

An annotated checklist of ectoparasites of terrestrial mammals in New Zealand

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One hundred and forty-seven species of parasites (59 Acari, 11 Amblycera, 30 Diptera, 1 Hemiptera, 1 Pentastomida, 28 Phthiraptera, 17 Siphonaptera), together with their synonyms and common names, are listed from 30 species of wild, feral or domestic animals and man from New Zealand and offshore islands. Where known, geographical distribution and range are included; indexes for cross referencing are provided.

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INTRODUCTION

In this checklist we have attempted to catalogue all the ectoparasitic arthropods (in the broadest sense) recorded from terrestrial mammals in New Zealand; obligate, facultative and accidental parasites of man and of domestic and wild mammals are included, but not those of zoo or marine mammals. The New Zealand literature on these parasites is scattered, often fragmentary and difficult to trace. We hope that this list will enable anyone interested in ectoparasites to ascertain quickly and easily which species have been recorded here, on which hosts they have been found and by whom.

In preparing this checklist we have sought and have received the help of many. In particular, we would like to acknowledge advice and constructive criticisms received from J. R. H. Andrews, Mrs D. M. Bishop, T. K. Crosby, A. C. G. Heath, P. R. Kettle, P. B. McKenna, R. L. C. Pilgrim and G. R. Ramsay.

In spite of our best efforts and those of our colleagues to check the accuracy of our drafts, it seems inevitable that some errors will be present in the checklist. The authors accept full responsibility and would appreciate being informed of errors that users might detect.

ARRANGEMENT OF CHECKLIST

The principal list comprises an annotated catalogue of the ectoparasites arranged alphabetically according to scientific name, authority, family and order.

Synonyms: A comprehensive synonymy is not provided, but synonyms likely to be encountered in the New Zealand literature are.

Normal Host: The normal or principal hosts occurring in *New Zealand* are named. Other possible hosts not present in New Zealand are not included. In some instances where host lists are extensive and readily available in the literature the appropriate reference is cited instead. Species that are not usually parasitic but have been recorded as pseudoparasites, and/or allergenic parasites, are entered as "not normally parasitic". (A number of free-living mites fall into this category.)

Also recorded from: Accidental or abnormal hosts recorded in *New Zealand* are listed under this category — e.g., infestations of man with *Oestrus ovis* and *Gasterophilus intestinalis* larvae.

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Distribution: An indication of the world distribution of the species is given. Where possible more detailed information on the distribution in the New Zealand sub-region is provided.

New Zealand record: The reference cited indicates the *first* New Zealand record. If a species has been recorded on different occasions from more than one host, all the first records are cited. If a name other than that currently accepted was used in a record, this is bracketed.

Description: The authors felt that the value of the checklist would be enhanced by inclusion of references to descriptions that would assist in specimen identification. It proved difficult in many instances, however, to locate recent descriptions of reliable accuracy which were also likely to be readily available in New Zealand. Consequently it proved necessary to compromise and include references to descriptions of some parasites more for their availability than their completeness, and because they contained clear line-drawings. The senior author has copies of the descriptions cited, which will be provided on request.

APPENDICES

Appendix 1 (p. 274) is a list of parasites recorded from each mammalian host. Hosts are listed alphabetically by their common names.

Appendix 2 (p. 278) is an alphabetical list of those parasites for which "common names" appear in Bulletin 4 of the Entomological Society of New Zealand (Ferro, 1977).

Appendix 3 (p. 279) is a list of parasites by taxonomic families arranged alphabetically.

Appendix 4 (p. 280) list mammalian hosts for which no ectoparasites have been recorded in New Zealand.

CHECKLIST

- Acarus siro* (Linnaeus, 1758) Tyroglyphidae Acari
Aleurobius farinae var. *africana*: Oudemans, 1906
Tyroglyphus farinae: de Geer, 1778
 Stored product mite. Not parasitic. Also recorded from: man (*Homo sapiens*).
 Distribution: Cosmopolitan. N.Z. record: Thomson (1922) (as *T. farinae*).
 Description: Hughes (1976: 33).
 Notes: Occasional allergenic parasite of man.
- Aedes (Ochlerotatus) antipodeus* (Edwards, 1920) Culicidae Diptera
Ochlerotatus antipodeus: Edwards, 1920
 Normal host: probably birds. Also recorded from: man, may attack day or night.
 Graham (1939: 212).
 Distribution: Throughout N.Z.: Indigenous. N.Z. record: Edwards (1920).
 Description: Belkin (1968: 98).
 Notes: It is unlikely man is only mammalian host.
- A. (O.) subalbistrotris* Klein & Marks, 1960 Culicidae Diptera
 Normal host: probably birds. Also recorded from: man (Belkin, 1968: 102).
 Distribution: Otago, Coastal Southland: Indigenous. N.Z. record: Hutton (1881) (as *A. albistrotris*).
 Description: Belkin (1968: 100).
- A. (Findlaya) notoscriptus* (Skuse, 1889) Culicidae Diptera
 Normal host: probably birds. Also recorded from: man (Graham 1939: 212)
 Ox (*Bos taurus*) (Graham 1929: 205).
 Distribution: Australia, N.Z., New Caledonia, New Guinea, Moluccas.
 In N.Z., North Auckland, Little Barrier, Gisborne, Nelson. N.Z. record: Miller (1920) (as *Ochlerotatus notoscriptus*).
 Description: Belkin (1962, 1968: 103).
 Notes: Probably introduced. (See Belkin, 1968: 105).

- Allothyrus australasiae* (Womersley, 1935) Holothyridae Acari
 Free living: Not parasitic. Also recorded from: man (Helson, 1956).
 Distribution: Not known. N.Z. record: Womersley (1935).
 Description: Womersley (1935) (as *Holothyru* *australasiae*).
 Notes: Occasional allergenic parasite of man.
- Amblyomma triguttatum triguttatum* (Koch, 1844) Ixodidae Acari
Amblyomma triguttatum: Koch, 1844
 Normal host: macropods (in Australia). Also recorded from: man.
 Distribution: Queensland, New South Wales, Western Australia.
 N.Z. record: Rowe (1980).
 Description: Roberts (1970: 109).
 Notes: One engorged nymph collected from female visitor from Australia; Rowe's general identification confirmed to species by Heath (unpublished).
- Androlaelaps casalis casalis* (Berlese, 1887) Laelaptidae Acari
Haemolaelaps megaventralis: Sweatman, 1962
 Normal host: birds, rodents. Also recorded from: hedgehog (*Erinaceus europaeus*) (in N.Z.) (Sweatman, 1962).
 Distribution: Cosmopolitan: Recorded overseas from nests of birds, poultry, rodents.
 N.Z. record: Sweatman (1962) (as *H. megaventralis*).
 Description: Evans & Till (1966: 152).
 Notes: For full synonymy, see Evans & Till (1966).
- Atellana papilio* Domrow, 1958 Listrophoridae Acari
 Normal host: Brushtailed opossum (*Trichosurus vulpecula*).
 Distribution: Presumed range of *T. vulpecula*. N.Z. record: Sweatman (1962).
 Description: Domrow (1958).
- Austrosimulium (Austrosimulium) australense* (Schiner, 1868) Simuliidae Diptera
Austrosimulium tillyardi: Tonnoir, 1923
 Normal host: probably birds, recorded from Fiordland crested penguin (*Eudyptes pachyrhynchus pachyrhynchus*) (Fallis *et al.*, 1976). Also recorded from: man (Helson, 1956).
 Distribution: North Island and coastal areas of South Island, Stewart Is. N.Z. record: Hutton (1881).
 Description: Dumbleton (1973: 505).
 Notes: Principal North Island blackfly pest species. Considerable confusion now exists over the common names of simuliids. Bulletin 4 of The Entomological Society of N.Z. correctly lists these insects as "blackflies" (Ferro, 1977), but all species are popularly known as "sandflies".
- A. (A.) dumbletoni* Crosby, 1976 Simuliidae Diptera
 Normal host: Fiordland crested penguin. Also recorded from: man.
 Distribution: Known from South Island only. N.Z. record: Crosby (1976).
 Description: Crosby (1976).
- A. (A.) unguatum* Tonnoir, 1925 Simuliidae Diptera
 Normal host: probably birds, recorded from Fiordland crested penguin (Fallis *et al.*, 1976).
 Also recorded from: man (Helson, 1956).
 Distribution: Known from South Island only. N.Z. record: Tonnoir (1925: 250).
 Description: Dumbleton (1973: 526).
 Notes: Principal South Island blackfly pest species.
- Calliphora hilli* Patton, 1925 Calliphoridae Diptera
C. milleri: Hardy, 1937
 Normal "host": carrion (larvae only). Also recorded from: sheep (*Ovis aries*) (larvae only).

Distribution: Known only from N.Z.: Indigenous. N.Z. record: Miller (1921) (as *C. rufipes*).

Description: Miller (1939: 30) (as *C. rufipes*).

Notes: *C. rufipes* does not occur in New Zealand.

C. hortona (Walker, 1849)

Calliphoridae Diptera

C. icela: Miller, 1921

Normal "host": Presumably carrion (larvae only). Also recorded from: sheep (larvae only).

Distribution: N.Z.: Indigenous. N.Z. record: Miller (1921).

Description: Miller (1939: 38) (as *C. icela*).

Notes: *C. icela* does not occur in New Zealand.

C. nothocalliphoralis Miller, 1939

Calliphoridae Diptera

Normal "host": Presumably carrion (larvae only). Also recorded from: sheep (larvae only).

Distribution: Not known. N.Z. record: Miller (1939).

Description: Miller (1939: 49).

Notes: One record only of flystrike in sheep. Doubt as to species validity (J. P. Dear, pers. comm.).

C. quadrimaculata (Swederus, 1787)

Calliphoridae Diptera

C. cockaynei: Hutton, 1904.

Normal "host": carrion (larvae only). Also recorded from: sheep (larvae only).

Distribution: Indigenous (throughout). N.Z. record: Hutton (1881).

Description: Miller (1939: 43).

C. stygia (Fabricius, 1781)

Calliphoridae Diptera

Musca stygia: Fabricius

C. villosa: Rob-Desvoidy

Musca laemica: White

C. laemica: Hardy

Normal "host": carrion (larvae only). Also recorded from: sheep (larvae only).

Distribution: Australasia. N.Z. record: White (1846).

Description: Miller (1939: 32) (as *C. laemica*).

Notes: A common primary strike fly.

C. vicina Rob-Desvoidy, 1830

Calliphoridae Diptera

Musca erythrocephala: Meigen, 1826

C. erythrocephala: Seguy, 1928

Normal "host": carrion (larvae only). Also recorded from: sheep (larvae only).

Distribution: Cosmopolitan (except for African continent south of Sahara).

N.Z. record: Miller (1921) (as *C. erythrocephala*).

Description: Miller (1939: 35) (as *C. erythrocephala*).

Caparinia tripilis (Michael, 1889)

Psoroptidae Acari

Normal host: hedgehog.

Distribution: Presumed to be range of hedgehog. N.Z. record: Brockie (1958).

Description: Krantz (1978: 426).

Ceratophyllus (*Ceratophyllus*) *gallinae* (Schränk, 1803)

Ceratophyllidae Siphonaptera

Pulex avium: Kirk, 1900

Normal host: domestic fowl (*Gallus domesticus*) and other birds. Also recorded from: man (Tenquist, unpublished), stoat (*Mustela erminea*) (C. M. King, pers. comm.).

Distribution: Cosmopolitan: prevalence and distribution in N.Z. not known. N.Z. record: Kirk (1900) (as *P. avium*).

Description: Dunnet & Mardon (1974: 130).

Cheyletiella parasitivorax (Megnin, 1878)

Cheyletiellidae Acari

Normal host: rabbit (*Oryctolagus cuniculus*). Also recorded from: man, cat (*Felis catus*).

Distribution: Cosmopolitan: Prevalence and distribution in N.Z. not known. N.Z.

- record: Womersley (1941) (rabbits) Moxham *et al.* (1968) (cats, man).
 Description: Womersley (1941), Smiley (1970).
 Notes: Having examined specimens of *Cheyletiella* from rabbits and cats, and discussed the matter with others who have done so in New Zealand, the authors consider that specimens from the two hosts cannot be distinguished according to the descriptions given by Smiley (1970). In view of our doubts about the validity of the species *C. blakei*, the species name *parasitivorax* has been retained for specimens from both hosts.
- C. yasguri* Smiley, 1965 Cheyletiellidae Acari
 Normal host: dog (*Canis familiaris*). Also recorded from: man.
 Distribution: Cosmopolitan. N.Z. record: Davis & Kyle (1969).
 Description: Foxx & Ewing (1969), Smiley (1970).
- Cheyletus eruditus* (Schrank, 1781) Cheyletidae Acari
 Stored-product mite: Not normally parasitic. Also recorded from: man.
 Distribution: Cosmopolitan. N.Z. record: Cornere (1971).
 Description: Hughes (1976: 235).
 Notes: Occasional allergenic parasite of man.
- Chorioptes bovis* (Hering, 1845) Psoroptidae Acari
 Normal host: sheep, horse (*Equus caballus*), ox, goat (*Capra hircus*).
 Distribution: Cosmopolitan: widespread in N.Z. N.Z. record: Helson (1956).
 Description: Sweatman (1957).
 Notes: For synonymy, see Sweatman (1957).
- Chortoglyphus arcuatus* (Troupeau, 1879) Chortoglyphidae Acari
Tyroglyphus arcuatus: Troupeau, 1879
Chortoglyphus nudus: Berlese, 1884
 Stored product mite: Not normally parasitic. Also recorded from: man.
 Distribution: Eurasia, N.Z. N.Z. record: Robertson (1946).
 Description: Hughes (1976: 183).
 Notes: Occasional allergenic parasite of man.
- Chrysomya rufifacies* (MacQuart, 1842) Calliphoridae Diptera
 Normal "host": carrion (larvae only). Also recorded from: sheep (larvae only).
 Distribution: Southeast Asia, Australasian regions. N.Z. record: Miller (1922).
 Description: Zumpt (1965: 92).
 Notes: Occasional primary and secondary strike fly.
- Cimex lectularius* (Linnaeus, 1758) Cimicidae Hemiptera
 Normal host: man.
 Distribution: Cosmopolitan N.Z. record: Hutton (1904)
 Description: Smith (1973: 385).
 Notes: Thomson (1922) states that this parasite was present in New Zealand from early European settlement.
- Coquillettidia (Austromansonia) tenuipalpis* (Edwards, 1924) Culicidae Diptera
Mansonia tenuipalpis: Miller & Phillips, 1952
Taeniorhynchus (Coquillettidia) tenuipalpis: Edwards, 1924
 Normal host: Not known, probably birds. Also recorded from: man.
 Distribution: Throughout N.Z. especially western half. N.Z. record: Edwards (1924: 336).
 Description: Belkin (1968: 76).
 Notes: For synonymy, see Belkin (1968).
- C. (Coquillettidia) iracunda* (Walker, 1848) Culicidae Diptera
Mansonia iracundus: Walker, 1848
 Normal host: birds. Also recorded from: man.
 Distribution: North Auckland, Great Barrier, Mayor Is., Ohakune, Westland. N.Z. record: Hutton (1881) (as *Culex iracundus*).

Description: Miller & Phillips (1952: 23), Belkin (1968: 78).

Notes: Belkin (1968) records this as attacking unspecified farm livestock.

Ctenocephalides canis (Curtis, 1826) Pulicidae Siphonaptera

Preferred host: dog. Also recorded from: hare (*Lepus europaeus*), man (Smit, 1979).

Distribution: cosmopolitan, widespread in N.Z. N.Z. record: Thomson (1922).

Description: Dunnet & Mardon (1974: 36).

Notes: for synonymy see Dunnet & Mardon (1974).

C. felis felis (Bouché, 1835) Pulicidae Siphonaptera

Pulex canis: Duges, 1832

Pulex felis: Bouché, 1835

Preferred host: cat. Also recorded from: black rat (*Rattus rattus*) (Smit, 1979); rabbit (Bull, 1953); hedgehog (Brockie, 1958); man (Smit, 1965).

Distribution: cosmopolitan: widespread in New Zealand. N.Z. record: Thomson (1922).

Description: Dunnet & Mardon (1974: 38).

Notes: commonly responsible for household infestations.

Culex (Culex) pervigilans Bergroth, 1889 Culicidae Diptera

Normal host: probably birds. Also recorded from: man, ox, sheep.

Distribution: throughout N.Z. N.Z. record: Edwards (1924).

Description: Miller & Phillips (1952: 19), Belkin (1968: 56).

C. (C.) quinquefasciatus (Say, 1823) Culicidae Diptera

Culex (C.) fatigans: Miller & Phillips, 1952

Normal host: not known. Also recorded from: man (Graham, 1939) (by implication only).

Distribution: widespread in tropical, sub-tropical and temperate zones.

In N.Z.: N. Auckland, Auckland, Waitomo, Coromandel, coastal.

N.Z. record: Hutton (1881) (as *C. acer*).

Description: Belkin (1968: 68).

Notes: introduced into N.Z. For synonymy, see Belkin (1968).

Culiseta (Climacura) tonnoiri (Edwards, 1925) Culicidae Diptera

Theobaldia tonnoiri: Edwards, 1925

Theobaldinella tonnoiri: Miller & Phillips, 1952

Normal host: probably birds, recorded from Fiordland crested penguin (Crosby, 1978). Also recorded from: man.

Distribution: N. Auckland, most of South Island. N.Z. record: Tonnoir (1922) (in Edwards, 1925).

Description: Miller & Phillips (1952: 26), Belkin (1968: 71).

Damalinia bovis (Linnaeus, 1758) Trichodectidae Phthiraptera

Pediculus bovis: Linnaeus, 1758

Normal host: ox. Also recorded from: host-specific.

Distribution: cosmopolitan: widespread in N.Z. N.Z. record: Thomson (1922) (as *T. scalaris*).

Description: Seguy (1944: 388).

Notes: North American authors use "*Bovicola*" for "*Damalinia*".

D. caprae (Gurlt, 1843) Trichodectidae Phthiraptera

Trichodectes caprae: Gurlt, 1843

Normal host: goat. Also recorded from: host-specific.

Distribution: range of goat. N.Z. record: Johnston & Harrison (1912) (as *T. climax*).

Description: Seguy (1944: 391) (as *T. climax*).

D. hemitragi (Cummings, 1916) Trichodectidae Phthiraptera

Trichodectes hemitragi: Cummings, 1916

Normal host: tahr (*Hemitragus jemlahicus*). Also recorded from: host-specific.

- Distribution: not known. N.Z. record: Andrews (1971) (as *Damalinia (Bovicola) hemitragi*).
 Description: male: Andrews (1971); female, Cummings (1916: 273).
 Notes: for synonymy, see Andrews (1971).
- D. limbata* (Gervais, 1844) Trichodectidae Phthiraptera
Trichodectes limbatus: Gervais, 1844
 Normal host: goat. Also recorded from: host-specific.
 Distribution: not known. N.Z. record: Andrews (1973).
 Description: Seguy (1944: 394) (as *T. limbatus*).
 Notes: similar to *D. caprae* and occupying same ecological niche: probably often confused with *D. caprae*.
- D. lipeuroides* (Megnin, 1884) Trichodectidae Phthiraptera
Trichodectes lipeuroides: Megnin, 1884
Tricholipeurus virginianus: Peters, 1930
 Normal host: white-tailed deer (*Odocoileus virginianus*). Also recorded from: host-specific.
 Distribution: not known. N.Z. record: Andrews (1969).
 Description: Peters (1930).
- D. longicornis* (Nitzsch, 1818) Trichodectidae Phthiraptera
Trichodectes longicornis: Nitzsch, 1818
 Normal host: red deer (*Cervus elaphus*). Also recorded from: wapiti (*C. canadiensis*), chamois (*Rubicapra rubicapra*) (Andrews, 1973).
 Distribution: not known. N.Z. record: Andrews (1964).
 Description: Seguy (1944: 396) (as *T. longicornis*), Andrews (1964) (male).
- D. ovis* (Schränk, 1781) Trichodectidae Phthiraptera
Pediculus ovis: Schränk, 1781
 Normal host: sheep. Also recorded from: host-specific.
 Distribution: cosmopolitan: throughout New Zealand. N.Z. record: early Dept. of Agriculture records before 1880.
 Description: Seguy (1944: 399) (as *Trichodectes ovis*).
- D. parallela* (Osborn, 1896) Trichodectidae Phthiraptera
Trichodectes parallela: Osborn, 1896
 Normal host: white-tailed deer. Also recorded from: host-specific.
 Distribution: not known. N.Z. record: Andrews (1973).
 Description: Osborn (1896).
- Demodex bovis* Stiles, 1892 Demodicidae Acari
 Normal host: ox. Also recorded from: host-specific.
 Distribution: not known. N.Z. record: Helson (1956).
 Description: Desch & Nutting (1971).
- D. brevis* Akbulatova, 1963 Demodicidae Acari
 Normal host: man. Also recorded from: host-specific.
 Distribution: cosmopolitan. N.Z. record: Nutting *et al.* (1975).
 Description: Desch & Nutting (1972).
- D. caballi* Railliet, 1895 Demodicidae Acari
Demodex folliculorum var. *equi*: Railliet, 1895
 Normal host: horse. Also recorded from: host-specific.
 Distribution: not known. N.Z. record: Nutting *et al.* (1975) (as *Demodex* sp.).
 Description: Desch & Nutting (1978).
- D. canis* Leydig, 1859 Demodicidae Acari
 Normal host: dog. Also recorded from: host-specific.

- Distribution: cosmopolitan: common in N.Z. N.Z. record: Thomson (1922) (as *D. folliculorum* var. *canis*).
Description: Nutting & Desch (1978).
- D. caprae* Railliet, 1895 Demodicidae Acari
Normal host: goat. Also recorded from: host-specific.
Distribution: not known. N.Z. record: Nutting *et al.*, 1975.
Description: Cram (1925).
- D. cati* Hirst, 1919 Demodicidae Acari
Normal host: cat. Also recorded from: host-specific.
Distribution: not known. N.Z. record: D. Rutherford (pers. comm.).
Description: Desch. & Nutting (1979).
- D. erminae* Hirst, 1919 Demodicidae Acari
Normal host: stoat (*Mustela erminae*). Also recorded from: host-specific.
Distribution: presumed range of host. N.Z. record: Nutting *et al.* (1975).
Description: Hirst (1919).
- D. folliculorum* Simon, 1842 Demodicidae Acari
Normal host: man. Also recorded from: host-specific.
Distribution: cosmopolitan. N.Z. record: Thomson (1922).
Description: Desch & Nutting (1972).
- D. phylloides* Csokor, 1879 Demodicidae Acari
Normal host: Pig (*Sus scrofa*). Also recorded from: host-specific.
Distribution: probably cosmopolitan: widespread in N.Z. N.Z. record: Thomson (1922) (as *D. folliculorum* var. *suis*).
Description: Desch & Nutting (1971).
- Demodex* sp. (undescribed) Demodicidae Acari
Normal host: hare (*Lepus europaeus*). Also recorded from: host-specific.
Distribution: not known. Presumed range of host. N.Z. record: Nutting *et al.* (1975).
Description: Undescribed. One specimen only from Wairarapa.
- Demodex* sp. (undescribed) Demodicidae Acari
Normal host: Kiore (*Rattus exulans*). Also recorded from: host-specific.
Distribution: not known. Presumed range of host. N.Z. record: Sweatman (1962).
Description: Undescribed.
- Demodex* sp. (undescribed) Demodicidae Acari
Normal host: polecat (*Putorius p. furo*). Also recorded from: host-specific.
Distribution: not known. Presumed range of host. N.Z. record: Nutting *et al.* (1975).
Description: Undescribed.
- Demodex* sp. (undescribed) Demodicidae Acari
Normal host: red deer. Also recorded from: host-specific.
Distribution: not known. Presumed range of host. N.Z. record: Nutting *et al.* (1975).
Description: Undescribed.
- Demodex* sp. (undescribed) Demodicidae Acari
Normal host: sheep. Also recorded from: host-specific.
Distribution: not known. Presumed range of host. N.Z. record: Nutting *et al.* (1975).
Description: Hirst (1919), Nemeseri & Szekey (1961).
Notes: Nutting *et al.* (1975) doubt species validity in diagnostic reference.
- Demodex* sp. (undescribed) Demodicidae Acari
Normal host: weasel (*Mustela nivalis*). Also recorded from: host-specific.
Distribution: Not known. Presumed range of host. N.Z. record: Nutting *et al.* (1975).
Description: Undescribed.

- Dermanyssus gallinae* (de Geer, 1778) Dermanyssidae Acari
Acarus gallinae: de Geer, 1778
 Normal host: poultry and many other wild birds. Also recorded from: man, dog.
 Distribution: cosmopolitan. N.Z. record: Laird (1950) (man), Ramsay *et al.* (1975) (dog).
 Description: Evans & Till (1966: 350).
 Notes: for synonymy, see Evans & Till (1966).
- Dermatophagoides pteronyssinus* (Trouessart, 1897) Pyroglyphidae Acari
Mealia pteronyssina: Trouessart, 1897
 Free living mite: not normally parasitic. Also recorded from: man (Cornere, 1971).
 Distribution: cosmopolitan. N.Z. record: Cornere (1971).
 Description: Fain (1966).
 Notes: occasional allergenic parasite of man.
- Eulaelaps stabularis* (Koch, 1836) Laelaptidae Acari
 Normal host: *Rattus* spp. Recorded only from: black rat (Campbell Is.).
 Distribution: not known. N.Z. record: Wilson (1964).
 Description: Wilson (1964), Evans & Till (1966: 260).
- Falculifer rostratus* Bucholz, 1889 Dermoglyphidae Acari
 Normal host: pigeon (*Columba livia*). Also recorded from: man (Heath *et al.*, 1971).
 Distribution: cosmopolitan. N.Z. record: Whitten (1962).
 Description: Baker & Wharton (1952: 380).
- Felicola subrostratus* (Burmeister, 1838) Trichodectidae Phthiraptera
Trichodectes subrostratus: Burmeister, 1838
 Normal host: cat. Also recorded from: host-specific.
 Distribution: cosmopolitan. N.Z. record: Helson (1956) (as *F. subrostrata*).
 Description: Seguy (1944: 404) (as *T. subrostratus*).
- Gasterophilus intestinalis* (de Geer, 1776) Gasterophilidae Diptera
Oestrus intestinalis: de Geer, 1776
Oestrus equi: Clark, 1797
 Normal host: horse. Also recorded from: man (Heath *et al.*, 1968) (accidental host).
 Distribution: cosmopolitan: widespread throughout N.Z. N.Z. record: Hutton (1904) (as *G. equi*).
 Description: Zumpt (1965: 125).
 Notes: see Kettle (1974) for notes on history of *G. intestinalis* in N.Z. and confusion with *G. equi*.
- G. nasalis* (Linnaeus, 1758) Gasterophilidae Diptera
Oestrus nasalis: Linnaeus, 1758
Gasterophilus veterinus: Seguy, 1928
Gasterophilus crossi: Paton, 1928
 Normal host: horse. Also recorded from: host-specific.
 Distribution: cosmopolitan, less common than *G. intestinalis* in N.Z. (Kettle, 1974).
 N.Z. record: Hutton (1904) (as *G. equi*).
 Description: Zumpt (1965: 117).
- Gliricola porcelli* (Linnaeus, 1758) Gyropidae Amblycera
 Normal host: guinea-pig (*Cavia porcelli*). Also recorded from: host-specific.
 Distribution: probably cosmopolitan. N.Z. record: Tenquist (unpublished data, 1961).
 Description: Seguy (1944: 53).
 Notes: Recorded from laboratory colonies (Tenquist, unpublished) and pet animal infestations (Charleston, unpublished).
- Glycyphagus domesticus* (de Geer, 1778) Glycyphagidae Acari
Acarus domesticus: de Geer, 1778
 Free-living mite: not normally parasitic. Also recorded from: man.

Distribution: cosmopolitan. N.Z. record: Thomson (1922), Cornere (1971) (from man).

Description: Hughes (1976: 140).

Notes: occasional allergenic parasite of man.

Gohieria fusca (Oudemans, 1902) Glycyphagidae Acari

Glycyphagus fuscus: Oudemans, 1902

Free-living mite: not normally parasitic. Also recorded from: man (Cornere, 1971).

Distribution: Europe, Asia, New Zealand, N.Z. record: Robertson (1946).

Description: Hughes (1976: 178).

Notes: occasional allergenic parasite of man.

Gymnolaelaps annectans Womersley, 1955 Laelaptidae Acari

Recorded from: stoat, kiore

Distribution: not known. N.Z. record: Ramsay (pers. comm.).

Description: Womersley (1955).

Gyropus ovalis Nitzsch, 1818 Gyropidae Amblycera

Normal host: guinea-pig. Also recorded from: host-specific.

Distribution: not known. N.Z. record: from laboratory colonies (Tenquist (1961) unpublished)

Description: Seguy (1944: 52).

Haemaphysalis (Kaiseriana) longicornis Neumann, 1901 Ixodidae Acari

Normal host: most mammals (see below) and some birds.

Distribution: Korea, Japan, Australia, Pacific Is., N.Z. N.Z. record: Reid (1911) (as *H. bispinosa*).

Description: Hoogstraal *et al.* (1968), Roberts (1970: 80).

Recorded from the following in New Zealand: *Canidae* (dog); *Erinacidae* (hedgehog); *Hominidae* (man); *Leporidae* (hare, rabbit); *Muridae* (black rat, Norway rat, mouse); *Mustelidae* (stoat, weasel); *Felidae* (cat); *Equidae* (donkey) (*Equus asini*), (horse); *Suidae* (pig); *Cervidae* (red deer, rusa deer, sambar deer); *Bovidae* (goat, ox sheep).

Notes: *H. bispinosa* does not occur in N.Z.

Haematopinus asini (Linnaeus, 1758) Haematopinidae Phthiraptera

Pediculus asini: Linnaeus, 1758

Pediculus macrocephalus: Burmeister, 1838

Normal host: donkey. Also recorded from: horse (Pilgrim, pers. comm.).

Distribution: cosmopolitan. N.Z. record: Thomson (1922) (as *H. macrocephalus*).

Description: Ferris & Stojanovich (1951: 85).

Notes: see Ferris & Stojanovich (1951) for full synonymy.

H. eurysternus (Nitzsch, 1818) Haematopinidae Phthiraptera

Pediculus eurysternus: Nitzsch, 1818

Normal host: ox

Distribution: cosmopolitan. N.Z. record: Kirk (1900).

Description: Ferris & Stojanovich (1951: 88).

Notes: does not appear to be common in N.Z.; see Ferris & Stojanovich (1951) for synonymy.

H. suis (Linnaeus, 1758) Haematopinidae Phthiraptera

Pediculus suis: Linnaeus, 1758

Haematopinus urius: Nitzsch, 1818

Normal host: pig. Also recorded from: man (Tenquist, 1977) accidental: normally host-specific.

Distribution: cosmopolitan: common in N.Z. N.Z. record: Thomson (1922) (as *H. urius*).

Description: Ferris & Stojanovich (1951: 92).

Notes: see Ferris & Stojanovich (1951) for full synonymy.

- Haemodipsus lyriocephalus* (Burmeister, 1839) Hoplopleuridae Phthiraptera
 Normal host: hare.
 Distribution: presumed throughout range of host. N.Z. record: collected from hare at Greytown C. 1960, specimen lost. Collected from hares at Wairoa, c. 1978 (Heath & Tenquist, unpublished data).
 Description: Ferris & Stojanovich (1951: 179)
 Notes: see Ferris & Stojanovich (1951) for full synonymy.
- H. ventricosus* (Denny, 1842) Hoplopleuridae Phthiraptera
Haematopinus ventricosus: Denny, 1842
 Normal host: rabbit.
 Distribution: cosmopolitan. N.Z. record: Thomson (1922: 339) (as *Haematopinus ventricosus*).
 Description: Ferris & Stojanovich (1951: 179).
- Hirstionyssus talpae* Zenskaya, 1955 Macronyssidae Acari
Hirstionyssus arcuatus: Koch, 1839
 Normal host: hedgehog.
 Distribution: presumed range of host. N.Z. record: Sweatman (1962) (as *H. arcuatus*).
 Description: Womersley (1956) (as *H. arcuatus*).
- Hoplopleura oenomydis* Ferris, 1921 Hoplopleuridae Phthiraptera
 Normal host: *Rattus* spp. Recorded only from *R. exulans*.
 Distribution: not known. N.Z. record: Ford-Robertson & Bull (1966) (as *H. pacifica*).
 Description: Ferris & Stojanovich (1951: 139)
 Notes: see Ferris & Stojanovich (1951) for full synonymy.
- Hypoderma* sp, Latreille, 1818 Oestridae Diptera
 Normal host: ox. Also recorded from: host-specific.
 Distribution: widespread in Northern Hemisphere. N.Z. record: Thomson 1922 (as *H. bovis*).
 Notes: Introduced with imported cattle on many occasions and recorded from animals in quarantine but has never become established in New Zealand. Species introduced have not been recorded except by Thomson (1922), though the basis for his specific identification is uncertain. Larvae from quarantined animals have been found to include *H. lineatum* (Charleston, unpublished). It is likely that both species have been introduced at various times.
- Ixodes holocyclus* Neumann, 1899 Ixodidae Acari
 Normal host: various mammalian hosts: In N.Z. recorded from dog and man.
 Distribution: East Coast of Australia. N.Z. record: Hutton (1974) (dog) Saville (1979) (pers. comm.) (man).
 Description: Roberts (1970: 56).
 Notes: an occasional quarantine intercept from Australia.
- Leptopsylla segnis* (Schonherr, 1811) Leptopsyllidae Siphonaptera
Pulex segnis: Schonherr, 1811
 Normal host: mouse (*Mus musculus*). Also recorded from: black rat, Norway rat, kiore.
 Distribution: cosmopolitan. N.Z. record: Thomson (1922) (as *Ctenopsyllus musculi*).
 Description: Dunnet & Mardon (1974: 125).
- Linguatula serrata* (Leuckart, 1860) Linguatulidae Pentastomida
 Definitive host: dog. Also recorded from: hare (Sweatman, 1962), rabbit (Gurr, 1953), cat, sheep (L. K. Whitten, pers. comm.).
 Distribution: not known, probably cosmopolitan. Not common in N.Z. N.Z. record: Thomson (1922).
 Description: Zumpt (1962: 362).
- Linognathus ovillus* (Neumann, 1907) Linognathidae Phthiraptera
Haematopinus ovillus: Neumann, 1907
 Normal host: sheep. Also recorded from: host-specific.

Distribution: N.Z., U.K., U.S.A., Russia, Falkland Is. N.Z. record: Gilruth (1908).
 Description: Ferris & Stojanovich (1951: 231).
 Notes: this parasite was described from N.Z. material and subsequently found elsewhere.

L. pedalis (Osborn, 1896) Linognathidae Phthiraptera

Haematopinus pedalis: Osborn, 1896

Linognathus pedalis: Ferris & Stojanovich, 1951

Normal host: sheep. Also recorded from: host-specific.

Distribution: U.S.A., S. America, N.Z., Australia, South Africa.

N.Z. record: Thomson (1922) (as *H. pedalis*).

Description: Ferris & Stojanovich (1951: 231).

Notes: for full synonymy see Ferris & Stojanovich (1951).

L. setosus (von Olfers, 1816) Linognathidae Phthiraptera

Pediculus setosis: von Olfers, 1816

Normal host: dog. Also recorded from: host-specific.

Distribution: cosmopolitan. N.Z. record: Thomson (1922) (as *Haematopinus piliferus*).

Description: Ferris & Stojanovich (1951: 235).

Notes: see Ferris & Stojanovich (1951) for full synonymy.

L. stenopsis (Burmeister, 1838) Linognathidae Phthiraptera

Pediculus stenopsis: Burmeister, 1838

Normal host: goat. Also recorded from: host-specific.

Distribution: cosmopolitan. N.Z. record: Helson (1956).

Description: Ferris & Stojanovich (1951: 238).

Notes: see Ferris & Stojanovich (1951) for full synonymy.

L. vituli (Linnaeus, 1758) Linognathidae Phthiraptera

Pediculus vituli: Linnaeus, 1758

Haematopinus vituli: Thomson, 1922

Normal host: ox. Also recorded from: host-specific.

Distribution: cosmopolitan: widespread in N.Z. N.Z. record: Thomson (1922) (as *Haematopinus vituli*).

Description: Ferris & Stojanovich (1951: 241).

Notes: see Ferris & Stojanovich (1951) for full synonymy.

Listrophorus gibbus Pagenstecher, 1861 Listrophoridae Acari

Normal host: rabbit. Also recorded from: hare, opossum (Sweatman, 1962).

Distribution: range of *O. cuniculus*. N.Z. record: Bull (1953).

Description: Coffee (1971).

L. mustelae Megnin, 1885 Listrophoridae Acari

Normal host: polecat, stoat.

Distribution: not known. N.Z. record: Sweatman (1962)

Description: Megnin (1885) (not available)

Lucilia sericata (Meigen, 1826) Calliphoridae Diptera

Musca sericata: Meigen, 1826

Phaenicia sericata: Rob-Desvoidy, 1863.

Normal "host": carrion. Also recorded from: sheep (larvae only) man (larvae only) goat (G. Old, pers. comm., 1980).

Distribution: throughout the temperate zone. N.Z. record: Gilruth (1907).

Description: Zumpt (1965: 47).

Notes: common primary strike fly in N.Z. Most U.S. literature refers to this fly as *Phaenicia sericata*.

Maorigoeldia (Maorigoeldia) argyropus (Walker, 1848) Culicidae Diptera

Culex argyropus: Walker, 1848

Tripteroides argyropus: Miller & Phillips, 1952.

- Normal host: not known. Also recorded from: man (Graham, 1939) (by implication only.)
 Distribution: throughout N.Z. N.Z. record: Walker (1848).
 Description: Belkin (1968: 106).
 Notes: for synonymy, see Belkin (1968)
- Melophagus ovinus* Latreille, 1802 Hippoboscidae Diptera (Pupipara)
 Normal host: sheep. Also recorded from: goat, man.
 Distribution: cosmopolitan. N.Z. record: Thomson (1922).
 Description: Bequaert (1942).
 Notes: for synonymy see Bequaert (1942).
- Mesolaelaps australiensis* (Hirst, 1926) Laelaptidae Acari
Laelaps (Mesolaelaps) australiensis: Hirst, 1926
 Normal host: kiore.
 Distribution: not known. N.Z. record: Sweatman (1962).
 Description: Hirst (1926).
- Musca domestica* Linnaeus, 1761 Muscidae Diptera
 Not normally parasitic. Also recorded from: sheep (larvae only) (Miller, 1939).
 Distribution: cosmopolitan. N.Z. record: Bathgate (1871).
 Description: Zumpt (1965: 31).
 Notes: occasional cause of tertiary myiasis.
- Muscina stabulans* (Fallén, 1816) Muscidae Diptera
 Not normally parasitic. Also recorded from: sheep (larvae only) (Miller, 1939).
 Distribution: cosmopolitan. N.Z. record: Thomson (1922).
 Description: Zumpt (1965: 36).
 Notes: occasional cause of tertiary myiasis.
- Myobia musculi* (Shrank, 1781) Myobiidae Acari
 Normal host: mouse.
 Distribution: cosmopolitan. N.Z. record: Sweatman (1962), Whitten (1962).
 Description: Baker *et al.* (1956: 79).
- Myocoptes musculus* (Koch, 1844) Listrophoridae Acari
 Normal host: mouse
 Distribution: cosmopolitan. N.Z. record: Sweatman (1962), Whitten (1962).
 Description: Baker *et al.*, (1956: 150).
- Nosopsyllus (Nosopsyllus) fasciatus* (Bosc, 1800) Ceratophyllidae Siphonaptera
Pulex fasciatus: Bosc, 1800
Ceratophyllus fasciatus: Thomson, 1922
Nosopsyllus fasciatus: Smit, 1965
 Preferred host: *Rattus* spp. Recorded from: black rat, Norway rat, kiore, dog, hedgehog nest, mouse, rabbit, stoat, weasel, polecat, cat (Smit, 1979).
 Distribution: cosmopolitan. N.Z. record: Thomson (1922) (as *C. fasciatus*).
 Description: Dunnet & Mardon (1974: 128).
- N. (N.) londiniensis* (Rothschild, 1903) Ceratophyllidae Siphonaptera
Ceratophyllus londiniensis: Rothschild, 1903
Nosopsyllus londiniensis londiniensis: Smit, 1965
 Normal host: mouse, black rat.
 Distribution: cosmopolitan. N.Z. record: Smit (1965).
 Description: Dunnet & Mardon (1974: 129).
- Notoedres cati* (Hering, 1838) Sarcoptidae Acari
 Normal host: cat
 Distribution: cosmopolitan. N.Z. record: Whitten (1962).
 Description: Baker & Wharton (1952: 362), Baker *et al.* (1956: 137).

- N. muris* (Megnin, 1877) Sarcoptidae Acari
 Normal host: black rat, kiore (Sweatman, 1962), Norway rat (Whitten, 1962), hedgehog (Heath *et al.*, 1971).
 Distribution: not known. N.Z. record: Sweatman (1962), Whitten (1962).
 Description: Hughes (1959: 45).
- Oestrus ovis* Linnaeus, 1758 Oestridae Diptera
 Normal host: sheep. Also recorded from: man (Tenquist, 1977); goat (D. Bishop, 1979, pers. comm.).
 Distribution: cosmopolitan. N.Z. record: Hudson (1892) (as *O. perplexus*).
 Description: Zumpt (1965: 175).
- Ophyra rostrata* (Rob-Desvoidy, 1830) Muscidae Diptera
Peronia rostrata: Rob-Desvoidy, 1830
Ophyra analis: MacQuart, 1846
 Not normally parasitic. Also recorded from: sheep (larvae only) (Miller, 1939).
 Distribution: Australasia. N.Z. record: Miller (1939).
 Description: Zumpt (1965: 41).
 Notes: for full synonymy see Zumpt (1965). Occasional cause of tertiary myiasis.
- Opifex fuscus* Hutton, 1902 Culicidae Diptera
 Normal host: not known, probably birds. Also recorded from: man.
 Distribution: indigenous, coastal areas of N.Z. N.Z. record: Hutton (1902).
 Description: Belkin (1968: 84).
 Notes: breeds in salt-water pools.
- Ornithonyssus bacoti* (Hirst, 1913) Dermanyssidae Acari
 Normal host: *Rattus* spp. Also recorded from: man.
 Distribution: tropical, with incursions into temperate zones. N.Z. record: Lamb (1952) (as *Bdellonyssus bacoti*) (on man).
 Description: Evans & Till (1966: 321).
 Notes: for synonymy see Evans & Till (1966).
- O. bursa* (Berlese, 1888) Dermanyssidae Acari
 Normal host: domestic fowl (*G. domesticus*) and other domestic and wild birds. Also recorded from: man (Murray, 1951).
 Distribution: cosmopolitan. N.Z. record: Murray (1951) (as *Liponyssus bursa*).
 Description: Strandtman & Wharton (1958: 86).
 Notes: associated with allergy in man (Charleston, unpublished observation).
- O. spinosa* Manson, 1973 Dermanyssidae Acari
 Normal host: long-tailed bat (*Chalinolobus tuberculatus*).
 Distribution: record only from Mahaoenui, near Pio Pio. N.Z. record: Manson (1973).
 Description: Manson (1973).
- Otodectes cynotis* (Hering, 1838) Psoroptidae Acari
 Normal host: cat, dog. Also recorded from: polecat (Sweatman, 1962).
 Distribution: cosmopolitan: common and widespread in N.Z. N.Z. record: Thomson (1922) (as *Chorioptes auricularum*).
 Description: Sweatman (1958a).
- Pagipsylla galliralli* (Smit, 1965) Rhopalopsyllidae Siphonaptera
Stivalius galliralli: Smit, 1965
 Normal hosts: various avian hosts: see Smit, 1979. Also recorded from: man.
 Description: Smit (1979: 172).
 Notes: see Smit (1979) for full host list.
- Parapsyllus longicornis* (Enderlein, 1901) Rhopalopsyllidae Siphonaptera
Pulex longicornis: Enderlein, 1901
 Normal host: penguins, gulls, gannets. Also recorded from: kiore.
 Distribution: N.Z. Falklands, Tristan da Cunha. N.Z. record: Smit (1965).

- Description: Smit (1979: 161).
Notes: see Smit (1979) for full host list.
- P. magellanicus* Jordan, 1938 Rhopalopsyllidae Siphonaptera
P. magellanicus heardi: Dunnet, 1961
Normal host: wide range of sea birds (see Smit, 1979). Also recorded from: man (Smit, 1979).
Distribution: sub-antarctic islands. N.Z. record: Smit (1979).
Description: Smit (1979: 162).
Notes: see Smit (1979) for host list.
- P. nestoris antichthones* Smit, 1979 Rhopalopsyllidae Siphonaptera
Normal hosts: various (see Smit, 1979). Also recorded from: man. N.Z. record: Smit (1979).
Description: Smit (1979: 160).
Notes: see Smit (1979) for full host list.
- Pediculus humanus* (Linnaeus, 1778) Pediculidae Phthiraptera
Normal host: man. Also recorded from: host-specific.
Distribution: cosmopolitan. N.Z. record: Banks (1896).
Description: Ferris & Stojanovich (1951: 261).
Notes: the authors follow Ferris & Stojanovich (1951) in considering *P. humanus* inclusive of *P. humanus capitis*, the head louse, and *P. humanus humanus* (= *P. humanus corporis*, the body louse). The confusion over whether these and their variants should be given sub-species status or not is reviewed by Ferris & Stojanovich. Both "head" and "body" lice have been recorded in N.Z., although the former is by far the more common.
- Petrogalochirus* sp. (Fain) Listrophoridae Acari
Normal host: red-necked wallaby (*Macropus rufogriseus*).
Distribution: not known. N.Z. record: Heath (unpublished).
Description: undescribed.
- Polyplax serrata* (Burmeister, 1839) Hoplopleuridae Phthiraptera
Pediculus serratus: Burmeister, 1839
Normal host: mouse.
Distribution: cosmopolitan. N.Z. record: Heath, (pers. comm., 1979) Charleston (unpublished data).
Description: Ferris & Stojanovich (1951: 210).
Notes: see Ferris & Stojanovich (1951) for full synonymy.
- P. spinulosa*: Burmeister, 1839 Hoplopleuridae Phthiraptera
Pediculus spinulosus: Burmeister, 1839
Normal host: *Rattus* spp. Recorded from: black rat, Norway rat, kiore.
Distribution: cosmopolitan. N.Z. record: Clay (1964) (Campbell Is.).
Description: Ferris & Stojanovich (1951: 211).
Notes: see Ferris & Stojanovich (1951) for full synonymy.
- Porribius pacificus* Jordan, 1946 Ischnopsyllidae Siphonaptera
Normal host: long-tailed bat.
Distribution: presumably to range of above in N.Z. N.Z. record: Jordan (1946).
Description: Jordan (1946)
- Psorergates (Psorobia) mustelae* Lukoschus, 1969 Psorergatidae Acari
Normal host: weasel
Distribution: not known. N.Z. record: Kettle (unpublished data, 1974).
Description: Lukoschus (1969).
- P. ovis* Womersley, 1941 Psoregatidae Acari
Normal host: sheep. Also recorded from: host-specific.
Distribution: not known. Common throughout Australia, parts of N.Z. and S. America.

N.Z. record: Whitten & Elliott (1956).

Description: Womersley (1941).

Notes: in N.Z. this parasite appears to be confined to merino and corriedale flocks.

Psoroptes cuniculi (Delafond, 1859)

Psoroptidae Acari

Dermatodectes cuniculi: Delafond, 1859

Normal host: rabbit. Also recorded from: goat (Heath, unpublished data) horse (Shaw, 1966).

Distribution: cosmopolitan. N.Z. record: Thomson (1922) (as *Sarcoptes minor*).

Description: Sweatman (1958b).

Notes: usually confined to ear canal.

P. natalensis Hirst, 1919

Psoroptidae Acari

Normal host: ox.

Distributions: S. Africa, S. America, N.Z., France. N.Z. record: Sweatman (1958b).

Description: Hirst (1919).

Notes: prevalence unknown.

P. ovis (Hering, 1838)

Psoroptidae Acari

Sarcoptes ovis: Hering, 1838

Dermatodectes bovis: Gerlach, 1857

Normal host: sheep.

Distribution: widely distributed but full range not known. N.Z. record: early N.Z. provincial government records c. 1850.

Description: Zumpt (1961: 332).

Notes: cause of disease commonly known as "sheep scab". This parasite was eradicated from N.Z. c. 1880.

Phthirus pubis (Linnaeus, 1758)

Pediculidae Phthiraptera

Pediculus pubis: Linnaeus, 1758

Phthirus inguinalis: Thomson, 1922

Phthirus pubis: Helson, 1956.

Normal host: man.

Distribution: cosmopolitan. N.Z. record: Thomson (1922) (as *Phthirus inguinalis*).

Description: Ferris & Stojanovich (1951: 281).

Notes: for synonymy, see Ferris & Stojanovich (1951). See Thomson (1922) for note on history of this species in N.Z.

Pulex irritans Linnaeus, 1758

Pulicidae Siphonaptera

Preferred host: man. Also recorded from: dog, black rat, Norway rat (Smit, 1979).

Distribution: cosmopolitan. N.Z. record: White & Doubleday in Dieffenbach (1843) as "*Pulex*".

Description: Dunnet & Mardon (1974: 34).

Pyemotes tritici (La Greze-Fossat & Montagne, 1851)

Pyemotidae Acari

P. ventricosus: Oudemans, 1936.

P. herfsi: Hughes: 1976

Free-living mite: not normally parasitic. Also recorded from: man (Helson, 1956).

Distribution: cosmopolitan. N.Z. record: Helson (1956) (as *P. ventricosus*).

Description: Hughes (1976: 271) (as *P. herfsi*).

Notes: occasional allergenic parasite of man.

Pygiopsylla hoplia Jordan & Rothschild, 1922

Pygiopsyllidae Siphonaptera

Normal host: kiore. Also recorded from: Norway rat.

Distribution: Pacific area. N.Z. record: Hilgendorf (1917) (as *P. hilli*).

Description: Dunnet & Mardon (1974: 65).

P. phiola Smit, 1979

Pygiopsyllidae Siphonaptera

P. hoplia (mis. det.) Smit, 1965, Ford-Robertson & Bull, 1966

Hosts: kiore, Norway rat, black rat, man.

Distribution: N.Z. mainland, offshore islands. N.Z. record: Smit (1979: 172).

Description: Smit (1979: 172).

- Radfordia affinis* (Poppe, 1896) Myobiidae Acari
 Normal host: mouse
 Distribution: not known. N.Z. record: Heath (unpublished data, from laboratory colonies).
 Description: Poppe (1896) (as *Myobia affinis*).
- Rhipicephalus sanguineus* (Latreille, 1806) Ixodidae Acari
 Normal host: dog.
 Distribution: mainly within latitudes 50° N and 35° S, but not normally in N.Z. N.Z. record: McKenna *et al.* (1975).
 Description: Roberts (1970: 87).
 Notes: occasional quarantine intercept. McKenna *et al.* consider it could establish in N.Z.
- Sarcoptes scabiei* (de Geer, 1778) Sarcoptidae Acari
 Normal host: man, dog, pig, polecat (other hosts overseas).
 Distribution: cosmopolitan. N.Z. record: Dieffenbach (1843).
 Description: Fain (1968)
 Notes: for extensive synonymy, and explanation of so-called sub-species, see Fain (1968).
- Solenopotes burmeisteri* (Fahrenholz, 1919) Linognathidae Phthiraptera
Linognathus burmeisteri: Fahrenholz, 1919
 Normal host: red deer. Also recorded from: host-specific.
 Distribution: Europe, New Zealand. N.Z. record: Andrews (1964).
 Description: Ferris & Stojanovich (1951: 253)
 Notes: see Ferris & Stojanovich (1951) for full synonymy.
- S. capillatus* (Enderlein, 1904) Linognathidae Phthiraptera
 Normal host: ox. Also recorded from: host-specific.
 Distribution: not known. N.Z. record: Whitten (1971).
 Description: Ferris & Stojanovich (1951: 253).
- Spilopsyllus cuniculi* (Dale, 1878) Pulicidae Siphonaptera
 Normal host: rabbit.
 Distribution: range of rabbit. N.Z. record: Sobey *et al.*, (1973).
 Description: Smit (1979: 177).
 Notes: introduced to Macquarie Is. in 1968 as vector of myxomatosis: not present on mainland.
- Stomoxys calcitrans* (Linnaeus, 1758) Muscidae Diptera
Conops calcitrans: Linnaeus, 1758
 Normal host: sucks blood from many mammals. Recorded from: (in N.Z.) ox, horse, sheep, man, dog.
 Distribution: cosmopolitan. N.Z. record: Thomson (1922).
 Description: Zumpt (1965: 35).
- Tarsonemus granarius* Lindquist, 1972 Tyroglyphidae Acari
 Stored product mite. Also recorded from: man.
 Distribution: not known. N.Z. record: Cornere (1971) (as *Tarsonemus* sp.).
 Description: Hughes (1976: 268).
 Notes: occasional allergenic parasite of man. Presumed *T. granarius* (Ramsay, pers. comm.).
- Trichodectes canis* (de Geer, 1778) Trichodectidae Phthiraptera
Ricinus canis: de Geer, 1778
Trichodectes latus: Thomson, 1922
 Normal host: dog. Also recorded from: host-specific.
 Distribution: cosmopolitan. N.Z. record: Thomson (1922) (as *T. latus*).
 Description: Werneck (1936: 504).

- Trichosurolaelaps crassipes* Womersley, 1956 Dermanyssidae Acari
 Normal host: opossum. Also recorded from: man (Tenquist, 1977).
 Distribution: range of *T. vulpecula*. N.Z. record: Sweatman (1962).
 Description: Womersley (1956).
 Notes: occasional allergenic parasite of man.
- Werneckiella equi* (Denny, 1842) Trichodectidae Phthiraptera
Trichodectes equi: Denny, 1842
Damalinia equi: Hopkins & Clay, 1952
Bovicola equi: Helson, 1956
 Normal host: horse. Also recorded from: host-specific.
 Distribution: cosmopolitan: widespread in N.Z. N.Z. record: Helson (1956) (as *B. equi*).
 Description: Moreby (1978: 399)
- Xenopsylla cheopis* (Rothschild, 1903) Pulicidae Siphonaptera
Pulex cheopis: Rothschild, 1903
 Normal host: black rat, Norway rat. Also recorded from: man.
 Distribution: cosmopolitan. N.Z. record: MacLean (1955).
 Description: Dunnet & Mardon (1974: 42).
 Notes: for history of plague in N.Z. see MacLean (1955).
- X. vexabilis* Jordan, 1955 Pulicidae Siphonaptera
 Normal host: Norway rat. Also recorded from: kiore.
 Distribution: Australasia, Pacific region. N.Z. record: Hilgendorf (1917) (as *X. cheopis*).
 Description: Dunnet & Mardon (1974: 43).

APPENDIX 1: PARASITE LIST BY HOST

Bat (long tailed)	Acari	<i>Ornithonyssus spinosa</i>
	Siphonaptera	<i>Poribius pacificus</i>
Black rat	Acari	<i>Eulaelaps stabularis</i>
		<i>Haemaphysalis longicornis</i>
		<i>Notoedres muris</i>
	Phthiraptera	<i>Polyplax spinulosa</i>
	Siphonaptera	<i>Ctenocephalides felis felis</i>
		<i>Leptopsylla segnis</i>
		<i>Nosopsyllus fasciatus</i>
		<i>N. londiniensis</i>
		<i>Pulex irritans</i>
		<i>Pygiopsylla phiola</i>
		<i>Xenopsylla cheopis</i>
Cat	Acari	<i>Cheyletiella parasitivorax</i>
		<i>Demodex cati</i>
		<i>Haemaphysalis longicornis</i>
		<i>Otodectes cynotis</i>
		<i>Notoedres cati</i>
	Pentastomida	<i>Linguatula serrata</i>
	Phthiraptera	<i>Felicola subrostratus</i>
	Siphonaptera	<i>Ctenocephalides felis felis</i>
		<i>Nosopsyllus fasciatus</i>
Chamois	Phthiraptera	<i>Damalinia longicornis</i>
Dog	Acari	<i>Cheyletiella yasguri</i>
		<i>Demodex canis</i>
		<i>Dermanyssus gallinae</i>
		<i>Haemaphysalis longicornis</i>
		<i>Ixodes holocyclus</i>
		<i>Otodectes cynotis</i>

		<i>Rhipicephalus sanguineus</i>
		<i>Sarcoptes scabiei</i>
	Pentostomida	<i>Linguatula serrata</i>
	Diptera	<i>Stomoxys calcitrans</i>
	Phthiraptera	<i>Linognathus setosus</i>
		<i>Trichodectes canis</i>
	Siphonaptera	<i>Ctenocephalides canis</i>
		<i>C. felis felis</i>
		<i>Nosopsyllus fasciatus</i>
		<i>Pulex irritans</i>
Donkey	Acari	<i>Haemaphysalis longicornis</i>
	Phthiraptera	<i>Haematopinus asini</i>
Goat	Acari	<i>Chorioptes bovis</i>
		<i>Demodex caprae</i>
		<i>Haemaphysalis longicornis</i>
		<i>Psoroptes cuniculi</i>
	Diptera	<i>Lucilia sericata</i>
		<i>Melophagus ovinus</i>
		<i>Oestrus ovis</i>
	Phthiraptera	<i>Damalinia caprae</i>
		<i>D. limbata</i>
		<i>Linognathus stenopsis</i>
Guinea pig	Phthiraptera	<i>Gliricola porcelli</i>
		<i>Gyropus ovalis</i>
Hare	Acari	<i>Demodex</i> sp.
		<i>Haemaphysalis longicornis</i>
		<i>Listrophorus gibbus</i>
	Pentastomida	<i>Linguatula serrata</i>
	Phthiraptera	<i>Haemodipsus lyriocephalus</i>
	Siphonaptera	<i>Ctenocephalides canis</i>
Hedgehog	Acari	<i>Androlaelaps casalis casalis</i>
		<i>Caparinia tripilis</i>
		<i>Haemaphysalis longicornis</i>
		<i>Hirstionyssus talpae</i>
		<i>Notoedres muris</i>
	Siphonaptera	<i>Nosopsyllus fasciatus</i>
		<i>Ctenocephalides felis felis</i>
Horse	Acari	<i>Chorioptes bovis</i>
		<i>Demodex caballi</i>
		<i>Psoroptes cuniculi</i>
		<i>Haemaphysalis longicornis</i>
	Diptera	<i>Gasterophilus intestinalis</i>
		<i>G. nasalis</i>
		<i>Stomoxys calcitrans</i>
	Phthiraptera	<i>Haematopinus asini</i>
		<i>Werneckiella equi</i>
Kiore	Acari	<i>Demodex</i> sp.
		<i>Gymnolaelaps annectans</i>
		<i>Mesolaelaps australiensis</i>
		<i>Notoedres muris</i>
	Phthiraptera	<i>Hoplopleura oenomydis</i>
		<i>Polyplax serrata</i>
	Siphonaptera	<i>Leptopsylla segnis</i>
		<i>Nosopsyllus fasciatus</i>
		<i>Parapsyllus longicornis</i>
		<i>Pygiopsylla hoplia</i>
		<i>P. phiola</i>
		<i>Xenopsylla vexabilis</i>

Man	Acari	<i>Acarus siro</i>
		<i>Allothyrus australasiae</i>
		<i>Amblyomma t. triguttatum</i>
		<i>Cheyletiella parasitivorax</i>
		<i>C. yasguri</i>
		<i>Cheyletus eruditus</i>
		<i>Chortoglyphus arcuatus</i>
		<i>Demodex brevis</i>
		<i>D. folliculorum</i>
		<i>Dermanyssus gallinae</i>
		<i>Dermatophagoides pteronyssinus</i>
		<i>Falculifer rostratus</i>
		<i>Glycyphagus domesticus</i>
		<i>Gohieria fusca</i>
		<i>Haemaphysalis longicornis</i>
		<i>Ixodes holocyclus</i>
		<i>Ornithonyssus bacoti</i>
		<i>O. bursa</i>
		<i>Pyemotes tritici</i>
		<i>Sarcoptes scabiei</i>
		<i>Tarsonemus granarius</i>
		<i>Trichosuroelaps crassipes</i>
	Diptera	<i>Aedes notoscriptus</i>
		<i>A. antipodeus</i>
		<i>A. subalbirostris</i>
		<i>Austrosimulium australense</i>
		<i>A. dumbletoni</i>
		<i>A. unguatum</i>
		<i>Cocquillettidia tenuipalpis</i>
		<i>C. iracunda</i>
		<i>Culex pervigilans</i>
		<i>C. quinquefasciatus</i>
		<i>Culiseta tonnoiri</i>
		<i>Gasterophilus intestinalis</i>
		<i>Lucilia sericata</i>
		<i>Maorigoeldia argyropus</i>
		<i>Melophagus ovinus</i>
		<i>Oestrus ovis</i>
		<i>Opifex fuscus</i>
		<i>Stomoxys calcitrans</i>
	Hemiptera	<i>Cimex lectularius</i>
		<i>Haematopinus suis</i>
		<i>Pediculus humanus</i>
	Phthiraptera	<i>Pthirus pubis</i>
		<i>Ceratophyllus gallinae</i>
		<i>Ctenocephalides canis</i>
		<i>C. felis felis</i>
		<i>Nosopsyllus fasciatus</i>
		<i>Pagipysylla galliralli</i>
		<i>Parapsyllus magellanicus</i>
		<i>P. antichthones</i>
		<i>Pulex irritans</i>
		<i>Pygiopsylla phiola</i>
		<i>Xenopsylla cheopis</i>
Mouse	Acari	<i>Haemaphysalis longicornis</i>
		<i>Myobia musculi</i>
		<i>Myocoptes musculus</i>
		<i>Radfordia affinis</i>
	Phthiraptera	<i>Polyplax serrata</i>
	Siphonaptera	<i>Leptopsylla segnis</i>
		<i>Nosopsyllus fasciatus</i>
		<i>N. londiniensis</i>

Norway rat	Acari	<i>Haemaphysalis longicornis</i> <i>Notoedres muris</i>
	Phthiraptera Siphonaptera	<i>Polyplax spinulosa</i> <i>Leptopsylla segnis</i> <i>Nosopsyllus fasciatus</i> <i>Pulex irritans</i> <i>Pygiopsylla hoplia</i> <i>P. phiola</i> <i>Xenopsylla cheopis</i> <i>X. vexabilis</i>
Opossum	Acari	<i>Atellana papilio</i> <i>Listrophorus gibbus</i> <i>Trichosurolaelaps crassipes</i>
Ox	Acari	<i>Chorioptes bovis</i> <i>Demodex bovis</i> <i>Haemaphysalis longicornis</i> <i>Psoroptes natalensis</i>
	Diptera	<i>Aedes notoscriptus</i> <i>Culex pervigilans</i> <i>Hypoderma</i> sp. <i>Stomoxys calcitrans</i>
	Phthiraptera	<i>Damalinia bovis</i> <i>Haematopinus euryternus</i> <i>Linognathus vituli</i> <i>Solenopotes capillatus</i>
Pig	Acari	<i>Demodex phylloides</i> <i>Haemaphysalis longicornis</i> <i>Sarcoptes scabiei</i>
	Phthiraptera Siphonaptera	<i>Haematopinus suis</i> <i>Pulex irritans</i>
Polecat (ferret)	Acari	<i>Demodex</i> sp. <i>Listrophorus mustelae</i> <i>Otodectes cynotis</i> <i>Sarcoptes scabiei</i>
	Siphonaptera	<i>Nosopsyllus fasciatus</i>
Rabbit	Acari	<i>Cheyletiella parasitivorax</i> <i>Haemaphysalis longicornis</i> <i>Listrophorus gibbus</i> <i>Psoroptes cuniculi</i>
	Pentastomida Phthiraptera Siphonaptera	<i>Linguatula serrata</i> <i>Haemodipsus ventricosus</i> <i>Ctenocephalides felis felis</i> <i>Nosopsyllus fasciatus</i> <i>Spilopsyllus cuniculi</i>
Red deer	Acari	<i>Demodex</i> sp. <i>Haemaphysalis longicornis</i>
Red-necked wallaby	Phthiraptera	<i>Damalinia longicornis</i> <i>Solenopotes burmeisteri</i>
	Acari	<i>Petrogalochirus</i> sp.
Rusa deer	Acari	<i>Haemaphysalis longicornis</i>
Sambar	Acari	<i>H. longicornis</i>
Sheep	Acari	<i>Chorioptes bovis</i> <i>Demodex</i> sp. <i>Haemaphysalis longicornis</i> <i>Psorergates ovis</i> <i>Psoroptes ovis</i>

	Pentastomida	<i>Linguatula serrata</i>
	Diptera	<i>Calliphora hilli</i>
		<i>C. hortona</i>
		<i>C. nothocalliphoralis</i>
		<i>C. quadrimaculata</i>
		<i>C. stygia</i>
		<i>C. vicina</i>
		<i>Chrysomya rufifacies</i>
		<i>Culex pervigilans</i>
		<i>Lucilia sericata</i>
		<i>Melophagus ovinus</i>
		<i>Musca domestica</i>
		<i>Muscina stabulans</i>
		<i>Oestrus ovis</i>
		<i>Ophyra rostrata</i>
		<i>Stomoxys calcitrans</i>
	Phthiraptera	<i>Damalinia ovis</i>
		<i>Linognathus setulosus</i>
		<i>L. pedalis</i>
Stoat	Acari	<i>Demodex erminae</i>
		<i>Gymnolaelaps annectans</i>
		<i>Haemaphysalis longicornis</i>
		<i>Listrophorus mustelae</i>
	Siphonaptera	<i>Ceratophyllus gallinae</i>
		<i>Nosopsyllus fasciatus</i>
Tahr	Phthiraptera	<i>Damalinia hemitragi</i>
Wapiti	Phthiraptera	<i>D. longicornis</i>
Weasel	Acari	<i>Demodex</i> sp.
		<i>Haemaphysalis longicornis</i>
		<i>Psorergates mustela</i>
	Siphonaptera	<i>Nosopsyllus fasciatus</i>
White-tailed deer	Phthiraptera	<i>Damalinia lipaeuroides</i>
		<i>D. parallela</i>

APPENDIX 2: LIST OF COMMON NAMES

<i>Acarus siro</i>	bakers itchmite	<i>Damalinia bovis</i>	cattle biting louse
<i>Androlaelaps</i>		<i>D. caprae</i>	goat biting louse
<i>casalis</i>	cosmopolitan nest mite	<i>D. equi</i>	horse biting louse*
<i>Atellana papilio</i>	opossum fur mite	<i>D. limbata</i>	fringed goat louse
<i>Austrosimulium</i>		<i>D. ovis</i>	sheep body louse
<i>australense</i>	New Zealand blackfly	<i>Demodex bovis</i>	cattle follicle mite
<i>A. unguatum</i>	West Coast blackfly	<i>D. brevis</i>	human follicle mite
<i>Calliphora</i>		<i>D. canis</i>	dog follicle mite
<i>quadrimaculata</i>	N.Z. blue blowfly	<i>D. cati</i>	cat follicle mite
<i>C. stygia</i>	brown blowfly	<i>Leptopsylla segnis</i>	mouse flea
<i>C. vicina</i>	European blowfly	<i>Linognathus setulosus</i>	sheep face louse
<i>Caparinia tripilis</i>	hedgehog mange mite	<i>L. pedalis</i>	sheep foot louse
<i>Ceratophyllus gallinae</i>	European chicken flea	<i>L. setosus</i>	dog sucking louse
<i>Cheyletiella parasitivorax</i>	rabbit cheyletiellid mite	<i>L. stenopsis</i>	goat sucking louse
<i>C. yasguri</i>	dog cheyletiellid mite	<i>L. vituli</i>	long-nosed cattle louse
<i>Cheyletus eruditus</i>	common cheyletid mite	<i>Listrophorus gibbus</i>	rabbit fur mite
<i>Chorioptes bovis</i>	chorioptic mange mite	<i>L. mustelae</i>	Mustelid fur mite
<i>Chrysomya rufifacies</i>	hairy maggot fly	<i>Lucilia sericata</i>	green blowfly
<i>Ctenocephalides canis</i>	dog flea	<i>Melophagus ovinus</i>	sheep ked
<i>C. felis felis</i>	cat flea	<i>Musca domestica</i>	house fly
<i>Culex pervigilans</i>	vigilant mosquito	<i>Myobia musculi</i>	mouse myobiid mite

<i>Myocoptes musculus</i>	myocoptic mange mite	<i>Psoroptes cuniculi</i>	rabbit ear itch mite
<i>Nosopsyllus fasciatus</i>	European rat flea	<i>P. equi</i>	horse scab mite
<i>Notoedres cati</i>	cat mange mite	<i>P. natalensis</i>	cattle scab mite
<i>N. muris</i>	rat ear itch mite	<i>P. ovis</i>	sheep scab mite
<i>Oestrus ovis</i>	sheep nasal bot fly	<i>Pthirus pubis</i>	crab louse
<i>Opifex fuscus</i>	saltpool mosquito	<i>Pulex irritans</i>	human flea
<i>Ornithonyssus bacoti</i>	tropical rat mite	<i>Pygiosylla hoplia</i>	kiore flea
<i>O. bursa</i>	tropical fowl mite	<i>Radfordia affinis</i>	mouse myobiid mite
<i>Otodectes cynotis</i>	ear mange mite	<i>Sarcoptes scabiei</i>	scabies mite
<i>Pediculus humanus</i>	human louse	<i>Stomoxys calcitrans</i>	stable fly
<i>Porribius pacificus</i>	N.Z. bat flea	<i>Trichodectes canis</i>	dog biting louse
<i>Psorergates ovis</i>	sheep itch mite	<i>Xenopsylla cheopis</i>	oriental rat flea

* Listed as *Werneckiella equi*

APPENDIX 3: LIST OF FAMILIES

Calliphoridae

Calliphora hilli
C. hortonae
C. nothocalliphoralis
C. quadrimaculata
C. stygia
C. vicina
Chrysomya rufifacies
Lucilia sericata

Ceratophyllidae

Ceratophyllus gallinae
Nosopsyllus fasciatus
N. londiniensis

Cheyletiellidae

Cheyletiella parasitivorax
C. yasguri
Cheyletus eruditus

Chortoglyphidae

Chortoglyphus arcuatus

Cimicidae

Cimex lectularius

Culicidae

Aedes antipodeus
A. notoscriptus
A. subalbistrostris
Coquillettidia tenuipalpis
C. iracunda
Culex pervigilans
C. quinquefasciatus
Culiseta tonnoiri
Maorigoeldia argyropus
Opifex fuscus

Demodicidae

Demodex bovis
D. brevis
D. caballi
D. canis
D. caprae
D. cati

D. erminae

D. folliculorum
D. phylloides
 Plus several undescribed species.

Dermanyssidae

Dermanyssus gallinae
Eulaelaps stabularis
Ornithonyssus bacoti
O. bursa
O. spinosa
Trichosurolaelaps crassipes

Dermoglyphidae

Falculifer rostratus

Gasterophilidae

Gasterophilus intestinalis
G. nasalis

Glycyphagidae

Glycyphagus domesticus
Gohieria fusca

Gyropidae

Gliricola porcelli
Gyropus ovalis

Haematopinidae

Haematopinus asini
H. eurysternus
H. suis

Hippoboscidae

Melophagus ovinus

Holothyridae

Allothyrus australasiae

Hoplopleuridae

Haemodipsus lyriocephalus
H. ventricosus
Hoplopleura oenomydis
Polyplax serrata
P. spinulosa

Ischnopsyllidae

Porribius pacificus

Ixodidae

*Amblyomma triguttatum triguttatum**Haemaphysalis longicornis**Ixodes holocyclus**Rhipicephalus sanguineus*

Laelapidae

*Androlaelaps casalis casalis**Eulaelaps stabularis**Gymnolaelaps annectans**Mesolaelaps australiensis*

Leptopsyllidae

Leptopsylla segnis

Linguatulidae

Linguatula serrata

Linognathidae

*Linognathus ovillus**L. pedalis**L. setosus**L. stenopsis**L. vituli**Solenopotes burmeisteri**S. capillatus*

Listrophoridae

*Atellana papilio**Listrophorus gibbus**L. mustelae**Myocoptes musculus**Petrogalochirus* sp.

Macronyssidae

Hirstionyssus talpae

Muscidae

*Musca domestica**Muscina stabulans**Ophyra rostrata**Stomoxys calcitrans*

Myobiidae

*Myobia musculi**Radfordia ensifera*

Oestridae

Oestrus ovis

Pediculidae

*Pediculus humanus**Pthirus pubis*

Psorergatidae

*Psorergates (Psorobia) mustelae**P. ovis*

Psoroptidae

*Caparinia tripilis**Chorioptes bovis**Otodectes cynotis**Psoroptes ovis**P. cuniculi**P. natalensis*

Pulicidae

*Ctenocephalides canis**C. felis felis**Pulex irritans**Spilopsyllus cuniculi**Xenopsylla cheopis**X. vexabilis*

Pygiopsyllidae

*Pygiopsylla hoptia**P. phiola*

Pyemotidae

Pyemotes tritici

Pyroglyphidae

Dermatophagoides pteronyssinus

Rhopalopsyllidae

*Pagipsylla galliralli**Parapsyllus longicornis**P. magellicanus**P. nestoris antichthones*

Sarcoptidae

*Notoedres cati**N. muris**Sarcoptes scabiei*

Simuliidae

*Austrosimulium australense**A. dumbletoni**A. unguatum*

Trichodectidae

*Damalinia bovis**D. caprae**D. hemitraga**D. limbata**D. lipeuroides**D. longicornis**D. ovis**D. parallela**Felicola subrostratus**Trichodectes canis**Werneckiella equi*

Tyroglyphidae

*Acarus siro**Tarsonemus granarius***APPENDIX 4: N.Z. MAMMALS FOR WHOM NO EXTERNAL PARASITES HAVE BEEN RECORDED.**

fallow deer

sika deer

moose

wallaby (black striped)

wallaby (black tailed)

wallaby (brush tailed rock)

wallaby (parma)

wallaby (white throated)

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