

# PARASITES OF ZOO-ANIMALS IN THE NETHERLANDS AND OF EXOTIC ANIMALS II

by

J. JANSEN JR. and E. VAN DEN BROEK

*Institute for Veterinary Parasitology and Parasitic Diseases, State University, Utrecht*

## INTRODUCTION

The first list of identified parasites of zoo-animals has been published in 1959 (SWIERSTRA et al.). This supplementary paper presents a list of material, examined and identified in the period 1959-1963.

Most of the parasites have again been collected by DR. P. ZWART and DRs. F. G. POELMA, now at the Department of Exotic Animals, Institute for General Pathology, Veterinary Faculty, Utrecht, whose cooperation is gratefully acknowledged.

Our thanks are also due to several taxonomists who identified parasites belonging to special groups, as stated in accompanying notes.

The material is in the collection of the Institute for Veterinary Parasitology, State University, Utrecht (Biltstraat 172). A part of several samples has been handed over to the State Museum of Natural History, Leiden.

## Abbreviations:

H, Hexapoda (Insecta); A, Acarina; T, Trematoda; C, Cestoda; N, Nematoda; Ac, Acanthocephala; Hir., Hirudinea; P, Pentastomide.

Asterisks indicate new host-parasite records.

Numbers behind the names of parasites or hosts refer to footnotes.

## MAMMALIA

### PRIMATES

#### Apes:

*Anthropopithecus troglodytes*

*Enterobius vermicularis* (Linnaeus, 1758) N

*Bertiella studeri* (Blanchard, 1891) C

*Gorilla gorilla*

*Pneumonyssus cf. congoensis* Ewing, 1929 A

*Hylobates* sp.

cf. *Prosthenorchis elegans* Travassos, 1917 Ac

*Symphalangus syndactylus*

*Ascaris cf. lumbricoides* Linnaeus, 1758 N

#### Old world monkeys:

*Cercopithecus hamlyni*

*Armillifer annulatus* (Baird, 1853) P

*Cercopithecus talapoin*

*Pithecostrongylus digitatus* Jansen, 1964 N

#### New world monkeys:

*Callithrix jacchus*

*Subulura jacchi* (Marcel, 1857) N

#### *Saimiri sciurea*

*Longistriata dubia* Travassos, 1921 N

*Molineus torulosus* (Molin, 1861) N

*Dipetalonema gracile* (Rudolphi, 1809) N

*Prosthenorchis elegans* Travassos, 1917 Ac

*Phanerosolus orbicularis* (Diesing, 1850) T

*Lobatorobius sceleratus* (Travassos, 1925) N

#### *Lagothrix lagotricha*

*Dipetalonema gracile* (Rudolphi, 1809) N

#### "South American monkey"

*Necator americanus* (Stiles, 1902) N

### LEMURIDAE

#### *Nycticebus coucang*

*Prosthenorchis elegans* Travassos, 1917 Ac

### CARNIVORA

#### *Acinonyx jubatus*

*Toxascaris leonina* (Linstow, 1902) N

#### *Felis bengalensis*

*Toxocara cati* (Schrank, 1788) N

*Paragonimus westermanni* (Kerbert, 1878) T

<i>Thalarctos maritimus</i>					
<i>Toxascaris transfuga</i> (Rudolphi, 1819)	N				
<i>Potos flavus</i>					
<i>Molineus</i> cf. <i>paraensis</i> Travassos, 1937	N				
<i>Procyon cancrivorus</i> <sup>1)</sup>					
<i>Toxocara</i> cf. <i>canis</i> Werner, 1782	N				
<i>Capillaria entomelas</i> (Dujardin, 1845)	N				
<i>Putorius putorius</i>					
<i>Filaroides martis</i> (Werner, 1782)	N				
<i>Euparyphium melis</i> (Schrank, 1788)	T				
<b>PINNIPEDIA</b>					
<i>Otaria byroni</i>					
<i>Anisakis</i> cf. <i>similis</i> (Baird, 1853)	N				
<i>Zalophus californianus</i>					
<i>Parafilaroides</i> cf. <i>decorus</i> Dougherty & Herman, 1947	N				
"sea-lion"					
<i>Contraecum osculatum</i> (Rudolphi, 1802)	N				
<i>Zalophotrema hepaticum</i> Stunkard & Alvey, 1929	T				
<i>Odobenus rosmarus</i>					
<i>Antarctophthirus trichechi</i> (Boheman, 1865)	H				
<b>PROBOSCIDEA</b>					
<i>Elephas indicus</i>					
<i>Quilonia travanca</i> Lane, 1914	N				
<i>Grammocephalus hybridatus</i> van den West-huysen, 1938	N				
<i>Pseudodiscus collinsi</i> (Cobbold, 1875)	T				
<i>Hawkesius hawkesi</i> (Cobbold, 1875)	T				
<i>Fasciola jacksoni</i> Cobbold, 1869	T				
<b>HYRACOIDEA</b>					
<i>Procavia syriaca</i>					
* <i>Grassenema hyracis</i> (Ezzat, 1954) nov. comb.*)	N				
<b>PERISSODACTYLA</b>					
<i>Equus asinus</i>					
<i>Echinococcus granulosus</i> Batsch, 1796 (Larva)	C				
<i>Equus zebra</i>					
<i>Parascaris equorum</i> (Goeze, 1782)	N				
<i>Equus caballus</i> × <i>Equus zebra</i> (zebroid)					
<i>Parascaris equorum</i> (Goeze, 1782) *)	N				
<b>ARTIODACTYLA</b>					
<i>Bos indicus</i>					
<i>Capillaria bilobata</i> Bhalerao, 1933	N				
* <i>Nematodirus helvetianus</i> May, 1920	N				
<i>Saiga tatarica</i>					
<i>Camelostrongylus mentulatus</i> (Railliet & Henry, 1909)	N				
<i>Cysticercus tenuicollis</i> Rudolphi, 1819	C				
<i>Ovis aries musimon</i>					
<i>Skrjabinema ovis</i> (Skrjabin, 1915)	N				
<i>Ammotragus lervia</i>					
<i>Haemonchus contortus</i> (Rudolphi, 1803)	N				
<i>Trichostrongylus axei</i> (Cobbold, 1879)	N				
<i>Trichostrongylus colubriformis</i> (Giles, 1892)	N				
<i>Trichostrongylus vitrinus</i> Looss, 1905	N				
<i>Stadelmannia circumcincta</i> (Stadelmann, 1894)	N				
<i>Stadelmannia trifurcata</i> (Ransom, 1907)	N				
<i>Capillaria bovis</i> (Schnyder, 1906)	N				
<i>Capra hircus reversa</i>					
<i>Trichostrongylus axei</i> (Cobbold, 1879)	N				
<i>Damaliscus albifrons</i>					
<i>Trichostrongylus axei</i> (Cobbold, 1879)	N				
<i>Ranfiger tarandus</i>					
<i>Oedemagena tarandi</i> (Linnaeus, 1758)	H				
<i>Dama dama</i>					
<i>Spiculoptera asymmetrica</i> (Ware, 1925)	N				
<i>Stadelmannia lasensis</i> (Asadov, 1953)	N				
<i>Stadelmannia trifurcata</i> (Ransom, 1907)	N				
<i>Trichostrongylus axei</i> (Cobbold, 1879)	N				
<i>Ostertagia mossi</i> Dikmans, 1931	N				
<i>Oesophagostomum venulosum</i> (Rudolphi, 1809)	N				
<i>Camelus bactrianus</i>					
<i>Dictyocaulus cameli</i> Boev, 1952 <sup>4)</sup>	N				
<i>Fasciola hepatica</i> Linnaeus, 1758	T				
<b>RODENTIA</b>					
<i>Castor</i> sp.					
<i>Travassosius rufus</i> Khalil, 1922	N				
<i>Cynomys ludovicianus</i>					
<i>Trichostrongylus texanus</i> Dikmans, 1937	N				
<i>Sciurus prevosti</i>					
<i>Ancylostoma gilsoni</i> Gedoelst, 1917	N				
<i>Ratufa bicolor</i>					
<i>Orchopeas howardi howardi</i> (Baker, 1895 <sup>5)</sup>	H				
<i>Notoedres centrifera</i> Jansen, 1963	A				

<sup>1)</sup> Caught in Surinam.

<sup>2)</sup> As far as we are aware *Cobboldina hyracis* Ezzat, 1954 has not yet been transferred to the genus *Grassenema* Petter, 1959 which we consider a valid genus to contain the attractid nematodes of the *Procavia* spp. Moreover, the occurrence of *Grassenema hyracis* (Ezzat, 1954) n. comb. constitutes a new host-parasite record.

<sup>3)</sup> In a zebroid of a circus which died in a cachectic condition 1357 adult specimens of *Parascaris equorum*, weighing 2950 gram were found.

<sup>4)</sup> The lungworms of *Camelus bactrianus* are named *Dictyocaulus cameli* according to the nomenclature of BOEV (1954). There are, however, no morphological differences with *Dictyocaulus viviparus* of cattle.

<sup>5)</sup> Identification confirmed by Mr. F. G. A. M. Smit, Tring (Great Britain).

EDENTATA		<i>Pavo cristatus albus</i>	
<i>Tamandua tetradactyla</i> <sup>1)</sup>		<i>Goniodes pavonis</i> (Linnaeus, 1758)	H
<i>Graphidiops major</i> Travassos, 1949	N	<i>Numida galatea</i>	
		<i>Ascaridia galli</i> (Schrank, 1788)	N
		<i>Heterakis gallinarum</i> (Schrank, 1788)	N
MONOTREMATA		<i>Afropavo congensis</i>	
<i>Tachyglossus aculeatus</i>		<i>Capillaria obsignata</i> Madsen, 1945	N
<i>Nicollina tachyglossa</i> (Baylis, 1930)	N	<i>Gallus gallus</i> ("nègre-soie")	
		<i>Dermanyssus gallinae</i> (De Geer, 1788)	A
		<i>Menopon gallinae</i> (Linnaeus, 1758)	H
MARSUPIALIA			
<i>Macropus</i> sp.			
<i>Dipetalonema</i> cf. <i>websteri</i> (Cobbold, 1879) <sup>6)</sup>	N		
AVES		ANSERIFORMES	
		<i>Aix galericulata</i>	
		<i>Cyathostoma brantae</i> (Cram, 1928)	N
		<i>Aythya fuligula</i>	
		<i>Tracheophilus sisowi</i> Skrjabin, 1913	T
PASSERIFORMES		<i>Cairina moschata</i>	
<i>Serinus canaria</i>		<i>Hypoderaeum conoideum</i> (Bloch, 1782)	T
<i>Sternostoma tracheacolum</i> Lawrence, 1948 <sup>7)</sup>	A	<i>Anas acuta</i>	
<i>Cissa chinensis</i>		<i>Rhinonyssus rhinolethrum</i> (Trouessart, 1895)	A
<i>Dermanyssus gallinae</i> (De Geer, 1778)	A	<i>Branta cyanoptera</i>	
		<i>Cytodites nudus</i> (Visioli, 1870)	A
TROGONIFORMES		<i>Cygnus melanorhynchus</i>	
<i>Pharomachrus mocino</i>		<i>Echinuria uncinata</i> (Rudolphi, 1819)	N
<i>Strigea caluri</i> Dubois, 1962	T	<i>Psilotrema spiculigerum</i> (Mühling, 1898) <sup>8)</sup>	T
		<i>Psilotrema simillimum</i> (Mühling, 1898) <sup>8)</sup>	T
PSITTACIFORMES		<i>Cygnus olor</i>	
<i>Melopsittacus undulatus</i>		<i>Echinuria uncinata</i> (Rudolphi, 1819)	N
<i>Ornithomyia</i> cf. <i>avicularia</i> (Linnaeus, 1758)	H	<i>Filicollis anatis</i> (Schrank, 1788)	Ac
		<i>Cotylurus syriacus</i> Dubois, 1934 <sup>10)</sup>	T
GALLIFORMES		PHOENICOPTERIFORMES	
<i>Phasianus mongolicus</i>		<i>Phoenicopterus ruber ruber</i>	
<i>Heterakis isolonche</i> Linstow, 1906	N	<i>Leptotaenia ischnorhyncha</i> (Lühe, 1898)	C
<i>Crossoptilon auritum</i>			
<i>Heterakis isolonche</i> Linstow, 1906	N		
<i>Tragopan satyrus</i>		CICONIIFORMES	
<i>Heterakis gallinarum</i> (Schrank, 1788)	N	<i>Sphenorhynchus abdimii</i>	
<i>Capillaria phasianina</i> Kotlán, 1940	N	<i>Cathaemasia variabilis</i> van den Broek, 1960	T
<i>Phasianus colchicus</i>		<i>Choanotaenia riccii</i> Fuhrmann & Baer, 1944 <sup>11)</sup>	C
<i>Trichostrongylus tenuis</i> (Mehlis, 1846)	N	<i>Ephippiorhynchus senegalensis</i>	
<i>Alectoris graeca chukar</i>		<i>Chaunocephalus</i> sp. indet. <sup>12)</sup>	T
<i>Ascaridia galli</i> (Schrank, 1788)	N		
<i>Lophortyx californica</i>			
<i>Capillaria caudinflata</i> (Molin, 1858)	N		
<i>Ascaridia galli</i> (Schrank, 1788)	N		
<i>Heterakis gallinarum</i> (Schrank, 1788)	N		
<i>Pavo cristatus</i>			
<i>Amyrsidea minuta</i> Emerson, 1961 <sup>8)</sup>	H		

<sup>6)</sup> In imported kangaroo-meat, one specimen only; see RAETHEL (1960).

<sup>7)</sup> Identified by Mr. G. L. van Eyndhoven, Amsterdam.

<sup>8)</sup> Identified by Dr. T. Clay, London.

<sup>9)</sup> Host kept in a pond, where especially the pulli were heavily infected by means of endemic snails; see HONER (1964).

<sup>10)</sup> Identified by Dr. G. Dubois, Neuchâtel (Switzerland)

<sup>11)</sup> Identification confirmed by Prof. Dr. J. G. Baer, Neuchâtel (Switzerland).

<sup>12)</sup> This seems to be the first record of specimens of *Chaunocephalus* from this host. It is possible that they belong to a new species. However, not all descriptions of the various species of *Chaunocephalus* known thus far were available for comparison.

<i>Bubulcus ibis</i>					
<i>Nephrostomum ramosum</i> (Sonsino, 1895)	T				
<i>Cochlearius cochlearius</i>					
<i>Parastrigea brasiliiana</i> (Szidat, 1928) <sup>13)</sup>	T				
<b>GRUIFORMES</b>					
<i>Tetrapteryx paradisea</i>					
<i>Porrocaecum ardeae</i> Froelich, 1802	N				
<b>PROCELLARIIFORMES</b>					
<i>Fulmarus glacialis</i> <sup>14)</sup>					
<i>Stegophorus stellae-polaris</i> (Parona, 1901)	N				
<b>PELECANIFORMES</b>					
<i>Sula bassana</i> <sup>14)</sup>					
<i>Corynosoma strumosum</i> (Rudolphi, 1802)	Ac				
<i>Tetrabothrius heterosoma</i> Baird, 1853	C				
<b>SPHENISCIFORMES</b>					
<i>Spheniscus humboldti</i>					
<i>Contraecum</i> cf. <i>spiculigerum</i> (Rudolphi, 1809)	N				
<i>Cotylurus cumilitestis</i> Dubois, 1962	T				
<i>Spheniscus</i> sp.					
<i>Cotylurus cumilitestis</i> Dubois, 1962	T				
<i>Cotylurus erraticus</i> (Rudolphi, 1809) <sup>13)</sup>	T				
<b>SUMMARY</b>					
A list is given of identified parasites of zoo-animals and exotic animals, collected in the years 1959-1963.					

**REPTILIA****SAURIA**

<i>Lacerta viridis</i>					
<i>Neoliponyssus lacertinus</i> (Berlese, 1892)					A
<i>Tupinambis</i> sp.					
<i>Physaloptera</i> cf. <i>retusa</i> Rudolphi, 1819					N
<i>Chameleon calcaratus</i>					
<i>Anchitrema sanguineum</i> (Sonsino, 1894)					T
<i>Chameleon</i> sp.					
<i>Prosthodendrium obtusum</i> (Looss, 1896)					T

**OPHIDIA**

<i>Python sabae</i>					
<i>Ophidascaris filaria</i> (Dujardin, 1845)					N
<i>Thamnophis sirtolis</i>					
<i>Rhabdias fuscovenosa</i> var. <i>catanensis</i> (Rizzo, 1902)					N

**CHELONIA**

"tortoise"					
<i>Angusticaecum holopterum</i> (Rudolphi, 1809)					N

**PISCES**

<i>Cyprinus carpio</i>					
<i>Piscicola geometra</i> (Linnaeus, 1758)					Hir.

**LITERATURE**

- BOEV, S. N., 1954: Lung nematodes of ungulates in Kazakhstan. Alma Ata (in Russian).
- BROEK, E. VAN DEN, 1960: *Cathaemasia variabilis* n. sp. (Trematoda: Cathaemasiidae) from the oesophagus of *Sphenorhynchus abdimii*. Journ. Helminthology 34, 243-246.
- DUBOIS, G., 1962: Les Strigeida (Trematoda) de la collection E. van den Broek. Bull. Soc. Neuchâteloise Sci. Nat. 85, 109-120.
- 1964: Du statut de quelques Strigeata La Rue, 1926 (Trematoda). I. Bull. Soc. Neuchâteloise Sci. Nat. 87, 27-71.
- EZZAT, M. A. E., 1954: On some helminth parasites from Procaviidae. (Miscellaneous Zoologica H. Schouteden). Ann. K. Mus. Belg. Kongo, Tervuren, n. r. Zool. Wetensch. 1, 169-179.
- HONER, M. R., 1964: Parasitic mortality in birds. Tijdschr. Diergeneesk. 89, suppl. 1, 192-194.
- JANSEN JR, J., 1963: The nematode *Capillaria obsignata* in the Congo Peacock (*Afropavo congensis* Chapin). Bull. Soc. Roy. de Zoologie d'Anvers 26, 93-94.
- 1964: *Pithecostrongylus digitatus* n.sp. from the small intestine of *Cercopithecus talapoin* (Schreber). Tijdschr. Diergeneesk. 89, 695-700.
- PETTER, A. J., 1959: Deux nouveaux genres de nématodes atractides, parasites du daman des rochers (*Procavia ruficeps* (Ehrenberg)). Bull. Soc. Zool. France 84, 195-204.
- RAETHEL, H. S., 1960: Über das Vorkommen von Blut-fadenwürmern (Filarien) in tiefgekühltem Kängurufleisch des Lebensmittelhandels. Archiv für Lebensmittelhygiene 11, nr. 7.
- REERDS, B. W., 1965: Over darmparasieten bij de olifant. Tijdschr. Diergeneesk. 90, 717-724.
- SWIERSTRA, D., J. JANSEN JR. and E. VAN DEN BROEK, 1959: Parasites of zoo-animals in the Netherlands. Tijdschr. Diergeneesk. 84, 1301-1305.
- ZWART, P., 1962: Acariasis in canaries, a clinical report. Nordisk Veterinaer Medicin 14, suppl. 1, 292-295.

<sup>13)</sup> Identification confirmed by Dr. G. Dubois, Neuchâtel (Switzerland).

<sup>14)</sup> Hosts collected in Scotland, parasites from the collection of the Zoological Museum, Amsterdam.