Zootaxa 3937 (3): 471–499
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3937.3.3
http://zoobank.org/urn:lsid:zoobank.org:pub:F7CAD672-4865-411B-A5C7-D46AB3A2299D

Checklist of the Helminth Parasites of South American Bats

CLÁUDIA PORTES SANTOS[1] & DAVID I. GIBSON[2]

[1]*Laboratório de Avaliação e Promoção da Saúde Ambiental, Instituto Oswaldo Cruz, Av. Brasil, 4365, Rio de Janeiro, Brasil, 21.040-360. E-mail cpsantos@ioc.fiocruz.br*
[2]*Department of Life Sciences, Natural History Museum, Cromwell Road, London SW7 5BD, UK. E-mail d.gibson@nhm.ac.uk*

Abstract

Although the Chiroptera represents a significant proportion (*c*.20%) of the mammalian fauna and South America has the highest diversity of bat species, only about a third of the known species in this region have had helminth parasites reported from them. This work represents the first comprehensive checklist of the helminth parasites (nematodes, acanthocephalans, trematodes and cestodes) of South American bats. The data were extracted from more than 120 references and are presented as a key to each group of parasites down to the generic level, with an indication of how the bats become infected, accompanied by a list of the species recorded for each genus. This is followed, in tabular form, by parasite-host and host-parasite checklists. The parasite-host list also includes their geographical distribution in South America (at the country level) and site data, plus the references in which the parasite records occur. The host-parasite list is arranged according to the classification of the hosts. In all, *c*.370 host-parasite associations are recorded, involving 114 nominal species of helminths from 92 named chiropteran taxa.

Key words: Chiroptera, bats, helminths, South America, checklist, Nematoda, Acanthocephala, Trematoda,Cestoda

Introduction

The Chiroptera is a large group, representing 20–22% of mammalian species (e.g. Simmons, 2005), and some of the highest chiropteran (bat) species diversity in the world occurs in the Neotropical region (Willig & Selcer 1989). Since the work of Diesing (1850), the helminth parasites of bats in South America have been studied sporadically and locally in more than 120, generally small, investigations with little or no continental or national compilation or evaluation. Given that there is increasing evidence suggesting that there is cryptic diversity in Neotropical bats and that many bat species are endangered, 'a comprehensive survey of potential diversity is needed on a scale which is taxonomically diverse' and 'geographically broad' (Clare *et al*. 2011). The same is true for their helminth parasites, for, as indicated below, only about a third of the known bat species in South America have had helminths reported from them.

Recorded helminths include members of the phyla Nematoda, Acanthocephala and Platyhelminthes, the latter including the classes Trematoda and Cestoda. These records exclusively represent endoparasites. Bats generally acquire such parasites in the form of a passive infection via their diet, with the result that the alimentary canal and thoracic and abdominal cavities are the most parasitized sites. Infected bats usually represent the 'definitive (or final) host', harbouring the parasite as a sexual adult, or, more rarely, as either an 'intermediate host', in which one or more larval stages develop, or a 'paratenic host', in which a larval stage can survive without further development. In addition to increasing our knowledge in terms of biodiversity and disease, the study of the helminth parasites of bats is important as it contributes to our understanding of feeding habits and other aspects of their biology, and may indicate useful biological markers for bat populations.

Methods

The identification of helminths is best realized using specimens in good condition, which means that the parasites

Accepted by N. Dronen: 3 Mar. 2015; published: 26 Mar. 2015

should be collected from freshly killed hosts and fixed live. The following details may be of interest to readers with no experience of collecting helminth parasites. Live specimens are best cleaned in a 0.8% saline medium, heat-fixed in boiling water or a hot fixative to avoid contraction, and then stored in 70–80% alcohol (the heat-fixation techniques advocated for fish trematodes by Cribb & Bray (2010) can be used for helminths from bats). A slight pressure can be applied to acanthocephalans during fixation to prevent the contraction of the proboscis and to some platyhelminths to make some internal details clearer. After fixation, nematodes and acanthocephalans are generally studied as temporary wet mounts between a slide and a coverslip in a clearing agent, such as glycerine, lactophenol or beechwood creosote, depending on the size of the worm. Platyhelminths are normally mounted as permanent wholemounts on slides in Canada balsam, after being stained by various, usually carmine-based, stains such as Mayer's paracaramine. In some cases serial sections are needed, which are usually stained with haematoxylin and eosin.

The parasite-host and host-parasite checklists for South American parasitic helminths from bats presented in this work were compiled from data acquired from searches of the literature, aided especially by searches of data-bases such as the *Web of Science* (Zoological Record), *Helminthological Abstracts* and the Host-Parasite Data-base of the Natural History Museum, London (Gibson *et al*. 2005). The chiropteran nomenclature mainly follows Wilson & Reeder (2005), with additional data from Reis *et al*. (2007) and Nogueira *et al*. (2014). Selected data from the CABI Keys (Khalil *et al*. 1994; Gibson *et al*. 2002; Jones *et al*. 2005; Bray *et al*. 2008; Anderson *et al*. 2009) aided the preparation of some of the keys, but were adapted and updated to suit the situation.

Helminth groups

A general view of the groups of helminths (parasitic worms) that parasitize bats is presented below, with an indication of how they are transmitted to or between bats, identification keys to the generic level and a list of the species of parasites for each genus. The keys are designed to distinguish known taxa found in bats and will not necessarily work for taxa from other hosts or for newly recorded taxa from bats. In addition, for each parasite species, a complete checklist of its host species, the South American countries in which it has been found and the sites within the body which it inhabits are tabulated (Table 1), along with the associated bibliographic data. This is followed by a list of chiropteran host, arranged by family, and a compilation of their helminth parasites (Table 2).

Key to the Phyla

1. Body usually dorso-ventrally flattened, acoelomate . . . . . Platyhelminthes
- Body cylindrical, pseudocoelomate 2
2. Proboscis at anterior end of body . . . . . Acanthocephala
- Proboscis at anterior end of body absent. . . . . .Nematoda

Phylum Nematoda

This phylum is one of the most abundant and widespread animal groups, occurring in large numbers in a variety of environments as free-living forms, animal parasites and plant parasites. At least 30,000 species are known, but huge numbers have yet to be described. They are symmetrically bilateral, unsegmented, pseudocoelomate and normally dioecious worms which are usually filiform in shape. All nematodes have five life-history stages, four larval and one adult, and intermediate hosts are usually, but not always, involved in the life-cycle of animal parasitic forms.

Key to Superfamilies

1. Males with well-developed copulatory bursa, supported by numerous rays; body frequently with longitudinal cuticular ridges . . . . . .Trichostrongyloidea
- Males without copulatory bursa (small bursa may be present in some capillariids, but with few rays); body normally without

longitudinal cuticular ridges (although lateral alae may be present) 2
2. Parasites of tissues and/or body cavities of host 3
- Parasites of digestive tract 4
3. Parasites of wing tissues of bats . . . . . Muspiceoidea
- Parasitic in other tissues and/or cavities . . . . . Filarioidea
4. Body with two rows of lateral spines; oesophagus clearly divided into two regions . . . . . Rictularioidea
- Body without rows of lateral spines; oesophagus not clearly divided into two regions 5
5. Body with lateral bacillary bands (longitudinal row of large cells); long oesophagus in form of row of large cells (stichocytes) . . . . . Trichinelloidea
- Body without above features; oeosphagus short, claviform . . . . . Seuratoidea

Superfamily Filarioidea Weinland

Filarioid nematodes are subcutaneous parasites transmitted by the bite of haematophagous arthropods which harbour a larval stage.

Family Onchocercidae Leiper

1. Buccal cavity long, tubular, with thick walls; vulva postoesophageal or at level of oesophagus. . . . . *Litomosoides* Chandler
Species: *L. artibei* Esslinger, 1973; *L. brasiliensis* Almeida, 1936; *L. caliensis* Esslinger, 1973; *L. carolliae venezuelensis* Rodrigo, 1964; *L. chandleri* Esslinger, 1973; *L. colombiensis* Esslinger, 1973; *L. hamletti* Sandground, 1934; *L. molossi* Esslinger, 1973; *L. salazari* Notarnicola, Jiménez Ruíz & Gardner, 2010; *L. serpicula* (Molin, 1858); *L. solarii* Guerrero, Martin, Gardner & Bain, 2002; *L. teshi* Esslinger, 1973; *L. yutajensis* Guerrero, Martin & Bain, 2003; *Litomosoides* sp.
- Buccal cavity not long and tubular, without thick walls; vulva pre-oesophageal. . . . . ..*Migonella* Lent, Freitas & Proença
Species: *M. fracchiai* Lent, Freitas & Proença, 1946

Superfamily Muspiceoidea Brumpt

These subcutaneous parasites have a direct life-cycle. Larvae leave via the skin and are transmitted by ingestion during mutual or individual grooming.

Family Muspiceidae Brumpt

Lukonema Chabaud & Bain
Species: *L. lukoschusi* Chabaud & Bain, 1974

Superfamily Physalopteroidea Railliet

Physalopteroids are gut parasites of all major vertebrate groups, but occur mainly in mammals, birds and reptiles. The final host normally acquires the parasite by ingesting insects harbouring the third-stage larva. As no adult has been found, this group is not included in the key to superfamilies.

Family Physalopteridae Railliet

Physaloptera Rudolphi
Species: *Physaloptera* sp. (juv.)

Superfamily Rictularioidea Hall

Rictularioid nematodes utilize an insect intermediate host. Transmission to bats occurs when they feed on infected insects.

Family Rictulariidae Hall

1. Mouth oriented dorsally; with single oesophageal tooth . . . . . *Rictularia* Froelich
   Species: *Rictularia* sp.
- Mouth apical; with three oesophageal teeth . . . . . *Pterygodermatites* Wedl
  Species: *P. elegans* (Travassos, 1928)

Superfamily Seuratoidea Hall

There is only one record, of an unidentified species of *Seuratum*, from South American chiropterans. Intestinal parasites of this genus are normally acquired by small mammals when feeding on insects harbouring a larval stage.

Family Seuratidae Hall

Seuratum Hall
Species: *Seuratum* sp.

Superfamily Trichinelloidea Ward

Trichinelloids have a direct life-cycle. Eggs are released with the faeces and are eaten directly or in/on organisms (e.g. plants, insects) which have been in contact with the faeces.

Family Capillariidae Railliet

1. Caudal alae present in male. 2
- Caudal alae absent in male 4
2. Spicule with spiny sheath . . . . . *Pterothominx* Freitas
   Species: *P. angrense* (Freitas, 1934); *P. brevidelphis* Freitas & Mendonça, 1960(b)
- Spicule without spiny sheath. 3
3. Bursa of male with complex system of symmetrical rays. . . . . *Tenoranema* Mas-Coma & Esteban
   Species: *T. rivarolai* (Lent, Freitas & Proença, 1946)
- Bursa of male with one or more pairs of rays which may be curved . . . . . *Aonchotheca* López-Neyra
  Species: *A. cubana* (Freitas & Lent, 1937); *A. magnifica* Freitas & Mendonça, 1961; *A. parca* Freitas & Dobbin Jr., 1961(a); *A. pereirai* (Freitas & Lent, 1936); *A. pintoi* (Freitas, 1934); *A. pulchra* (Freitas, 1934)[1]; *Aonchotheca* sp.
4 Male with spiny spicular sheath . . . . . *Capillaria* Zeder[2]
  Species: *Capillaria* sp.
- Male with smooth spicular sheath. . . . . *Pseudocapillaria* Freitas
  Species: *P. pusilla* (Travassos, 1914)

Superfamily Trichostrongyloidea Leiper

Trichostrongyloid nematodes have a direct life-cycle. Eggs leave with the host's faeces. Transmssion occurs via larvae ingested with contaminated food. These parasites are especially common in herbivores.

Keys to Families

1. Dorsal external ray of male copulatory bursa absent . . . . . Molineidae

1. Recently transferred from *Pterothominx* by Cardia *et al*. (2014).
2. It is likely that this report represents another capillariid genus.

- Dorsal external ray of male copulatory bursa present. 2
2. Rays of male copulatory bursa grouped 2-2-1 . . . . . .Ornithostrongylidae
- Rays of male copulatory bursa grouped 2-3. . . . . .Heligmonellidae

Family Molineidae Skrjabin & Schulz

1. Cephalic extremity with cuticular spines. 2
- Cephalic extremity without cuticular spines 5
2. Cephalic extremity with 2 large ventral spines 3
- Cephalic extremity surrounded by ring of 8 large spines 4
3. Cephalic spines side by side in ventral field . . . . . *Biacantha* Wolfgang
   Species: *B. desmoda* Wolfgang, 1954; *B. normaliae* Oviedo, Ramallo & Claps in Oviedo, Ramallo, Claps & Miotti, 2012
- Cephalic spines opposite (in dorsal and ventral fields). . . . . .*Websternema* Vaucher & Durette-Desset
   Species: *W. parnelli* (Webster, 1971)
4. Anterior and posterior branches of ovejector vestibule similar in length. . . . . .*Parahistiostrongylus* Pérez Vigueras
   Species*: P. octacanthus* (Lent & Freitas, 1940) (also attributed to *Stilestrongylus*)
- Anterior branch of ovejector vestibule longer than posterior.. . . . . *Histiostrongylus* Molin
   Species: *H. coronatus* Molin, 1861; *H. paradoxus* Travassos, 1918; *Histiostrongylus* sp.
5. Cephalic extremity with vesicle divided in two regions 6
- Cephalic extremity with simple, undivided vesicle 9
6. Posterior part of cephalic vesicle equal or longer than anterior part. 7
- Posterior part of cephalic vesicle shorter than anterior part . . . . . *Torrestrongylus* Vigueras
   Species: *Torrestrongylus* sp.
7. Spicule undivided distally. 8
- Spicule divided distally . . . . . *Tricholeiperia* Travasssos
   Species: *T. leiperi* Travassos, 1935; *T. peruensis* Vargas, Martinez, Tantaleán, Cadenilias & Pacheco, 2009; *T. proencai* Travassos, 1937
8. Dorsal ray of male copulatory bursa long and divided in distal third; ovejector of female without spines . . . . . .*Anoplostrongylus* Boulenger
   Species: *A. paradoxus* (Travassos, 1918)
- Dorsal ray of male copulatory bursa short and deeply divided; ovejector of female with spines. . . . . .*Molostrongylus* Durette-Desset & Vaucher
   Species: *M. acanthocolpos* Durette-Desset & Vaucher, 1996; *M. mbopi* Durette-Desset & Vaucher, 1999
9. Tail of female without appendices/tubercles. . . . . .*Cheiropteronema* Sandground
   Species: *C. globocephala* Sandground, 1929; *C. striatum* Oviedo, Ramallo & Claps, 2010; *Cheiropteronema* sp.
- Tail of female with appendices/tubercles. 10
10. Tail of female with two appendices. . . . . *Bidigiticauda* Chitwood
    Species: *B. embryophilum* (Freitas & Dobbin Jr., 1960 (a)); *B. vivipara* Chitwood, 1938
- Tail of female with five to seven tubercles . . . . . *Carostrongylus* Durette-Desset & Vaucher
   Species: *C. touzeti* Durette-Desset & Vaucher, 1989

Family Heligmonellidae Skrjabin & Schikhobalova

Stilestrongylus Freitas, Lent & Almeida
Species: *S. octacanthus* (Lent & Freitas, 1940) (also attributed to *Parahistiostrongylus*)

Family Ornithostrongylidae Travassos

Allintoshius Chitwood
Species: *A. bioccai* Rossi & Vaucher, 2002; *A. nudicaudatus* (Freitas & Mendonça, 1963); *A. parallintoshius* (Araújo, 1940); *A. urumiac* (Freitas & Mendonça, 1960(a)); *Allintoshius* sp.

Phylum Acanthocephala

The Acanthocephala is a small group of more than a thousand species (thorny-headed worms) which occur as

intestinal parasites of a wide range of vertebrates at the adult stage. They are readily recognisable by the possession of a single large, eversible, armed proboscis at the anterior end, which they use to attach to the wall of their host's intestine. Acanthocephalans are dioecious and have a body-cavity which contains little but their reproductive organs. The lack of a gut means that they absorb nutrients from the host's intestine directly through their body wall.

Acanthocephalans all use arthropods as intermediate hosts. In the case of bats, the rare cases of infection are by the ingestion of insects harbouring a cystacanth larva encysted in its body, or, possibly, in the case of carnivorous bats, by feeding on small vertebrates acting as paratenic hosts. According to Gibson & McCarthy (1987), there are no species specific acanthocephalan parasites of bats, i.e. they tend to be accidentally infected with the parasites of other vertebrates. These worms are usually encysted juveniles and do not develop to maturity, so the bat is likely acting as a paratenic host. Nevertheless, Smales (2007) reported immature specimens from the intestine.

Key to families

1. Proboscis cylindrical; proboscis receptacle double-walled; protonephridial organs absent . . . . . Moniliformidae
- Proboscis subspherical; proboscis receptacle with single, thick wall; protonephridial organs present . . Oligacanthorhynchidae

Family Moniliformidae Van Cleave

Moniliformis Travassos

Species: *M. moniliformis* (Bremser, 1811); *M. convolutum* Meyer, 1932

Family Oligacanthorhynchidae Southwell & Macfie

Neoncicola Schmidt

Species: *N. artibei* Smales, 2007

Phylum Platyhelminthes

The platyhelminths, or flatworms, include free-living and parasitic groups. These worms are bilaterally symmetrical, lack a body cavity, comprise three main cell layers, may lack an intestine and usually lack an anus, and are usually hermaphroditic. Two groups occur as parasites in chiropterans, the trematodes (flukes) and the cestodes (tapeworms).

Key to Classes

1. Body usually in shape of tape, segmented and with multiple set of reproductive organs. . . . . .Cestoda
- Body not segmented and with a single set of reproductive organs . . . . . Trematoda

Class Cestoda Rudolphi

The Cestoda is a relatively large, diverse group of parasites (*c*.8,000 species), almost all of which are found parasitic in the intestine of different groups of vertebrates. They lack a gut and absorb nutrients through their surface layer. The majority are long, tape-like and segmented, with a complete set of reproductive organs in each segment. They anchor themselves to the intestinal wall of their host using an array of different attachment organs (hooks, suckers, etc.).

Keys to Families

1. Absence of rostellum with hooks on scolex . . . . . Anoplocephalidae
- Presence of rostellum with hooks on scolex . . . . . .Hymenolepididae

Family Anoplocephalidae Cholodkovsky

Bats are generally infected with cestodes by the ingestion of larvae encysted in an intermediate host. In the case of anoplocephalids, this occurs via the ingestion of cysticercoid larvae encysted in oribatid mites.

1. Testes postero-lateral to ovary. 2
- Testes pre- and postero-lateral to ovary . . . . . *Cycloskrjabinia* Spasskii
  Species: *Cycloskrjabinia* sp.
2. Genital atrium with poorly developed musculature . . . . . *Mathevotaenia* Akhumyan
  Species: *M. boliviana* Sawada & Harada, 1986; *M. immatura* Rêgo, 1963
- Genital atrium with well-developed radial musculature . . . . . .*Atriotaenia* Sandground
  Species: *A. hastati* Vaucher, 1982(a)

Family Hymenolepididae Ariola

The life-cycle of hymenolepidids is similar to that of anoplocephalds, with transmission occurring via the ingestion of cysticercoid larvae in fleas and other insects.

1. Rostellum unarmed; testes separated into two groups by ovary . . . . . *Hymenolepis* Weinland
  Species: *H. dasypteri* Vaucher, 1985; *Hymenolepis* sp.
- Rostellum armed; testes not separated into two groups by ovary. . . . . *Vampirolepis* Spasskii
  Species: *V. artibei* Zdzitowiecki & Rutkowska, 1980; *V. bihamata* Sawada & Harada, 1986; *V. crassihamata* Sawada & Harada, 1986; *V. christensoni* (Macy, 1931(a)); *V. decipiens* (Diesing, 1850); *V. elongata* Rêgo, 1962; *V. guarany* Rêgo, 1962; *V. longisaccata* Sawada & Harada, 1986; *V. mazanensis* (Vaucher, 1986(b)); *V. pandonensis* Sawada & Harada, 1986; *V. phyllostomi* Vaucher, 1982(b); *V. promopsis* (Vaucher, 1986(a)); *V. santacruzensis* Sawada & Harada, 1986; *V. temmincki* (Vaucher, 1986(a)); *Vampirolepis* sp.

Class Trematoda Rudolphi

The Trematoda is a large class of 15,000–20,000 parasitic species which utilize all of the major vertebrate groups as hosts. The vast majority belong to the subclass Digenea, the members of which are characterised by having multiple generations (usually three) within their life-cycle, i.e. two asexual generations which mature in a molluscan host and one sexual generation which occurs within a vertebrate host. In terms of morphology, life-cycle and site, the group is very plastic, although this is not the case for individual lower taxa. Digeneans are usually parasites of the alimentary canal of their host, usually have a blind intestine and usually attach to the host using two (sometimes one) suckers. Transmission to the vertebrate host is usually by the direct penetration of a larval stage (the cercariae) or, more often, by the ingestion of an encysted larval stage (the metacercaria) with the host's food, e.g. within an intermediate host.

Key to Families

1. Alimentary canal absent . . . . . Anenterotrematidae
- Alimentary canal present. 2
2. Body bipartite, with spatulate anterior and oval posterior regions . . . . . Diplostomidae
- Body not bipartite 3
3. Anterior body bears proboscis with hooks . . . . . Rhopaliidae
- Anterior region of body without proboscis 4
4. Intestinal caeca short to medium, may be restricted to anterior region of body; vitelline fields limited in distribution, often with

limited number of follicles, often restricted to forebody 5
- Intestinal caeca medium to long; vitelline fields usually extensive, with many follicles, entirely or mainly in hindbody 6
5. True cirrus-sac absent; pseudocirrus-sac usually present; genital pore usually median or submedian in forebody . . . . . Lecithodendriidae
- True cirrus-sac present; genital pore usually sublateral to lateral at level of ventral sucker. . . . . Phaneropsolidae
6. Genital pore in posterior region of body 7
- Genital pore in anterior region of body 8
7. Ventral sucker absent. . . . . Nudacotylidae
- Ventral sucker present . . . . . Urotrematidae
8. Ovary between testes (in forms from the Americas). . . . . Hasstilesiidae
- Ovary anterior or posterior to testes 9
9. Ovary post-testicular . . . . . Dicrocoeliidae
- Ovary pre-testicular. . . . . Plagiorchiidae

Family Anenterotrematidae Yamaguti

The life-cycle of anenterotrematids is not known, but, judging by related digenean groups, the bats acquire the parasite by the ingestion of arthropods infected with the metacercarial stage. All digeneans utilize molluscs as first intermediate hosts.

1. Body pyriform, less than 1mm in length. . . . . *Anenterotrema* Stunkard
   Species: *A. eduardocaballeroi* (Freitas, 1960); *A. liliputianum* (Travassos, 1928); *A. mesolecitha* Marshall & Miller, 1979; *Anenterotrema* sp.
- Body elongate, measuring 1–5 mm. . . . . *Apharyngotrema* Marshall & Miller
  Species: *A. apharyngotrema* Marshall & Miller, 1979; *A. lenti* Santos & Gibson, 1998

Family Dicrocoeliidae Looss

Dicrocoeliids are parasites of terrestial mammals and birds, with mollucs and arthropods serving as intermediate hosts. Bats acquire these parasites by feeding on insects harbouring the metacercarial stage.

1. Testes oblique . . . . . *Metadelphis* Travassos
   Species: *M. alvarengai* Travassos, 1955
- Testes symmetrical . . . . . *Parametadelphis* Travassos
  Species: *P. compactus* Travassos, 1955

Family Diplostomidae Poirier

Transmission is normally associated with the aquatic environment and effected by the ingestion of a fish or an invertebrate harbouring the metacercarial stage.

Neodiplostomum Railliet
Species: *Neodiplostomum vaucheri* Dubois, 1983

Family Hasstilesiidae Hall

In the Americas, hasstilesiids are parasites of rodents and lagomorphs. The record below is the first from a bat. *Hasstilesia tricolor* is essentially a parasite of rabbits. All of the larval development of this group takes place in the molluscan host. The infection of frugivorous bats may take place when they accidentally ingest infected molluscs in their diet or by drinking water containing cercarial larvae.

Hasstilesia Hall
Species: *H. tricolor* (Stiles & Hassall, 1894)

Family Lecithodendriidae Lühe

The lecithodendriids are closely related to the phaneropsolids, from which they are often difficult to distinguish based on morphology.Together they form the major group of bat parasites. The synonymies indicated are based on Lotz & Font (2008a).

Bats become infected by ingesting insects harbouring the encysted metacercarial stage.

1. Pseudocirrus-sac surrounding seminal vesicle absent. . . . . *Castroia* Travassos
   Species: *C. amplicava* Travassos, 1928; *C. silvai* Travassos, 1928
- Thin-walled pseudocirrus-sac surrounds seminal vesicle 2
2. Genital atrium in forebody armed with spines . . . . . *Acanthatrium* Faust
   Species: *A. fugleri* Marshall & Miller, 1979
- Genital atrium unarmed. 3
3 Deep acetabulo-genital sac enclosing separate genital pores and ventral sucker . . . . . *Gymnoacetabulum* Lunaschi & Drago (= *Suttonia* Lunaschi)
   Species: *G. talaveraense* (Lunaschi, 2002)
- Acetabulo-genital sac absent; genital pore usually but not always common. 4
4. Pseudogonotyl (thick area of tegument surrounded by gland-cells) lateral to ventral sucker . . . . . *Ochoterenatrema* Caballero
   Species: *O. caballeroi* Freitas, 1957[3]; *O. diminutum* (Chandler, 1938); *O. fraternum* Freitas & Ibañez, 1963; *O. labda* Caballero, 1943
- Pseudogonotyl absent 5
5. Caeca extend into posterior region of body . . . . . *Chiropterotrema* Vélez & Thatcher
   Species: *C. antioquiense* Vélez & Thatcher, 1992(a)
- Caeca end in forebody. 6
6. Testes lateral to ventral sucker; body lacks large ventral cleft . . . . . *Paralecithodendrium* Odhner (= *Prosthodendrium* Dollfus)
   Species: *P. aranhai* Lent, Freitas & Proença, 1945*; P. brachycolon* Freitas & Dobbin Jr., 1960(b); *P. buongerminni* (Lent, Freitas & Proença, 1946); *P. conturbatum* (Freitas, 1960); *P. cordiforme* (Braun, 1900); *P. megovarium* (Marshall & Miller, 1979); *Paralecithodendrium* sp.
- Testes in anterior region of body; body with large ventral cleft . . . . . *Topsiturvitrema* Vélez & Thatcher
   Species: *T. verticalia* Vélez & Thatcher, 1992

Family Nudacotylidae

Nudacotylids occur in the intestines of several, normally vegetarian, groups of mammals in the Americas. Transmission occurs by the ingestion of metacercariae encysted on vegetation or other surfaces.

Nudacotyle Barker

Species: *N. carollia* Vélez & Thatcher, 1992; *N. novicia* Barker, 1916

Family Phaneropsolidae Mehra

The phaneropsolids are closely related to the lecithodendriids, from which they are often difficult to distinguish based on morphology. Together they form the major group of bat parasites. The synonymies indicated are based on Lotz & Font (2008b).

Bats become infected by ingesting insects harbouring the encysted metacercarial stage.

1. Caeca medium in length, reach into hindbody 2
- Caeca short, reach only to level of ventral sucker or retained in forebody. 3
2. Genital pore sublateral to submedian, in forebody . . . . . *Maxbraunium* Caballero & Zerecero
   Species: *M. tubiporum* (Braun, 1900)
- Genital pore lateral, at level of ventral sucker . . . . . *Postorchigenes* Tubangui (= *Czosnowia* Zdzitowiecki)
   Species: *P. mbopi* Vaucher, 1981; *P. paraguayensis* Fischthal & Martin, 1978
3. Male and female genital pores widely separated; male pore well anterior to ventral sucker, median or submedian . . . . . *Tremajoannes* Saoud

3. Syn. of *Ochoterenatrema diminutum* (Chandler, 1938) according to Cain (1966).

Species: *T. buckleyi* Saoud 1964

- Genital pore common or male and female pores close together, submedial to sublateral and close to level of ventral sucker.. .4

4. Ovary in forebody or at level of anterior region of ventral sucker; cirrus-sac not oriented horizontally . . . . . *Limatulum* Travassos (= *Stumiratrema* Vélez & Thatcher)
Species: *L. brevicoecum* Mañé-Garzón & González, 1976; *L. gastroides* Macy, 1935; *L. oklahomense* Macy, 1931(b); *L. umbilicatum* (Vélez & Thatcher, 1992)

- Ovary at level of posterior region of ventral sucker or in anterior hindbody; cirrus-sac oriented horizontally.. . . . . *Parabascus* Looss (= *Limatuloides* Dubois; *Parabascoides* Stunkard)[4]
Species: *P. cephalolecithus* (Marshall & Miller, 1979); *P. limatulus* (Braun, 1900)

Family Plagiorchiidae Lühe

This is a large group, occurring in a wide range of tetrapods. Metacercariae commonly occur encysted in both larval and adult insects; it is likely that bats acquire the parasites from the latter.

Plagiorchis Lühe
Species: *P. parumbursatus* Freitas & Dobbin Jr, 1961

Family Rhopaliidae Looss

Species of this rare group occur mainly in marsupials from the Americas, but occasionally in other in omnivorous mammals (and birds). The life-cycle is not known, but bats likely acquire the parasite by the ingestion of metacercariae encysted on the surface of vegetation or on/in molluscs or other invertebrates.

Rhopalias Stiles & Hassall
Species: *R. coronatus* (Rudolphi, 1819)

Family Urotrematidae Poche

Urotrematids occur in a variety of insectivorous rodents, bats, lizards and fishes. Bats acquire the parasite by the ingestion of encysted metacercariae in their insect prey.

Urotrema Braun
Species: *U. scabridum* Braun, 1900

Records

See Table 1 for a checklist relating to the various species of helminth parasites occurring in South American bats extracted from more than 120 references. The data in the table include the name of the parasite, its chiropteran host(s), the name of the South American countries in which it has been recorded, the site(s) of the parasite within the host and the related reference(s). Table 2 is a host-parasite checklist, listing the groups and species of helminth parasites so far recorded from the individual South American bat species which have been investigated.

Helminth parasites have been reported from 92 named chiropteran species belonging to six families, which is only about a third of the known taxa; Nogueira *et al*. (2014) listed 178 species of bats (from nine families) as occurring in Brazil alone and Wikepedia listed 275 bats (from nine families) as present in the whole of South America (Wikipedia: The free encyclopedia, 2014). The *c.*370 records of 114 nominal species of helminth parasites include 53 nematode species, three acanthocephalans, 18 cestodes and 40 trematodes. Despite the fact that the Chiroptera is the second largest mammalian order, given that the vast majority are insectivores, it is not surprising that their helminth fauna is not very diverse and tends to be somewhat restricted to those helminth

4. According to recent molecular studies (Kanarek *et al*. 2014), this genus belongs to the Pleurogenidae.

TABLE 1. List of records of helminth species from bats in South America, with their host(s), geographical distribution, site and data-sources.

Parasite	Host(s)	Locality	Site	Reference(s)
NEMATODA				
Allintoshius bioccai	*Eptesicus furinalis*	Paraguay	-	Rossi & Vaucher 2002
Allintoshius nudicaudatus	*Myotis nigricans*	Brazil	Small intestine	Freitas & Mendonça 1963; Vicente *et al*. 1997
Allintoshius parallintoshius	*Tadarida brasiliensis, Eptesicus furinalis, Myotis albescens, M. nigricans, M. riparius, M. ruber, M. levis*	Brazil, Paraguay, Peru	Small intestine	Araújo 1940; Lent *et al*. 1946; Vicente *et al*. 1997; Rossi & Vaucher 2002
Allintoshius sp.	*Saccopteryx bilineata, Molossops temminckii, Carollia castanea*	Colombia	-	Cuartas-Calle & Muñoz-Arango 1999
Allintoshius urumiac	*Myotis nigricans*	Brazil	Small intestine	Freitas & Mendonça 1960a; Vicente *et al*. 1997
Anoplostrongylus paradoxus	*Nyctinomops laticaudatus, Tadarida brasiliensis, Eumops perotis,* Phylostomidae gen. sp.	Brazil, Paraguay	Small intestine	Travassos 1918; Travassos 1920; Lent *et al*. 1946; Durette-Desset & Pinto 1977; Vicente *et al*. 1997
Aonchotheca cubana	*Molossus currentium* (as *M. bondae*), *M. molossus*	Colombia	-	Cuartas-Calle & Muñoz-Arango 1999
Aonchotheca magnifica	*Molossus rufus*	Brazil	Small intestine	Freitas & Mendonça 1961; Vicente e*t al*. 1997
Aonchotheca parca	*Glossophaga soricina*	Brazil	Small intestine	Freitas & Dobbin Jr. 1961a, 1962; Vicente *et al*. 1997
Aonchotheca pereirai	Molossidae gen. sp.	Brazil	Intestine	Freitas & Lent 1935
Aonchotheca pintoi	Chiroptera gen. sp.	Brazil	Small intestine	Freitas 1934
Aonchotheca pulchra	*Tadarida brasiliensis, Nyctinomops laticaudatus, N. macrotis*	Brazil, Paraguay	Stomach, stomach mucosa	Freitas 1934; Freitas & Lent 1936; Lent *et al*. 1946; Travassos & Freitas 1964; Vicente *et al*. 1997; Cardia *et al*. 2014
Aonchotheca sp.	Chiroptera gen. sp.	Argentina	-	Ramallo *et al*. 2007
Biacantha desmoda	*Desmodus rotundus*	Venezuela, Ecuador	-	Guerrero 1985; Vaucher & Durette-Desset 1986
Biacantha normaliae	*Desmodus rotundus*	Argentina	Intestine	Oviedo *et al*. 2012
Bidigiticauda embryophilum	*Glossophaga soricina*	Brazil	Small intestine	Freitas & Dobbin Jr. 1960a, 1962; Vicente *et al*. 1997
Bidigiticauda vivipara	*Artibeus lituratus*	Venezuela	-	Guerrero 1985
Capillaria sp.	*Anoura caudifer, Artibeus jamaicensis, Carollia perspicillata, Tadarida brasiliensis, Trachops cirrhosus, Sturnira erythromos, S. magna*	Argentina, Brazil, Colombia, Venezuela	Stomach	Cuartas-Calle & Muñoz-Arango 1999; Noronha *et al*. 2002; Nogueira *et al*. 2004; Drago *et al*. 2007; Guerrero 1985
Carostrongylus touzeti	*Carollia brevicauda, C. castanea, C. perspicillata perspicillata*	Ecuador, Paraguay, Peru	-	Durette-Desset & Vaucher 1989

.....continued on the next page

TABLE 1. (Continued)

Parasite	Host(s)	Locality	Site	Reference(s)
Cheiropteronema globocephala	*Sturnira lilium, Artibeus anderseni, A. cinereus, A. obscurus* (as *A.fuliginosus*), *A. jamaicensis, A. lituratus, A. planirostris, A. watsoni*	Brazil, Colombia, Ecuador, French Guiana, Peru Venezuela	Stomach, Intestine	Durette-Desset & Vaucher 1988; Cuartas-Calle & Muñoz-Arango 1999; Nogueira *et al*. 2004; Guerrero 1985
Cheiropteronema striatum	*Artibeus planirostris*	Argentina	Intestine	Oviedo *et al*. 2010
Cheiropteronema sp.	*Artibeus planirostris, Carolla perspicillata*	Peru, Venezuela	-	Durette-Desset & Vaucher 1988; Guerrero 1985
Histiostrongylus coronatus	*Phyllostomus discolor, Myotis nigricans, Myotis* sp.	Brazil, Colombia, Venezuela	Small intestine	Molin 1861; Travassos 1937; Diaz-Ungria 1973, 1979; Vicente *et al*. 1997; Cuartas-Calle & Muñoz-Arango 1999; Guerrero 1985
Histiostrongylus paradoxus	*Artibeus jamaicensis*	Colombia	Intestine	Travassos 1918; Cuartas-Calle & Muñoz-Arango 1999
Histiostrongylus sp.	*Phyllostomus hastatus, Carollia brevicauda, C. perspicillata*	Brazil, Colombia	Small intestine	Vicente *et al*. 1997; Cuartas-Calle & Muñoz-Arango 1999
Litomosoides artibei	*Artibeus cinereus, Artibeus* sp.	Colombia	Thoracic & abdominal cavities	Esslinger 1973; Cuartas-Calle & Muñoz-Arango 1999; Marinkelle & Garcia-Castañeda 1999; Brandt & Gardner 2000
Litomosoides brasiliensis	*Anoura caudifer, A. geoffroyi, Myotis* sp., *Phyllostomus discolor, P. elongatus, P. hastatus, Phyllostomus* sp., *Carollia brevicauda, C. castanea, C. perspicillata, Carollia* sp., *Sturnira lilium, Lionycteris spurrelii, Glossophaga soricina, Glossophaga* sp., *Lonchophylla thomasi*, *Trachops cirrhosus*	Brazil, Venezuela, Colombia, Peru, French Guiana, Bolivia	Thoracic & abdominal cavities	Almeida 1936; Rêgo 1961; Diaz-Ungría 1963; Esslinger 1973; Padilha & Barros-Araújo 1976; Guerreiro *et al*. 2002; Brandt & Gardner 2000; Marinkelle & Garcia-Castañeda 1999; Vicente *et al*. 1997; Mourão *et al*. 2002; Cuartas-Calle & Muñoz-Arango 1999; Notarnicola *et al*. 2010; Guerrero 1985
Litomosoides caliensis	*Sturnira lilium, S. tildae*	Colombia	Thoracic & abdominal cavities	Esslinger 1973; Brandt & Gardner 2000; Marinkelle & Garcia-Castañeda 1999; Cuartas-Calle & Muñoz-Arango 1999
Litomosoides carolliae venezuelensis	*Carollia* sp.	Venezuela	-	Rodrigo 1964
Litomosoides chandleri	*Artibeus jamaicensis, A. planirostris, Nyctinomops laticaudatus, Sturnira lilium, S. oporaphilum, Lasiurus ega, Phyllonycteris poeyi*	Colombia, Bolivia, Brazil, French Guiana, Venezuela, Peru	Thoracic & abdominal cavities	Esslinger 1973; Brandt & Gardner 2000; Marinkelle & Garcia-Castañeda 1999; Cuartas-Calle & Muñoz-Arango 1999; Bain *et al*. 2003; Notarnicola *et al*. 2010; Guerrero 1985
Litomosoides colombiensis	*Platyrrhinus* (as *Vampyrops*) *dorsalis, P.* (as *V.*) *helleri, Artibeus jamaicensis*	Colombia	Thoracic & abdominal cavities	Esslinger 1973; Brandt & Gardner 2000; Marinkelle & Garcia-Castañeda 1999

.....continued on the next page

TABLE 1. (Continued)

Parasite	Host(s)	Locality	Site	Reference(s)
Litomosoides salazari	*Lasiurus ega*	Bolivia	Body-cavity	Notarnicola *et al*. 2010
Litomosoides serpicula	*Phyllostomus* sp.	Brazil	Abdominal cavity	Molin 1858
Litomosoides solarii	*Trachops cirrhosus*	Peru	Body-cavity	Guerrero *et al*. 2002
Litomosoides sp.	*Sturnira lilium, Myotis riparius*	Argentina,Brazil	Abdominal cavity	Boero & Delpietro 1970; Vicente *et al*. 1987, 1997
Litomosoides teshi	*Carolia perspicillata*	Colombia	Thoracic & abdominal cavities	Esslinger 1973; Brandt & Gardner 2000; Marinkelle & Garcia-Castañeda 1999; Cuartas-Calle & Muñoz-Arango 1999
Litomosoides yutajensis	*Pteronotus parnellii*	Venezuela	Microfilariae in blood system	Guerrero *et al*. 2003, 2006
Lukonema lukoschusi	*Noctilio labialis* (= *N. leporinus* or *N. albiventris*), *Lophostoma* (as *Tonatia*) *carrikeri, Carollia perspicillata, Desmodus rotundus, Saccopteryx leptura, Eptesicus brasiliensis melanopterus*	Suriname, French Guiana	Uropatagium	Chabaud & Bain 1974
Migonella fracchiai	*Myotis nigricans*	Paraguay	Mesenteries	Lent *et al*. 1946
Molostrongylus acanthocolpos	*Molossops temmincki*	Paraguay	Intestine	Durette-Desset & Vaucher 1996, 1999
Molostrongylus mbopi	*Cynomops abrasus, C. planirostris, Molossops temmincki*	Paraguay	Intestine	Durette-Desset &Vaucher 1999
Parahistiostrongylus octacanthus	*Pteronotus parnelli, Phyllostomus hastatus*	Venezuela	-	Guerrero 1985
Physaloptera sp. (juv.)	Chiroptera gen. sp.	Argentina	-	Ramallo *et al*. 2007
Pseudocapillaria pusilla	*Sturnina lilium, Lonchophylla robusta*	Brazil, Colombia	Small intestine	Travassos 1914; Freitas 1934; Freitas & Lent 1936; Vicente *et al*. 1997; Cuartas-Calle & Muñoz-Arango 1999
Pterothominx angrensis	*Molossus rufus*	Brazil	Small intestine	Freitas 1934; Freitas & Lent 1936; Vicente *et al*. 1997
Pterothominx brevidelphis	*Myotis nigricans*	Brazil	Stomach	Freitas & Mendonça 1960b; Vicente *et al*. 1997
Pterygodermatites elegans	*Eumops perotis*	Brazil	Intestine	Travassos 1928; Vicente *et al*. 1997
Rictularia sp.	*Tadarida brasiliensis, Micronycteris megalotis, Myotis nigricans*	Brazil, Colombia	Intestine	Cuartas-Calle & Muñoz-Arango 1999; Noronha *et al*. 2002
Seuratum sp.	*Myotis keaysi*	Venezuela	-	Guerrero 1985
Stilestrongylus octacanthus	*Phyllostomus hastatus*	Brazil	Small intestine	Lent & Freitas 1940; Vicente *et al*. 1997
Tenoranema rivarolai	*Nyctinomops laticaudatus*	Paraguay	Small intestine	Lent *et al*. 1946
Torrestrongylus sp.	*Sturnira bidens, Micronycteris schmidtorum*	Colombia	Small intestine	Cuartas-Calle & Muñoz-Arango 1999

.....continued on the next page

TABLE 1. (Continued)

Parasite	Host(s)	Locality	Site	Reference(s)
Websternema parnelli	*Pteronotus parnelli*	Venezuela	-	Guerrero 1985
ACANTHOCEPHALA				
Moniliformis convolutum	*Vampyrum spectrum*	Brazil	Intestine	Meyer 1932; Gibson & McCarthy 1987
Moniliformis moniliformis	*Phyllostomus hastatus*	Brazil	Intestine	Machado Filho 1946; Gibson & McCarthy 1987
Neoncicola artibei	*Artibeus lituratus*	Paraguay	Small intestine	Smales 2007
CESTODA				
Atriotaenia hastati	*Phyllostomus hastatus*	Paraguay, Peru	Intestine	Vaucher 1982a; Vargas *et al*. 2009b
Cycloskrjabinia sp.	*Phyllostomus* sp.	Bolivia		Sawada & Harada 1986
Hymenolepis dasypteri	*Lasiurus ega argentinus*	Paraguay	Intestine	Vaucher 1985; Nama 1990
Hymenolepis sp.	*Noctilio leporinus*	Paraguay		Schmidt & Martin 1978
Mathevotaenia boliviana	*Glossophaga soricina*	Bolivia	Intestine	Sawada & Harada 1986; Sawada 1997
Mathevotaenia immatura	*Glossophaga soricina*	Brazil	Small intestine	Rêgo 1963
Vampirolepis artibei	*Glossophaga soricina*	Peru	Intestine	Mendoza *et al*. 1997
Vampirolepis bihamata	*Micronycteris minuta*	Bolivia	Intestine	Sawada & Harada 1986; Sawada 1990, 1997
Vampirolepis christensoni	*Nyctinomops laticaudatus,* Molossidae gen. sp., Chiroptera gen. sp.	Brazil, Paraguay, Bolivia	Small intestine	Rêgo 1962; Travassos 1965
Vampirolepis crassihamata	*Molossus molossus*	Bolivia	Intestine	Sawada & Harada 1986; Sawada 1990, 1997
Vampirolepis decipiens	*Cynomops abrasus brachymeles, Eumops patagonicus* (as *E. bonariensis beckeri*), *E. glaucinus, E. perotis, Molossops temmincki, Pteronotus parnellii rubiginosus* (as *Chilonycteris rubiginosa*), *Eptesicus fuscus, Nyctinomops laticaudatus, Myotis albescens*	Brazil, Argentina, Paraguay	Intestine	Diesing 1850; Linstow 1904; Joyeux 1945; Rêgo 1962; Travassos 1965; Boero & Delpietro 1970; Vaucher, 1982b, 1986a; Nama 1990; Sawada 1990
Vampirolepis elongata	*Molossus rufus, Glossophaga soricina, Artibeus obscurus* (as *A. fuliginosus*), *A. planirostris, A. lituratus, Pygoderma bilabiatum; Phyllostomus hastatus, Platyrrhinus helleri,* Chiroptera gen. sp.	Brazil, Argentina, Paraguay, Bolivia, Peru	Small intestine	Rêgo 1962; Sawada 1990; Travassos 1965; Boero & Delpietro 1970; Nama 1990; Vaucher 1982b, 1986a,1992; Nogueira *et al*. 2004; Vargas *et al*. 2009b

.....continued on the next page

TABLE 1. (Continued)

Parasite	Host(s)	Locality	Site	Reference(s)
Vampirolepis pandonensis	*Eptesicus furinalis*	Bolivia	Intestine	Sawada & Harada 1986; Sawada 1990, 1997
Vampirolepis phyllostomi	*Phyllostomus hastatus hastatus, Eumops bonariensis beckeri*	Peru, Paraguay, Bolivia	Intestine	Vaucher 1982b; Sawada & Harada 1986; Sawada 1990; Nama 1990
Vampirolepis promopsis	*Promops centralis*	Paraguay	Intestine	Vaucher 1986a
Vampirolepis santacruzensis	*Molossus molossus*	Bolivia	Intestine	Sawada & Harada 1986; Sawada 1990, 1997
Vampirolepis sp.	*Artibeus fraterculus, Noctilio leporinus*	Peru, Bolivia	Intestine	Sawada & Harada 1986; Sawada 1990; Vargas *et al*. 2009b
Vampirolepis temmincki	*Molossops temmincki*	Paraguay	Intestine	Vaucher 1986a, 1992; Sawada 1990; Nama 1990
TREMATODA				
Acanthatrium fugleri	*Molossus molossus*	Ecuador	Small intestine	Marshall & Miller 1979
Anenterotrema eduardocaballeroi	*Molossus rufus rufus, M. molossus, Phyllostomus elongatus, P. hastatus, Eumops glaucinus, Eumops* sp., *Histiotus velatus*	Brazil, Colombia	Small intestine	Freitas 1960; Caballero 1961; Caballero & Caballero 1969; Freitas & Dobbin Jr. 1962; Travassos *et al*. 1969; Thatcher 1993; Lunaschi 2002; Caro *et al*. 2003
Anenterotrema liliputianum	*Histiotus velatus, Molossus molossus* (also as *M. obscurus*), *M. rufus* (also as *M. ater*), Molossidae gen. sp., *Molossops temminckii, Myotis nigricans, Phyllostomus elongatus, Peropteryx macrotis*	Brazil, Argentina	Small intestine	Travassos 1928; Freitas 1961; Freitas & Dobbin Jr. 1962; Caballero & Caballero 1969; Travassos *et al*. 1969; Thatcher 1993; Ferreira & Brasil-Sato 1998; Lunaschi & Notarnicola 2010
Anenterotrema mesolecitha	*Carollia perspicillata perspicillata*	Ecuador	Small intestine	Marshall & Miller 1979
Anenterotrema sp.	*Anoura caudifer, Saccopteryx bilineata*	Brazil	Small intestine	Santos & Gibson 1998
Apharyngotrema apharyngotrema	*Molossus molossus*	Ecuador	Small intestine	Marshall & Miller 1979
Apharyngotrema lenti	*Anoura caudifer, Saccopteryx bilineata*	Brazil	Gall-bladder	Santos & Gibson 1998
Castroia amplicava	Molossidae gen. sp., *Peropteryx kappleri*	Colombia, Brazil	Intestine	Travassos 1928; Martin 1969; Travassos *et al*. 1969; Thatcher 1993; Caro *et al*. 2003
Castroia silvai	*Anoura caudifer, Peropteryx macrotis, P. kappleri*	Colombia	Small intestine	Travassos 1928; Martin 1969; Travassos *et al*. 1969; Vélez & Thatcher 1992a
Chiropterotrema antioquiense	*Carollia perspicillata perspicillata*	Brazil, Colombia	Small intestine	Vélez & Thatcher 1992a; Boeger *et al*. 1985
Gymnoacetabulum talaveraense	*Molossus molossus, Tadarida brasiliensis, Myotis levis*	Argentina	Intestine	Lunaschi 2002; Lunaschi & Drago 2007; Drago *et al*. 2007; Lunaschi & Notarnicola 2010
Hasstilesia tricolor	*Artibeus anderseni, A. lituratus, A. obscurus, Chiroderma trinitatum, Mesophylla macconnelli , Vampyressa* (*Vampyriscus*) *bidens, Vampyrodes caraccioli*	Brazil	Small intestine	Nogueira *et al*. 2004

.....continued on the next page

TABLE 1. (Continued)

Parasite	Host(s)	Locality	Site	Reference(s)
Limatulum umbilicatum	*Sturnira lilium*	Colombia, Argentina	Small intestine	Vélez & Thatcher 1992a; Lunaschi *et al*. 2003; Drago *et al*. 2007
Maxbrauniun tubiporum	*Lasiurus blossevillii*	Brazil	Intestine	Braun 1900; Travassos *et al*. 1969; Thatcher 1993
Metadelphis alvarengai	*Eptesicus furinalis*	Brazil	Intestine	Travassos 1955; Travassos *et al*. 1969; Thatcher 1993
Neodiplostomum vaucheri	*Chrotopterus auritus*	Peru	Intestine	Dubois 1983
Nudacotyle carollia	*Carollia perspicillata perspicillata*	Ecuador, Colombia	Small intestine	Vélez & Thatcher 1992b
Nudacotyle novicia	*Artibeus lituratus, Molossus molossus*	Ecuador, Colombia	Small intestine	Marshall & Miller 1979; Caro *et al*. 2003
Ochoterenatrema caballeroi	*Cynomops planirostris, Molossops* sp.	Brazil	Intestine	Freitas 1957; Travassos *et al*. 1969; Thatcher 1993
Ochoterenatrema diminutum	*Myotis nigricans, Mollosus mollosus*	Brazil	Intestine	Ferreira & Brasil-Sato 1998
Ochoterenatrema fraternum	*Tadarida brasiliensis*	Peru	Intestine	Freitas & Ibañez 1963; Caballero & Caballero 1969; Tantaleán *et al*. 1992; Thatcher 1993
Ochoterenatrema labda	*Myotis levis, Tadarida brasiliensis*	Argentina	Anterior intestine	Drago *et al*. 2007; Lunaschi & Notarnicola 2010
Parabascus cephalolecithus	*Carollia castanea*	Ecuador	Small intestine	Marshall & Miller 1979
Parabascus limatulus	*Molossus* sp., *Myotis nigricans, Tadarida brasiliensis*	Brazil, Paraguay, Argentina	Small intestine	Braun 1900; Travassos 1921; Lent *et al*. 1945; Lunaschi 2004; Drago *et al*. 2007; Lunaschi & Drago 2007
Paralecithodendrium aranhai	*Nyctinomops laticaudatus, Molossus molossus*	Paraguay	Small intestine	Lent *et al*. 1945; Travassos *et al*. 1969; Thatcher 1993
Paralecithodendrium brachycolon	*Molossus molossus, Molossus rufus rufus*	Brazil	Small intestine	Freitas & Dobbin Jr. 1960b, 1962; Caballero & Caballero 1969; Travassos *et al*. 1969
Paralecithodendrium buongerminni	*Molossus molossus. M. rufus* (as *M. ater*)	Brazil, Paraguay	Small intestine	Lent *et al*. 1946; Dubois 1960; Travassos *et al*. 1969; Ferreira & Brasil-Sato 1998
Parametadelphis compactus	*Glyphonycteris* (as *Micronycteris*) *behnii*	Brazil	Small intestine	Travassos 1955; Travassos *et al*. 1969; Thatcher 1993
Paralecithodendrium conturbatum	*Noctilio albiventris*, *Molossus molossus, Myotis nigricans, Tadarida brasiliensis*	Brazil, Ecuador, Argentina	Small intestine	Freitas 1960; Travassos & Freitas 1964; Travassos *et al*. 1969; Caballero & Caballero 1969; Marshall & Miller 1979; Thatcher 1993; Boero & Led 1971; Lunaschi & Drago 2007
Paralecithodendrium cordiforme	*Molossus molossus* (also as *M. major*), *Miniopterus schreibersii*	Brazil, Colombia	Small intestine	Braun 1900; Travassos 1921; Dubois 1960; Travassos *et al*. 1969; Thatcher 1993; Caro *et al*. 2003
Paralecithodendrium megovarium	*Molossus molossus*	Ecuador	Small intestine	Marshall & Miller 1979

.....continued on the next page

TABLE 1. (Continued)

Parasite	Host(s)	Locality	Site	Reference(s)
Postorchigenes paraguayensis	*Eumops bonariensis beckeri, Noctilio leporinus*	Brazil, Paraguay	Intestine	Fischthal & Martin 1978; Boeger *et al*. 1985
Rhopalias coronatus	*Carollia perspicillata*	Ecuador	Small intestine	Marshall & Miller 1979
Topsiturvitrema verticalia	*Carollia perspicillata perspicillata, Myotis levis*	Colombia, Argentina	Small intestine	Vélez & Thatcher 1992a; Lunaschi 2006; Lunaschi & Drago 2007
Tremajoannes buckleyi	*Pteronotus davyi fulvus, Mormoops megalophylla, Molossus molossus*	Ecuador, Colombia	Small intestine	Saoud 1964; Caballero & Caballero 1969; Martin 1969; Marshall & Miller 1979
Urotrema scabridum	*Noctilio albiventris, Noctilio* sp., *Myotis nigricans*, *M. ater* (as *M. chiloensis ater* – syn. of *M. chiloensis* or *M. levis*), *M. levis, Molossops temminckii, Molossus molossus, M. rufus, Molossus* sp., *Eumops bonariensis, Lasiurus cinereus, Lasiurus intermedius*, *Lasiurus* (*Dasypterus*) sp., *Promops nasutus, P. centralis, Phyllostomus* sp., *Tadarida brasiliensis*	Brazil, Paraguay, Ecuador, Uruguay, Argentina, Colombia	Small intestine; large intestine	Braun 1900; Lent *et al*. 1945; Freitas & Dobbin Jr. 1962;Travassos & Freitas 1964; Mañé-Garzón & Telias 1965; Travassos *et al*. 1969; Caballero & Caballero 1969; Marshall & Miller 1979; Thatcher 1993; Caro *et al*. 2003; Drago *et al*. 2007; Lunaschi & Notarnicola 2010
Negative result				
No helminth eggs found in faeces	*Carollia perspicillata, Sturnira lilium*, *Artibeus lituratus, A. obscures, Platyrrhinus recifinus*	Brazil		Pinheiro *et al.,* 2013

TABLE 2. Host-parasite list of South America bats with their helminth species.

Emballonuridae Gervais		
Peropteryx kappleri Peters	Trematoda	*Castroia amplicava, C. silvai, Limatulum gastroides*
Peropteryx macrotis (Wagner)	Trematoda	*Anenterotrema liliputianum, Castroia silvai*
Rhynchonycteris naso (Wied-Neuwied)	Cestoda	*Vampirolepis mazanensis*
Saccopteryx bilineata (Temminck)	Nematoda	*Allintoshius* sp.
	Cestoda	*Vampirolepis mazanensis*
	Trematoda	*Anenterotrema* sp., *Apharyngotrema lenti*
Saccopteryx leptura (Schreber)	Nematoda	*Lukonema lukoschusi*
Molossidae Gervais		
Cynomops abrasus (Temminck)	Nematoda	*Molostrongylus mbopi*
Cynomops abrasus brachymeles (Peters)	Cestoda	*Vampirolepis decipiens*
Cynomops planirostris (Peters)	Nematoda	*Molostrongylus mbopi*
	Trematoda	*Ochoterenatrema caballeroi*
Eumops bonariensis (Peters)	Trematoda	*Urotrema scabridum*
Eumops glaucinus (Wagner)	Cestoda	*Vampirolepis decipiens*
	Trematoda	*Anenterotrema eduardocaballeroi*
Eumops patagonicus Thomas (as *E. bonariensis beckeri* Sanborn)	Cestoda	*Vampirolepis decipiens, V. guarany, V.phyllostomi*
	Trematoda	*Postorchigenes paraguayensis*
Eumops perotis (Schinz)	Nematoda	*Anoplostrongylus paradoxus, Litomosoides molossi, Pterygodermatites elegans*
	Cestoda	*Vampirolepis decipiens*
Eumpos sp.	Trematoda	*Anenterotrema eduardocaballeroi*
Molossops temminckii (Burmeister)	Nematoda	*Allintoshius* sp., *Molostrongylus acanthocolpos, M. mbopi*
	Cestoda	*Vampirolepis decipiens, V. temmincki*
	Trematoda	*Anenterotrema liliputianum, Urotrema scabridum*
Molossops sp.	Trematoda	*Ochoterenatrema caballeroi*
Molossus currentium Thomas (as *M. bondae* Allen)	Nematoda	*Aonchotheca cubana, Litomosoides molossi*

.....continued on the next page

TABLE 2. (Continued)

Molossus molossus (Pallas) (some as *M. m. crassicaudatus* Geoffroy, *M. major* Kerr and *M. obscurus* Geoffroy)	Nematoda	*Aonchotheca cubana, Litomosoides molossi*
	Cestoda	*Vampirolepis crassihamata, V. guarany, V. longisaccata, V. santacruzensis*
	Trematoda	*Acanthatrium fugleri, Anenterotrema eduardocaballeroi, A. liliputia, Apharyngotrema apharyngotrema, Gymnoacetabulum talaveraense, Limatulum gastroides, Nudacotyle novicia, Ochoterenatrema diminutum, Paralecithodendrium aranhai, P. brachycolon, P. buongerminni, P. conturbatum, P. cordiforme, P. megovarium, Paralecithodendrium* sp., *Plagiorchis parumbursatus, Tremajoannes buckleyi, Urotrema scabridum*
Molossus rufus Geoffroy (some as *M. ater* Geoffroy)	Nematoda	*Aonchotheca magnifica, Pterothominx angrensis, Paralecithodendrium brachycolon*
	Cestoda	*Vampirolepis elongata*
	Trematoda	*Anenterotrema eduardocaballeroi, A. liliputia, Paralecithodendrium buongerminni, Urotrema scabridum*
Molossus sp.	Trematoda	*Parabascus limatulus, Urotrema scabridum*
Nyctinomops laticaudatus (Geoffroy)	Nematoda	*Anoplostrongylus paradoxus, Aonchotheca pulchra, Litomosoides chandleri, Tenoranema rivarolai*
	Cestoda	*Vampirolepis christensoni, V. decipiens*
	Trematoda	*Paralecithodendrium aranhai*
Nyctinomops macrotis (Gray)	Nematoda	*Aonchotheca pulchra*
Promops centralis Thomas	Cestoda	*Vampirolepis promopsis*
	Trematoda	*Urotrema scabridum*
Promops nasutus (Spix)	Trematoda	*Urotrema scabridum*
Molossidae gen. sp.	Nematoda	*Aonchotheca pereirai*
	Cestoda	*Vampirolepis christensoni*
	Trematoda	*Anenterotrema liliputianum, Castroia amplicava, Limatulum oklahomense*
Mormoopidae Saussure		
Mormoops megalophylla (Peters)	Trematoda	*Tremajoannes buckleyi*
Pteronotus davyi fulvus Thomas	Trematoda	*Tremajoannes buckleyi*
Pteronotus parnellii Gray	Nematoda	*Litomosoides yutajensis, Parahistiostrongylus octacanthus, Websternema parnelli*
Pteronotus parnellii rubiginosus (Wagner) (as *Chilonycteris rubiginosa* Wagner)	Cestoda	*Vampirolepis decipiens*

.....continued on the next page

TABLE 2. (Continued)

Noctilionidae Gray		
Noctilio albiventris Desmarest	Nematoda	*Tricholeiperia proencai*
	Trematoda	*Paralecithodendrium conturbatum, Urotrema scabridum*
Noctilio leporinus (Linnaeus)	Nematoda	*Tricholeiperia proencai*
	Cestoda	*Hymenolepis* sp., *Vampirolepis* sp.
	Trematoda	*Postorchigenes paraguayensis*
Noctilio labialis Kerr (= *N. leporinus* or *N. albiventris*)	Nematoda	*Lukonema lukoschusi*
Noctilio sp.	Trematoda	*Urotrema scabridum*
Phyllostomidae Gray		
Anoura caudifer (Geoffroy)	Nematoda	*Capillaria* sp., *Litomosoides brasiliensis*
	Trematoda	*Anenterotrema* sp., *Apharyngotrema lenti, Castroia silvai*
Anoura geoffroyi Gray	Nematoda	*Litomosoides brasiliensis, L. hamletti*
Artibeus anderseni Osgood	Nematoda	*Cheiropteronema globocephala*
	Trematoda	*Hasstilesia tricolor*
Artibeus cinereus (Gervais)	Nematoda	*Cheiropteronema globocephala, Litomosoides artibei*
Artibeus fraterculus Anthony	Cestoda	*Vampirolepis* sp.
Artibeus jamaicensis Leach	Nematoda	*Capillaria* sp., *Cheiropteronema globocephala, Histiostrongylus paradoxus, Litomosoides chandleri, L. colombiensis, L. hamletti, Tricholeiperia proencai*
Artibeus lituratus (Olfers)	Nematoda	*Bidigiticauda vivipara, Cheiropteronema globocephala*
	Acanthocephala	*Neoncicola artibei*
	Cestoda	*Vampirolepis elongata*
	Trematoda	*Hasstilesia tricolor, Nudacotyle novicia*
Artibeus obscurus (Schinz) (sometimes as *A. Fuliginosus* Gray)	Nematoda	*Cheiropteronema globocephala*
	Cestoda	*Vampirolepis elongata*
	Trematoda	*Hasstilesia tricolor*
Artibeus planirostris (Spix)	Nematoda	*Cheiropteronema globocephala, C. striatum, Cheiropteronema* sp., *Litomosoides chandleri*
	Cestoda	*Vampirolepis elongata*
Artibeus watsoni Thomas	Nematoda	*Cheiropteronema globocephala*
Artibeus sp.	Nematoda	*Litomosoides artibei*

.....continued on the next page

TABLE 2. (Continued)

Carollia brevicauda (Schinz)	Nematoda	*Carostrongylus touzeti, Histiostrongylus* sp., *Litomosoides brasiliensis*
Carollia castanea Allen	Nematoda	*Allintoshius* sp., *Carostrongylus touzeti, Litomosoides brasiliensis*
	Trematoda	*Parabascus cephalolecithus*
Carollia perspicillata (Linneaus)	Nematoda	*Capillaria* sp., *Carostrongylus touzeti, Cheiropteronema* sp., *Histiostrongylus* sp., *Litomosoides brasiliensis, L. hamletti, L. teshi, Lukonema lukoschusi*
	Trematoda	*Anenterotrema mesolecitha, Chiropterotrema antioquiense, Nudacotyle carollia, Rhopalias coronatus, Topsiturvitrema verticalia*
Carollia sp.	Nematoda	*Litomosoides brasiliensis, L. carolliae venezuelensis*
Chiroderma trinitatum Goodwin	Trematoda	*Hasstilesia tricolor*
Chrotopterus auritus (Peters)	Trematoda	*Neodiplostomum vaucheri*
Desmodus rotundus (Geoffroy)	Nematoda	*Biacantha desmoda, B. normaliae, Lukonema lukoschusi*
Glossophaga soricina (Pallas)	Nematoda	*Aonchotheca parca, Bidigiticauda embryophilum, Litomosoides brasiliensis, L. guiterasi, L. hamletti*
	Cestoda	*Mathevotaenia boliviana, M. immature, Vampirolepis artibei, V. elongata*
Glossophaga sp.	Nematoda	*Litomosoides brasiliensis, L. hamletti*
Glyphonycteris (as *Micronycteris*) *behnii* (Peters)	Trematoda	*Parametadelphis compactus*
Lionycteris spurrelli Thomas	Nematoda	*Litomosoides brasiliensis*
Lonchophylla robusta Miller	Nematoda	*Litomosoides hamletti, Pseudocapillaria pusilla*
	Trematoda	*Limatulum gastroides*
Lonchophylla thomasi Allen	Nematoda	*Litomosoides brasiliensis*
Lophostoma (as*Tonatia*) *carrikeri* (Allen)	Nematoda	*Lukonema lukoschusi*
Lophostoma silvicolum occidentalis Davis & Carter	Nematoda	*Tricholeiperia peruensis*
Mesophylla macconnelli Thomas	Trematoda	*Hasstilesia tricolor*
Micronycteris megalotis (Gray)	Nematoda	*Rictularia* sp.
Micronycteris minuta (Gervais)	Cestoda	*Vampirolepis bihamata*
Micronycteris schmidtorum Sanborn	Nematoda	*Torrestrongylus* sp.
Phyllonycteris poeyi Gundlach	Nematoda	*Litomosoides chandleri*
Phyllostomus discolor Wagner	Nematoda	*Histiostrongylus coronatus, Litomosoides brasiliensis*
Phyllostomus elongatus (Geoffroy)	Nematoda	*Litomosoides brasiliensis*
	Trematoda	*Anenterotrema eduardocaballeroi, A. liliputianum*

.....continued on the next page

TABLE 2. (Continued)

Phyllostomus hastatus (Pallas)	Nematoda	*Histiostrongylus* sp., *Litomosoides brasiliensis, Parahistiostrongylus octacanthus, Stilestrongylus octacanthus*
	Acanthocephala	*Moniliformis moniliformis*
	Cestoda	*Atriotaenia hastati, Pygoderma bilabiatum, Vampirolepis phyllostomi*
	Trematoda	*Anenterotrema eduardocaballeroi*
Phyllostomus sp.	Nematoda	*Litomosoides brasiliensis, L. serpicula*
	Cestoda	*Cycloskrjabinia* sp.
	Trematoda	*Urotrema scabridum*
Platyrrhinus (as *Vampyrops*) *dorsalis* Thomas	Nematoda	*Litomosoides colombiensis*
Platyrrhinus (sometimes as *Vampyrops*) *helleri* (Peters)	Nematoda	*Litomosoides colombiensis*
	Cestoda	*Vampirolepis elongata*
Pygoderma bilabiatum (Wagner)	Cestoda	*Vampirolepis elongata*
Sturnira bidens Thomas	Nematoda	*Torrestrongylus* sp.
Sturnira erythromos Tschudi	Nematoda	*Capillaria* sp.
Sturnira lilium (Geoffroy)	Nematoda	*Cheiropteronema globocephala, Litomosoides brasiliensis, L. caliensis, L. chandleri, L. guiterasi, Litomosoides* sp., *Pseudocapillaria pusilla*
	Trematoda	*Limatulum umbilicatum*
Sturnira magna de al Torre	Nematoda	*Capillaria* sp.
Sturnira oporaphilum Tschudi	Nematoda	*Litomosoides chandleri*
Sturnira tildae de al Torre	Nematoda	*Litomosoides caliensis*
Tadarida brasiliensis (Geoffroy)	Nematoda	*Allintoshius parallintoshius, Anoplostrongylus paradoxus, Aonchotheca pulchra, Capillaria* sp., *Rictularia* sp.
	Trematoda	*Gymnoacetabulum talaveraense, Ochoterenatrema fraternum, O. labda, Parabascus limatulus, Paralecithodendrium conturbatum, Urotrema scabridum*
Trachops cirrhosus (Spix)	Nematoda	*Capillaria* sp., *Litomosoides brasiliensis, L. solarii, Tricholeiperia leiperi*
Vampyressa (*Vampyriscus*) *bidens* (Dobson)	Trematoda	*Hasstilesia tricolor*
Vampyrodes caraccioli (Tomas)	Trematoda	*Hasstilesia tricolor*
Vampyrum spectrum (Linnaeus)	Acanthocephala	*Moniliformis convolutum*
Phylostomidae gen. sp.	Nematoda	*Anoplostrongylus paradoxus*
Vespertilionidae Gray		
Eptesicus brasiliensis melanopterus Jentink	Nematoda	*Lukonema lukoschusi*

.....continued on the next page

TABLE 2. (Continued)

Eptesicus furinalis (d'Orbigny)	Nematoda	*Allintoshius bioccai, A. parallintoshius*
	Cestoda	*Vampirolepis guarany, V. pandonensis*
	Trematoda	*Metadelphis alvarengai*
Eptesicus fuscus (Beauvois)	Nematoda	*Litomosoides hamletti*
	Cestoda	*Vampirolepis decipiens*
Histiotus velatus (Geoffroy)	Trematoda	*Anenterotrema eduardocaballeroi, A. liliputianum*
Lasiurus blossevillii (Lesson & Garnot)	Trematoda	*Maxbrauniun tubiporum*
Lasiurus cinereus (Beauvois)	Trematoda	*Urotrema scabridum*
Lasiurus ega (Gervais)	Nematoda	*Litomosoides chandleri, L. salazari*
Lasiurus ega argentinus Thomas	Cestoda	*Hymenolepis dasypteri, Vampirolepis guarany*
	Trematoda	*Postorchigenes mbopi*
Lasiurus intermedius (Allen)	Trematoda	*Urotrema scabridum*
Lasiurus (*Dasypterus*) sp.	Trematoda	*Urotrema scabridum*
Miniopterus schreibersii (Kuhl)	Trematoda	*Paralecithodendrium cordiforme*
Myotis albescens (Geoffroy)	Nematoda	*Allintoshius parallintoshiius*
	Cestoda	*Vampirolepis decipiens*
Myotis ater (Peters) (as *M. chiloensis ater* – syn. of *M. chiloensis* (Waterhouse) or *M. levis*)	Trematoda	*Urotrema scabridum*
Myotis keaysi Allen	Nematoda	*Seuratum* sp.
Myotis levis (Geoffroy)	Nematoda	*Allintoshius parallintoshius*
	Trematoda	*Gymnoacetabulum talaveraense, Limatulum brevicoecum, Ochoterenatrema labda, Topsiturvitrema verticalia, Urotrema scabridum*
Myotis nigricans (Schinz)	Nematoda	*Allintoshius nudicaudatus, A. parallintoshius, A. urumiac, Histiostrongylus coronatus, Litomosoides molossi, Migonella fracchiai, Pterothominx brevidelphis, Rictularia* sp.
	Trematoda	*Anenterotrema liliputianum, Limatulum oklahomense, Ochoterenatrema diminutum, Parabascus limatulus, Paralecithodendrium conturbatum, Urotrema scabridum*
Myotis riparius Handley	Nematoda	*Allintoshius parallintoshius, Litomosoides* sp.
Myotis ruber (Geoffroy)	Nematoda	*Allintoshius parallintoshius*
Myotis sp.	Nematoda	*Histiostrongylus coronatus, Litomosoides brasiliensis*
Chiroptera gen. sp.	Nematoda	*Aonchotheca pintoi, Aonchotheca* sp., *Physaloptera* sp. (juv.)
	Cestoda	*Vampirolepis christensoni, V. elongata*

groups which involve insects as intermediate hosts. Consequently, it would appear that the endoparasitic fauna of this group in South America appears rather depauperate when compared to the rich ectoparasitic fauna reported by Frank *et al*. (2014), i.e. 273 species. Thus, in terms of those chiropteran taxa examined so far, the diversity of helminth parasites is only slightly greater than that of their hosts.

Acknowledgments

This study was part-funded by the Fundação Carlos Chagas Filho de Amparo à Pesquisa no Rio de Janeiro (FAPERJ), the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES Parasitologia Básica) and the Conselho Nacional de Pesquisa (CNPq) – PROEP/Fiocruz and Edital Universal 2014.

References

Almeida, J.L. (1936) Sobre um parasito de Chiroptera: *Litomosoides brasiliensis*. *Revista do Departamento Nacional de Produção Animal*, 3, 133–139.

Anderson, R.C., Chabaud, A.G. & Willmott, S. (Eds.) (2009) *Keys to the Nematode Parasites of Vertebrates: Archival Volume.* CABI, Wallingford, 424 pp.

Araújo, T.L. (1940) *Parallintoshius parallintoshius* n.g., n.sp., (Nematoda, Trichostrongylidae) parasita de Chiroptera. *Revista da Faculdade de Medicina Veterinária de São Paulo*, 1, 205–210. http://dx.doi.org/10.11606/issn.2318-5066.v1i3/4p205-210

Bain, O., Guerrero, R., Rodriguez, B., Babayan, S. & Jouvenet, N. (2003) Examination of type material of two species of *Litomosoides* (Filarioidea: Onchcercidae), parasites from bats; taxonomic consequences. *Parasite*, 10, 211–218. http://dx.doi.org/10.1051/parasite/2003103211

Barker, F.D. (1916) A new monostome trematode parasitic in the muskrat with a key to the parasites of the American muskrat. *Transactions of the American Microscopical Society*, 35, 175–184. http://dx.doi.org/10.2307/3222011

Boeger, W.A., Thatcher, V.E. & Marques, S.A. (1985) A validade de *Czosnowia* Zdzitowiecki, 1967, a redescricao de *C. paraguayensis* (Fischthal & Martin, 1978) n. comb. (Trematoda: Lecithodendriidae) e aspectos de sua patologia no fígado do morcego*, Molossus ater* (Geoffrey), no Brasil. *Studies on Neotropical Fauna and Environment*, 20, 7–155. http://dx.doi.org/10.1080/01650528509360683

Boero, J.J. & Delpietro, H. (1970) El parasitismo de la fauna autóctona. VII. Los parásitos de los murciélagos argentinos. *Jornadas Internas de la Facultad de Ciencias Veterinarias. La Plata*, 1970, 76–82.

Boero, J.J. & Led, J.E. (1971) El parasitismo de la fauna autóctona. V. Los parásitos de las aves argentinas. VI. Los parásitos de los ofídios argentinos. VII. Los parásitos de los murciélagos argentinos. *Analecta Veterinaria*, 3, 91–103.

Brant, S.V. & Gardner, S.L. (2000) Phylogeny of species of the genus *Litomosoides* (Nematoda: Onchocercidae): Evidence of rampant host switching. *Journal of Parasitology*, 86, 545–554. http://dx.doi.org/10.2307/3284870

Braun, M.G.C.C. (1900) Trematoden der Chiroptera. *Annalen des Naturhistorischen Museums in Wien*, 15, 217–236.

Bray, R.A., Gibson, D.I. & Jones, A. (Eds.) (2008) *Keys to the Trematoda*. Vol. 3. CABI, Wallingford, 824 pp.

Braun, M.G.C.C. (1900) Trematoden der Chiroptera. *Annalen des K.K. Naturhistorischen Hofmuseums, Wien*, 15, 217–236.

Bremser, J.G. (1811) *Nachricht von einer beträchtlichen Sammlung thierischer Eingeweidewürmer, und Einladung zu einer literarischen Verbindung, um dieselbe zu vervollkommen, und sie für die Wissenschaft und die Liebhaber allgemein nützlich zu machen*. K.K. Naturalienkabinettsdirektion, Wien, 31 pp.

Caballero y C., E. (1943) Tremátodos de los murciélagos de México. IV. Descripción de un nuevo género de la subfamilia Lecithodendriinae Looss, 1902, y una nueva especie de *Prosthodendrium* Dollfus, 1931. *Anales del Instituto de Biología, Universidad NacionalAutonóma de México, Serie Zoología*, 14 (1), 173–193.

Caballero y C., E. (1961) Trematodos de los murciélagos de México. VIII. Catalogo taxonomico de los trematodos que parasitan a los murciélagos (Mammalia, Chiroptera Blumenbach, 1774). *Anales del Instituto de Biologia. Universidad México, México DF*, 31, 215–287.

Caballero y C., E. & Caballero, G. (1969) Trematodos de los murciélagos de México. IX. Descripcion de una nueva especie de *Platynosomum* Looss, 1907 y a continuacion el primer suplemento del catalogo taxonomico de los trematodos que parasitam a los murciélagos. *Revista de la Sociedad Méxicana de Historia Natural*, 30, 263–290.

Cardia, D.F.F., Hoppe, E.G.L., Tebaldi, J.H., Fornazari, F., Menozzi, B.D., Langoni, H., do Nascimento, A.A. & Bresciani, K.D.S. (2014) Redescription and taxonomical considerations about *Aonchotheca* (*Aonchotheca*) *pulchra* n. comb. (Enoplida: Trichuridae), a nematode of *Nyctinomops* spp. *Brazilian Journal of Veterinary Parasitology*, 23, 399–402. http://dx.doi.org/10.1590/s1984-29612014070

Caro, F., Carvajal, H., Bonelo, A. & Vélez, I. (2003) Trematodos de murciélagos de la ciudad de Cali y areas vecinas (Colombia). *Actualidades Biologicas (Medellin),* 25 (78), 79–88.

Chabaud, A.G. & Bain, O. (1974) Données nouvelles sur la biologie des Nématodes Muspiceides, fournies par l'étude d'un parasite de Chiropteres: *Lukonema lukoschusi* n. gen. n. sp. *Annales de Parasitologie Humaine et Comparée*, 48, 819–834.
Chandler, A.C. (1938) A report on the parasites of a bat, *Nycticeius humeralis*, with descriptions of four new helminths. *Livro Jubilar do Professor Lauro Travassos, Rio de Janeiro*, 3, 107–114.
Chitwood, B.G. (1938) Some nematodes from the caves of Yucatan. *Publications of the Carnegie Institute of Washington*, 491, 51–66.
Clare, E.L., Lim, B.K., Fenton, M.B. & Hebert, P.D.N. (2011) Neotropical bats: estimating species diversity with DNA barcodes. *PLoS ONE*, 6 (7), e22648.
http://dx.doi.org/10.1371/journal.pone.0022648
Cribb, T.H. & Bray, R.A. (2010) Gut wash, body soak, blender and heat-fixation: approaches to the effective collection, fixation and preservation of trematodes of fishes. *Systematic Parasitology*, 76, 1–7.
http://dx.doi.org/10.1007/s11230-010-9229-z
Cuartas-Calle, C. & Muñoz-Arango, J. (1999) Nematodos en la cavidad abdominal y el tracto digestivo de algunos murciélagos Colombianos. *Caldasia***,** 21, 10–25.
Diaz-Ungria, C. (1963) Nématodes parasites, nouveaux ou intéressants, du Vénézuéla. *Annales de Parasitologie Humaine et Comparée*, 38, 893–914.
Diaz-Ungria, C. (1973) Helmintos endoparasitos de Venezuela. *Ciência Veterinária, Maracaibo*, 3, 37–343.
Diaz-Ungria, C. (1979) Algunas species de helmintos nuevas para Venezuela. *Revista Ibérica de Parasitologia*, 39, 313–336.
Diesing, K.M. (1850) *Systema Helminthum*. *Vol. 1.* Braumüller, Vindobonae, 679 pp.
Drago, F.B., Lunaschi, L.I., Delgado, L. & Robles, R. (2007) Helmintofauna de quirópteros de la Reserva Natural Punta Lara, Provincia de Buenos Aires. *XXI Jornadas Argentinas de Mastozoología*, No. 236, 255.
Dubois, G. (1960) Contribution à l´étude des Trématodes de Chiroptéres. *Revue Siusse de Zoologie, Genève*, 67, 1–80.
Dubois, G. (1983) Un neodiplostome peruvien, *Neodiplostomum* (*N.*) *vaucheri* n. sp. (Trematoda: Strigeoidea: Diplostomidae), parasite d'une chauve-souris. *Revue Suisse de Zoologie, Genève*, 90, 179–182.
Durette-Desset, M.-C. & Pinto, R.M. (1977) Nouvelles données morpho-logiques sur des Nématodes trichostrongylides des collections de l'Institut Oswaldo Cruz. *Bulletin du Muséum National d'Histoire Naturelle, Paris*, 469, 755–764.
Durette-Desset, M.-C. & Vaucher, C. (1988) Trichostrongyloidea (Nematoda) parasites de Chiroptéres neotropicaux. II. Nouvelles données sur le genre *Cheiropteronema* Sandground, 1929. *Revue Suisse de Zoologie*, *Genève*, 95, 889–899.
Durette-Desset, M.-C. & Vaucher, C. (1989) Trichostrongyloidea (Nematoda) parasites de chiroptéres neotropicaux. III. *Carostrongylus touzeti* gen. n., sp. n. chez *Carollia* spp. (Phyllostomatidae). *Revue Suisse de Zoologie, Genève*, 96, 697–706.
Durette-Desset, M.-C. & Vaucher, C. (1996) *Molostrongylus acanthocolpos* gen. n. sp. n. (Nematoda, Trichostrongylina, Molineoidea) parasite de *Molossops temmincki* (Chiroptera, Molossidae) au Paraguay. *Revue Suisse de Zoologie*, *Genève*, 103, 905–913.
Durette-Desset, M.-C. & Vaucher, C. (1999) *Molostrongylus mbopi* sp. n. (Nematoda, Trichostrongylina, Molineoidea), parasite de *Molossops* spp. (Chiroptera, Molossidae) au Paraguay. *Revue Suisse de Zoologie, Genève*, 106, 407–418.
Esslinger, J.H. (1973) The genus *Litomosoides* Chandler, 1931 (Filaroidea: Onchocercidae) in Colombian bats and rats. *Journal of Parasitology*, 59, 225–246.
http://dx.doi.org/10.2307/3278809
Esslinger, J.H., Vaughn, J.B. & Arata, A.A. (1968) Filarial infections in Colombian bats. *Bulletin of Tulane University Medical Faculty*, 27, 19–22.
Ferreira, V.S., Brasil-Sato, M.C. (1998) Digeneticos (Cercomeria, Lecithodendriidae) de morcegos (Chiroptera) dos municípios de Seropédica e Rio de Janeiro, do Estado do Rio de Janeiro, Brasil. *Bios (Belo Horizonte)*, 6 (6), 83–88.
Fischthal, J.H. & Martin, R.L. (1978) *Postorchigenes paraguayensis* sp. n. (Trematoda, Pleurogenidae), a digenetic trematode from the large fishing bat, *Noctilio leporinus rufescens* Olfers, from Paraguay. *Acta Parasitologica Polonica*, 25, 217–221.
Frank, R., Münster, J., Schulze, J., Liston, A. & Klimpel, S. (2014) Macroparasites of Microchiroptera: Bat ectoparasites of Central and South America. *In*: Klimpel, S. & Mehlhorn, H. (Eds.), *Bats (Chiroptera) as Vectors of Diseases and Parasites*. *Parasitology Research Monographs*, 5, 87–130.
http://dx.doi.org/10.1007/978-3-642-39333-4_5
Freitas, J.F.T. (1934) Sôbre as espécies do gênero *Capillaria* Zeder, 1800, parasitas de morcegos**.** *Memórias do Instituto Oswaldo Cruz*, 28, 239–261.
http://dx.doi.org/10.1590/S0074-02761934000200004
Freitas, J.F.T. (1957) *Ochoterenatrema caballeroi* sp. n. (Trematoda: Lecithodendriidae). *Revista Brasileira de Biologia*, 17, 285–289.
Freitas, J.F.T. (1960) Sôbre uma nova espéce do gênero "*Prosthodendrium*" Dollfus, 1931 (Trematoda, Lecithodendriidae). *Revista Brasileira de Biologia*, 20, 265–268.
Freitas, J.F.T. (1961) Sôbre o *Paralecithodendrium liliputianum* Travassos, 1928 (Trematoda). *Memórias do Instituto Oswaldo Cruz*, 59, 45–57.
Freitas, J.F.T. & Dobbin, J.E. Jr. (1960a) Nota prévia sobre novo nematóide Strongyloidea parasito de quiroptera. *Atas da Sociedade de Biologia do Rio de Janeiro*, 4, 56–58.
Freitas, J.F.T. & Dobbin, J.E. Jr. (1960b) Nota prévia sôbre novo trematódeo do gênero *Paralecithodendrium*. *Atas da Sociedade de Biologia do Rio de Janeiro*, 4, 59–60.

Freitas, J.F.T. & Dobbin, J.E. Jr. (1961a) *Aonchotheca parca* sp. nov., nematódeo capilarídeo parasito de quiróptero. *Atas da Sociedade de Biologia do Rio de Janeiro*, 5, 21–22.
Freitas, J.F.T. & Dobbin, J.E. Jr. (1961b) *Plagiorchis parumbursatus* sp. nov., trematódeo parasito de quiróptero. *Atas da Sociedade de Biologia do Rio de Janeiro*, 5, 22–25.
Freitas, J.F.T. & Dobbin, J.E. Jr. (1962) Contribuição ao conhecimento da fauna helmintológica de quirópteros no Estado de Pernambuco, Brasil. *Anais da Faculdade de Farmácia*, 5, 53–83.
Freitas, J.F.T. & Ibañez, H.N. (1963) Fauna helmintologica do Peru – *Ochoterenatrema fraternum* sp. n. (Trematoda, Lecithodendriidae). *Revista Brasileira de Biologia*, 23, 255–258.
Freitas, J.F.T. & Lent, H. (1935) Nota prévia sôbre duas novo especies do gênero *Capillaria* (Nematoda), e referencia a novos hospedadores de helmintos conhecidos. *Revista Médico-Cirúrgica do Brasil*, 43, 301–303.
Freitas, J.F.T. & Lent, H. (1936) Estudo sobre os Capillariinae parasitos de mamíferos (Nematoda: Trichuroidea). *Memórias do Instituto Oswaldo Cruz*, 31, 85–160.
Freitas, J.F.T. & Mendonça, J.M. (1960a) Novo nematódeo trichostrongilídeo parasito de quiróptero. *Boletim do Museu Paraense Emílio Goeldi*, 29, 1–4.
Freitas, J.F.T. & Mendonça, J.M. (1960b) Novo nematódeo do gênero *Pterothominx* Freitas, 1959 (Trichuroidea, Capillariidae). *Revista Brasileira de Biologia*, 20, 269–272.
Freitas, J.F.T. & Mendonça, J.M. (1961) Novo capilariineo do gênero *Aonchotheca* López-Neyra, 1949 (Nematoda, Trichuroidea). *Memórias do Instituto Oswaldo Cruz*, 59, 59–63.
Freitas, J.F.T. & Mendonça, J.M. (1963) Quarta espécie do gênero *Parallintoshius* Araújo, 1940 (Nematoda: Trichostrongylidae). *Revista Brasileira de Biologia*, 23, 223–226.
Gibson, D.I. & McCarthy, T.J. (1987) Bats as hosts of acanthocephalan parasites. *Helminthological Abstracts*, Series A, 56, 159–162.
Gibson, D.I., Bray, R.A. & Harris, E.A. (Compilers) (2005) *Host-Parasite Database of the Natural History Museum, London*. Available from: http://www.nhm.ac.uk/research-curation/scientific-resources/taxonomy-systematics/host-parasites/ (accessed 3 March 2014)
Gibson, D.I., Jones, A. & Bray, R.A. (Eds.) (2002) *Keys to the Trematoda*. *Vol. 1*. CABI, Wallingford, 521 pp.
Guerrero, R. (1985) Parasitología. *In:* Aguilera, M. (Ed.), *El Estudio de los Mamíferos en Venezuela. Evaluación y Perspectivas*. Fondo Editorial Acta Científica Venezolana, Caracas, Venezuela, pp. 35–91.
Guerrero, R., Martin, C., Gardner, S.L. & Bain, O. (2002) New and known species of *Litomosoides* (Nematoda: Filarioidea): important adult and larval characters and taxonomic changes. *Comparative Parasitology*, 69, 177–195. http://dx.doi.org/10.1654/1525-2647(2002)069[0177:naksol]2.0.co;2
Guerrero, R., Martin, C. & Bain, O. (2003) *Litomosoides yutajensis* n. sp., first record of this filarial genus in a mormoopid bat. *Parasite*, 10, 219–225. http://dx.doi.org/10.1051/parasite/2003103219
Guerrero, R., Bain, O., Attout, T. & Martin, C. (2006) The infective larva of *Litomosoides yutajensis* Guerrero *et al*., 2003 (Nematoda: Onchocercidae), a Wolbachia-free filaria from bat. *Parasite*, 13, 127–130. http://dx.doi.org/10.1051/parasite/2006132127
Jones, A., Bray, R.A. & Gibson, D.I. (Eds) (2005) *Keys to the Trematoda. Vol. 2*. CABI, Wallingford, 745 pp.
Joyeux, C. (1945) Cestodes du Brésil. I. *Arkiv för Zoologi, Uppsala*, 37, 1–4.
Kanarek, G., Zaleśny, G., Sitko, J. & Tkach, V.V. (2014) Phylogenetic relationships and systematic position of the families Cortrematidae and Phaneropsolidae (Platyhelminthes: Digenea). *Folia Parasitologica*, 61, 523–528. http://dx.doi.org/10.14411/fp.2014.057
Khalil, L.F., Jones, A. & Bray, R.A. (Eds.) (1994) *Keys to the Cestode Parasites of Vertebrates*. CABI, Wallingford, 751 pp.
Lent, H. & Freitas, J.F.T. (1937) Espécies do *Capillaria* em Cuba. *Anais da Academia Brasileira de Ciências*, 9, 91–97.
Lent, H. & Freitas, J.F.T. (1940) *Histiostrongylus octacanthus* n. sp. (Nematoda: Strongyloidea). *Arquivo Instituto Benjamin Baptista, Rio de Janeiro*, 6, 91–96.
Lent, H., Freitas, J.F.T. & Proença, M.C. (1945) Trematódeos de morcegos colecionados no Paraguay. *Revista Brasileira de Biologia*, 5, 499–507.
Lent, H., Freitas, J.F.T. & Proença, M.C. (1946) Algunos nemátodos de murciélagos coleccionados en el Paraguay. *Revista Brasileira de Biologia*, 6, 485–497.
Linstow, O. von (1904) Beobachtungen an Nematoden und Cestoden. *Archiv für Naturgeschichte*, 70, 297–309.
Lotz, J.M. & Font, W.F. (2008a) Family Lecithodendriidae Lühe, 1901. *In:* Bray, R.A., Gibson, D.I. & Jones, A. *Keys to the Trematoda*. *Vol. 3*. CABI, Wallingford, pp. 527–536.
Lotz, J.M. & Font, W.F. (2008b) Family Phaneropsolidae Mehra, 1935. *In:* Bray, R.A., Gibson, D.I. & Jones, A. *Keys to the Trematoda*. *Vol. 3*. CABI, Wallingford, pp. 545–562.
Lunaschi, L. (2002) Tremátodos Lecithodendriidae y Anenterotrematidae de Argentina, México y Brazil. *Anales del Instituto de Biología, Universidad Nacional Autónoma de México*, 73, 1–10.
Lunaschi, L. (2004) Redescripción de *Limatuloides limatulus* (Braum) [Braun] Dubpris [Dubois], 1964 (Trematoda, Lecithodenfriidae [Lecithodendriidae]), un parasito de *Tadarida brasilensis* [*brasiliensis*] (Geof.) (Chiroptera, Molossidae) de Argentina. *Gayana*, 68, 102–107. http://dx.doi.org/10.4067/s0717-65382004000100011
Lunaschi, L. (2006) Redescripción y reubicación sistematica del trematodo *Topsiturvitrema verticalia* (Trematoda: Digenea) en

una familia nueva. *Revista de Biologia Tropical*, 54, 1041–1045.
http://dx.doi.org/10.15517/rbt.v54i3.13966
Lunaschi, L. & Drago, F.B. (2007) Checklist of digenean parasites of wild mammals from Argentina. *Zootaxa*, 1580, 35–50.
Lunaschi, L. & Notarnicola, J. (2010) New host records for Anenterotrematidae, Lecithodendriidae and Urotrematidae trematodes in bats from Argentina, with redescription of *Anenterotrema liliputianum*. *Revista Mexicana de Biodiversidad*, 81, 281–287.
Lunaschi, L., Urriza, L. & Alvarez, V.H.M. (2003) *Limatulum oklahomensis* Macy, 1932 in *Myotis nigricans* (Chiroptera) from Argentina and a redescription of *L. umbilicatum* (Vélez & Thatcher, 1990) comb. nov. (Digenea, Lecithodendriidae). *Acta Parasitologica*, 48, 172–175.
Machado Filho, D.A. (1946) Sôbre *Moniliformis moniliformis* (Bremser), *Moniliformis travassosi* Meyer, 1932 e outras espéces duvidosas do gênero (Acanthocephala). *Boletim de Escola Nacional Veterinária*, *Rio de Janeiro*, 1, 13–27.
Macy, R.W. (1931a) A key to the species of *Hymenolepis* found in bats and the description of a new species, *H. christensoni*, from *Myotis lucifugus.Transactions of the American Microscopical Society*, 50, 344–347.
http://dx.doi.org/10.2307/3222075
Macy, R.W. (1931b) New bat trematodes of the genera *Plagiorchis*, *Limatulum*, and *Dicrocoelium*. *Journal of Parasitology*, 18, 28–33.
http://dx.doi.org/10.2307/3271740
Macy, R.W. (1935) A new trematode, *Limatulum gastroides* (Lecithodendriidae), from the little brown bat, *Myotis lucifugus. Proceedings of the Helminthological Society of Washington*, 2, 74–75.
Mañé-Garzón, F. & González, L.E. (1976) Digenea de los murciélagos del Uruguay. I. *Limatulum brevicoecum* n. sp. del estomago de *Myotis levis levis* (I. Goeffroy). *Revista de Biologia del Uruguay*, 4, 79–84.
Mañé-Garzón, F. & Telias, D. (1965) Un nuevo tremátodo del género *Urotrema* de la rata de água y redescripcion de *Urotrema scabridum* Braun, 1900. *Comunicaciones Zoologicas del Museo de Historia Natural de Montevideo*, 8, 1–9.
Marinkelle, C.J. & Garcia-Castañeda, M.R. (1999) A key to the microfilariae of the genus *Litomosomoides* (Phylum Nematoda), endoparasites from Colombian bats. *Caldasia*, 21, 167–173.
Marshall, M.E. & Miller, G.C. (1979) Some digenetic trematodes from Ecuadorian bats including five new species and one new genus. *Journal of Parasitology*, 65, 909–917.
http://dx.doi.org/10.2307/3280248
Martin, D.R. (1969) Lecithodendriid trematodes from the bat, *Peropteryx kappleri*, in Colombia, including discussions of allometric growth and significance of ecological isolation. *Proceedings of the Helminthological Society of Washington*, 36, 250–260.
Mendoza, L., Chavez, J. & Tantaleán, M. (1997) Cestodos parasitos de murciélagos de Ica, Peru. *Parasitología al Dia*, 21, 20–24.
Meyer, A. (1932) Acanthocephala. *In:* Bronns, H.G. (Ed.), *Klassen und Ordnungen de Tierreichs*. Akadeische Verlagsgellschaft, Leipzig, 582 pp.
Molin, R. (1858) Versuch einer Monographie der Filarien. *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften. Mathematisch-Naturwissenschaftlich Classe, Wien*, 28, 365–461.
Molin, R. (1861) Il sottordine degli acrofalli ordinato scientificamente secundo e risutamenti delle indagini anatomiche et embriogeniche**.** *Memorie del Real Istituto di Scienze, Lettre ed Arti, Venezia*, 9, 427–633.
Mourão, E.D., Avilla, L.S. & Lent, H. (2002) Redescrição de *Litomosoides brasiliensis* Almeida, 1936 (Nematoda: Filariidae) Parasito de *Anoura caudifera* (Chiroptera: Phyllostomidae). *Memórias do Instituto Oswaldo Cruz*, 97, 495–499.
http://dx.doi.org/10.1590/s0074-02762002000400007
Nama, H.S. (1990) An overview of the tapeworm genus *Hymenolepis* Weinland, 1958 *sensu lato* from arid and non-arid regions. *Scientific Reviews on Arid Zone Research*, 7, 1–80.
Nogueira, M.R., de Fabio, S.R. & Peracchi, A.L. (2004) Gastrointestinal helminth parasitism in fruit-eating bats (Chiroptera, Stenodermatinae) from western Amazonian Brazil. *Revista de Biologia Tropical*, 52, 387–392.
http://dx.doi.org/10.15517/rbt.v52i2.15254
Nogueira, M.R., de Fabio, S.R., Moratelli, L., Tavares, V.C., Gregorin, R. & Peracchi, A.L. (2014) Checklist of Brazilian bats, with comments on original records. *Check List*, 10, 808–821.
http://dx.doi.org/10.15560/10.4.808
Noronha, D., Vicente, J.J. & Magalhães Pinto, R. (2002) A survey of new host records for nematodes from mammals deposited in the Helminthological Collection of the Oswaldo Cruz Institute (CHIOC). *Revista Brasileira de Zoologia*, 19, 945–949.
http://dx.doi.org/10.1590/s0101-81752002000300032
Notarnicola, J., Jimenez Ruiz, F.A. & Gardner, S.L. (2010) *Litomosoides* (Nemata: Filarioidea) of bats from Bolivia with records for three known species and the description of a new species. *Journal of Parasitology*, 96, 775–782.
http://dx.doi.org/10.1645/ge-2371.1
Oviedo, M.C., Ramallo, G. & Claps, L.E. (2010) Una especie nueva de *Cheiropteronema* (Nematoda, Molineidae) en *Artibeus planirostris* (Chiroptera, Phyllostomidae) en la Argentina. *Iheringia, Série Zoologia*, 100, 242–246.
http://dx.doi.org/10.1590/s0073-47212010000300009
Oviedo, M.C., Ramallo, G., Claps, L.E. & Miotti, M.D. (2012) A new species of *Biacantha* (Nematoda: Molineidae), a parasite of the common vampire bat from the Yungas, Argentina. *Journal of Parasitology*, 98, 1209–1215.
http://dx.doi.org/10.1645/ge-3155.1

Padilha, T.N. & Barros-Araújo, J.L. (1976) Estudo sobre duas espécies do gênero *Litomosoides* Chandler, 1931, com novos aspectos biológicos (Nematoda: Filarioidea). *Revista Brasileira de Biologia*, 36, 251–256.
Pinheiro, M.C., Ribeiro, C.C.D.U., Lourenço, E.C., Landulfo, G.A., Luz, H.R., Famadas, K.M. & Rodrigues, M.L.A. (2013) Levantamento de enteroparasitos em morcegos através de técnica de centrífugo flutuaçã (Mammalia: Chiroptera) em área de floresta tropical. *Neotropical Helminthology*, 7, 143–147.
Ramallo, G., Oviedo, M. & Claps, L.E. (2007) Nematofauna parasita de quirópteros de la Provincia de Entre Ríos, Argentina: Informe preliminar. *XXI Jornadas Argentinas de Mastozoología*, No. 237, 256.
Rêgo, A.A. (1961) Sôbre algumas espécies do gênero *Litomosoides* Chandler, 1931 (Nematoda, Filarioidea*). Memórias do Instituto Oswaldo Cruz*, 59, 1–9.
http://dx.doi.org/10.1590/s0074-02761961000100001
Rêgo, A.A. (1962) Sôbre alguns "*Vampirolepis*" parasitos de quirópteros (Cestoda, Hymenolepididae). *Revista Brasileira de Biologia*, 22, 129–136.
Rêgo, A.A. (1963) Nova éspecies do gênero *Mathevotaenia* Akhumian, 1946, parasita de quirópteros (Cestoda, Anoplocephalidae). *Revista Brasileira de Biologia*, 23, 31–34.
Reis, N.R., Peracchi, A.L., Pedro, W.A. & Lima, I.P. (Eds.) (2007) *Morcegos do Brasil*. N.R. Reis, Londrina, 253 pp.
Rodrigo, A.G. (1964) Contribuición al estudio de los Filarioidea de Quiroptera, con descripción de *Litomosoides carolliae venezuelensis*, ssp. n. *Anais do Segundo Congresso Latino-Americano de Zoologia, 16-21 July 1962, São Paulo*, 7, 261–263.
Rossi, P. & Vaucher, C. (2002) *Allintoshius bioccai* n. sp. (Nematoda), a parasite of the bat *Eptesicus furinalis* from Paraguay, and new data on *A. parallintoshius* (Araujo, 1940). *Parassitologia*, 44, 59–66.
Rudolphi, C.A. (1819) *Entozoorum synopsis cui accedunt mantissa duplex et indices locupletissimi*. Berolini, 811 pp.
Sandground, J.H. (1929) Some new parasitic nematodes from Yucatan (Mexico) including a new genus of strongyle from cattle. *Bulletin of the Museum of Comparative Zoology, Harvard College*, 69, 515–524
Sandground, J.H. (1934) Description of a species of the filariid genus *Litomosoides* from *Glossophaga soricina* (Cheiroptera). *Annals and Magazine of Natural History*, Series 10, 14, 595–599.
Santos, C.P. & Gibson, D.I. (1998) *Apharyngotrema lenti* n. sp., a new anenterotrematid trematode from the gall-bladder of some Amazonian bats, with comments on *Anenterotrema* Stunkard, 1938 and *Apharyngotrema* Marshall & Muller, 1979. *Systematic Parasitology*, 41, 149–156.
http://dx.doi.org/10.1023/a:1006011822647
Saoud, M.F.A. (1964) On a new trematode, *Tremajoannes buckleyi* gen. et sp. nov. (Lecithodendriidae) from Central American bats with some notes on *Phaneropsolus orbicularis* (Diesing, 1850) Braun, 1901. *Journal of Helminthology*, 38, 97–108.
http://dx.doi.org/10.1017/s0022149x00033642
Sawada, I. (1990) *Vampirolepis ezoensis* sp. n. (Cestoda: Hymenolepididae) from Japanese northern bat, *Eptesicus nilssoni parvus* Kishida, with a list of known species of the genus *Vampirolepis* Spassky from bats. *Japanese Journal of Parasitology*, 39, 176–185.
Sawada, I. (1997) Check-list of new cestode species recorded by Sawada. *Nara Sangyo University Journal of Industry and Economics*, 11, 111–127.
Sawada, I. & Harada, M. (1986) Bat cestodes from Bolivia, South America, with descriptions of six new species. *Zoological Science, Tokyo*, 3, 367–377.
Schmidt, G.D. & Martin, R.L. (1978) Tapeworms of the Chaco Boreal, Paraguay, with two new species. *Journal of Helminthology*, 52, 205–209.
http://dx.doi.org/10.1017/s0022149x00005381
Simmons, N.B. (2005) Order Chiroptera. *In*: Wilson, D.E. & Reeder, D.M. (Eds.), *Mammal species of the world: a taxonomic and geographic reference. 3rd Edition. Vol. 1*. Johns Hopkins University Press, Baltimore Maryland, pp. 312–529.
Smales, L.R. (2007) Oligacanthorhynchidae (Acanthocephala) from mammals from Paraguay with the description of a new species of *Neoncicola*. *Comparative Parasitology*, 74, 237–243.
http://dx.doi.org/10.1654/4271.1
Stiles, C.W. & Hassall, A. (1894) A new species of intestinal fluke (*Distoma tricolor*) in the cotton-tail rabbit (*Lepus sylvaticus* Bachman) and in the northern hare (*L. americana* Erxleben). *Veterinary Magazine*, 1, 729–737.
Tantaleán, V.M., Sarmiento, B.L. & Huiza, P.A. (1992) Digeneos (Trematoda) del Peru. *Boletin de Lima*, 80, 47–84.
Thatcher, V.E. (1993) *Trematódeos Neotropicais*. Instituto Nacional de Pesquisas da Amazônia, Manaus, 553 pp.
Travassos, L. (1914) Sôbre as epécies brasileiras do gênero *Capillaria* Zeder, 1800. *Brazil Médico*, 28, 429.
Travassos, L. (1918) Contribuição para o conhecimento da fauna helmintológica brasileira. VII. Espécies brasileiras do gênero *Thelazia* Bosc, 1819. *Revista do Museu Paulista*, 10, 215–230.
Travassos, L. (1920) Trichostrongylidae brasileiros. *Revista da Sociedade Brasileira de Ciências*, 3, 199–205.
Travassos, L. (1921) Contribuições para o conhecimento da fauna helmintológica brasileira. XV. Sôbre as espécies brasileiras da familia Lecithodendriidae Odhner, 1911. *Archivos da Escola Superior de Agricultura e Medicina Veterinária*, 5, 73–79.
Travassos, L. (1928) Sôbre uma espécie do genero *Rictularia* Froelich (Nematoda). *Boletim Biologico, S. Paulo*, 14, 129–143.
Travassos, L. (1935) Contribuição ao conhecimento dos Trichostrongylidae. *Anais Academia Brasileira de Ciências*, 7, 355–360.
Travassos, L. (1937) *Revisão da Family Trichostrongylidae Leiper, 1912.* Monografia do Instituto Oswaldo Cruz, Rio de Janeiro, 512 pp.

Travassos, L. (1955) Sôbre dois novos Dicrocoeliidae de Chiroptera. *Anais Academia Brasileira de Ciências, Rio de Janeiro*, 27, 561–565.
Travassos, L. (1965) Contribuição para o inventário crítico da zoologia no Brasil: Fauna helmintológica: considerações preliminares – cestódeos. *Publicações Avulsas do Museu Nacional, Rio de Janeiro*, 48 (50), 1–84.
Travassos, L. & Freitas, J.F.T. (1964) Pesquisas helmintológicas realizadas em Maicuru, estado do Pará. *Publicações Avulsas do Museu Paraense Emílio Goeldi*, 2, 3–16.
Travassos, L., Freitas, J.F.T. & Kohn, A. (1969) Trematódeos do Brasil. *Memórias do Instituto Oswaldo Cruz*, 67, 1–886.
Vargas, M., Martinez, R., Tantaleán, M., Cadenilias, R. & Pacheco, V. (2009a) *Tricholeiperia peruensis* n. sp. (Nematoda, Molineidae) del quiróptero *Lophostoma silvicolum occidentalis* (Phyllostomidae) en Tumbes, Perú. *Revista Peruana de Biología*, 15 (2008), 23–26.
http://dx.doi.org/10.15381/rpb.v15i2.1697
Vargas, M., Martinez, R. & Tantaleán, M. (2009b) Cestodos de quirópteros del Parque Nacional Cerros de Amotape, Tumbes, Perú. *Revista Peruana de Biología*, 16, 57–60.
http://dx.doi.org/10.15381/rpb.v16i1.176
Vaucher, C. (1981) Helminthes parasites du Paraguay. II. *Postorchigenes mbopi* n. sp. (Trematoda: Lecithodendriidae) chez *Lasiurus ega argentinus* (Thomas). *Bulletin de la Société Neuchâteloise des Sciences Naturelles*, 104, 47–51.
Vaucher, C. (1982a) Helminthes parasites du Paraguay. III: *Atriotaenia hastati* n. sp. (Cestoda: Linstowiidae) parasite de *Phyllostomus hastatus hastatus* (Pallas). *Bulletin de la Société Neuchâteloise des Sciences Naturelles*, 105, 155–161.
Vaucher, C. (1982b) Cestodes parasites de chiroptères en Amerique du Sud: revision de *Hymenolepis elongatus* (Rêgo, 1962) et description de *Hymenolepis phyllostomi* n. sp. *Revue Suisse de Zoologie*, 89, 451–459.
Vaucher, C. (1985) Helminthes parasites du Paraguay. X: *Hymenolepis dasipteri* n. sp. (Cestoda, Hymenolepididae) chez *Dasipterus ega argentinus* Thomas (Chiroptera, Vespertilionidae). *Bulletin de la Société Neuchâteloise des Sciences Naturelles*, 10, 155–161.
Vaucher, C. (1986a) Helminthes parasites du Paraguay. XI: Hymenolepididae (Cestoda) parasites de chiroptères Molossidae, avec description de deux espèces nouvelles. *Revue Suisse de Zoologie*, 93, 393–407.
Vaucher, C. (1986b) Cestodes parasites de Chiroptères em Amerique du Sud. II: *Hymenolepis mazanensis* n. sp., chez *Saccopteryx bilineata* (Temm.) et *Rhynchonycteris naso* (Wied-Neuwied) (Chiroptera: Emballonuridae) em Amazonie péruvienne. *Revue Suisse de Zoologie*, 93, 817–821.
Vaucher, C. (1992) Revision of the genus *Vampirolepis* Spasskij, 1954 (Cestoda: Hymenolepididae). *Memórias do Instituto Oswaldo Cruz,* 87, 299–304.
http://dx.doi.org/10.1590/s0074-02761992000500056
Vaucher, C. & Durette-Desset, M.C. (1986) Trichostrongyloidea (Nematoda) parasites de Chiroptères néotropicaux. I. *Websternema parnelli* (Webster, 1971) n.gen. n.comb. et *Linustrongylus pteronoti* n.gen. n.sp., parasites de *Pteronotus* au Nicaragua. *Revue Suisse de Zoologie*, 93, 237–246.
Vélez, I. & Thatcher, V. (1992a) Cinco espécies de Lecithodendriidae (Trematoda) en murciélagos de Colombia, incluyendo tres nuevos generos. *Revista Brasileira de Zoologia*, 7, 155–164.
http://dx.doi.org/10.1590/s0101-81751990000200015
Vélez, I. & Thatcher, V. (1992b) *Nudacotyle carollia* sp. nov. (Trematoda, Nudacotylidae) parasito intestinal de *Carollia perspicillata* L. (Chiroptera) en Colombia. *Revista Brasileira de Zoologia*, 7, 69–72.
http://dx.doi.org/10.1590/s0101-81751990000200005
Vicente, J.J., Rodrigues, H.O., Steindel, M., Padovani, C.R. & Schlemper, B.R. Jr (1987) Contribuição ao conhecimento da fauna helmintológica de mamíferos da Ilha de Santa Catarina, SC. *Atas da Sociedade de Biologia do Rio de Janeiro*, 27, 5–8.
Vicente, J.J., Rodrigues, H.O., Gomes, D.C. & Pinto, R.M. (1997) Nematóides do Brasil. Parte V. Nematóides de Mamíferos. *Revista Brasileira de Zoologia*, 14, 1–452.
http://dx.doi.org/10.1590/s0101-81751997000500001
Vigueras, P.I. (1934) Notas sobre las espécies de Filarioidea encontradas en Cuba. *Memorias Sociedad Cubana Historia Natural*, 8, 55–58.
Webster, W.A. (1971) Studies on the parasites of Chiroptera. I. Helminths of Jamaican bats of the genera *Tadarida*, *Chilonycteris*, and *Monophyllus*. *Proceedings of the Helminthological Society of Washington*, 38, 195–199.
Wikipedia: The free encyclopedia (2014) *List of South American mammals*. Available from: http://en.wikipedia.org/wiki/List_of_South_American_mammals (accessed 5 December, 2014)
Willig, M.R. & Selcer, K.W. (1989) Bat species density gradients in the new world: a statistical assessment. *Journal of Biogeography*, 16, 189–195.
http://dx.doi.org/10.2307/2845093
Wilson, D.E. & Reeder, D.M. (Eds.) (2005) *Mammal species of the world. A taxonomic and geographic reference. 3rd Edition.* Johns Hopkins University Press, Baltimore, 2142 pp.
Wolfgang, R.W. (1954) Studies on the endoparasitic fauna of Trinidad mammals. X. Parasites of Chiroptera. *Canadian Journal of Zoology*, 32, 20–34.
Zdzitowiecki, K. & Rutkowska, M.A. (1980) The helminthofaina of bats from Cuba. 3. A review of trematodes. *Acta Parasitologica Polonica*, 26, 201–214.