

Review articles

Analysis of study comprehensiveness for nematode fauna of hydrophilic birds in Ukrainian Polissya

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ABSTRACT. The fauna of helminths of hydrophilic birds was subject of many works in Ukraine. But the most of investigators dealt with helminth fauna of waterfowls in general. And only few works were dedicated to the parasitic nematodes. There are registered 81 species of helminths on Ukraine and 36 species of nematode of hydrophilic bird for Polissya (23 species for Belarus, 15 for Poland and 18 for Ukraine). As well it was compared lists of parts of Polissya between itself. The comprehension of the parasitic nematodes from different part of Polissya showed that 6 species of nematodes are common for whole Polissya: *Eucoleus contortus*, *Amidostomum anseris*, *Echinuria uncinata*, *Porrocaecum crassum*, *Porrocaecum semiteres* and *Tetrameres fissispina*. Further studies are necessary to increase our knowledge on biodiversity of the parasitic nematodes in waterfowls and clear up their taxonomic status.

Key words: nematode, birds, helminths, Polissya, Ukraine

Introduction

Nematode fauna of hydrophilic birds is studied best in the steppe and forest-steppe zones, while in Polissya and Carpathians this issue is still poorly investigated. Polissya is promising region for further researches because of more favourable conditions in this natural area for the living of populations of wild hydrophilic birds. This is an attempt to analyse study comprehensiveness of nematode fauna of hydrophilic birds in Ukrainian Polissya. The emphasis is made on works focused on studying of wild birds. Nematodes of this environmental group of birds from Ukrainian Polissya are compared to the fauna of this group from all over Ukraine, and with the fauna from adjacent areas: Polish Polissya and Belarusian Polissya.

Overview studies of nematodes in hydrophilic birds from Ukraine

Hydrophilic birds are clearly singled out environmental group of animals with characteristic

complex of parasites. Nematodes are an important part of the complex. Nematode fauna of hydrophilic birds from Ukraine are an object of interest of researchers for 150 years. Nematodes were studied in parallel with the researches of the other helminths of birds. Such approach is closely related to the characteristics of helminthological studies in this group of vertebrates, and with relatively low infection of these birds with nematodes. Therefore, number of works focused on bird nematodes only is relatively few. More often authors studied them together with other helminths.

The first data on water bird nematodes from Ukraine were published by Shtandel in 1874. At the turn of the XIX and XX century, Kowalewski studied this group of animals. In his papers he provided information about the bird fauna of helminths (including nematodes) from the western regions of Ukraine. Next there were fundamental works of Skrâbin (1916, 1923, 1926) where, along with other groups of helminths, nematode fauna of birds from Ukraine was also described [1–3].

Our knowledge on the helminth fauna of this region was significantly extended after helmintho-

logical expedition in Ukraine organized Skrâbin and his closest disciples. The priorities of the 8th All-Union Helminthological expedition included studying of the helminth fauna of the fishes (primarily commercial) in the basin of the Sea of Azov and Black Sea. However, during examinations, birds which are definitive hosts for many species of fish helminths were also studied. Results of treatment of helminthological material from this expedition were published by Isajčikov [4]. In total, 150 birds were studied, of them 58 are wetland species. The birds were most infected with nematodes, their portion was 69.33%. Totally, during the expedition 185 samples of different nematode species were collected.

During the 25th Helminthological Expedition to Donbas, 38 specimens of 23 bird species (mainly terrestrial) were examined. Nematodes were found in 15 studied specimens belonging to 10 species. Small amount of material from birds was due to the fact that the main purpose of the expedition was studying helminthoses in local population, and birds were autopsied sporadically [5].

The main aim of the 26th Helminthological Expedition was the comprehensive study of helminths of vertebrates in the middle part of Dnipro stream. Report from this expedition was published by Baskakov. There were studied 200 specimens of birds from 55 species, with hydrophilic birds dominated. Nematodes were found in 26 bird species, prevalence was 33.5% [6].

After the World War II, in 1950–1960th, there were numerous publications on the fauna of wild hydrophilic birds in Ukraine. That time there were several fundamental theses: Saakova, [7], Smogorževskaâ [8], Leonov [9], Srebrodol'skaâ [10]. In abstracts of those works are data on fauna of nematodes, their morphology, systematics and ecology.

Saakova in her thesis gave the results of study on bird helminths from the Danube Delta. There were 234 birds studied, of them 93.3% infected. Totally, 156 helminth species were recorded. According to the number of species, nematodes took third place after trematodes and cestodes. Totally, 36 species from 10 families were registered, with prevalence 49%. Thus the percentage of birds infected with nematodes was higher than that with cestodes, but lower than with trematodes. Prevalence was greatest in copepods, and the lowest in waders and gulls. The most numerous were family Acuarioidea (7 species) and Amidostomatidae (5 species), 9 nematode

species (37 registered) were geohelminths. The author draws attention to the phenomenon of parasites exchange between birds with similar nutrition (in the area studied, the most intensive exchange with nematodes was in fish-eating birds). The author also writes about the pathogenicity of certain species of helminths from wild birds to domestic birds. In particular, 7 nematode species are considered to be able to cause helminthoses in domestic waterbirds in the region [7].

Leonov in his thesis [9] describes the helminth fauna of fish-eating birds near the Dnipro estuary of the Black Sea and Dnipro River Delta. Special attention is paid there to the role of waterbirds in distribution and circulation helminths dangerous for fish, poultry and humans. The paper covers the entire period of birds living in the territory of researches. Totally, 449 birds of 22 species from 12 genera were studied. In the birds studied 108 helminth species were found, of them 26 nematode species. The most widespread birds were gulls and storks. Consequently, the helminth fauna in representatives of these taxa were studied in the best way; data on other bird species are limited. In environmental and faunistic part the author points out specific features of helminth fauna in well studied bird orders, examines the specificity of local parasite-host systems. The author points to 27 helminth species potentially dangerous for fish and game animals. Also, the author gives recommendations how to reduce damage that birds can cause to industrial species and human health.

The thesis of Smogorževskaâ is about the study of bird helminth fauna in Dnipro River valley. Birds were shooting in the lower, middle and upper streams. The study examined 388 birds from 34 species. By the number of helminth species identified, nematodes are in the third place after cestodes. Totally, 23 nematode species were found. Interestingly that by the prevalence nematode took the second place (37.1%). The author provides a full list of helminths found with a percentage of infected birds, with faunistic analysis. The most typical and most diverse nematodes in the region are representatives from families Acuariidae and Anisakidae. The paper describes some patterns on regional helminth fauna: age, dependence of helminth fauna of the food, the area of helminths origin (most were local). Also, the role of nematodes obtained from little gull, common gull, night heron and red-necked grebe in infection of domestic and game birds (including *Streptocara*

crassicauda, *Echinuria uncinata*, *Tetrameres fissipina*, etc.) [8].

Data on nematodes fauna in birds from the Western Polissya are in thesis of Srebrodol'skaâ [10] and papers published by this material. The area of researches covered the north of Volyn region. There were 8 nematode species found in waterbirds. It should be noted that this work is about birds in the region, and helminthological data is only supplemental to the general picture of birds.

Another works of Srebrodol'skaâ [11,12] on parasite fauna of waders from Volyn Polissya are also noteworthy. They presented data on helminth fauna composition in waders, noted some features of helminth fauna in certain species. In waders were totally 5 nematodes species found, and they are third in species diversity after trematodes and cestodes.

The thesis of Sergienko [13] highlights some issues of the nematode fauna in the Upper Dniester basin. Totally, 600 waterbirds were studied of 32 species. Of these, in 28 species helminthological studies were first in the area. The researcher focused on the most numerous game birds. Also 222 terrestrial birds (woodpeckers and Passerine), 18 leeches, 2030 molluscs and 2855 crustaceans were studied. There were 315 stomachs from 11 bird species were examined. In waterbirds 10 nematode species were recorded. For the first time in the former USSR *Contraecaecum travasossi* was registered. Analysis shows that nematodes accounts 11.5% of species diversity (5 families). In this paper, a list of helminth species, intensity and prevalence for each host were given. In the faunistic part of this work there are analysis helminth fauna, and overall estimation of helminth fauna birds in the upper Dniester. Analysis is made according to bird orders. Ecological chapter deals with the effects of the feeding, lifestyle and some other factors on the formation of the waterbirds helminth fauna. Particular attention is drawn to revealing sites where birds are infected with worms. As part of work, there was analysis of the helminth fauna in vertebrates and invertebrates from this region to find helminth intermediate hosts. Among the animals studied there were fish, molluscs and crustaceans. The comparative analysis of helminth fauna in the study region with the helminth fauna on the Western Ukrainian Polissya was done. In general, the fauna on the upper Dniester is richer that can be explained by better conditions for the development of invertebrates – intermediate hosts, however there are also mutual helminth species.

There are given some patterns of zoogeographical distribution of helminths in waterbirds in the area studied.

Also Sergienko published some papers on various features of helminth fauna in different groups of hydrophilic birds in upper Dniester basin. The following groups of birds: gulls [14], rails and waders [15], ducks [16], grebes [17] were examined. The publications listed species composition of bird helminth fauna, data on helminth cenoses, and data on seasonal dynamics of worms for some bird species.

An important work for extending knowledge on the fauna of hydrophilic birds of Ukraine became monographic work of Smogorževskaâ “Helminthes of waterfowl and waterbirds of Ukraine” [18]. This book summarized all studies on helminth fauna in the region published to the time of its release. The work listed 99 nematode species parasitizing birds. In the systematic chapter of the monograph, for each helminth species (including nematodes) there are the following data: key tables for species within the genus; species where the parasite was found; prevalence and intensity of infection; place of collection; synonyms; degree of invasion of definitive hosts; localization and place of the finding; data on the intermediate and reservoir hosts within Ukraine. There are original drawings of the parasites studied at different stages of their life cycles. Nematodes first discovered in the territory of Ukraine were given separately. In addition to systematic section, the monograph has several chapters on helminths ecology and zoogeography.

We should also remember another work of Smogorževskaâ et al. on helminth fauna of the Black Sea Reserve. This work summarized data regularly collected from 1960 to 1978. Totally 300 bird species were studied with 181 species of cestodes, 143 trematodes, 75 nematodes and 15 species of Acanthocephala. The article contains a list of all registered helminth species [19].

Doctoral thesis of Smogorževskaâ is the result of many years study of helminth fauna from hydrophilic birds in Ukraine. This work gave the structural analysis of helminth fauna from hydrophilic birds made by separation and comparison of the different faunistic parasite complexes. Such an approach allowed us to characterize helminth faunas of the study region, identify the main regional characteristics and factors determining helminth fauna formation. Despite the work is on helminth fauna, but given to its systemic

nature, it is very important for knowledge of nematodes fauna of animals studied and understanding of its place in faunistic parasite complexes [20].

We should notice Grušinskaâ's article on cestode and nematode fauna in the Dnipro valley. This work is an original continuation of Smogorževskaâ's works in this region. The author notes that despite the well study of helminth fauna in the Dnipro valley, the changes in hydrological regimen due to reservoirs construction caused changes in the ecosystem that in turn had effect on bird helminths. Material was collected on Kremenchuk reservoir. There were 90 birds studied. Nematodes were found in river tern, common gull, gray heron, night heron, small white heron, mallard and black kite. There were 9 species of nematodes found. Nematode *Cyrnea mansion* from black kite was registered for the first time in Ukraine. The author notes that the birds of the region are infected with nematodes to a little degree. Common gull and gray heron were the most infected with nematodes. The publication showed that helminth fauna of the region changed since the last study, a new nematode species was found and some species not registered previously was found indicating the dynamic changes in the fauna of the area [21].

The fundamental work on nematode fauna of birds hydrophilic of Ukraine is Smogorževskaâ's monograph "Nematodes, Vol. 3. Acuarioidea" from series "Fauna of Ukraine". This book is on the superfamily fauna in general, however there are a lot of information on nematodes of hydrophilic birds. Of 43 species of the superfamily registered in Ukraine, 25 parasitize hydrophilic birds. There are key tables for superfamily taxa identification. Each species is supplied with original data and data from literature. These are: history of the study; morphological description; host range in the world and Ukraine, development and embryogenesis; data on intermediate hosts especially for species important for veterinary medicine. The book is illustrated with original drawings with details of morphology for species from Ukraine [22].

Later it was published a number of papers on helminthes of hydrophilic birds of Ukraine. One of the most noteworthy is the work of Kornûšin et al. [23] on complex research of helminth fauna of eiders nesting on coastal islands of the Black Sea. The most interesting is the distance of this colony from the main nesting area of these birds for thousands of kilometers. Totally, 23 birds were

examined. Material was collected in 1986–1989. There were 5 nematode species and one species was not identified to the family: *Capillaria anatis*, *Amidostomum acutum*, *Tetrameres fissispina*, *Cosmocephalus obvelatus*, *Streptocara crassicauda*. They consist up to 15.2% of species in helminth fauna of this eiders population. None of nematode species is not included into core helminth fauna of this population, therefore there are no dominant species. The researchers also gave analysis of infection rate according to age of eiders. Nematodes often infected young birds, however their overall infestation is low. *Amidostomum acutum* and *Streptocara crassicauda* are widespread among different bird species in the region. Other 3 species of nematodes were adopted from local birds. Therefore there are no specific eiders parasites among nematodes.

Data on nematodes fauna in the south of Ukraine was presented in the thesis of Berežnij on helminth fauna of waterbirds in Ascania Nova Reserve. It was found 5 nematode species typical for Ukraine. The data on the intensity, prevalence and faunistic analysis were presented. Also some recommendations on helminthoses prevention were given [24].

The basic work in studying helminth fauna of pelicans and herons in the south of Ukraine is paper of Kornûšin et al. [25]. They summarized original and literature data for the period from 1952 to 2001. The authors listed 134 species of helminths (including 29 nematode species). A detailed analysis of helminths circulation in birds of the region studied is given.

We would like to note the paper of Kyrylenko and Kelembet [26] with an overview of helminthological researches in birds in Ukraine as a whole. The subject area of scientific works of researchers who worked in different years in the field is submitted.

Analysis and discussion

A list of nematode species of hydrophilic birds registered in Ukraine (Table 1) is made. This list does not include worms of birds of prey. List is based on books of Smogorževskaâ [18,22], the most complete works on bird nematodes in Ukraine. To describe nematode species in Belarusian Polissya we used Merkushova's article [27]. This monograph contains general information about helminth species found in fish, amphibians, reptiles, birds and

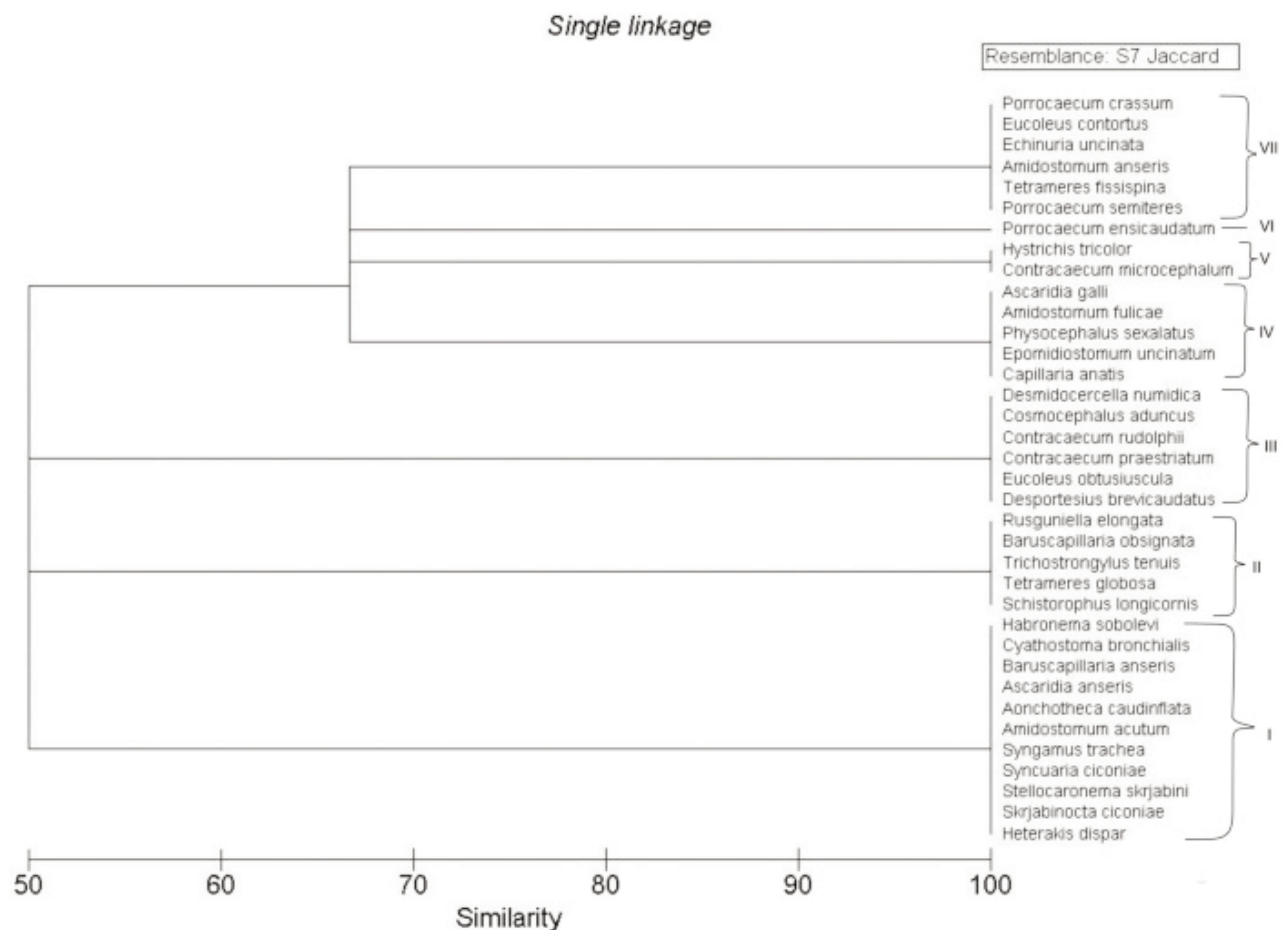


Fig.1. Cluster analysis of the list of nematodes in hydrophilic birds from Polissya
 I-III – species characteristic for one country within Polissya only (I – Belarus, II – Ukraine, III – Poland);
 IV – species common for Belarus and Ukraine; V – species common to Poland and Ukraine;
 VI – species common for Belarus and Poland; VII – species common to Polissya.

mammals from Belarus. Description of each species includes data on its hosts and places of finding within the country. Also, it has a summary on biology of certain helminth species from Belarus. The paper has lists of helminth species for each host. The data on the fauna of Polish Polissya were taken from monographic work of Okulewicz [28]. These are data on helminths for each studied bird from Poland, namely collection points, hosts, researchers and brief descriptions on biology of some worms. Thus, in comparative table (Table 2) we used data from the most comprehensive summarizing works in those areas. Table does not include data from the Russian Polissya because there are no generalizing works on bird nematodes, and the Russian Polissya is small area relatively to the entire Polissya. The table data were analysed by hierarchical clustering program PRIMER 6. The resulting dendrogram is shown in Fig. 1. Names of species are given according to the Fauna Europaea project [29].

Table 1 shows that there are 81 species of nematodes of hydrophilic birds in Ukraine. Moreover, in primary sources there are species identified to the genus only, so they cannot be compare with species registered in the database: *Microtetrameres* sp. Leonov, 1958; *Agamospirura* sp. Serkowa, 1948; *Agamospirura* sp. Henry et Sisoff, 1913; *Capillaria* sp. 2 Smogorjewska, 1954; *Capillaria* sp. 1 Smogorjewska, 1954; *Tetrameres* sp. Smogorjewska, 1962; *Epomidiostomum* sp. Smogorjewska, 1966; *Microtetrameres* sp. Smogorjewska, 1965; *Contraecacum* sp. Smogorjewska, 1964. Special attention in this list should be paid to family Agamospirura. This is widely used group name for spirurates larvae. General trend is to clarify the systematic position of this species. However, here we give these 2 species as they were previously presented in original works.

Table 2 shows that in Polissya 36 species of nematodes in hydrophilic birds were found. Species identified to the genus only are not given in Table 2.

Table 1. List of nematode species of hydrophilic birds in Ukraine

Species	Species name in original paper
<i>Acuaria phalacrocoracis</i> Smogorjevskaja, 1961	<i>Cheilosprurua phalacrocoracis</i> Smogorjevskaja, 1961
<i>Ancyracanthopsis petrovi</i> Guschanskaja, 1950	
<i>Chevreuria revoluta</i> Rudolphi, 1819	
<i>Chordocephalus squamata</i> Linstow, 1883	<i>Skrjabinocara squamata</i> Linstow, 1883
<i>Cosmocephalus obvelatus</i> Creplin, 1825	
<i>Cosmocephalus capellae</i> Yamaguti, 1935	
<i>Decorataria decorata</i> Cram, 1927	
<i>Desportesius invaginatus</i> Linstow, 1901	
<i>Desportesius brevicaudatus</i> Dujardin, 1845	
<i>Dispharynx nasuta</i> Rudolphi, 1819	
<i>Echinuria uncinata</i> Rudolphi, 1819	
<i>Echinuria heterobrachiata</i> Wehr, 1937	
<i>Echinuria pamirica</i> Ryzikov & Borgarenko, 1965	
<i>Echinuria skrjabiniensis</i> Efimov, 1949	
<i>Ingliseria cirrohamata</i> Linstow, 1888	
<i>Paracuaria adunca</i> Creplin, 1846	
<i>Rusguniella elongata</i> Rudolphi, 1819	
<i>Schistorophus longicornis</i> Hemprich & Ehrenberg, 1866	
<i>Schistorophus skrjabini</i> Wassilkowa, 1926	
<i>Sciadiocara umbellifera</i> Molin, 1860	
<i>Skrjabinoclava decorata</i> Solonitzin, 1928	
<i>Skrjabinoclava horrida</i> Rudolphi, 1809	
<i>Skrjabinoclava longifuniculata</i> Sobolev, 1952	
<i>Streptocara crassicauda</i> Creplin, 1829	
<i>Streptocara recta</i> Linstow, 1879	
<i>Syncuaria contorta</i> Molin, 1858	
<i>Synhimantus niloticus</i> Leonov, 1958	
<i>Synhimantus sirry</i> Khalil, 1931	
<i>Viktorocara charadrii</i> Belopolskaya, 1953	
<i>Aprocta turgida</i> Stossich, 1902	
<i>Contraeaecum rudolphii</i> Hartwich, 1964	<i>Contraeaecum spiculigerum</i> Rudolphi, 1809
<i>Contraeaecum microcephalum</i> Rudolphi, 1809	
<i>Contraeaecum ovale</i> Linstow, 1907	
<i>Contraeaecum travassosi</i> Gutierrez, 1943*	
<i>Porrocaecum crassum</i> Deslongchamps, 1824	
<i>Porrocaecum ardeae</i> Frölich, 1812	
<i>Porrocaecum ensicaudatum</i> Zeder, 1800	
<i>Porrocaecum semiteres</i> Zeder, 1800	
<i>Porrocaecum reticulatum</i> Linstow, 1899	
<i>Eustrongylides excisus</i> Jagerskiold, 1909	
<i>Eustrongylides mergorum</i> Rudolphi, 1809	

<i>Eustrongylides tubifex</i> Nitzsch, 1819	
<i>Hystrichis tricolor</i> Dujardin, 1845	
<i>Heterospiculum sobolevi</i> Shigin, 1951	
<i>Gnathostoma hispidum</i> Fedstchenko, 1872	
<i>Gnathostoma pelecani</i> Chatin, 1874	
<i>Tetrameres araliensis</i> Efimov & Rijova, 1939	
<i>Tetrameres dubia</i> Travassos, 1917	
<i>Tetrameres globosa</i> Linstow, 1879	
<i>Tetrameres gubanovi</i> Shigin, 1957	
<i>Tetrameres nouveli</i> Seurat, 1914	
<i>Tetrameres numenii</i> Mamaev, 1959	
<i>Tetrameres skrjabini</i> Panova, 1962	
<i>Tetrameres fissispina</i> Diesing, 1861	
<i>Tetrameres crami</i> Swales, 1933	
<i>Tetrameres pavonis</i> Tschertkova, 1953	
<i>Tetrameres striata</i> Oshmarin, 1956	
<i>Tetrameres ardeae</i> Shigin, 1953	
<i>Ascaridia galli</i> Schrank, 1788	
<i>Heterakis dispar</i> Schrank, 1790	<i>Ganguleterakis dispar</i> Schrank, 1790
<i>Heterakis gallinarum</i> Schrank, 1788	
<i>Physocephalus sexualatus</i> Molin, 1860	
<i>Cyathostoma bronchialis</i> Muhling, 1884	<i>Hovorkonema bronchialis</i> Muhling, 1884
<i>Cyathostoma tadornae</i> Chatin, 1874	
<i>Syngamus palustris</i> Ryjikov, 1949	
<i>Baruscapillaria obsignata</i> Madsen, 1945	<i>Capillaria obsignata</i> Madsen, 1945
<i>Capillaria carbonis</i> Rudolphi, 1819	
<i>Capillaria pudendotecta</i> Lubimova, 1947	
<i>Capillaria laricola</i> Wasilkova, 1930	<i>Eucoleus laricola</i> Wasilkova, 1930
<i>Capillaria anatis</i> Schrank, 1790	<i>Thominx anatis</i> Schrank, 1790
<i>Capillaria fulicae</i> Pavlov et Borgarenko, 1959	<i>Thominx fulicae</i> Pavlov et Borgarenko, 1959
<i>Eucoleus trilobus</i> Linstow 1875*	
<i>Eucoleus spiralis</i> Molin, 1858	<i>Thominx spiralis</i> Molin, 1858
<i>Eucoleus vanelli</i> Rudolphi, 1819	<i>Thominx vanelli</i> Rudolphi, 1819
<i>Eucoleus contortus</i> Creplin, 1839	<i>Thominx contorta</i> Creplin, 1839
<i>Amidostomum acutum</i> Lundahl, 1848	
<i>Amidostomum anseris</i> Zeder, 1800	
<i>Amidostomum cygni</i> Wehr, 1933	
<i>Amidostomum fulicae</i> Rudolphi, 1819	
<i>Epomidiostomum uncinatum</i> Lundahl, 1848	
<i>Trichostrongylus tenuis</i> Mehlis, 1846	
Total: 81	

*absent in Fauna Europaea project

Table 2. Nematodes species of hydrophilic birds in Polissya

Species	Belarus	Ukraine	Poland
<i>Amidostomum acutum</i> Lundahl, 1848	+		
<i>Amidostomum anseris</i> Zeder, 1800	+	+	+
<i>Amidostomum fulicae</i> Rudolphi, 1819	+	+	
<i>Aonchotheca caudinflata</i> Molin, 1858 (<i>Capillaria caudinflata</i> Molin, 1958) *	+		
<i>Ascaridia anseris</i> Schwartz, 1926	+		
<i>Ascaridia galli</i> Schrank, 1788	+	+	
<i>Baruscapillaria anseris</i> Madsen, 1945 (<i>Capillaria anseris</i> Madsen, 1945) *	+		
<i>Baruscapillaria obsignata</i> Madsen, 1945		+	
<i>Capillaria anatis</i> Schrank, 1790 (<i>Thominx anatis</i> Schrank, 1790) *	+	+	
<i>Contracaecum microcephalum</i> Rudolphi, 1809		+	+
<i>Contracaecum praestriatum</i> Monnig, 1923			+
<i>Contracaecum rudolphii</i> Hartwich, 1964			+
<i>Cyathostoma bronchialis</i> Muhling, 1884	+		
<i>Desmidocercella numidica</i> Seurat, 1920			+
<i>Desportesius brevicaudatus</i> Dujardin, 1845			+
<i>Echinuria uncinata</i> Rudolphi, 1819	+	+	+
<i>Epomidiostomum uncinatum</i> Lundahl, 1848 (<i>Epomidiostomum anatinum</i> Skrjabin, 1915)	+	+	
<i>Eucoleus contortus</i> Creplin, 1839 (<i>Thominx contorta</i> Creplin, 1839) *	+	+	+
<i>Eucoleus obtusiuscula</i> Rudolphi, 1819			+
<i>Habronema sobolevi</i> Ryjova et Dubov, 1955	+		
<i>Heterakis dispar</i> Schrank, 1790 (<i>Ganguleterakis dispar</i> Schrank, 1790) *	+		
<i>Hystrichis tricolor</i> Dujardin, 1845		+	+
<i>Physocephalus sexalatus</i> Molin, 1860	+	+	
<i>Porrocaecum crassum</i> Deslongchamps, 1824	+	+	+
<i>Porrocaecum ensicaudatum</i> Zeder, 1800	+		+
<i>Porrocaecum semiteres</i> Zeder, 1800	+	+	
<i>Rusguniella elongata</i> Rudolphi, 1819		+	
<i>Schistorophus longicornis</i> Hemprich et Ehrenberg in Schneider, 1866		+	
<i>Skrjabinocia ciconiae</i> Morozov, 1958	+		
<i>Stellocaronema skrjabini</i> Gilbert, 1930	+		
<i>Syncuaria ciconiae</i> Gilbert, 1927	+		
<i>Syngamus trachea</i> Montagu, 1811	+		
<i>Tetrameres fissispina</i> Diesing, 1861	+	+	+
<i>Tetrameres globosa</i> Linstow, 1879		+	
<i>Trichostrongylus tenuis</i> Mehlis, 1846		+	
Total	23	18	15

* Note: in brackets - species name as it appears in original paper

Their names and country of registration are as follows: *Agamospirura* sp. Gilbert, 1930 (Belarus); *Agamospirura* sp. Henry et Sisoff, 1913 (Ukraine); *Syngamidae* gen. sp. Ryjova et Dubov, 1955 (Belarus); *Tetrameres* sp. Ryjova et Dubov, 1955

(Belarus); *Capilaria* sp. (Poland).

Therefore, 18 nematode species of hydrophilic birds were found in Ukrainian Polissya, 23 in Belarus, and 15 in Poland. Comparing the nematode fauna of Polissya as a whole with that in Polissya as

a part of a certain country, we can obtain the following data: 6 species are unique for Poland, 5 species – for Ukraine, and 11 species – for Belarus. Comparing species from fauna of Poland and Belarus, we can find 7 common species for these areas: *Amidostomum anseris*, *Echinuria uncinata*, *Porrocaecum crassum*, *Porrocaecum ensicaudatum*, *Porrocaecum semiteres*, *Tetrameres fissispina*, *Eucoleus contortus*. In Belarus and Ukraine we have 11 common species: *Amidostomum anseris*, *Amidostomum fulicae*, *Ascaridia galli*, *Capillaria anatis*, *Echinuria uncinata*, *Epomidiostomum uncinatum*, *Eucoleus contortus*, *Physocephalus sexalatus*, *Porrocaecum crassum*, *Porrocaecum semiteres*, *Tetrameres fissispina*. In Ukraine and Poland we get 8 common species of nematodes: *Amidostomum anseris*, *Echinuria uncinata*, *Porrocaecum crassum*, *Porrocaecum semiteres*, *Tetrameres fissispina*, *Eucoleus contortus*, *Contracaecum microcephalum*, *Hystri-chis tricolor*. Considering the Polissya fauna as a whole, we receive 6 common species for the entire territory: *Eucoleus contortus*, *Amidostomum anseris*, *Echinuria uncinata*, *Porrocaecum crassum*, *Porrocaecum semiteres* and *Tetrameres fissispina*.

Analysing species common for Polissya as a whole, we saw them widespread in the world. In Polissya, poultry, due to their commercial importance, are the best studied in terms of parasitology. However, in poultry helminth fauna human impact on the formation of parasites fauna must be considered, therefore this fauna can often be brought into the area due to economic activity.

Conclusions

The study of nematodes in hydrophilic birds in Ukraine was the most intensive in 1960–1970. Totally 81 nematode species of hydrophilic birds were found there, and 18 of them in Ukrainian Polissya. In Polissya in general there were recorded 36 species of nematodes, and 6 of them are characteristic for the whole area. Analysis of literature shows that a large amount of material is accumulated in Ukraine. However, this analysis points out to the irregularity in studying of these animals. In particular, there are the following trends. First, during the entire period of researches, most attention was given to poultry due its economic value. Second, steppe and forest steppe zones are explored in the best way while Carpathians and Polissya were covered with such studies to a lesser

extent. Therefore, we can conclude that wild hydrophilic birds in Ukrainian Polissya are studied insufficiently, they needed better examination. This is due to low interest in this group of birds in researchers in this area in the past, as well as the lack of recent studies in the region preventing from vision of an integral picture of helminth fauna of waterbirds in Ukraine.

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