

CATALOGUE OF AUSTRALIAN MAMMALS AND THEIR RECORDED
INTERNAL PARASITES. I-IV.

PART I. MONOTREMES AND MARSUPIALS (pp. 101-125). PART II. EUTHERIA (pp. 126-143).

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By M. JOSEPHINE MACKERRAS, Queensland Institute of Medical Research, Brisbane.

(Communicated by Dr. I. M. Mackerras.)

[Read 30th July, 1958.]

PART I. MONOTREMES AND MARSUPIALS.

Synopsis.

Part I contains the names of three monotremes and 158 marsupials. Parasites have been recorded from all the monotremes and from 72 marsupials. They have been found in representatives of all the families except the Notoryctidae, which have probably not been examined.

Blood protozoa are known from two monotremes (*Trypanosoma* and *Theileria*) and from six marsupials (*Trypanosoma*, *Theileria*, and *Haemogregarina* (*sens. lat.*)).

Two trematodes are known from the platypus and five from polyprotodont marsupials. No trematodes have been recorded from diprotodonts except, occasionally, *Fasciola hepatica* (an introduced parasite).

Two adult cestodes are known from echidnas, five from polyprotodonts, and twenty-one from diprotodonts. The majority of the cestodes belong to the Anoplocephalidae. Hydatids (introduced with domestic animals) occur in wallabies and kangaroos.

Nematodes are known from an echidna and from 55 marsupials. Of about 156 described species nearly 80% belong to the Strongyloidea. No unequivocal record of an adult member of the Ascaridoidea has been made.

One species of Acanthocephala occurs in bandicoots.

It is desirable at times to take stock of the present position and to summarize what is known of any particular subject. In this way the limitations of our knowledge become clearer and new lines of attack may appear. Many years ago the late Professor T. Harvey Johnston began to list the parasites of Australian animals. His 1916 census embraced all vertebrate and invertebrate hosts. Today, largely as a result of his own and his colleagues' efforts, such a comprehensive list would require many more than the 34 pages of print it occupied in 1916.

In the following four parts an attempt has been made to bring part of the information up to date in readily accessible form, by recording the protozoan, helminth, and pentastomid parasites known to occur in mammals in Australia. It is hoped that these lists will provide a useful stepping-off point for young parasitologists. It is hoped, too, that the publication of the names of very numerous species, from which no parasites seem to have been recorded, may draw attention to the large gaps in our knowledge and stimulate workers in other fields of animal study to preserve all parasites which they may find, and also to submit blood films and unwanted carcasses to parasitologists, whenever it may be feasible to do so. Many strange and unique forms have already been found in our indigenous fauna, but undoubtedly many more await discovery.

The classification and synonymy given by Iredale and Troughton (1934)* and by Troughton (1954)‡ have been used as a basis for Parts I and II, but some alterations

* A Check-list of the Mammals Recorded from Australia, by Tom Iredale and E. Le G. Troughton, *Australian Museum Memoir* VI. Sydney, 1934.

‡ *Furred Animals of Australia*, by Ellis Troughton. Angus and Robertson, Sydney, 5th ed., 1954, 376 pp.

have been made. A few records from non-indigenous animals, chiefly from islands north of Australia, are included, because the same parasites may occur in mainland species.

Although care has been taken to search the literature and to check all references, errors and omissions will undoubtedly be found, and the author would be grateful to have attention drawn to them. An attempt has been made to make the bibliography to Part I as complete as possible, but this has not been feasible in Parts II to IV. A selection has therefore been made of those articles dealing with host-parasite records (with due regard for synonymy), life histories, or epidemiology.

ARRANGEMENT OF PARASITES.

Abbreviations Used.

Long lists of names are confusing, so the parasites are arranged in a definite order and an indication of their systematic position is given by abbreviations placed before the name. The Protozoa are arranged in the following way: Mastigophora (M.), Sarcodina (Sa.), Sporozoa (Sp.), and Ciliata (C.).

All the Trematoda mentioned belong to the Digenea Prosostomata, the following families being represented: Paramphistomatidae (Param.), Cathaemasiidae (Catha.), Dicrocoeliidae (Dicro.), Diplostomatidae (Diplo.), Fasciolidae (Fasci.), Heterophyidae (Heter.), Microphallidae (Micro.), Notocotylidae (Notoc.), Opisthorchiidae (Opist.), Plagiorchiidae (Plagi.), Pronocephalidae (Prono.), Rhabdiopoeidae (Rhabd.), Schistosomatidae (Schis.), and Strigeidae (Strig.).

Cestoda: Order Cyclophyllidea (CY.), with five families: Anoplocephalidae (Ano.), Davaineidae (Dav.), Dilepididae (Dil.), Hymenolepididae (Hym.), and Taeniidae (Tae.); Order Pseudophyllidea (PS.) with one family: Diphylobothriidae (Dip.); Order Tetraphyllidea (TE.) with one family: Phyllobothriidae (Phy.).

Nematoda: Superfamilies Rhabdiasoidea (RH.), Trichuroidea (TR.), Strongyloidea (ST.), Oxyuroidea (OX.), Ascaridoidea (AS.), Spiruroidea (SP.), and Filarioidea (FI.). The families of the Strongyloidea are indicated as follows: Trichostrongylidae (Tri.), Ancylostomidae (Anc.), Strongylidae (Str.), and Metastrongylidae (Met.).

For the sake of brevity, the letters J. and M. are used for T. H. Johnston and P. M. Mawson; and Y. and M. for W. Yorke and P. A. Maplestone.

The authority for each parasite record is given after the author's name and date. Numbers in brackets refer to the numbered list of references. The sequence is chronological, so the numbers are frequently not in serial order.

PARASITES OF MONOTREMES AND MARSUPIALS.

History of Discovery.

The first parasites of a marsupial to attract attention were the tapeworm inhabiting the bile ducts of the grey kangaroo and the large filarial worm which infests the bursae and tendon sheaths around the knee joint, and even the joint itself, of the same animal. The tapeworm was briefly described as *Taenia festiva* by Rudolphi in 1819 from a specimen in the Vienna Museum.

Two specimens of the filaria were recorded in the 1830 catalogue of the Royal College of Surgeons. It is possible that these specimens were part of the original collection of John Hunter, but proof of this is lacking. They are mentioned by Dr. George Bennett in a letter to Sir Richard Owen, dated Sydney, February 4th, 1833. Bennett said he was sending a collection of "Ascarides taken from the inner part of the knee joint of both legs in a large male kangaroo (of the common species)". The same author referred to them in his book (Bennett, 1834), remarking that the worm was recorded in the Catalogue of the Royal College of Surgeons as *Filaria macropi majoris*.

Cobbold (1879) mentioned these worms, ". . . which have been indicated as *Filariae macropidis gigantei*", continuing: "It would, in my opinion, be far better to call the worm after its discoverer, Webster's filaria (*F. Websteri*).". Efforts to trace Webster's original discovery have failed. Even the man's initials do not seem to be recorded. It seems probable that the discovery was made in London at some time between 1791, when it is known that kangaroos were sent to England, and 1830.

Froriep* evidently confused Webster and Bennett, because the quotation said to come from "Webster's Wanderings" is word for word from Bennett's "Wanderings in New South Wales, etc." except that, where Bennett used the pronoun "I", Froriep wrote "Herr Webster". This reference to Webster may therefore be disregarded.

Eisig (1869) described, but did not name, a filarial worm, which has not been rediscovered, from the pericardium of a wallaby which died in the Heidelberg Zoo. Leidy (1875) described *Filaria spelaea* from the coelome of a wallaby which died in the Philadelphia Zoo. Kreff (1871) studied the tapeworms of local birds and mammals in New South Wales, but the complexity of the group was not appreciated at the time, and his descriptions are too vague for recognition. Fortunately, T. H. Johnston (1912) was able to rehabilitate many of Kreff's species of bird tapeworms, but those recorded from marsupials remain unrecognizable.

Cobbold (1879) gave provisional names to a tapeworm from the echidna and one from the native bear, as well as changing the name of the kangaroo filaria to *Filaria websteri*. However, as he did not describe any of the forms mentioned, his names have been regarded as *nomina nuda*, although there is no real doubt as to the identity of *F. websteri*. Lumholtz (1884) recorded the occurrence of worms lying between the skin and muscles of the tree kangaroo, and implied that they were common in other marsupials. These parasites of the tree kangaroo have not been rediscovered.

Collections of indigenous parasites were made by medical men, veterinarians and others, notably by J. P. Hill, N. A. Cobb, W. H. D. Le Souef, G. Masters, and L. Gallard in New South Wales, J. and T. L. Bancroft and the explorer R. Semon in Queensland, during the latter part of the nineteenth and early twentieth centuries. Systematic work was at first undertaken in Europe by professional parasitologists, to whom collections were sent. Thus, von Linstow in Germany, Zschokke in Switzerland, Nybelin in Sweden, Beddard, Baylis, Yorke, and Maplestone in England, named many species. Following the pioneering work of Leidy and Eisig, parasitologists in various parts of the world have been interested in the entozoa of exotic animals dying in their local zoological gardens. Among these, Ortlepp, Wood, and Cameron in Britain, Canavan, Chandler, and Schwartz in U.S.A., and Mönnig in South Africa, have made important contributions to the study of the parasitic fauna of Australian marsupials.

Early in the present century workers in Australia began to play an increasing part in recording the parasites found and in describing new species. Among these are J. B. Cleland, T. H. Johnston, S. J. Johnston, J. A. Gilruth, W. Nicoll, A. Breinl, D. A. Welsh, and H. Priestley. T. H. Johnston and his colleagues in Adelaide made the first really planned attack on the problem. Recently D. F. Sandars has revised the trematodes and cestodes, and compared them with those of American marsupials. Valuable check lists have been published from time to time, for example by Sweet (1909) in Melbourne, T. H. Johnston (1909 to 1918) in Sydney and Brisbane, Johnston and Cleland (1912, 1937) in Sydney and Adelaide, Oldham (1933) and Young (1939) in London. Skrjabin *et al.* (1954) listed many nematodes of monotremes and marsupials under their hosts ("Key to Parasitic Nematodes", vol. 4, pp. 733-742).

Practically no work has been done on blood parasites. Trypanosomes, haemogregarines and *Theileria* are known to occur, but no *Plasmodium* has yet been found. Some remarkable trematodes and cestodes are known, but the nematodes have received most attention, and one of the most striking features of the marsupial record is the immense development of the subfamily Trichoneminae of the family Strongylidae, 14 genera† having been erected to accommodate these parasites.

* Froriep, L. F. von (1834): Notizen aus dem Gebiete der Natur- und Heilkunde, vol. 42, p. 328.

† These are: *Cloacina* v. Linstow, *Coronostrongylus* J. & M., *Cyclostrongylus* J. & M., *Labiostrongylus* Y. & M., *Macropostrongylus* Y. & M., *Maplestonea* J. & M., *Parazoniolum* J. & M., *Paramacropostrongylus* J. & M., *Papillostrongylus* J. & M., *Pharyngostrongylus* Y. & M., *Phascostrongylus* Canavan, *Potorostrongylus* J. & M., *Spirostrongylus* Y. & M., and *Zoniolum* Cobb.

HOSTS AND PARASITES.

Class MAMMALIA

Order MONOTREMATA

Family ORNITHORHYNCHIDAE

Genus ORNITHORHYNCHUS Blumenback, 1800

O. ANATINUS (Shaw and Nodder, 1799) (The platypus)

Protozoa(M.) *Trypanosoma* sp. (36)(Sp.) *Theileria* sp. (36)*Trematoda*(Catha.) *Mehlisia ornithorhynchi* (S. J. Johnston, 1901) (45)(? Fam.) *Moreauia mirabilis* S. J. Johnston, 1915 (48)

Family TACHYGLOSSIDAE

Genus TACHYGLOSSUS Illiger, 1811. (Echidnas)

T. ACULEATUS (Shaw and Nodder, 1792)

Protozoa(Sp.) *Theileria tachyglossi* Priestley, 1915 (104)*Cestoda*(CY., Ano.) *Linstowia echidnae* (Thompson, 1893) (117), (135)*Cittotaenia tachyglossi* T. H. Johnston, 1913 (53)(CY.) *Taenia phoptica* Cobboid, 1879 (a *nomen nudum*) (32)*Nematoda*(ST., Tri.) *Nicollina tachyglossi* (Baylis, 1930) (7), (8)*N. echidnae* (Baylis, 1930) (7), (8)(FI.) *Dipetalonema* sp. (subcutaneous) (90)

T. SETOSUS (Geoffroy, 1803)

Cestoda(CY., Ano.) *Linstowia echidnae* (Thompson, 1893) (74)

Order MARSUPIALIA

Suborder POLYPROTODONTIA

Family DASYURIDAE

Subfamily PHASCOGALINAE

Genus ANTECHILINUS Macleay, 1841. (Marsupial mice)

A. APICALIS (Gray, 1842) No records

A. BELLUS (Thomas, 1904) No records

A. FLAVIPES (Waterhouse, 1838)

Nematoda(ST., Met.) *Plectostrongylus fragilis* Mackerras and Sandars, 1953 (91)

A. GODMANI (Thomas, 1923) No records

A. MACDONNELLENSIS (Spencer, 1896) No records

A. MACULATUS (Gould, 1851) No records

A. MIMULUS (Thomas, 1906) No records

A. MINIMUS (Geoffroy, 1803) No records

A. SWAINSONII (Waterhouse, 1840) No records

Genus PLANIGALE Troughton, 1928. (Flat-skulled marsupial mice)

PL. INGRAMI (Thomas, 1906) No records

PL. SUBTILISSIMA (Lonnberg, 1913) No records

PL. TENUIROSTRIS Troughton, 1928 No records

Genus PHASCOGALE Temminck, 1824. (Brush-tailed marsupial rats)

PH. CALURA Gould, 1844 No records

PH. TAPOATAFA (Meyer, 1793)

syn. *penicillata* Shaw, 1800

Two parasites from "brush-tailed rats" may belong here.

Nematoda(SP.) *Denticulospirura dentata* J. & M., 1941 (69), (70)*Acanthocephala**Gigantorhynchus* sp. (50)

Genus DASYCERCUS Peters, 1875. (Crested-tailed marsupial mice)

D. BLYTHI (Waite, 1904) No records
D. CRISTICAUDA (Krefft, 1867)*Nematoda*(SP.) *Physaloptera* sp. (131)

Genus DASYUROIDES Spencer, 1896. (Marsupial rats)

D. BYRNEI Spencer, 1896 No records

Genus SMINTHOPSIS Thomas, 1887. (Marsupial mice)

S. CRASSICAUDA (Gould, 1844) No records
S. FROGGATTI (Ramsay, 1887) No records
S. GRANULIPES Troughton, 1932 No records
S. HIRTIPES Thomas, 1898 No records
S. LARAPINTA Spencer, 1896*Nematoda*(SP.) *Rictulariidae* (undescribed sp. collected by Dr. D. F. Sanders)S. LEUCOPUS (Gray, 1842) No records
S. LONGICAUDA Spencer, 1909 No records
S. LUMHOLTZI Iredale & Troughton, 1934 No records
S. MURINA (Waterhouse, 1838) No records
S. PSAMMOPHILA Spencer, 1895 No records
S. STALKERI Thomas, 1906 No records

Genus ANTECHINOMYS Krefft, 1867. (Jerboa marsupials)

A. LANIGER (Gould, 1856) No records
A. SPENCERI Thomas, 1906 No records

Subfamily DASYURINAE

Genus DASYURUS Geoffroy, 1796. (Native cats)

D. QUOLL (Zimmermann, 1777)
syn. *viverrinus* Shaw, 1800*Protozoa*(Sp.) *Haemogregarina dasyuri* Welsh, Dalyell & Burfitt, 1909 (122), (123)
= *Hepatozoon dasyuri* (Welsh, Dalyell & Burfitt) Wenyon, 1926 (126)
Toxoplasma sp. (113)*Trematoda*(Dicro.) *Brachylaemus dasyuri* (S. J. Johnston, 1913) (47), (110D)
(Catha.) *Mehlisia acuminata* S. J. Johnston, 1913 (47)*Cestoda*

(PS., Dip.) Sparganum (49)

Nematoda(SP.) *Echinonema cinctum* (v. Linstow, 1898) (52) (1 specimen)
(FI.) *Dipetalonema dasyuri* J. & M., 1938 (53)

DASYURUS SP. (Cairns, N.Q.)

Nematoda(SP.) *Spirocerca heydoni* Baylis, 1927 (5)

Genus DASYURINUS Matschie, 1916. (Native cat)

D. GEOFFROYII (Gould, 1841) No records

Genus SATANELLIUS Pocock, 1926

S. HALLUCATUS (Gould, 1842), the little northern native cat

Protozoa(Sp.) *Sarcocystis* sp. (90)

Trematoda(Dicro.) *Zonorchis* sp. (110)*Nematoda*(Fl.) *Dipetalonema capilliforme* Baylis, 1934 (11)Genus *DASYUROPS* Matschie, 1916. (Native cats)D. GRACILIS (Ramsay, 1888) No records
D. MACULATUS (Kerr, 1792), the tiger cat*Trematoda*(Strig.) *Pharyngostomoides*, n. sp. (110E)*Cestoda*(CY., Tae.) *Dasyurotaenia robusta* Beddard, 1912 (110A)(PS., Dib.) *Diphyllobothrium (Spirometra) erinacei* (Rudolphi, 1819) as sparganum (108)*Nematoda*(ST., Tri.) *Trichostrongylus* (s.l.) sp. (64)(SP.) *Physaloptera* sp. (90)(FL.) *Filaria* (s.l.) sp. (58)Genus *SARCOPHILUS* Geoffroy & Cuvier, 1837. (Tasmanian devil)

S. HARRISII* (Boitard, 1841)

Trematoda(Strig.) *Alaria* sp. (25)*Fibricola sarcophila* Sandars, 1957 (110C)*Cestoda*(CY., Tae.) *Anoploaenia dasyuri* Beddard, 1911 (16), (25), (110A)*Dasyurotaenia robusta* Beddard, 1912 (17)

(PS.) Sparganum (90)

Nematoda(ST., Tri.) *Nicollina sarcophili* Cameron, 1931 (25)(SP.) *Physaloptera sarcophili* J. & M., 1940 (67)

Subfamily THYLACININAE

Genus *THYLACINUS* Temminck, 1824. (Tasmanian wolf)

T. CYNOCEPHALUS (Harris, 1808)

*Cestoda**Dithyridium cynocephali*† Ransom, 1907 (105)

Family MYRMECOBIIDAE

Genus *MYRMECOBIUS* Waterhouse, 1836. (Marsupial ant-eaters)

M. FASCIATUS Waterhouse, 1836

Nematoda

(ST., Tri.) Trichostrongylidae (undescribed sp. collected by Mr. J. H. Calaby)

M. RUFUS Wood Jones, 1923 No records

Family NOTORYCTIDAE

Genus *NOTORYCTES* Stirling, 1891. (Marsupial moles)

N. CAURINUS Thomas, 1920 No records

N. TYPHLOPS (Stirling, 1889) No records

Family PERAMELIDAE

Genus *THYLACIS* Illiger, 1811Syn. *Isoodon* Desmarest, 1817. (Short-nosed bandicoots)

T. AURATUS (Ramsay, 1887) No records

T. BARROWENSIS (Thomas, 1901) No records

* Kreis (1952) recorded several parasites from two marsupials, *Sarcophilus harrisi* and *Macropus giganteus*. However, it is not clear which parasites came from which host.

† Tapeworm cysts were found in an animal which died in the National Zoological Park, Washington. They may have been acquired in captivity.

T. MACROURUS (Gould, 1842)

Cestoda(CY., Hym.) *Hymenolepis peramelidarum* Nybelin, 1917 (98)(CY., Ano.) *Linstowia semoni* (Zschokke, 1896) (98)

T. NAUTICUS (Thomas, 1922)

No records

T. OBESULUS (Shaw and Nodder, 1797)

Protozoa(M.) *Trypanosoma* sp. (86)*Giardia* sp. (90)*Trichomonas* sp. (90)(Sa.) *Entamoeba* sp. (90)(Sp.) *Eimeria* sp. (90)*Klossiella* sp. (35), (86)*Haemogregarina peramelis* Welsh and Dalyell, 1909 (86)*Theileria* sp. (86)*Sarcocystis* sp. (86)*Toxoplasma gondii* (Nicolle and Manceaux, 1908) (103), (103A)Recorded as *Encephalitozoon* sp. in (86)*Trematoda*(Dicro.) *Brachylaemus dasyuri* (S. J. Johnston, 1913) (46), (86), (110D)Syn. *Harmostomum simile* S. J. Johnston, 1913*Zonorchis australiensis* Sandars, 1958 (110E)Recorded as *Platynosomum* sp. in (86)*Cestoda*(CY., Hym.) *Hymenolepis peramelidarum* Nybelin, 1917 (86), (110B)(CY., Ano.) *Linstowia semoni* (Zschokke, 1896) (134), (135), (110B)*Nematoda*(RH.) *Parastrongyloides* sp. (90)*Strongyloides* sp. (90)(TR.) *Trichuris peramelis* Baylis, 1932 (9), (86)*Capillaria* sp. (86)(ST., Tri.) *Filarinema peramelis* J. & M., 1938 (60), (86)

Trichostrongylidae—undescribed spp. (90)

(ST. Str.) *Cloacina* sp. (61)(ST., Met.) *Marsupostrongylus bronchialis* Mackerras & Sandars, 1953 (91)*Filostrongylus peramelis* Mackerras, 1955 (88)(OX.) *Subulura peramelis* Baylis, 1930 (6), (86)(SP.) *Echinonema cinctum* (v. Linstow, 1898) (83), (86)*Physaloptera* sp. (90)(FI.) *Dipetalonema johnstoni* Mackerras, 1954 (86) (87)*Acanthocephala**Moniliformis semoni* (v. Linstow, 1898) (83), (86)

Larval forms (90)

Pentastomida (Phylum Arthropoda)

Larval forms (90)

T. PENINSULAE (Thomas, 1922)

No records

T. TOROSUS (Ramsay, 1877)

Nematoda(OX.) *Subulura peramelis* Baylis, 1930 (73)(SP.) *Echinonema cinctum* (v. Linstow, 1898) (73)

Genus PERAMELES Geoffroy, 1804. (Long-nosed bandicoots)

P. BOUGAINVILLEI Quoy and Gaimard, 1824 No records

P. EREMIANA Spencer, 1897 No records

P. FASCIATA Gray, 1841 No records

P. GUNNI Gray, 1838 No records

P. MYOSURA Wagner, 1841

Nematoda(OX.) *Subulura peramelis* Baylis, 1930 (64)

P. NASUTA Geoffroy, 1804

Protozoa(Sp.) *Klossiella* sp. (90)*Theileria* sp. (90)*Haemogregarina peramelis* Welsh and Dalyell, 1909 (124), (125)= *Hepatozoon peramelis* (Welsh and Dalyell, 1909) Wenyon, 1926 (126)*Toxoplasma gondii* (Nicolle and Manceaux, 1908) (103) (103A)*Trematoda*(Dicro.) *Zonorchis australiensis* Sandars, 1953 (110E)*Cestoda*(CY., Hym.) *Hymenolepis peramelidarum* Nybelin, 1917 (110B)(CY., Ano.) *Linstowia semoni* (Zschokke, 1896) (49)(CY., Dil.) *Mirandula parva* Sandars, 1956 (109)*Nematoda*(RH.) *Parastrongyloides* sp. (90)(TR.) *Trichuris peramelis* Baylis, 1932 (63)

(ST., Tri.) Trichostrongylidae—undescribed spp. (90)

(ST., Met.) *Filostrongylus peramelis* Mackerras, 1955 (88)(OX.) *Subulura peramelis* Baylis, 1930 (63)(SP.) *Echinonema cinctum* (v. Linstow, 1898) (67)*Physaloptera parvicollaris* J. & M., 1940 (67)*Ph. peramelis* J. & M., 1939 (63)(FI.) *Dipetalonema johnstoni* Mackerras, 1954 (87)*Dipetalonema* sp. (lung) (63), (67)*Acanthocephala**Moniliformis semoni* (v. Linstow, 1898) (50), (56)

Genus THYLACOMYS Blyth, 1840. (Rabbit bandicoots or bilbies)

Syn. *Macrotis* Reid, 1837 (preoccupied); *Paragalia* Gray, 1841; (or *Peragale*)

T. LAGOTIS (Reid, 1837) No records

T. LEUCURA (Thomas, 1887) No records

T. LEUCURA MINOR (Spencer, 1897)

Nematoda(OX.) *Subulura peragale* J. & M., 1940 (67)(SP.) *Physaloptera peragale* J. & M., 1940 (66)*Ph. thalacomys* J. & M., 1940 (67)

Genus CHAEROPUS Ogilby, 1838. (Pig-footed bandicoots)

C. ECAUDATUS Ogilby, 1838 No records

? BANDICOOT (New Guinea)

(? *Echymipera* sp. or *Peroryctes* sp.)*Nematoda*(SP.) *Physaloptera papuensis* J. & M., 1940 (67)

Suborder DIPROTODONTIA

Family PHALANGERIDAE

Subfamily TARSIPEDINAE

Genus TARSIPES Gray, 1842. (Honey possum)

T. SPENSERAE Gray, 1842 No records

Subfamily PHALANGERINAE

Genus ACROBATES Desmarest, 1818. (Pigmy glider)

A. PYGMAEUS (Shaw, 1793) No records

Genus CERCARTETUS Gloger, 1841. (Pigmy possums)

C. CONCINNUS (Gould, 1845) No records

C. NANUS (Desmarest, 1818) No records

Genus EUDROMICIA Mjoberg, 1916. (Pigmy possums)

- E. LEPIDA (Thomas, 1888) No records
 E. MACRURA Mjoberg, 1916 No records

Genus GYMNOBELIDEUS McCoy, 1867. (Possum)

- G. LEADBEATERI McCoy, 1867 No records

Genus PETAURUS Shaw and Nodder, 1791. (Gliders)

- P. AUSTRALIS Shaw and Nodder, 1791 No records
 P. BREVICEPS Waterhouse, 1839

Protozoa

- (Sp.) *Haemogregarina petauri* Welsh and Barling, 1909 (90)
 P. NORFOLCENSIS Kerr, 1792 No records
 P. SCIUREUS Shaw, 1794

Protozoa

- (Sp.) *Haemogregarina petauri* Welsh and Barling, 1909 (120), (121)
 = *Hepatoozon petauri* (Welsh and Barling) Wenyon, 1926 (126)
 (host given as *Petaurus* sp., probably *sciureus*)

Genus DACTYLOPSILA Gray, 1858. (Striped possum)

- D. PICATA Thomas, 1908 No records

Genus PSEUDOCHEIRUS Ogilby, 1837. (Ring-tail possums)

- P. CONVOLUTOR (Oken, 1816) No records
 P. HERBERTENSIS (Collett, 1884)

Cestoda

- (CY., Ano.) *Prototaenia aberrata* (Nybelin, 1917) (98)
Prototaenia pseudochiri (Nybelin, 1917) (98)
 P. LANIGINOSUS (Gould, 1858)

Protozoa

- (Sp.) *Haemogregarina* sp. (90)

Cestoda

- (CY., Ano.) ? *Prototaenia* sp. (110)
 P. OCCIDENTALIS Thomas, 1888 No records
 P. PEREGRINUS (Boddaert, 1785) No records

Genus PSEUDOCHEIROPS Matschie, 1915. (Striped ring-tail possum)

- Ps. ARCHERI (Collett, 1884) No records

Genus PETROPSEUES Thomas, 1923. (Rock ring-tail possum)

- P. DAHLI (Collett, 1895) No records

Genus HEMIBELIDEUS Collett, 1884. (Bushy-tipped ring-tail possum)

- H. LEMUROIDES Collett, 1884

Cestoda

- (CY., Ano.) *Parabertiella campanulata* Nybelin, 1917 (98)
Prototaenia undulata (Nybelin, 1917) (98)
Prototaenia pellucida (Nybelin, 1917) (98)

Nematoda

- (FI.) Microfilariae in blood (112).

Genus SCHCINOBATES Lesson, 1842

Syn. *Petauroides* Thomas, 1888. (Greater gliders)

- S. VOLANS (Kerr, 1792) No records
 S. VOLANS INCANUS Thomas, 1923

Nematoda

- (OX.) *Austroxyuris finlaysoni* J. & M., 1938 (60)
Passalurus parvus J. & M., 1938 (60)
Oxyuris (s.l.) *acuticaudata* J. & M., 1938 (60)

Genus TRICHOSURUS Lesson, 1828. (Brush-tailed possums)

T. CANINUS (Ogilby, 1836)

Nematoda(ST., Tri.) *Asymmetricstrongylus trichosuri* J. & M., 1939 (62)(FI.) *Dipetalonema trichosuri* (Breinl, 1913) (67)*Filaria* sp. (50), (58)

T. FULIGINOSUS (Ogilby, 1831)

No records

T. VULPECULA (Kerr, 1792)

*Protozoa**Entamoeba* sp. (90)*Cestoda**Taenia phalangistae* Krefft, 1871 (76) (not rediscovered)*Nematoda*(RH.) *Parastrongyloides* sp. (90)(ST., Tri.) *Trichostrongylus colubriformis* (Giles, 1892) (15)*T. rugatus* Mönnig, 1925 (15)*Trichostrongylidae* (undescribed sp.) (90)(OX.) *Syphacia trichosuri* J. & M., 1938 (60)(SP.) *Protospirura marsupialis* Baylis, 1927 (5), (12), (60), (63)(FI.) *Dipetalonema trichosuri* (Breinl, 1913) (23), (58)*Filaria dentifera* v. Linstow, 1897 (81) (not rediscovered)*Microfilaria* (sheathed) (21)

Genus WYULDA Alexander, 1919. (Scaly-tailed possum)

W. SQUAMICAUDATA Alexander, 1919

No records

Genus SPILOCUSCUS Gray, 1862. (Cuscus)

SP. NUDICAUDATUS (Gould, 1850)

No records

Genus PHALANGER Storr, 1780. (Phalangers or cuscuses)

P. MACULATUS KRÄMERI Schwartz, 1910 (Manus Is.)

Cestoda(CY., Ano.) *Prototaenia kapul* (Baylis, 1934) (13)

P. ORIENTALIS PENINSULAE Tate, 1945

No records

P. URSINUS (Temminck, 1827) (Celebes)

Cestoda(CY., Ano.) *Prototaenia edulis* (Zschokke, 1899) (136), (137)*P. sarasinorum* (Zschokke, 1899) (136), (137)PHALANGISTA sp. (? *Trichosurus* sp. or *Phalanger* sp.), New Guinea*Cestoda*(CY., Ano.) *Prototaenia rigida* (Janickí, 1905) (44)

Family PHASCOLARCTIDAE

Genus PHASCOLARCTOS de Blainville, 1816. (Koala)

P. CINEREUS Goldfuss, 1817

Cestoda(CY., Ano.) *Prototaenia obesa* (Zschokke, 1896) (134), (135), (110B)*Taenia geophiloides* Cobbold, 1879, is a *nomen nudum* (32)

Family VOMBATIDAE

Genus VOMBATUS Geoffroy, 1803

Syn. *Phascolomis* Geoffroy, 1803. (Wombats)

V. HIRSUTUS (Perry, 1810)

Syn. *mitchelli* Owen, 1838*Protozoa*(Sp.) *Toxoplasma wenyoni* Coutelen, 1932 (33)*Cestoda*(CY., Ano.) *Moniezia* sp. (49)

Nematoda(ST., Str.) *Oesophagostomum giltneri* Schwartz, 1928 (111)*Phascolostrongylus turleyi* Canavan, 1931 (27)

V. URSINUS (Shaw, 1800)

Cestoda(CY., Ano.) *Progamotaenia diaphana* (Zschokke, 1907) (138)

Genus LASIORHINUS Gray, 1863. (Hairy-nosed wombat)

L. LATIFRONS (Owen, 1845)

Protozoa(Sp.) *Ileocystis wombati* Gilruth and Bull, 1912 (41)= *Globidium wombati* (Gilruth and Bull, 1912) Wenyon, 1926 (126)*Nematoda*(ST., Str.) *Macropostrongylus lasiorhini* Mawson, 1955 (91A)*Phascolostrongylus stirtoni* Mawson, 1955 (91A)

Genus WOMBATULA Iredale and Troughton, 1934. (Queensland wombat)

W. GILLESPIEI (de Vis, 1900)

No records

"WOMBAT" (ex Philadelphia Zoo)

*Cestoda**Taenia bipapillosa* Leidy, 1875 (79)This is practically a *nomen nudum*

Family MACROPODIDAE

Subfamily HYPSPRYMNODONTINAE

Genus HYPSPRYMNODON Ramsay, 1876. (Musk rat-kangaroo)

H. MOSCHATUS Ramsay, 1876

No records

Subfamily POTOROINAE

Genus BETTONGIA Gray, 1837. (Rat-kangaroo)

B. CUNICULA (Ogilby, 1838)

No records

B. GAIMARDI (Desmarest, 1822)

No records

B. LESUEURI (Quoy and Gaimard, 1824)

No records

B. LESUEURI GRAYI Gould

Protozoa(Sp.) *Sarcocystis bettongiae* Bourne, 1932 (22)

B. PENICILLATA Gray, 1837

No records

Genus AEPYPRYMNUS Garrod, 1875. (Rat-kangaroo)

A. RUFESCENS (Gray, 1837)

No records

Genus POTOROUS Desmarest, 1804. (Rat-kangaroos)

P. GILBERTI (Gould, 1841)

No records

P. PLATYOPS (Gould, 1844)

No records

P. TRIDACTYLUS (Kerr, 1792)

Protozoa(Sp.) *Theileria* sp. (90)*Nematoda*(ST., Tri.) *Austrostrongylus potoroo* J. & M., 1949 (72)(ST., Str.) *Labiostongylus eugenii* (J. & M., 1940) (72)*Potorostongylus finlaysoni* J. & M., 1939 (64)(OX.) *Oxyuris* (s.l.) *potoroo* J. & M., 1939 (64)(FI.) *Filaria* (s.l.) sp. (58)

Genus CALOPRYMNUS Thomas, 1888. (Rat-kangaroo)

C. CAMPESTRIS (Gould, 1843)

No records

Subfamily MACROPODINAE

Genus DENDROLAGUS Müller, 1839. (Tree kangaroos)

D. BENNETTIANUS de Vis, 1887

Nematoda(FI.) *Filaria* sp. (50)*Dipetalonema spelaea* (Leidy, 1875) (58)

D. LUMHOLTZI Collett, 1884

Nematoda(FI.) *Dipetalonema* sp. ? *roemeri* (v. Linstow, 1905) (58)

D. INUSTUS Schlegel and Müller, 1839-44 (New Guinea)

Protozoa(M.) *Trichomonas guttula* Kirby and Honigberg, 1950 (75)*Trematoda*

Species not specified (liver and bile ducts) (43)

Nematoda(FI.) *Dipetalonema dendrolagi* (Solomon, 1933) (114)

Genus LAGORCHESTES Gould, 1841. (Hare-wallabies)

L. CONSPICILLATUS Gould, 1842

Cestoda(CY., Ano.) *Progamotaenia lagorchestis* (Lewis, 1914) (80)*Cittotaenia villosa* Lewis, 1914 (80)

L. HIRSUTUS Gould, 1844

Nematoda(ST., Str.) *Labiostrongylus communis* (J. & M., 1939) (67)

L. LEPORIDES (Gould, 1841)

No records

Genus LAGOSTROPHUS Thomas, 1887. (Banded wallaby)

L. FASCIATUS (Péron and Lesueur, 1807)

No records

Genus ONYCHOGALEA Gray, 1841. (Nail-tail wallabies)

O. FRAENATA (Gould, 1841)

Cestoda(CY., Ano.) *Progamotaenia bancrofti* (T. H. Johnston, 1912) (52), (98)*Nematoda*(ST., Str.) *Labiostrongylus onychogale* (J. & M., 1939) (61)(FI.) *Dipetalonema annulipapillatum* J. & M., 1938 (58)*D. rarum* J. & M., 1938 (58)*D. roemeri* (v. Linstow, 1905) (58)

Microfilariae in blood (101)

Filaria sp. (50)

O. LUNATA (Gould, 1841)

No records

O. UNGUIFER (Gould, 1841)

Cestoda(CY., Ano.) *Progamotaenia festiva* (Rudolphi, 1819) (98), (119)

Genus PERADORCAS Thomas, 1904. (Little rock-wallaby)

P. CONCINNA (Gould, 1842)

No records

Genus PETROGALE Gray, 1837. (Rock-wallabies)

P. BRACHYOTIS Gould, 1841

No records

P. HACKETTI Thomas, 1905

No records

P. INORNATA Gould, 1842

No records

P. LATERALIS Gould, 1842

Nematoda(ST., Str.) *Cloacina elegans* J. & M., 1938 (59)*C. ernabella* J. & M., 1938 (59)*C. hydriformis* J. & M., 1938 (59)

- (ST., Str.) *C. longelabiata* J. & M., 1939, new name for *minor* J. & M., 1938 (59)
C. macropodis J. & M., 1938 (59)
C. parva J. & M., 1938 (59)
C. petrogale J. & M., 1938 (59)
Labiostrongylus longispicularis Wood, 1929 (59)
L. petrogale J. & M., 1938 (59)
Pharyngostrongylus alpha J. & M., 1938 (59)
Ph. beta J. & M., 1938 (59)
- P. LONGMANI Thomas, 1926 No records
- P. PEARSONI Thomas, 1922
- Nematoda*
- (ST., Str.) *Cloacina petrogale* J. & M., 1938 (66)
Labiostrongylus longispicularis Wood, 1929 (66)
Macropostrongylus pearsoni J. & M., 1940 (66)
Pharyngostrongylus alpha J. & M., 1938 (66)
Ph. beta J. & M., 1938 (66)
- P. PENICILLATA (Griffith, Smith and Pidgeon, 1827)
- Protozoa*
- (Sp.) *Sarcocystis mucosae* (Blanchard, 1885) Minchin, 1903 (subintestinal) (93)
= *Globidium mucosae* (Blanchard, 1885) Wenyon, 1926 (126)
- Cestoda*
- (CY., Ano.) *Triplotaenia mirabilis** Boas, 1902 (20)
- Nematoda*
- (ST., Str.) *Cloacina robertsi* J. & M., 1939 (61)
C. similis J. & M., 1939 (61)
Pharyngostrongylus alpha J. & M., 1938 (61)
Ph. zeta J. & M., 1939 (61)
- (FI.) *Dipetalonema spelaea* (Leidy, 1875) (58), (63)
Dipetalonema sp. (63)
Microfilariae in blood (102)
- P. ROTHSCHILDI Thomas, 1904 No records
- P. WILKINSI Thomas, 1926 No records
- P. XANTHOPUS Gray, 1855
- Nematoda*
- (ST., Str.) *Cloacina australis* J. & M., 1938 (66)
C. communis J. & M., 1938 (66)
C. curta J. & M., 1938 (66)
C. frequens J. & M., 1938 (66)
C. longelabiata J. & M., 1939 (66)
C. macropodis J. & M., 1938 (66)
Labiostrongylus longispicularis Wood, 1929 (66)
Pharyngostrongylus beta J. & M., 1938 (66)
- (FI.) *Dipetalonema* sp. (58)
Filaria sp. (26)
- PETROGALE SP.
- Protozoa*
- (Sp.) *Sarcocystis macropodis* Gilruth and Bull, 1912 (41)
= *Globidium* sp. Wenyon, 1926 (126)
- Genus SETONIX Lesson, 1842. (Quokka)
- S. BRACHYURUS (Quoy and Gaimard, 1830)
- Protozoa*
- (Sa.) *Entamoeba* sp. (90)

* This peculiar cestode is regarded by some helminthologists as a monster. It would be very desirable to get more material from this host.

Cestoda

- (CY., Ano.) *Progamotaenia bancrofti* (T. H. Johnston, 1912) (110B)
Progamotaenia sp. (110B)

Nematoda

- (FI.) Microfilariae in blood (102)

Genus DORCOPSIS Schlegel and Müller, 1842

- D. VETERUM (Lesson and Garnot, 1826) (Japan Island)

Nematoda

- (ST., Str.) *Macropostrongylus dorcopsis* Baylis, 1940 (14)

Genus THYLOGALE Gray, 1837. (Pademelons or little scrub wallabies)

- T. BILLARDIERII (Desmarest, 1822)

Nematoda

- (ST., Str.) *Labiostrongylus uncinatus* (J. & M., 1939) (64)
Pharyngostrongylus delta J. & M., 1938 (64)
Ph. epsilon J. & M., 1939 (64)
Zoniolaimus buccalis (J. & M., 1939) (64)

- T. COXENII (Gray, 1866)

No records

- T. EUGENII (Desmarest, 1817)

Syn. *derbianus* (Gray, 1837)

Cestoda

- (CY., Ano.) *Progamotaenia festiva* (Rudolphi, 1819) (32), (119)

Nematoda

- (ST., Tri.) *Austrostrongylus thylogale* J. & M., 1940 (66)
(ST., Str.) *Cloacina curta* J. & M., 1938 (70)
C. petrogale J. & M., 1938 (65), (70)
Labiostrongylus eugenii (J. & M., 1940) (65), (66), (70)
Spirostrongylus kartana Mawson, 1955 (91A)
(SP.) *Physaloptera* sp. (larval form) (65)

- T. FLINDERSI Wood Jones, 1924

Nematoda

- (ST., Str.) *Cloacina macropodis* J. & M., 1938 (66)
C. petrogale J. & M., 1938 (66)
Pharyngostrongylus beta J. & M., 1938 (66)

- T. PARMA (Waterhouse, 1846)

Nematoda

- (ST., Str.) *Cloacina thetidis* J. & M., 1939 (67)
Coronostrongylus coronatus J. & M., 1939 (67)
Parazoniolaimus collaris J. & M., 1939 (67)
Pharyngostrongylus alpha J. & M., 1938 (67)
Ph. delta J. & M., 1939 (67)
Ph. epsilon J. & M., 1939 (62)
Ph. gamma J. & M., 1939 (67)
Spirostrongylus parma (J. & M., 1939) (62), (91A)
Zoniolaimus buccalis (J. & M., 1939) (67)

- T. STIGMATA Gould, 1860

No records

- T. THETIS (Lesson, 1827)

Protozoa

- (Sp.) *Coccidium* (*Eimeria*) sp. (50)

Cestoda

- (CY., Tae.) *Echinococcus granulosis* (Batsch, 1786) as hydatid (49)

Nematoda

- (ST., Anc.) *Hypodontus thetidis* J. & M., 1939 (62)
(ST., Str.) *Globocephaloides thetidis* J. & M., 1939 (62)
Cloacina bancroftorum J. & M., 1939 (62)
C. similis J. & M., 1939 (62)

- (ST., Str.) *C. thetidis* J. & M., 1939 (62)
Coronostrongylus coronatus J. & M., 1939 (61)
Cyclostrongylus medioannulatus J. & M., 1940 (67)
Labiostrongylus onychogale (J. & M., 1939) (67)
L. uncinatus J. & M., 1939 (65)
Pharyngostrongylus alpha J. & M., 1938 (62)
Ph. delta J. & M., 1939 (62)
Ph. epsilon J. & M., 1939 (62)
Ph. theta J. & M., 1939 (62)
Ph. zeta J. & M., 1939 (61), (62)
Zoniolaimus australis (J. & M., 1939) (61)
Z. buccalis (J. & M., 1939) (62)
- (FL.) *Dipetalonema* sp. (67)
- T. WILCOXI (McCoy, 1866)

Cestoda

- (CY., Tae.) *Echinococcus granulosus* (Batsch, 1786) as hydatid (37)
(CY., Dav.) *Calostaurus macropus* (Ortlepp, 1922) (110B)

Nematoda

- (ST., Str.) *Cloacina macropodis* J. & M., 1938 (61)
C. similis J. & M., 1939 (67)
C. thetidis J. & M., 1940 (67)
Coronostrongylus coronatus J. & M., 1939 (61)
Labiostrongylus communis (J. & M., 1939) (61)
Pharyngostrongylus epsilon J. & M., 1939 (61)
Zoniolaimus australis (J. & M., 1939) (61)
Z. buccalis (J. & M., 1939) (61)
- (FL.) *Dipetalonema thylogali* Mackerras, 1954 (87)

Genus WALLABIA Trouessart, 1905. (Brush wallabies, or large wallabies)

The generic name *Protemnodon* Owen, 1873, based on fossil material, is also used for this group of wallabies

W. AGILIS (Gould, 1842)

Cestoda

- (CY., Ano.) *Progamotaenia festiva* (Rudolphi, 1819) (98), (119)

Nematoda

- (ST., Str.) *Cloacina cornuta* (Davey and Wood, 1938) (34)
C. digitata J. & M., 1940 (72)
C. longispiculata J. & M., 1939 (61)
C. macropodis J. & M., 1938 (61)
C. robertsi J. & M., 1939 (61)
Labiostrongylus insularis J. & M., 1949 (72)
L. labiostrongylus Y. & M., 1926 (10)
Macropostrongylus australis Y. & M., 1926 (10)
M. macropostrongylus Y. & M., 1926 (10), (61), (63)
M. yorkei Baylis, 1927 (10), (61), (63)
- (FL.) *D. annulipapillatum* J. & M., 1938 (60), (61)
D. roemeri (v. Linstow, 1905) (72)
D. ? spelaeu (Leidy, 1875) (11)

W. BICOLOR (Desmarest, 1804) including subspecies *mastersii*, Krefft and *apicalis* Gunther

Syn. *ualabatus* Lesson and Garnot, 1827

Cestoda

- (CY., Tae.) *Echinococcus granulosus* (Batsch, 1786) as hydatid (49), (37)
(CY., Dil.) *Bancroftiella tenuis* T. H. Johnston, 1911 (50)
(CY., Ano.) *Progamotaenia bancrofti* (T. H. Johnston, 1912) (110B)

Nematoda

- (ST., Tri.) *Austrostrongylus aggregatus* J. & M., 1940 (67)

- (ST., Str.) *Globocephaloides thetidis* J. & M., 1939 (67)
Cloacina gallardi J. & M., 1940 (67)
C. macropodis J. & M., 1938 (62)
C. similis J. & M., 1939 (61)
C. wallabiae J. & M., 1939 (62)
Cyclostrongylus dissimilis J. & M., 1939 (62)
Cy. wallabiae J. & M., 1939 (62)
Labiostrongylus clelandi (J. & M., 1939) (61), (62), (64)
L. communis (J. & M., 1939) (61)
L. ualabatus (J. & M., 1939) (62), (64)
L. uncinatus (J. & M., 1939) (61)
Macrostrongylus dissimilis J. & M., 1939 (62)
Maplestonema typicum J. & M., 1939 (62)
Parazoniolaimus collaris J. & M., 1939 (62), (64)
Pharyngostrongylus olpha J. & M., 1938 (62)
Ph. beta J. & M., 1938 (62)
Ph. epsilon J. & M., 1939 (62), (64)
Spirostrongylus gallardi (J. & M., 1942) (71), (91A)
Zoniolaimus brevicaudatus Cobb, 1898 (62)
Z. setifera Cobb, 1898 (62)
- (FI.) *Dipetalonema annulipapillatum* J. & M., 1938 (58)
D. roemeri (v. Linstow, 1905) (58)
D. spelaea (Leidy, 1875) (49), (63)
- W. BROWNI (Ramsay, 1877), New Britain, New Guinea
Nematoda
(ST., Str.) *Cloacina dahli* v. Linstow, 1898 (82)
- W. BRUNII (Schreber, 1778), Aru Island.
Cestoda
(CY., Dav.) *Calostaurus macropus* (Ortlepp, 1922) (100), (110B)
- W. DORSALIS (Gray, 1837)
Cestoda
(CY., Tae.) *Echinococcus granulosus* (Batsch, 1786) hydatid (2), (37)
Nematoda
(ST., Tri.) *Austrostrongylus minutus* J. & M., 1938 (60)
(ST., Str.) *Globocephaloides affinis* J. & M., 1939 (61)
G. wallabiae J. & M., 1939 (61)
Cloacina bancroftorum J. & M., 1939 (61)
C. burnettiana J. & M., 1939 (61)
C. digitata J. & M., 1940 (67)
C. longispiculata J. & M., 1939 (61)
C. similis J. & M., 1940 (67)
Labiostrongylus longispicularis Wood, 1929 (67)
L. uncinatus (J. & M., 1939) (61)
Papillostrongylus labiatus J. & M., 1939 (61)
Pharyngostrongylus delta J. & M., 1939 (61)
Ph. epsilon J. & M., 1939 (61)
Ph. gamma J. & M., 1939 (61)
Ph. theta J. & M., 1940 (67)
Ph. zeta J. & M., 1939 (61)
Zoniolaimus buccalis (J. & M., 1939) (61)
- (FI.) *Dipetalonema annulipapillatum* J. & M., 1938 (58)
D. roemeri (v. Linstow, 1905) (58)
= *Filaria websteri* Cobbold (52)
- W. ELEGANS (Lambert, 1807)
Syn. *parryi* Bennett, 1835
Protozoa
(Sp.) *Coccidium* (*Eimeria*) sp. (50)

Cestoda(CY., Tae) *Echinococcus granulosus* (Batsch, 1786) as hydatid (37)*Nematoda*

- (ST., Str.) *Cloacina communis* J. & M., 1938 (61)
Labiostrongylus bancrofti (J. & M., 1939) (61)
Macropostrongylus yorkei Baylis, 1927 (61)
Pharyngostrongylus brevis Canavan, 1931 (61)
Ph. gamma J. & M., 1939 (61)
Ph. macropodis Y. & M., 1926 (61)
Zoniolaimus buccalis (J. & M., 1939) (61)
- (FL.) *Dipetalonema roemeri* (v. Linstow, 1905) (58)
 = *Filaria websteri* Cobbold (52)

W. GREYI (Waterhouse, 1846)

No records

W. IRMA (Jourdan, 1837)

Nematoda

- (ST., Str.) *Cloacina curta* J. & M., 1938 (65)
Labiostrongylus communis (J. & M., 1939) (64), (65)
Macropostrongylus irma J. & M., 1940 (65)
Pharyngostrongylus beta J. & M., 1938 (65)
- W. RUFOGRISEA (Desmarest, 1817) (including Tasmanian subspecies *frutica* Ogilby, 1838)
 Syn. *ruficollis* Desmarest, 1817; *bennetti* Waterhouse, 1838

Protozoa

- (Sp.) *Toxoplasma* sp. (106)
Eimeria macropodis Wenyon and Scott, 1925 (127), (118)
Ileocystis macropodis Gilruth and Bull, 1912 (127), (118)
Lymphocystis macropodis Gilruth and Bull, 1912 (127), (118)
Coccidia (116)

Trematoda(Fasci.) *Fasciola hepatica* L., 1758 (50)*Cestoda*

- (CY., Ano.) *Thysanotaenia incognita* Meggitt, 1927 (92)
 (CY., Tae.) *Echinococcus granulosus* (Batsch, 1786) as hydatid (37)

Nematoda

- (RH.) *Strongyloides* sp. (116)
- (ST., Tri.) *Asymmetricostrongylus asymmetricus* (Cameron, 1926) (24)
As. dissimilis (Wood, 1931) (78)
Austrostrongylus macropodis Chandler, 1924 (29)
Au. wallabiae J. & M., 1939 (62)
- (ST., Str.) *Globocephaloides trifidospicularis* Kung, 1948 (78)
Cloacina linstowi J. & M., 1940 (67)
C. similis J. & M., 1939 (67)
C. thetidis J. & M., 1939 (67)
Coronostrongylus coronatus J. & M., 1939 (67)
Cyclostrongylus gallardi J. & M., 1940 (62)
Labiostrongylus communis (J. & M., 1939) (62), (64)
L. australis Kung, 1948 (78)
L. onychogale J. & M., 1939 (62)
Macropostrongylus lesouefi J. & M., 1939 (62)
M. wallabiae J. & M., 1939 (62)
Pharyngostrongylus alpha J. & M., 1938 (62)
Ph. beta J. & M., 1938 (62)
Ph. brevis Canavan, 1931 (62)
Ph. delta J. & M., 1939 (62)
Ph. epsilon J. & M., 1939 (62)
Ph. eta J. & M., 1939 (62)
Ph. gamma J. & M., 1939 (62)
Ph. iota J. & M., 1939 (62)

- (ST., Str.) *Ph. longibursaris* Kung, 1948 (78)
Ph. macropodis Y. & M., 1926 (62)
Ph. theta J. & M., 1939 (64)
Ph. zeta J. & M., 1939 (62), (64)
Zoniolaimus australis (J. & M., 1939) (62)
Z. buccalis (J. & M., 1939) (64)
Z. chaetophorus J. & M., 1949 (72)
New name for *setifer* J. & M., 1939 (62)
Z. cobbi Kung, 1948 (78)
Z. labiatus J. & M., 1939 (62), (64)
- (FI.) *Dipetalonema roemeri* (v. Linstow, 1905) (58)
Dipetalonema sp. (63)
Filaria sp. (38)
- W. WELSBY (Longman, 1922)
- Nematoda*
- (ST., Str.) *Cloacina macropodis* J. & M., 1938 (61)
Cloacina sp. (61)
Labiostongylus insularis (J. & M., 1939) (61)
Macropostrongylus macropostrongylus Y. & M., 1926 (61)
M. yorkei Baylis, 1927 (61)
- (FI.) *Dipetalonema roemeri* (v. Linstow, 1905) (58)
- ? WALLABY
- Nematoda*
- (FI.) *Dipetalonema* sp. (encysted in liver) (65)
(AS.) *Contraeacum erraticum* J. & M., 1940 (65)
(The latter specimens were labelled "Ascaris from wallaby" in a very old collection in the Australian Museum. Johnston and Mawson (1940a) consider it is possible the label was misplaced, as the worms resemble forms from cormorants. No other ascarids have been recorded in marsupials.)
- Genus MACROPUS Shaw and Nodder, 1790. (Kangaroos)
Syn. *Halmaturus* Illiger, 1811
- M. MAJOR* Shaw, 1800 (also referred to as *giganteus* Zimmermann, 1777)
- Protozoa*
- (Sp.) *Coccidium (Eimeria)* sp. (50)
- Trematoda*
- (Fasci.) *Fasciola hepatica* L., 1758 (49)
- Cestoda*
- (CY., Tae.) *Echinococcus granulosus* (Batsch, 1786) hydatid (49)
(CY., Ano.) *Progamotaenia festiva* (Rudolphi, 1819) (49), (110B)
- Nematoda*
- (ST., Str.) *Cloacina communis* J. & M., 1938 (67)
C. expansa J. & M., 1939 (62)
C. magnipapillata J. & M., 1939 (62), (64)
C. obtusa J. & M., 1939 (62)
Cyclostrongylus clelandi J. & M., 1939 (62)
Labiostongylus bipapillosus (J. & M., 1939) (61), (65)
L. longispicularis Wood, 1929 (62), (64)
L. kungi Mawson, 1955 (91A)
Pharyngostongylus alpha J. & M., 1938 (62), (64), (73)
Ph. beta J. & M., 1938 (62), (64)
Ph. macropodis Y. & M., 1926 (61), (65)
- (FI.) *Dipetalonema roemeri* (v. Linstow, 1905) (4), (58), (64)
Dipetalonema sp. (58)
Filaria websteri Cobbold, 1879 (32), (39), (52)
Filaria macropi majoris (39)

* See footnote under *Sarcophilus harrisii* (p. 106).

M. MELANOPS Gould, 1842 (possibly only a colour phase of *M. major*)*Nematoda*

- (ST., Str.) *Cloacina australis* J. & M., 1938 (66)
C. communis J. & M., 1938 (66)
C. curta J. & M., 1938 (66)
C. frequens J. & M., 1938 (66)
C. hydriformis J. & M., 1938 (66)
C. longelabiata J. & M., 1939 (66)
C. macropodis J. & M., 1938 (66)
C. parva J. & M., 1938 (66)
C. obtusa J. & M., 1939 (66)
C. vestibulata J. & M., 1940 (66)
Labiostrongylus longispicularis Wood, 1929 (64)
Paramacropostrongylus typicus J. & M., 1940 (66)
Pharyngostrongylus alpha J. & M., 1938 (66)
Ph. beta J. & M., 1938 (66)
- (Fl.) *Dipetalonema roemeri* (v. Linstow, 1905) (58), (66)

M. OCYDROMUS Gould, 1842

Nematoda

- (ST., Str.) *Cloacina curta* J. & M., 1938 (65)
C. obtusa J. & M., 1939 (65)
Pharyngostrongylus beta J. & M., 1938 (65)
- (Fl.) *Dipetalonema roemeri* (v. Linstow, 1905) (72)

M. TASMANIENSIS Le Souef, 1923

Nematoda

- (ST., Str.) *Labiostrongylus longispicularis* Wood, 1929 (67), (72)

M. FULIGINOSUS (Desmarest, 1817)

Nematoda

- (ST., Str.) *Labiostrongylus communis* (J. & M., 1939) (65)
(Fl.) *Dipetalonema roemeri* (v. Linstow, 1905) (67)

MACROPUS SP., presumably *M. major**Nematoda*

- (ST., Anc.) *Hypodontus macropi* Mönnig, 1929 (73)

Genus MEGALEIA Gistel, 1848. (Red kangaroo)

M. RUFUS (Desmarest, 1822) (usually called *Macropus rufus*)*Protozoa*

- (Sp.) *Toxoplasma* sp. (42)

Cestoda

- (CY., Ano.) *Baeriella proterogyna* Fuhrmann, 1932 (40)

Nematoda

- (RH.) *Strongyloides* sp. (90)
(ST., Anc.) *Hypodontus macropi* Mönnig, 1929 (96)
(ST., Tri.) *Filarinema flagrifer* Mönnig, 1929 (97)
(ST., Str.) *Cloacina hydriformis* J. & M., 1938 (59)
C. inflata J. & M., 1938 (59)
C. liebigi J. & M., 1938 (59)
C. longelabiata J. & M., 1939 (63)
New name for *minor* J. & M., 1938 (59)
C. longispiculata J. & M., 1939 (62)
C. magnipapillata J. & M., 1939 (62)
C. petrogale J. & M., 1938 (59)
Labiostrongylus longispicularis Wood, 1929 (59), (62), (65)
Pharyngostrongylus alpha J. & M., 1938 (62), (73)
Ph. australis (Mönnig, 1926) (94), (97), (129)
Ph. beta J. & M., 1938 (65)

Genus OSPHRANTER Gould, 1842. (Wallaroes and Euros)

O. ANTILOPINUS Gould, 1842

Nematoda(FL.) *Dipetalonema roemeri* (v. Linstow, 1905) (84)

O. ANTILOPINUS WOODWARDI (Thomas, 1901)

Cestoda(CY., Ano.) *Progamotaenia festiva* (Rudolphi, 1819) (98)*Nematoda*(ST., Tri.) *Asymmetricostrongylus australis* (Wood, 1931) (130)*A. dissimilis* (Wood, 1931) (130)(ST., Str.) *Labiostrongylus longispicularis* Wood, 1929 (128)*Macropostrongylus baylisi* Wood, 1931 (130)*Pharyngostrongylus australis* (Mönnig, 1926) (129)*Ph. woodwardi* Wood, 1931 (130)

O. BERNARDUS (Rothschild, 1904)

Nematoda(ST., Str.) *Pharyngostrongylus brevis* Canavan, 1931 (27)

O. ERUBESCENS (Sclater, 1870)

Nematoda(ST., Str.) *Cloacina australis* J. & M., 1938 (59)*C. communis* J. & M., 1938 (59)*C. curta* J. & M., 1938 (59)*C. dubia* J. & M., 1938 (59)*C. frequens* J. & M., 1938 (59)*C. longelabiata* J. & M., 1939 (63)New name for *minor* J. & M., 1938 (59)*C. macropodis* J. & M., 1938 (59)*C. magna* J. & M., 1938 (59)*C. parva* J. & M., 1938 (59)*Labiostrongylus grandis* J. & M., 1938 (59)*L. longispicularis* Wood, 1929 (59)*L. macropodis* J. & M., 1938 (59)

O. ISABELLINUS Gould, 1842

Nematoda(ST., Str.) *Labiostrongylus longispicularis* Wood, 1929 (59)

O. REGINAE (Schwartz, 1910)

No records

O. ROBUSTUS (Gould, 1841)

Protozoa(M.) *Trichomonas guttula* Kirby and Honigberg, 1950 (75)*Retortamonas mitrula* Kirby and Honigberg, 1950 (75)*Monocercomonas* sp. (75)*Cestoda*(CY., Tae.) *Echinococcus granulosus* (Batsch, 1786) hydatid (49)*Nematoda*(ST., Str.) *Cloacina minor* (Davey and Wood, 1938) (34)*Labiostrongylus longispicularis* Wood, 1929 (128), (65)*Macropostrongylus labiatus* Davey and Wood, 1938 (34)*M. macrostoma* Davey and Wood, 1938 (34)*Pharyngostrongylus alpha* J. & M., 1938 (62)*Ph. beta* J. & M., 1938 (67)*Ph. ornatus* Davey and Wood, 1938 (34)(FL.) *Dipetalonema robertsi* J. & M., 1938 (60)*D. roemeri* (v. Linstow, 1905) (58), (66)*D. tenue* J. & M., 1938 (58)*Dipetalonema* sp. (58)

MACROPUS SP. (unidentified kangaroos or wallabies)

Protozoa

- (Sp.) *Ileocystic macropodis* Gilruth and Bull, 1912 (41)
 = *Globidium macropodis* (Gilruth and Bull) Wenyon, 1926 (126)
Lymphocystic macropodis Gilruth and Bull, 1912 (41)
 = *Globidium* sp. Wenyon, 1926 (126)
Toxoplasma sp. (106)

Cestoda

- (CY., Ano.) *Progamotaenia zschokkei* (Janicki, 1905), New Guinea (44)
Bothriocephalus marginatus Krefft, 1871 (76)
Taenia fimbriata Krefft, 1871 (76)
Taenia mastersi Krefft, 1871 (76)
 (Krefft's species are unrecognizable)

Nematoda

- (ST., Str.) *Globocephaloides macropodis* Y. & M., 1926 (132)
Labiostrongylus communis J. & M., 1939 (61)
L. labiostrongylus Y. & M., 1926 (132)
Macropostrongylus australis Y. & M., 1926 (132)
M. macropostrongylus Y. & M., 1926 (132)
M. yorkei Baylis, 1927 (5)
Pharyngostrongylus eta J. & M., 1939 (61)
Ph. macropodus Y. & M., 1926 (132)
Spirostrongylus spirostrongylus Y. & M., 1926 (132)
(FI.) *Dipetalonema annulipapillatum* J. & M., 1938 (60)
D. roemeri (v. Linstow, 1905) (60)
Filaria macropodis gigantei (3)
F. macropi majoris (18)
F. websteri Cobbold, 1879 (32)
 These three *Filariæ* are synonymous with *Dipetalonema roemeri*
 (v. Linstow, 1905)

MACROPUS SP. (a wallaby from Millmerran, Q.)

Nematoda

- (ST., Str.) *Labiostrongylus uncinatus* (J. & M., 1939) (61)
Pharyngostrongylus eta J. & M., 1939 (61)

"LE KANGAROO DES ROCHERS"

Protozoa

- (Sp.) *Balbiana* sp. ("Siegant dans le tissu conjonctif") (19)
 (Minchin (1903) regarded *Balbiana* as a synonym of *Sarcocystis*)

Acknowledgements.

I would like to thank the Librarian of the Queensland Institute of Medical Research, Mrs. M. Macgregor, for her unflinching help with the references. The list could not have been compiled without her cooperation. I would also like to thank the Director, Dr. I. M. Mackerras, for his encouragement and helpful criticism of the MS., and Mrs. J. W. Phillips for her careful and accurate typing.

Thanks are also due to Mr. W. R. Le Fanu, Librarian of the Royal College of Surgeons, for his kindness in endeavouring to trace the elusive Mr. Webster—the discoverer of the kangaroo filaria. Gratitude is also expressed to Mr. G. Mack, Director of the Queensland Museum, for his help with the names of animals.

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PART II. EUTHERIA.

Synopsis.

Part II contains the names of 171 animals, eight of them introduced by man. There are 85 native rats belonging to 17 genera; parasites have been recorded from 8 species belonging to 4 genera. There are 49 native bats, including flying foxes, belonging to 24 genera; parasites have been recorded from 10 species belonging to 5 genera. Extra-territorial records for 7 bats belonging to 4 genera are included. Other records are from the dingo and certain marine mammals.

Blood protozoa are known to occur in three native rats (*Trypanosoma*, *Hepatozoon*, and *Bartonella*), in flying foxes (*Trypanosoma* and *Hepatocystis*) and in insectivorous bats (? *Polychromophilus*). Trematodes are known from a water rat (3 species), small bats (several undescribed species), the dugong (10 species), and a seal (one species). Cestodes are known from some rats and bats, and are common in carnivorous marine mammals. Nematodes occur in all groups. Acanthocephala are recorded from two native rats and several marine animals.

The parasites of the introduced animals are the same as those they harbour in other parts of the world. The dingo has been found to be infested with many of the parasites of the domestic dog.

This part deals with the native Eutherian mammals and the following introduced animals: rabbit, hare, brown and black rats, mouse, dog, cat, and fox. The parasites of some of the introduced animals were recorded by Johnston in a series of papers and exhibits from 1909 to 1918. Some were recorded by Sweet (1909*a*, 1909*b*), and the helminths were brought together by Young (1939). The parasites of the dog and fox have been dealt with by Pullar (1946), and Seddon (1950, 1952) listed parasites from all this group except the mouse and rats.

The records made by Johnston and his colleagues from marine mammals in the Antarctic and in the sub-Antarctic islands are included here, the hosts being occasional visitors to our southern shores. Extra-territorial records for the dugong are included, and also for some bats, because the Australian representatives of these wide-ranging mammals may be hosts to the same or related parasites.

Relatively few records have been found for the indigenous Eutheria. This appears to be due to the lack of examinations rather than to any deficiency in the parasitic fauna, since a few species which have been carefully examined have been found to harbour many parasites.

The explanation of the abbreviations used will be found at the beginning of Part I (p. 102).

HOSTS AND PARASITES

Order LAGOMORPHA

Family LEPORIDAE

Genus LEPUS L., 1758

L. EUROPAEUS Pallas, 1778, the hare* (introduced)

Protozoa

(Sp.) *Eimeria perforans* (Leuckart, 1879) (98)

Trematoda

(Fasci.) *Fasciola hepatica* L., 1758 (20), (105), (97)

Cestoda

(CY., Tae.) *Taenia pisiformis* Bloch, 1780, as *Cysticercus pisiformis* (15), (109), (45), (97)

Multiceps serialis (Gervais, 1847), as *Coenurus serialis* (109), (45), (97)

* The species of hare which has gone wild in Australia is sometimes referred to as *Lepus timidus*. However, Mr. G. Mack, Queensland Museum, considers that it should be called *L. europaeus*.

Genus *ORYCTOLAGUS* Lilljeborg, 1874

O. CUNICULUS (L., 1758), the rabbit (introduced)

Protozoa

- (Sp.) *Eimeria stiedae* (Lindemann, 1865) (38), (39), (99), (45), (98), (79)
E. perforans (Leuckart, 1879) (99), (98), (79)
E. irresidua Kessel and Jankiewicz, 1931 (79)
E. media Kessel, 1929 (79)
E. magna Pérard, 1928 (99), (98), (79)
Toxoplasma sp. (111), (98)

Trematoda

- (Fasci.) *Fasciola hepatica* L., 1758 (20), (105), (97), (79)

Cestoda

- (CY., Tae.) *Taenia pisiformis* Bloch, 1780, as *Cysticercus pisiformis* (109), (38), (39), (103), (45), (93), (97), (79)
Multiceps serialis (Gervais, 1847) as *Coenurus serialis* (103), (38), (39), (109), (45), (93), (97), (79)
Echinococcus granulosus (Batsch, 1786) as hydatid (103), (38), (39), (109), (45), (97)
(PS., Dip.) *Diphyllbothrium (Spirometra) erinacei* (Rudolphi, 1819) as sparganum (experimental) (10)

Nematoda

- (ST., Tri.) *Trichostrongylus colubriformis* (Giles, 1892) (90)
T. retortaeformis (Zeder, 1800) (90), (63), (79)
T. vitrinus Looss, 1905 (90)
Graphidium strigosum (Dujardin, 1845) (38), (109), (63), (45), (79)
Nematodirus spathiger (Railliet, 1896) (79)
Nematodirus sp. (79)
(OX.) *Passalurus ambiguus* (Rudolphi, 1819) (41), (45), (90), (63), (79)

Order RODENTIA

Family MURIDAE

Subfamily HYDROMYINAE

Genus *HYDROMYS* Geoffroy, 1804. (Water rats)

- H. CAURINUS Thomas, 1909 No records
H. CHRYSOGASTER Geoffroy, 1804

Trematoda

- (Plagi.) *Plagiorchis jaenschi* Johnston and Angel, 1951 (51), (52)
(Micro.) *Microphallus minutus* Johnston, 1948 (51)
(Strig.) *Fibricola minor* Dubois, 1936 (27), (51)

Cestoda

- (CY., Hym.) *Hymenolepis diminuta* (Rudolphi, 1819) (30)
(PS., Dip.) *Diphyllbothrium (Spirometra) erinacei* (Rudolphi, 1819) as sparganum* (72)

Nematoda

- (TR.) *Trichuris muris* (Schränk, 1788) (30)
Capillaria sp.* (72)
(ST., Tri.) Trichostrongylidae, undescribed species* (72)
(ST., Anc.) Ancylostomidae, undescribed species (72)
(OX.) *Ganguleterakis spumosa* (Schneider, 1866) (30)
(AS.) *Neoascaris* sp. (102)
(SP.) *Cosmocephalus australiensis* J. & M., 1952 (65)
Spirura (s.l.) sp. (65)
Protospirura muris (Gmelin, 1790) (30)
Gongylonema sp. (30)

* I am indebted to Mrs. D. G. Delamoir, Queensland Institute of Medical Research Field Station, Innisfail, North Queensland, for the species marked with an asterisk from the various native rats.

*Acanthocephala**Pseudoporrorchis hydromuris** Edmonds, 1957 (29A)*Pentastomida* (Phylum Arthropoda)*Linguatula* sp.* (larvae) (72)

H. FULIGINOSUS	Gould, 1853	No records
H. GROOTENSIS	Troughton, 1935	No records
H. LAWNENSIS	Troughton, 1923	No records
H. LONGMANI	Thomas, 1923	No records
H. MELICERTES	Thomas, 1921	No records
H. MOAE	Troughton, 1935	No records

Genus XEROMYS Thomas, 1889

X. MYOIDES	Thomas, 1889	No records
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Subfamily MURINAE

Genus RATTUS Fischer, 1803. (Rats)

R. ASSIMILIS (Gould, 1858)—the allied rat

Protozoa

(M.)	<i>Trypanosoma lewisi</i>	(Kent, 1880) (72)
(Sp.)	<i>Bartonella muris</i>	Mayer, 1921 (72)
	<i>Hepatozoon muris</i>	(Balfour, 1906) (72)
	<i>Toxoplasma gondii</i>	(Nicolle and Manceaux, 1908) (83)

Cestoda

(CY., Hym.)	<i>Hymenolepis diminuta</i>	(Rudolphi, 1819) (95)
	<i>Hymenolepis australiensis</i>	Sandars, 1957 (95)
(CY., Dav.)	<i>Raillietina</i> (<i>Raillietina</i>) <i>celebensis</i>	(Janicki, 1902) (1), (95)
(CY., Dil.)	<i>Choanotaenia ratticola</i>	Sandars, 1957 (95)
(CY., Tae.)	<i>Taenia taeniaeformis</i>	(Batsch, 1786) as <i>Cysticercus fasciolaris</i> Rudolphi, 1808 (95)

Nematoda

(RH.)	<i>Strongyloides</i> sp.	(72)
(TR.)	<i>Capillaria</i> sp.	(72)
(ST., Tri.)	<i>Trichostrongylidae</i> , sp. not identified	(72)
(ST., Met.)	<i>Angiostrongylus cantonensis</i>	(Chen, 1935) (72)
(OX.)	Unidentified species*	(72)
(AS.)	<i>Neoscaris mackerrasae</i>	Sprent (101)
	<i>Amplicaecum</i> sp. (larvae)	(102)
(SP.)	<i>Physaloptera trougtoni</i>	J. & M., 1941 (60)

Acanthocephala

Unidentified species* (72)

R. COLLETTI	Thomas, 1904	No records
R. CONATUS	Thomas, 1923	

Nematoda

(ST., Tri.)	<i>Nippostrongylus braziliense</i> *	(Travassos, 1914) (72)
	<i>Trichostrongylidae</i> (2 unidentified species*)	(72)
(ST., Met.)	<i>Angiostrongylus cantonensis</i> *	(Chen, 1935) (72)

Cestoda

Unidentified species* (72)

R. CULMORUM	(Thomas and Dollman, 1909)	No records
R. FUSCIPES	(Waterhouse, 1839)	No records
R. GREYII	(Gray, 1841)	No records
R. LEUCOPUS	(Gould, 1867)	No records
R. LUTREOLUS	(Gray, 1841)	No records
R. MANICATUS	(Gould, 1858)	No records
R. MELVILLEUS	Thomas, 1921	No records
R. SORDIDUS	(Gould, 1858)	No records
R. TUNNEYI	(Thomas, 1904)	No records
R. VELLEROSUS	(Gould, 1847)	No records

R. VILLOSISSIMUS (Waite, 1897)

Protozoa

- (M.) *Trichomonas* sp. (72)
Hexamita sp. (72)
Giardia sp. (72)
- (Sa.) *Entamoeba* sp. (72)
- (Sp.) *Bartonella muris* Mayer, 1921 (17)

Cestoda

Unidentified larvae in lungs (72)

R. NORVEGICUS (Berkenhout, 1769), the brown rat (introduced)

Protozoa

- (M.) *Trypanosoma lewisi* (Kent, 1880) (85), (38), (55), (45), (30)
Trichomonas muris (Grassi, 1879) (72)
Hexamita muris (Grassi, 1881) (72)
- (Sa.) *Entamoeba muris* (Grassi, 1879) (72)
- (Sp.) *Hepatozoon muris* (Balfour, 1906) (18), (38), (39), (55), (45)
Eimeria nieschulzi Dieben, 1924 (72)
Coccidia (30)
Sarcocystis muris (Blanchard, 1885) (38), (55), (45)
Bartonella muris Mayer, 1921 (72)
Toxoplasma gondii (Nicolle and Manceaux, 1908) (83)

Cestoda

- (CY., Tae.) *Taenia taeniaeformis* (Batsch, 1786) as *Cysticercus fasciolaris* Rudolphi, 1808 (68), (82), (38), (109), (45), (30)
- (CY., Hym.) *Hymenolepis diminuta* (Rudolphi, 1819) (38), (39), (109), (45)
H. nana (v. Siebold, 1853) (39), (109), (45)
- (CY., Dav.) *Raillietina* (R.) *celebensis* (Janicki, 1902) recorded as *Davainea* sp. (45)
- (PS., Dip.) *Diphyllobothrium* (*Spirometra*) *erinacei* (Rudolphi, 1819) as sparganum (experimental) (10), (94)

Nematoda

- (RH.) *Strongyloides* sp. (30)
- (TR.) *Trichuris muris* (Schränk, 1788) (30)
Capillaria hepatica (Bancroft, 1893) (39), (109), (45), (30)
Trichosomoides crassicauda (Bellingham, 1840) (39), (109), (45)
- (ST., Tri.) *Nippostrongylus braziliense* (Travassos, 1914) (45), (30), recorded as *Oesophagostomum* sp. (39), (109)
- (ST., Met.) *Angiostrongylus cantonensis* (Chen, 1935) (73)
- (OX.) *Syphacia obvelata* (Rudolphi, 1802) (39), (109), (45)
Aspicularis tetraptera (Nitzsch, 1821) (46)
Ganguleterakis spumosa (Schneider, 1866) (39), (109), (45), (30)
- (SP.) *Protospirura muris* (Gmelin, 1790) (39), (109), (45)
Gongylonema sp. (30)

Acanthocephala

Moniliformis dubius Meyer, 1932 (38), (39), (109), (45), (30), (57)

R. RATTUS (L., 1758), the black rat (introduced), including *R. R. alexandrinus*

Protozoa

- (M.) *Trypanosoma lewisi* (Kent, 1880) (85), (38), (55), (45), (30)
- (Sp.) *Hepatozoon muris* (Balfour, 1906) (38), (55), (45)
Coccidia (30)
Sarcocystis muris (Blanchard, 1885) (39), (55), (45)

Cestoda

- (CY., Tae.) *Taenia taeniaeformis* (Batsch, 1786) as *Cysticercus fasciolaris* Rudolphi, 1808 (39), (109), (45)
- (CY., Hym.) *Hymenolepis diminuta* (Rudolphi, 1819) (38), (39), (109), (45), (30)
H. nana (v. Siebold, 1853) (39), (109), (45), (30)

Nematoda

- (RH.) *Strongyloides* sp. (72)

- (TR.) *Trichuris muris* (Schrank, 1788) (39), (109), (45), (30)
Capillaria hepatica (Bancroft, 1893) (39), (109), (45), (30)
Trichosomoides crassicauda (Bellingham, 1840) (39), (45)
- (ST., Tri.) *Nippostrongylus braziliense* (Travassos, 1914) (46)
- (ST., Met.) *Angiostrongylus cantonensis* (Chen, 1935) (73)
- (OX.) *Syphacia obvelata* (Rudolphi, 1802) (39), (109), (45), (30)
Ganguleterakis spumosa (Schneider, 1866) (39), (109), (45)
- (SP.) *Protospirura muris* (Gmelin, 1790) (39), (109), (45)
Gongylonema sp. (30)
- Acanthocephala*
Moniliformis dubius Meyer, 1932 (38), (39), (109), (45), (30), (57)
- RATTUS SP. (introduced)
- Protozoa*
- (M.) *Trypanosoma lewisi* (Kent, 1880) (19), as *Haematomonas* (3)
- (Sp.) *Hepatozoon muris* (Balfour, 1906) as *Leucocytozoon* sp. (19)
- Cestoda*
- (CY., Tae.) *Taenia taeniaeformis* (Batsch, 1786) as *Cysticercus fasciolaris* Rudolphi, 1808 (68), (82)
- Nematoda*
- (TR.) *Capillaria hepatica* (Bancroft, 1893) (4)
- Genus *Mus* L., 1758
- M. MUSCULUS L., 1758, the house mouse (introduced)
- Protozoa*
- (M.) *Trichomonas muris* (Grassi, 1879) (24)
Hexamita muris (Grassi, 1881) (72)
Giardia muris (Grassi, 1879) (24)
- (Sa.) *Entamoeba muris* (Grassi, 1879) (24)
- (Sp.) *Klossiella muris* Smith and Johnston, 1902 (24)
Eimeria falciformis (Eimer, 1870) (72)
Eperythrozoon coccoides Schilling, 1928 (24), (25)
Cryptosporidium muris Tyzzer, 1907 (24)
- Cestoda*
- (CY., Tae.) *Taenia taeniaeformis* (Batsch, 1786) as *Cysticercus fasciolaris* Rudolphi, 1808 (82), (39), (109), (45)
- (CY., Hym.) *Hymenolepis diminuta* (Rudolphi, 1819) (38), (39), (109), (45)
H. nana (v. Siebold, 1853) (39), (109), (45), (24)
- (PS., Dip.) *Diphyllobothrium (Spirometra) erinacei* (Rudolphi, 1819) as sparganum experimental (10), (94)
- Nematoda*
- (TR.) *Trichuris muris* (Schrank, 1788) (39), (109), (45)
Capillaria hepatica (Bancroft, 1893) (39), (109), (45)
Trichosomoides crassicauda (Bellingham, 1840) (39)
- (OX.) *Syphacia obvelata* (Rudolphi, 1802) (39), (109), (45), (24)
Aspiculuris tetraptera (Nitzsch, 1821) (45), (46), (24)
Ganguleterakis spumosa (Schneider, 1866) (39), (109), (45)
- (SP.) *Protospirura muris* (Gmelin, 1790), (39), (109), (45), (60)
Gongylonema sp. (45), (30)
- Genus *Pseudomys* Gray, 1832. (Native mice)
- P. AUSTRALIS Gray, 1832 No records
- P. AURITUS Thomas, 1910 No records
- P. FIELDI Waite, 1896 No records
- P. HIGGINSI (Trouessart, 1899) No records
- P. MINNIE Troughton, 1932 No records
- P. RAWLINNAE Troughton, 1932 No records
- P. SHORTRIDGEI (Thomas, 1907) No records

Genus *THETOMYS* Thomas, 1910. (Native mice)

T. FERULINUS (Thomas, 1902)	No records
T. GOULDII (Waterhouse, 1839)	No records
T. GRACILICAUDATUS (Gould, 1845)	No records
T. NANUS (Gould, 1858)	No records
T. PRAECONIS Thomas, 1910	No records

Genus *LEGGADINA* Thomas, 1910. (Native mice)

L. BERNEYI Troughton, 1936	No records
L. DELICATULA (Gould, 1842)	No records
L. FIELDI (Waite, 1896)	No records
L. FORRESTI (Thomas, 1906)	No records
L. HERMANNsburgensis (Waite, 1896)	No records
L. MESSORIA Thomas, 1925	No records
L. PATRIA (Thomas and Dollman, 1909)	No records
L. WAITEI Troughton, 1932	No records

Genus *GYOMYS* Thomas, 1910. (Native mice)

G. ALBOCINEREUS (Gould, 1845)	No records
G. APODEMOIDES Finlayson, 1932	No records
G. DESERTOR Troughton, 1932	No records
G. FUMEUS Brazenor, 1934	No records
G. GLAUCUS Thomas, 1910	No records
G. NOVAEHOLLANDIAE (Waterhouse, 1843)	No records
G. OCCIDENTALIS Tate, 1951	No records
G. PUMILUS Troughton, 1936	No records

Genus *MASTACOMYS* Thomas, 1882. (Broad-toothed rat)

M. FUSCUS Thomas, 1882	No records
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Genus *LAOMYS* Thomas, 1909. (Thick-tailed rats)

L. PEDUNCULATUS (Waite, 1896)	No records
L. WOODWARDI Thomas, 1909	No records

Genus *ASCOPHARYNX* Waite, 1900. (Kangaroo mice)

A. CERVINUS (Gould, 1853)	No records
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Genus *MESEMBRIOMYS* Palmer, 1906. (Shaggy rabbit-rats)

M. GOULDII (Gray, 1843)	No records
M. MACRURUS (Peters, 1876)	No records

Genus *CONILURUS* Ogilby, 1838. (Rabbit-rats)

C. ALBIPES (Lichtenstein, 1829)	No records
C. HEMILEUCURUS (Gray, 1858)	No records
C. PENICILLATUS (Gould, 1842)	No records

Genus *LEPORILLUS* Thomas, 1906. (Stick-nest rats)

L. APICALIS (Gould, 1853)	No records
L. CONDITOR (Sturt, 1848)	No records
L. JONESI Thomas, 1921	No records

Genus *NOTOMYS* Lesson, 1842. (Kangaroo-mice)

N. ALEXIS Thomas, 1922	No records
N. AISTONI Brazenor, 1934	No records
N. AQUILO Thomas, 1921	No records
N. AMPLUS Brazenor, 1936	No records
N. LONGICAUDATUS (Gould, 1844)	No records
N. MEGALOTIS Iredale and Troughton, 1934	No records

(*Nomen novum* for *macrotis* Thomas, 1921)

N. MITCHELLI (Ogilby, 1838)	No records
N. MORDAX Thomas, 1922	No records
N. RICHARDSONII (Gould, 1853)	No records

Genus *ZYZOMYS* Thomas, 1909. (White-tailed rat)

Z. ARGURUS (Thomas, 1889)	No records
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Genus *MELOMYS* Thomas, 1922. (Scale-tailed tree rats)

M. AUSTRALIUS Thomas, 1924	No records
M. BANFIELDI (de Vis, 1907)	

Nematoda

(SP.) <i>Physaloptera banfieldi</i> J. & M., 1941 (60)	
M. CALLOPES Finlayson, 1943	No records
M. CERVINIPES (Gould, 1852)	

Nematoda

(FI.) <i>Microfilaria</i> in blood†	
M. LIMICAUDA Troughton, 1935	No records
M. LITTORALIS (Lönnerberg, 1916)	

Protozoa

(Sp.) <i>Bartonella muris</i> * Mayer, 1921 (72)	
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Nematoda

(ST., Tri.) Trichostrongylidae, undescribed species* (72)	
(ST., Met.) <i>Angiostrongylus cantonensis</i> * (Chen, 1935) (72)	
(OX.) Species not identified* (72)	

Cestoda

Species not identified* (72)

Pentastomida (Phylum Arthropoda)*Linguatula* sp.* (larvae) (72)

M. MELICUS (Thomas, 1913)	No records
M. MIXTUS Troughton, 1935	No records
M. MURINUS (Thomas, 1913)	No records
M. RUBICOLA Thomas, 1924	No records

Genus *UROMYS* Peters, 1867. (Giant scale-tailed rats)

U. CAUDIMACULATUS (Kreffft, 1867)	
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Nematoda

(ST., Tri.) Trichostrongylidae, undescribed species*	
U. EXILIS Troughton and Le Souef, 1929	No records
U. SHERRINI Thomas, 1923	No records

Order SIRENIA

Family DUGONGIDAE

Genus *DUGONG* Lacépède, 1799Syn. *Halicore* Illiger, 1811

D. DUGON (Müller, 1776), the dugong—syn. <i>australis</i> Owen, 1847	
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Trematoda

(Param.) <i>Solenorchis travassosi</i> Hilmy, 1949 (35)	
<i>S. gohari</i> Hilmy, 1949 (35)	
<i>S. naguibmahfouzi</i> Hilmy, 1949 (35)	
<i>S. baeri</i> Hilmy, 1949 (35)	
<i>Indosolenorchis hirudinaceus</i> Crusz, 1951 (22)	
(Prono.) <i>Taprobanella bicaudata</i> Crusz and Fernand, 1954 (23)	
<i>Lankatrema mannarensis</i> Crusz and Fernand, 1954 (23)	
<i>Opisthotrema dujonis</i> (Leuckart, 1874), syn. <i>cochleare</i> Fischer, 1883 (37)	
<i>Pulmonicola pulmonale</i> (v. Linstow, 1904) (71)	
(Rhab.) <i>Rhabdiopoeus taylori</i> S. J. Johnston, 1913 (37)	

Nematoda

(AS.) <i>Paradujardinia halicoris</i> (Owen, 1833) (59)	
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† See footnote under *H. chrysogaster*.

Order CARNIVORA
Suborder FISSIPEDIA
Family FELIDAE
Genus FELIS L., 1758

F. CATUS L., 1758, the domestic cat (introduced)

Protozoa

- (Sp.) *Toxoplasma* sp. (111), (98)
Isoospora felis Wenyon, 1923 (11)
I. rivolta (Grassi, 1879) (11)

Trematoda

Four species known to occur in Brisbane cats (102)

Cestoda

- (CY., Tae.) *Taenia taeniaeformis* (Batsch, 1786) (82), (15), (39), (89), (97)
(CY., Dil.) *Dipylidium caninum* (L., 1758) (82), (38), (39), (109), (89), (97)
(PS., Dip.) *Diphyllobothrium (Spirometra) erinacei* (Rudolphi, 1819), syn. *Dibothriocephalus felis* (Creplin, 1825) (21), (109), (42), (97), (9), (10), (94)

Nematoda

- (ST., Anc.) *Ancylostoma caninum* (Ercolani, 1859) (42), (14), (89), (97)
A. braziliense (Gomez de Faria, 1910) (33), (97)
(ST., Met.) *Aelurostrongylus abstrusus* (Railliet, 1898) (31), (97)
(AS.) *Toxocara cati* (Schränk, 1788), syn. *mystax* Zeder, 1800 (68), (82), (89), (97), (100)
Toxascaris leonina (v. Linstow, 1902) (only found once) (97)
(SP.) *Gnathostoma spinigerum* Owen, 1836 (33), (97)

Family CANIDAE

Genus CANIS L., 1758

C. FAMILIARIS L., 1758, the domestic dog (introduced)

Protozoa

- (Sp.) *Isoospora bigemina* (Stiles, 1891) (72)
I. felis Wenyon, 1923 (11)
I. rivolta (Grassi, 1879) (11)
Coccidiosis (species not specified) (98)
? *Hepatozoon* sp. (16), (98)
Toxoplasma sp. (111), (98)

Trematoda

- (Diplo.) *Alaria alata* (Goeze, 1782) (not indigenous) (74), (97)

Cestoda

- (CY., Dil.) *Dipylidium caninum* (L., 1758) (82), (15), (38), (39), (109), (92), (89), (97)
(CY., Tae.) *Echinococcus granulosus* (Batsch, 1786) (106), (107), (108), (82), (39), (109), (92), (93), (89), (97)
Multiceps serialis (Gervais, 1847) (21), (39), (109), (92), (97)
Taenia hydatigena Pallas, 1766, syn. *marginata* Batsch, 1786 (15), (38), (109), (89), (97)
T. ovis (Cobbold, 1869) (109), (91), (88), (97)
T. pisiformis (Bloch, 1780), syn. *serrata* Goeze, 1782 (15), (21), (39), (109), (92), (89), (97)
T. taeniaeformis (Batsch, 1786), syn. *crassicollis* Rudolphi, 1810 (92)
(PS., Dip.) *Diphyllobothrium (Spirometra) erinacei* (Rudolphi, 1819) (88), (97), (10)
Diphyllobothrium latum (L., 1758) (32), (97)

Nematoda

- (TR.) *Trichuris vulpis* (Frohlich, 1789) (92), (88), (97)
(ST., Anc.) *Ancylostoma caninum* (Ercolani, 1859) (82), (109), (80), (92), (89), (97)
A. braziliense (Gomez de Faria, 1910) (33), (97)
Uncinaria stenocephala (Railliet, 1894) (109), (92), (88), (97)

- (ST., Met.) *Angiostrongylus vasorum* (Baillet, 1866) (91), (97)
Filaroides osleri (Cobbold, 1879) (109), (88), (97), (67)
- (AS.) *Toxascaris leonina* (v. Linstow, 1902), syn. *imbata* Railliet and Henry, 1911 (92), (89), (97)
Toxocara canis (Werner, 1782), syn. *marginata* Rudolphi, 1802 (82), (39), (109), (92), (89), (97)
- (SP.) *Spirocerca sanguinolenta* Rudolphi, 1819 (not indigenous) (40), (109)
- (FL.) *Dirofilaria immitis* (Leidy, 1856) (2), (5), (6), (38), (109), (14), (80), (89), (97)
- Pentastomida* (Phylum Arthropoda)
Linguatula serrata (Frohlich, 1789) (86)
- C. ANTARCTICUS Kerr, 1792, the dingo— syn. *C. dingo* Meyer, 1793
- Protozoa*
(Sp.) *Eimeria canis* Wenyon, 1923 (11)
Isoospora rivolta Grassi, 1879 (11)
- Cestoda*
(CY., Dil.) *Dipylidium caninum* (L., 1758) (109), (44), (97), (28)
(CY., Tae.) *Echinococcus granulosus* (Batsch, 1786) (39), (109), (44), (97), (28)
Multiceps serialis (Gervais, 1847) (28)
Taenia hydatigena Pallas, 1766 (28)
T. pisiformis (Bloch, 1780) (28)
- (PS., Dip.) *Diphyllobothrium* (*Spirometra*) *erinacei* (Rudolphi, 1819) (88), (28)
- Nematoda*
(ST., Anc.) *Ancylostoma caninum* (Ercolani, 1859) (44), (97)
(AS.) *Toxascaris leonina* (v. Linstow, 1902) (84)
- Pentastomida* (Phylum Arthropoda)
Linguatula dingophila Johnson, 1910 (36)
? = *L. serrata* (Frohlich, 1789) (44), (28)
- Genus VULPES Skjöldebrand, 1777
- V. VULPES (L., 1758), the fox (introduced)
- Cestoda*
(CY., Dil.) *Dipylidium caninum* (L., 1758) (88), (97)
(CY., Tae.) *Multiceps serialis* (Gervais, 1847) (39), (88), (97)
Taenia hydatigena Pallas, 1766 (88), (97)
T. ovis (Cobbold, 1869) (87), (97)
T. pisiformis (Bloch, 1780) (97)
- (PS., Dip.) *Diphyllobothrium* (*Spirometra*) *erinacei* (Rudolphi, 1819) (88), (97), as sparganum (42)
- Nematoda*
(ST., Anc.) *Uncinaria stenocephala* (Railliet, 1894) (88), (97), (65)
(AS.) *Toxascaris leonina* (v. Linstow, 1902) (88), (97)
Toxocara canis (Werner, 1782) (88), (97)
(FL.) *Dirofilaria immitis* (Leidy, 1856) (97)
- Suborder PINNIPEDIA
Family OTARIIDAE
Genus NEOPHOCA Gray, 1866
- N. CINEREA (Péron and Lesueur, 1816), the hair seal
- Cestoda*
(PS., Dip.) *Diphyllobothrium* (*Cordicephalus*) *arctocephalinum* Johnston, 1937 (48)
- Nematoda*
(AS.) *Contraecaeum osculatum* (Rudolphi, 1802) (48), (59)
- Acanthocephala*
Corynosoma australe Johnston, 1937 (48), (54)

- Genus OTARIA Péron, 1816
- O. FORSTERI Lesson, 1828
Nematoda
 (AS.) *Terranova piscium* (Rudolphi, 1802) (66)
Contracaecum osculatum (Rudolphi, 1802) (76)
- O. HOOKERI Gray, 1859
Nematoda
 (AS.) *Terranova piscium* (Rudolphi, 1802) (66)
- Genus GYPSOPHOCA Gray, 1866
- G. DORIFERA (Wood Jones, 1925)
Acanthocephala
Corynosoma clavatum Goss, 1940 (54)
- G. TASMANICA (Scott and Lord, 1926)
Cestoda
 (PS., Dip.) *Diphyllobothrium (Cordicephalus) arctocephalinum* Johnston, 1937 (26)
Nematoda
 (AS.) *Contracaecum osculatum* (Rudolphi, 1802) (59), (65)
Stomachus sp. (59), (65)
- Family PHOCIDAE
- Genus LOBODON Gray, 1844
- L. CARCINOPHAGUS (Hombron and Jacquinot, 1842), the crab-eating seal
Nematoda
 (AS.) *Contracaecum osculatum* (Rudolphi, 1802) (62)
C. radiatum (v. Linstow, 1907) (50), (62)
- Genus HYDRURGA Gistel, 1848
- H. LEPTONYX (Blainville, 1820), the sea-leopard
Cestoda
 (PS., Dip.) *Diphyllobothrium (Cordicephalus) quadratum* (v. Linstow, 1893) (49)
D. (C.) scoticum (Rennie and Reid, 1912) (49)
Nematoda
 (ST., Met.) *Parafilaroides hydrurgae* Mawson, 1953 (76)
 (AS.) *Contracaecum osculatum* (Rudolphi, 1802) (50), (62), (76)
C. radiatum (v. Linstow, 1907) (62), (76)
C. stenocephalum (Railliet and Henry, 1907) (50)
Stomachus similis (Baird, 1853) (50), (59), (66), (76)
Terranova piscium (Rudolphi, 1802), (50), (66), (76)
Acanthocephala
Corynosoma bullosum (v. Linstow, 1892) (29)
- Genus LEPTONYCHOTES Gill, 1872
- L. WEDDELLII (Lesson, 1826), Weddell's seal
Trematoda
 (Notoc.) *Ogmogaster antarctica* Johnston, 1931 (47)
Cestoda
 (PS., Dip.) *Diphyllobothrium (Cordicephalus) lashleyi* (Leiper and Atkinson, 1914)
 (49)
D. mobile (Rennie and Reid, 1912) (49)
D. perfoliatum (Railliet and Henry, 1912) (49)
D. rufum (Leiper and Atkinson, 1914) (49)
D. wilsoni (Shiple, 1907) (49)
Nematoda
 (AS.) *Contracaecum osculatum* (Rudolphi, 1802) (50), (62)
C. radiatum (v. Linstow, 1907) (50), (62)
C. rectangulum (v. Linstow, 1907) (71A)
C. stenocephalum (Railliet and Henry, 1907) (50)
Terranova piscium (Rudolphi, 1802) (50), (62)

- (SP.) *Physaloptera guiarti* Garin, 1913 (112)
Acanthocephala
Corynosoma antarcticum (Rennie, 1907) (53)

Genus MACRORHINUS Cuvier, 1826

- M. PROBOSCIDEUS (Péron and Lesueur, 1807), the elephant seal.

Usually referred to as *Mirounga leonina* (L., 1758)

Cestoda

- (PS., Dip.) *Diphylobothrium (Cordicephalus) tectum* (v. Linstow, 1892) (49)
 (TE., Phy.) *Phyllobothrium* sp. (49)

Nematoda

- (ST., Anc.) *Uncinaria hamiltoni* Baylis, 1933 (62)
 (AS.) *Contracaecum osculatum* (Rudolphi, 1802) (50), (62), (76)
C. radiatum (v. Linstow, 1907) (76)
Stomachus similis (Baird, 1853) (50), (62), (76)
Terranova piscium (Rudolphi, 1802) (50), (62), (66)

- (FI.) *Filaria* (s.l.) sp. (76)

Acanthocephala

Corynosoma bullosum (v. Linstow, 1892) (29)

Order CETACEA

(Whales, porpoises and dolphins)

Only species from which parasites have been recorded in Australia are mentioned in this list.

Family PHYSETERIDAE

Genus KOGIA Gray, 1846

- K. BREVICEPS (Blainville, 1838), the pigmy sperm whale.

Cestoda

- (TE., Phy.) *Phyllobothrium delphini* (Bosc, 1802) (cysts in blubber) (58)

Nematoda

- (AS.) *Stomachus simplex* (Rudolphi, 1809) (58), (61)
Terranova kogiae (J. & M., 1939) (58)
 (FI.) *Crassicauda magna* J. & M., 1939 (58)

Family PILOCOENIDAE

Genus GRAMPIDELPHIS Iredale and Troughton, 1933

- G. EXILIS Iredale and Troughton, 1933, the grampus-dolphin

Nematoda

- (FI.) *Crassicauda grampicola* J. & M., 1941 (59)

Genus GLOBICEPHALUS Hamilton, 1836

- GL. VENTRICOSUS (Lacépède, 1804), the blackfish, or pilot whale

Nematoda

- (AS.) *Stomachus oceanicus* J. & M., 1951 (64)

Family DELPHINIDAE

Genus DELPHINUS L., 1758

- D. DELPHIS L., 1758, the common dolphin—syn. *forsteri* Gray, 1846

Trematoda

Distoma sp. (68)

Cestoda

Tetrabothrius forsteri (Kreff, 1871) (68)

Nematoda

- (ST., Met.) *Halocercus delphini* Baylis and Daubney, 1925 (112)
 (AS.) *Ascaris* sp. (68)
Stomachus simplex (Rudolphi, 1809) (59)
 (SP.) *Echinocephalus uncinatus* Molin, 1858 (probably ingested with prey) (59)

*Acanthocephala**Echinorhynchus* sp. (68)*Corynosoma cetaceum* Johnston & Best, 1942 (54)*Corynosoma* sp. (56)

Genus LAGENORHYNCHUS, Gray, 1846

L. OBSCURUS (Gray, 1828), the dolphin.

Nematoda(AS.) *Stomachus simplex* (Rudolphi, 1809) (61)

Genus TURSIOPS Gervais, 1855

T. TRUNCATUS (Montague, 1815), the bottle-nosed dolphin

Nematoda(ST., Met.) *Halocercus lagenorhynchi* Baylis and Daubney, 1925 (59)*Stenurus ovatus* (v. Linstow, 1910) (112)*Acanthocephala**Corynosoma cetaceum* Johnston and Best, 1942 (54)

Order CHIROPTERA

Family PTEROPODIDAE

Genus PTEROPUS Brisson, 1762. (Flying foxes)

P. BRUNNEUS Dobson, 1878

No records

P. CONSPICILLATUS Gould, 1850

Protozoa(Sp.) *Hepatocystis pteropi** (Breinl, 1913) (12)

P. COLINUS Anderson, 1908 (New Hebrides)

Protozoa(Sp.) *Hepatocystis pteropi* (Breinl, 1913) (77)

P. GEDDIEI MacGillivray, 1860 (New Hebrides)

Protozoa(Sp.) *Hepatocystis pteropi* (Breinl, 1913) (77)*Nematoda*(AS.) *Toxocara pteropodis* Baylis, 1936 (8)

P. GOULDII Peters, 1867

Protozoa(M.) *Trypanosoma pteropi* Breinl, 1913 (13)(Sp.) *Hepatocystis pteropi* (Breinl, 1913) (13), (12), (69), (75)

P. NEOHIBERNICUS Peters, 1876 (Bismarck Arch.)

Nematoda(FL.) *Filaria hepatica* v. Linstow, 1898 (70)

P. POLIOCEPHALUS Temminck, 1825

Protozoa(Sp.) *Hepatocystis pteropi* (Breinl, 1913) (72)*Cestoda*(CY., Hym.) *Hymenolepis* sp. (43)*Nematoda*(FL.) *Filaria* sp. (body cavity) (43)

P. SCAPULATUS Peters, 1862

Protozoa(Sp.) *Hepatocystis pteropi* (Breinl, 1913) (12), (69)

Genus DOBSONIA Palmer, 1898

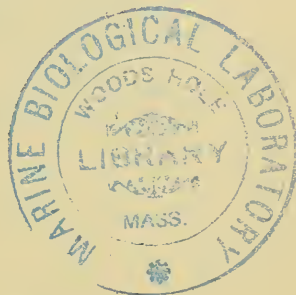
D. MAGNA Thomas, 1905

No records

D. MOLUCENSIS (Quoy and Gaimard, 1830) (New Guinea)

Protozoa(Sp.) ? *Hepatocystis* sp. (75)

* The first reference to this parasite was made by O'Brien (1909), who referred to the presence of "enhaemamoebae" in the blood of a flying fox at Cairns. He noted its resemblance to the quartan malaria parasite of man.



- Genus NYCTIMENE E.A., 1797. (Tube-nosed fruit bats)
- N. PAPUANUS Anderson, 1910 No records
 N. ROBINSONI Thomas, 1904 No records
- Family KIODOTIDAE
- Genus SYCONYCTERIS Matschie, 1899. (Blossom bats)
- S. AUSTRALIS (Peters, 1867) No records
- Genus ODONTONYCTERIS Jentink, 1902. (Northern blossom bats)
- O. LAGOCHILUS PYGAMAEUS (Anderson, 1911) No records
- Suborder MICROCHIROPTERA
- Family RHINOLOPHIDAE
- Genus RHINOLOPHUS Gray, 1834. (Horseshoe bats)
- R. MEGAPHYLLUS Gray, 1834 No records
- Family HIPPOSIDERIDAE
- Genus RHINONICTERIS Gray, 1847. (Horseshoe bats)
- R. AURANTIUS (Gray, 1845) No records
- Genus HIPPOSIDEROS Gray, 1831. (Horseshoe bats)
- H. ALBANENSIS Gray, 1866 No records
 H. CERVINUS (Gould, 1854) No records
 H. DIADEMA REGINAE Troughton, 1937 No records
 H. SEMONI Matschie, 1903
- Protozoa*
- (Sp.) ? *Polychromophilus** sp. (72)
- H. STENOTIS Thomas, 1913 No records
- Family MEGADERMIDAE
- Genus MACRODERMA Miller, 1906. (False vampire bats)
- M. GIGAS (Dobson, 1880) No records
- Family VESPERTILIONIDAE
- Genus NYCTOPHILUS Leach, 1821. (Long-eared bats)
- N. BIFAX Thomas, 1915 No records
 N. DAEDALUS Thomas, 1915 No records
 N. GEOFFROYI Leach, 1821
- Cestoda*
- (CY., Ano.) *Oochoristica nyctophili* Hickman, 1954 (34)
- N. TIMORIENSIS (Geoffroy, 1806) No records
 N. WALKERI Thomas, 1892 No records
- Genus VESPADELUS Iredale and Troughton, 1934. (Short-eared bats)
- V. PUMILIS (Gray, 1841)
- Protozoa*
- (Sp.) ? *Polychromophilus* sp. (72)
- Trematoda*: An unidentified species (72)
- Nematoda*: An unidentified species (72)
- Genus PIPISTRELLUS Kaup, 1829. (Pipistrels)
- P. ABRAMUS (Temminck, 1840) No records
- Genus REGISTRELLUS Troughton, 1943
- R. REGULUS (Thomas, 1906) No records
- Genus FALSISTRELLUS Troughton, 1943
- F. TASMANIENSIS (Gould, 1858) No records

* The malaria parasites of insectivorous bats in Australia have been tentatively assigned to the genus *Polychromophilus* Dionisi, 1899, until more information has been obtained about them.

Genus CHALINOLOBUS Peters, 1866. (Lobe-lipped bats)

C. GOULDII (Gray, 1841)	No records
C. MORIO (Gray, 1841)	No records
C. PICATUS (Gould, 1852)	No records
C. ROGERSI Thomas, 1909	No records

Genus MYOTIS Kaup, 1829

M. AUSTRALIS (Dobson, 1878)	No records
M. MACROPUS (Gould, 1855)	No records

M. MYOTIS (Bechstein, 1819) (Palestine)

Protozoa

(Sp.) "a haemosporidian" (78)

M. NATTERERII (Kuhl, 1819) (Palestine)

Protozoa

(Sp.) "a haemosporidian" (78)

Genus SCOTEANAX Troughton, 1943. (Broad-nosed bats)

S. RUPPELLII (Peters, 1866)	No records
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Genus SCOTOREPENS Troughton, 1943. (Broad-nosed bats)

S. BALSTONI (Thomas, 1906)	No records
S. GREYII (Gould, 1858)	No records
S. INFLUATUS (Thomas, 1924)	No records
S. ORION (Troughton, 1937)	No records

Genus MINIOPTERUS Bonaparte, 1837. (Bent-winged bats)

M. AUSTRALIS Tomes, 1858, New Hebrides

Protozoa

(Sp.) *Polychromophilus murinus* Dionisi, 1899 (77)

M. BLEPOTIS (Temminck, 1840)

Protozoa

(Sp.) ? *Polychromophilus* sp. (72)

Trematoda

Two unidentified species (72)

Cestoda

(CY., Hym.) *Hymenolepis miniopteri* Sandars, 1957 (96)

Nematoda

(ST., Tri.) *Anoplostrongylus heydoni* Baylis, 1930 (7)

(FL.) *Litomosa* sp. (Heart) (72)

M. SCHREIBERSII (Natterer, 1819) (Italy to Malaya)

Protozoa

(M.) *Trypanosoma vespertilionis* Battaglia, 1904, Italy (110)

(Sp.) *Polychromophilus melanipherus* Dionisi, 1899, Italy (110)

"a haemosporidian" (Palestine) (78)

MINIOPTERUS sp.

Nematoda

(ST., Tri.) *Nycteridostrongylus unicollis* Baylis, 1930 (7)

Genus PHONISCUS Miller, 1905. (Dome-headed bat)

P. PAPUENSIS (Dobson, 1878)	No records
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Family EMBALLONURIDAE

Genus SACCOLAIMUS Temminck, 1841. (Free-tailed bats)

S. AUSTRALIS (Gould, 1854)	No records
S. FLAVIVENTRIS (Peters, 1867)	No records
S. GEORGIANUS (Thomas, 1915)	No records
S. NUDICLUNIATUS (De Vis, 1905)	No records

Family MOLOSSIDAE

Genus AUSTRONOMUS Iredale and Troughton, 1934. (Mastiff bats)

A. AUSTRALIS (Gray, 1839) No records

Genus MICRONOMUS Iredale and Troughton, 1934

M. NORFOLKENSIS (Gray, 1839) No records

M. PLANICEPS (Peters, 1866) No records

Genus CHAEREPHON Dobson, 1874. (Northern mastiff bats)

C. COLONICUS (Thomas, 1906) No records

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PART III. INTRODUCED HERBIVORA AND THE DOMESTIC PIG.

Synopsis.

Part III contains the names of eleven introduced mammals, parasites being recorded from six of them.

Important protozoa recorded from stock are the organisms causing tick-borne fevers in cattle, *Babesia argentina*, *B. bigemina* and *Anaplasma marginale*. Non-pathogenic trypanosomes occur in sheep and cattle, *Trichomonas foetus* occurs in cattle, and *Eimeria faurei* in sheep and goats.

Only four species of trematodes have become established, namely, the liver fluke and three flukes inhabiting the rumen of sheep and cattle.

Three species of adult cestodes occur in the horse, and four in ruminants. Hydatids have been recorded from sheep, cattle, goats, pigs, horses, and camels. Larval stages of other dog tapeworms occur in sheep, cattle, goats, and pigs.

Numerous species of nematodes are present in stock, most important being species of Trichostrongylidae in sheep and cattle, and of Strongylidae in the horse.

One Acanthocephala is known from the pig.

Many Australian workers have studied the parasites of domestic animals in this country, so that most of the species which were imported with their hosts are now well known. The invaluable publications of Seddon (1950, 1952) form the basis of this list, which could not have been compiled without them. Earlier records were listed by Sweet (1909*a*, 1909*b*), Johnston (1909*a*, 1909*b*, 1916) and Young (1939). The reader is referred to these publications, particularly those of Seddon, for references to the extensive literature on the parasites of stock.

One of the reasons for publishing this account is to enable a comparison to be made between the parasites of the large herbivorous marsupials (i.e. kangaroos and

wallabies) on the one hand, and those of the introduced herbivora on the other. Both groups have numerous parasites, particularly nematodes belonging to the Strongyloidea. In the marsupials, the family Strongylidae is most abundantly represented, greatly outnumbering the Trichostrongylidae. This occurs also in the horse, in which 15 species of Strongylidae belonging to six genera are known in Australia. About half the species belong to the subfamily Trichoneminae, which is the most numerous also in the marsupials, but the genera are distinct. In the ruminants, on the other hand, the Trichostrongylidae predominate, being represented by 23 species belonging to five genera in cattle and sheep in Australia.

It is interesting to find that, with a few exceptions, there has been no mixing of the parasitic groups. The most important exceptions are the transference of hydatids to marsupials, some of which have unfortunately proved good hosts, and the occurrence of the liver fluke in some wallabies and kangaroos. Apparently no parasites of marsupials have been found yet in domestic animals.

An interesting and instructive account of the subject was given by Dr. F. H. S. Roberts in his presidential address to Section L of the Australian and New Zealand Association for the Advancement of Science at the meeting in Sydney in 1952.*

The explanation of the abbreviations used will be found at the beginning of Part I (p. 102).

HOSTS AND PARASITES

Order ARTIODACTYLA

Family SUIDAE

Genus SUS L., 1758

S. SCROFA L., 1758, the domestic pig (introduced)

Protozoa

- (Sa.) *Entamoeba polecki* Prowazek, 1912 (77)
 (M.) *Trichomonas* sp. (114)
 (Sp.) *Coccidiosis* (sp. not identified) (114)
Eimeria debblecki Douwes, 1921 (77)
Sarcocystis meischeriana Kühn, 1865 (64), (58)
 (C.) *Balantidium* sp., probably *B. coli* (Malmsten, 1857) (74), (114)

Trematoda

- (Fasci.) *Fasciola hepatica* L., 1758 (108), (117), (91), (113)

Cestoda

- (CY., Tae.) *Echinococcus granulosus* (Batsch, 1786) as hydatid (41), (14), (123), (91), (113)
Taenia solium L., 1758, as *Cysticercus cellulosae* (Gmelin, 1790) (57), (2), (113)
Taenia hydatigena Pallas, 1766, as *Cysticercus tenuicollis* (Rudolphi, 1810) (85), (14), (123), (117), (91), (113)
 (PS., Dip.) *Diphyllobothrium (Spirometra) erinacei* (Rudolphi, 1819), as sparganum (88), (113), (5), (49)

Nematoda

- (RH.) *Strongyloides ransomi* Schwartz and Alicata, 1930 (67), (91), (113)
 (TR.) *Trichuris trichiura* (L., 1771) (85), (58), (123), (67), (117), (91), (113)
 (ST., Tri.) *Trichostrongylus axei* (Cobbold, 1879), rare (102), (113)
Trichostrongylus colubriformis (Giles, 1892), rare (102), (113)
Hyostromylus rubidus (Hassall and Stiles, 1892) (67), (117), (91), (113)
 (ST., Str.) *Stephanurus dentatus* Diesing, 1839 (80), (24), (25), (3), (123), (59), (112), (91), (113)
Oesophagostomum dentatum (Rudolphi, 1803) (67), (117), (91), (113)
O. quadrispinulatum Marcone, 1901 (67), (91), (113)
 (ST., Anc.) *Ancylostoma duodenale* (Dubini, 1843) (75), (117), (91), (113)
Necator americanus (Stiles, 1902) (1), (117), (91), (113)

* Roberts, F. H. S., 1953.—Host specificity of livestock parasites in Australia. *Rep. Aust. Ass. Adv. Sci.*, 29: 247-57.

- (ST., Met.) *Metastrongylus apri* (Gmelin, 1790) (70), (85), (123), (67), (117), (91), (113)
M. pudendotectus (Wostokow, 1905) (67), (117), (91), (113),
 (AS.) *Ascaris suum* Goeze, 1782, syn. *suilla* Dujardin, 1845 (85), (14), (123), (117), (67), (91), (93), (113). (Often referred to as *lumbricooides* L., 1758)
 (SP.) *Ascarops strongylina* (Rudolphi, 1819) (85), (123), (117), (91), (113)
Physocephalus sexalatus (Molin, 1860) (67), (117), (91), (113)
Gnathostomum hispidum (Fedschenko, 1872) (52), (117), (91), (113) (only found once)
Acanthocephala
Macracanthorhynchus hirudinaceus (Pallas, 1781) (85), (57), (123), (117), (91), (113)

Family CAMELIDAE

Genus CAMELUS L., 1758

C. DROMEDARIUS L., 1758, the Indian camel (introduced)

Protozoa

- (M.) *Trypanosoma evansi* (Steel, 1885) (not indigenous) (15), (114)
 Cestoda
 (CY., Tae.) *Echinococcus granulosus* (Batsch, 1786), as hydatid (15), (123), (113)
 Nematoda
 (TR.) *Trichuris* sp. (113)
 (FI.) *Onchocerca fasciata* (Railliet and Henry, 1919) (18), (100), (113)
 Microfilariae in blood (15)
Dipetalonema evansi (Lewis, 1882) (123)

Family BOVIDAE

Genus Bos L., 1758

B. TAURUS L., 1758, the ox (introduced)

Protozoa

- (M.) *Trypanosoma theileri* Laveran, 1902 (124), (125), (114)
Trichomonas foetus Riedmuller, 1929 (34), (114)
 (Sp.) *Anaplasma centrale* Theiler, 1910 (73), (114)
A. marginale Theiler, 1910 (71), (114)
Babesia argentina Lignières, 1901 (118), (72), (114)
B. bigemina (Smith and Kilborne, 1892) (86), (56), (14), (30), (114)
Theileria mutans (Theiler, 1906) (31), (32), (114)
Bartonella bovis Donatien and Lestoquard, 1934 (82), (115)
Eperythrozoon wenyonii Adler and Ellenbogen, 1934 (83), (115)
 Coccidiosis (sp. not identified) (114)
Eimeria sp. (16)
Sarcocystis tenella Railliet, 1886 (64)
Sarcosporidiosis (30)
S. blanchardi Doflein, 1901 (114)
 Trematoda*
 (Param.) *Paramphistomum ichikawai* Fukui, 1922 (36), (37)
Calicophoron calicophorum (Fischoeder, 1901) (36), (38)
Ceylonocotyle streptocoelium (Fischoeder, 1901) (36), (37)
 (Fasci.) *Fasciola hepatica* L., 1758 (89), (14), (57), (123), (91), (113)

* All flukes found in the rumen were referred to as *Amphistoma conicum* Rudolphi, 1809, in the older literature (20), (85), (3), (14). This name proved to be a synonym of *cervi* Schrank, 1790, and the parasites were then referred to as *Paramphistomum cervi* (123), (120), (121), (60), (91). Later it was realized that at least three species were present, and they were recorded as *P. cervi* (Schrank, 1790), *P. explanatum* (Creplin, 1847), and *P. cotylophorum* (Fischoeder, 1901) (101), (113), (35). Recently, Durie (1951, 1953, 1956) worked on the group, and found that the species present in Australia are those given here.

Cestoda

- (CY., Ano.) *Moniezia benedeni* (Moniez, 1879), syns. *planissima* Stiles and Hassall, 1893, and *alba* Perroncito, 1879 (123), (91), (113), (104)
M. denticulata (Rudolphi, 1810) (14), (120), (123), (113)
M. expansa (Rudolphi, 1810), syn. *trigonophora* Stiles and Hassall, 1892 (85), (58), (123), (91), (113)
Helictometra giardi (Moniez, 1879), rare (45), (113)
(CY., Tae.) *Echinococcus granulosus* (Batsch, 1786) as hydatid (89), (41), (14), (123), (91), (113)
Taenia saginata Goeze, 1782, as *Cysticercus bovis* (Cobbold, 1861) (84), (113)
Taenia hydatigena Pallas, 1766, as *Cysticercus tenuicollis* Rudolphi, 1810 (85), (123), (91), (113)

Nematoda

- (RH.) *Strongyloides papillosus* (Wedl, 1856) (91), (113)
(TR.) *Trichuris globosa* (v. Linstow, 1901) (96), (113)
T. ovis (Abildgaard, 1795) (58), (123), (91), (113)
T. parvispiculum Ortlepp, 1937 (96), (113)
Capillaria sp. (98), (113)
(ST., Tri.) *Cooperia curticei* (Railliet, 1893) (101), (113)
C. mcmastersi Gordon, 1932 (45), (101), (113)
C. oncophora (Railliet, 1898) (45), (101), (113)
C. pectinata Ransom, 1907 (91), (113)
C. punctata v. Linstow, 1907 (45), (91), (113)
C. spatulata Baylis, 1938 (101), (113)
Haemonchus contortus (Rudolphi, 1803) (4), (29), (123), (91), (113), (105)
H. placei (Place, 1893) (105)
Nematodirus filicollis (Rudolphi, 1802) (101), (113)
N. spathiger (Railliet, 1896) (101), (113)
Ostertagia circumcincta (Stadelmann, 1894) (29), (91), (113)
O. occidentalis Ransom, 1907 (101), (113)
O. ostertagi (Stiles, 1892) (44), (91), (113)
Trichostrongylus axei (Cobbold, 1879), syn. *extenuatus* Railliet, 1898 (123), (10), (91), (113)
T. colubriformis (Giles, 1892), syn. *instabilis* Railliet, 1893 (91) (113)
T. longispicularis Gordon, 1933 (101), (113)
T. vitrinus Looss, 1905 (101), (113)
(ST., Anc.) *Bunostomum phlebotomum* (Railliet, 1900) (111), (91), (113)
(ST., Str.) *Bosicola radiatum** (Rudolphi, 1813) (3), (4), (14), (123), (101), (113)
Stephanurus dentatus Diesing, 1839 (91), (113)
(ST., Met.) *Dictyocaulus viviparus* (Bloch, 1782) (14), (123), (10), (91), (113)
(AS.) *Neoascaris vitulorum* (Goeze, 1782) (68), (51)
(SP.) *Gongylonema pulchrum* Molin, 1857 (121), (123), (113)
G. verrucosum (Giles, 1892) (113)
(FI.) *Onchocerca gibsoni* (Cleland and Johnston, 1910) (81), (42), (17), (18), (65), (91), (113)
O. gutterosa Neumann, 1910 (62), (91), (113)
O. lienalis (Stiles, 1892) (62), (113)
Setaria cervi (Rudolphi, 1819) (not indigenous) (113)

Pentastomida (Phylum Arthropoda)

- Lingulatulula serratum* (Frohlich, 1789) (larvae) (66), (123)
B. INDICUS L., 1758, the zebu (introduced) No records

Genus BUBALUS Frisch, 1775

- B. BUBALUS (L., 1758), the water buffalo (introduced) No records

* Confused with *Oesophagostomum columbianum* by earlier workers.

Genus OVIS L., 1758

O. ARIES L., 1758, domestic sheep (introduced)

Protozoa*

- (M.) *Giardia* sp. (127), (114)
Trypanosoma melophagium (Flu, 1908) (124), (125), (114)
- (Sp.) *Eimeria faurei* (Moussu and Marotel, 1901) (63)
Coccidiosis (sp. not identified) (114)
Sarcocystis tenella Railliet, 1886 (114)
S. (Balbiania) gigantea Railliet, 1886 (58), (64)
Globidium gilruthi (Chatton, 1910) (43), (114)
Toxoplasma sp. (128), (114)

Trematoda†

- (Param.) *Paramphistomum ichikawai* Fukui, 1922 (37)
Calicophoron calicophorum (Fischoeder, 1901) (38)
Ceylonocotyle streptocoelium (Fischoeder, 1901) (37)
- (Fasci.) *Fasciola hepatica* L., 1758 (50), (85), (120), (59), (91), (113)
- (Dicro.) *Dicrocoelium dendriticum* (Rudolphi, 1819) (not indigenous) (27), (113)

Cestoda

- (CY., Ano.) *Moniezia benedeni* (Moniez, 1879) (58), (123), (113)
M. expansa (Rudolphi, 1810) (26), (69), (85), (9), (58), (123), (91), (113)
Helictometra giardi (Moniez, 1879) (22), (14), (58), (123), (45), (91), (113)
- (CY., Tae.) *Echinococcus granulosus* (Batsch, 1786) as hydatid (55), (76), (85), (41), (14), (91), (113)
Taenia hydatigena Pallas, 1766, as *Cysticercus tenuicollis* Rudolphi, 1810 (85), (19), (14), (123), (91), (113)
T. ovis Cobbold, 1860, as *Cysticercus ovis* (33), (48), (101), (113)

Nematoda

- (RH.) *Strongyloides papillosus* (Wedl, 1856) (116), (91), (113)
- (TR.) *Trichuris globulosa* (v. Linstow, 1901) (99), (113)
T. ovis (Abildgaard, 1795), syn. *affinis* Rudolphi, 1802 (6), (85), (119), (58), (91), (113)
T. parvispiculum Ortlepp, 1937 (99), (113)
- (ST., Tri.) *Cooperia curticei* (Railliet, 1893) (116), (78), (91), (113)
C. mcmastersi Gordon, 1932 (46), (113)
C. oncophora (Railliet, 1898) (45), (97), (113)
C. pectinata Ransom, 1907 (39), (97), (113)
C. punctata v. Linstow, 1907 (46), (97), (113)
Haemonchus contortus (Rudolphi, 1803) (26), (85), (21), (119), (123), (91), (113), (105)
H. placei (Place, 1893) (105)
Nematodirus flicollis (Rudolphi, 1802) (123), (91), (113)
N. furcatus May, 1920 (99), (113)
N. spathiger (Railliet, 1896) (97), (113)
Ostertagia circumcincta (Stadelmann, 1894) (123), (91), (113)
O. mentulata (Railliet and Henry, 1909) (99), (113)
O. ostertagi (Stiles, 1892) (11), (116), (45), (91), (113)
O. trifurcata (Ransom, 1907) (45), (97), (113)
Trichostrongylus axei (Cobbold, 1879) (116), (91), (113)
T. colubriformis (Giles, 1892) (116), (91), (113)
T. falculatus Ransom, 1911 (97), (113)

* Commensal flagellates and ciliates are found in the rumen. Moir (1955) stated that six species were constantly present, but they were not identified.

† See footnote under Trematodes of the ox. Rumen flukes in sheep were recorded as *A. conicum* (70), (80), (25); as *P. cervi* (120); and as *P. cervi*, *P. explanatum*, and *Cotylophoron cotylophorum* (113).

- (ST., Tri.) *T. longispicularis* Gordon, 1933 (46), (113)
T. probolurus (Railliet, 1896) (46), (97), (113)
T. rugatus Mönnig, 1925 (45), (97), (113)
T. vitrinus Looss, 1905 (45), (97), (113)
- (ST., Anc.) *Bunostomum trionocephalum* Rudolphi, 1808 (26), (21), (45), (99), (113)
- (ST., Str.) *Chabertia ovina* (Gmelin, 1790) (85), (123), (113)
Oesophagostomum columbianum Curtice, 1890 (4), (21), (119), (123), (91), (113)
O. venulosum (Rudolphi, 1809) (8), (97), (113)
- (St., Met.) *Dictyocaulus flaria* (Rudolphi, 1809) (70), (26), (85), (3), (119), (123), (113)
Muellerius capillaris (Mueller, 1889) (109), (113)
- (Fl.) *Onchocerca gibsoni* (Cleland and Johnston, 1910) (rare) (91), (113)
- Genus CAPRA L., 1758
- C. HIRCUS L., 1758, the goat (introduced)
- Protozoa
- (Sp.) *Eimeria faurei* (Moussu and Marotel, 1901) (53)
- Trematoda
- (Fasci.) *Fasciola hepatica* L., 1758 (113)
- Cestoda
- (CY., Ano.) *Moniezia expansa* (Rudolphi, 1810) (91), (113)
(CY., Tae.) *Echinococcus granulosis* (Batsch, 1786) as *hydatid* (91), (113)
Taenia hydatigena Pallas, 1766, as *Cysticercus tenuicollis* Rudolphi, 1810 (57), (123), (113)
- Nematoda
- (RH.) *Strongyloides papillosus* (Wedl. 1856) (52), (53), (113)
(TR.) *Trichuris ovis* (Abildgaard, 1795) (53), (113)
(ST., Tri.) *Cooperia curticei* Railliet, 1893 (40), (113)
Haemonchus contortus (Rudolphi, 1803) (13), (53), (91), (113)
Nematodirus sp. (113)
Ostertagia circumcincta (Stadelmann, 1894) (40), (113)
Trichostrongylus axei (Cobbold, 1879) (53), (91), (113)
T. colubriformis (Giles, 1892) (52), (53), (91), (113)
T. probolurus (Railliet, 1896) (113)
T. rugatus Mönnig, 1925 (113)
T. vitrinus Looss, 1905 (113)
- (ST., Str.) *Oesophagostomum columbianum* Curtice, 1890 (53), (91), (113)
O. venulosum (Rudolphi, 1809) (113)
- (ST., Met.) *Muellerius capillaris* (Müller, 1889) (61), (113)
- Family CERVIDAE
Genus CERVUS L., 1758
- C. ELEPHAS L., 1758, the red deer (introduced) No records
- Order PERISSODACTYLA
Family EQUIDAE
Genus EQUUS L., 1758
- E. CABALLUS L., 1758, the horse (introduced)
- Trematoda
- (Param.) *Gastrodiscus aegyptiacus* (Cobbold, 1876) (not indigenous) (123), (113)
- Cestoda
- (CY., Ano.) *Anoplocephala magna* (Abildgaard, 1789), syn. *plicata* Rudolphi, 1810 (3), (23), (58), (123), (106), (91), (113)
A. perfoliata (Goeze, 1782) (85), (9), (23), (121), (58), (123), (106), (91), (113)
Paranoplocephala mammillana (Mehlis, 1831) (28), (23), (58), (123), (95), (113)

(CY., Tae.) *Echinococcus granulosus* (Batsch, 1786) as hydatid (58), (113)

Nematoda

(ST., Tri.) *Trichostrongylus axei* (Cobbold, 1879) (47), (95), (113)

(ST., Str.) *Oesophagodontus robustus* (Giles, 1911) (106), (113)

Strongylus edentatus (Looss, 1900) (121), (58), (123), (7), (91), (113)

S. equinus Mueller, 1780, syn. *armatus* Rudolphi, 1802 (85), (3), (28), (123), (7), (91), (113)

S. vulgaris (Looss, 1900) (121), (123), (7), (91), (113)

Triodontophorus brevicauda Boulenger, 1916 (8), (113)

T. minor (Looss, 1900) (8), (113)

T. serratus (Looss, 1900) (121), (106), (113)

T. tenuicollis Boulenger, 1916 (106), (113)

Triodontophorus sp. (123)

Gyalocephalus sp. (8), (113)

Poteriostomum imparidentatum Quiel, 1919 (106), (113)

Trichonema aegyptiacum Railliet, 1923 (113)

T. calicatum (Looss, 1900) (121), (123), (113)

T. longibursatum (Yorke and Macfie, 1918) (7), (113)

T. poculatum (Looss, 1900) (121), (123), (8), (113)

T. tetracanthum (Mehlis, 1831) (85), (28), (58), (123), (7), (91)

(ST., Met.) *Dictyocaulus arnfieldi** (Cobbold, 1884) (85), (3), (123), (91), (113)

(OX.) *Oxyuris equi* (Schränk, 1788) (85), (3), (57), (123), (7), (91), (113)

Probstmayria vivipara (Probstmayr, 1865) (113)

(AS.) *Parascaris equorum* (Goeze, 1782), syn. *megaloccephala* Cloquet, 1824 (85), (3), (28), (121), (58), (123), (91), (113)

(SP.) *Draschia megastoma* (Rudolphi, 1819) (85), (3), (58), (123), (54), (12), (91), (113)

Habronema microstoma (Schneider, 1866) (85), (58), (123), (54), (12), (91), (113)

H. muscae (Carter, 1861) (54), (61), (12), (91), (113)

(FI.) *Onchocerca reticulata* Diesing, 1841, syn. *cervicalis* Railliet and Henry, 1910 (8), (100), (113), (90)

E. ASINUS L., 1758, the ass (introduced)

No records

E. CABALLUS × E. ASINUS, the mule (introduced)

No records

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PART IV. MAN.

Synopsis.

Eighteen protozoa, five trematodes, nine cestodes, and thirteen nematodes have been recorded from man in Australia. Several of these were certainly acquired outside this continent (one protozoan, four trematodes, two cestodes, and three nematodes). Certain others, while acquired locally, were accidental infections with parasites of other animals (one trematode, five cestodes, and three nematodes). Others (including the malarial and filarial parasites) are very rare.

Echinococcus granulosus is the most dangerous animal parasite of the white population in the southern part of Australia, and the hookworms of the native population in the north.

Schistosome dermatitis, creeping eruption, and visceral *larva migrans* are caused by parasites of other animals, which are not adapted to complete their development in the human host.

Australia is fortunately free from many harmful parasitic diseases, and others, which were formerly important, are now becoming uncommon. Malaria belongs to the latter group. It was once endemic in parts of Australia north of 19°S, and sharp epidemics occurred from time to time in towns and mining camps. The available evidence strongly suggests that the disease was imported, probably repeatedly, by migration from the north; by Asiatics, by islanders from New Guinea and the Solomons, and by Europeans entering from the north, particularly from New Guinea. There is no evidence that the disease was endemic in the aboriginal people.

White (1867) and Dyson (1889) described severe fevers in North Queensland, some of which were probably malarial. O'Brien (1908, 1909) recorded three types in Cairns, benign, malignant and quartan, his cases being diagnosed by microscopic examination. Epidemics occurred in Cairns from time to time. Breinl and Taylor (1918) investigated one, in which *Plasmodium vivax* and *P. falciparum* were both present. In 1942 there was an epidemic due to *P. vivax* alone. This epidemic was investigated by Dr. G. A. M. Heydon, who showed that the vector was *Anopheles farauti* Lav. This is the only occasion when the vector has been definitely proved. Small outbreaks occurred during the war in army camps at Selheim and Canungra,

areas outside the distribution of *An. farauti*, and the vector was thought to be *An. annulipes* Walk. Malaria has been acquired as far south as Victoria, but only rarely.

Cilento (1924) and Ford (1950) have given good accounts of the history of malaria in Australia. It seems to have disappeared as an endemic disease from Queensland, except for small foci in some of the Torres Strait islands (Mackerras and Sandars, 1954). There may still be endemic malaria in parts of the Northern Territory and in the Kimberley District of Western Australia, but Black (1950) could find no evidence of it in 1382 natives and 121 white people examined in these areas.

Filariasis is another diminishing disease. It was probably introduced into Queensland in the middle of the last century, and probably by Chinese immigrants. By the seventies it was a frequent cause of morbidity in Queensland, and it was in Brisbane that the adult worms were discovered by J. Bancroft in 1876. The first assessment of the frequency of the infection was made in 1910 by McLean, who found that nearly 11% of 1200 admissions to the Brisbane General Hospital were infected. When the staff of the Australian Hookworm Campaign carried out a survey for malaria and filariasis in 1922-24, the infection rate in Brisbane was 5%, one of the highest rates in the State. However, in 1938 Derrick examined 228 persons in the Brisbane General Hospital without finding a single carrier. The disease has receded everywhere in Queensland, only six cases having been notified in the last decade. This recession was well advanced before any effective treatment became available, and in spite of the fact that a good vector, *Culex fatigans* Wied., is still abundant and widespread.

Ancylostomiasis has decreased greatly since the time of the Australian Hookworm Campaign, 1919-24, when 8% of 202,582 persons examined in Australia were infected. The great majority of these examinations were made in coastal Queensland, where the overall rate was 9%. In some districts about 25% were infected at this time. In a few high-rainfall areas of North Queensland there is still an infection rate of about 1% in rural school children; elsewhere the disease has disappeared from the white population. It is still widely disseminated among the aborigines, particularly in Queensland and in the Northern Territory, although there has been a remarkable improvement in the last few years in some settlements, for example at Mona Mona Mission, Yarrabah and Palm Island.

Human schistosomes have been repeatedly introduced, particularly *S. haematobium*, which was brought back by many soldiers returning from the Boer War. Treatment was ineffective, and they remained carriers for years. Nevertheless only two indigenous cases were reported during ensuing years. They occurred in Western Australia in 1911 and 1912, and may have been infected from the same source (Nelson, 1912). During the First World War Australian soldiers were infected in Egypt with *S. mansoni* and *S. haematobium*, and during the last war some air force personnel, exposed to risk in the Philippines, acquired infection with *S. japonicum*. More effective treatment, however, was available. One case (*S. haematobium*) was reported in New South Wales in 1924, but the source of infection could not be traced. There have been no notifications since the last war, and it is safe to conclude that human schistosomes have not become established anywhere in Australia.

Hydatid disease is undoubtedly the most serious helminthic disease present in Australia. It was one of the first to attract attention, and the literature on the subject is enormous. Graham (1937) observed that its incidence in Melbourne children had declined during the previous three decades. However, there does not seem to be any cause for complacency, as the number of cases notified each year in Victoria, where notification has been practised consistently, has not fallen since 1937. The infection rate in rural dogs in New South Wales has not decreased in the last thirty years (Gemmell, 1957), so that the risk of infection is evidently still considerable.

We have unfortunately no means of finding out what parasites the aborigines harboured before they came in contact with white people. No parasites have been found in them which were not already well known in other communities, and at the present time they have the same array of species as the white people.

The first observation of a parasite of man in Australia appears to have been made by Surgeon P. Cunningham in 1829, in a book entitled "Two Years in New South Wales". He noted the presence of "teres" (or roundworms) in children at Port Jackson. The first collection of records and references to human parasites was made by Georgina Sweet in 1908 (published in 1909). In 1909, T. H. Johnston began to record carefully all the parasites recognized at the Bureau of Microbiology, Sydney (Johnston, 1909a, 1909b, 1909c). In 1912, Johnston and Cleland gave an account of the helminths of man in Australia, bringing their records up to date in 1937. Johnston (1916) recorded all parasites found in Queensland. In 1939 Young listed the helminths and gave many references to the subject.

The explanation of the abbreviations used will be found at the beginning of Part I (p. 102).

Order PRIMATES
Family HOMINIDAE
Genus HOMO L., 1758

H. SAPIENS L., 1758—man (introduced)

Protozoa

- (M.) *Trichomonas hominis* (Davaine, 1860) (13)
T. vaginalis Donné, 1837 (67)
Giardia lamblia Stiles, 1915 (75), (113), (13)
Chilomastix mesnili (Wenyon, 1910) (75), (13)
Leishmania donovani (Laveran and Mesnil, 1903) (not indigenous)
(45A), (42A), (89)

- (Sa.) *Entamoeba coli* (Grassi, 1879) (59), (113), (13)
E. histolytica Schaudinn, 1903 (38), (52), (108A), (57), (113), (13)
Amoebiasis (clinical) (79)
E. gingivalis (Gros, 1849) (57)

- Endolimax nana* (Wenyon and O'Connor, 1917) (13)
Dientamoeba fragilis Jepps and Dobell, 1918 (13), (20)
Iodamoeba bütschlii (Prowazek, 1913) (75), (113), (32), (13)

- (Sp.) *Plasmodium vivax* (Grassi and Feletti, 1890) (80), (81), (57), (60)
P. falciparum Welch, 1897 (81), (59), (60)
P. malariae (Laveran, 1881) (81), (59), (60)
Malaria (clinical) (111), (35)
Pneumocystis carinii Delanoë, 1912 (88)
Sarcocystis sp. (Seen in sections of heart at Anatomy Department, University of Queensland. Subject was a healthy child killed in an accident)

Toxoplasma sp. (90), (36), (82), (102)

- (C.) *Balantidium coli* (Malmsten, 1857) (109)

Trematoda

- (Fasci.) *Fasciola hepatica** L., 1758 (1), (54)
(Opist.) *Clonorchis sinensis* (Cobbold, 1875) (not indigenous) (112), (53), (57), (97), (98)
(Schis.) *Schistosoma haematobium* (Bilharz, 1852) (not indigenous except (77) and (50)) (86), (96), (101), (57), (76), (77), (87), (50)
S. mansoni Sambon, 1907 (not indigenous) (61)
S. japonicum Katsurada, 1904 (not indigenous) (30)

Cestoda

- (CY., Tae.) *Taenia solium* L., 1758 (not indigenous) (57), (104)
T. saginata Goeze, 1782 (56), (57), (78), (104), (85)
*Echinococcus granulosus** (Batsch, 1786), as hydatid (34), (51), (107), (57), (33), (42), (40)
(CY., Hym.) *Hymenolepis diminuta** (Rudolphi, 1819) (4), (21), (104), (14)
H. nana (v. Siebold, 1852) (109), (75), (66), (104)

* Species marked with an asterisk are parasites of other animals, and only accidentally infected man.

- (CY., Dil.) *Dipylidium caninum** (L., 1758) (14)
 (CY., Dav.) *Raillietina (Raillietina) celebensis** (Janicki, 1902) (5)
 (PS., Dib.) *Diphyllobothrium latum* (L., 1758), syn. *Dibothriocephalus parvus*
 Stephens, 1906 (not indigenous) (37) (57), (104), (94)
Sparganum†* (99), (69), (25), (95)
- Nematoda*
- (RH.) *Strongyloides stercoralis* (Bavay, 1876) (2), (108), (57), (18), (78),
 (66), (62), (104)
- (TR.) *Trichuris trichiura* (L., 1771) (48), (57), (109), (66)
Trichinella spiralis (Owen, 1835) (not indigenous, except (55)) (55),
 (57), (83), (9)
- (ST., Tri.) *Trichostrongylus colubriformis** (Giles, 1892) (47), (92), (46)
*T. axei** (Cobbold, 1879) (47)
*Haemonchus contortus** (Rudolphi, 1803) (104), (47)
- (ST., Anc.) *Ancylostoma duodenale* (Dubini, 1843) (49), (81), (57), (18), (78),
 (66), (104), (8)
- Necator americanus* (Stiles, 1902) (70), (57), (78), (66), (104)
- (OX.) *Enterobius vermicularis* (L., 1758) (26), (93), (57), (78), (66)
- (AS.) *Ascaris lumbricoides* (L., 1758) (91), (68), (100), (56), (57), (109),
 (104), (3)
- (FI.) *Wuchereria bancrofti* (Cobbold, 1877) (27), (28), (29), (6), (7), (57),
 (74), (17), (23), (105), (110), (43), (45)
Loa loa (Cobbold, 1864) (not indigenous) (106), (22)
Dracunculus medinensis (L., 1758) (not indigenous) (72), (84)

LESIONS DUE TO OTHER HELMINTHS

Larval stages of some helminths, which do not normally develop in man, may gain entrance through the skin or alimentary canal and set up lesions of various kinds before they perish in the foreign host.

1. *Dermatitis.*

Two distinct types of lesions may be caused by the invasion by larval helminths of the skin of a previously sensitized person.

(a) "Bathers' itch" or "Schistosome dermatitis" is caused by forked-tail cercariae, larval stages of various schistosomes, and is characterized by an itchy, papular rash.

In the swamps of the lower Murray River the lesions are probably due to *Cercaria parocellata* Johnston and Simpson, 1939, emitted by the fresh-water snail *Limnaea lessoni* (63). *C. parocellata* is thought to be a larval *Trichobilharzia*, a group of blood flukes, which live in the veins of the nasal mucosa and intestine of water birds. Johnston (1941) thought that the black swan, *Chenopsis atrata* (Latham), which is known to harbour a schistosome, might be the definitive host, and recently Bearup (1957) has found schistosome eggs in the nasal mucus of the grey teal, *Querquedula gibberifrons* (Müller) (12). Either of these birds may prove to be the definitive host. Macfarlane (1952) described the lesions produced experimentally by *C. parocellata* from the Murray River, and reported similar lesions from the Wagin lakes in Western Australia (71).

In the shallow estuaries and salt-water lagoons of the New South Wales coast the lesions may be caused by the cercariae of *Austrobilharzia terrigalensis* S. J. Johnston, 1917, which are emitted by the common marine snail, *Pyrazus australis* Quoy and Gaimard, and have been shown by Bearup (1955, 1956) to be capable of producing the characteristic rash. The adults live in the portal system of the seagull, *Larus novae-hollandiae* Stephens (10), (11).

(b) "Creeping eruption" or "cutaneous larva migrans" is caused by the infective larvae of foreign hookworms, and is characteristically an itchy, serpiginous rash, which advances as the larva burrows along below the *stratum granulosum*. Heydon

† Probably the larval stage of *Diphyllobothrium (Spirometra) erinacei* (Rudolphi, 1819), the adults being parasites of carnivores.

(1929) showed that it could be caused by the infective larvae of cat and dog hookworms, *Ancylostoma braziliense* de Faria, 1910, and *A. caninum* (Ercolani, 1859), particularly by the former (44).

2. *Visceral larva migrans.*

This is a chronic condition, characterized by enlargement of the liver and extreme eosinophilia, accompanied sometimes by pneumonitis. It is caused by the migration of the larvae of the dog ascarid, *Toxocara canis* (Werner, 1782), through the viscera and especially through the liver. This disease is usually seen in small children who have had close contact with puppies. Two presumptive cases were reported by Blanch (1956) (16).

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