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TAXONOMIC ANALYSIS OF HELMINTHS FOUND IN DOMESTIC POULTRY IN THE FERGANA VALLEY

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ABSTRACT

The modern species composition of domestic poultry helminths in the Fergana Valley was studied, and it was found to consist of 45 species. These include 12 species of cestodes, 15 species of trematodes, and 18 species of nematodes. During the research, representatives of the families Davaineidae, Ascaridiidae, Heterakidae, Strongylida, and Capillaridae (Raillietina tetragona, Skrjabinia cesticillus, Ascaridia galli, Heterakis gallinarum, Syngamus trachea) were found in almost all domestic poultry. The research on the distribution, biology, and host damage properties of these helminths is essential for developing control measures.

KEYWORDS

Poultry, helminth, species composition, cestode, trematode, nematode, Fergana Valley.

INTRODUCTION

Worldwide experience shows that the negative impact of helminths on domestic, agricultural, and wild animals is increasing yearly, causing significant economic losses to livestock.

In our country, comprehensive measures are being implemented to further develop poultry farming, increase rural employment and income, and supply the domestic market with meat and egg products.

In this regard, it is important to protect poultry from diseases, prevent the introduction of infectious diseases from other regions into Uzbekistan, and apply

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scientific and technological advancements in this process.

From this perspective, the widespread presence of helminths in domestic poultry and their role in causing various diseases make their study significant not only for veterinary issues but also for solving broader socio-economic problems.

LITERATURE REVIEW AND RESEARCH METHODS

The last analysis of the helminths of domestic poultry in the valley region was conducted nearly half a century ago, focusing on domestic waterfowl. Specifically, M.M. Adisheva's research in 1963 was aimed at studying the helminths of domestic waterfowl in the Andijan region [2]. Additionally, some scientific sources on the helminthofauna of birds in Central Asia and Uzbekistan provide general information on the occurrence of helminths in the republic [4, 5, 9, 10, 11]. These sources serve as a preliminary overview for ecological-faunistic research in the region.

Subsequent studies of helminths in water and terrestrial birds in western and central Uzbekistan have expanded the knowledge of helminths in domestic poultry [1, 3, 8]. However, the helminthofauna of domestic poultry in the Fergana Valley has not been fully studied. Our research results contribute to filling this gap to some extent.

The processes of dissecting birds, identifying helminths, processing them, and preparing temporary or permanent specimens were carried out according to generally accepted parasitological methods [7]. Species identification of helminths was based on relevant scientific sources. Permanent specimens and collections of helminths were prepared following the methods proposed by I.I. Zokirov and G.M. Zokirova [12].

RESULTS AND DISCUSSION

The modern species composition of helminths in domestic poultry of the Fergana Valley consists of 2 phyla, 4 classes, 4 orders, 19 families, and 31 genera, comprising a total of 45 species. These include 12 species of cestodes, 15 species of trematodes, and 18 species of nematodes.

THE HELMINTHS IDENTIFIED IN DOMESTIC POULTRY

Phylum: PLATYHELMINTES Claus, 1887

Class: CESTODA
Order: Cyclophyllidea
Family: Davaineidae Braun, 1900
Genus: *Davainea* Blanchard, 1891

1. *Davainea proglottina* (Davaine,1860)

Genus: *Raillietina* Fuhrmann, 1920

2. *Raillietina echinobothrida* Mégnin, 1880
3. *Raillietina penetrans* (Baczynska, 1914)
4. *Raillietina tetragona* (Molin, 1858)

Genus: *Skrjabinia* Fuhrmann, 1920

5. *Skrjabinia cesticillus* (Molin, 1858)

Family: Dilepididae Railliet & Henry, 1909
Genus: *Choanotaenia* Railliet, 1896

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6. *Choanotaenia infundibulum* (Bloch, 1779)

Family: Hymenolepididae Ariola, 1899

Genus: *Diorchis* Clerc, 1903

7. *Diorchis elisae* Skrjabin, 1914

Genus: *Drepanidotaenia* Raillet, 1892

8. *Drepanidotaenia lanceolata* (Bloch, 1782)

Genus: *Fimbriaria* Froelich, 1802

9. *Fimbriaria fasciolaris* (Pallas, 1781)

Genus: *Microsomacanthus* Lopez-Neyra, 1942

10. *Microsomacanthus arcuata* (Kowalewski, 1904)
11. *Microsomacanthus microsoma* (Creplin, 1829)
12. *Microsomacanthus compressa* (Linton, 1892)

Class: TREMATODA Rudolphi, 1808
Order: Diplostomida Olson, Cribb, Tkach, Bray & Littlewood, 2003
Family: Schistosomatidae Stiles & Hassall, 1898
Genus: *Bilharziella* Looss, 1899

13. *Bilharziella polonica* (Kowalewsky, 1895)

Genus: *Ornithobilharzia* Odhner, 1912

14. *Ornithobilharzia canaliculata* (Rudolphi, 1819)

Genus: *Trichobilharzia* Skrjabin & Zakharow, 1920

15. *Trichobilharzia ocellata* (La Valette St.George, 1855)

Order: Plagiorchiida La Rue, 1957
Family: Collyriclidae Ward, 1917
Genus: *Collyriclum* Ward, 1917

16. *Collyriclum faba* (Bremser, 1831)

Family: Echinostomatidae Looss, 1899
Genus: *Echinostoma* Rudolphi, 1809

17. *Echinostoma aquatica* (Baschkirova, 1941)
18. *Echinostoma miyagawai* Ishii, 1932
19. *Echinostoma paraulum* Dietz, 1909
20. *Echinostoma revolutum* (Fröhlich, 1802)

Genus: *Echinoparyphium* Dietz, 1909

21. *Echinoparyphium recurvatum* (von Linstow, 1873)

Genus: *Petasiger* Dietz, 1909

22. *Petasiger (Neopetasiger) skrjabini* Baschkirova, 1941

Family: Notocotylidae Luhe, 1909
Genus: *Notocotylus* Diesing, 1839

23. *Notocotylus attenuatus* (Rudolphi, 1809)

Family: Plagiorchiidae Lühe, 1901
Genus: *Plagiorchis* Lühe, 1899

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24. *Plagiorchis arcuatus* Shtrom, 1924

Family: Prosthogonimidae Luhe, 1909
Genus: ***Prosthogonimus*** Luhe, 1899

25. *Prosthogonimus cuneatus* (Rudolphi, 1809)
26. *Prosthogonimus ovatus* (Rudolphi, 1803)
27. *Prosthogonimus pellucidus* (von Linstow, 1873)

Tip (Phylum): NEMATODA Diesing, 1861
Class: CHROMADOREA Inglis, 1983
Order: Rhabditida Chitwood, 1933
Family: Acuariidae Railliet, Henry & Sisoff, 1912
Genus: ***Acuaria*** Bremser, 1811

28. *Acuaria hamulosa* (Diesing, 1851)
29. *Acuaria spiralis* Molin, 1858

Family: Amidostomidae Travassos, 1919
Genus: ***Amidostomum*** Railliet & Henry, 1909

30. *Amidostomum monodon* (Linstow, 1882)
31. *Amidostomum anseris* (Zeder, 1800)

Family: Ascaridiidae Travassos, 1919
Genus: ***Ascaridia*** Dujardin, 1845

32. *Ascaridia galli* (Schrank, 1788)
33. *Ascaridia numidae* Leiper, 1908

Family: Heterakidae Railliet & Henry, 1912
Genus: ***Ganguleterakis*** Lane, 1914

34. *Ganguleterakis dispar* Schrank, 1790

Genus: ***Heterakis*** Dujardin, 1845

35. *Heterakis gallinarum* (Schrank, 1788)

Family: Strongylida Molin, 1861
Genus: ***Syngamus*** Siebold, 1836

36. *Syngamus trachea* (Montagu, 1811)

Family: Subuluridae Travassos, 1914
Genus: ***Subulura*** Molin, 1860

37. *Subulura suctoria* (Molin, 1860)

Family: Syngamidae Leiper, 1912
Genus: ***Cyathostoma*** Blanchard, 1849

38. *Cyathostoma bronchialis* (Mühlig, 1884)

Family: Tetrameridae Travassos, 1914
Genus: ***Tetrameres*** Creplin, 1846

39. *Tetrameres fissispina* (Diesing, 1861)
40. *Tetrameres spinosa* (Maplestone, 1931)

Family: Thelaziidae Skrjabin, 1915

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Genus: *Oxyspirura* Dsresche, 1897

41. *Oxyspirura schulzi* (Skrjabin, 1929)

Class: ENOPLEA Inglis, 1983
Order: Enoplida Flipjev, 1929
Family: Capillaridae Railliet, 1915
Genus: *Aonchotheca* López-Neyra, 1947

42. *Aonchotheca caudinflata* (Molin, 1858)

Genus: *Baruscapillaria* Moravec, 1982

43. *Baruscapillaria obsignata* (Madsen, 1945)

Genus: *Capillaria* Zeder, 1800

44. *Capillaria anatis* (Schrank, 1790)
45. *Capillaria phasianina* Kotlan, 1940

The abundance of parasitic worms in the study area is associated with the relatively high maintenance of domestic chickens, turkeys, ducks, and geese in households, as well as the diverse biotopes of the valley. The list presented shows that the helminths in domestic poultry of the region are quite diverse. Notably, about ten species of helminths discovered had not been previously recorded in the Fergana Valley. During the research, differences in the helminth fauna structure of domestic poultry were observed.

The helminth fauna of domestic poultry, based on taxonomic composition, includes 27 species of flatworms (Platyhelminthes), representing 60% of the total helminth fauna. The remaining species (18 species, 40%) belong to nematodes.

Faunistic analysis results show that the class distribution, based on the number of species, decreases in the following order: Trematoda - 15 species (33.3%), Chromadorea - 14 species (31.1%), Cestoda - 12 species (26.7%), and the class Nematoda - 4 species (8.9%).

When comparing the helminth species by order, they are divided into 5 orders, with each class having varying numbers of representatives. Specifically, the class Cestoda includes the order Cyclophyllidea, while the class Trematoda includes the orders Diplostomida and Plagiorchiida, and the class Chromadorea includes the order Rhabditida, with the class Enoplea represented by the order Enoplida.

Among domestic poultry, the order Rhabditida has the highest number of species (14), accounting for 31.1% of the helminth fauna. The number of families (9, or 47.4%) and genera (10, or 32.3%) within this order also lead compared to other orders. A similar situation is observed in the order Plagiorchiida of the class Trematoda, which includes 5 families (26.3%), 7 genera (22.6%), and 12 species (26.7%). This distribution is also found among the order Cyclophyllidea of the class Cestoda (12 species, 26.7%).

The large number of representatives in the aforementioned orders, especially Raillietina Fuhrmann, Skrjabinia Fuhrmann, Echinostoma Rudolphi, Notocotylus Diesing, Prosthogonimus Luhe, Acuaria Bremser, Ascaridia Dujardin, and Heterakis Dujardin, can be attributed to their widespread occurrence in nature and the high density of these taxa (see Table 1).

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Leading large groups in the helminth fauna of domestic poultry (Cicadinea, Aphidinea) are of significant interest to other researchers due to their high representation [1, 3, 4, 9, 11]. The next most prominent group is the order Enoplea of nematodes, which includes 1 family (5.3%), 3 genera (9.7%), and 4 species (8.9%).

Moreover, the order Diplostomida of trematodes includes only 1 family (5.3%), 3 genera (9.7%), and 3 species (6.7%) (see table 1).

Table 1

Taxonomic distribution of helminths in domestic poultry of the Fergana Valley

Phylum	Class	Order	Number of family	% share	Number of genus	% share	Number of species	% share
Platyhelmintes	Cestoda	Cyclophyllidea	3	15.8%	8	25.8%	12	26,7%
	Trematoda	Diplostomida	1	5.3%	3	9.7%	3	6,7%
		Plagiorchiida	5	26.3%	7	22.6%	12	26,7%
Nematoda	Chromadorea	Rhabditida	9	47.4%	10	32.3%	14	31,1%
	Enoplea	Enoplida	1	5.3%	3	9.7%	4	8,9%
	Total		19	100%	31	100%	45	100%

Analyzing the distribution of helminths by family, 8 families (Dilepididae, Collyriclidae, Notocotylidae, Plagiorchiidae, Strongylida, Subuluridae, Syngamidae, Thelaziidae) are monotopic, 5 families (Acuariidae, Amidostomidae, Ascaridiidae, Heterakidae, Tetrameridae) have 2 species each and are bitopic, 2 families (Schistosomatidae, Prosthogonimidae) are tritopic, with 3 species each, and 1 family (Capillaridae) is tetratopic with 4 species. The remaining 3 families (Davaineidae, Hymenolepididae, Echinostomatidae) are polytopic, with more than 5 species. The families Hymenolepididae and Echinostomatidae are dominant in domestic poultry of the Fergana Valley.

The diversity of helminth species is accompanied by a high number of genera. In domestic poultry of the Fergana Valley, helminths belonging to 31 genera were identified. Of these, 22 genera (70.9%) are monotopic,

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5 genera (16.1%) are bitopic, 3 genera (9.7%) are tritopic, and 1 genus (3.2%) is tetratopic, with 4 species.

CONCLUSION

The modern species composition of helminths in domestic poultry of the Fergana Valley has been studied, and 45 species have been identified. These include 12 species of cestodes, 15 species of trematodes, and 18 species of nematodes.

During the research, representatives of the families Davaineidae, Ascaridiidae, Heterakidae, Strongylida, and Capillaridae (Raillietina tetragona, Skrjabinia cesticillus, Ascaridia galli, Heterakis gallinarum, Syngamus trachea) were found in almost all domestic poultry.

Research on the distribution, biology, and host damage properties of these helminths is essential for developing control measures against them. Therefore, further studies on helminths in domestic poultry are ongoing.

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