

## A Synoptic Check-List and Host-List of the Ectoparasites found on South African Mammalia, Aves, and Reptilia. (Supplement No. 1.)

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### INTRODUCTION.

It has been considered advisable to bring the Synoptic Check-list of the Ectoparasites found on South African Mammalia, Aves and Reptilia, published in the 18th Report of the Director of Veterinary Services and Animal Industry, Union of South Africa, 1932, up to date by publishing supplements from time to time as necessity warrants, and this is the first of the series.

Not only is a number of new records reported upon in this paper, but it has also been found necessary to make alterations to the synonymy of a number of species.

References to the original check-list are recorded in this paper as follows:—

Bedford, *S. Afr. Ectoparasites*, p. ... (1932).

**Order ACARINA.**

**Suborder ASTIGMATA.**

Family ANALGESIDAE.

Genus PTEROLICHUS Robin.

*Pterolichus* Bedford, *S. Afr. Ectoparasites*, p. 244 (1932).

**Pterolichus ardeae** (Canestrini).

*Dermaleichus ardeae* Canes., *Atti Real. Ist. Veneto Sci., Lett. ed Art.* (5), V, p. 51 (1878).

*Pterolichus* (*Eupterolichus*) *ardeae* (Canes.) Canestrini & Kramer, *Demod. und Sarc.*, p. 41 (1899).

Recorded from *Botaurus stellaris* (Bittern) and other species of Ardeidae.

**Pterolichus buchholzi** (Canestrini). See *Ptiloxenus buchholzi* (Canestrini).

**Pterolichus buchholzi fascigera** Mégnin & Trouessart. See *Ptiloxenus fascigera* (Mégnin & Trouessart).

**Pterolichus columbi major** Mégnin & Trouessart. See *Ptiloxenus major* (Mégnin & Trouessart).

**Pterolichus nisi** (Canestrini). See *Gabucinia nisi* (Canes.).

**Pterolichus numenii** (Canestrini). See *Avenzoaria numenii* (Canes.).

**Pterolichus prozanae** (Canestrini). See *Grallobia porzanae* (Canes.).

**Pterolichus rallorum** Robin. See *Grallobia rallorum* (Canes.).

**Pterolichus rehbergi gracilis** Mégnin & Trouessart. See *Ptiloxenus rehbergi gracilis* (Mégnin & Trouessart).

**Pterolichus squatarolae** (Canestrini). See *Avenzoaria squatarolae* (Canes.).

Genus AVENZOARIA Oudemans.

**Avenzoaria** Bedford, *S. Afr. Ectoparasites*, p. 248 (1932).

**Avenzoaria numenii** (Canestrini).

*Pterolichus numenii* (Canes.) Bedford, *S. Afr. Ectoparasites*, p. 246 (1932).

Described from specimen taken off *Phaeopus phaeopus* (Whimbrel).

**Avenzoaria ochropodus** Hull.

*Avenzoaria ochropodus* Hull, *Trans. Northern Nat. Union*, p. 206, f. 1-3 (1934).

Described from specimens taken off Green Sandpiper, *Tringa erythropus* Vroeg. = *Totanus ochropus* L.

**Avenzoaria squatarolae** (Canestrini).

*Pterolichus squatarolae* (Canes.) Bedford, *S. Afr. Ectoparasites*, p. 248 (1932).

Described from specimens taken off Grey Plover, *Squatarola squatarola*.

**Avenzoaria totani** (Canestrini).

*Avenzoaria totani* (Canes.) Bedford, *S. Afr. Ectoparasites*, p. 250 (1932).

*Additional records*: Hull (1934) records this species from *Crocethia alba* (Sanderling), and specimens have been taken off *Rhyacophilus glareola* (Wood Sandpiper) at Onderstepoort (coll. G.A.H.B.: det. C. D. Radford).

Genus **PTILOXENUS** Hull.

*Ptiloxenus* Hull, Trans. Northern Nat. Union, p. 202 (1934).

*Genotype*: *Pterolichus major* Mégnin and Trouessart.

**Ptiloxenus buchholzi** (Canestrini).

*Pterolichus buchholzi* (Canes.) Bedford, *S. Afr. Ectoparasites*, p. 244 (1932).

Recorded taken off *Squatarola squatarola* (Grey Plover) and *Limosa limosa* (Black-tailed Godwit).

**Ptiloxenus fasciger** (Mégnin & Trouessart).

*Pterolichus buchholzi fascigera* Mégnin & Trouessart, Bedford, *S. Afr. Ectoparasite*, p. 245 (1932).

Recorded taken off *Arenaria interpres* (Trunstone), *Totanus totanus* (Redshank) and *Calidris canutus* (Knot).

**Ptiloxenus major** (Mégnin & Trouessart).

*Pterolichus columbi major* Mégn. & Trt., Bedford, *S. Afr. Ectoparasites*, p. 245 (1932).

Recorded taken off crested grebe, *Podiceps infuscata* (= *P. cristata*).

**Ptiloxenus rehbergi gracilis** (Mégnin & Trouessart).

**Pterolichus rehbergi gracilis** Mégn. & Trt., Bedford, *S. Afr. Ectoparasites*, p. 247 (1932).

Described from specimens taken off *Himantopus himantopus* (Black-winged Stilt).

**Ptiloxenus vanelli** (Canestrini).

*Dermaleichus vanelli* Canes., *Atti Real. Ist. Venet oSci., Lett. ed Art.* (5), V, p. 62 (1878).

*Proctophyllodes vanelli* Canes., *Atti Soc. Veneto-Trent.*, VI, p. 37, pl. 1, f. 5 (1879).

*Pterolichus* (*Eupterolichus*) *vanelli* (Canes.) Canes. and Kramer, *Demod. und Sarc.*, p. 53 (1899).

Specimens have been taken off Crowned Lapwing, *Stephani-byx coronatus* (Bodd.) at Onderstepoort (coll. G.A.H.B.; det. C. D. Radford). Originally described from specimens taken off European Lapwing, *Vanellus vanellus* (= *V. cristatus*).

CHECK-LIST OF SOUTH AFRICAN ECTOPARASITES.

Genus GRALLOBIA Hull.

*Grallobia* Hull, *Trans. Northern Nat. Union*, p. 202 (1934).

This genus includes four species found on Rallidae.

*Genotype: Dermaleichus porzanae* Canestrini.

**Grallobia porzanae** (Canestrini).

*Pterolichus porzanae* (Canes.) Bedford, *S. Afr. Ectoparasites*, p. 247 (1932).

Described from specimens taken off *Ortygometra porzana* (Spotted Crane).

**Grallobia rallorum** (Robin).

*Pterolichus rallorum* Robin Bedford, *S. Afr. Ectoparasites*, p. 247 (1932).

Described from specimens taken off *Crex crex* (Corn-crake).

Genus GABUCINIA Oudemans.

*Gabucinia* Bedford, *S. Afr. Ectoparasites*, p. 250 (1932).

**Gabucinia nisi** (Canestrini).

*Pterolichus nisi* (Canes.) Bedford, *S. Afr. Ectoparasites*, p. 246 (1932).

Recorded taken off *Pygargus pygargus* (Montagu's Harrier) and *Pervis apivorus* (Honey Buzzard).

Genus EUSTATHIA Oudemans.

*Eustathia* Bedford, *S. Afr. Ectoparasites*, p. 251 (1932).

*Chauliacia* Bedford, *ibid.*, p. 251 (1932).

*Chauliacia* is considered to be a synonym of *Eustathia*. It included a single species—*securiger* Robin—found on *Micropus apus* (European Swift).

Genus HIRSTIA Hull.

*Hirstia* Hull, *The Vasculum*, XVII, iv, p. 145 (1931).

**Hirstia chelidonis** Hull.

*Hirstia chelidonis* Hull, *The Vasculum*, XVII, iv, p. 146 (1931). Described from specimens taken off *Chelidonaria urbana* (Mouse Martin) and *Hirundo rustica* (Swallow).

Genus SYRINGOBIA Trouessart & Neumann.

*Syringobia* Bedford, *S. Afr. Ectoparasites*, p. 255 (1932).

**Syringobia calceata** Trouessart.

*Syringobia calceata* Trt., Bedford, *S. Afr. Ectoparasites*, p. 256 (1932).

Males and females taken off *Thalasseus bergii* (Swift Tern), Swakopmund, South-West Africa (coll. R. D. Bradfield: det. C. D. Radford).

**Syringobia chelopus** Trouessart & Neumann).

*Syringobia chelopus* Trt. & Neu., Bedford, *S. Afr. Ectoparasites*, p. 256 (1932).

Hull (1934) has recorded this species from *Crocethia alba* (Sanderling).

**Syringobia tricalcarata** Trouessart & Neumann.

*Syringobia tricalcarata* Trt. & Neu., *Bull. Sci. France Belgique*, XIX, p. 345 (1888).

*Syringobia tricalcarata* Trt. & Neu., *Canes. and Kramer. Demod. und Sarc.*, p. 74 (1899).

Specimens have been taken off Three-banded Sandplover, *Afroæchus tricollaris* (Vieill.) at Onderstepoort (coll. G.A.H.B.; det. C. D. Radford). Originally described from specimens taken off *Charadrius dubius*.

## Genus PTERONYSSUS Robin.

*Pteronyssus*, Bedford, *S. Afr. Ectoparasites*, p. 258 (1932).

**Pteronyssus gracilipes** Trouessart & Neumann. See *Leptosphyra gracilipes* (Trt. & Neu.).

**Pteronyssus nuntiaeveris** Berlese. See *Pteronyssoides nuntiaeveris* (Berlese).

**Pteronyssus obscurus** Berlese. See *Pteronyssoides obscurus* (Berlese).

**Pteronyssus pallens** Berlese. See *Pteronyssoides pallens* (Berlese).

**Pteronyssus puffini** (Buchholz).

*Giebelia puffini* (Buchh.) Bedford, *S. Afr. Ectoparasites*, p. 257 (1932).

*Additional record*: Specimens have been taken off *Thalasseus bergii* (Swift Tern) at Swakopmund, South-West Africa (coll. R. D. Bradfield; det. C. D. Radford).

**Pteronyssus truncatus** Trouessart. See *Pteronyssoides truncatus* (Trt.).

## Genus PTERONYSSOIDES Hull.

*Pteronyssoides* Hull, *The Vasculum*, XVII, iv, p. 145 (1931).

*Genotype*: *Pteronyssus striatus* Robin.

The following species formally placed in the genus *Pteronyssus* are now included in this genus:—

**Pteronyssoides nuntiaeveris** (Berlese).

*Pteronyssus nuntiaeveris* Berl., Bedford, *S. Afr. Ectoparasites*, p. 258 (1932).

**Pteronyssoides obscurus** (Berlese).

*Pteronyssus obscurus* Berl., Bedford, *ibid.*, p. 258 (1932).

**Pteronyssoides pallens** (Berlese).

*Pteronyssus pallens* Berl., Bedford, *ibid*, p. 258 (1932).

**Pteronyssoides truncatus** (Trouessart).

*Pteronyssus truncatus* Trt., Bedford, *ibid*, p. 258 (1932).

GENUS MÉGNINIA Berlese.

*Mégninia* Bedford, *S. Afr. Ectoparasites*, p. 259 (1932).

**Mégninia aestivalis** Berlese. See *Pandalura aestivalis* (Berlese).

**Mégninia aestivialis subintegra** Berlese. See *Pandalura subintegra* (Berlese).

**Mégninia columbae** (Buchholz). See *Diplaegidia columbae* (Buchholz).

GENUS PANDALURA Hull.

*Pandalura* Hull, *Trans. Northern Nat. Union*, p. 203 (1934).

*Genotype*: *Dermaleichus strigisoti* Buchholz.

**Pandalura aestivalis** (Berlese).

*Mégninia aestivalis* (Berl.) Bedford, *S. Afr. Ectoparasites*, p. 259 (1932).

Described from specimens taken off *Micropus apus* (European Swift).

**Pandalura subintegra** (Berlese).

*Mégninia subintegra* (Berl.) Bedford, *S. Afr. Ectoparasites*, p. 259 (1932).

Recorded taken off *Chelidonaria urbica* (House Martin) and *Riparia riparia* (European Sand Martin).

GENUS DIPLAEGIDIA Hull.

*Diplaegidia* Hull, *Trans. Northern Nat. Union*, p. 203 (1934).

*Genotype*: *Dermaleichus columbae* Buchholz.

**Diplaegidia columbae** (Buchholz).

*Mégninia columbae* (Berl.) Bedford, *S. Afr. Ectoparasites*, p. 259 (1932).

Recorded from domestic and other pigeons in Europe.

GENUS LEPTOSPHYRA Hull.

*Leptosphyra* Hull, *Trans. Northern Nat. Union*, p. 203 (1934).

*Genotype*: *Analges centropodus* Mégnin.

**Leptosphyra gracilipes** (Trouessart & Neumann).

*Pteronyssus gracilipes* (Trt. and Neu.), Bedford. *S. Afr. Ectoparasites*, p. 258 (1932).

Described from specimens taken off *Totanus totanus* (Redshank).

## Genus ANALGES Nitzsch.

*Analges* Bedford, *S. Afr. Ectoparasites*, p. 260 (1932).

**Analges bidentatus** Giebel. See *Analgopsis bidentatus* (Giebel).

**Analges bifidus** (Nitzsch). See *Analgopsis bifidus* (Nitzsch).

## Genus ANALGOPHIS Trouessart.

*Analgopsis* Trouessart, *Ann. Mag. Nat. Hist.*, Ser. 9, iv, p. 336 (1919).

*Genotype*: *Acarus passerinus* Linn.

**Analgopsis bidentatus** (Giebel).

*Analges bidentatus* (Giebel), Bedford, *S. Afr. Ectoparasites*, p. 260 (1932).

Recorded taken off the migrant, *Acrocephalus arundinaceus* (Great Reed Warbler), and other Passerines in Europe.

**Analgopsis bifidus** (Nitzsch).

*Analges bifidus* (Nitzsch) Bedford, *S. Afr. Ectoparasites*, p. 261 (1932).

## Genus ALLOPTES Canestrini.

*Alloptes* Bedford, *S. Afr. Ectoparasites*, p. 262 (1932).

**Alloptes lambda** (Trouessart).

*Pterocolus lambda* Trouessart, *Bull. Soc. d'Étud. Sci. Angers*, XIV, p. 72 (1885).

*Alloptes lambda* (Trt.) Canestrini and Kramer, *Demod. und Sarc.*, p. 113 (1899).

Specimens have been taken off *Philomachus pugnax* (Ruff and Reeve) and *Rhyacophilus glareola* (Wood Sandpiper) at Onderstepoort (coll. G.A.H.B.; det. C. D. Radford). Originally described from *Nettapus auritus*, Madagascar.

## Genus PTERODECTES Robin.

*Pterodectes* Bedford, *S. Afr. Ectoparasites*, p. 264 (1932).

**Pterodectes ortygometrae** (Canestrini). See *Brephosceles ortygometrae* (Canes.).

**Pterodectes ortygometrae furciger** (Trouessart). See *Brephosceles furcifer* (Trt.).

## Genus BREPHOSCELES Hull.

*Brephosceles* Hull, *Transv. Northern Nat. Union*, p. 204 (1934).

*Genotype*: *Pterolichus forficiger* Mégnin and Trouessart.

**Brephosceles ortygometrae** (Canestrini).

*Pterodectes ortygometrae* (Canes.) Bedford, *S. Afr. Ectoparasites*, p. 265 (1932).

Recorded taken off *Ortygometra porzana* (Spotted Crake).

**Brephosceles furcifer** (Trouessart).

*Pterodectes furcifer* (Trt.) Bedford, *S. Afr. Ectoparasites*, p. 265 (1932).

Described from specimens taken off *Smutsornis africanus* (Two-banded Courser).

Genus PROCTOPHYLLODES Robin.

*Proctophyllodes* Robin, *Compt. Rend. hebdom, des Séan. Acad. Sci.*, LXVI, p. 786 (1868).

*Genotype: Delmaleichus glandarinus* C. L. Koek.

**Proctophyllodes arcuaticaulis** Trouessart.

*Proctophyllodes arcuaticaulis* Trouessart, *Bull. Soc. d'Étud. sci. Angers*, XVI, p. 148 (1886).

*Proctophyllodes arcuaticaulis* (Trt.) Canes & Kramer. *Demod. und Sarc.*, p. 118 (1899).

Specimens have been taken off S. African Tawny Pipit, *Anthus rugulus raalteni* (Lay.), Onderstepoort (coll. E. C. G. Bedford; det. C. D. Radford).

**Suborder PROSTIGMATA.**

Family PTERYGOSOMIDAE VITZTHUM.

This family includes a number of small mites parasitic on lizards. Lawrence (1935) has recorded 39 species from South Africa parasitic on lizards belonging to the families Geckonidae, Agamidae, Zonuridae, Gerrhosauridae and Lacertidae.

Keys to the species are not included here as Lawrence has given keys in his papers and these should be consulted.

*Key to the South African Genera* (after Lawrence).

- |  |                                     |
|--|-------------------------------------|
| 1. A dorsal scute present ... ..                               | 2                                   |
| A dorsal scute not present ... ..                              | 3                                   |
| 2. Dorsum with few setae, these very long ... ..               | <i>Pimeliaphilus</i> . <sup>1</sup> |
| Dorsum with numerous setae, these shorter ... ..               | <i>Geckobia</i> .                   |
| 3. Apex of hypostome much enlarged, dorsum with few setae      | 4                                   |
| Hypostome subparallel; dorsum with numerous setae ... ..       | 5                                   |
| 4. Body longer than wide, size large, skin leathery            |                                     |
|  | <i>Ixodiderma</i> .                 |
| Body much wider than long, size small, skin not leathery       |                                     |
|  | <i>Scaphothrix</i> .                |
| 5. Dorsum with a dense anterior patch of setae on each side    |                                     |
| of the mouth-parts, eyes absent ... ..                         | <i>Pterygosoma</i> .                |
| 6. Dorsum without a dense anterior patch of setae on each side |                                     |
| of the mouth-parts, eyes present ... ..                        | <i>Zonurobia</i> .                  |

<sup>1</sup> No species has been found in South Africa up to the present, and it is unlikely that they occur in this region.



Genus IXODIDERMA Lawrence.

*Ixodiderma* Lawrence, *Parasitology*, XXVII, i, p. 22 (1935).

This genus includes three species parasitic on Zonuridae and Lacertidae.

*Genotype*: *Ixodiderma inverta* Lawrence.

1. ***Ixodiderma inverta*** Lawrence.

*Ixodiderma inverta* Lawrence, *Parasit.*, XXVII, i, pp. 24-29, t.f. 13-16 (1935).

Described from numerous adults and nymphs taken off *Pseudocordylus subviridis*, Belfast, Transvaal, also from *P. microlepidotus*, Table Mountain; *P. fasciatus*, Katberg, Coetzeesberg, Bedford, Butterworth, Grahamstown, Somerset East (Cape Province); *P. subviridis*, Lydenburg, Woodbush, Ermelo, Carolina, Wakkerstroom (Transvaal), Thaba Putsoa, Maletsunyane Falls (Basutoland), Giants Castle (Natal); *Zonurus coeruleopunctatus*, Montague Pass, George; *Z. polyzonus*, Steinkop, Lamberts Bay, Phillipstown, Cradock (Cape Province); Aus, Krailuft (South-West Africa).

2. ***Ixodiderma lacertae*** Lawrence.

*Ixodiderma lacertae* Lawrence, *Parasit.*, XXVII, i, pp. 29-30, t.f. 17 (1935).

Described from adults and nymphs taken off *Scapteira depressa*, locality unknown; also from *S. suborbitalis*, *S. knoxii* and *Tropidosaura gularis*, localities unknown, and from *Eremias undata*, Luderitzbucht, and *E. inornata*, Narudas Sud (South-West Africa). All the hosts belong to the family Lacertidae.

3. ***Ixodiderma pilosa*** Lawrence.

*Ixodiderma pilosa* Lawrence, *Parasit.*, XXVII, i, p. 30, f. 18 (1935).

Described from adults taken off *Pseudocordylus subviridis*, Drakensberg and Mont-aux-Sources, Basutoland.

Genus SCAPHOTHRIX Lawrence.

*Scaphothrix* Lawrence, *Parasitology*, XXVII, i, p. 20 (1935).

This genus includes a single species parasitic on Zonuridae.

1. ***Scaphothrix convexa*** Lawrence.

*Scaphothrix convexa* Lawrence, *Parasit.*, XXVII, i, pp. 21-22, t.f. 12 (1935).

Described from adults taken off *Zonurus polyzonus*, Vondeling, Cape Province; also from the same host species Kimberley; *Z. peersi*, Garies (Namaqualand) and *Z. cordylus*, Capetown.

Genus PTERYGOSOMA Peters.

*Pterygosoma* Peters, *Sitzber. Ges. Natf. Freunde, Berlin* (1849).

*Eupterygosoma* Trägårdh, *Res. Swed. Zool. Exped. to Egypt and the White Nile*, No. 20, *Acariden*, p. 59 (1905).

*Pterygosoma* Lawrence, *Parasit.*, XXVIII, p. 20 (1936).

This genus includes fifteen species, twelve occurring on South African lizards belonging to the families Agamidae and Gerrhosauridae.

*Genotype*: *Pterygosoma agamae* Peters.

1. ***Pterygosoma aculeatum*** Lawrence.

*Pterygosoma aculeatum* Lawrence, *Parasit.*, XXVIII, p. 25, t.f. 20 (1936).

Described from adults taken off *Agama hispida aculeata*, Strydenburg, Cape Province; also from same host species, Kaotive, Central Kalahari; Kakamas; Kimberley and Fourteen Streams; and from *A. hispida distanti*, Pretoria, and Chishawasha, Rhodesia.

2. ***Pterygosoma agamae*** Peters.

*Pterygosoma agamae* Peters, *Sitzber. Ges. Natf. Freunde*, Berlin (1849); *Hirst. Jour. Linn. Soc. (Zool.)*, XXXVI, p. 194, f. 14 (1926); Lawrence, *Parasit.*, XXVIII, i, p. 25 (1936).

Recorded by Lawrence (1936) from *Agama Kirkii*, Mazoe, Chishawasha and Zimbabwe, Rhodesia; also from *Agama mossambica*, Mozambique.

3. ***Pterygosoma armatum*** Lawrence.

*Pterygosoma armatum* Lawrence, *Parasit.*, XXVIII, i, p. 30, t.f. 23 (1936).

Described from adults taken off *Agama hispida armata*, Weenen, Natal.

4. ***Pterygosoma bedfordi*** Lawrence.

*Pterygosoma bedfordi* Lawrence, *Parasit.*, XXVIII, i, p. 24, t.f. 16 a, b, 18 a, b (1936).

Described from adults, nymphs and larvae taken off *Agama atra atra*, Hermanus, Cape Province.

5. ***Pterygosoma bicolor*** Lawrence.

*Pterygosoma bicolor* Lawrence, *Parasit.*, XXVII, i, pp. 34-35, t.f. 20, 22 c (1935).

Described from adults taken off *Gerrhosaurus flavigularis*, Serowe, Bechuanaland; also from *G. nigrolineatus*, locality unknown, and *G. auritus*, Kaokoveld, South-West Africa.

6. ***Pterygosoma gerrhosauri*** Lawrence.

*Pterygosoma gerrhosauri* Lawrence, *Parasit.*, XXVII, i, pp. 33-34, t.f. 19 (1935).

Described from adults taken off *Gerrhosaurus validus*, Zululand; also from same host species, Plumtree, Rhodesia, and *G. major grandis*, Leydsdorp, Transvaal.

7. **Pterygosoma hirsti** Lawrence.

*Pterygosoma hirsti* Lawrence, *Parasit.*, XXVIII, i, p. 22, t.f. 17 a-d (1936).

Described from adults taken off *Agama atra atra*, Vondeling, Cape Province.

8. **Pterygosoma hystrix** Lawrence.

*Pterygosoma hystrix* Lawrence, *Parasit.*, XXVII, i, pp. 37-38, t.f. 21, 22 a, b (1935).

Described from adults found on venter scales of belly and tail of *Gerrhosaurus flavigularis*; Grahamstown, Cape Province.

9. **Pterygosoma longipalpe** Lawrence.

*Pterygosoma longipalpe* Lawrence, *Parasit.*, XXVIII, i, p. 25, t.f. 19 a, b (1936).

Described from adults taken off *Agama atra atra*, Namaqualand; also from same host, Vondeling, and from *Agama hispida aculeata*, Murraysburg.

10. **Pterygosoma melanum** Hirst.

*Pterygosoma melanum* Hirst, *Jour. Linn. Soc. (Zool.)*, XXXVI, p. 196, f. 16 (1926); Lawrence, *Parasit.*, XXVIII, i, pp. 21-22 (1936).

Recorded by Lawrence (1935) from the following hosts: *Agama atra atra*, Cradock, Beaufort West, Kimberley, Fourteen Streams, Victoria West, Van Rhynsdorp, Hanover, Phillipstown, Hermanus, St. James, Table Mountain, and Cape Point, Cape Province; Garies, Namaqualand; Rustenburg, Pretoria, Rosslyn, Maquassie, near Wolmaransstad, Transvaal; Vryburg, Bechuanaland; Maseru, Basutoland, and Luderitzbucht, South-West Africa; also from *Agama anchietae knobelii*, Aus, South-West Africa.

11. **Pterygosoma transvaalensis** Lawrence.

*Pterygosoma transvaalensis* Lawrence, *Parasit.*, XXVIII, i, pp. 28-29, t.f. 22 (1936).

Described from adults taken off *Agama atricollis*, Mariepskop, Eastern Transvaal; also from the same host species, Weenen, Natal.

12. **Pterygosoma triangulare** Lawrence.

*Pterygosoma triangulare* Lawrence, *Parasit.*, XXVIII, i, p. 28, t.f. 21 (1936).

Described from adults taken off *Agama hispida brachyura*, Bitterfontein, Namaqualand; also from same host, unknown locality, and from *A. hispida hispida*, Darling and Port Nolloth.

## Genus ZONUROBIA Lawrence.

*Zonurobia* Lawrence, *Parasit.*, XXVII, i, p. 4 (1935).

This genus includes nine species and five varieties found on South African lizards belonging to the family *Zonuridae*.

*Genotype*: *Zonurobia cordylensis*.

1. **Zonurobia circularis circularis** Lawrence.

*Zonurobia circularis* Lawrence, *Parasit.*, XXVII, i, pp. 8-9, t.f. 1 c, d, 4 (1935).

Described from adults taken off *Platysaurus guttatus*, Salisbury, S. Rhodesia; also from the same host species, Plumtree, Chisawasha, Zimbabwe (Southern Rhodesia); and Pietersburg, Mariepo, Shiliowane, Nylstroom (Transvaal); and four specimens from *Zonurus jonesi* which probably constitute a variety.

**Zonurobia circularis capensis** Lawrence.

*Zonurobia circularis*, var. *capensis*, Lawrence, *Parasit.*, XXVII, i, p. 10 (1935).

Described from specimens taken off *Platysaurus capensis*, Kamieskroon, Namaqualand.

**Zonurobia circularis latior** Lawrence.

*Zonurobia circularis latior* Lawrence, *Parasit.*, XXVII, i, pp. 9-10 (1935).

Described from specimens taken off *Zonurus vittifer*, Belfast Potgietersrust, Haenertzburg, Middelburg (Transvaal), and Ubombo (Zululand); also from *Zonurus breyeri*, Waterberg Mountains, Transvaal.

**Zonurobia circularis longipilis** Lawrence.

*Zonurobia circularis*, var. *longipilis*, Lawrence, *Parasit.*, XXVII, i, pp. 10-11 (1935).

Described from specimens taken off *Platysaurus guttatus*, Blyde River, Transvaal.

**Zonurobia circularis spiniventer** Lawrence.

*Zonurobia circularis*, var. *spiniventer*, Lawrence, *Parasit.*, XXVII, i, p. 10, t.f. 5 (1935).

Described from specimens taken off *Platysaurus guttatus minor*, Nylstroom and Waterberg District, Transvaal.

**Zonurobia circularis transvaalensis** Lawrence.

*Zonurobia circularis*, var. *transvaalensis*, Lawrence, *Parasit.*, XXVII, i, p. 11 (1935).

Described from specimens taken off *Platysaurus wilhelmi*, Olifants River, Eastern Transvaal.

2. **Zonurobia cordylensis** Lawrence.

*Zonurobia cordylensis* Lawrence, *Parasit.*, XXVII, i, pp. 5-7, t.f. 1 a, h, 2 (1935).

Described from adults and nymphs taken off *Zonurus cordylus*, Table Mountain, East London, Stutterheim, George, and Hogsback, in the Cape Province; also from specimens from the same host, Smithfield, Orange Free State, which may constitute a variety.

3. **Zonurobia debilipes** Lawrence.

*Zonurobia debilipes* Lawrence, *Parasit.*, XXVII, i, pp. 13-15, t.f. 1 i, 7 (1935).

Described from adults taken off *Zonurus warreni*, Ubombo, Zululand.

4. **Zonurobia montana** Lawrence.

*Zonurobia montana* Lawrence, *Parasit.*, XXVII, i, pp. 19-20, t.f. 11 (1935).

Described from specimens taken off *Zonurus namaquensis*, Karasberg Mountains, South-West Africa.

5. **Zonurobia polyzonensis** Lawrence.

*Zonurobia polyzonensis* Lawrence, *Parasit.*, XXVII, i, pp. 7-8, t.f. 1 b, g, 3 (1935).

Described from specimens taken off *Zonurus polyzonus*, unknown locality; also from same host species from Kimberley, Vondeling, Darling, Leliefontein (Namaqualand), Kuruman, Fourteen Streams, Van Rhynsdorp, and four specimens from *Zonurus peersi*, Kamiesburg (Namaqualand).

6. **Zonurobia sanguinea** Lawrence.

*Zonurobia sanguinea* Lawrence, *Parasit.*, XXVII, i, pp. 16-18, t.f. 9 (1935).

Described from specimens taken off *Zonurus coeruleopunctatus*, Montagu Pass, George.

7. **Zonurobia semilunaris** Lawrence.

*Zonurobia semilunaris* Lawrence, *Parasit.*, XXVII, i, pp. 11-13, t.f. 1 e, f, 6 (1935).

Described from specimens taken off *Pseudocordylus microlepidotus*, unknown locality; also from *P. fasciatus*, Bedford and Grahamstown, Cape Province.

8. **Zonurobia subquadrata** Lawrence.

*Zonurobia subquadrata* Lawrence, *Parasit.*, XXVII, i, pp. 18-19, t.f. 10 (1935).

Described from specimens taken off *Zonurus robertsi*, between Nieuwoudville and Van Rhynsdorp, and at Klaver, C.P.

9. **Zonurobia transvaalica** nom. nov. (Lawrence).

*Zonurobia transvaalensis* Lawrence, *Parasit.*, XXVII, i, p. 15, t.f. 8 (1935), *nec.* Lawrence, p. 11, 1935.

Described from specimens taken off *Zonurus vandami*, Leydsdorp, Transvaal; also from *Z. vandami perkoensis*, Eastern Transvaal; *Z. barbertonensis depressus*, Louis Trichardt; and *Z. laevigatus*, Entabeni, Zoutpansberg, Transvaal.

Genus GECKOBIA Mégnin.

*Geckobia* Mégnin, *Bull. Soc. Ent. Fr.*, Ser. 5, p. 8 (1878).

*Geckobia* Lawrence, *Parasit.*, XXVIII, i, p. 2 (1936).

Lawrence (1936) has recorded fourteen species from South African Geckonidae.

1. ***Geckobia australis*** Hirst.

*Geckobia australis* Hirst, *Jour. Linn. Soc. (Zool.)*, XXXVI, p. 176, f. 3 (1926).

*Geckobia australis* (Hirst) Lawrence, *Parasit.*, XXVIII, i, p. 4 (1936).

Recorded found on *Lygodactylus capensis capensis*. The types were from Beira, Portuguese East Africa, and Lawrence (1936) has recorded it from the following localities in the Transvaal: Hectorspruit, Komatipoort, Mariepskop, Palmyrville, Zoutpansberg, Roodepoort, Pretoria District, Rustenburg and Vygeboompoort; also from Salisbury and unknown locality. Rhodesia.

2. ***Geckobia hemidactyli*** Lawrence.

*Geckobia hemidactyli* Lawrence, *Parasit.*, XXVIII, i, p. 14, t.f. 11 (1936).

Described from specimens taken off *Hemidactylus tasmani*, Driefontein, Southern Rhodesia; also from the same host species, Kutama, Southern Rhodesia; *H. mabouia*, Lourenço Marques, and Zambi, Belgian Congo.

3. ***Geckobia hewitti*** Lawrence.

*Geckobia hewitti* Lawrence, *Parasit.*, XXVIII, i, pp. 8-10, t.f. 7 (1936).

Described from specimens taken off *Pachydactylus maculatus*, Resolution Halt, Grahamstown; also from same host, unknown locality.

4. ***Geckobia homopholis*** Lawrence.

*Geckobia homopholis* Lawrence, *Parasit.*, XXVIII, i, p. 15, t.f. 1, 12 (1936).

Described from specimens taken off *Homopholis wahlbergii*, Bulawayo and Salisbury, Rhodesia; Geelhoutkop, Waterberg District, and Waterval Boven, Transvaal.

5. ***Geckobia karrooica*** Lawrence.

*Geckobia Karrooica* Lawrence, *Parasit.*, XXVIII, i, p. 18, t.f. 15 (1936).

Described from specimens taken off *Oedura Karrooica wilmoti*, Tarkastad.

6. **Geckobia namaquensis** Lawrence.  
*Geckobia namaquensis* Lawrence, *Parasit.*, XXVII, p. 10, t.f. 8 (1935).  
 Described from specimens taken off *Pachydactylus namaquensis*, Garies and Steinkopf, Namaqualand; also from *Pachydactylus capensis gariesensis*, Garies.
7. **Geckobia natalensis** Lawrence.  
*Geckobia natalensis* Lawrence, *Parasit.*, XXVII, p. 8, t.f. 6 (1935).  
 Described from specimens taken off *Lygodactylus capensis capensis*, Umhlatu, Natal, and Mozambique.
8. **Geckobia oedurae** Lawrence.  
*Geckobia oedurae* Lawrence, *Parasit.*, XXVIII, i, p. 6, t.f. 6 (1936).  
 Described from specimens taken off *Oedura transvaalica platyceps*, Empandeni, near Salisbury, and Driefontein, Southern Rhodesia.
9. **Geckobia ovambica** Lawrence.  
*Geckobia ovambica* Lawrence, *Parasit.*, XXVIII, i, p. 4, t.f. 3 (1936).  
 Described from two specimens taken off *Rhoptropus barnardi*, Kunene River, South-West Africa.
10. **Geckobia pachydactyli** Lawrence.  
*Geckobia pachydactyli* Lawrence, *Parasit.*, XXVIII, i, pp. 12-14, t.f. 10 (1936).  
 Described from specimens taken off *Pachydactylus bibronii*, *bibronii*, Bitterfontein, Namaqualand; also from the same host, Aus and Oup River, South-West Africa, and Leliefontein, Namaqualand.
11. **Geckobia phyllodactyli** Lawrence.  
*Geckobia phyllodactyli* Lawrence, *Parasit.*, XXVIII, i, p. 15, t.f. 2, 13 (1936).  
 Described from adults, nymph and larva taken off *Phyllodactylus porphyrens*, Hermanus and Capetown.
12. **Geckobia rhoptropi** Lawrence.  
*Geckobia rhoptropi* Lawrence, *Parasit.*, XXVIII, i, pp. 11-12, t.f. 9 (1936).  
 Described from specimens taken off *Rhoptropus ocellatus*, Leliefontein, Namaqualand; also from *Lygodactylus bradfieldi*, Okahandja, South-West Africa.
13. **Geckobia tasmani** Lawrence.  
*Geckobia tasmani* Lawrence, *Parasit.*, XXVIII, i, p. 6, t.f. 4 (1936).  
 Described from specimens taken off *Hemidactylus tasmani*, Chishawasha, near Salisbury, Rhodesia.

14. **Geckobia transvaalensis** Lawrence.

*Geckobia transvaalensis* Lawrence, *Parasit.*, XXVIII, i, pp. 17-18, t.f. 14 (1936).

Described from specimens taken off *Lygodactylus capensis capensis*, Eastern Transvaal; also from *Pachydactylus capensis affinis*, Plumtree, Southern Rhodesia; *P. capensis capensis*, Kimberley and Vryburg; *P. capensis tigrinus*, Zoutpansberg; *Chondrodactylus angulifer*, Kanus Siding, South-West Africa; and doubtful records from *Pachydactylus punctatus* and *P. capensis formosus*, unknown localities.

**Suborder MESOSTIGMATA.**

Family DERMANYSIDAE.

Genus LIPONYSSUS Kolenati.

**Liponyssus biscutatus** Hirst.

♀ *Liponyssus biscutatus* Hirst, *Proc. Zool. Soc. Lond.*, p. 779, t.f. 21, 22 (1921).

Described from specimens taken off Cardinal Woodpecker, *Dendropicus fuscescens* (= *D. cardinalis*), South Africa. Two females have also been taken off *D. fuscescens transvaalensis*, Buffelsdraai, Transvaal, 26th March, 1916 (det. C. D. Radford).

**Liponyssus bursa** (Berlese).

*Leiognathus bursa* Berlese, *Bull. Soc. ent. Ital.*, XX, p. 208, pl. 9, f. 6 (1888).

♂ ♀ *Leiognathus morsitans* Hirst, *Bull. Ent. Res.*, VI, pp. 56-58, t.f. 1-3 (1915).

*Liponyssus bursa* (Berlese) Hirst, *Mites Injurious to Domestic Animals*, pp. 89-90, t.f. 66, 67A, 68A, 69A, 70 (1922).

*Liponyssus bursa* (Berlese) Bedford, *S. Afr. Ectoparasites*, p. 272 (1932).

Specimens have been taken off South African Tawny Pipit, *Anthus rufulus raalteni* (Lay.), Onderstepoort (coll. E. C. G. Bedford; det. C. D. Radford).

**Liponyssus flavus** (Kolenati).

Males and females taken off Cardinal Woodpecker, *Dendropicus fuscescens transvaalensis* Rbts., Buffelsdraai, Transvaal, 26th March, 1916 (det. C. D. Radford). This species was described from specimens taken off bats, and Hirst (1921) has recorded it from noctule bat, Aylesford, Kent, England.

**Liponyssus viator** Hirst.

♀ *Liponyssus viator* Hirst, *Proc. Zool. Soc. Lond.*, p. 775, t.f. 20 (1921).

Described from specimens taken off Indian Swift, *Colleoptera* (= *Cypselus*) *affinis*, Calcutta; also from Woodpecker, *Gecinus vaillanti*, Tangier. Specimens have been taken off Cape Black-headed Sparrow, *Passer melanurus melanurus*, Onderstepoort (coll. G.A.H.B.; det. C. D. Radford).



**Superfamily IXODOIDEA.**

## Family ARGASIDAE.

## Genus ARGAS Latreille.

**Argas brumpti** Neumann.

Ad. ♂ *Argas brumpti* Neumann, *Archiv. de Parasit.*, XI, pp. 224-229, f. 9-14 (1907); Nuttall, Warburton, Cooper and Robinson, *Ticks: Mon. Ixod.*, I, pp. 30-33, 95, f. 38-47 (1908); Neumann, *Das Tierreich, Ixodidae*, pp. 121-122 (1911).

L. *Argas brumpti* (Neu.), Cunliffe, *Parasit.*, VI, pp. 379-381, t.f. 1 (1914).

Adults and nymphs have been found at Gemsbok Plain, Oup River, Kalahari (coll. V. FitzSimons), and one adult has been received from Dr. R. F. Lawrence found under a stone at Lekkersing, Richtersveld; also engorged larvae, which I refer to this species, from a lizard, *Gerrhosaurus validus*, Mara, N.W. Transvaal.

This species was originally described from specimens collected in Somaliland. They attacked man in dusty sheltered hollowed out places beneath overhanging rocks into which opened porcupine burrows. Cunliffe (1914) recorded specimens from Kenya Colony. They were found in dust of an anthep, and also reported to be found in dust where big game roll. King (*Bull. Ent. Res.*, VI, pp. 191-193, 1915) and Rutledge (*Bull. Ent. Res.*, XXI, p. 273, 1930) have recorded this species from the Sudan; the former found adults and nymphs in crevices between rocks and in caves, and the latter larvae on the ground lizard, *Agama colonorum*. King has reared larvae on a guinea-fowl, *Numida meleagris*, but failed to feed them on fowls, sparrows, pigeons, doves and bats.

**Argas moubata** Murray.

*Argas moubata* (Murray) Bedford, *S. Afr. Ectoparasites*, p. 280 (1932).

*Additional record*: Numerous specimens collected in a pig-stye at Doornkraal, Pietersburg District, Northern Transvaal, March, 1934 (coll. G. V. O. Lund). Attempts to transmit *Aegyptianella pullorum* to fowls with this species failed (Bedford and Coles, 1933).

**Argas persicus** (Oken).

*Argas persicus* (Oken), Bedford, *S. Afr. Ectoparasites*, p. 281 (1932).

This species has been proved by Bedford and Coles (1933) to transmit *Aegyptianella pullorum* to domestic fowls.

## Family IXODIDAE.

## Genus IXODUS Latreille.

**Ixodes pilosus** Koch.

*Ixodes pilosus* (Koch) Bedford, *S. Afr. Ectoparasites*, p. 285 (1932).

*Additional record*: Specimens sent by Dr. R. F. Lawrence taken off *Leptailurus serval* Schr. (Serval Cat), Pietermaritzburg, Natal.

Genus HAEMAPHYSALIS Koch.

**Haemaphysalis aciculifer** Warburton.

*Haemaphysalis aciculifer* (Warb.) Bedford, *S. Afr. Ectoparasites*, p. 289 (1932).

*Additional record*: Males and females taken off *Leptailurus serval* Schr. (Serval Cat), Pietermaritzburg, Natal (sent by Dr. R. F. Lawrence).

**Haemaphysalis leachii** (Audouin).

*Haemaphysalis leachii* (Aud.) Bedford, *S. Afr. Ectoparasites*, p. 289 (1932).

*Additional record*: Adults taken off the same host as the above species.

**Haemaphysalis silacea** Robinson.

*Haemaphysalis silacea* (Robinson) Bedford, *S. Afr. Ectoparasites*, p. 290 (1932).

*Additional record*: Adults taken off *Tragelaphus sylvaticus* (Bushbuck), Mount Edgecombe, Natal, July, 1934.

Genus RHIPICEPHALUS Koch.

**Rhipicephalus simpsoni** Nuttall.

♂ ♀ *Rhipicephalus simpsoni* Nuttall, *Parasit.*, III, iv, pp. 413-416, t.f. 6, 7 (1910).

A male recorded by Bedford (1932) as *R. simus* C. L. Koch from *Thryonomys swinderianus variegatus* (Natal Cane-rat), Nylstroom, Transvaal, proves to be this species. Adults have also been received from Mr. C. H. E. Hopkins taken off *T. swinderianus*, N'buya, Uganda. Originally described from adults taken off a large rodent in S. Nigeria.

**Rhipicephalus simus** C. L. Koch.

*Rhipicephalus simus* (C. L. Koch) Bedford, *S. Afr. Ectoparasites*, p. 298 (1932). See *Rhipicephalus simpsoni* (Nuttall).

Genus HYALOMMA Koch.

**Hyalomma aegyptium aegyptium** (Linnaeus).

*Hyalomma aegyptium aegyptium* (Linn.) Bedford, *S. Afr. Ectoparasites*, p. 301 (1932).

*Additional record*: One female taken off *Atelerix frontalis* (Hedgehog). Springvale, South-West Africa (coll. E. Meyer).

**Hyalomma aegyptium impressum** Koch.

*Hyalomma aegyptium impressum* (Koch) Bedford, *S. Afr. Ectoparasites*, p. 302 (1932).

*Additional record*: One larva off *Bhuchanga adsimilis* (Fork-tailed Drongo), Onderstepoort.

Genus *AMBLYOMMA* Koch.***Amblyomma hebraeum* Koch.**

*Amblyomma hebraeum* Koch (Bedford), *S. Afr. Ectoparasites*, p. 304 (1932).

*Additional record*: Adults taken off *Aepyceros melampus* (Impala), Bar R Ranch, Swaziland (coll. G. Martinaglia).

***Amblyomma petersi* Karsch.**

*Amblyomma petersi* (Karsch) Bedford, *S. Afr. Ectoparasites*, p. 306 (1932).

*Additional record*: One female received from Mr. C. Kent taken off tortoise, Melmoth, Zululand.

Genus *APONOMMA* Neumann.***Aponomma larve capensis* Neumann.**

*Aponomma larve capensis* (Neu.) Bedford, *S. Afr. Ectoparasites*, p. 308 (1932).

*Additional record*: Adults taken off *Acontias plumbeus* (Blind Lizard). Sangwana District, Zululand (coll. H. W. Bell Marley).

***Aponomma neglectum* S. and L. F. Hirst.**

♂ ♀ *Amblyomma* (*Aponomma*) *neglectum* S. and L. F. Hirst, *Ann. Mag. Nat. Hist.* (8), VI, p. 305, t.f. 7-8 (1910).

Described from adults taken off *Varanus albigularis*, Deelfontein, C.P. The male has three metallic green spots on the scutum and the female one.

**Suborder MALLOPHAGA.**

Superfamily ISCHNOCERA.

Family PHILOPTERIDAE.

Genus *DEGEERIELLA* Neumann.

*Degeeriella* Bedford, *S. Afr. Ectoparasites*, p. 319 (1932).

***Degeeriella annulata* (Denny).**

*Nirmus annulatus* Burmeister, *Handb. der. Ent.*, ii, p. 428 (1838); no description; Denny, *Mon. Anoplur. Brit.*, p. 132, pl. 8, f. 5 (1842).

*Nirmus oedicnemi* Denny, *ibid.*, p. 138, pl. 7, f. 8 (1842).

*Nirmus annulatus* Nitzsch in Giebel, *Zeit. f. ges. Nat.*, XIII, p. 311 (1861). Giebel, *Insecta Epizoa*, p. 159, pl. 5, f. 9, 10 (1874).

*Docophorus annulatus* Piaget, *Les Pédiculines*, p. 664, pl. 54, f. 5 (1880).

*Philopterus annulatus* Harrison, *Parasit.*, IX, i, p. 88 (1916).

*Degeeriella oedicnemi* Harrison, *ibid.*, IX, i, p. 119 (1916).

Previously recorded from the Stone Curlew, *Oedinenemus oedinenemus* (= *O. crepitans*); also by Piaget (1880) from *O. magnirostris*. Specimens have been taken off *Oedinenemus vermiculatus* (Water Thickknee), Rustenburg District, Transvaal (coll. W. Powell). Through the kindness of Colonel Meinertzhagen I have been able to compare these with specimens taken off the type host, *O. oedinenemus*, Suffolk, England.

Piaget was correct in considering Denny's *D. oedinenemi* to be immature specimens of *D. annulata*, but it is difficult to understand how he came to place this species in the genus *Docophorus*.

**Degeeriella birostris** (Giebel).

*Nirmus birostris* Giebel, *Insecta Epizoa*, p. 174 (1874).

*Nirmus gloriosus* Kellogg & Kuwana, *Proc. Wash. Acad. Sci.*, IV, p. 467, pl. 29, f. 1 (1902), part; Kellogg, *Trans. Am. Ent. Soc.*, XXXII, p. 313 (1906); Kellogg & Paine, *Ent. News*, XXI, p. 125 (1910); Kellogg & Mann, *Ent. News*, XXIII, p. 58 (1912).

*Degeeriella gloriosa* Ferris, *Bern. P. Bishop Mus., Honolulu*, Bull. 98, pp. 68-69, t.f. 18A-E (1932); Bedford, *S.A. Ectoparasites*, p. 322 (1932).

The types (males) of *D. birostris* were taken off *Sterna* sp. = ? *fuliginosa*. It has also been recorded as *D. gloriosa* from *Sterna fuliginosa*, *S. anathaeta*, *Anous stolidus*, and certain land birds (abnormal hosts), Galapagos and Revillagigedo Islands; *Sterna lunata*, Laysan Is., and *Sterna fuscata*, Marquesas. Specimens have been taken off *Sterna fuliginosa*, Eshowe, Zululand (coll. B. De Meillon).

**Degeeriella colymbina** (Scopoli). See *Esthiopterum colymbina* (Scopoli).

**Degeeriella emarginata** (Kellogg & Chapman). See *D. separata* (Kellogg & Kuwana).

**Degeeriella gloriosa** (Kellogg & Kuwana). See *D. birostris* (Giebel).

**Degeeriella separata** (Kellogg & Kuwana).

*Nirmus gloriosus* Kellogg & Kuwana, *Proc. Wash. Acad. Sci.*, IV, p. 467 (1902), Part ...

*Nirmus separatus* Kellogg & Kuwana, *ibid.*, IV, p. 472, pl. 29, f. 6 (1902). Kellogg, *Trans. Am. Ent. Soc.*, XXXII, p. 317 (1906), part; Uchida, *Annot. Zool. Japan*, IX, p. 484 (1918).

*Nirmus gloriosus* var. *emarginatus* Kellogg & Chapman, *Jour. New York Ent. Soc.*, X, p. 159 (1902).

*Degeeriella separata* (K. & K.) Ferris, *Bern. P. Bishop Mus., Honolulu*, pp. 69-70, t.f. 19A-E (1932).

This species has, as Ferris has shown, been confused with *D. birostris*. It has been taken off *Anous stolidus*, *Sterna fuliginosa* and certain land birds (abnormal hosts), Galapagos and Revillagigedo Islands: also off *Anous stolidus*, Hawaii and Marquesas.

**Degeeriella scolopacis** (Denny). See *Rhynonirmus scolopacis* (Denny).

**Degeeriella vanelli** (Denny).

*Nirmus vanelli* Denny, *Mon. Anoplur. Brit.*, p. 128, pl. 7, f. 6 (1842).

Described from specimens taken off *Squatarola* (= *Vanellus squatarola*) (Grey Plover), a migrant to South Africa. Harrison (1916) sank *D. vanelli* as a synonym of *D. juncea* (Scopoli) found on *Vanellus vanellus*, but it is a distinct species.

Genus RHYNONIRMUS Thompson.

*Rhynonirmus* Thompson, *Parasitology*, XXVII, ii, p. 281 (1935).

This genus includes three species found on Scolopacidae.  
*Genotype*: *Lipeurus infuscatus* Osborn.

**Rhynonirmus scolopacis** (Denny).

*Degeeriella scolopacis* (Denny) Bedford, *S. Afr. Ectoparasites*, p. 327 (1932).

*Rhynonirmus scolopacis* (Denny) Thompson, *Parasit.*, XXVII, ii, p. 284, t.f. 2A-B, 4c (1935).

Recorded taken off *Capella* (= *Scolopax*) *gallinago* in Europe, and *Capella nigripennis* in South Africa.

Genus GONIODES Nitzsch.

**Goniodes numidae** Mjöberg.

*Goniodes numidae* (Mjöberg) Bedford, *S. Afr. Ectoparasites*, p. 330 (1932).

*Additional record*: Specimens taken off *Numida coronata*, Vryburg, C.P.

Genus GONICOTES Burmeister.

**Gonicotes gigas** Taschenberg.

*Gonicotes gigas* (Taschenb.) Bedford, *S. Afr. Ectoparasites*, p. 332 (1932).

*Additional record*: Specimens taken off *Numida coronata*, Vryburg, C.P.

**Gonicotes hologaster** Nitzsch.

*Gonicotes hologaster* (Nitzsch) Bedford, *S. Afr. Ectoparasites*, p. 331 (1932).

*Additional record*: Specimens taken off *Numida coronata*, Vryburg, C.P.

## Genus PECTINOPYGUS Mjöberg.

**Pectinopygus gracilicornis** (Piaget).

- ♂ *Lipeurus gracilicornis* Piaget, *Les Pédiculines*, p. 309, pl. 25, f. 6 (1880), part.
- ♂ *Lipeurus gracilicornis*, var. *majus*, Kellogg, *Occ. Papers, California Acad. Sci.*, VI, p. 30, pl. 3, f. 5 (1899), part; Kellogg & Kuwana, *Proc. Wash. Acad. Sci.*, IV, p. 477 (1902), part; Kellogg, *Trans. Amer. Ent. Soc.*, XXXIII, p. 321 (1906).
- ♂ *Esthiopterum gracilicornis* (Piaget) Ferris, *Bern. P. Bishop Mus., Honolulu*, Bull. 98, pp. 61-62, t.f. 13A-E (1932).

Ferris has shown this species to have been confused with *P. sulae* (Rudow). It has been recorded from *Fregata minor* and *F. aquila*, the former occurring on the South African coast.

**Pectinopygus sulae** (Rudow).

- Lipeurus sulae* Rudow, *Zeit. f. ges. Naturw.*, XXXVI, p. 134 (1870).
- ♀ *Lipeurus gracilicornis* Piaget, *Les Pédiculines*, p. 309 (1880), part.
- ♀ *Lipeurus gracilicornis*, var. *major*, Kellogg, *Occ. Papers, California Acad. Sci.*, VI, p. 30 (1899), part; Kellogg & Kuwana, *Proc. Wash. Acad. Sci.*, IV, p. 477 (1902), part; Kellogg, *Trans. Am. Ent. Soc.*, XXXII, p. 319 (1906), part.
- ♂ *Lipeurus helleri* Kellogg & Kuwana, *Proc. Wash. Acad. Sci.*, IV, p. 479, pl. 30, f. 3 (1902); Kellogg, *Trans. Amer. Ent. Soc.*, XXXII, p. 319 (1906), part.
- Lipeurus potens* Kellogg & Kuwana, *Proc. Wash. Acad. Sci.*, IV, p. 477 (1902), part; Kellogg, *Trans. Amer. Ent. Soc.*, XXXII, p. 319 (1906), part.
- ♀ ♂ *Pectinopygus sulae* (Rudow) Ferris, *Bern. P. Bishop Mus., Honolulu*, Bull. 98, pp. 64-67, t.f. 16A-B, 17A-D (1932).

This species has, as Ferris has shown, been confused with both *P. gracilicornis* and *P. potens*. It has been found on *Fregata minor*, which occurs on the South African coast; also on *Fregata aquila*, *Sula* spp. and several abnormal hosts.

## Genus ESTHIOPTERUM Harrison.

- Esthiopterum* Bedford, *S. Afr. Ectoparasites*, p. 337 (1932).
- Esthiopterum anseris** (Linn.). See *Anaticola anseris* (Linn.).
- Esthiopterum ardeae** (Linn.). See *Anaticola ardea* (Linn.).
- Esthiopterum asymmetricum** (Rudow). See *Anaticola asymmetrica* (Rudow).
- Esthiopterum capitatum** (Piaget). See *Anaticola capitata* (Piaget).
- Esthiopterum ciconiae** (Linn.). See *Ardeicola ciconia* (Linn.).

**Esthiopterum colymbina** (Scopoli).

*Degeeriella colymbina* (Scop.) Bedford, *S. Afr. Ectoparasite*, p. 320 (1932).

This species must be placed in *Esthiopterum* and not in *Degeeriella*. It cannot remain in *Esthiopterum*, however, and eventually a new genus will have to be erected for it.

**Esthiopterum concinnum** (Kellogg and Chapman).

*Lipeurus concinnus* Kellogg & Chapman, *Occ. Papers, California Acad. Sci.*, VI, pp. 97-99, pl. 7, f. 2 (1899).

Described from specimens taken off *Diomedea albatrus*. Specimens have also been taken off *Nealbatrus chlororhynchus* (Yellow-billed Mollymawk), Capetown, C.P. (coll. R. F. Lawrence).

**Esthiopterum crassicorne** (Scop.). See *Anaticola crassicornis* (Scop.).**Esthiopterum diversum** (Kellogg).

*Esthiopterum diversum* (Kellogg). *S. Afr. Ectoparasites*, p. 338 (1932).

*Additional record*: Recorded by Kellogg & Chapman (1899) taken off *Nconectris* (= *Puffinus*) *griseus* (Sooty Shearwater).

**Esthiopterum genitale** (Piaget). See *Ardeicola genitalis* (Piaget).**Esthiopterum giganticola** (Kellogg). See *E. tricolor* (Piaget).**Esthiopterum lepidum** (Nitzsch). See *Ardeicola lepida* (Nitzsch).**Esthiopterum leucoproctum** (Nitzsch). See *Ardeicola leucoprocta* (Nitzsch).**Esthiopterum maculatum** (Nitzsch). See *Ardeicola maculata* (Nitzsch).**Esthiopterum obscurum** (Rudow).

*Esthiopterum obscurum* (Rudow) Bedford, *S. Afr. Ectoparasites*, p. 340 (1932).

Both *E. tricolor* (Piaget) and *E. lepturus* (Enderlein) have been recorded as synonyms of this species, but they are the same as *E. giganticola* (Kellogg). *E. obscurum*, of which *E. melanocnemis* (Giebel) and *E. gaini* (Neumann) are synonyms, has only been found on *Macronectes gigantea* (Giant Petrel).

**Esthiopterum pederiforme** (Dufour).\*

*Philopterus pederiformis* Dufour, *Ann. Soc. Ent. Fr.*, IV, p. 676, pl. 21, f. 4 (1834).

*Metapeuron laeve* Rudow, *Zeit. f. ges. Naturw.*, XXXV, p. 140 (1870).

*Lipeurus angulicollis* Giebel, *Ann. Mag. Nat. Hist.*, XVII, p. 388 (1876).

\* Thompson [*Ann. Mag. Nat. Hist.* (10), xvi, p. 485, 1935] has recently erected the genus *Episbates* for the reception of this species.

CHECK-LIST OF SOUTH AFRICAN ECTOPARASITES.

*Lipeurus breviceps* Piaget, *Tijd. v. Ent.*, XXXIII, p. 243, pl. 9, f. 6 (1889).

*Lipeurus macilhennyi* Kellogg and Kuwana, *Proc. Acad. Nat. Sci. Philad.*, p. 155, pl. 7, f. 3 (1900).

Described from specimens taken off *Diomedea exulans* and by Kellogg & Kuwana (1900) from *Diomedea nigripes*. Females have been taken off *D. exulans* (Wandering Albatross) at Port Elizabeth, C.P. (1935) (coll. J. A. Pringle).

**Esthiopterum stellare** (Denny). See *Ardeicola stellaris* (Denny).

**Esthiopterum subsignatum** (Giebel). See *Anaticola subsignata* (Giebel).

**Esthiopterum tricolor** (Piaget).

*Lipeurus tricolor* Piaget, *Les Pédiculines*, p. 363, pl. 30, f. 4 (1880).

*Nirmaus giganticola* Kellogg, *Proc. California Acad. Sci.*, VI, p. 105, pl. 5, f. 6 (1896); Bedford, *S. Afr. Ectoparasites*, p. 339 (1932).

*Lipeurus confidens* Kellogg, *Occ. Papers, California Acad. Sci.*, p. 26, pl. 3, f. 1 (1899).

*Lipeurus miriceps* Kellogg & Kuwana, *Proc. Wash. Acad. Sci.*, IV, p. 480 (1902).

*Lipeurus lepturus* Enderlein, *Deutsch. Süd. polar Expt.*, X, p. 453 (1909).

This species has been confused with *E. obscurum* (Rudow). It has only been found on *Diomedeidae*, and has been recorded from the following South African species: *Diomedea exulans* (Wandering Albatross), *Thalassarche melanophrys* (Mollymawk), *Diomedella cauta layardi* (Layard's Albatross), *Nealbatrus chlororhynchus* (Yellow-billed Mollymawk) and *Phoebastria palpebrata* (Sooty Albatross).

Genus ARDEICOLA Clay.

*Ardeicola* Clay, *Proc. Zool. Soc. London*, iii, p. 615, t.f. 1, 3 (1935).

This genus includes species found on Gressores (storks, ibises and herons). They were formerly placed in the genus *Lipeurus* and later in *Esthiopterum*.

*Genotype*: *Pediculus ardeae* Linn.

**Ardeicola ardea** (Linn.).

*Esthiopterum ardeae* (L.) Bedford, *S. Afr. Ectoparasites*, p. 337 (1932).

**Ardeicola bicolor** (Piaget).

*Lipeurus bicolor* Piaget, *Tijd. v. Ent.*, XXXI, p. 157, pl. 4, f. 1 (1888).

Described from females and males taken off *Ephippiorhynchus* (= *Tantalus*) *senegalensis* (Saddle-bill Stork).



**Ardeicola capitata** (Piaget).

*Esthiopterum capitatum* (Piaget) Bedford, *S. Afr. Ectoparasites*, p. 337 (1932).

**Ardeicola ciconia** (Linn.).

*Esthiopterum ciconiae* (L.) Bedford, *S. Afr. Ectoparasites*, p. 338 (1932).

**Ardeicola genitalis** (Piaget).

*Esthiopterum genitale* (Piaget) Bedford, *S. Afr. Ectoparasites*, p. 339 (1932).

**Ardeicola lepida** (Nitzsch).

*Esthiopterum lepidum* (Nitzsch) Bedford, *S. Afr. Ectoparasites*, p. 339 (1932).

**Ardeicola leucoprocta** (Nitzsch).

*Esthiopterum leucoproctum* (Nitzsch) Bedford, *S. Afr. Ectoparasites*, p. 339 (1932).

Specimens have been taken off the type host, *Pyrherodia purpurea* (Purple Heron), Worcester, C.P.

**Ardeicola maculata** (Nitzsch).

*Lipeurus maculatus* Nitzsch in Giebel, *Zeit. f. ges. Naturw.*, XXVIII, p. 383 (1866); Giebel, *Insecta Epizoa*, p. 225 (1874).

Described from specimens taken off *Ciconia nigra* (Black Stork). According to Miss Clay, it is distinct from *A. ciconia*.

**Ardeicola raphidia** (Nitzsch).

*Lipeurus raphidius* Nitzsch in Giebel, *Zeit. f. ges. Naturw.*, XXVIII, p. 384 (1866); Giebel, *Insecta Epizoa*, p. 229 (1874).

*Lipeurus raphidius* Piaget, *Les Pédiculines*, p. 317, pl. 26, f. 3 (1880).

Described from specimens taken off *Plegadis falcinellus* (Glossy Ibis).

**Ardeicola stellaris** (Denny).

*Esthiopterum stellare* (Denny) Bedford, *S. Afr. Ectoparasites*, p. 340 (1932).

*Additional synonym: Lipeurus botauri* Osborn, *Bull. Div. Ent., U.S. Dept. Agric.*, Washington, No. 5, p. 234 (1896).

Described from specimens taken off *Botaurus lentiginosus* (American Bittern).

## GENUS ANATICOLA Clay.

*Anaticola* Clay, *Proc. Zool. Soc. Lond.*, iii, p. 617, t.f. 2, 4 (1935).

This genus includes species found on Anatidae (swans, geese and ducks) and *Phoenicopteridae* (flamingoes). They were formerly placed in the genus *Lipeurus* and later in *Esthiopterum*.

*Genotype: Pediculus crassicornis* Scopoli.

**Anaticola anseris** (Linn.).

*Esthiopterum anseris* (Linn.) Bedford, *S. Afr. Ectoparasites*, p. 337 (1932).

**Anaticola asymmetrica** (Rudow).

*Esthiopterum asymmetricum* (Rudow) Bedford, *S. Afr. Ectoparasites*, p. 337 (1932).

**Anaticola crassicornis** (Scopoli).

*Esthiopterum crassicorne* (Scop.) Bedford, *S. Afr. Ectoparasites*, p. 338 (1932).

**Anaticola subsignata** (Giebel).

*Esthiopterum subsignatum* (Giebel) Bedford, *S. Afr. Ectoparasites*, p. 341 (1932).

Genus GIEBELIA Kellogg.

*Giebelia* Bedford, *S. Afr. Ectoparasites*, p. 343 (1932).

**Giebelia mirabilis** Kellogg.

*Giebelia mirabilis* Kellogg, *Proc. California Acad. Sci.*, VI, p. 138, pl. 11, f. 7, 8 (1896).

Recorded by Kellogg and Chapman (1899) taken off *Neonectris* (= *Puffinus*) *griseus* (Sooty Shearwater). It was described from specimens taken off *Puffinus opisthomelas*.

Genus CUMMINGSIELLA Ewing.

*Dollabella* Cummings, *Proc. Zool. Soc. Lond.*, p. 675 (1916). Bedford, *S. Afr. Ectoparasites*, p. 347 (1932).

*Cummingsiella* Ewing, *Proc. Biol. Soc. Wash.*, XLIII, p. 125 (1930).

As Ewing has pointed out, Cummings' name *Dollabella* is preoccupied as it was used by Giebel in 1845 for a genus of mollusks.

Genus PHILOPTERUS Nitzsch.

*Philopterus* Bedford, *S. Afr. Ectoparasites*, p. 348 (1932).

**Philopterus albidus** (Piaget).

*Philopterus semisignatus* (Piaget) Bedford, *S. Afr. Ectoparasites*, p. 355 (1932).

Through the kindness of Colonel R. Meinertzhagen I have been able to compare specimens of *P. semisignatus* taken off *Corvus corax corax* in the Outer Hebrides, Scotland, with specimens of *P. albidus* from *Corvus albus*, Aliwal North, C.P., and find that they are distinct species.

**Philopterus gonothorax** (Giebel).

*Philopterus gonothorax* (Giebel) Bedford, *S. Afr. Ectoparasites*, p. 351 (1932).

*Docophorus lari*, var. *parvus*, Piaget (*Les Pédiculines*, p. 112, 1880), described from specimens taken off *Larus dominicanus*, proves to be a synonym of this species.

**Philopterus snyderi** (Kellogg & Paine).

*Docophorus snyderi* Kellogg & Paine, *Ent. News*, XXI, p. 124, f. 1, 2 (1910).

*Philopterus snyderi* (Kellogg & Paine) Ferris, *Bern. P. Bishop Mus. Honolulu*, Bull. 98, pp. 71-72, t.f. 20A-D (1932).

Specimens taken off *Sterna fuliginosa*, Eshowe, Zululand (coll. B. De Meillon). This species was described from specimens taken off *Sterna lunata*, Laysan Is.; also recorded from *Sterna fuscata*, Marquesas.

## Family TRICHODECTIDAE.

## Genus DASYONYX Bedford.

*Dasyonyx* Bedford, *S. Afr. Ectoparasites*, p. 359 (1932).

**Dasyonyx windhuki** Bedford.

*Dasyonyx windhuki* Bedford, *Onderstepoort Jour. Vet. Sci. & Anim. Indust.*, VII, i, p. 38, f. 6-7, (1936).

Described from males and females taken off *Procapra windhuki*, Naukluft, South-West Africa; also from *Procapra* sp. Otjosongomha, Waterberg, South-West Africa.

**Dasyonyx validus** Bedford.

*Trichodectes lindfieldi* Ferris, *Rep. Harvard Afr. Exped. upon Afr. Repub. Liberia and Belg. Congo*, ii, p. 1030, f. 19, 20A, C, D, E, G, H (1930), *nec.* Hill, 1928.

*Dasyonyx validus* Bedford, *Proc. Zool. Soc. London*, p. 721 (1932).

Males from *Dendrohyrax arborea*, Port Alfred, C.P. (coll. R. F. Lawrence). Also recorded by Ferris (1930) from *D. adolfriederici*, Belgian Congo, and *D. validus*, Mt. Kilimanjaro, and by Bedford (1936) from *D. scheelei*, Tanganyika Territory.

## Genus PROCAVIPHILUS Bedford.

**Procaziphilus serraticus** (Hill).

*Procaziphilus serraticus* (Hill) Bedford, *S. Afr. Ectoparasites*, p. 361 (1932).

*Additional record*: One female from *Procapra windhuki*, Naukluft, South-West Africa (coll. K. Jordan).

## Genus BOVICOLA Ewing.

*Bovicola* Bedford, *S. Afr. Ectoparasites*, p. 361 (1932).

**Bovicola hilli** Bedford.

*Bovicola hilli* Bedford, *Onderstepoort Jour. Vet. Sci. & Anim. Indust.*, II, i, p. 43, t.f. 4-6 (1934).

Described from specimens taken off Waterbuck, *Kobus ellipsiprymus* (Ogilby), Umfolosi Game Reserve, Zululand. It has also been found on *Kobus defassus*, Uganda.

**Bovicola crassipes** (Rudow).

*Bovicola limbatus* (Gervais) Bedford, *S. Afr. Ectoparasites*, p. 362 (1932).

According to Bedford (1936) Gervais' *Trichodectes climax* and *T. limbatus* should be discarded; *Trichodectes pilosus* Piaget (*Les Pédiculines*, p. 406, pl. 48, f. 4, 1880), nec Giebel, 1874, should be sunk as a synonym of this species, and *T. climax*, var. *major*, Piaget is the same as *B. painei* (Kellogg & Nakayama).

**Bovicola major** (Piaget).

*Trichodectes climax*, var. *major*, Piaget, *Les Pédiculines*, Suppl., p. 86, pl. 9, f. 5 (1885).

*Trichodectes painei* Kellogg & Nakayama, *Psyche*, XXI, p. 90, f. 1 (1914).

*Bovicola painei* (K. & N.) Bedford, *S. Afr. Ectoparasites*, p. 362 (1932).

*B. major* has been confused with *B. limbatus*. It proves to be the same as *B. painei* over which it has priority (see Bedford, 1936).

**Bovicola martinaglia** Bedford.

*Bovicola martinaglia* Bedford, *Onderstepoort Jour. Vet. Sci. & Anim. Indust.*, VII, i, p. 43, f. 11-13 (1936).

Described from specimens taken off *Onotragus leche* in the Zoological Garden, Johannesburg.

**Bovicola painei** (Kellogg & Nakayama). See *Bovicola major* (Piaget).

**Bovicola pelea** Bedford.

*Bovicola pelea* Bedford, *Onderstepoort Jour., Vet. Sci. & Anim. Indust.*, II, i, p. 41, t.f. 1-3 (1934).

Described from specimens taken off Vaal Rhebok, *Pelea capreolus* (Behst.), Naauwpoort, C.P.

Genus TRICHOLIPEURUS Bedford.

**Tricholipeurus aepycerus** Bedford.

*Tricholipeurus aepycerus* Bedford, *S. Afr. Ectoparasites*, p. 363 (1932).

Described from specimens reported to have been taken off an Impala, *Aepyceros melampus*, on the Kunene River, South-West Africa, but Bedford (1934) has shown that the host was probably *Aepyceros petersi* Boch.

**Tricholipeurus elongatus** Bedford.

*Tricholipeurus elongatus* Bedford, *Onderstepoort Jour. Vet. Sci. & Anim. Indust.*, II, i, p. 46, t.f. 7-9 (1934).

Described from specimens taken off an Impala, *Aepyceros melampus*, Kruger National Park, Transvaal.

Genus DAMALINIA Mjöberg.

*Damalinea* Bedford, *S. Afr. Ectoparasites*, p. 364 (1932).

**Damalinea hopkinsi** Bedford.

*Damalinea hopkinsi* Bedford, *Onderstepoort Jour. Vet. Sci. & Anim. Indust.*, VII, i, p. 47, f. 18-19 (1936).

This species, described from specimens taken off Eland (*Taurotragus oryx pattersonianus*) in Uganda, is certain to be found also on the South African Eland.

## Genus FELICOLA Ewing.

*Felicola* Bedford, *S. Afr. Ectoparasites*, p. 365 (1932).

*Suricatoecus* Bedford, *ibid.*, p. 365 (1932).

*Suricatoecus* proves to be a synonym of *Felicola*.

**Felicola acuticeps** (Neumann).

*Trichodectes acuticeps* Neumann, *Archiv. Parasit.*, V, p. 601 (1902).

*Felicola genetta* (Bedford) Bedford, *S. Afr. Ectoparasites*, p. 366 (1932).

*Trichodectes genetta* Bedford proves to be a synonym of *T. acuticeps* Neu. I am deeply indebted to Mr. Fabio L. Werneck for very kindly sending me photographs of drawings he made of the types of *T. acuticeps*.

**Felicola cooleyi** (Bedford).

*Suricatoecus cooleyi* Bedford, *S. Afr. Ectoparasites*, p. 365 (1932).

*Additional record*: Specimens have been taken off *Mungos mungo colonus*, Uganda.

## Superfamily AMBLYCERA.

## Family MENOPONIDAE.

## Genus NUMIDICOLA Ewing.

*Numidicola longicornis* Ewing, the type of the genus, is undoubtedly a synonym of *N. antennata* (Kellogg & Paine).

**Numidicola antennata** (Kellogg & Paine).

*Numidicola antennata* (Kellogg & Paine) Bedford, *S. Afr. Ectoparasites*, p. 371 (1932).

*Additional record*: Specimens taken off *Numida coronata*, Vryburg, C.P.

## Genus MENOPON Nitzsch.

*Menopon* Bedford, *S. Afr. Ectoparasites*, p. 372 (1932).

**Menopon inaequale** Piaget. See *Myrsidea inaequalis* (Piaget).

**Menopon paululum** Kellogg & Chapman.

*Menopon paululum* Kellogg & Chapman, *Occ. Papers, California Acad. Sci.*, VI, p. 119, pl. 8, f. 2 (1899).

Described from specimens taken off *Puffinus opisthomelas*, *P. creatopus* and *Neonectris* (= *Puffinus*) *griseus* (Sooty Shearwater), the last-named occurring on the South African coast.

**Menopon petulans** Kellogg & Chapman.

*Menopon petulans* Kellogg & Chapman, *Occ. Papers, California Acad. Sci.*, VI, p. 121, pl. 8, f. 3 (1899).

Described from a male taken off *Neonectris* (= *Puffinus*) *griseus* (Sooty Shearwater), Bay of Monterey, California.

Genus UCHIDA Ewing.

*Neumannia* Uchida, *Jour. Coll. Agr. Imp. Univ. Tokyo*, IX, i, p. 27 (1926), *nec* Trouessart (1888); Bedford, *S. Afr. Ectoparasites*, p. 378 (1932).

*Uchida* Ewing, *Proc. Biol. Soc. Washington*, XLIII, p. 125 (1930).

As Ewing has pointed out, Uchida's name *Neumannia* cannot stand as it was used by Trouessart in 1888 for a genus of Acarina.

Genus MENACANTHUS Neumann.

*Menacanthus* Bedford, *S. Afr. Ectoparasites*, p. 378 (1932).

**Menacanthus gonophaeus** (Burmeister).

*Menopon gonophaeum* Burmeister, *Handbuch der Ent.*, II, p. 440 (1838); Giebel, *Insecta Epizoa*, p. 282, p. 15, f. 1 (1874).

*Menopon ovatum* Piaget, *Les Pédiculines*, p. 430, pl. 34, f. 6 (1880).

*Myrsidea gonophaea* (Nitzsch) Harrison, *Parasit.*, IX, i, p. 58 (1916).

*Myrsidea ovata* (Piaget) Harrison, *ibid*, IX, p. 59 (1916); Bedford, *S. Afr. Ectoparasites*, p. 382 (1932).

*Menacanthus corvus* Bedford, *Rep. Dir. Vet. Serr. & Anim. Indust., Un. S. Afr.*, XVI, p. 155, f. 1-3 (1930); Bedford, *S. Afr. Ectoparasites*, p. 379 (1932).

The types of *gonophaeus* were taken off *Corvus corax* in Europe, and those of *ovatus* and *corvus* off *Corvus albus* (= *C. scapulatus*), and the latter also from *Heterocorax capensis*. Through the kindness of Mr. C. D. Radford I have received specimens taken off *Corvus frugilegus* in England.

Harrison (1916) sank *Menopon anaspilum* Nitzsch as a synonym of *Menopon gonophaeum* Nitzsch, but I have received through the kindness of Colonel R. Meinertzhagen specimens taken off *Corvus corax corax* (type host) in the Outer Hebrides, Scotland, and find that it is a distinct species of *Myrsidae*.

Genus MYRSIDEA Waterston.

*Myrsidea* Bedford, *S. Afr. Ectoparasites*, p. 382 (1932).

**Myrsidea inaequalis** (Piaget).

*Menopon inaequale* Piaget, *Les Pédiculines*, p. 443, pl. 35, f. 1 (1880).

*Menopon inaequale* (Piaget) Bedford, *S. Afr. Ectoparasites*, p. 373 (1932).

Described from specimens taken off Red-backed Shrike, *Enneoctonus collurio* (= *Lanius collurio*), a migrant to South Africa. It is probably a synonym of *Menopon coarctatum* (Scopoli).

**Myrsidea ovata** (Piaget). See *Menacanthus gonophaeus* (Nitzsch).

## Genus TRINOTON Nitzsch.

**Trinoton aculeatum** Piaget.

*Trinoton aculeatum* (Piaget) Bedford, *S. Afr. Ectoparasites*, p. 382 (1932).

*Additional record*: Specimens taken off *Paecilonitta erythrorhyncha* (Red-billed Teal), Rustenburg District, Transvaal.

## Genus HELEONOMUS Ferris.

**Heleonomus miandrius** (Kellogg).

*Heleonomus miandrius* (Kellogg) Bedford, *S. Afr. Ectoparasites*, p. 385 (1932).

*Heleonomus confusus* (Ferris) Bedford, *ibid.*, p. 384 (1932).

Described by Kellogg (1910) from specimens taken off *Balearica regulorum gibbericeps* in East Africa. Later Ferris (1916) considered that the female described by Kellogg was distinct from the male, and proposed the name *confusus* for it. Kellogg in describing the female states that it is markedly smaller than the male, and has a narrow uncoloured median longitudinal line extending from abdominal segment 3 along the thoracic segments, and to the middle of the head, where it forks. Both the size and uncoloured line indicate that the specimens were immature; similar lines being found in immature specimens of species of *Actornithophilus*, *Trinoton*, etc. I have examined males, females and immature females sent me by Dr. H. Schouteden taken off *Balearica regulorum* (Crowned Crane) in the Belgian Congo, and find that the immature specimens agree perfectly with Kellogg's description, except that the line extends to the fourth abdominal segment. The mature females are slightly larger than the males, and the plates on tergites i-iv are divided in the middle by a narrow line as in immature specimens, except the fourth, which is only partly divided.

## Genus COLPOCEPHALUM Nitzsch.

*Colpocephalum* Bedford, *S. Afr. Ectoparasites*, p. 388 (1932).

**Colpocephalum angulaticeps** Piaget.

*Colpocephalum angulaticeps* Piaget, *Les Pédiculines*, p. 569, pl. 47, f. 8 (1880).

*Colpocephalum spineum* Kellogg, *Occ. Papers, California Acad. Sci.*, VI, pp. 38-39, pl. 4, f. 1 (1889); Kellogg & Kuwana, *Proc. Wash. Acad. Sci.*, IV, p. 484 (1902); Waterston, *Nat. Hist. Rep. Brit. Antarctic Exped. Zool.*, III, p. 270 (1921).

*Colpocephalum angulaticeps* (Piaget) Ferris, *Bern. P. Bishop. Mus., Honolulu*, Bull. 98, p. 54, f. 8A-F (1932); Bedford, *S. Afr. Ectoparasites*, p. 389 (1932).

Ferris has shown *spineum* to be a synonym of *angulaticeps*. The former was described by Kellogg from *Fregata aquila*, Panama, and the latter from *Fregata minor*. It has also been recorded from other sea-birds, but its presence on these was in all probability due to straggling, except possibly, as Ferris has stated, its occurrence on *Sula websteri*.

**Colpocephalum decimfasciatum** Boisduval & Lacordavei.

*Colpocephalum decimfasciatum* Bois. & Lac. Bedford, *S. Afr. Ectoparasits*, p. 380 (1932).

*Additional synonym: Colpocephalum laticeps* Kellogg, *Proc. Calif. Acad. Sci.*, VI, p. 149, pl. 12, f. 8 (1896). Described from specimens taken off *Ardea egretta*, Kansas, U.S.A., and *Botaurus lentiginosus*, Colorado, U.S.A.

*Colpocephalum nyctarde* Denny from *Nycticorax nycticorax* is probably also a synonym.

*Additional records:* From Buff-backed Egret, *Bubulcus ibis* (L.), Johannesburg (coll. G. Martinaglia), Rustenburg District (coll. W. Powell), and Sandford, Bergville District (coll. J. R. Freat). Specimens have also been received from Mr. L. II. Dunn taken off *Nycticorax nycticorax naevius* (Boddaert), Panama, and from Mr. H. S. Peters taken off *Ardea herodias herodias* (Great Blue Heron), Fredericktown, Ohio, U.S.A. (coll. L. E. Hicks).

**Colpocephalum ephippiorhynchi** Mjöberg. See *C. zebra* Nitzsch.

**Colpocephalum oreas** Kellogg. See *C. zebra* Nitzsch.

**Colpocephalum semicinctum** Rudow. See *C. subaequale* Nitzsch.

**Colpocephalum subaequale** Nitzsch.

*Colpocephalum subaequale* Nitzsch in Burmeister, *Handbuch*, II, p. 438 (1838); Giebel, *Insecta Epizoa*, p. 265, pl. 13, f. 13-14 (1874); Kellogg, *Proc. California Acad. Sci.*, VI, p. 525, pl. 72, f. 1 (1896).

*Colpocephalum semicinctum* Rudow, *Zeit. f. ges. Naturw.*, XXVII, p. 471 (1866); Bedford, *S. Afr. Ectoparasites*, p. 392 (1932).

The types of *subaequale* were taken off *Corvus corax* and *C. frugilegus* in Europe, and the type of *semicinctum* off *Corvus albus* (= *C. scapulatus*). Through the kindness of Colonel R. Meinertzhagen and Mr. C. D. Radford, I have received specimens taken off *Corvus corax*, *Corvus frugilegus* and *Pyrrhocorax pyrrhocorax* in England, and find they are identical with specimens taken off *Corvus albus*.

Specimens have been taken off *Corvultur albicollis* (White-necked Raven), Maseru, Basutoland, and Maziba, Uganda (coll. G. H. E. Hopkins) Kellogg (1896 and 1899) has recorded it from the American crows, *Corvus americanus* and *C. corax sinuatus*.

**Colpocephalum zebra** Nitzsch.

*Colpocephalum zebra* Nitzsch, in Burmeister, *Handbuch*, II, p. 438 (1838); Denny, *Anoplur. Brit.*, p. 210, pl. 19, f. 2 (1842); Piaget, *Les Pédiculines*, pp. 545-546, pl. 45, f. 5 (1880).

*Colpocephalum ephippiorhynchi* Mjöberg, *Arkiv. f. Zool.*, VI, p. 43, pl. 3, f. 9 (1910).



*Colpocephalum oreas* Kellogg, *Schwed. Exp. Kilimanjaro*, p. 51, pl. 7, f. 8 (1910).

*Colpocephalum zebra* (Nitzsch) Ferris, *Parasit.*, XVI, i, p. 59, f. 2A-G (1924); Bedford, *S. Afr. Ectoparasites*, p. 394 (1932).

Specimens recently taken off *Ephippiorhynchus senegalensis* (Saddle-bill Stork), Mazabuka, Northern Rhodesia (coll. P. L. le Roux), prove that both *C. ephippiorhynchi* and *C. oreas*, which were described from specimens taken off the same species of host, are synonyms of *C. zebra*.

### Suborder SIPHUNCULATA.

Family HAEMATOPINIDAE Enderlein.

Genus SCIPIO Cummings.

#### **Scipio tripedatus** Ferris.

*Scipio tripedatus* Ferris, *Contrib. Toward Mon. Suck. Lice*, Part V, p. 15 (285), t.f. 173-175 (1932).

*Scipio* nov. sp. Bedford, *S. Afr. Ectoparasites*, p. 402 (1932).

Described from a female and immature specimens taken off a "nokey" in South Africa; also a male from *Petromys typicus tropicalis*, Windhoek, South-West Africa, and specimens from *P. typicus*, Soebatsfontein, near Garies, Namaqualand (coll. R. F. Lawrence).

Genus POLYPLAX Enderlein.

*Polyplax* Bedford, *S. Afr. Ectoparasites*, p. 403 (1932).

#### **Polyplax serrata** (Burmeister).

*Pediculus serratus* Burmeister, "*Rhynchota*", *Gen. Ins.*, No. 6 (1839).

*Polyplax serrata* (Burm.) Ferris, *Contrib. Towards Mon. Suck. Lice*, iv, pp. 191-192, t.f. 120B-E (1923).

Specimens have been taken off a White Mouse at Onderstepoort (coll. G.A.H.B.). It was described from specimens taken off *Mus musculus* (House Mouse) in Europe.

#### **Polyplax spinulosa** (Burmeister).

*Polyplax spinulosa* (Burm.) Bedford, *S. Afr. Ectoparasites*, p. 405 (1932).

*Additional record*: *Grammomys dolichurus* (Cape Arboreal Rat), Pietermaritzburg, Natal (coll. V. F. Woodiwiss).

Genus *Hoplopleura* Enderlein.

#### **Hoplopleura biseriata** Ferris

*Hoplopleura biseriata* (Ferris) Bedford, *S. Afr. Ectoparasites*, p. 406 (1935).

*Additional record*: Specimens received from Dr. B. De Meillon taken off *Tatera joanae* Thos., Ondongo, South-West Africa (coll. K. Schetter).

Genus HAEMODIPSUS Enderlein.

*Haemodipsus* Ferris, *Contrib. Toward Mon. Suck. Lice*, V, p. 59 [329] (1932).

*Haemodipsus* Bedford, *S. Afr. Ectoparasites*, p. 407 (1932).

This genus now comprises four species found on Leporidae.

**Haemodipsus africanus** Bedford.

*Haemodipsus africanus* Bedford, *Onderstepoort Jour. Vet. Sci. & Anim. Indust.*, II, i, p. 48, t.f. 10 (1934).

Described from a female taken off *Lepus zuluensis* Thos. & Schw., Jericho, Transvaal.

Genus PROLINOGNATHUS Ewing.

*Prolinognathus* Ferris, *Contrib. Toward Mon. Suck. Lice*, V, p. 138 [408] (1932).

*Prolinognathus* Bedford, *S. Afr. Ectoparasites*, p. 408 (1932).

This genus includes two species found on Procaviidae, both of which may occur on the same host.

**Prolinagnathus caviae-capensis** (Cummings).

*Prolinognathus caviae-capensis* (Cumms.) Ferris, *Contrib. Toward Mon. Suck. Lice*, V, p. 139 [409], t.f. 250A, 251A, E-J (1932).

*Prolinognathus caviae-capensis* (Pallas) Bedford, *S. Afr. Ectoparasites*, p. 408 (1932), part.

As Ferris (1932) has pointed out, this species should be credited to Cummings (1913) rather than to Pallas (1767), and has been confused with *P. leptocephalus* (Ehrenberg). Both Pallas and Cummings recorded it from *Procapra capensis*, and specimens have been taken off the same host species at Hout Bay, near Capetown; also off *Procapra coombi*, Onderstepoort. Specimens recorded from other hosts prove to be *P. leptocephalus*.

**Prolinognathus leptocephalus** (Ehrenberg).

*Pediculus leptocephalus* Ehrenberg, *Symbolae Physicae, Decas Prima*, p. f. (1828).

*Prolinognathus leptocephalus* (Ehrenb.) Ferris, *Contrib. Toward Mon. Suck. Lice*, V, p. 142 [412], t.f. 250B, 251B-D (1932).

Originally described from *Procapra* (= *Hyrax*) *syriacus*, and Ferris has recorded it from the same host species from Syria. Specimens have also been taken off *Procapra coombi*, Onderstepoort and Rooikrans, Transvaal; *Procapra capensis*, Hout Bay, near Capetown (coll. R. F. Lawrence); *Procapra* sp., Lamberts Bay, C.P. (Tvl. Mus. No. 2148); *Procapra waterbergensis*, Otjiwarongo, South-West Africa (Tvl. Mus. No. 5335); *Heterohyrax ruddi*, Macequece, Portuguese East Africa (Tvl. Mus. No. 6215), and Ferris (1932) has recorded it from *Procapra brucei rudolfi*, Marsabit Road, Kenya Colony.

Genus *LINOGNATHUS* Enderlein.

*Linognathus* Ferris, *Contrib. Toward Mon. Sucking Lice*, V, p. 66 [336] (1932).

*Linognathus* Bedford, *S. Afr. Ectoparasites*, p. 408 (1932).

This genus has recently been monographed by Ferris and now comprises twenty-seven species found on Bovidae and domestic dog; of these twenty have been recorded from South Africa.

***Linognathus aepycerus* Bedford.**

*Linognathus aepycerus* Bedford, *Onderstepoort Jour. Vet. Sci. & Anim. Indust.*, VII, i, p. 62, t.f. 5-6 (1936).

Described from males and females taken off *Aepyceros melampus* (Impala), between Pretoria and Johannesburg; also females off the same host, Rustenburg District, Transvaal.

***Linognathus angulatus* (Piaget).** See *Linognathus gazella* Mjöberg.***Linognathus bedfordi* Ferris.**

*Linognathus bedfordi* Ferris, *Contrib. Toward Mon. Suck. Lice*, V, p. 117 [387], t.f. 236, 238B, C, E, H, 239A-D (1932).

Described from specimens taken off *Antidorcas marsupialis* (Springbok) at Onderstepoort.

***Linognathus damaliscus* Bedford.**

*Linognathus damaliscus* Bedford, *Onderstepoort Jour. Vet. Sci. & Anim. Indust.*, VII, i, p. 61, t.f. 3-4 (1936).

Described from males and females taken off *Damaliscus albifrons* (Blesbok). Zoological Gardens, Johannesburg, and females off *Damaliscus dorcas* (Bontebok), Bredasdorp, C.P.

***Linognathus fractus* Ferris.**

*Linognathus fractus* Ferris, *Contrib. Toward Mon. Suck. Lice*, V, p. 96 [366], t.f. 220, 221 (1932).

*Linognathus* nov. sp. Bedford, *S. Afr. Ectoparasites*, p. 409 (1932).

Described from specimens taken off *Tragelaphus sylvaticus* (Bushbuck) at Onderstepoort.

***Linognathus gazella* Mjöberg.**

*Linognathus gazella* Mjöberg, *Arkiv. för Zoologi*, VI, p. 157, f. 78 (1910).

*Linognathus gilvus* Fahrenholz, *Jahrbuch der Hamburg Wissenschaft. Anstalt.*, XXXIV, p. 18, f. 5 (1917).

*Linognathus gazella* (Mjöberg) Ferris, *Contrib. Toward Mon. Suck. Lice*, V, p. 111 [381], t.f. 232B, E, F, 234 (1932).

*Linognathus angulatus* Bedford, *S. Afr. Ectoparasites*, p. 409 (1932).

As Ferris (1932) has pointed out, specimens recorded by Ferris (1916) and Bedford (1927 and 1932) taken off *Cephalopus natalensis* (Red Duiker), Mfongosi, Zululand and *Sylvicapra grimmii* (Duiker) from Trausvaal and Zululand prove to be *L. gazella*. Bedford (1932) also recorded it as *L. angulatus* from *Philantomba monticola* (Blue Duiker), Pietermaritzburg, Natal. *L. gazella* was described by Mjöberg from "gazella", Hamburg Zoological Gardens, and also erroneously recorded by him as *L. angulatus* from *Cephalophus* sp. in the same gardens. The latter were later described by Fahrenholz as *L. gilvus*.

*L. angulatus* is only known from *Cephalopus nigrifrons* and should be deleted from the South African list.

**Linognathus hippotrugi** Ferris.

*Linognathus hippotrugi* Ferris, *Contrib. Toward Mon. Suck. Lice*, V, p. 103 [373], t.f. 226, 227 (1932).

Described from specimens taken off *Hippotragus niger* (Sable Antelope) in the Zoological Gardens, Johannesburg.

**Linognathus limnotragi** Cummings.

*Linognathus limnotragi* Cummings, *Bull. Ent. Res.*, IV, p. 36, f. 1 (1913).

*Linognathus limnotragi* (Cumms.) Ferris, *Contrib. Toward Mon. Suck. Lice*, V, p. 113 [383], t.f. 231A, 1-1, 232C-D (1932).

Recorded by Ferris taken off *Tragelaphus sylvaticus* (Bush-buck) at Onderstepoort; also from *Tragelaphus scriptus*, Zoological Gardens, London. It was described by Cummings from specimens taken off *Limnotragus* (= *Tragelaphus*) *gratus*, in the Zoological Gardens, London, from the Congo.

**Linognathus peleus** Bedford.

*Linognathus peleus* Bedford, *Onderstepoort Jour. Vet. Sci. & Anim. Indust.*, VII, i, p. 59, t.f. 1-2 (1936).

Described from males and females taken off *Pelea capreolus* (Vaal Rhebok), Naauwpoort, C.P.

**Linognathus spicatus** Ferris.

*Linognathus spicatus* Ferris, *Contrib. Toward Mon. Suck. Lice*, V, p. 118 [388], t.f. 237, 238A, G, 239E (1932).

Described from specimens taken off *Gorgon taurinus* (Blue Wildebeest), Maasstroom, Northern Transvaal. Specimens have also been taken off the same host species in the Zoological Gardens, Pretoria.

Genus HAEMATOPINUS Leach.

*Haematopinus* Bedford, *S. Afr. Ectoparasites*, p. 411 (1932).

*Haematopinus* Ferris, *Contrib. Toward Mon. Suck. Lice*, VI, p. 5 [419] (1933).

This genus has recently been monographed by Ferris and now comprises eleven species found on ungulates; of these eight are parasitic on South African hosts.

**Haematopinus acuticeps** Ferris.

*Haematopinus acuticeps* Ferris, *Contrib. Toward Mon. Suck. Lice*, VI, p. 53 [467], f. 275 (1933).

Described from females taken off *Hippotigris burchelli* (Zebra), Mpwapwa, Tanganyika Territory.

Genus PHTHIRUS Leach.

**Phthirus pubis** (Linnaeus).

*Phthirus pubis* (Linn.) Bedford, *S. Afr. Ectoparasites*, p. 414 (1932).

Specimens have been received from Dr. R. F. Lawrence taken off a chimpanzee in the French Congo along with specimens of *Pediculus schaeffi* Fahrenholz.

**Order HEMIPTERA (= RHYNGOTA).**

Suborder HETEROPTERA.

Genus CACODMUS Stal.

**Cacodmus sparsilis** Rothschild.

*Cacodmus sparsilis* (Roths.) Bedford, *S. Afr. Ectoparasites*, p. 416 (1932).

Specimens have been taken off *Scotophilus nigrita dingani* at Onderstepoort. Previously recorded taken from the same host in Natal.

**Cacodmus villosus** (Stal).

*Cacodmus villosus* (Stal) Bedford, *S. Afr. Ectoparasites*, p. 415 (1932).

*Additional records*: From *Rousettus collaris* (Illiger), Pietermaritzburg, Natal, and *Eptesicus capensis*, Onderstepoort (coll. G.A.H.B.).

Genus APHRANIA Jordan & Rothschild.

*Aphrania* Jordan & Roths., *Novit. Zool.*, XIX, p. 353 (1912).

*Generic characters*: Setae shorter than in *Cacodmus*, only a small number of lateral ones on the pronotum longer than the first antennal segment. Second segment of proboscis shorter than fourth. Hind tibia with distinct pseudo-joint, mid tibia with indistinct joint, and fore tibia without pseudo-joint. This genus contains a single species.

**Aphrania barys** Jordan & Rothschild.

♂ *Aphrania barys* Rothschild & Jordan, *Novit. Zool.*, XIX, p. 355-356, t.f. 3, 4 (1912).

Described from males collected at Maseru, Basutoland. The host is unknown.

Order DIPTERA.

DIPTERA PUPIPARA.

Family HIPPOBOSCIDAE.

Genus HIPPOBOSCA Linn.

*Hippobosca* Bedford, *S. Afr. Ectoparasites*, p. 418 (1932).

**Hippobosca martinaglia** Bedford.

*Hippobosca martinaglia* Bedford, *Onderstepoort Journ. Vet. Sci. & Anim. Indust.*, VII, i, p. 67, f. 1 (1936).

Described from females and a male taken off Impala, *Aepyceros melampus* (Lcht.), Bar R Ranch, Swaziland.

Genus ORNITHEZA Speiser.

**Ornitheza metallica** (Schiner).

*Ornitheza metallica* (Sch.) Bedford, *S. Afr. Ectoparasites*, p. 421 (1932).

*Additional record*: One female from Layard's *Bulbul*, *Loidorusa layardi* (Gurn.), Onderstepoort, 2 Nov., 1933 (coll. G.A.H.B.).

Genus CRATAERINA von Olfers.

*Crataerina* Bedford, *S. Afr. Ectoparasites*, p. 425 (1932).

**Crataerina melbae** (Rondani).

*Chelidomyia melbae* Rondani, *Bull. Soc. Ent. Ital.*, XI, p. 17 (1879).

*Crataerina melbae* (Rond.) Austen, *Parasit.*, XVIII, iii, pp. 358-359 (1926).

One male and one female taken off African Great Swift, *Tachymarptis melba africana* (Temm.), Mamathes, Basutoland, 12th December, 1933 (coll. C. J. Guillardmod). In the female the second basal cell is divided into two by a supernumerary transverse vein, but in the male this cell is not divided. Normally it is divided in both sexes.

This species has previously been reported taken off the Alpine Swift, *T. melba* (L.). Austen records one male from Switzerland and one female without locality label.

Family STREBLIDAE.

Genus RAYMONDIA Frauenfeld.

**Raymondia bedfordi** Ferris.

*Raymondia bedfordi* (Ferris) Bedford, *S. Afr. Ectoparasit.*, p. 427 (1932).

*Additional record*: From *Petalia damarensis* (Ptrs.), Gokha Hills.

**Raymondia huberi huberi** Frauenfeld.

*Raymondia huberi* (Frauenfeld) Bedford, *S. Afr. Ectoparasites*, p. 427 (1932).

*Additional records*: From *Hipposideros caffer* (Sund.), Tzaneen, Northern Transvaal (coll. H. H. Dilly), and *Cleotis percivalli australis* Rbts., Uitkyk, near Krugersdorp, Transvaal (coll. G. van Son).

**Raymondia waterstoni** Jobling.

♀ ♂ *Raymondia waterstoni* Jobling, *Parasit.*, XXIII, i, pp. 79-83, t.f. 1, 2A-D (1931).

Described from specimens taken off *Rhinolophus simulator* from Tanganyika Territory.

*Additional records*: From *Rhinolophus geoffroyii augur* Anders., in a cave, Pretoria (coll. G.A.H.B.); also from *Rhinolophus empusa* and *Cleotis percivalli australis* Rbts., Uitkyk, near Krugersdorp, Transvaal (coll. G. van Son).

## Genus NYCTERIBOSCA Speiser.

*Nycteribosca* Jobling, *Parasit.*, XXVI, i, pp. 64-69 (1934).

This genus now contains 17 species, one of which is doubtful. Of these, only two have been recorded from the Ethiopian region.

**Nycteribosca africana** (Walker).

*Strebla africana* Walker, *List of the Specimens of Diptera Insects in the Collection of the British Museum*, Part IV, 1146 (1849).

*Raymondia kollari* Frauenfeld, *Sitzungsber. Akad. Wiss. Wien*, XVIII, p. 329, f. 1A-B (1855), *nec* Schiner, 1868.

*Nycteribosca kollari* Speiser, *Arch. f. Naturg.*, LXVI, p..... (1900).

*Nycteribosca africana* (Walker) Jobling, *Parasit.*, XXVI, i, pp. 86-88, t.f. 10A-C (1934).

*Nycteribosca africana* (Walker) Bedford, *S. Afr. Ectoparasites*, p. 427 (1932).

*Nycteribosca kollari* (Speiser) Bedford, *ibid.*, p. 427 (1932).

As Jobling has shown, *Nycteribosca kollari* (Frauenfeld) is a synonym of *Nycteribosca africana* (Walker).

*Additional record*: From *Rhinolophus empusa*, Uitkyk, near Krugersdorp, Transvaal (coll. G. van Son).

**Order SIPHONAPTERA.**

## Family TUNGIDAE.

## Genus ECHIDNOPHAGA Olliff.

**Echidnophaga larina** Jordan & Rothschild.

*Echidnophaga larina* (Jord. & Roths.) Bedford, *S. Afr. Ectoparasites*, p. 435 (1932).

*Additional record*: Domestic Pigs, Pretoria District.

Family PULICIDAE.

Genus PROCAVIOPSYLLA Jordan.

**Procaviopsylla angolensis** Jordan.

*Procaviopsylla angolensis* (Jordan) Bedford, *S. Afr. Ectoparasites*, p. 438 (1932).

*Additional record*: Specimens have been collected by Dr. B. De Meillon from *Heterohyrax granti*, Zoutpansberg, Northern Transvaal.

Genus XENOPSYLLA Glinkiewicz.

*Xenopsylla* Bedford, *S. Afr. Ectoparasites*, p. 440 (1932).

**Xenopsylla cheopis** (Rothschild).

*Xenopsylla cheopis* (Roths.) Bedford, *S. Afr. Ectoparasites*, p. 442 (1932).

*Additional record*: *Mus musculus* (House Mouse), Pietermaritzburg, Natal (coll. V. F. Woodiwiss).

**Xenopsylla phyllomae** De Meillon.

♂ *Xenopsylla phyllomae* De Meillon, *Publ. S. Afr. Instit. Med. Res.* (33), VI, p. 265, pl. 4, f. 1-2 (1934).

Described from a male taken off *Aethomys chrysophilus tzaneensis* (Jameson), Zoutpansberg, Northern Transvaal.

Genus CTENOCEPHALIDES Stiles & Collins.

**Ctenocephalides connatus** (Jordan).

*Ctenocephalides connatus* (Jordan) Bedford, *S. Afr. Ectoparasites*, p. 447 (1932).

*Additional record*: Specimens taken off a hare, Tzaneen, Northern Transvaal (coll. B. De Meillon).

Genus CERATOPHYLLUS Curtis.

*Ceratophyllus* Bedford, *S. Afr. Ectoparasites*, p. 448 (1932).

Jordan (1933) has recently split this genus up into a number of genera. Both *C. fasciatus* (Bosc.) and *C. londiniensis* Rothschild are now included in the genus *Nosopsyllus* Jordan.

Genus NOSOPSYLLUS Jordan.

*Nosopsyllus* Jordan, *Novit. Zool.*, XXXIX, i, p. 76 (1933).

*Genotype*: *Ceratophyllus fasciatus* (Bosc.).

(See note under previous genus.)

Genus CHIASTOPSYLLA Rothschild.

**Chiastopsylla rossi** (Waterston).

*Chiastopsylla rossi* (Waterst.) Bedford, *S. Afr. Ectoparasites*, p. 453 (1932).

*Additional record*: Specimens taken off *Grammomys dolichurus* (Cape Arboreal Rat), Pietermaritzburg, Natal (coll. V. F. Woodiwiss).



## Genus CTENOPHTHALMUS Kolenati.

**Ctenophthalmus calceatus** Waterston.

*Ctenophthalmus calceatus* (Waterst.) Bedford, *S. Afr. Ectoparasites*, p. 457 (1932).

*Additional records*: Specimens have been received from Dr. V. F. Woodiwiss taken off the following hosts at Pietermaritzburg, Natal: *Otomys irroratus* (Water Rat), *Mus musculus* (House Mouse), *Rhabdomys pumilio* (Striped Mouse), *Rattus rattus* (Black Rat) and *Grammomys dolichurus* (Cape Arboreal Rat).

## Genus DINOPSYLLUS Jordan &amp; Rothschild.

**Dinopsyllus lypusus** Jordan & Rothschild.

*Dinopsyllus lypusus* J. & R. Bedford, *S. Afr. Ectoparasites*, p. 458 (1932).

*Additional records*: Specimens have been taken off *Mus musculus* (House Mouse) and *Grammomys dolichurus* (Cape Arboreal Rat), Pietermaritzburg, Natal (coll. V. F. Woodiwiss).

## Genus LEPTOPSYLLA Jordan and Rothschild.

**Leptopsylla segnis** (Schönh.).

*Leptopsylla segnis* (Schönh) Bedford, *S. Afr. Ectoparasites*, p. 460 (1932).

*Additional record*: Specimens taken off *Grammomys dolichurus* (Cape Arboreal Rat), Pietermaritzburg, Natal (coll. V. F. Woodiwiss).

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