

## A preliminary study on Mallophaga in South African birds

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**ABSTRACT.** *Ciconiphilus decimfasciatus minor* (PIAG.) from *Bubulcus ibis* is recognized a valid subspecies. *Pseudocolpocephalum doriabagla* ANSARI from Oriental *Bubulcus ibis coromandus* is regarded now as a junior synonym (syn. n.) of *C. d. minor* (PIAG.). *Austromenopon aegialitidis* (DURR.) is recorded for the first time from the Afrotropical Region and from *Stephanibyx coronatus*. *Actornithophilus hoplopteri* (MJÖB.) and *Cypseloecus excisus* are recorded for the first time from *Anitibyx armatus* and *Hirundo spilodera*, respectively. An unknown louse of the subfamily Brueeliinae was collected from *Spreo bicolor*. Occurrence of the following lice species in the Afrotropical Region has been confirmed: *Dennyus vonarxi* BÜTT. from *Tachymarptis melba*, *Colimenopon* sp. from *Urocolius indicus*, *Plegadiphilus threskiornis* BEDL. from *Threskiornis aethiopicus*, *Actornithophilus crinitus* CLAY from *Stephanibyx coronatus*, *Saemudssonina africana* TIMM. from *S. coronatus*, *Quadriceps kilimandjarensis* (KELL.) from *S. coronatus*, *Q. chorleyi* TIMM. from *Anitibyx armatus*, *Q. princeps* TIMM. from *Rhinoptilus africanus hartingi* and *Oedicnemiceps* sp. from *Burhinus capensis*. Biometric data of parasites are presented.

**KEY WORDS:** Phthiraptera, Mallophaga, South Africa, host records, biometrics.

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### INTRODUCTION

The most comprehensive parasite-host list of Afrotropical Mallophaga is presented in LEDGER'S (1980) monograph. No additions or corrections regarding lice species represented in our material have been made to date. This paper represents therefore a further contribution to the knowledge of South African amblyceran species of Menoponidae, Ancistrionidae and Colpocephalidae and ischnoceran species of Rallicolidae and Philopteridae. Materials examined in this study were collected from nine bird species

belonging to the orders Charadriiformes, Ciconiiformes, Coliiformes, Apodiformes and Passeriformes.

Nomenclature and classification of Mallophaga follows EICHLER (1963) and ZŁOTORZYCKA (1984), while that of host species follows WOLTERS (1975, 1976).

## MATERIAL AND METHODS

Birds parasitised by lice were obtained in 1993-1995 from Bloemfontein and its immediate vicinity, and from the Dewetsdorp and Bethlehem districts of the Free State province, South Africa. The material was identified to the species level using published keys (see references). Results of the identifications are shown in Table 1.

Table 1. Material examined. M – male, F – female, N - nymph.

Host species	Locality Date	Mallophaga species	M	F	N
<i>Smutsornis africanus</i>	Bloemfontein March 1994	<i>Quadraceos princeps</i>	1	0	0
<i>Antibyx armatus</i>	Bloemfontein April 1994	<i>Actornithophilus hoplopteri</i> s. lat.	8	3	0
		<i>Quadracep chorleyi</i>	1	3	1
<i>Antibyx armatus</i>	Bloemfontein Nov.-Feb.1994	<i>Actornithophilus hoplopteri</i> s. lat.	0	1	0
		<i>Quadraceps chorleyi</i>	3	4	0
<i>Stephanibyx coronatus</i>	Bloemfontein April 1994	<i>Actornithophilus crinitus</i>	12	12	0
		<i>Quadraceps kilimandjarensis</i>	122	105	0
		<i>Saemundssonina africana</i> s. lat.	1	1	0
<i>Stephanibyx coronatus</i>	Bloemfontein August 1994	<i>Actornithophilus crinitus</i>	1	3	1
		<i>Quadraceps kilimandjarensis</i>	4	2	0
		<i>Saemundssonina africana</i> s. lat.	0	3	0
<i>Stephanibyx coronatus</i>	Bloemfontein Feb. 1994	<i>Actornithophilus crinitus</i>	18	27	4
		<i>Quadraceps kilimandjarensis</i>	17	30	3
		<i>Saemundssonina africana</i> s. lat.	1	2	0
<i>Stephanibyx coronatus</i>	Bloemfontein May 1994	<i>Actornithophilus crinitus</i>	28	14	3
		<i>Austromenopon aegialitidis</i> s. lat.	2	1	0
		<i>Quadraceps kilimandjarensis</i>	35	41	5
		<i>Saemundssonina africana</i> s. lat.	0	2	0
<i>Stephanibyx coronatus</i>	Bloemfontein Nov. 1993- Jan. 1994	<i>Actornithophilus crinitus</i>	3	6	0
		<i>Austromenopon aegialitidis</i> s. lat.	0	1	0
		<i>Quadraceps kilimandjarensis</i>	4	3	0
		<i>Saemundssonina africana</i> s. lat.	0	3	0

<i>Stephanibyx coronatus</i>	Bloemfontein June-July 1994	<i>Actornithophilus crinitus</i>	1	0	0
		<i>Quadriceps kilimandjarensis</i>	9	11	0
		<i>Saemundssonina africana</i> s. lat.	0	7	0
<i>Burhinus capensis</i>	Bloemfontein Feb. 1994	<i>Oedicephalus</i> sp.	0	0	2
<i>Threskiornis aethiopicus</i>	Wolwekop, Jan. 1994	<i>Plegadiphilus threskiornis</i>	41	26	2
<i>Threskiornis aethiopicus</i>	Dewetsdorp distr. Nov.-Jan. 1994	<i>Plegadiphilus threskiornis</i>	16	9	4
<i>Bubulcus ibis</i>	Dewetsdorp distr. Jan. 1994 Nov.-Jan. 1994 Jan. 1994	<i>Ciconiphilus decimfasciatus</i>	3	12	1
		<i>Ciconiphilus decimfasciatus</i>	5	10	1
		<i>Ciconiphilus decimfasciatus</i>	1	3	0
<i>Tachymarptis melba</i>	Bloemfontein August 1994	<i>Dennyus vonarxi</i>	5	6	22
<i>Urocolius indicus</i>	Glen n. Bloemfontein Feb. 1995	<i>Colimenopon</i> sp.	0	0	1
<i>Spres bicolor</i>	Clarens Bethlehem distr. Nov. 1993	Brueeliinae	0	0	1
<i>Hirundo spilodera</i>	Dewetsdorp distr. OFS Feb. 1994	<i>Cypseloecus excisus</i> ssp.	0	1	0

The material is mounted on slides and deposited in the collections of the National Museum in Bloemfontein, South Africa, and the Natural History Museum of Wrocław University, Poland.

## RESULTS

### Menoponidae

#### *Dennyus vonarxi* BÜTTIKER 1954

Type host: *Apus melba melba* (L.) (= *Tachymarptis m. melba*) (Apodiformes)

The original description is based on specimens collected from *Apus m. melba* at a few localities in Switzerland and *Apus melba africanus* collected by G.H.E. Hopkins in southern Africa. Unfortunately, BÜTTIKER (1954) did not designate a holotype and paratypes. Among 52 males and 21 females deposited in BÜTTIKER'S collection in Zurich two males and four females were designated as paratypes of *D. vonarxi* (LEDGER 1971). It appears, therefore, that BÜTTIKER only designated the type series for *D. vonarxi* in his collection.

Based on the above-mentioned material and on the material collected from other *Apus melba* subspecies from a few localities in Africa (including South Africa) and Asia, LEDGER (1971) re-described *D. vonarxi*. Although he pointed out that most of the material

was deposited in The British Museum of Natural History in London, *D. vonarxi* is not listed amongst Mallophaga species deposited at this museum (HOPKINS & CLAY 1952, 1953, 1955).

BÜTTIKER (1954) noted similarities between *D. vonarxi* and *D. chelidoneus*. As it appears from EICHLER'S (1946) species list of Mallophaga, *D. chelidoneus* collected from *Apus a. apus* L. was described by SCHRANK in 1803 and is probably a junior synonym of *Dennyus hirundinis* (L., 1761). LEDGER (1971) regarded *D. hirundinis* as being different from *D. vonarxi*. Earlier (1968a) he noted that *D. vonarxi* is similar to *D. aequatorialis* LEDGER, 1968.

**Table 2.** Measurements (in mm) of *Dennyus vonarxi* from *Tachymarptis melba*.

	Males (n = 5)	Females (n = 6)
Length of head	0.48-0.52	0.48-0.52
Width of head	0.62-0.70	0.63-0.69
Width of prothorax	0.36-0.39	0.35-0.41
Width of mesothorax	0.40-0.47	0.43-0.52
Width of metathorax	0.63-0.65	0.68-0.71
Width of abdomen	0.71-0.90	0.90-1.03
Total body length	2.17-3.36	2.54-2.79

LEDGER (1980) also pointed out that hosts of both lice species are closely related as BROOKE (1972) placed both swift species (previously in *Apus*) in the genus *Tachymarptis* ROBERTS. Morphology, especially that of copulatory organs, of specimens in our material collected from *T. melba* agrees with the description of *D. vonarxi*. Specimens from our collection were slightly smaller than those of BÜTTIKER (1954) and LEDGER (1971).

### *Colimenopon* sp. indet.

*Colimenopon urocolius* (BEDFORD, 1930), (type host: *Urocolius indicus transvaalensis* ROBERTS, Coliiformes) is related to *Machaerilaemus* HARR. and was placed in the latter genus by BEDFORD (1930). LEDGER (1968b) listed *Colimenopon urocolius* (BEDF.), collected from *Colius indicus* (= *Urocolius indicus*) in the former Transvaal, South Africa, but did not describe the material. LEDGER (1980) also gives no details.

There is only one nymph amongst our material, identified as *Colimenopon* sp. It probably belongs to *C. urocolius*, but *Colimenopon hamatum* (NEUMANN 1912), described from an unknown African host, cannot be excluded. LEDGER (1980), after CLAY (1955), regards *Colius striatus* as the type host of *C. hamatum*.

### Ancistrionidae

#### *Austromenopon aegialitidis* (DURRANT, 1906)

Type host: *Aegialitis vocifera* L. (= *Charadrius v. vociferus* L.) (Charadriiformes)

*A. aegialitidis* should be regarded as a species-group including *A. aegialitidis* from *Charadrius vociferus*, *A. leucurae* TIMM. from *Chettusia leucura* (LICHT.), *A. gregariae* TIMM. from *Ch. gregaria* (PALL.), and lice populations from other hosts (e.g. *Hemiparra*, *Hoplopterus*, *Stephanibyx*, *Rhinoptilus* and *Vanellus*) which are difficult to differentiate

(CLAY 1959). For this reason all populations of the genus *Austromenopon* are regarded as the 'aegialitidis' species-group (CLAY 1959).

For the Afrotropical Region two species of *Austromenopon* s. l. are listed by LEDGER (1980), namely *A. gregariae* from *Chettusia gregaria* and *A. leucurae* from *C. leucura*. This is somewhat controversial as the Afrotropical Region is beyond the geographical ranges of both host species. Furthermore, TIMMERMANN (1954) described *Austromenopon leucurae* from India and *A. gregariae* from Arabia. According to WOLTERS (1975) geographical

**Table 3.** Measurements (in mm) of *Austromenopon aegialitidis* from *Stephanibyx coronatus*.

	Male (n = 1)	Females (n = 2)
Length of head	0.23	0.29-0.34
Width of head	0.36	0.48-0.51
Width of prothorax	0.28	0.36-0.39
Width of mesothorax	0.30	0.44-0.49
Width of metathorax	0.33	0.50-0.54
Width of abdomen	0.40	0.70-0.80
Total body length	1.02	1.52-1.80

ranges of *Chettusia gregaria* and *Ch. leucura* are entirely Asiatic. On the other hand, *Stephanibyx coronatus* (BODD.) (= *Vanellus coronatus*), a potential host for *Austromenopon aegialitidis* s. l., does occur in the Afrotropical Region. In one of six specimens of *S. coronatus* investigated by us, one male and two females *A. aegialitidis* s. l. were found (Table 3).

This is therefore the first record of this species in the Afrotropical Region and for *Stephanibyx coronatus*.

### *Plegadiphilus threskiornis* BEDFORD, 1939

Type host: *Threskiornis aethiopicus aethiopicus* (LATH.) (Ciconiiformes)

*P. threskiornis* is the type-species of *Plegadiphilus* BEDFORD, 1939. LEDGER (1971) listed other *Threskiornis* species, such as *Th. melanocephalus* (LATH.), *Th. molucca* (CUV.) and *Th. spinicollis* (JAM.) as being hosts for the louse. This author also included *Hagedashia hagedash* (LATH.) as a host.

**Table 4.** Measurements (in mm) of *Plegadiphilus threskiornis* from *Threskiornis aethiopicus*.

	Males (n = 30)	Females (n = 23)
Length of head	0.27-0.32	0.29-0.34
Width of head	0.42-0.47	0.47-0.54
Width of prothorax	0.31-0.36	0.33-0.39
Width of mesothorax	0.38-0.43	0.44-0.51
Width of metathorax	0.41-0.44	0.47-0.54
Width of abdomen	0.57-0.69	0.72-0.83
Total body length	1.36-1.52	1.64-1.83

Populations from all of the above-mentioned host species are characterized by narrow and elongated basal apodeme in the male genitalia. This feature was observed in males in our material collected from *Threskiornis aethiopicus*. These specimens were identified as *Plegadiphilus threskiornis*. Their body measurements are shown in Table 4.

The type host of *T. threskiornis* is known from the Afrotropical Region. LEDGER (1980) also recorded this louse from other Afrotropical host species, namely *Hagedashia hagedash* which is regarded by WOLTERS (1976) as *Bostrychia (Hagedashia) hagedash*. Other host species listed by LEDGER (1971) occur mainly in Asia and only exceptionally in northern Africa.

***Actornithophilus hoplopteri* (MJÖBERG, 1910)**

Type host: *Hoplopterus spinosus* (L.) (Charadriiformes)

CLAY (1962) recognized 'hoplopteri' as the species-group which includes *Actornithophilus hoplopteri* s. l. and *A. pauliani* SÉGUY which parasitise *Chionis minor*. According to her *A. hoplopteri* s. l. (species-group) parasite Vanellinae; this excludes *Stephanibyx coronatus* and *Chettusia gregaria*. LEDGER (1980) points out that *A. hoplopteri* s. l. is the main parasite of African birds of the genera *Vanellus*, *Hoplopterus*, *Stephanibyx* (excluding *S. coronatus*), *Xiphidiopterus*, *Afribyx*, *Hemiparra*, *Sarciophorus* and *Chettusia* (excluding *Ch. gregaria*). LEDGER (1980) after CLAY (1962) also listed species from the genus *Pluvialis* as being hosts of *A. hoplopteri* s. l., although they are not related to Vanellinae as suggested WOLTERS (1975). The genus *Pluvialis* was placed into

**Table 5.** Measurements (in mm) of *Actornithophilus hoplopteri* s. l. from *Anitibyx armatus*.

	Males (n = 7)	Females (n = 2)
Length of head	0.34-0.36	0.37-0.38
Width of head	0.41-0.46	0.49-0.50
Width of prothorax	0.27-0.30	0.34-0.38
Width of mesothorax	0.37-0.39	0.43-0.46
Width of metathorax	0.39-0.41	0.46-0.50
Width of abdomen	0.45-0.49	0.54-0.65
Total body length	1.49-1.61	1.89-1.92

Cursoriinae (Glareolidae) by WOLTERS (1974). WOLTERS (1975) erected the genus *Anitibyx* to accommodate *A. armatus* (BURCH.), previously placed in the genus *Stephanibyx* (syn. *Vanellus*).

Our material from *Anitibyx armatus* is referable to *Actornithophilus hoplopteri* s. l. Body measurements are listed in Table 5. This is the first record of *Anitibyx armatus* (widespread in the Afrotropical Region) as a host of *A. hoplopteri* s. l.

***Actornithophilus crinitus* CLAY, 1962**

Type host: *Stephanibyx c. coronatus* (BODD.) (Charadriiformes)

This species is similar to *Actornithophilus hoplopteri* although CLAY (1962) describing it pointed out certain differences. Description of *A. crinitus* is based on the material collected in Kenya, Namibia and South Africa.

**Table 6.** Measurements (in mm) of *Actornithophilus crinitus* from *Stephanibyx coronatus*.

	Males (n = 7)	Females (n = 2)
Length of head	0.31-0.37	0.35-0.42
Width of head	0.41-0.49	0.44-0.56
Width of prothorax	0.27-0.32	0.29-0.36
Width of mesothorax	0.31-0.42	0.38-0.52
Width of metathorax	0.38-0.44	0.44-0.56
Width of abdomen	0.43-0.52	0.54-0.72
Total body length	1.33-1.70	1.70-2.20

Kenya, Namibia and South Africa.

LEDGER (1980) did not provide any further details. Lice in our collection represent *Actornithophilus crinitus* CLAY from the type host species. They are characterized by features in agreement with the original diagnosis, including biometric data (Table 6).

## Coplocephalidae

### *Ciconiphilus decimfasciatus* (BOISDUVAL et LACORDAIRE, 1835)

Type host: *Ardea cinerea cinerea* L. (Ciconiiformes)

PRICE & BEER (1965) regarded *C. decimfasciatus* as a species complex, parasitising various species of Ardeidae. The authors compiled a list of synonyms but did not exclude the possibility of recognizing a few subspecies within *C. decimfasciatus*. The list of synonyms include:

- Liotheum 10-fasciatum* BOISDUVAL et LACORDAIRE, 1835; type host: *Ardea cinerea cinerea* L.  
*Colpocephalum importunum* DENNY, 1842; type host: *Ardea cinerea* L.  
*Colpocephalum nyctarde* DENNY, 1842; type host: *Nycticorax nycticorax* (L.).  
*Colpocephalum obscurum* GIEBEL, 1874; type host: *Casmerodius albus egretta* (GMEL.).  
*Monopon sulcatum* PIAGET, 1880; type host: *C. a. egretta* (GMEL.).  
*Colpocephalum importunum* var. *major* PIAGET, 1880; type host: *Egretta garzetta* (L.).  
*Colpocephalum trochioxum* var. *minor* PIAGET, 1885 (nec *C. minus* PIAGET, 1880); type host: *Bubulcus ibis* (L.).  
*Colpocephalum castaneum* PIAGET, 1885; type host: *Chenopis atrata* (LATH.) - probably in error.  
*Colpocephalum laticeps* KELLOGG, 1896; type host: *Casmerodius albus egretta* (GMEL.).  
*Colpocephalum veratrum* KELLOGG, 1910; type host: *Casmerodius albus melanorhynchus* (WAGL.).  
*Colpocephalum tamamurensis* UCHIDA, 1926; type host: *Nycticorax n. nycticorax* (L.).  
*Colpocephalum boisduvali* EICHLER, 1937, nom. nov. for *C. importunum* var. *major* PIAGET, 1880, p. 549 (nec p. 519).  
*Pseudocolpocephalum doriabagla* ANSARI, 1951; type host: *Bubulcus ibis coromandus* (BODD.). Syn. n.

A complete list of all *Ciconiphilus* species was given by CARRIKER (1964) shortly before PRICE & BEER (1965). According to CARRIKER (1964), *C. obscurus*, *C. boisduvali* and *C. doriabagla* are good species. Other synonyms listed by PRICE & BEER (1965) were regarded as subspecies of *C. decimfasciatus*. Those which may occur in Poland were listed by ZŁOTORZYCKA (1976). Among those which are widespread in the world, including Africa, are *C. decimfasciatus boisduvali* (EICHL.) from *Egretta garzetta* (L.), *C. d. nyctardis* (DENNY) from *Nycticorax n. nycticorax* (L.) and *C. d. obscurus* (GIEB.) from *Egretta alba* L. (= *Casmerodius albus*) (ZŁOTORZYCKA 1976). *Ardea melanocephala*, *A. purpurea*, *Egretta intermedia*, *Bubulcus ibis*, *Melanophryx ardesiaca*, *Demigretta gularis*, *Ardeola ralloides* and *Butorides striatus* were listed by LEDGER (1980) as a host species of *Ciconiphilus decimfasciatus* (with no subspecies recognized) in the Afrotropical Region.

There are lice collected from *Bubulcus ibis* (L.) in our material from Africa. At present *B. ibis* is widespread in all zoogeographical regions of the world. Lice parasitising this host originally are recorded as *Colpocephalum trochioxum minor* PIAG. 1885 from Africa, and *Pseudocolpocephalum doriabagla* ANS., 1951 from Asia.

PRICE & BEER (1965) provide detailed description of *Ciconiphilus decimfasciatus* s. l. only, while for other louse species and subspecies parasitising hosts other than *Ardea cinerea* they give only minor morphometric differences. However, the varietas *minor* attributed by PIAGET (1885) to *C. trochiosum* (BURM.) should actually be attributed to *C. decimfasciatus* s. l., as *trochioxum* is now placed in the genus *Ardeiphilus* BEDF. (after HOPKINS & CLAY 1952).

In comparison with *C. decimfasciatus* s. str., apodema in *Ciconiphilus decimfasciatus minor* PIAG. parasitising *Bubulcus ibis* is shorter with body measurements slightly smaller. In our opinion these minor differences allow recognition of *C. decimfasciatus minor* PIAG. as a subspecies. *Pseudocolpocephalum doriabagla* ANSARI, 1951 proposed for *Colpocephalum trochioxum* var. *minor* PIAG., 1885 now is regarded as a new synonym of *C. decimfasciatus minor* (PIAG.).

In our collection specimens from *Bubulcus ibis* were identified as *Ciconiphilus decimfasciatus minor* (PIAG.). Body measurements of these specimens are presented in Table 7.

**Table 7.** Measurements (in mm) of *Ciconiphilus decimfasciatus* s. str. from *Ardea cinerea* and *C. d. minor* from *Bubulcus ibis*.

	<i>C. decimfasciatus</i> s. str.		<i>C. d. minor</i>	
	Males (n = 10)	Females (n = 10)	Males (n = 6)	Females (n = 11)
Length of head	0.35-0.39	0.38-0.41	0.30-0.35	0.34-0.39
Width of head	0.52-0.56	0.58-0.60	0.44-0.49	0.47-0.54
Width of prothorax	0.34-0.36	0.38-0.40	0.30-0.33	0.34-0.37
Width of mesothorax	0.41-0.47	0.50-0.54	0.36-0.42	0.44-0.52
Width of metathorax	0.45-0.51	0.57-0.62	0.43-0.47	0.54-0.63
Width of abdomen	0.56-0.65	0.76-0.82	0.54-0.62	0.67-0.79
Total body length	1.52-1.86	2.01-2.14	1.30-1.58	1.55-1.86

## Rallicolidae

### *Saemundssonina africana* TIMMERMANN, 1951

Type host: *Hemiparra crassirostris* (HART.) (Charadriiformes)

TIMMERMANN (1959) recognized three subspecies of *Saemundssonina africana*, namely *S. africana* s. str. (parasite of *Hemiparra crassirostris*), *S. a. senegalla* TIMM., 1969, parasiting *Afribyx senegallus* (= *Xiphidiopterus senegallus* L.), both from the Afrotropical Region, and *S. a. sycophanta* TIMM., 1962 (parasite of *Lobibyx novaehollandiae*; = *Lobipluvia* (*Lobibyx*) *novaehollandiae* STEPH., which occur in Tasmania. LEDGER (1980) regarded *S. africana* as a species complex, placing *S. africana senegalla* TIMM. in a list of synonyms. He listed *Chettusia leucura*, *Xiphidiopterus albiceps*, *Stephanibyx coronatus*, *S. melanopterus* and *Afribyx senegallus* as host species of *S. africana* in the Afrotropical Region.

**Table 8.** Measurements (in mm) of *Saemundssonina africana* from *Stephanibyx coronatus*.

	Males (n = 2)	Females (n = 20)
Length of head	0.57-0.62	0.64-0.75
Width of head	0.63-0.67	0.77-0.89
Width of prothorax	0.28-0.32	0.37-0.41
Width of pterothorax	0.41-0.46	0.54-0.65
Width of abdomen	0.63-0.75	0.92-1.39
Total body length	1.52-1.64	1.89-2.48

There are 2 male and 15 female lice from *Stephanibyx coronatus* in our collection; these were identified as *Saemundssonina africana* s. l. Their body measurement, given in Table 8, are similar to those given by TIMMERMANN (1951, 1969) for a population parasiting *S. coronatus*. However, males in our collection are slightly smaller than those in TIMMERMANN'S collection.

### *Quadriceps kilimandjarensis* (KELLOGG, 1910)

Type host: *Hoplopterus armatus* (BURCH.) (= *Anitibyx armatus*) (Charadriiformes) according to HOPKINS & CLAY (1952)

*Quadriceps kilimandjarensis* was described by KELLOGG (1910), from a raptor *Buteo augur*, in which it probably occurred only accidentally; a species from Charadriiformes is expected to be the main host of the louse. HOPKINS & CLAY (1952) regarded *Anitibyx armatus* as the type host, but according to TIMMERMANN (1954), *Stephanibyx coronatus* (BODD.) or *S. lugubris* (LESS.) (= *Titihioia lugubris*) are the main hosts. Furthermore, TIMMERMANN (1954) regarded *Q. kilimandjarensis* as a subspecies of *Quadriceps hoplopteri*. He recognised six subspecies (including *Q. hoplopteri* s. str.) of *Q. hoplopteri* (MJÖB.); three of these have been recorded from the Afrotropical Region. According to him most specimens of *Q. hoplopteri* s. l. from *Stephanibyx melanopterus minor* (now placed in the genus *Titihioia* ROBTS.), *Afribyx senegallus major* and *A. s. lateralis* (now both placed in the genus *Xiphidiopterus* REICHB.) from *Sarciphorus tectus tectus* and *Chettusia gregaria*, respectively, did not differ from *Q. h. kilimandjarensis*, although they have slightly different body measurements!

LEDGER (1980) placed the species *kilimandjarensis* in the genus *Quadriceps*; he did not regard it as a subspecies of *Q. hoplopteri*. Furthermore, considering TIMMERMANN'S (1954)

**Table 9.** Measurements (in mm) of *Quadriceps kilimandjarensis* from *Stephanibyx coronatus*.

	Males (n = 30)	Females (n = 30)
Length of head	0.42-0.50	0.43-0.54
Width of head	0.27-0.33	0.27-0.35
Width of prothorax	0.16-0.22	0.17-0.24
Width of pterothorax	0.23-0.30	0.25-0.34
Width of abdomen	0.29-0.42	0.31-0.46
Total body length	1.49-1.67	1.70-2.05

host-parasite list, he regarded *Q. hoplopteri* as a species complex. Body measurements of males and females of *Q. kilimandjarensis* from *Stephanibyx coronatus* in our collection (Table 9) are slightly smaller than those given by TIMMERMANN (male body length: 1.73-1.87 mm; female body length: 1.97-2.11 mm).

Specimens of *Q. kilimandjarensis* from our collection are slightly larger than *Q. cholreysi*, which agrees with data provided by TIMMERMANN (1954).

*Quadriceps chorleyi* TIMMERMAN, 1954

Type host: *Hoplopterus armatus* (BURCH.) (= *Anitibyx armatus*) (Charadriiformes)

TIMMERMAN (1954) described *chorleyi* as a subspecies of *Quadriceps hoplopteri* (MJÖB.). The same bird species given by HOPKINS & CLAY (1952) as the type host for *Q. kilimandjarensis* was regarded by him as the host species of *Q. chorleyi* (for reasons see TIMMERMAN, 1954, p. 201).

According to LEDGER (1980) all subspecies, included by TIMMERMAN in *Quadriceps hoplopteri*, are good species with different male genital organs. For this reason

**Table 10.** Measurements (in mm) of *Quadriceps chorleyi* from *Anitibyx armatus*.

	Males (n = 3)	Females (n = 4)
Length of head	0.42-0.48	0.46-0.50
Width of head	0.27-0.29	0.29-0.32
Width of prothorax	0.19-0.20	0.20-0.22
Width of pterothorax	0.23-0.26	0.25-0.30
Width of abdomen	0.29-0.32	0.28-0.37
Total body length	1.46-1.55	1.80-1.95

our material from *Anitibyx armatus* was identified as *Q. chorleyi*. According to LEDGER (1980) *Q. chorleyi* was recorded from a widespread and common type host species.

Body measurements of males and females in our collection are given in Table 10. No biometric data for the species were available to date.

*Quadriceps princeps* TIMMERMAN, 1952

Type host: *Rhinoptilus africanus hartingi* SHARP. (= *Smudsornis africanus hartingi*) (Charadriiformes)

	Male
Length of head	0.43
Width of head	0.32
Width of prothorax	0.18
Width of pterothorax	0.26
Width of abdomen	0.33
Total body length	1.33

**Table 11.** Measurements (in mm) of *Quadriceps princeps* from *Rhinoptilus africanus*.

LEDGER (1980) merely listed this species from the Afrotropical Region.

In our collection this species is represented by one male only (Table 11).

*Oedicnemiceps* sp. indet.

Most authors do not accept the genus *Oedicnemiceps* EICHLER, 1943 because it is very similar to the genus *Quadriceps* CLAY et MEIN. (HOPKINS & CLAY 1952). ZŁOTORZYCKA (1978) expanded the very short diagnosis of the genus erected by EICHLER, which together with appended figures of *O. annulatus*, confirms *Oedicnemiceps* as a separate genus. Instead of ZŁOTORZYCKA (1978), LEDGER (1980) refers to ZŁOTORZYCKA (1967), where only references were listed and some photographs shown for *O. annulatus*.

The type host of *Oedicnemiceps annulatus* (DENNY 1842), *Burhinus oedicnemus* (L.) breeds in the Palaearctic Region, only overwintering in the Afrotropical Region. LEDGER (1980) listed three main host species of *O. annulatus* (placed in the genus *Quadriceps*) in the Afrotropical Region, namely *Burhinus capensis* (LICHT.), *B. senegalensis* (SWAINS.) and *B. vermicularis* (CAB.). If, therefore, few host species are attributed to *O. annulatus*, this louse species should be treated as a species complex.

There is only one nymph from *B. capensis* in our collection from Africa which was identified as *Oedicnemiceps* sp.

## Phloptoridae

### *Cypseloecus excisus* (NITZSCH, 1818)

Type host: *Delichon urbica urbica* (L.) (Passeriformes)

LEDGER (1980) listed *Phlopterus excisus microsomaticus* TANDAN, 1955 (now placed in the genus *Cypseloecus* CONCI) from the Afrotropical Region. TANDAN (1955) used the name *microsomaticus* for *Docophorus hirundinis* PIAGET, 1871 (nec *Pediculus hirundinis* SCHRANK, 1803; nec *P. hirundinis* L., 1761) from the type host *Hirundo rustica* L. He also studied the material from Asia. TENDEIRO (1958) recorded this subspecies from Mozambique. LEDGER (1980) stated that it was also recorded in *Riparia riparia* (L.) by BALAT (1966). In fact, it was *Cypseloecus excisus*, not identified to the subspecies level. Eventually LEDGER (1980) listed *C. e. microsomaticus* from *Hirundo abyssinica* GEUERIN et MEH., collected in Angola, pointing out that these specimens were smaller than

**Table 12.** Measurements (in mm) of *Cypseloecus excisus excisus* from *Hirundo spilodera*.

	Female ( $n = 1$ )
Length of head	0.44
Width of head	0.41
Width of prothorax	0.27
Width of pterothorax	0.40
Width of abdomen	0.54
Total body length	1.39

*microsomaticus*, probably collected from the type host. In our material body measurements of a female found in *Hirundo spilodera* SUND. are intermediate between *C. e. excisus* and *C. e. microsomaticus* (Table 12). ZŁOTORZYCKA (1997) gives 1.22-1.44 mm and 1.57-1.70 mm as body length for *C. e. excisus* male and female, respectively. Females from our collection may therefore belong to both subspecies. *Hirundo spilodera* is a new host for *Cypseloecus excisus excisus*.

### Brueeliinae indet.

There is one nymph collected from *Spreo bicolor* (GMEL.) (Passeriformes: Sturnidae) in our material. LEDGER (1980) does not list any louse parasitising *S. bicolor*. This starling is therefore a new host for Afrotropical Mallophaga.

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