flies badly, not far. It originates from an ordinary wild duck, or mallard. They are bred for meat, as well as eggs and fatty liver (foie gras); in addition, they receive a feather and fluff [7]. At present, 108 species of parasites are known (45 species of trematodes, 30 species of cestodes, 30 species of nematodes, 3 species of acanthocephalus) of domestic waterfowl. Of these, 91 species are found in ducks, 58 species in geese [8]. Despite the fact that research works on the study of helminth fauna of waterfowl poultry in certain areas of the Republic of Azerbaijan have been carried out in different years [9-14], fauna research has not been conducted in the Nakhchivan Autonomous Republic. Therefore, the implementation of large-scale research in this area and its separate districts have a great theoretical and practical significance. Babek region was called Nakhchivan till 1978. Administrative centre is Babek city. Territory of region 901,7 km^2, population 62 886 (01.01.2011), highest peaks – Kechaltapa (2744 m), Garagush (2617 m), Buzgov (2475 m), Anabadgadik (2081 m), Nahajir (1807 m), water reservoirs – Araz (1072 km), Jahri (45 km), Sirab (11 km), Gahab (21 km), Uzunoba, Nehram. The landscape of the region is monteinous in the North and Eastern part. So as the Northern part is composed by Duzdagh, Daralayaz ridge and Gizilboghaz Mountains. The Eastern part consists of tributaries and rifts of Zangazur chain. Gulustan plain is located in the Souththern part of the region [15].
Taking account all mentioned above, the present investigation was conducted to study the helminthic fauna of waterfowl poultry, proper placement of the studied helminthes and to analyze their ecological features in the territory of Babek region, Nakhchivan AR.

2. Materials and Methods

The present research was conducted in individual poultry farms of 14 different areas of the Babek district of Nakhchivan Autonomous Republic (Gusnut, Cheshmabasar, Vayhir, Kultepe, Aliabad, Goshadize, Payiz, Jahri, Buzgov, Khal-Khal, Sirab, Shikhmahmud, Upper Uzunoba, Badashgan villages) (Fig. 1). A total of 125 birds of waterfowl poultry (*Anas platyrhynchos* - 62 and *Anser anser domains* - 63), of different ages (1-2 years) and sex (male, female), have been studied during 2014-2017 years by parasitological splitting [16]. The collected parasites were fixed in 4% formal-aldehyde (formalin) or 70% ethyl alcohol, then dyed (karmin), dehydrated, permanent preparations were made through the wing balm, have been captured and photographed by the MBS-9 binoculars and the Promo Star (Zeiss) light microscope (Canon D650), have determined according to the designer of K.M. Ryjikov (1967) [17].

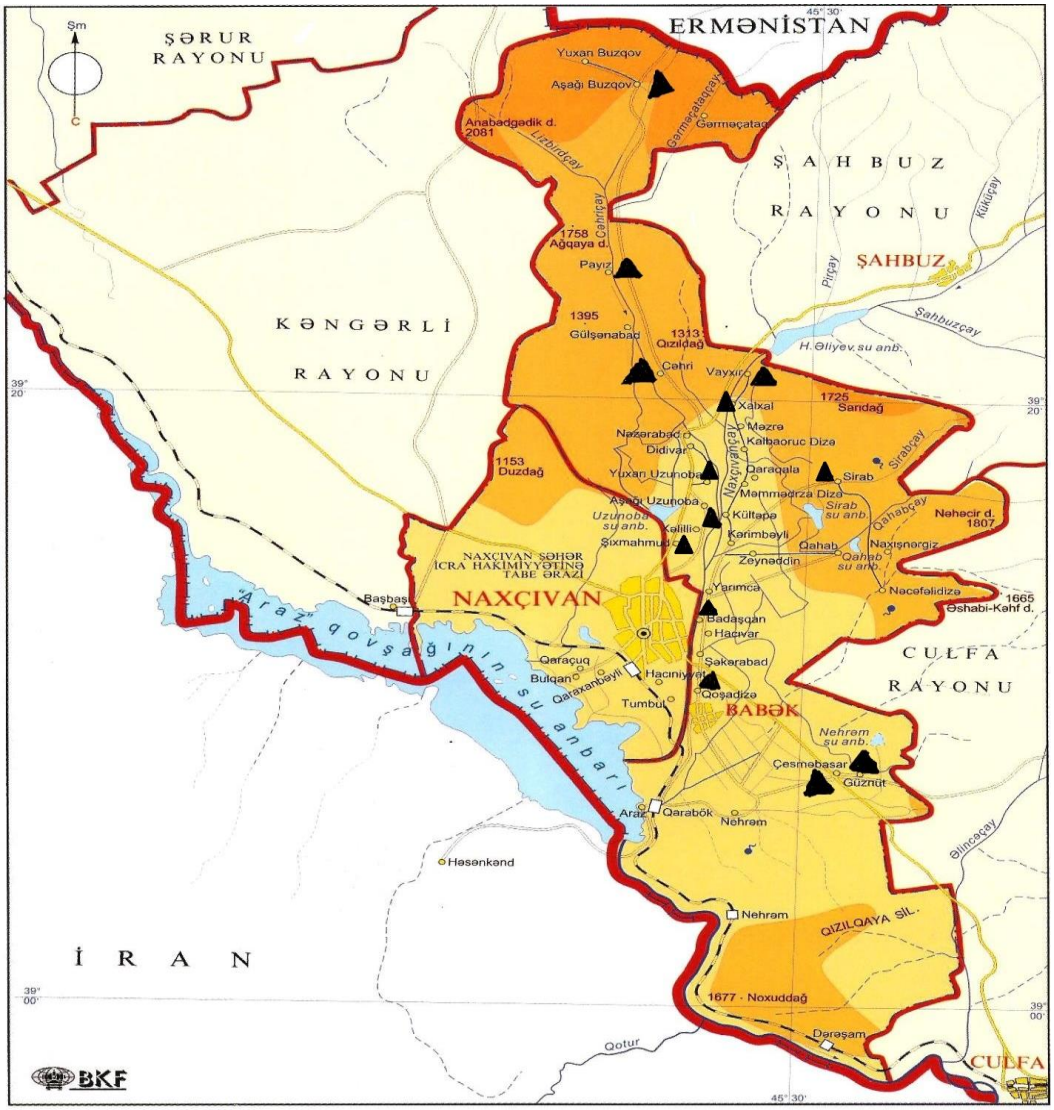

Fig 1: Map scheme of material obtained from poultry farms in Babak district of Nakhchivan AR

3. Results

During the researches conducted in 14 different districts of Babak region of Nakhchivan Autonomous Republic, 6 species of helminths (1 species of cestod, 5 species of nematodes) were identified in the birds. It was the initial study on the parasitic fauna of poultry in these research areas, so parasites were grouped according to the system of Shchults RS and Gvozdev KV [18]. For the first time, the intensity and extensiveness of infections in the territory of Babak region of Nakhchivan AR were mentioned as follows:

Class: Cestoidea (Rudolphi, 1808) - tapeworms
Order: *Cyclophyllidae* (Beneden in Braum, 1900)
Suborder: *Hymenolepidata* (Skrjabin, 1940)
Family: *Hymenolepididae* (Ariola, 1899)
Species: *Fimbriaria fasciolaris* (Pallas, 1781).

During the researches carried out by us, the domestic ducks in the territory of Goshadize, Jahri, Khal-Khal villages of Babak region of Nakhchivan AR (E.İ. 14,5%, İ.İ. 1-3) were noted (E.I.- extensiveness of invasion; I.I.- intensity of invasion). The cestoda that has the complex life cycle did not occur in the domestic geese in the investigated areas. This is most likely due to the fact that the domestic geese in the mentioned area less use the ponds during feeding.

Class: Nematoda (Rudolphi, 1808)
Order: *Trichocephalida* (Skrjabin et Schulz, 1928)
Suborder*: Trichocephalata* (Skrjabin et Schulz, 1928)
Family: *Capillaridae* (Neuveu - Lemaire, 1936)
Species: *Capillaria obsignata* (Madsen, 1945).

During helminthological research, the domestic ducks (E.İ.

36,5%, İ.İ. 7-10) in the Goshadize, Kultepe, Cheshmebasar villages and the domestic geese (E.İ. 4,76%, İ.İ. 4-6) in the Khal-Khal village Babek district, was noted.

Suborder: *Strongulata* (Railliet et Henry, 1913)
Family: *Amidostomatidae* (Baylis et Daubney, 1896)
Species: *Amidostomum anseris* (Zeder, 1800) Railliet et Henry, 1909.

The helmints were identified in the domestic ducks (E.İ. 29,0%, İ.İ. 1-8) in the poultry farms in the villages of Cheshmabasar, Goshadze, Payiz and Buzgov, and in the domestic geese (E.İ. 15,9%, İ.İ. 1-6) in the Kultepe, Aliabad, Cahri, Buzgov, Khal-Khal, Badashgan villages. This helminth is a specific parasite for waterfowl poultry, and it is widespread in geese and ducks in other regions of Azerbaijan.

Family: *Trichostrongylidae* (Leiper, 1912)
Species: *Trichostrongylus tenuis* Railliet et Henry, 1909.

This parasite was found in the domestic ducks (E.İ. 9,68%, İ.İ. 1-1) in the house poultry farms of village of Cheshmabasar, and in domestic geese (E.İ. 9,52%, İ.İ. 1-9) in the villages of Kultapa, Aliabad and Jahri in the territory of Babak district of Nakhchivan AR. The development of birds has been stopped with the help of other helminths (*G. dispar*) because of parasitizing of the appendix of the gut.
Order: *Ascaridida* (Skrjabin, 1915, subordo) Skrjabin et Schultz, 1940

Suborder: *Oxyurata* (Skrjabin, 1923)
Family: *Heterakidae* (Railliet et Henry, 1912)
Species: *Ganguleterakis dispar* (Schrank,1790).

In the territory of Babek district, in the poultry farms of the villages of Cheshmabasar, Kultapa, Goshadize, Buzgov, in the domestic ducks (E.İ. 29,0%, İ.İ. 1-9) was found. The helminths were identified in the domestic geese in the poultry farms of Kultepe, Aliabad, Cahri, Buzgov, Khal-Khal, Badashgan villages(E.İ. 23,8%, İ.İ. 1-6). This type of nematode also has the ability to cause severe damage to the host (host) when the intensity of the intake was high, as the specific parasites of the waterfowl poultry. This kind of *A.anseris* nematode is also widely spread throughout Azerbaijan.

Order: *Spirurida* (Chitwood, 1933)
Family: *Tetrameridae* (Travassos, 1914)
Species: *Tetrameres fissispina* (Diesing, 1861)

As a result of helminthological investigations carried out by us, we found in the domestic ducks in poultry farms of the villages of Cheshmebasar, Goshadize, and Payiz in the Babek district (E.İ. 22,2%, İ.İ. 1-6). Did not mark in the domestic geese.
6 species of parasites (1 species of cestodes – *F. fasciolaris* and 5 species of nematodes – *A. anseris, T. tenius, C. obsignata, G. dispar, T. fissispina*) was noted in the waterfowl poultry in the territory of Babak district of Nakhchivan AR. 4 species of them was found in the domestic geese (*A. anseris, T. tenius C. obsignata, G.dispar*) and all 6 species were found in the domestic ducks. 4 species of helminths are geohelminth. 2 species of it (*F. fasciolaris, T. fissispina*) are biohelminth. Total infection by parasites in the Babak region was 31.2%. The helminths have not been mentioned in waterfowl poultry in the poultry farms in the villages of Guznut, Waykhir, Sirab, Shikhmahmud, and Upper Uzunoba. The following percentages shown the infection rate in the research areas: Chehsmabasar - 66.7%, Kultepe - 50.0%, Aliabad - 22.2%, Goshadize - 58.3%, Payiz - 40.0%, Jahri - 28.6%, Buzgoo - 28.6%, Khal-Khal - 50.0% and Badashgan - 41.7%. It should be noted that more helminths (5 species - *T. tenius, C. obsignata, A. anseris, G. dispar, T. fissispina* in the Cheshmebasar, and 5 species - *A. anseris, C. obsignata, G. dispar, T. fissispina, F. fasciolaris* in the Goshadize) were found in areas with high rates of infection. *A. anseris* and *G. dispar* nematodes are more commonly found in the water birds in the research areas than others (*G.dispar* – 8 out of the 14 research areas, *A.anseris* - 9 out of the 14 research areas).

4. Conclusion

For the first time, 125 waterfowl poultry birds (*Anas platyrhynchos dom.* – 62 and *Anser anser dom.* – 63) were studied in Babak region of Nakhchivan Autonomous Republic during 2014-2017 years and 6 types of helminths were recorded. 4 species of them was found in the domestic geese (*A. anseris, T. tenius C. obsignata, G.dispar*) and all 6 species were found in the domestic ducks. The percentage of more infections in waterfowl poultry birds was observed in private poultry farms of Cheshmebasar (İ.E.-66,7%) and Goshadize (İ.E.-58,3%) villages. The prospect of this study is that, following the example of the Babek region, it is necessary to cover helminthological studies in all regions of the Nakhchivan AR. Identification of such environmental factors as - the composition of helminthofauna, the highest intensity and extensiveness of helminth infection, the dependence of infection on the growth, sex and season, helminth species pathogenic to humans, gives us complete information for the development of control measures and stabilization of invasive diseases of domestic waterfowl in this region.

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