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PART I.

A CHECK-LIST AND HOST-LIST OF THE ECTOPARASITES RECORDED FROM BRITISH BIRDS AND MAMMALS.

PART I. MAMMALS (excluding Bats).

By GORDON B. THOMPSON.

This paper constitutes the first of a series of three papers in which I hope to present host-lists and check-lists of the parasites of British birds and mammals. This part deals with the mammals except the bats, which will form the subject of the second part. The third part will be devoted to the birds and their parasites, and it is possible that owing to its length it may have to be divided into parts. The domestic animals will not be included in this series, but I hope to be able to deal with them separately.

The principles which I have followed in preparing these lists may be roughly outlined as follows:—Under each parasite name I have given (i) the reference to the original description, (ii) references to any papers in which the species has been transferred to another genus and (iii) references to papers containing descriptions and drawings which may be found useful for the identification of the species. The nomenclature used is, I think, the most up-to-date and in most cases generally accepted. All the host names have been corrected in accordance with the 'List of British Vertebrates' (published by the British Museum (Nat. Hist.), London (1935)). Immediately below the bibliography of the parasite I have given the names of the hosts upon which the parasite occurs. In the case of the Mallophaga, Siphunculata and Hippoboscidae this is a simple matter, but in the case of the Siphonaptera I have only listed the name or names of the hosts which are, on the basis of all the records which I have collected together, most frequently parasitised by a particular flea. In many instances fleas have been listed as

occurring on a very large number of hosts, but as it is quite obvious that they are not the true parasites of some hosts, I can see little point in listing them all. I have, however, drawn attention to these facts in the notes given below each parasite. Under each parasite I have given some notes on the comparative abundance or rarity of the species and have also cited the authors, together with dates and pagination of papers, to whom those interested may refer for further details of records. A complete bibliography of the papers containing the records will be given at the end of the final part of this paper.

The host-list at the end of the paper is compiled for the most part from the first part of the paper, *i.e.* only those parasites are listed from a host which I have noted as being the probable true host. With regard to the various island forms of mammals, all the fleas which have thus far been recorded from them are listed owing to their interest from the point of view of distribution.

It is to be hoped that these lists will stimulate further interest in the parasites of our birds and mammals. There remains much to be done. There is much need for the collection of all parasites from the various mammals inhabiting the numerous islands off our coasts. As recently as 1936 a new flea was added to the British list, and there is every reason to expect further additions. There are at least two species of sucking-lice which almost certainly occur, but have not yet been recorded. These should be looked for on the shrew and dormouse.

Specimens of parasites accompanied by the necessary data, *i.e.* name of host, locality, date, collector's name, may be sent to me for determination at the following address:—53 Arodene Road, London, S.W.2.

MALLOPHAGA.

Family TRICHODECTIDAE.

Genus *TRICHODECTES* Nitzsch, 1818.

Genotype:—*Trichodectes canis* De Geer.

1. *Trichodectes melis* (Fabricius).

Pediculus melis Fabricius, 1805, *Systema Antliatorum*, p. 341.

Trichodectes crassus Nitzsch, 1818, *Germa's Magazin der Ent.*, Bd. III, p. 295.

T. crassus Nitzsch, Denny, 1842, *Monographia Anoplurorum Britanniae*, pp. 187-188, Pl. XVII, f. 3.

T. melis (Fabricius), Kéler, 1938, *Nova Acta Leop. Carol.*, N.S., Bd. V, No. 32, pp. 424-425, figs. 1-3, 5-9, 11, 12, 17 and 18.

Host:—*Meles meles meles* (L.) (Badger).

This louse is a specific parasite of the badger and has been recorded from this host in the British Isles by Denny (1842), Waterston (1910, p. 50), Evans (1912, p. 274), Waterston (1912, p. 124), Bagnall (1930, pp. 8-9), Hunter (1933, p. 72), Thompson (1934, p. 135; 1935, p. 215) and Walsh (1938, p. 186).

2. *Trichodectes vulpis* Denny.

Trichodectes vulpis Denny, 1842, *Monographia Anoplurorum Britanniae*, p. 189, Pl. XVII, f. 5.

T. vulpis Denny, Kéler, 1938, *Nova Acta Leop. Carol.*, N.S., Bd. V, No. 32, pp. 425-426, fig. 19.

Host:—*Vulpes vulpes crucigera* (Bechstein) (Fox).

Denny's description of this specific parasite of the fox was based on specimens obtained from a fox at Amesbury, Wiltshire. Bagnall (1932, p. 17) recorded the species from a fox shot at Fatfield, Co. Durham. As far as I am aware these are the only British records. I have tried in vain to obtain specimens. Recently I saw some eggs which I take to be those of *T. vulpis* Denny collected from a fox caught near Oswestry, Shropshire.

Genus *STACHIELLA* Kéler.

Genotype:—*Stachiella mustelae* (Schrank).

3. *Stachiella mustelae* (Schrank).

Pediculus mustelae Schrank, 1803, *Fauna Boica*, III (1), p. 186.

Trichodectes dubius Nitzsch in Denny, 1842, *Monographia Anoplurorum Britanniae*, p. 190, Pl. XVII, f. 2 (? part).

Stachiella mustelae (Schrank), Kéler, 1938, *Nova Acta Leop. Carol.*, N.S., Bd. V, No. 32, pp. 429-431, figs. 22, 23.

Host:—*Mustela nivalis nivalis* L. (Weasel).

N.B.—See notes under the next species.

4. *Stachiella retusa* (Nitzsch).

Trichodectes retusus Nitzsch in Burmeister, 1838, *Handbuch der Entomologie*, II, p. 436.

T. dubius Nitzsch in Denny, 1842, *Monographia Anoplurorum Britanniae*, p. 190 (? part).

Stachiella retusa (Nitzsch), Kéler, 1938, *Nova Acta Leop. Carol.*, N.S., Bd. V, pp. 431-433, fig. 24.

Host:—*Mustela erminea stabilis* Barrett-Hamilton (Stoat).

Kéler (1938) has recently pointed out that the lice occurring on the weasel and stoat represent two different species. The

earlier workers named two species, but until recently they have been regarded as one. In citing the records below I have not attempted to distinguish those records which refer to one or other of the parasites as now recognised. Denny (1842) apparently confused the species, but it seems that the one which he described was *S. mustelae* (Schränk). Denny's original specimens are, as far as we know, lost. I understand that a further change in the name of one of these species is necessary. This correction will be noted in a footnote in a forthcoming part.

The two species which seem to occur commonly on their respective hosts have been recorded from the British Isles by Denny (1842, p. 190), Evans (1912, p. 274), Bagnall (1932, p. 18), Britten (1932, p. 20) and Thompson (1935, p. 215).

Genus *FELICOLA* Ewing.

Genotype:—*Felicola subrostrata* (Nitzsch).

5. *Felicola subrostrata* (Nitzsch).

Trichodectes subrostratus Nitzsch in Burmeister, 1838, Handbuch der Entomologie, II, p. 436.

Felicola subrostrata (Nitzsch), Kéler, 1938, Nova Acta Leop. Carol. N.S., Bd. V, No. 32, pp. 443-445, figs. 30-31.

Host:—*Felis silvestris grampia* Miller (Scottish Wild Cat).

This species is the common parasite of the domestic cat, from which host it was originally described. In 1936 (pp. 76-77) I recorded it for the first time from the Wild Cat.

Genus *LUTRIDIA* Kéler.

Genotype:—*Lutridia exilis* (Nitzsch).

6. *Lutridia exilis* (Nitzsch).

Trichodectes exilis Nitzsch in Giebel, 1861, Zeit. f. ges. Nat., XVIII, p. 87.

Lutridia exilis (Nitzsch), Kéler, 1938, Nova Acta Leop. Carol. N.S., Bd. V, No. 32, pp. 433-435, fig. 25.

Host:—*Lutra lutra* (L.) (Otter).

Originally described from specimens obtained from an otter in Germany, this species was first recorded from the British Isles by Bagnall (1930, pp. 6-8) on the basis of specimens taken from the head of an otter killed at Bywell Bridge, Stocksfield-on-Tyne. Bagnall (1932, p. 17) recorded additional specimens. It has not been recorded since.

Genus *RHABDOPEDILON* Kéler.

Genotype:—*Rhabdopedilon longicornis* (Nitzsch).

7. *Rhabdopedilon longicornis* (Nitzsch).

Trichodectes longicornis Nitzsch in Burmeister, 1838, Handbuch der Entomologie, II, p. 436.

T. similis Denny, 1842, Monographia Anoplurorum Britanniae, p. 194, Pl. XVII, fig. 6.

Rhabdopedilon longicornis (Nitzsch), Kéler, 1938, Nova Acta Leop. Carol. N.S., Bd. V, No. 32, p. 456, figs. 39-40.

Host:—*Cervus elaphus scoticus* Lönnberg (Red Deer).

Cameron's records of this species as *T. cervi* (Proc. R. phys. Soc. Edinb., 1932, XXII, p. 87, and Trans. Highld. Agric. Soc. Scotland, 1937, XLIX, pp. 145-147, fig. 49) are, I believe, the only records since Denny's time.

Genus *TRICHOIPEURUS* Bedford.

Genotype:—*Tricholipeurus aepycerus* Bedford.

8. *Tricholipeurus tibialis* (Piaget).

Trichodectes tibialis Piaget, 1880, Les Pédiculines, p. 399, Pl. XXXII, fig. 6.

? *T. longicornis* Denny (nec Nitzsch), 1842, Monographia Anoplurorum Britanniae, pp. 192-193, Pl. XVII, fig. 8.

Host:—*Dama dama* (L.) (Fallow Deer).

Bagnall (1932, p. 16) recorded this species from fallow deer in Northumberland. According to Piaget (1880) it occurs also on the roe deer (*Capreolus capreolus thotti* Lönnberg).

SIPHUNCULATA.

Family HAEMATOPINIDAE.

Genus *ENDERLEINELLUS* Fahrenholz.

Genotype:—*E. nitzschi* Fahrenholz.

1. *Enderleinellus nitzschi* Fahrenholz.

Pediculus sphaerocephalus Nitzsch, 1818 (nec Olfers, 1816), Germar's Magazin der Ent., III, p. 305.

Enderleinellus nitzschi Fahrenholz, 1916, Arch. Naturgesch., Abt. A, LXXXI, p. 29.

E. nitzschi Fahrenholz, Ferris, 1919, Contrib. toward a Mon. Sucking Lice, I, pp. 8-11, figs. 1, 2.

Host:—*Sciurus vulgaris leucourus* Kerr. (Red Squirrel).

This species has not positively been placed on the British

list, but Evans (1913, p. 94) recorded it as *Polyplax sphaerocephalus* (Burm.) from a squirrel. Unfortunately he did not keep the specimens and could not be absolutely certain of the identification.

2. *Enderleinellus longiceps* Kellogg and Ferris.

Enderleinellus longiceps Kellogg and Ferris, 1915, Leland Stanford Jr. Univ. Publ., Univ. Ser., Stanford Univ., California, pp. 44-46, Pl. II, fig. 5; Pl. IV, fig. 12; Pl. VI, fig. 2.

E. longiceps Kellogg and Ferris, Ferris, 1919, Contrib. toward a Mon. Sucking Lice, I, pp. 19-22, figs. 9, 10.

Host:—*Sciurus carolinensis* Gmelin (Grey Squirrel).

Originally described from specimens collected from 'Gray Squirrel' in Nebraska, U.S.A., it was first recorded from a British example of the grey squirrel by Britten (1933, p. 34). Also recorded by me (Thompson, 1935, p. 214) from a grey squirrel collected in Surrey.

Genus *HOPLOPLEURA* Enderlein.

Genotype:—*Hoplopleura acanthopus* (Burm.).

3. *Hoplopleura acanthopus* (Burm.).

Pediculus acanthopus Burmeister, 1838, Genera Insectorum, Rhynchota, No. 5, [Pl. I], fig. 2.

Haematopinus acanthopus (Burm.), Denny, 1842, Monographia Anoplurorum Britanniae, pp. 25-26, Pl. XXIV, fig. 3.

Hoplopleura acanthopus (Burm.), Ferris, 1921, Contrib. toward a Mon. Sucking Lice, II, pp. 63-67, figs. 34, 35.

Host:—*Microtus agrestis hirtus* (Bellamy) (Short-tailed Vole).

This distinctive species was first recorded from the British Isles by Denny (1842) and subsequently by Bagnall (1930, p. 106), Elton (1931, p. 710) and Britten (1932, p. 23).

4. *Hoplopleura affinis* (Burm.).

Pediculus affinis Burmeister, 1838, Genera Insectorum, Rhynchota, No. 10.

Hoplopleura affinis (Burm.), Ferris, 1921, Contrib. toward a Mon. Sucking Lice, II, pp. 75-79, figs. 42, 43.

Host:—*Apodemus sylvaticus sylvaticus* (L.) (Long-tailed Field Mouse).

Bagnall's record (1930, p. 105) seems to be the only British record of this species.

5. *Hoplopleura longula* (Neumann).

Haematopinus (Polyplax) longulus Neumann, 1909, Arch. Parasit., Paris, XIII, pp. 513-515, figs. 15-17.

Hoplopleura longula (Neumann), Ferris, 1921, Contrib. toward a Mon. Sucking Lice, II, pp. 68-70, figs. 36, 37.

Host:—*Micromys minutus soricinus* (Hermann) (Harvest Mouse).

This species was originally described on the basis of specimens obtained from a harvest mouse at Colchester, Essex. This is the only record.

6. *Hoplopleura sciuricola* Ferris.

Hoplopleura sciuricola Ferris, 1921, Contrib. toward a Mon. Sucking Lice, II, pp. 110-112, figs. 69, 70.

Host:—*Sciurus carolinensis* Gmelin.

In 1935 I recorded this parasite for the first time from a British specimen of the grey squirrel (see Thompson, 1935, p. 214).

Genus *POLYPLAX* Enderlein.

Genotype:—*P. spinulosa* (Burm.).

7. *Polyplax spinulosa* (Burm.).

Pediculus spinulosus Burmeister, 1838, Genera Insectorum, Rhynchota, No. 8.

Haematopinus spinulosus (Burm.), Denny, 1842, Monographia Anoplurorum Britanniae, p. 26, Pl. XXIV, f. 5.

Polyplax spinulosa (Burm.), Ferris, 1923, Contrib. toward a Mon. Sucking Lice, IV, pp. 187-191, figs. 119, 120A, 120D, 120F, 120H.

Pediculus spiniger Burmeister, 1839, Genera Insectorum, Rhynchota, No. 9.

Haematopinus spiniger (Burm.), Denny, 1842, Monographia Anoplurorum Britanniae, p. 27, Pl. XXIV, f. 6.

Polyplax spiniger (Burm.), Ferris, 1923, Contrib. toward a Mon. Sucking Lice, IV, p. 193.

Hosts:—*Rattus rattus* (L.), *R. norvegicus* (Erxleben), *Arvicola a. amphibius* (L.).

This species is the common parasite of the rats and has been recorded by Denny (1842), Evans (1913, pp. 93-94), Bagnall (1930, p. 105) and Britten (1932, p. 23). It was recorded from *Apodemus s. sylvaticus* (L.) by Ferris (1923, p. 188) on the basis of specimens collected by Waterston, but I do not think it is a true parasite of this host. Denny (1842) and Bagnall (1930, p. 106, and 1932, p. 45) have recorded a parasite as *P. spiniger*

(Burm.) from the water vole, but according to Ferris this species is the same as *P. spinulosa* (Burm.).

8. *Polyplax serrata* (Burm.).

Pediculus serratus Burmeister, 1838, Genera Insectorum, Rhynchota, No. 6.

Polyplax serrata (Burm.), Ferris, 1923, Contrib. toward a Mon. Sucking Lice, IV, pp. 191-192, figs. 120B, 120E.

Hosts:—*Mus musculus* L., *Apodemus s. sylvaticus* (L.), *Apodemus h. hebridensis* (de Winton).

Recorded by Evans (1913, p. 94), Bagnall (1930, p. 105), Britten (1932, p. 23) and Ferris (1923, p. 191) from the house mouse. Ferris (1923, p. 191) and Elton (1931, p. 709) recorded it from *Apodemus s. sylvaticus* (L.). Elton (1936, p. 32) recorded it from the Hebridean mouse.

Genus *NEOHAEMATOPINUS* Mjöberg.

Genotype:—*N. sciuropteri* (Osborn).

9. *Neohaematopinus sciurinus* (Mjöberg).

Acanthopinus sciurinus Mjöberg, 1910, Ark. Zool., VI (13), pp. 161-164, figs. 80-83.

Neohaematopinus sciurinus (Mjöberg), Ferris, 1923, Contrib. toward a Mon. Sucking Lice, IV, pp. 243-248, figs. 155, 158, 159.

Host:—*Sciurus carolinensis* Gmelin.

This species was added to the British list by me (Thompson, 1934, p. 135) and subsequently recorded by me (1935, p. 214).

Genus *HAEMODIPSUS* Enderlein.

Genotype:—*H. lyriocephalus* (Burm.).

10. *Haemodipsus lyriocephalus* (Burm.).

Pediculus lyriocephalus Burmeister, 1838, Genera Insectorum, Rhynchota, No. 11, [Pl. 2], f. 7.

Haematopinus lyriocephalus (Burm.), Denny, 1842, Monographia Anoplurorum Britanniae, pp. 27-28, Pl. XXIV, f. 4.

Haemodipsus lyriocephalus (Burm.), Ferris, 1932, Contrib. toward a Mon. Sucking Lice, V, pp. 330-332, figs. 202, 203.

Host:—*Lepus europaeus occidentalis* de Winton (Brown Hare).

This louse is the specific parasite of the hares. It appears only to have been recorded by Denny (1842), who did not state the host species or locality, and by Evans (1913, p. 94) and

Bagnall (1930, p. 106). Presumably the same species will be found on the Irish and Scottish mountain or blue hare.

11. *Haemodipsus ventricosus* (Denny).

Haematopinus ventricosus Denny, 1842, Monographia Anoplurorum Britanniae, pp. 30-31, Pl. XXV, fig. 6.

Haemodipsus ventricosus (Denny), Ferris, 1932, Contrib. toward a Mon. Sucking Lice, V, pp. 332-335, figs. 204, 205A, C, D, F, G.

Host:—*Oryctolagus cuniculus* (L.).

The original description of this species by Denny was presumably based on specimens obtained from a rabbit in the British Isles. The species has since been recorded by Evans (1913, p. 94), Bagnall (1930, p. 106) and Britten (1933, p. 35). In my own experience it is not common on rabbits.

Family ECHINOPHTHIRIDAE.

Genus *ECHINOPHTHIRUS* Giebel.

Genotype:—*E. horridus* (Olfers).

12. *Echinophthirius horridus* (Olfers).

Pediculus horridus Olfers, 1816, De vegetativis et animatis corporibus in corporibus animatis reperiundis commentarius, Part I, p. 84.

P. phocae Lucas, 1834, Guerin's Mag. de Zool., IV, Cl. IX, Pl. C [=CXXI], fig. 12.

Echinophthirius phocae (Lucas), Evans, 1913, Proc. R. phys. Soc. Edinb., XIX, p. 95, fig.

E. horridus (Olfers), Ferris, 1934, Contrib. towards a Mon. Sucking Lice, VII, pp. 476-480, figs. 277, 278.

Host:—*Phoca vitulina* L. (Common Seal).

This interesting parasite, which often occurs in great numbers on its host, has been recorded by Evans (1913) and Waterston (1913, p. 113).

DIPTERA

Family HIPPOBOSCIDAE.

Genus *HIPPOBOSCA* Linnaeus.

Genotype:—*Hippobosca equina* Linn.

1. *Hippobosca equina* Linn.

Hippobosca equina Linn., 1758, Systema Naturae, 10th Ed., I, p. 607.

H. equina Linn., Roberts, 1925, Ann. Trop. Med. Parasit., XIX, pp. 81-90.

H. equina Linn., Roberts, 1927, Ann. Trop. Med. Parasit., XXI, pp. 11-26, Pls. III, IV.

H. equina Linn., Bequaert, 1930, Psyche, Camb. Mass., XXXVII, pp. 310-313.

This is the well-known 'forest-fly' of the New Forest. In the British Isles the fly is only found in numbers in the New Forest, Hampshire, and in the sheltered valleys of S. Carnarvonshire and N. Merionethshire in N. Wales. It is usually found on horses (the 'wild' horses of the New Forest), but sometimes occurs on cattle. It has been recorded on a number of occasions, but I do not propose to cite the references here, as it cannot really be considered as a parasite of our wild mammals.

2. *Lipoptena cervi* (Linn.).

Pediculus cervi Linn., 1758, Systema Naturae, 10th Ed., I. p. 611.

Haemobora pallipes Curtis, 1824, British Entomology, VIII, Pl. XIV.

Lipoptena cervi (Linn.), Bequaert, 1937, Bull. Brooklyn ent. Soc., XXXII, pp. 94-98.

Hosts:—*Cervus elaphus scoticus* Lönnberg, *Dama dama* (L.), *Capreolus capreolus thotti* Lönnberg.

The deer ked, as this parasite is often called, occurs on all the three species of deer found in this country. It has been recorded on numerous occasions and among the records the following may be cited:—Waterston (1910, p. 49), Cameron (1932, pp. 87-88, and 1937, pp. 33-35) and Thompson (1936, pp. 76-77). Curtis' description of *Haemobora pallipes* was based on a winged male of *L. cervi* (Linn.). The winged forms are not often seen.

COLEOPTERA.

Family LEPTINIDAE.

Genus LEPTINUS.

Genotype:—*Leptinus testaceus* Müll.

1. *Leptinus testaceus* Müller.

Leptinus testaceus Müller, 1817, in Germar's Mag. ent., II, p. 266 (sp. 268).

Leptinus testaceus Müller, Fowler, 1889, Coleoptera of the British Isles, III, p. 9.

Hosts:—Muridae.

This tiny beetle is included, as it seems almost certain that it is a true parasite.

SIPHONAPTERA.

Family PULICIDAE.

Genus XENOPSYLLA Glinkiewicz.

Genotype:—*Xenopsylla cheopis* (Roths.).

1. *Xenopsylla cheopis* (Roths.).

Pulex cheopis Rothschild, 1903, Ent. mon. Mag., XXXIX, p. 85, Pl. I, figs. 3, 9, Pl. II, figs. 12, 19.

Xenopsylla cheopis (Rothschild), 1915, Ent. mon. Mag., LI, p. 54, figs. 1, 9, 12.

Hosts:—*Rattus rattus* (L.), *Rattus norvegicus* (Erxleben).

According to Jordan and Rothschild the true home of this species is in all probability the Nile Valley. It has only been recorded on rare occasions from rats collected at seaports and on one occasion from rats at Guy's Hospital. See Rothschild (1905, p. 139; 1911, pp. 68 and 113), Matheson (1927), Walsh (1938, p. 185) and Mayfield (1938).

Genus ARCHAEOPSYLLA Dampf.

Genotype:—*Archaeopsylla erinacei* (Bouché).

2. *Archaeopsylla erinacei* (Bouché).

Pulex erinacei Bouché, 1835, Nova Acta Leop. Carol., XVII, 1, p. 507.

Archaeopsylla erinacei (Bouché), Rothschild, 1915, Ent. mon. Mag., LI, pp. 55-56, fig. 3.

Host:—*Erinaceus europaeus* L. (Hedgehog).

This flea is the specific parasite of the hedgehog and usually occurs in very large numbers on this host. It has occasionally been recorded from other hosts (e.g. fox and rats), but these are accidental occurrences. For records see Evans (1904, p. 193), Waterston (1914, p. 90), Bagnall (1921, p. 191), Jeffery (1922, p. 124), Thompson (1935, p. 215) and Walsh (1938, p. 185).

Genus SPILOPSYLLUS Baker.

Genotype:—*Spilopsyllus cuniculi* (Dale).

3. *Spilopsyllus cuniculi* (Dale).

Pulex cuniculi Dale, 1878, Hist. Glanvilles Woot., p. 291, No. 10.

Spilopsyllus cuniculi (Dale), Rothschild, 1915, Ent. mon. Mag., LI, pp. 57-58, fig. 6.

Hosts:—*Oryctolagus cuniculus* (L.), *Lepus europaeus occidentalis* de Winton, *Lepus timidus scoticus* Hilzheimer.

This flea is the specific parasite of the Leporidae. It is very common on rabbits, but rarer on hares. Wild cats and foxes have been listed as hosts of this flea, but its occurrence on these hosts must be regarded as accidental. For records see Evans (1904, p. 194; 1906, p. 212), Malloch (1907, p. 86), Waterston (1914, p. 90), Bagnall (1921, p. 191), Jeffery (1922, p. 124), Thompson (1936, p. 76) and Walsh (1938, p. 185).

Family CERATOPHYLLIDAE.

Genus *MALARAEUS* Jordan.

Genotype:—*Malareus telchinum* (Roths.).

4. *Malareus penicilliger* (Grube).

Pulex penicilliger Grube, 1852, Middend. Sibir. Reise., II, 1, p. 500, Pl. XXXII, f. 9.

Ceratophyllus penicilliger (Grube), Rothschild, 1915, Ent. mon. Mag., LI, pp. 74-75, figs. 49, 50.

Malareus penicilliger (Grube), Jordan, 1933, Novit. Zool., XXXIX, p. 76.

Hosts:—*Clethrionomys glareolus britannicus* (Miller), *Microtus agrestis hirtus* (Bellamy), *Apodemus s. sylvaticus* (L.).

A common species which has been recorded on numerous occasions. It is, according to the available data, a common parasite of the three hosts listed above. It has also been recorded from *Talpa europaea* L., *Sorex araneus castaneus* Jenyns, *Muscardinus avellanarius* (L.), *Clethrionomys skomerensis* (Barrett-Hamilton), *Microtus agrestis neglectus* (Thompson), *M. orcadensis orcadensis* Millais, *M. orcadensis sandayensis* Millais, *Rattus rattus* (L.) and *Mus musculus* L. It would appear that this flea is a parasite of Muridae (*i.e.* voles and mice). For records see Evans (1906, p. 212), Waterston (1906, p. 212; 1909, p. 227; 1914, p. 160), Dunlop (1908, p. 19), Jeffery (1922, p. 123), Hallett (1930, p. 73), Elton (1931, p. 706), Davis (1934, pp. 97-98), Britten (1934, p. 258) and Walsh (1938, p. 186).

Genus *NOSOPSYLLUS*.

Genotype:—*Nosopsyllus fasciatus* Bosc.

5. *Nosopsyllus fasciatus* (Bosc).

Pulex fasciatus Bosc., 1800, Bull. Sci. Soc. Philom., II, No. 44, p. 156.

Ceratophyllus fasciatus (Bosc), Rothschild, 1915, Ent. mon. Mag., LI, p. 73, figs. 40, 41, 43, 44.

Nosopsyllus fasciatus (Bosc), Jordan, 1933, Novit. Zool., XXXIX, p. 76.

Hosts:—*Clethrionomys glareolus britannicus* (Miller), *Microtus agrestis hirtus* (Bellamy), *Apodemus s. sylvaticus* (L.), *Rattus* spp., *Mus musculus* L.

This common species has a wide distribution. Originally considered to be the true parasite of *Rattus* spp. and the house mouse, it appears from the records to occur very commonly on the bank vole, Hebridean vole and the long-tailed field mouse. It has also been recorded on occasions from the weasel and the stoat, but I think these are accidental occurrences. For records see Rothschild (1903, p. 65; 1911, p. 113), Evans (1904, p. 194), Waterston (1906, p. 212; 1909, p. 227; 1914, p. 91), Strickland and Merriman (1912-1913, p. 8), Nuttall and Strickland (1912-1913, p. 18), Jeffery (1922, p. 123), Bagnall (1921, p. 194), Elton (1934, p. 108), Thompson (1935, p. 215) and Walsh (1938, p. 186).

6. *Nosopsyllus londiniensis* (Rothschild).

Ceratophyllus londiniensis Roths., 1903, Ent. Rec., XV, pp. 64-65, pl. 3.

C. londiniensis Roths., 1915, Ent. mon. Mag., LI, p. 73, figs. 45, 46.

Nosopsyllus londiniensis (Roths.), Jordan, 1933, Novit. Zool., XXXIX, p. 77.

Host:—*Mus musculus* L., *Rattus* spp.

This is a rare species of Mediterranean origin according to Rothschild. It has only been recorded by Rothschild (1903, p. 65), Britten (1932, p. 23), Matheson (1927). Britten's record is of interest, since he found it among some parasites collected from *Apodemus s. sylvaticus* L. near Preston.

Genus *MEGABOTHRIS* Jordan.

Genotype:—*Megabothris walkeri* (Roths.).

7. *Megabothris walkeri* (Roths.).

Ceratophyllus walkeri Rothschild, 1902, Ent. mon. Mag. XXXVIII, p. 225, Pl. IV, figs. 4, 5, 7.

C. walkeri Roths., 1915, Ent. mon. Mag., LI, pp. 75-76, figs. 51, 52.

Megabothris walkeri (Roths.), Jordan, 1933, Novit. Zool., XXXIX, p. 77.

Hosts:—*Clethrionomys glareolus britannicus* (Miller), *Microtus agrestis hirtus* (Bellamy).

This is a common species and apparently a parasite of 'wild' Muridae. It has been recorded on occasions from the mole, common shrew, water vole, Scottish short-tailed vole,

long-tailed field mouse, rats, house mouse, stoat and weasel, but more commonly from the two hosts mentioned above. I cannot agree with Rothschild, who said that the stoat and weasel were its chief hosts. For records see Evans (1906, p. 241), Waterston (1909, p. 22; 1914, p. 160), Strickland and Merriman (1912-1913, p. 13), Bagnall (1921, p. 195), Jeffery (1922, p. 123), Elton (1931, p. 706), Britten (1934, p. 258), Davis (1934, p. 98) and Walsh (1938, p. 186).

8. *Megabothris turbidus* (Rothschild).

Ceratophyllus turbidus Rothschild, 1909, Novit. Zool., XVI, pp. 59-60, Pl. IX, f. 70.

C. mustelae Rothschild (*nec* Dale), 1915, Ent. mon. Mag., LI, p. 76, figs. 53, 54.

C. turbidus Roths., 1920, Ectoparasites, p. 77, fig. 74.

Megabothris turbidus (Roths.), Jordan, 1933, Novit. Zool., XXXIX, p. 77.

Hosts:—*Clethrionomys glareolus britannicus* (Miller), *Clethrionomys skomerensis* (Barrett-Hamilton), *Microtus agrestis neglectus* (Thompson), *Microtus a. hirtus* (Bellamy), *M. o. orcadensis* Millais, *Apodemus s. sylvaticus* (L.).

This species seems also to be a parasite of the 'wild' Muridae. It has been recorded on a few occasions from rats and house mice. (There are records of this species having been taken from the stoat, but I do not think they have been published.) For records see Evans (1906, p. 119), Strickland and Merriman (1912-13, p. 12), Bagnall (1921, p. 195), Jeffery (1922, p. 123), Hallett (1930, p. 73), Elton (1931, p. 706) and Davis (1934, p. 98).

9. *Megabothris rectangulatus* (Wahlgren).

Ceratophyllus rectangulatus Wahlgren, 1903, Ark. Zool., I, p. 182, Pl. VIII, f. 7.

C. rectangulatus Wahlgren, Jordan, 1932, Novit. Zool., XXXVIII, p. 256, fig. 12.

Megabothris rectangulatus (Wahlgren), Jordan, 1933, Novit. Zool., XXXIX, p. 77.

M. rectangulatus (Wahlgren), Rothschild, 1936, Novit. Zool., XXXIX, pp. 270-274, figs. 31, 36.

Host:—*Microtus agrestis neglectus* (Thompson).

Miss M. Rothschild added this species to the British list in 1936 on the basis of specimens obtained by Mr. D. H. S. Davis in Argyllshire. This is the only record to date (Thompson, 1939).

Genus *ORCHOPEAS* Jordan.

Genotype:—*Orchopeas wickhami* (Baker).

10. *Orchopeas wickhami* (Baker).

Ceratophyllus wickhami Baker, 1895, Canad. Ent., XXVII, p. 109.

Orchopeas wickhami (Baker), Jordan, 1933, Novit. Zool., XXXIX, p. 71.

Host:—*Sciurus carolinensis* Gmelin.

Introduced into the British Isles with its host, this species was first recorded by Donisthorpe (1925). It has since been recorded by Britten (1933, p. 35), Sikes (1930, p. 361), and Thompson (1934, p. 135; 1935, p. 215), but is apparently not very common.

Genus *MONOPSYLLUS* Kolenati.

Genotype:—*M. sciurorum* (Schrank).

11. *Monopsyllus sciurorum* (Schrank).

Pulex sciurorum Schrank, 1803, Fauna Boica, III (1), p. 195.

Ceratophyllus sciurorum (Schrank), Rothschild, 1915, Ent. mon. Mag., LI, p. 74, figs. 42, 47, 48.

Monopsyllus sciurorum (Schrank), Jordan, 1933, Novit. Zool., XXXIX, p. 78.

Hosts:—*Sciurus vulgaris leucourus* Kerr, *Sciurus carolinensis* Gmelin.

This species is the common parasite of both the red and grey squirrel, which are its true hosts. It has, however, been taken on a few occasions on the dormouse, stoat, weasel and in the nests of birds such as the woodpecker, buzzard, sparrow hawk and long-eared owl. For records see Evans (1901, p. 92; 1904, p. 194), Waterston (1906, p. 212; 1910, p. 185; 1914, p. 159), Bagnall (1921, p. 194), Jeffery (1922, p. 123), Middleton (1930, p. 828), Sikes (1930, p. 361), Thompson (1934, p. 135; 1935, p. 215) and Walsh (1938, p. 186).

Genus *PARACERAS* Wagner (1916).

Genotype:—*P. melis* (Walker).

12. *Paraceras melis* (Walker).

Pulex melis Walker, 1856, Dipt. Brit., III, p. 5, No. 14.

C. melis (Walker), Rothschild, 1915, Ent. mon. Mag., LI, pp. 76-77, figs. 55-56.

Host:—*Meles meles meles* (L.).

The specific parasite of the badger, this species has not been recorded on many occasions. See Bagnall (1930, p. 9), Hunter (1934, p. 72), Thompson (1934, p. 135; 1935, p. 216) and Walsh (1938, p. 186).

Genus *CTENOPHTHALMUS* Kolenati.

Genotype:—*Ctenophthalmus bisoctodentatus* Kolenati.

13. *Ctenophthalmus bisoctodentatus* Kolenati.

Ctenophthalmus bisoctodentatus Kolenati, 1863, Hor. Soc. ent. Ross., II, p. 35, No. 12, Pl. 2, f. 6.

C. bisoctodentatus Kolenati, Rothschild, 1915, Ent. mon. Mag., LI, p. 78, figs. 60, 61, 68.

Host:—*Talpa europaea* L.

This species appears to be an almost specific parasite of the mole. It has on odd occasions been recorded from other hosts, e.g. common shrew, short-tailed vole, long-tailed field mouse and the brown rat. For records see Rothschild (1900, p. 20), Evans (1906, p. 163), Strickland and Merriman (1912-13, p. 14), Nuttall and Strickland (1912-13, p. 18), Waterston (1914, p. 164), Bagnall (1921, pp. 195-197), Elton (1931, p. 706), Thompson (1935, p. 216) and Walsh (1938, p. 186).

14. *Ctenophthalmus agyrtes nobilis* (Rothschild).

Typhlopsylla agyrtes nobilis Rothschild, 1898, Novit. Zool., V, p. 539.

Ctenophthalmus agyrtes (Heller), Rothschild, 1915, Ent. mon. Mag., LI, p. 78, figs. 57-59.

C. agyrtes celticus Jordan & Rothschild, 1922, Ectoparasites, pp. 282-283.

C. agyrtes nobilis (Roths.), Thompson, 1935, Ent. mon. Mag., LXXI, p. 257.

Hosts:—*Talpa europaea* L., *Sorex araneus castaneus* Jenyns, *Clethrionomys glareolus britannicus* Miller, *Arvicola a. amphibius* (L.), *Microtus agrestis hirtus* (Bellamy), *M. o. orcadensis* Millais, *Apodemus s. sylvaticus* (L.), *A. h. hebridensis* (de Winton).

A very common species occurring on many hosts. It appears to occur on any species of Talpidae, Soricidae and Muridae. It has been recorded from the following hosts in addition to those listed above:—*Neomys fodiens bicolor* (Shaw), *Clethrionomys skomerensis* (Barrett-Hamilton), *Apodemus f. fridariensis* (Kinneer), *A. h. fiolagan* Hinton, *Micromys minutus soricinus* (Hermann), *Rattus norvegicus* (Erxleben) and *Mus musculus* L. For records see Saunders (1891, p. 171), Evans (1906, p. 162),

Strickland and Merriman (1912-13, pp. 11-12), Nuttall and Strickland (1912-13, p. 18), Waterston (1906, pp. 213-214; 1909, p. 228; 1914, pp. 162-163), Malloch (1907, p. 86), Dunlop (1908, p. 19), Evans (1910, p. 184), Bagnall (1921, pp. 195-197), Jeffery (1922, p. 123), Hallett (1930, p. 73), Elton (1931, p. 706), Davis (1934, p. 58), Thompson (1935, p. 216) and Walsh (1938, p. 186).

Genus *RHADINOPSYLLA* Jordan & Rothschild.

Genotype:—*R. masculana* Jordan & Rothschild.

15. *Rhadinopsylla isacanthus* (Roths.).

Typhlopsylla isacanthus Rothschild, 1907, Ent. mon. Mag., XLIII, p. 41, fig. 2.

Rhadinopsylla isacanthus (Rothschild), 1912, Novit. Zool., XIX, p. 367.

R. isacanthus (Roths.), 1915, Ent. mon. Mag., LI, p. 79, figs. 62, 64.

Hosts:—*Talpa europaea* L., *Clethrionomys glareolus britannicus* (Miller).

A rare species which has only been recorded from the two hosts listed above, and on one occasion from a house mouse.

16. *Rhadinopsylla pentacanthus* (Roths.).

Typhlopsylla pentacanthus Rothschild, 1897, Ent. Rec., IX, p. 55.

T. pentacanthus Roth., 1898, Novit. Zool., V, p. 541, Pl. XVa, fig. 3.

Rhadinopsylla pentacanthus (Roths.), 1912, Novit. Zool., XIX, p. 367.

R. pentacanthus (Roths.), 1915, Ent. mon. Mag., LI, pp. 79-80, figs. 63, 65, 69.

Hosts:—*Clethrionomys glareolus britannicus* (Miller), *Microtus agrestis hirtus* (Bellamy), *Apodemus s. sylvaticus* (L.).

This species is much commoner than the previous species. I cannot agree with Rothschild's statement that the chief host of this flea is the weasel. I would suggest that its occurrence on this host is accidental. Apart from the hosts listed above it has been found on the mole, Skomer vole, brown rat, weasel and stoat. For records see Rothschild (1898, p. 541), Evans (1906, p. 163), Waterston (1906, p. 214; 1914, p. 164), Strickland and Merriman (1912-13, p. 13), Bagnall (1921, pp. 195-197), Jeffery (1922, p. 123), Hallett (1930, p. 73), Elton (1931, p. 706), Davis (1934, pp. 97-98) and Walsh (1938, p. 186).

Genus *DORATOPSYLLA* Jordan & Rothschild.

Genotype:—*Doratopsylla dasyncnemus* (Roths.).

17. *Doratopsyllus dasyncnemus* (Roths.).

Typhlopsylla dasyncnemus Rothschild, 1897, Ent. Rec., IX, p. 159.

T. dasyncnemus Roth., 1898, Novit. Zool., V, p. 540-541, Pl. XVA, figs. 4, 5.

Doratopsylla dasyncnemus (Roths.), 1912, Novit. Zool., XIX, p. 62.

D. dasyncnemus (Roths.), 1915, Ent. mon. Mag., LI, p. 80, figs. 66, 67.

Host:—*Sorex araneus castaneus* Jenyns.

The common shrew seems to be the host of this species. It has, however, been recorded from the mole, pigmy shrew, bank vole, Skomer vole, short-tailed vole, long-tailed field mouse and Hebridean mouse on rare occasions. For records see Waterston (1906, p. 214; 1914, p. 164), Bagnall (1921, pp. 195-197), Jeffery (1922, p. 123), Hallett (1930, p. 73) and Elton (1931, p. 706).

Genus *PALAEOPSYLLA* Wagner.

Genotype:—*P. similis* Dampf.

18. *Palaeopsylla sorecis* (Dale).

Ceratophyllus sorecis Dale, 1878, Hist. Glanvilles Woot., p. 291, No. 6.

C. sorecis Dale, Roth., 1903, Ent. mon. Mag., XXXIX, p. 145.

Palaeopsylla sorecis (Dale), Dampf, 1911, Zool. Jahrb., Suppl., XII, p. 620, figs. c, d.

P. sorecis (Dale), Roth., 1915, Ent. mon. Mag., LI, p. 81, figs. 73, 74, 75.

Host:—*Sorex araneus castaneus* Jenyns.

This species seems also to be a true parasite of the common shrew. It has been recorded on odd occasions from the pigmy shrew, water shrew, bank vole, long-tailed field mouse and the brown rat. For records see Waterston (1906, p. 214; 1914, p. 164), Strickland and Merriman (1912-13, p. 15), Bagnall (1921, p. 196), Jeffery (1922, p. 123), Elton (1931, p. 706) and Walsh (1938, p. 186).

19. *Palaeopsylla kohauti* Dampf.

Palaeopsylla kohauti Dampf, 1911, Schrift. Phys.-ök. Ges. Königsb., LI, p. 325, figs. 1, 5c.

P. kohauti Dampf, Roth., 1915, Ent. mon. Mag., LI, p. 81, figs. 76, 77.

Host:—*Talpa europaea* L.

This species seems to be a characteristic parasite of the common mole. It has once been found on the bank vole. For records see Rothschild (1912, p. 67), Waterston (1914, p. 165) and Walsh (1938, p. 186).

20. *Palaeopsylla minor* (Dale).

Ceratophyllus minor Dale, 1878, Hist. Glanvilles Woot., p. 291, No. 7.

Palaeopsylla gracilis Dampf., 1910, Zool. Jahrb., Suppl., XII, p. 623, fig. E; p. 628, fig. J; p. 629, fig. L.

P. minor (Dale), Jordan and Rothschild, 1911, Novit. Zool., XVIII, p. 84.

Host:—*Talpa europaea* L.

Another apparently characteristic parasite of the common mole. It has also been taken on the following hosts, but only on rare occasions: the common shrew, bank vole, long-tailed field mouse, the brown rat, the stoat and the weasel. For records see Evans (1904, p. 194; 1909, p. 120), Strickland and Merriman (1912-13, p. 15), Waterston (1914, p. 165), Bagnall (1921, p. 195), Jeffery (1922, p. 123), Elton (1931, p. 706) and Walsh (1938, p. 186).

Genus *LEPTOPSYLLA* Jordan and Rothschild.

Genotype:—*L. segnis* (Schönh.).

21. *Leptopsylla segnis* (Schönh.).

Pulex segnis Schönherr, 1816, Kon. Vet. Nya Handb., XXXII, p. 98.

P. musculi Dugès, 1832, Ann. Sci. Nat., XXVII, pp. 163-164.

Leptopsylla musculi (Dugès), Jordan and Rothschild, 1911, Novit. Zool., XVIII, p. 85.

L. musculi (Dugès), Roth., 1915, Ent. mon. Mag., LI, p. 82, fig. 80.

Host:—*Mus musculus* L.

This is the true parasite of the house mouse in Europe. In the British Isles it occurs commonly on the house mouse and has also been recorded from the mole, bank vole, long-tailed field mouse, black and brown rat. For records see Saunders (1892, p. 67), Chitty (1893, p. 20), Rothschild (1899, p. 266), Godfrey (1906, p. 119), Evans (1906, p. 163), Waterston (1905,

p 214; 1914, p. 165), Strickland and Merriman (1913, p. 13), Bagnall (1921, pp. 194-197), Jeffery (1922, p. 123), Thompson (1935, p. 216) and Walsh (1938, p. 186).

22. *Leptopsylla spectabilis* (Roths.).

Typhlopsylla spectabilis Rothschild, 1898, Ent. Rec., X, p. 250, fig.

Leptopsylla spectabilis (Roths.), 1915, Ent. mon. Mag., LI, pp. 82-83, fig. 81.

Host:—*Clethrionomys glareolus britannicus* (Miller), *Microtus agrestis hirtus* (Bellamy).

The above-mentioned mammals seem to be the commonest hosts of this fairly common species. It has also been recorded from mole, common shrew, water vole, Hebridean vole, Scottish short-tailed vole, long-tailed field mouse, stoat and grey squirrel. For records see Rothschild (1909, p. 184), Waterston (1914, p. 165), Bagnall (1921, p. 196), Elton (1931, p. 706) and Davis (1934, p. 98).

Genus *TYPHLOCERAS* Wagner.

Genotype:—*T. poppei* Wagner.

23. *Typhloceras poppei* Wagner.

Typhloceras poppei Wagner, 1903, Hor. Soc. ent., Ross., XXXVI, p. 154, fig. 1.

T. poppei Wagner, Rothschild, 1915, Ent. mon. Mag., LI, p. 83, figs. 70, 71, 72.

Host:—*Apodemus s. sylvaticus* (L.).

This interesting parasite seems to be a specific parasite of the long-tailed field mouse, although it has been recorded from the short-tailed vole, Hebridean mouse, black rat and the house mouse. For records see Rothschild (1903, p. 196), Waterston (1914, p. 165), Jeffery (1922, p. 123), Elton (1934, p. 108) and Thompson (1935, p. 216).

Genus *HYSTRICHOPSYLLA* Taschenberg.

Genotype:—*H. talpae* (Curtis).

24. *Hystrichopsylla talpae* (Curtis).

Pulex talpae Curtis, 1826, Brit. Ent., VII, No. 114, fig.

Hystrichopsylla talpae (Curtis), Roths., 1900, Ent. Rec., XII, p. 257, Pl. X.

H. talpae (Curtis), Roths., 1915, Ent. mon. Mag., LI, p. 84, fig. 82.

Hosts:—*Talpa europaea* L., *Sorex araneus castaneus* Jenyns, *Clethrionomys glareolus britannicus* (Miller), *Microtus agrestis neglectus* (Thompson), *Microtus agrestis hirtus* (Bellamy), *Apodemus s. sylvaticus* (L.).

This very large flea is commonly found parasitising the hosts listed above. In addition it has been recorded from the water shrew, Skomer vole, water vole, Orkney vole, house mouse, stoat and weasel. For records see Chitty (1893, p. 20), Evans (1904, p. 194; 1906, p. 163, p. 241; 1909, p. 120), Dunlop (1908, p. 19), Waterston (1909, p. 228; 1910, p. 89; 1914, p. 88), Strickland and Merriman (1913, p. 14), Bagnall (1921, p. 196), Jeffery (1922, p. 123), Elton (1931, p. 706), Britten (1934, p. 259), Davis (1934, p. 98), Thompson (1934, p. 135; 1935, p. 217) and Walsh (1938, p. 186).

HOST-PARASITE LIST.

INSECTIVORA.

TALPIDAE.

Talpa europaea L. (Mole).—*C. bisoctodontatus* Kolenati, *C. agyrtes nobilis* Rothschild, *R. isacanthus* (Rothschild), *P. kohauti* Dampf, *P. minor* (Dale), *H. talpae* (Curtis).

SORICIDAE.

Sorex araneus castaneus Jenyns (Common Shrew).—*C. agyrtes nobilis* Rothschild, *D. dasyncnemus* (Rothschild), *P. sorecis* (Dale), *H. talpae* (Curtis).

ERINACEIDAE.

Erinaceus europaeus L. (Hedgehog).—*A. erinacei* (Bouché).

CARNIVORA.

CANIDAE.

Vulpes vulpes crucigera (Bechstein) (Fox).—*T. vulpis* Denny.

MUSTELIDAE.

Meles meles meles (L.) (Badger).—*T. melis* (Fabricius), *P. melis* (Walker). *Lutra lutra* (L.) (Otter).—*L. exilis* (Nitzsch). *Mustela erminea stabilis* Barrett-Hamilton (Stoat).—*S. retusa* (Nitzsch). *Mustela nivalis nivalis* L. (Weasel).—*S. mustelae* (Schrank).

FELIDAE.

Felis silvestris grampia Miller (Scottish Wild Cat).—*F. subrostrata* (Nitzsch).

PHOCIDAE.

Phoca vitulina L. (Common Seal).—*E. horridus* (Olfers).

RODENTIA.

LEPORIDAE.

Oryctolagus cuniculus (L.) (Rabbit).—*H. ventricosus* (Denny), *S. cuniculi* (Dale).

Lepus europaeus occidentalis de Winton (Brown Hare).—*H. lyriocephalus* (Burm.), *S. cuniculi* (Dale).

Lepus timidus scoticus Hilzheimer (Scottish Mountain or Blue Hare).—*S. cuniculi* (Dale).

MURIDAE.

- Clethrionomys glareolus britannicus* (Miller) (Bank Vole).—*M. penicilliger* (Grube), *N. fasciatus* (Bosc), *M. walkeri* (Rothschild), *M. turbidus* (Rothschild), *C. agyrtes nobilis* Rothschild, *R. isacanthus* (Rothschild), *R. pentacanthus* (Rothschild), *L. spectabilis* (Rothschild), *H. talpae* (Curtis).
- Clethrionomys skomerensis* (Barrett-Hamilton) (Skomer Vole).—*M. penicilliger* (Grube), *M. turbidus* (Rothschild), *C. agyrtes nobilis* (Rothschild), *R. pentacanthus* (Rothschild), *D. dasyacnemus* (Rothschild), *H. talpae* (Curtis).
- Arvicola amphibius amphibius* (L.) (Water Vole).—*P. spinulosa* (Burm.), *C. agyrtes nobilis* Rothschild.
- Microtus agrestis neglectus* (Thompson) (Scottish short-tailed Vole).—*M. turbidus* (Rothschild), *M. rectangulatus* (Wahlgren), *H. talpae* (Curtis).
- Microtus agrestis hirtus* (Bellamy) (Short-tailed Vole).—*H. acanthopus* (Burmeister), *M. penicilliger* (Grube), *N. fasciatus* (Bosc), *M. turbidus* (Rothschild), *C. agyrtes nobilis* (Rothschild), *R. pentacanthus* (Rothschild), *L. spectabilis* (Rothschild), *H. talpae* (Curtis).
- Microtus orcadensis orcadensis* Millais (Orkney Vole).—*M. penicilliger* (Grube), *M. turbidum* (Rothschild), *C. agyrtes nobilis* (Rothschild), *H. talpae* (Curtis).
- Microtus orcadensis sandayensis* Millais (Sanday Vole).—*M. penicilliger* (Grube).
- Apodemus sylvaticus sylvaticus* (L.) (Long-tailed Field-Mouse).—*H. affinis* (Burmeister), *P. serrata* (Burmeister), *M. penicilliger* (Grube), *N. fasciatus* (Bosc), *M. turbidus* (Rothschild), *C. agyrtes nobilis* Rothschild, *R. pentacanthus* (Rothschild), *T. poppei* Wagner, *H. talpae* (Curtis).
- Apodemus hebridensis hebridensis* (de Winton) (Hebridean Mouse).—*P. serrata* (Burmeister), *C. agyrtes nobilis* Rothschild.
- Apodemus hebridensis fiolagan* Hinton (Arran Mouse).—*C. agyrtes nobilis* Rothschild.
- Apodemus fridariensis fridariensis* (Kinnear) (Fair Isle Mouse).—*N. fasciatus* (Bosc), *C. agyrtes nobilis* Rothschild.
- Micromys minutus soricinus* (Hermann) (Harvest Mouse).—*H. longula* Neumann, *C. agyrtes nobilis* Rothschild.
- Rattus rattus* (L.) (Black Rat).—*P. spinulosus* (Burmeister), *X. cheopis* (Rothschild), *N. fasciatus* (Bosc), *N. londiniensis* (Rothschild).
- Rattus norvegicus* (Erxleben) (Brown Rat).—*P. spinulosa* (Burmeister), *X. cheopis* (Rothschild), *N. fasciatus* (Bosc), *N. londiniensis* (Rothschild).
- Mus musculus* (L.) (House Mouse).—*P. serrata* (Burmeister), *N. fasciatus* (Bosc.), *N. londiniensis* (Rothschild), *L. segnis* (Schönh.).

SCIURIDAE.

- Sciurus vulgaris leucourus* Kerr (Red Squirrel).—*E. nitzschi* Fahrenholz, *M. sciurorum* (Schränk).
- Sciurus carolinensis* Gmelin.—*E. longiceps* Kellogg & Ferris, *N. sciurinus* (Mjöberg), *H. sciuricola* Ferris, *O. wickhami* (Baker), *M. sciurorum* (Schränk).

UNGULATA.

CERVIDAE.

- Cervus elaphus scoticus* Lönnberg (Red Deer).—*R. longicornis* (Nitzsch), *L. cervi* (Linn.).
- Dama dama* (L.) (Fallow Deer).—*T. tibialis* (Piaget), *L. cervi* (Linn.).
- Capreolus capreolus thotti* Lönnberg (Roe Deer).—*L. cervi* (Linn.).