Checklist of the nematode parasites of wild birds of Argentina

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Abstract: A commented checklist of the nematodes parasites of Argentinean wild birds is presented. This is the first compilation of parasitological papers about nematodes of Argentinean birds published between 1873 and November 2019. This review includes information about 64 nematode nominal species and 13 taxa identified at generic level, belonging to five orders, 16 superfamilies, 20 families, and 44 genera. Five species were considered incertae sedis, because they were described based only on larval stages, and one species was maintained as species inquirenda. The highest number of taxa of nematodes was recorded in the family Acuariidae with 20 nominal species and two taxa identified at generic level, followed by Anisakidae with eight nominal species and one taxon identified at generic level, and Tetrameridae with eight nominal species and two taxa identified at generic level. Of the 1042 species of birds reported in Argentina, only 65 (6.24%) were reported as hosts of adult nematodes. The families of birds with the highest number of reported taxa were Tinamidae (12 nematode taxa), Laridae (11), Anatidae (8) and Phalacrocoracidae (7). The present review provides data on hosts, geographical distribution, sites of infection, location of material deposited in Helminthological Collections, references, and taxonomic comments. A host/parasite list is also provided.

Keywords: Aves - Helminths - Nematoda.

INTRODUCTION

Argentina possesses a high diversity of birds with 1033 native species and 9 introduced (Roesler & González Táboas, 2016). Nematodes are an important group of parasites in birds and their taxonomy, phylogeny, zoogeography, and ecology still requires study (Zhang et al., 2012). Particularly, in Argentina the literature on the nematode parasites of birds is scattered and the studies have focused mainly on taxonomy. The first reports of nematodes parasitizing Argentinean birds was carried out by the English parasitologist, Thomas Spencer Cobbold, who studied filariae found by Charles Darwin parasitizing the greater rhea from Bahía Blanca, Buenos Aires Province during his travel through South America between 1831 and 1836 (Cobbold, 1873, 1886). The next contribution was made by a German naturalist established in Argentina, Carlos Berg, who reported filariae in an egg of greater rhea (Berg, 1896). The next report was also carried out by a foreign scientist, Corrado Parona, who described some species of helminths from fishes, birds and mammals from material that was sent to him by Carlos Berg for identification, among them, five species of nematodes from wild birds were reported (Parona, 1900). Between 1918 and 1928, several works on microfilariae found in bloodstream of wild birds were published by local scientists, among the most outstanding works are the publications of the physician and bacteriologist Salvador Mazza, who was the main researcher working on Chagas-Mazza disease in Argentina (Biglieri, 1918; Mazza et al., 1927; Mazza & Franke, 1928). Between 1943 and 1975, fifteen papers were published on Nematoda of wild birds. Most of them were carried out by the veterinarians Juan José Boero and Jorge Eugenio Led (Boero & Led, 1968, 1971; Boero et al., 1968; Boero et al., 1972a, b). In this period the publications made by the European biologist Jacobus H. Schuurmans Stekhoven – who studied the nematodes of wild vertebrates of Argentina, Chile, and Paraguay during his stay in Argentina in the 50s – are particularly remarkable. He published an extensive work in which he described seven new species of nematodes parasitizing birds from northern Argentina and nine new geographical records (Schuurmans Stekhoven, 1951). During the following 20 years (1976-1995) only one...
contribution was published (Zeiss & Seigmur, 1981). From 1996, the number of publications carried out by Argentinean scientists increased, published by several groups of parasitologists mostly from the University of La Plata (Buenos Aires Province) and Puerto Madryn (Chubut Province) and mainly dedicated to nematodes of birds related to aquatic environments. The aim of this paper was to compile and summarize all the published reports about adult nematodes of wild birds from Argentina based on original records.

MATERIALS AND METHODS
This checklist was prepared on the basis of data published from 1873 to November 2019. Species reported in theses, dissertations, and scientific meetings were not listed because they represent informal publications. However, two proceedings of scientific meetings are mentioned in the comments, given that some species were originally described in these proceedings and were subsequently considered valid by other authors in formal publications. For the construction of this list only wild birds were included, domestic birds were not taken into account. Each taxonomic category of Nematoda is presented in alphabetical order. Each record contains information on the species or generic name, taxonomic authority, host(s), site of infection (SI), localities (Lo) (particular locality, province and geographical coordinates when reported in the original paper were converted to WGS 84 decimal degrees), number of lots and collection acronym when the material was deposited, and bibliographical references (numbers in superscript refer to the corresponding reference). The classification for nematodes follows the Keys to the Nematode Parasite of Vertebrates of Anderson et al. (2009) and Gibbons (2010), except for Tetrameridae and Microtetrameridae (Tetrameridae) which are considered as separate genera. The taxonomy of birds follows AVIBASE (Lepage, 2019), where also the taxonomic authorities of the bird taxa can be found. For the construction of this list only wild birds were considered valid by other authors in formal publications. However, domestic birds were not taken into account. Each taxonomic category of Nematoda is presented in alphabetical order. Each record contains information on the species or generic name, taxonomic authority, host(s), site of infection (SI), localities (Lo) (particular locality, province and geographical coordinates when reported in the original paper were converted to WGS 84 decimal degrees), number of lots and collection acronym when the material was deposited, and bibliographical references (numbers in superscript refer to the corresponding reference). The classification for nematodes follows the Keys to the Nematode Parasite of Vertebrates of Anderson et al. (2009) and Gibbons (2010), except for Tetrameridae and Microtetrameridae (Tetrameridae) which are considered as separate genera. The taxonomy of birds follows AVIBASE (Lepage, 2019), where also the taxonomic authorities of the bird taxa can be found. Acronyms used for the Biological Collections are: CHIOC (Coleção Helminológica do Instituto Oswaldo Cruz, Rio de Janeiro, Brazil); CH–N–FML (Colección Helminológica de la Fundación Miguel Lillo, Tucumán Province, Argentina); CNP–Par (Collection of the Centro Nacional Patagónico, Puerto Madryn, Argentina); IPCAS Helm. Coll (Helminthological Collection of the Institute of Parasitology, Biology Centre of the Czech Academy of Sciences, České Budějovice, Czech Republic); MLP–He, sometimes as CHMLP in the original papers (Colección Helminológica del Museo de La Plata, Buenos Aires Province, Argentina); USNM (United States National Museum, National Museum of Natural History, Washington, U.S.A.), also cited with a previous acronym USNPC (United States National Parasite Collection); NHMUK (The Natural History Museum, London, U.K.), sometimes as BMNH (British Museum of Natural History) in the original papers; MNHN (Muséum National d’Histoire Naturelle, Nematodes collection, Paris, France); MACN–pa (colección de parasitología, Museo Argentino de Ciencias Naturales “Bernadino Rivadavia”, Buenos Aires, Argentina).

RESULTS
At present, 71 papers have been published on some aspects of nematodes infecting Argentinean wild birds – most of them are related to taxonomic aspects, distribution, and host-parasite associations – while a few dealt with the pathological effects caused by nematodes in birds. The checklist from the available literature on nematodes parasites of wild birds in Argentina comprises records on 64 nematode nominal species and 13 taxa identified at generic level, belonging to five orders, 16 superfamilies, 20 families and 44 genera associated with 13 species of Pelicaniformes; eight species of Charadriiformes and Passeriformes; six species of Strigiformes; five species of Anseriformes; four species of Tinamiformes; three species of Falconiformes, Podicipediformes and Psittaciformes; two species of Accipitriformes, Piciformes, Rheiiformes and Sphenisciformes; and one species of Coraciiformes, Gruidae, Phoenicopteriformes and Procellariiformes.

Parasite-Host List

Phylum Nematoda
Class Adenophorea
Order Enoplida
Superfamily Dioctophymatoidea
Family Dioctophymidae
Genus Eustrongylides Jägerskiöld, 1909
Eustrongylides tubifex (Nitzsch in Rudolphi, 1819)
Host: Podiceps major. SI: proventriculus. Lo: Moreno Lake (-41.0667, -71.55), Río Negro Province. Reference: Brugni & Viozzi (2003).

Superfamily Trichinelloidea
Family Trichuridae
Genus Capillaria Zedler, 1800
Capillaria sp.
Host: Larus dominicanus. SI: not reported. Lo: San Carlos de Bariloche (-41.05, -75.4167), Río Negro Province. Reference: Kreiter & Semenas (1997).

Host: Nothura maculosa nigroguttata. SI: not reported. Lo: Buenos Aires Province. Reference: Boero et al. (1968).

Genus Eucolecus Dujardin, 1845
Eucolecus penoides (Freitas & Almeida, 1935)
Host: Nothura maculosa. SI: muscular stomach. Lo: Maipú, Buenos Aires Province. Reference: Kaseta
Genus Ornithocapillaria Baruš & Sergeeva, 1990
Ornithocapillaria ovopunctata (Linstow, 1873)
Host: Sturnus vulgaris. SI: intestine. Lo: Bernal (-34.6956, -58.2667), Buenos Aires Province. Material deposited: MLP–He 6735. Reference: Valente et al. (2014).

Genus Pterothominx Freitas, 1959
Pterothominx exilis (Dujardin, 1845)
Host: Sturnus vulgaris. SI: intestine. Lo: Bernal (-34.6956, -58.2667), Buenos Aires Province. Material deposited: MLP–He 6735. Reference: Valente et al. (2014).

Class Secernentea
Order Ascaridida
Superfamily Ascaridoidea
Family Anisakidae
Genus Contracecum Railliet & Henry, 1912
Contracecum australis Garbin et al., 2011
Host: Phalacrocorax brasilianus. SI: stomach. Lo: Piedras Moras Reserve (-32.1667, -64.3833), urban Lake Villa Dalcar (-33.1167, -64.3833) and Rio Cuarto (-33.1167, -64.3833), Córdoba Province. References: Biolo et al. (2012). Comment: adults and third and fourth stage larvae.

Contracecum chubutensis Garbin, Díaz, Cremonte & Navone, 2008
Host: Phalacrocorax atriceps. SI: stomach. Lo: Bahía Bustamante (-45.1833, -66.5)1, 2 and Puerto Madryn (-42.7833, -65.0333)1, Chubut Province. Material deposited: MLP–He 5748, 5749, 57501. References: Garbin et al. (20081, 20112).

Contracecum ovale (Linstow, 1907)
Host: Rollandia rolland. SI: stomach. Lo: Mar Chiquita Lagoon (-37.7667, -57.45) and Chascomús Lagoon

Contracecum microcephalum (Rudolphi, 1809)
Host: Ardea alba egretta (cited as Casmerodius albus egretta). SI: esophagus, stomach and small intestine. Lo: Leales, Tucumán Province1; La Plata Zoological Garden, Buenos Aires Province2. Material deposited: CH–N–FML 18171. References: Schuurmans Stekhoven (1951)1; Boero et al. (1972a)2.

Host: Ardea cocoi. SI: esophagus, stomach and small intestine. Lo: La Plata Zoological Garden, Buenos Aires Province. Reference: Boero et al. (1972a).

Host: Nycticorax nycticorax. SI: esophagus, stomach and small intestine. Lo: Uribalrea1 and La Plata Zoological Garden, La Plata2, Buenos Aires Province. References: Boero & Led (1971)1; Boero et al. (1972a)2.

Contracecum mirounga Nikolskiy, 1974
Host: Spheniscus magellanicus. SI: proventriculus. Lo: Peninsula Valdés (~42.0667 to - 42.8833, -63.63 to -64.50), Chubut Province. Material deposited: MLP–He 7464. Reference: Garbin et al. (2019a).

Contracecum multipapillatum (Drasche, 1882)
Hosts: Ardea alba Linnaeus1; Ardea alba egretta (cited as Egretta alba egretta)2. SI: esophagus and stomach. Lo: De Monte pond, San Miguel del Monte (-35.45, -58.7833)1 and Mar Chiquita coastal Lagoon (-37.7667, -57.45)2, Buenos Aires Province. Material deposited: MACN–pa 3851; MLP–He 45981. References: Labriola & Suriano (1996)1; Navone et al. (2000)1.

Host: Bubulcus ibis ibis. SI: esophagus and stomach. Lo: De Monte pond, San Miguel del Monte (-35.45, -58.7833), Buenos Aires Province. Material deposited: MACN–pa 385. Reference: Labriola & Suriano (1996).

Host: Egretta thula thula. SI: esophagus and stomach. Lo: De Monte pond, San Miguel del Monte (-35.45, -58.7833), Buenos Aires Province. Material deposited: MACN–pa 385. Reference: Labriola & Suriano (1996).

Comment: Labriola & Suriano (1996) described Contracecum philomultipapillatum, later this species was synonymized with C. multipapillatum by Navone et al. (2000).

Contracecum ovale (Linstow, 1907)
Host: Rollandia rolland. SI: stomach. Lo: Mar Chiquita Lagoon (-37.7667, -57.45) and Chascomús Lagoon
Contracaecum pelagicum
(Johnston & Mawson, 1942)

Host: Eudyptes chrysoceus (cited as E. crestatus). SI: intestine. Lo: not reported. Reference: Boero et al. (1972b). Comment: cited as Contracaecum spheniscus Boero & Led, 1970.

Host: Spheniscus magellanicus1, 2, 3. SI: intestine1, stomach2, 3. Lo: not reported1, Peninsula Valdés (-42.06667 to -42.8833, -63.63 to -64.5), Chubut Province2, 3; and Mar del Plata (-38.0833, -57.6333), Buenos Aires Province2. References: Boero et al. (1972b); Garbin et al. (2007); Díaz et al. (2010). Comment: cited as C. spheniscus by Boero et al. (1972b).

Host: Thalassarche melanophris (cited as Diomedea m.). SI: stomach. Lo: Peninsula Valdés (-42.06667 to -42.88333, -63.633 to -64.50), Chubut Province. Material deposited: MLP–He 5591. Reference: Garbin et al. (2007). Comment: Contracaecum spheniscus was described in the proceedings of a congress in 1970, based only on male specimen found in the proventriculus of S. magellanicus from the La Plata Zoological Garden. Boero et al. (1972b) considered it valid, and reported males and females parasitizing penguins. Finally, Garbin et al. (2019a) synonymized C. spheniscus with C. pelagicum.

Contracaecum travassossi Gutiérrez, 1943

Host: Phalacrocorax albiventer. SI: stomach. Lo: San José lighthouse, Chubut Province. Material deposited: CHIOC (number not provided). Reference: Gutiérrez (1943).

Contracaecum sp.

Host: Fulica leucopetera. SI: intestine. Lo: Trelew, Chubut Province. Reference: Parona (1900). Comment: Cited by Parona (1900) as Ascaris spiculigera Rudolphi, 1809. There is much confusion in the literature about the many species of Contracaecum. Hartwich (1964) revised this genus and presented a list of synonyms. Among them, considered Contracaecum spiculigera (Rudolphi, 1809) and A. spiculigera synonymous of C. microcephalum. Also, he studied other specimens identified by Rudolphi (1809) as A. spiculigera, but considered these specimens as members of Contracaecum rudolphii Hartwich, 1964.

Host: Larus dominicanus. SI: not reported. Lo: San Carlos de Bariloche (-43.05, -75.4167), Rio Negro Province1; Chubut Province2. References: Kreiter & Semenas (1997)1; Diaz et al. (2011a)2. Comment: immature adult specimens.

Host: Phalacrocorax albilventer. SI: recovered from pellets. Lo: Punta León Reserve (-43.0778, -64.4958), Chubut Province. Reference: Malacalza et al. (1988).

Host: Phalacrocorax atriceps. SI: recovered from pellets. Lo: Punta León Reserve (-43.0778, -64.4958), Chubut Province. Reference: Garbin et al. (2019b). Comment: third and fourth stage larvae and adults specimens.

Host: Phalacrocorax brasilianus (cited as Phalacrocorax olivaceus olivaceus). SI: proventriculus. Lo: Rio de la Plata1 (unspecified Province); and Los Quiroga dam, Santiago del Estero Province2. References: Szidat & Nani (1951); Zeiss & Seigmur (1981). Comment: cited as Contracaecum spiculigerum (see previous taxonomic comment).

Host: Phalacrocorax gaimardi. SI: recovered from pellets. Lo: Isla Elena (-47.75, -65.9333), Río Deseado, Santa Cruz Province. Comment: third and fourth stage larvae and adults specimens. Reference: Garbin et al. (2019b).

Host: Spheniscus magellanicus. SI: proventriculus. Lo: Rio de la Plata (-35.4333 to -41.0333; -57.1167 to -62.8), Buenos Aires Province. Material deposited: MLP–He 7465. Reference: Garbin et al. (2019a).

Family Ascaridiidae

Genus Porrocaecum Railliet & Henry, 1912

Porrocaecum heteropterum (Diesing, 1851)

Host: Plegadis chihi. SI: intestine. Lo: Guaminí (-37.00, -62.4833), Buenos Aires Province. Material deposited: MLP–He 4307/4 and NHMUK 1999.2.5.1–2. Reference: Digiani & Sutton (2001).

Host: Theristicus melanophris (Gmelin) (cited as Theristicus melanopis melanopis). SI: intestine. Lo: Rahue (-39.35, -70.9167), Neuquén Province. Material deposited: MLP–He 4599/1, 4600/1. Reference: Digiani & Sutton (2001).

Superfamily Heterakoidea

Family Ascaridiidae

Genus Ascaridia Dujardin, 1845

Ascaridia hernaphrodita (Frölich, 1789)

Host: Ara chloropterus. SI: small intestine. Lo: San Cosme Departament, Corrientes Province. Reference: Martinez et al. (2003).

Host: Pionus maximiliani siy. SI: small intestine. Lo:
San Antonio, Misiones Province. Material deposited: CH–N–FML 259. Reference: Schuurmans Stekhoven (1951).

Ascaridia sp.
Host: Nothura maculosa annectens. SI: small intestine. Lo: not reported. Reference: Bump & Bump (1969).

Family Heterakidae
Genus Heterakis Schrank, 1790
Heterakis sp.
Host: Nothura darwinii darwinii. SI: caecum. Lo: not reported. Reference: Bump & Bump (1969).

Genus Odontoterakis Skrjabin & Schikhobalova, 1947
Odontoterakis valvata (Schneider, 1866)
Host: Crypturellus tataupa. SI: intestinal caeca. Lo: La Plata Zoological Garden, Buenos Aires Province. Reference: Boero & Led (1968).

Genus Odontoterakis Skrjabin & Schikhobalova, 1947
Odontoterakis valvata (Schneider, 1866)

Host: Crypturellus tataupa. SI: intestinal caeca. Lo: La Plata Zoological Garden, Buenos Aires Province. Reference: Boero & Led (1968).

Genus Odontoterakis Skrjabin & Schikhobalova, 1947

Order Oxyurida
Superfamily Oxyuroidea
Family Heteroxyonematidae
Genus Eudromoxyura Anderson & Prestwood, 1972
Eudromoxyura aspiculuris (Boero & Led, 1971)
Hosts: Eudromia elegans1; Eudromia elegans albida2; Eudromia elegans wetmorei (cited as Eudromia elegans morenoi)3. SI: caecum1-2. Lo: Buenos Aires Province1; La Pampa, San Juan and Mendoza Provinces2; General Acha, La Pampa Province3. Material deposited: MLP–He 1621 D1; MNHN kh–4432; sb–559; USNM 1358790, 1358791, 1358792 (cited as USNPC 63080, 63081, 63082)2. References: Boero & Led (1971)1; Anderson & Prestwood (1972)2; Hugot et al. (1991)3. Comment: Boero & Led (1971) described Syphaciella aspiculuris from E. e. wetmorei, Anderson & Prestwood (1972) described Eudromoxyura elonbyrdi from E. e. elegans and E. e. albida. Later, Hugot et al. (1991) studied these specimens and synonymized both species with E. aspiculuris.

Genus Subulura Molin, 1860a
Subulura olympioi Barreto, 1918
Host: Notura maculosa. SI: duodenum. Lo: Maipú, Magdalena, Coronel Dorrego and Rauch, Buenos Aires Province. Reference: Kaseta (1973).

Subulura valvata (Rudolphi, 1819)
Host: Notura maculosa annectens. SI: caecum. Lo: not reported. Reference: Bump & Bump (1969).

Subulura sp.
Hosts: Notura darwinii darwinii; Notura darwinii salvadorii. SI: caecum. Lo: not reported. Reference: Bump & Bump (1969).

Order Spirurida
Superfamily Acuarioidea
Family Acuariidae
Genus Ancyracanthopsis Diesing, 1861a
Ancyrananthopsis winegardi Wong & Anderson, 1990
Host: Larus dominicanus. SI: gizzard. Lo: Balneario Orense (-38.70, -59.7833), Buenos Aires Province. Material deposited: MLP–He 4552. Reference: Cremonte et al. (2000).
Genus *Cosmocephalus* Molin, 1858a

*Cosmocephalus obvelatus* (Creplin, 1825)

**Host:** *Larus dominicanus*. **SI:** esophagus. **Lo:** Chubut Province. **Material deposited:** MLP–He 4811-1 (cited as 4811) and CNP–Par 17. **Reference:** Díaz et al. (2011a).

**Host:** *Spheniscus magellanicus*. **SI:** esophagus. **Lo:** Peninsula (-42.0667 to -42.8833, -63.633 to -64.5), Chubut Province. **Material deposited:** MLP–He 4811. **References:** Díaz et al. (2001, 2010).

Genus *Desportesius* Chabaud & Campana, 1949

*Desportesius longevaginatus* (Molin, 1860b)

**Host:** *Ciconia maguari*. **SI:** esophagus. **Lo:** not reported. **Reference:** Boero et al. (1972b). **Comment:** cited as *Synhimantus longevaginatus* (Molin, 1860b), and later this species was synonymized with *D. longevaginatus* by Wong et al. (1986).

Genus *Echinuria* Soloviev, 1912

*Echinuria cygni* Morini, Colombo & Martin, 1959

**Host:** *Cygnus melancoryphus*. **SI:** proventriculus². **Lo:** Buenos Aires Zoological Garden, Buenos Aires city¹; La Plata Zoological Garden, Buenos Aires Province². **References:** Rodriguez & Boero (1964)⁴; Boero & Led (1968)². **Comment:** the females of this species were originally described by Morini, Colombo & Martin in the proceedings of a meeting “*Actas y Trabajos del primer congreso Sudamericano de Zoología*” in 1959. Rodriguez & Boero (1964) and Boero & Led (1968) consider it a valid species, and described the males.

**Echinuria skrjabiniensis** Efimov in Skrjabin, Sobolev & Ivashkin, 1965

**Host:** *Calidris bairdii*. **SI:** proventriculus. **Lo:** Estancia María Cristina (-43.55, -70.6333), Sarmiento (-45.5833, -69.1167) and Estancia Quicahua (-42.45, -71.2167), Chubut Province. **Material deposited:** MLP–He 6346. **Reference:** Díaz et al. (2011b).

**Host:** *Calidris fuscicollis*. **SI:** proventriculus. **Lo:** Caleta Valdés (-42.50, -63.4167), Bahía Bustamante (-54.10, -66.5167) and Laguna del Ornitólogo (-43.2333, -65.2333), Chubut Province. **Material deposited:** MLP–He 6347. **Reference:** Díaz et al. (2011b).

**Host:** *Phoenicoperus chilensis*. **SI:** proventriculus. **Lo:** Epecuén Lake (-37.2167, -62.85), Buenos Aires Province. **Material deposited:** MLP–He 7258. **Reference:** Núñez et al. (2017).

Genus *Echinuria uncinata* (Rudolphi, 1819)

**Host:** *Lophonetta specularioides*. **SI:** lumen of proventriculus. **Lo:** San Jorge Gulf (-45.0333, -65.8667), Chubut Province. **Material deposited:** MLP–He 7021 and CNP–Par (number not provided). **Reference:** Agüero et al. (2015).

**Host:** *Netta peoposaca*. **SI:** proximal esophagus, almost at the junction with the proventriculus, within granulomas. **Lo:** Alvear (-29.1536, -56.9094), Corrientes Province. **Material deposited:** CHIOC 36627, 36628. **Reference:** Silveira et al. (2006).

Genus *Ingliseria* Gibson, 1968

*Ingliseria cirrhohamata* (Linstow, 1888)

**Host:** *Phalacrocorax atriceps* [cited as *P. (atriceps) albiventer*]. **SI:** esophagus. **Lo:** Patagonian Gulves (-42.0667 to -42.8833, -63.35 to -65.0667), Chubut Province. **Material deposited:** MLP–He 5863. **Reference:** Díaz et al. (2009).

**Host:** *Phalacrocorax brasilianus*. **SI:** esophagus. **Lo:** Patagonian Gulves (-42.0667 to -42.8833, -63.35 to -65.0667), Chubut Province. **Material deposited:** MLP–He 5864. **Reference:** Díaz et al. (2009).

Genus *Paracuaria* Rao, 1951

*Paracuaria adunca* (Creplin, 1846)

**Host:** *Larus dominicanus*. **SI:** under the koilin at the junction of the proventriculus and gizzard¹ and esophagus². **Lo:** Puerto Madryn (-42.7833, -65.0333) and Fracasso Beach (-42.4167, -64.1167), Chubut Province¹; Chubut Province². **Material deposited:** MLP–He 5825⁴; CNP–Par 18². **References:** Díaz et al. (2004¹, 2011a²).

Genus *Pectinospirura* Wehr, 1933

*Pectinospirura argentata* Wehr, 1933

**Host:** *Larus atlanticus*. **SI:** proventriculus. **Lo:** Bahía Blanca estuary¹ and Isla del Puerto (-38.80, -62.25²), Buenos Aires Province. **Material deposited:** MLP–He 5896¹. **References:** La Sala et al. (2009¹, 2012²).

**Host:** *Larus dominicanus*. **SI:** proventriculus. **Lo:** Balneario Orense (-38.70, -59.7833)¹ and Mar del Plata (-38.0833, -57.6333²), Buenos Aires Province. **Material deposited:** MLP–He 4064 (cited as 40,064)². **References:** Cremonte & Navone (1999)¹; Labriola & Suriano (2001)².
Genus *Sciadiocara* Skrjabin, 1916a
*Sciadiocara haematopodi* Cremonte, Navone & Ethegoin, 1999

**Host:** *Haematopus palliatus*. **SI:** gizzard. **Lo:** Mar Chiquita coastal lagoon (-37.7667, -57.45), Buenos Aires Province. **Material deposited:** MLP–He 4066/1, 4066/2, 4066/3 (cited as 40,066/1, 40,066/2, 40,066/3).

**Reference:** Cremonte et al. (1999).

**Host:** *Larus dominicanus*. **SI:** gizzard. **Lo:** Balneario Orense (-38.70, -59.7833), Buenos Aires Province. **Reference:** Cremonte et al. (1999).

**Comment:** Cremonte et al. (2000) reported third and fourth stage larvae of this species parasitizing *Larus dominicanus* from Mar Chiquita coastal Lagoon.

*Sciadiocara legendrei* (Petter, 1967)

**Host:** *Tachyeres leucocephalus*. **SI:** gizzard. **Lo:** San Jorge Gulf (-45.0333, -65.8667), Chubut Province. **Material deposited:** MLP–He 7023 and CNP–Par (number not provided). **Reference:** Agüero et al. (2015).

*Sciadiocara* sp.

**Host:** *Larus atlanticus*. **SI:** proventriculus. **Lo:** Isla del Puerto (-38.80, -62.25), Bahía Blanca estuary, Buenos Aires Province. **Material deposited:** MLP–He 5898.

**References:** La Sala et al. (2009, 2012).

*Genus Skrjabinoclava* Sobolev, 1943

*Skrjabinoclava andersoni* Cremonte & Navone, 1999

**Host:** *Larus atlanticus*. **SI:** proventriculus. **Lo:** Isla del Puerto (-38.80, -62.25), Bahía Blanca estuary, Buenos Aires Province. **Material deposited:** MLP–He 5897.

**References:** La Sala et al. (2009, 2012).

**Host:** *Larus dominicanus*. **SI:** proventriculus. **Lo:** Balneario Orense (-38.70, -59.7833), Buenos Aires Province. **Material deposited:** MLP–He 4065/1, 4065/2, 4065/3 (cited as 40,065/1, 40,065/2, 40,065/3).

**Reference:** Cremonte & Navone (1999).

*Skrjabinoclava* sp.

**Host:** *Larus dominicanus*. **SI:** not reported. **Lo:** Mar del Plata (-38.0833, -57.6333), Buenos Aires Province. **Reference:** Labriola & Suriano (2001).

Genus *Stegophorus* Wehr, 1934

*Stegophorus diomedae* (Johnston & Mawson, 1942)

**Host:** *Thalassarche melanophris* (cited as *Diomedea m.*). **SI:** muscular stomach. **Lo:** Fracasso Beach (-42.4167, -64.1167) and San José Gulf, Peninsula Valdés, Chubut Province. **Material deposited:** MLP–He 5095. **Reference:** Cremonte et al. (2002).

Genus *Streptocara* Railliet, Henry & Sisoff, 1912

*Streptocara formosensis* Sugimoto, 1930

**Host:** *Tachyeres leucocephalus*. **SI:** gizzard. **Lo:** Bahía Melo (-45.65, -65.8833) and San Jorge Gulf (-45.0333, -65.8667)2, Chubut Province. **Material deposited:** MLP–He 6661 and CNP–Par 601. **References:** Agüero & Díaz (2013)1; Agüero et al. (2015)2.

*Genus Syncuaria* Gilbert, 1927

*Syncuaria diacantha* Petter, 1961

**Host:** *Platalea ajaja*. **SI:** gizzard. **Lo:** Guaminí Lagoon (-37.00, -62.4833), Buenos Aires Province. **Material deposited:** MLP–He 4301/4. **Reference:** Digiani (1999).

*Syncuaria plegadis* Digiani, 1999

**Host:** *Plegadis chihi*. **SI:** gizzard. **Lo:** Punta Blanca (-34.9333, -57.6833), Guaminí Lagoon (-37.00, -62.4833) and Ramallo (-33.4667, -60.0333), Buenos Aires Province. **Material deposited:** MLP–He 3714/3, 3702/4, 3701/4, 3741/5, 3713/5, 3734/5 and IPCAS Helm. Coll. 749. **Reference:** Digiani (1999).

*Genus Synhimantus* Railliet, Henry & Sisoff, 1912

*Synhimantus milvagoi* Boero & Led, 1971

**Host:** *Phalacrocorax chimango*. **SI:** stomach. **Lo:** Uribelarrea, Buenos Aires Province. **Reference:** Boero & Led (1971).

*Subgenus Synhimantus* (Dispharynx) Railliet, Henry & Sisoff, 1912

*Synhimantus (Dispharynx) brevicordon* Schuurmans Stekhoven, 1951

**Host:** *Falco sparverius cinnamominus*. **SI:** cavity and stomach. **Lo:** Tafi del Valle, Tucumán Province. **Material deposited:** CH–N–FML 626. **Reference:** Schuurmans Stekhoven (1951). **Comment:** cited as *Dispharynx brevicordon*.

**Host:** *Muscisaxicola maculirostris maculirostris*. **SI:** cavity. **Lo:** Tafi del Valle, Tucumán Province. **Material deposited:**
**Synhimantus (Dispharynx) nasuta Chabaud, 1975**

**Host:** Sturnus vulgaris. **SI:** esophagus, proventriculus, and gizzard. **Lo:** Bernal (-34.6956, -58.2667), Buenos Aires Province. **Material deposited:** MLP–He 6733. **Reference:** Valente et al. (2014).

**Subgenus Synhimantus (Synhimantus) Railliet, Henry & Sisoff, 1912**

**Synhimantus (Synhimantus) laticeps** (Rudolfi, 1819)

**Host:** Asio clamator. **SI:** proventriculus. **Lo:** San Clemente del Tuyú (-36.35, -56.7167), Buenos Aires Province. **Material deposited:** MLP–He 7246. **Comment:** cited as *S. (S.) cf. laticeps*.

**Host:** Tyto alba. **SI:** gizzard. **Lo:** Mar Chiquita (-37.7667, -57.45), Buenos Aires Province. **Material deposited:** MLP–He 4609. **Reference:** Etchegoin et al. (2000).

**Superfamily Aproctoidea**

**Family Aproctidae**

**Genus Aprocta Linstow, 1883**

**Aprocta colaptidis** Schuurmans Stekhoven, 1951

**Host:** Colaptes campestroides. **SI:** neck (muscles and under the skin). **Lo:** Yabebiry Stream, San Ignacio, Misiones Province. **Reference:** Schuurmans Stekhoven (1951).

**Host:** Furnarius rufus. **SI:** squamous tissue of legs. **Lo:** Aguapey River, Misiones Province. **Reference:** Boero et al. (1972a).

**Host:** Zonotrichia capensis. **SI:** squamous tissue of legs. **Lo:** Aguapey River, Misiones Province. **Reference:** Boero et al. (1972a).

**Aprocta ptiloscelidis** Schuurmans Stekhoven, 1951

**Host:** Vanellus resplendens (cited as *Ptiloscelys resplendens*). **SI:** nasal cavity. **Lo:** Tafi del Valle, Tucumán Province. **Material deposited:** CH–N–FML 236. **Reference:** Schuurmans Stekhoven (1951).

**Genus Tetracheilonema Diesing, 1861a**

**Tetracheilonema quadriradiatum** (Molin, 1858b)

**Host:** Colaptes campestroides. **SI:** kidney (capsular membrane and adipose tissue) and neck (muscles and under the skin). **Lo:** Yabebiry Stream, San Ignacio, Misiones Province. **Reference:** Schuurmans Stekhoven (1951).

**Host:** Crypturellus tataupa. **SI:** thoracic and abdominal cavity. **Lo:** La Plata Zoological Garden, Buenos Aires Province. **Reference:** Boero & Led (1968).

**Hosts:** Nothura darwini darwini; Nothura darwini salvadorii. **SI:** body cavity. **Lo:** not reported. **Reference:** Bump & Bump (1969).

**Hosts:** Nothura maculosa; Nothura maculosa annectens; Nothura maculosa maculosa; Nothura maculosa nigroguttata. **SI:** kidney (capsular membrane and adipose tissue) and neck (muscles and under the skin); thoracic and abdominal cavity. **Lo:** Maipú, Magdalena and Coronel Dorrego, Buenos Aires Province; not reported; Yabebiry Stream, San Ignacio, Misiones Province; Buenos Aires Province. **Material deposited:** CH–N–FML 263, 264. **References:** Schuurmans Stekhoven (1951); Boero et al. (1968); Bump & Bump (1969); Kaseta (1973).

**Superfamily Diplotriaenoidea**

**Family Diplotriaenidæ**

**Genus Dicheilonema Diesing, 1861a**

**Dicheilonema rheae** (Owen, 1843)

**Host:** Coscoroba coscoroba. **SI:** general cavity. **Lo:** Azul, Buenos Aires Province. **Reference:** Gutiérrez (1956).

**Hosts:** Rhea americana; Rhea americana albescens (cited as *Rhea americana rothschildi*). **SI:** stomach; egg, thoracic and abdominal cavity; thoracic region (between flesh and bone); general cavity (peritoneum); abdominal and thoracic air sacs, coelomic cavity and subcutaneous tissue of left paw (femoro-tibial joint). **Lo:** Bahía Blanca, Buenos Aires Province; Luján, Buenos Aires Province; Argentinean Chaco; Buenos Aires Province. **Material deposited:** CH–N–FML 787. **References:** Cobbold (1873, 1886); Berg (1896); Marelli & Ubach (1923); Schuurmans Stekhoven (1951); Gutiérrez (1956); Comolli et al. (2011). **Comment:** cited these specimens as Filaria horrida Diesing, 1851. Yamaguti (1961) considered *F. horrida* synonymous of *D. rheae*.

**Host:** Rhea pennata garleppi (cited as *Pterocnemia p. g*.). **SI:** intercostal space (under the skin) and general cavity. **Lo:** Andalgalá, Catamarca Province. **Material deposited:** CH–N–FML 1060, 1071. **Reference:** Schuurmans Stekhoven (1951).
Genus *Diplotriaena* Henry & O’Zoux, 1909

*Diplotriaena modesta* Schuurmans Stekhoven, 1951

**Host:** *Aethenes modesta modesta*. **SI:** general cavity. **Lo:** Tafi del Valle, Tucumán Province. **Material deposited:** CH–N–FML 624. **Reference:** Schuurmans Stekhoven (1951).

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**Diplotriaena muscisaxicola**
Schuurmans Stekhoven, 1951

**Host:** *Muscisaxicola maculirostris maculirostris*. **SI:** general cavity. **Lo:** Tafi del Valle, Tucumán Province. **Reference:** Schuurmans Stekhoven (1951).

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Genus *Hamatospiculum* Skrjabin, 1916b

*Hamatospiculum flagellispiculosum* Schuurmans Stekhoven, 1951

**Host:** *Asio clamator* (cited as *Rhinoptynx clamator maculatus*). **SI:** neck. **Lo:** Bella Vista, Faimallá Departament, Tucumán Province. **Material deposited:** CH–N–FML 72. **Reference:** Schuurmans Stekhoven (1951).

**Host:** *Campephilus magellanicus*. **SI:** joints of the legs and tail. **Lo:** San Carlos de Bariloche (-41.179, -71.415), Rio Negro Province. **Reference:** Casalins et al. (2019).

**Host:** *Myiodynastes maculatus solitarius* (cited as *Myiodynastes solitarius*). **SI:** intestine. **Lo:** Tafi Viejo, Tucumán Province. **Reference:** Schuurmans Stekhoven (1951).

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**Hamatospiculum insigne** (Schneider, 1866)

**Host:** *Colaptes campestris*. **SI:** neck (muscles and under the skin). **Lo:** Yabebiry Stream, San Ignacio, Misiones Province. **Reference:** Schuurmans Stekhoven (1951).

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Genus *Monopetalonema* Diesing, 1861a

*Monopetalonema alcedinis* (Rudolphi, 1819)

**Host:** *Megaceryle torquata* (cited as *Ceryle torquata*). **SI:** abdominal cavity. **Lo:** Tucumán Province. **Reference:** Parona (1900). **Comments:** cited as *Filaria physalura* Bremser in Diesing 1851, and considered as synonymous of *M. alcedinis* by Yamaguti (1961).

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Genus *Serratospiculum* Skrjabin, 1915

*Serratospiculum tendo* (Nitzsch in Giebel, 1857)

**Host:** *Asio flammeus* (cited as *Asio brachyotus*). **SI:** under the skin of the nuchal region. **Lo:** not reported.

**Reference:** Parona (1900). **Comment:** cited as *Filaria attenuata* Rudolphi 1819.

**Host:** *Falco peregrinus cassini*. **SI:** air sacs. **Lo:** Maipú Department, Mendoza Province. **Reference:** Ibarra et al. (2019).

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Superfamily Filarioidea

Family Filaridae

**Genus Filaria** Müller, 1787

*Filaria bipapillosa* Molin, 1858b

**Host:** *Athene cunicularia* (cited as *Noctua cunicularia*). **SI:** under the skin. **Lo:** Buenos Aires Province. **Reference:** Parona (1900).

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Family Onchocercidae

**Genus Pelecitus Railliet & Henry, 1910**

*Pelecitus fulicaeatrae* (Diesing, 1861a)

**Host:** *Podiceps occipitalis*. **SI:** nodule of the tibiotarsometatarsus articulation. **Lo:** Puerto Madryn (-42.00, -65), Chubut Province. **Material deposited:** MLP–He 5702. **Reference:** Escudero et al. (2007).

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**Pelecitus tercostatus** (Molin, 1860c)

**Host:** *Amazona vinacea*. **SI:** subcutaneous nodes in both legs. **Lo:** San Pedro (-26.6217, -54.1097), Misiones Province. **Material deposited:** MLP–He 6504. **Reference:** Diaz et al. (2012).

**Host:** *Pionus maximiliani siv*. **SI:** leg joints. **Lo:** San Antonio, Misiones Province. **Material deposited:** CH–N–FML 258. **Reference:** Schuurmans Stekhoven (1951).

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Superfamily Habronematoidea

Family Habronematidae

**Genus Habronema** Diesing, 1861b

*Habronema sp.*

**Hosts:** *Nothura darwini darwini; N. d. salvadorii*. **SI:** proventriculus and gizzard. **Lo:** not reported. **Reference:** Bump & Bump (1969).

**Host:** *Nothura maculosa annectens*. **SI:** proventriculus and gizzard. **Lo:** not reported. **Reference:** Bump & Bump (1969).

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**Genus Procyrnea** Chabaud, 1958

*Procyrnea choique* Bagnato, Frixione, Digiani & Cremonete, 2017

**Host:** *Rhea pennata*. **SI:** proventriculus. **Lo:** Protected Natural Area Peninsula Valdés (-42.5407, -64.7901),...
Tetrameridae

Genus Tetrameres Creplin, 1846

**Tetrameres sp.**

**Host:** Coscoroba coscoroba. SI: proventriculus. Lo: La Plata Zoological Garden, La Plata, Buenos Aires Province. **Reference:** Boero & Led (1968).

**Host:** Phoenicopterus chilensis. SI: proventriculus. Lo: Frazasso Beach, San Jorge Gulf (-42.4167, -64.1167), Chubut Province. **Reference:** Boero & Led (1968).

Subgenus Tetrameres (Gynaecophila) Gubanov, 1950

**Tetrameres (Gynaecophila) aspicula** Digiani, 2000

**Host:** Plegadis chihi. SI: proventriculus, females within the glands and males free in the lumen. Lo: Punta Blanca (-34.9333, -57.6833), Guaminí (-37.00, -62.4833) and Ramallo (-33.5833, -59.8167), Buenos Aires Province. **Material deposited:** MLP–He 3778/5, 3682/1 and NHMUK 1999.11.29.1-6. **Reference:** Digiani (2000).

Subgenus Tetrameres (Petrovimeres) Chertkova, 1953

**Tetrameres (Petrovimeres) fissispina** (Diesing, 1861a)

**Host:** Lophonetta specularioides. SI: proventricular glands. Lo: San Jorge Gulf (-45.0333, -65.8667), Chubut Province. **Material deposited:** MLP–He 7022 and CNP–Par (numbers not provided). **Reference:** Agüero et al. (2015).

Subgenus Tetrameres (Tetrameres) Creplin, 1846

**Tetrameres (Tetrameres) megaphasmiadiatia** Cremonet, Digiani, Bala & Navone, 2001

**Host:** Calidris fuscicollis. SI: proventriculus, females within the glands and males free in the lumen. Lo: Fracasso Beach, San Jorge Gulf (-42.4167, -64.1167), Chubut Province. **Material deposited:** MLP–He 4617. **Reference:** Cremonet et al. (2001).

**Host:** Charadrius falklandicus. SI: proventriculus, females within the glands and males free in the lumen. Lo: Fracasso Beach, San Jorge Gulf (-42.4167, -64.1167), Chubut Province. **Material deposited:** MLP–He 4614, 4615, 4616, 4618. **Reference:** Cremonet et al. (2001).

**Tetrameres (Tetrameres) spalina** Núñez, Drago, Digiani & Lunaschi, 2017

**Host:** Phoenicopterus chilensis. SI: proventriculus. Lo: Epecuen Lake (-37.2167, -62.85) and Del Monte Lake (-36.9833, -62.4667), Buenos Aires Province. **Material deposited:** MLP–He 7254, 7255, 7256, 7257. **Reference:** Núñez et al. (2017).

**Tetrameres (Tetrameres) spirospiculum** Pinto & Vicente, 1995

**Host:** Theristicus melanopis (as Theristicus melanopis melanopis). SI: proventriculus. Lo: Rahue (-39.35, -70.9167), Neuquén, Province. **Material deposited:** MLP–He 4600/2. **Reference:** Digiani & Crempote (2001).

**Tetrameres (Tetrameres) tinamicola** Pence, Mollhagen & Prestwood, 1975

**Hosts:** Eudromia elegans albiga; Eudromia elegans elegans. SI: proventriculus, females within the glands and males free in the lumen. Lo: Tupungato, Mendoza Province and San Luis Province. **Material deposited:** USNM 1369385, 1369386, 1369387 (cited as 73822, 72823, 73824). **Reference:** Pence et al. (1975).

Genus Microtetrameres (Travassos, 1915)

**Microtetrameres canadensis argentinensis** Labriola & Suriano, 1996

**Host:** Bubulcus ibis ibis. SI: proventriculus. Lo: De Monte pond, San Miguel del Monte (-35.45, -58.7833), Buenos Aires Province. **Material deposited:** MACN–pa 384. **Reference:** Labriola & Suriano (1996).

**Microtetrameres urubitinta** Dueñas Díaz, Drago & Núñez, 2018

**Host:** Buteogallus urubitinta. SI: proventriculus; females within the glands, males free in the lumen. Lo: La Marcela farm (-26.2931, -59.1439), Pirané, Formosa Province. **Material deposited:** MLP–He 7447, 7448, 7449, 7450. **Reference:** Dueñas Díaz et al. (2018).

**Microtetrameres sp.**

**Host:** Coryphospingus cucullatus. SI: proventriculus. Lo: La Plata Zoological Garden, Buenos Aires Province. **Reference:** Boero & Led (1968).

**Host:** Cyanocorax chrysops. SI: proventriculus. Lo: La Plata Zoological Garden, Buenos Aires Province. **Reference:** Boero & Led (1968).
**Nematode parasites of Argentinean birds**

**Host:** *Sturnus vulgaris*. **SI:** proventriculus. **Lo:** Bernal (-34.6956, -58.2667), Buenos Aires Province. **Material deposited:** MLP–He 6734. **Reference:** Valente et al. (2014).

**Superfamily Physalopteroidea**  
**Family Physalopteridae**  
**Genus Physaloptera** Rudolphi, 1819  
**Physaloptera alata** Rudolphi, 1819  
**Host:** *Circus cinereus*. **SI:** cavity. **Lo:** Tafí del Valle, Tucumán Province. **Reference:** Schuurmans Stekhoven (1951).

**Superfamily Thelazioidea**  
**Family Thelaziidae**  
**Genus Thelazia** Bosc, 1819  
**Thelazia longicaudata** Schuurmans Stekhoven, 1951  
**Host:** *Strix rufipes rufipes*. **SI:** eyes. **Lo:** Pozo Hondo, Santiago del Estero Province. **Material deposited:** CH–N–FML 1297. **Reference:** Schuurmans Stekhoven (1951).

**Order Strongylida**  
**Superfamily Strongyloidea**  
**Family Deletrocephalidae**  
**Genus Paradeletrocephalus** Freitas & Lent, 1947  
**Paradeletrocephalus minor** (Molin, 1861)  
**Host:** *Rhea americana*. **SI:** intestine. **Lo:** Los Planteles farm, Tandil, Buenos Aires Province. **References:** Parona (1900), Comolli et al. (2006). **Comment:** cited as *Strongylus dimidiatus* (Diesing, 1851) by Parona (1900). This species was synonymized with *P. minor* by Freitas & Lent (1947).

**Superfamily Trichostrongyloidea**  
**Family Amidostomatidae**  
**Genus Epomidiostomum** Skrjabin, 1916a  
**Epomidiostomum vogelsangi** Travassos, 1937  
**Host:** *Cygnus melancoryphus*. **SI:** gizzard. **Lo:** La Plata Zoological Garden, Buenos Aires Province; Nuevo Gulf (-43.333, -65.333), Chubut Province. **Material deposited:** MLP–He 7024 and CNP–Par 2. **References:** Boero & Led (1968); Agüero et al. (2015).

**Species incertae sedis**  
**Microfilaria corderoi** Mazza & Franke, 1928 in the bloodstream of *Campephilus leucopogon* (cited as *Scapaneus leucopogon*) (Piciformes, Picidae) from Zapla, Jujuy Province (Mazza & Franke, 1928).

**Microfilaria fonsecai** Mazza & Franke, 1928 in the bloodstream of *Coryphosphingus cucullatus* (Passeriformes, Thraupidae) from Zapla, Jujuy Province (Mazza & Franke, 1928).

**Microfilaria parodii** Mazza & Franke, 1928 in the bloodstream of *Cyanocorax chrysops* (Passeriformes, Corvidae) from Zapla, Jujuy Province (Mazza & Franke, 1928).

**Microfilaria rojasi** Mazza, Deautier & Steullet, 1927 in the bloodstream of *Ictinia plumbea* (Accipitridae, Accipitriformes) from Colonia Azara, Misiones (Mazza et al., 1927).

**Microfilariae** in the bloodstream of *Turdus leucomelas* (Passeriformes, Turdidae) from Tucumán Province (Biglieri, 1918).

**Species inquirenda**  
**Cosmocephalus argentinensis** Boero & Led, 1970 was briefly described in the proceedings of a congress, based only on female specimens found parasitizing *Spheniscus magellanicus* from the La Plata Zoological Garden. Later, it was considered *species inquirenda* by Díaz et al. (2001) because of its inadequate description, no type material deposited and not formally published.

**Host-parasite list**

**Order Accipitriformes**  
**Family Accipitridae**  
**Buteogallus urubitinga**  
**Microtetrameres urubitinga**  
**Circus cinereus**  
**Physaloptera alata**

**Order Anseriformes**  
**Family Anatidae**  
**Coscoroba coscoroba**  
**Dichelonema rheae**  
**Tetrameres sp.**  
**Cygnus melancoryphus**  
**Echinuria cygni**  
**Epomidiostomum vogelsangi**  
**Lophonetta specularioides**  
**Echinuria uncinata**  
**Tetrameres (Petroximeres) fissa spinia**

**Netta peposaca**  
**Echinuria uncinata**  
**Tachyeres leucocephalus**  
**Sciadiocara legendrei**  
**Streptocara formosensis**

**Order Charadriiformes**  
**Family Charadriidae**  
**Charadrius falklandicus**  
**Tetrameres (Tetrameres) megaphasmidiata**
Oreopholus ruficollis
Oxyema sp.
Vanellus resplendens
Aprocta piloscelidis

Family Haematopodidae
Haematopus pallatus
Sciadiocara haematopodi

Family Laridae
Larus atlanticus
Pectinospirura argentata
Sciadiocara sp.
Skrjabinoclava andersoni
Larus dominicanus
Ancyracanthopsis vinegardi
Capillaria sp.
Contracaecum sp.
Cosmocephalus obvelatus
Eucolus sp.
Paracuaria aduna
Pectinospirura argentata
Sciadiocara haematopodi
Skrjabinoclava andersoni
Skrjabinoclava sp.

Family Scolopacidae
Calidris bairdii
Echinuria skrjabinensis
Calidris fuscicollis
Echinuria skrjabinensis
Tetrameres (Tetrameres) megaphasmiadiata

Order Coraciformes
Family Alcedinidae
Megaceryle torquata
Monopetalonema alcedinis

Order Falconiformes
Family Falconidae
Falco peregrinus cassini
Serratospiculum tendo
Falco sparverius cinnamoninis
Synhimantus (Dispharynx) brevicordon
Phalcoboenus chimango
Synhimantus milvagoi

Order Gruiformes
Family Railidae
Fulica leucoptera
Contracaecum sp.

Order Passeriformes
Family Corvidae
Cyanocorax chrysops
Microtetramereres sp.

Family Furnariidae
Asthenes modesta modesta
Diplotriaena modesta
Furnarius rufus
Aprocta colaptidis

Family Passerellidae
Zonotrichia capensis
Aprocta colaptidis

Family Sturnidae
Sturnus vulgaris (introduced species)
Microtetramereres sp.
Ornithocapillaria ovopunctata
Pterothominx exilis
Synhimantus (Dispharynx) nasuta

Family Tyrannidae
Muscisaxicola maculirostris maculirostris
Synhimantus (Dispharynx) brevicordon
Diplotriaena muscisaxicola
Myiodynastes maculatus solitarius
Hamatospiculum flagellispiculorum

Order Pelecaniformes
Family Ardeidae
Ardea alba
Contracaecum multipapillatum
Ardea alba egretta
Contracaecum microcephalum
Contracaecum multipapillatum
Ardea cocoi
Contracaecum microcephalum
Bubulcus ibis ibis
Contracaecum multipapillatum
Contracaecum microcephalum
Egretta thula thula
Contracaecum multipapillatum
Nycticorax nycticorax
Contracaecum microcephalum

Family Ciconiidae
Ciconia maguari
Desportesius longevaginatus

Family Phalacrocoracidae
Phalacrocorax albiventer
Contracaecum travassosi
Contracaecum sp.
Phalacrocorax atriceps
Contracaecum chubutensis
Contracaecum sp.
Ingliseria cirrohamata
Nematode parasites of Argentinean birds

**Phalacrocorax brasilianus**  
Contracaecum australe  
Contracaecum sp.  
Ingliseria cirrhamata

**Phalacrocorax gaimardi**  
Contracaecum sp.  
Contracaecum australe

**Family Threskiornithidae**  
*Platalea ajaja*  
Syncuaria diacantha

**Plegadis chihi**  
Porrocaecum heteropterum  
Syncuaria plegadisi  
Tetramerhes (Gynaecophila) aspicula

**Theristicus melanopis**  
Porrocaecum heteropterum  
Tetramerhes (Tetramerhes) spiroscopicul

**Order Phoenicopteriformes**  
**Family Phoenicopteridae**  
*Phoenicopterus chilensis*  
Echinuria skrjabiniiensis  
Tetramerhes (Tetramerhes) salina  
Tetramerhes sp.

**Order Piciformes**  
**Family Picidae**  
*Campephilus magellanicus*  
Hamatospiculum flagellispiculosum

**Colaptes campestrisedes**  
Aprocta colaptidis  
Hamatospiculum insigne  
Tetracheilonema quadrabibatatum

**Order Podicipediformes**  
**Family Podicipedidae**  
*Podiceps major*  
Eustrongylides tubifex

*Podiceps occipitalis*  
Pelecitus fulicaeatrae

**Rollandia rolland**  
Contracaecum ovale

**Order Psittaciformes**  
**Family Psittacidae**  
*Amazona vinacea*  
Pelecitus tercostatus

*Ara chloropterus*  
Ascaridia hermaphrodotida

*Pionus maximiliani*  
Ascaridia hermaphrodotida  
Pelecitus tercostatus

**Order Procellariiformes**  
**Family Diomeadeidae**  
*Thalassarche melanophрис*  
Contracaecum pelagicum  
Stegophorus diomedeae

**Order Rheiformes**  
**Family Rheidae**  
*Rhea americana*  
Dicheilonema rheae  
Paradeletrocephalus minor

*Rhea americana albescens*  
Dicheilonema rheae

*Rhea pennata*  
Procyrnea choique

*Rhea pennata garleppi*  
Dicheilonema rheae

**Order Sphenisciformes**  
**Family Spheniscidae**  
*Spheniscus magellanicanus*  
Contracaecum mirounga  
Contracaecum pelagicum  
Contracaecum sp.  
Cosmocephalus obvelatus  
Eudyptes chrysoce

**Order Strigiformes**  
**Family Tytonidae**  
*Tyto alba*  
Synhimantus (Synhimantus) laticeps

**Family Strigidae**  
*Asio flammens*  
Serratospiculum tendo

*Asio clamator*  
Hamatospiculum flagellispiculosum  
Synhimantus (Synhimantus) cf. laticeps

*Athene cunicularia*  
Filaria bipapillosa

*Megascops choliba*  
Skrabinura sp.

*Strix rufipes rufipes*  
Thelazia longicaudata

**Order Tinamiformes**  
**Family Tinamidae**  
*Crypturellus tataupa*  
Odontoterakis valvata  
Subulura strongylina  
Tetracheilonema quadrabibatatum

**Eudromia elegans**  
Eudromoxyura aspicularis

**Eudromia elegans albida**  
Eudromoxyura aspicularis  
Tetracheres (Tetramerhes) tinamicol
**Tetrameres**

*Eudromoxyura aspiculuris*

*Subulura sp.*

*Nothura maculosa nigroguttata*

*Subulura* sp.

*Dipetalonema quadrilabiatum*

*Subulura olympioi*

*Habronema* sp.

*Subulura* sp.

*Heterakis* sp.

*Subulura* sp.

*Eucoleus penidoi*

*Subulura* sp.

*Habronema* sp.

*Subulura* sp.

*Tetracheilonema quadrilabiatum*

*Subulura* sp.

*Habronema* sp.

*Subulura* sp.

*Nothura darwinii darwinii*

*Subulura* sp.

*Tetracheilonema quadrilabiatum*

*Subulura* sp.

*Tetracheilonema quadrilabiatum*

*Subulura* sp.

**DISCUSSION**

Helminths of wild birds have been less studied than those of other vertebrates, mainly because the birds are one of the most charismatic and protected groups. Then, it is difficult to obtain a sufficient number of these hosts because many are protected by national and international laws (Pérez Ponce de León et al., 2011). Much of the information available on parasites in wild birds comes from studies carried out in birds that died by natural causes (Núñez et al., 2017, 2018). Other important sources of information for taxonomic studies on helminths of birds are the helminthological collections, which preserve information on spatial and temporal biodiversity (Drago et al., 2018).

Reports of nematodes parasitizing wild birds were found in 17 of the 23 Argentinean Provinces. Most of the studies were carried out in Buenos Aires Province, with 63 reports, followed by Chubut and Tucumán Province with 38 and 11 reports, respectively. In Chaco, Entre Ríos, Jujuy, La Rioja, Santa Fe and Tierra del Fuego Provinces no nematodes have been reported parasitizing wild birds. The rest of the Provinces presented less than ten records. Sixteen reports were carried out in Zoological Gardens. This seems to be more related to the development of this line of work in scientific research centers in these Provinces, than with the real diversity in each Province, i.e. Centro de Estudios Parasitológicos y de Vectores (CEPAVE), Museo de la Plata and Facultad de Ciencias Veterinarias de La Plata in Buenos Aires Province, Centro Nacional Patagónico (CENPAT) in Chubut Province and Instituto Miguel Lillo in Tucumán Province. Sixteen reports were carried out in Zoological Gardens.

In Argentina, 1042 species of birds (1033 native and nine introduced species) belonging to 86 families have been reported (Roesler & González Táboas, 2016); however, only 65 bird species (6.24%) grouped into 29 families have been reported to be parasitized by adult nematodes. The families of birds with the highest number of reported taxa are Tinamidae, Laridae, Anatidae and Phalacrocoracidae with 12, 11, 8 and 7 taxa reported, respectively. The bird species with the highest number of taxa of nematodes reported are *Larus dominicanus* (Laridae) and *Nothura maculosa* (Tinamidae) with 10 and 9 taxa reported, respectively. *Larus dominicanus* is an abundant species that inhabits a great diversity of environments and has a generalist and opportunistic diet (Yorio et al., 2013), which means that it would be more likely to acquire a wide variety of nematodes with indirect life cycle. In addition, the helminths of these birds have been studied in numerous opportunities, being also the bird species with the highest number of digenean species reported (see Lunaschi et al., 2007; Drago & Lunaschi, 2015). The higher number of reports in tinamids may be related to the abundance of these birds and their ease of collection, because it is a species consumed by local inhabitants and the contribution of rural hunters with viscera is frequent. Only one introduced species, the European starling (*S. vulgaris*), was reported as host of nematodes. The first sightings of these birds in Argentina were in the city of Buenos Aires in 1987, expanding its distribution to various Provinces (Jensen, 2008). Although only one paper related to its helminths was published, three nominal species and one taxon identified at generic level of nematodes were reported (Valente et al., 2014).

The highest number of taxa of nematodes was recorded in the family Acuariidae with 20 nominal species and two taxa identified at generic level, followed by Anisakidae with eight and one, and Tetrameridae with eight and two, respectively. This could be related to the preference of habitat of studied birds, in this case mostly aquatic, given that these three families of Nematodes possess mainly aquatic life cycles.

In addition, five species of passeriform, accipitriform and piciform birds were reported as hosts of larval stages of nematodes (*microfilariae*) described as species of the genus *Microfilaria*. The name “*Microfilaria*” can be found as an informal generic name referring to a collective
group of blood filaroids, as proposed by Cobbold (1882). However, this genus is not valid and these names are also invalid. Unfortunately, it is not possible to assign these species to any other genus because adults are unknown, for proper identification it is necessary to find the adults housed in the subcutaneous tissue associated with these microfilariae. Numerous species of Filaroididae are known parasitizing birds (see Schmidt-Rhaesa, 2014), although in Argentina only two genera, Plecotus (Oncho cercidae) and Filaria (Filaridae), have been reported.

The group of helminths most studied in Argentinean birds are the digeneans (Drago & Lunaschi, 2015), with almost twice more nominal species reported than for nematodes (112 vs. 64), however the number of bird species studied is similar (70 vs. 65). The three families of birds with the highest number of digeneans reported are Laridae, Ardeidae and Accipitridae, while the families with the highest number of nematodes reported are Tinamidae, Laridae and Anatidae.

When comparing the number of species of nematodes in Argentinean birds with the richness found in other regions of similar birds diversity, for example Mexico, with 1096 bird species, it can be observed similar values of nematodes species. For example, García-Prieto et al. (2014) reported 64 nominal species and 17 indeterminate taxa of nematodes, parasitizing 65 bird species, which represents 5.9% of the birds present in this country. These results highlights the need for further investigation and research on this group of parasites, expanding the number of bird species examined, especially in poorly explored regions.

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