

The Migration of Helminthes Between Wild And Domestic Birds And Regularity of Their Circulation In Biocenosis

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DOI: 10.29322/IJSRP.9.06.2019.p9095
<http://dx.doi.org/10.29322/IJSRP.9.06.2019.p9095>

Abstract- This article analyzes the laws of helminthes exchanging among wild and domestic birds and their circulation development in different biocenoses.

Index Terms- circulation, migration, helminth, parasite, worm, biocenoses, laws, analyze, birds, environment, invasion, host.

I. INTRODUCTION

The rich fauna of birds of Uzbekistan, inhabiting in different landscapes for characteristic natural conditions are peculiar, causes a great diversity of the species composition of their helminthes. Numerous wild birds, often changing their habitats, contribute to the reservation and spread of helminthes. They carry them on the territory of various poultry farms, participating in the formation here of hearth of invasions.

II. MATERIALS AND RESEARCH METHODS

In order to study the law of helminthes exchange in wild and domestic birds, found in the mountainous, foothill, as well as tugays and anthropogenic zones of southern territories of Uzbekistan and on the basis of the above mentioned information in 2018-2019 years, helminthological researches were conducted. In the process of the research, generally accepted methods of studying in helminthological science Scriabin (1928) "Method of complete helminthological dissection", Dubinina (1972) "Parasitological study of birds" were used.

III. RESULTS AND DISCUSSION

According to our own research and literature data among parasitic helminthes in wild and domestic birds of Uzbekistan, there are 53 species, of which 23 species are the causative agents of serious helminth infections and cause significant damage to the poultry farms of the republic [1,2,3,4]. Of the common types of helminthes in domestic chickens, there are 28 parasitizing species; domestic ducks - 33, turkeys - 6. Among wild birds, the most common parasitic worms with domestic birds are [Acridotheres tristis](#) and *Sturnus vulgaris*, *Turdus merula* and etc. (Table 1)

Extensiveness of bird invasion by separate species of parasitic worms was 12–28%, the intensity of invasion ranges from 1.8 to 274.1 copies.

Table-1
The commonality of helminthes of wild and domestic birds of Uzbekistan

Species helmenths	of	Wild birds	Domestic birds
Cestoidea			
Raillietina echinobothrida		Streptopelia orientalis	hen
Raillietina weissi		Columba eversmanni and Columba livia	hen
Skriabinia cesticillus		Columba eversmanni and Columba livia	hen
Choanotaenia constricta		Acridotheres tristis	hen
Choanotaenia infundibulum		Phasianus colchicus, Acridotheres tristis	hen
Raillietina frontina		Columba livia	hen
Echinolepis carioca		Acridotheres tristis and Sturnus vulgaris	hen
Sobolovitaenia sobolovi		Acridotheres tristis	Hen, duck
Cloacotaenia megalops		Anas crecca, Anas acuta	duck
Trematoda			
Ehinosnotoma revolutum		Anas crecca, Anas acuta	Duck, goose
Ehinosstoma transfretanum		Fulica atra, Anas crecca, Anas acuta	Hen, duck
Bilharziella polonica		Chroicocephalus ridibundus, Anas crecca	Duck
Prosthogonimus ovatus		Phasianus colchicus, Sturnus vulgaris	Hen, Duck
Notacotylus attenuatus		Anas clypeata, Anas penelope	Duck
Acanthocephala			
Polymorphus magnus		Anas crecca, Fulica atra	Duck

Polymorphus minutus	Anas acuta	Duck
Prosthorrhynchus transverses	Turdus merula, Corvus corone, Upupa epops	hen
Nematoda		
Ascaridia galli	Phasianus colchicus, Columba livia	hen
Heterakis gallinarum	Streptopelia orientalis	hen
Capillaria obsignata	Upupa epops, Corvus corone, Acridotheres tristis	Hen
Amidostomum filicae	Anas crecca, Fulica atra	Duck
Dispharynx nasuta	Corvus corone, Upupa epops, Turdus merula	Hen
Tetrameres fissispina	Anas crecca, Anas acuta	Duck

Peculiarities of seasonal dynamics are associated with the presence in nature of intermediate hosts of helminthes, which mainly include beetles - (*Dilalaeicollis*, *Gonocephalum pubiferum*, *Tenebrio molitor*), woodlice (*Porcello scaber*, *P. laevis*, *P. fedtshencae*, *Armadillum vulgare*), and rain worms (*Allolobophora fassiensis*, *A. calliginosa*, *Eisenia rosea*), and some other representatives of the invertebrate fauna.

The high indexes of helminthes contamination were recorded in [Acridotheres tristis](#) and *Corvus corone* (EI 70.7-92.4%, AI 9.4-17.6 samples).

Recently, the process of synanthropization of some wild birds has been noted. In search of food of anthropogenic origin, they became regular visitors in poultry farms, which leads to an increase of parasitic diseases in poultry farms.

The main role in the spread and maintenance of helminth infestation belongs mainly to synanthropic birds, including the [Acridotheres tristis](#), having 4 common species with the domestic birds, and *Sturnus vulgaris* - 2, *Corvus corone* - 3, *Anas crecca* - 7, *Anas acuta* - 5, *Fulica atra* - 3, *Streptopelia orientalis* and *Streptopelia senegalensis* - 2.

To clarify the role of individual species of birds in the spread of helminth infestations by various species of helminthes, as well as some other indicators, we have identified the following groups: helminthes, in the distribution of which the main role is played by domestic birds – *Echinostoma revalutum*, *Prosthogonimus ovatus*, *Notocotylus attenuatus*, *Raillietina tetragona*, *Scriabina cesticillus*, *Choanotaenia infundibulum*, *Ascaridia galli*, *Heterakis gallinarum*, *Capillaria obsignata*.

In the distribution of helminthes, which the dominant role belongs to wild birds such as – *Echinostoma transfretanum*, *Bilharziella polonica*, *Echinolepis carioca*, *Dicranotaenia coronula*, *Cloacotaenia megalops*.

Helminthes, in the distribution of which in the same level contribute as domestic, so and wild birds - *Echinostoma revalutum*, *Prosthogonimus ovatus*, *S. cesticillus*, *Dispharynx nasuta*, *Raillietina echinobotrada*.

In the distribution of helminthes, which the main role belongs to human activities such as helminthes – *Echinostoma*

revalutum, *Scriabina cesticillus*, *Ascaridia galli*, *Heterakis gallinarum*, *Capillaria obsignata*.

Further strengthening by anthropogenic press (drying up the Aral Sea, the emergence of new reservoirs, etc.), which resulted in global environmental changes in large areas, which lead to a change in the habitats of many species of wild birds, including migratory ones, they provide prerequisites for a significant increase in the number of helminthes species that they are common to wild and domestic birds. The number of such helminthes, we can note following types – *Echinostoma transfretanum*, *Bilharziella polonica*, *Cloacotaenia megalops*, etc. We should define the epizootic groupings of parasitic worms, to which we attribute the widespread pathogens of invasions well-adapted and causing the greatest harm to the poultry farming (*Prosthogonimus ovatus*, *Notocotylus attenuatus*, *Raillietina echinobotrada*, *Choanotaenia infundibulum*, *Ascaridia galli*, *Heterakis gallinarum*, *Capillaria obsignata*, *Polimorphus magnus*), the pathogen agents of local foci of invasions are as follows: *Raillietina weissi*, *Dicranotaenia coronula*, *Dilepis undula*, *Anonchotaenia globata*, *Amidostomum filicae*, *Clinostomum complanatum*; rare pathogens of invasion, representing a potential threat (*Collyriclum faba*, *Diorchis brevis*, *Vitta rustica*, *Monopylidium passerum*, *Sobolevitaenia sobolovi*) are studied.

In general, the process of helminthes migration between wild and domestic birds has recently been activated. Permanent habitats, feedings, and overnight stays of most species of wild birds are often carried in territories that are closely related to economically used areas and settlements. In many respects, this is facilitated by social measures for the development and reclamation of new lands and other anthropogenic impacts on the natural environment.

The migration of parasitic worms between wild and domestic birds is ecologically interconnected with the characteristics of the circulation of helminthes in biocenoses and both concepts are one. Regularities of helminthes circulation are no less significant biocenoses and parasiticenosis of one or another host, living in these conditions and also should lie down to the basis of biological principles of regulation of natural - focal parasitic systems.

In aquatic biocenoses, mainly various aquatic birds (wild - coot, teal whistle, pintail, great cormorant, etc; domestics – duck, goose) and invertebrates (aquatic crustaceans, mollusks, etc.) were concentrated. Meanwhile, among the surveyed birds, the bulk of the population was terrestrial birds (orders - sparrows, pigeon, chicken) and invertebrates (insects, woodlice, mollusks, earthworms). At the same time, the presence and biocenoses of representatives of the invertebrate and vertebral fauna create favorable conditions for the circulation of helminthes in the natural environment among various components. An ecological analysis of these relationships in various biocenoses allowed basing the following 11 ways of circulation of the relevant groups of parasitic worms:

The bird (Fam. Phasianinae, Anatidae) is a terrestrial bird environment. The families of *Ascarididae* (*Ascaridiagalli*) and *Heterakidae* (*Heterakisgallinarum*) will participate in the circulation of helminthes by this way.

The bird (Fam. Anatidae) – aquatic environment – a bird. The families of the *Amidostomatidae* (*Amidostomum anseris*), *Heterakidae* (*Gangulaterakis dispar*) will participate in the circulation of helminthes by this way.

The bird (Fam. Accipitridae, Sturnidae, Ploceidae, Phasianidae, Corvidae) – terrestrial environment – intermediate host (earthworms, insects, rodents) – a bird. The representatives of this birds family such as Davainiidae (Raillietina echinobothrida, Scriabinia cesticillus, Davainea proglottina), Dilepididae (Choanotaenia infundibulum, Ch.constricta, Monopylidium passerum, Vitta rustica, Sobolovitaenia sobolovi, Anomotaenia constricta), Hymenolepididae (Aploparakis larina, A. filum, Diorchis brevis, Passerilepis crenata, P. stylosa) and Collyriclidae (Collyriclum faba) play a key role in the circulation of the helmenthes.

The bird (Fam. Anatidae, Laridae, Phalacrocoracidae) – aquatic environment – intermediate host (aquatic crustaceans) – a bird. The families of Polymorphiidae (Polomorphus magnus, P. minutus) and Filicollidae (Filicollis anatus) will participate in the circulation of helminthes by this way.

The bird (Fam. Galliformes, Corvidae) – terrestrial environment – reservoir hosts (earthworms) – a bird. The Syngamidae family (Syngamidae trachea) will participate in the circulation of helminthes by this way.

The bird (Fam. Anatidae, Sturnidae, Phasianidae, Ploceidae) – terrestrial environment – the first intermediate host (woodlice) – a bird, the second intermediate host (insect) – a bird. The families of Prosthogonimidae (Prosthogonimusovatus, P. cuneatus), Plagiorchidae (Plagiorchis arcuatus) will participate in the circulation of helminthes by this way.

The bird (Fam. Anatidae, Laridae) – aquatic environment – the first intermediate host (aquatic crustaceans) – the second intermediate host (fish) – a bird. The family of Ligulidae (Ligulaintestinalis, etc.) will participate in the circulation of helminthes by this way.

The bird (Fam. Galliformes) – terrestrial environment – intermediate host (mollusks) – additional host (crustaceans) – a bird. The Dicrocoeliidae family (Brachylectihumdonicum, Lyperosomumlongicauda, L. coracii) will participate in the circulation of helminthes by this way.

The bird (Fam. Anatidae, Galliformes, Rallidae) – aquatic environment – intermediate host (mollusks) – additional host (amphibians) – a bird. The Echinostomatidae family (Echinostoma revolutum, Eh. Transfrenanum, Eh. Chlorpodis) will participate in the circulation of helminthes by this way.

The bird (Fam. Anatidae, Podicipedidae, Charadriidae) – aquatic environment – intermediate host (crustaceans) - reservoir host (fish) – a bird. The Streptocaridae family

(Streptocaracassicaudas) will participate in the circulation of helminthes by this way.

The bird (Fam. Podicipedidae, Phalacrocoracidae, Ardeidae, Accipitridae) – aquatic environment – the first intermediate host (aquatic crustaceans) —the second intermediate host (fish) —the reservoir host (predatory fish, birds, amphibians, reptiles) — a bird. The families of Anisakidae (Contraeaecum microcephalum) and Diplostomidae (Neodiplostomumattenuatum) will participate in the circulation of helminthes by this way.

The above mentioned data indicate that 23 species of definitive hosts among wild and domestic birds, 12 species of intermediate, additional and reservoir hosts, consisting of representatives of invertebrate and vertebrate fauna are participated in the circulation of various parasitic worms in biocenoses.

In order to circulation one or another type of helminthes in the biocenosis, besides the epizootological chain “helminth - final host - intermediate host” and passing to the abiotic factor, there are also synchronization of the appearance in the environment of a sufficient number of invasive onset and susceptible to invasion of animals, as well as permanent and stable connections between the final and intermediate hosts of helminthes and other components, participating in the circulation of helminthes. In general, we can see that in the complex mechanisms of the formation of parasitic systems, numerous articulate biocenoses will participate, each of which is an integral part of the formation of a particular composition of the helminthofauna.

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