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**Omslagsbild/Front cover:** The domestic pigeon wing louse *Columbicola columbae* photographed on feather of domestic pigeon *Columba livia* in Salt Lake City, Utah, USA. Photo: Scott M. Villa and Juan Altuna, University of Utah.

Tamduvans vinglus *Columbicola columbae* fotograferad på fjäder av tamduva *Columba livia* i Salt Lake City, Utah, USA. Foto: Scott M. Villa och Juan Altuna, University of Utah.

# Checklist and key to the lice (Insecta: Phthiraptera) of Sweden

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A checklist of the 88 genera and 332 species of lice (Insecta: Phthiraptera) recorded from Sweden is provided, including records of 128 species and 12 genera hitherto not reported from Sweden. *Phlopterus linariae* (Piaget, 1885) is reported for the first time from *Spinus spinus* (Linnaeus, 1758). *Actornithophilus sedes* Eichler, 1944, is reported for the first time from *Calidris alpina alpina* (Linnaeus, 1758). We confirm that *Austromenopon lutescens* (Burmeister, 1838) naturally occurs on *Tringa glaroela* (Linnaeus, 1758). A brief overview of the knowledge of the louse fauna in the other Nordic countries, a basic overview of louse morphology, and a key to the lice of Sweden are also provided.

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Lice (Phthiraptera) are a diverse group of wingless, permanent ectoparasites of birds and mammals. The group is divided into four suborders: Amblycera on birds and mammals (Fig. 1), Anoplura on placental mammals (Fig. 2), Ischnocera on birds and mammals (Fig. 3), and the small

suborder Rhynchophthirina found exclusively on elephants and warthogs and so far unrecorded in Sweden. Anoplura are “sucking lice”, such as the human head and body louse *Pediculus humanus sensu lato* Linnaeus, 1758. Lice in this suborder have piercing mouthparts and feed primarily on



Figure 1. An example of an amblyceran louse, *Austromenopon alpinum*. The photo shows a female. Photo: Sarah Bush.

Ett exempel på en amblyceran lus, *Austromenopon alpinum*. Bilden visar en hona.

blood. Lice in the other three suborders constitute the “chewing lice”. These lice have mandibulate mouthparts used to bite or scrape the skin, hair, or feathers of their host, though some species may feed on blood. In older literature, the chewing lice are often known as the ‘Mallophaga’; however, this group is paraphyletic and the name discouraged (Lyal 1985; Johnson & Whiting 2002; Barker *et al.* 2003). A thorough review of the ecology and evolution of the chewing lice is provided by Clayton *et al.* (2016).

### *Ischnocera*

Ischnocera is the largest suborder of lice, which contains about 3000 of the 5000 known species of true lice (Price *et al.* 2003a). Representatives of Ischnocera are known from virtually all families of birds and many orders of mammals. The systematics of the Ischnocera is poorly understood, and most modern treatments recognize only four families: Gonioididae occurs on wildfowl (Galliformes) and pigeons (Columbiformes), Trichodectidae on some mammals, the extralimital Heptapsogastridae on tinamous (Tinamiformes) and seriemas (Cariamiformes), and the morphologically variable Philopteridae which comprises all other ischnoceran lice, including the extralimital *Trichophilopterus babakotophilus* Stobbe, 1913, known from lemurs (Ferris 1993a)”. The latter family is informally divided into a number of complexes, many of



Figure 2. An example of an anopluran louse, *Haematopinus suis*. The female (left) is substantially larger than the male (right).

Ett exempel på en anopluran lus, *Haematopinus suis*. Honan till vänster är mycket större än hanen till höger.

which may represent monophyletic groups deserving familial status.

Ischnoceran lice have developed highly specialized body forms (“ecomorphs”) associated with specific niches they occupy on the host’s body. These ecomorphs have evolved convergently in many different lineages of lice (Johnson *et al.* 2012), and appear to be closely correlated with how the lice escape the host’s primary defence, preening. Four general types of ecomorphs are generally recognized. “Wing lice” are slender and elongated (Figs 32–33, 38); they mainly escape preening by hiding between feather barbs on the wings. “Body lice” are rounded lice with broad, rounded heads (Figs 26–27); they mainly escape preening by burrowing deeply into the downy areas towards the base of the body feathers. “Head lice” have large triangular heads with very strong mandibles (Figs 34–35, 39). Head lice avoid preening because birds have difficulty preening their own heads. Notably, head lice are among the few lice that can be observed at a distance (Fig. 4). Lastly, a variety of body shapes are typically referred to as “generalists” (Figs 36–37, 40–41); this group is a catchall grouping, and as we learn more about these “generalist” lice, we are likely to find it also includes uniquely specialized lice (Baum 1968; Mey 1982a, 1994a).

Keys to the ischnoceran genera arranged according to host order were published by Price *et al.* (2003a); however, many of these ischnoceran genera were erected based on patterns of host association rather than characteristics of the lice themselves. We know from modern morphological and molecular treatments that many of these genera are paraphyletic (*e.g.* Johnson *et al.* 2002a), and large-scale revisions on many groups are sorely needed.

### *Amblycera*

Amblycera is the second largest suborder, comprising almost 1500 known species. Six families are generally recognized: Menoponidae on most groups of birds, Laemobothriidae primarily on birds of prey (Accipitriformes, Falconiformes) and rails (Gruiformes), Ricinidae on perching birds (Passeriformes) and hummingbirds (Apodiformes), Gyropidae mainly on rodents (Rodentia), Trimenoponidae on rodents and



Figure 3. An example of an ischnoceran louse, *Philopterus corvi*. The photo shows a male louse. Photo: Tomas Najer.

Ett exempel på en ischnoceran lus, *Philopterus corvi*. Bilden visar en hane.

neotropical marsupials (Paucituberculata and Didelphimorphia), and the extralimital Boopidae on Australopapuan marsupials (Dasyuromorphia, Diprotodontia, Peramelemorphia) and carnivorans (Carnivora). Trimenoponidae and Gyropidae are known in Sweden only from introduced mammals (guinea pigs).

Unlike ischnoceran lice, the amblyceran lice are most closely associated with the skin of the host rather than specific feather tracts. The five families of amblyceran lice recorded from Sweden are each very different morphologically (Figs 16–17, 22–25). Little is known about niche specialization in most groups of amblyceran lice. Some slender menoponid lice (*e.g.* *Actornithophilus*) are known to live part of their





Figure 4. – a) Black-headed gull *Chroicocephalus ridibundus* in winter plumage with several head lice, likely *Saemundssonina lari*, visible behind the eye. Head lice like these are often visible on bird with white heads, and the first author has seen this on several species of gull and on a domestic duck. – b) Close-up of same photo. Photo: Johan Lind /N, with kind permission.

– a) Skrättmåsar *Chroicocephalus ridibundus* i vinterdräkt med ett flertal huvudlöss, sannolikt *Saemundssonina lari*, klart synliga bakom ögat. Huvudlöss är ofta synliga på vithuvade fåglar, och försteförfattaren har sett dem i fält på flera måsarter och en tamanka. – b) Inzooming av samma bild.

lives inside larger quill feathers (e.g. Paterson 1954). Ricinid lice have mouthparts modified to pierce the host's skin to obtain blood (Nelson 1972a). Keys to the genera of Amblycera were provided by Clay (1970a), Ledger (1980), and Price *et al.* (2003a).

### Anoplura

The suborder Anoplura has just over 500 known species. All species occur on mammals, and anopluran lice have tarsal claws that are specialized to grasp and climb in hair. These lice have piercing, sucking mouthparts to penetrate skin and suck blood from the host. Gross morphology varies enormously within Anoplura (Figs 60a, 61a). Eight families of anopluran lice are recorded from Sweden: Linognathidae on canid carnivorans (Carnivora) and ungulates (Artiodactyla), Haematopinidae on ungulates (Perissodactyla and Artiodactyla), Echinophthiridae on seals (Pinnipedia), Polyplacidae, Hoplopleuridae, and Enderleinellidae on rodents (Rodentia), and Pediculidae and Pthiridae on primates (Primates). Another seven extralimital families

are generally recognized (Kim *et al.* 1986, Durdan & Musser 1994a). Anopluran lice are notably absent from some mammal groups such as whales and dolphins (Cetacea), bats (Chiroptera), which have no sucking or chewing lice, and pangolins (Pholidota) (Kim *et al.* 1986).

### The Lice of Sweden

The lice of Sweden are poorly known. Mjöberg (1910a) provided the only previous extensive report on Swedish Phthiraptera, and subsequent reports have focused on single suborders (e.g. Brinck 1948) or have been limited to one host or louse species (e.g. Overgaard 1952; Nilsson 1968). Ash (1960) collected lice extensively from birds at the Ottenby Bird Observatory, however the identity of most of these lice was never published. František Balát (1925–1992) collected lice from Sweden, mainly at Falsterbo and Skanör, in August and September, 1963. He examined 316 birds and collected about 45 species of lice; however, very few of these records have been published. Unfortunately, several of his slides, including some with material identi-

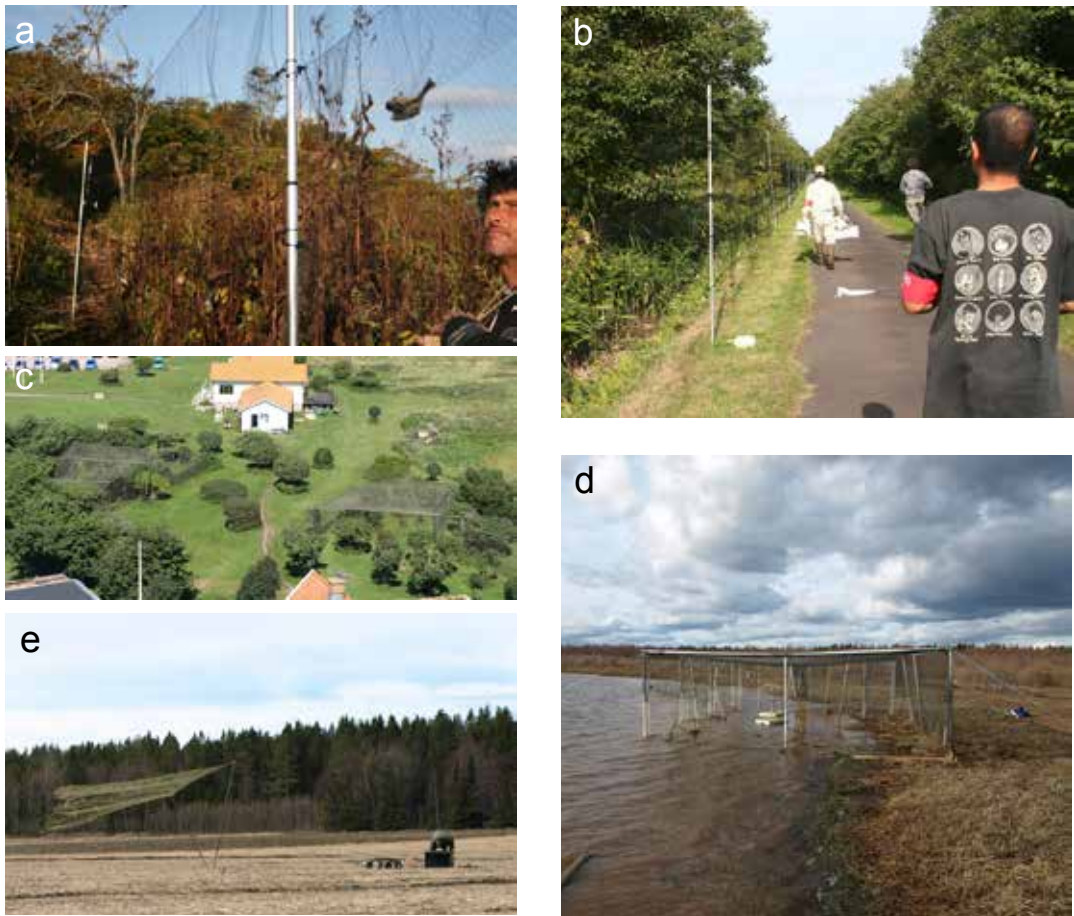


Figure 5. Some methods used to catch birds during this study. – a) Mist-netting of birds is by far the most common method; this photo is from Hamatombetsu, Japan. – b) Rows of mist-nets used at Hamatombetsu, Japan. – c) View over the two Heligoland traps at Ottenby Bird Observatory; birds are chased into the net funnels by the ringing staff, and collected in a box at the narrow end. – d) A duck trap at Umedeltat Bird Observatory. – e) a Dutch wilster-net at Umedeltat Bird Observatory; plovers and ruffs are lured in by sounds and visual lures, and caught by manually pulling the net when the birds are about to land.

Några av metoderna som använts till att fånga fåglar under det här projektet. – a) Slöjnet är den vanligaste metoden, här från insamling i Hamatombetsu, Japan. – b) Rader av slöjnet vid Hamatombetsu, Japan. – c) Helgoland-fällorna vid Ottenby Fågelstation sedda från Långe Jan; fåglarna jagas in i fällorna av ringmärkarna, och samlas upp i en låda i den smalare änden. – d) en andfälla vid Umedeltats Fågelstation. – e) holländska wilster-nät vid Umedeltats Fågelstation; pipare och brushanar lockas in med ljud och vettar och nätet falls över dem manuellt när de håller på att landa.

fied only to genus, are no longer in his collection, and there are no known records of their deposition. The only introduction to the order in Swedish is Stenram (1964).

The louse fauna of the other Nordic countries is also poorly known. Extensive published surveys are available only for the Faroes (Palma

& Jensen 2006, 2016) and Finland (Eichler & Hackman 1973, Hackman 1994). The louse fauna of Iceland was partially surveyed by Timmermann (*e.g.* Overgaard, 1942, Timmermann 1949a,b, 1950a,b,c) for some host groups. The louse fauna of Svalbard and nearby islands is fairly well known (Hackman & Nyholm 1968,

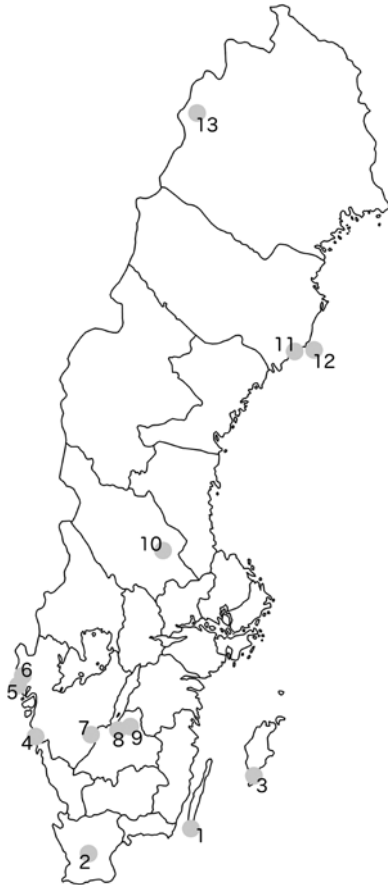


Figure 6. Map of Sweden, with collection localities marked: Karta över Sverige med insamlingslokaler utmärkta:

1 = Ottenby Bird Observatory; 2 = Skånes Zoo; 3 = Sundre Bird Observatory; 4 = various localities in Gothenburg, including Slotsskogen, Botaniska Trädgården, and Fågelcentralen; 5 = Sotenäs Bird Observatory; 6 = Nordens Ark; 7 = Svenska Transarbetsgruppen, Tranemo; 8 = Landsjön Bird Observatory; 9 = Ralången Bird Observatory; 10 = Falun Fågelklubb; 11 = Umedeltats Bird Observatory; 12 = Stora Fjäderågg Bird Observatory; 13 = Padjelanta National Park.

Mehl *et al.* 1982, Coulson *et al.* 2014), but there are virtually no published records of lice from mainland Norway and Denmark (Mehl, 1970a,b, 1971, 1975).

Here we provide an updated checklist of the known diversity of lice in Sweden based on an extensive review of published literature, specimens deposited in museums (see list of muse-

ums below) and our own survey of Swedish birds (2007–2016). The checklist includes 332 species and subspecies, 88 genera, and 16 families of lice recorded from Sweden, including 12 genera and 128 species and subspecies recorded from Sweden for the first time. We also provide a dichotomous key to identify all lice known from Sweden.

## Material and methods

### Terminology

Taxonomy of Ischnocera and Amblycera follows Price *et al.* (2003a) except for the *Brueelia*-complex, which follows Gustafsson & Bush (2017). Taxonomy for Anoplura follows Kim *et al.* (1986). Host taxonomy follows Clements *et al.* (2018) for birds and Wilson & Reeder (2005) for mammals. Breeding status for birds follows Sveriges Ornitologiska Förening (2017), using the following symbols: <sup>H</sup> = regularly breeding; <sup>h</sup> = breeding status unclear; <sup>F</sup> = regular migrant; <sup>T</sup> = regular vagrant (yearly, or >100 records); <sup>R</sup> = rare vagrant (<100 records). All mammals included here are resident in Sweden apart from the walrus and are not marked. Domestic mammals and birds and hosts where Swedish records derive from captive hosts have been marked with a <sup>D</sup>. Extralimital type hosts have been marked with <sup>E</sup>.

The following sources for morphological and setal nomenclature are followed: Clay (1951 – head structures and chaetotaxy of Philopteridae and Goniodidae), Symmons (1952 – head structure in all suborders) Clay (1969, 1970a – head chaetotaxy of Amblycera), Lyal (1985 – all characters of Trichodectidae), Kim *et al.* (1986 – all morphological characters of Anoplura), Mey (1994b – head and thoracic chaetotaxy of Ischnocera), Ciccino & Castro (1996 – abdominal chaetotaxy of Philopteridae), Yoshizawa & Johnsson (2006 – male genitalia), Valim & Silveira (2014 – head sensilla of Philopteridae and Goniodidae), Gustafsson *et al.* (2015 – head sensilla of Goniodidae) and Gustafsson & Bush (2017 – vulval chaetotaxy in Ischnocera). No systematic chaetotaxy of the trichodectid head has been proposed; we suggest some names for setae that may be homologous with similarly located setae in the other ischnoceran families (Fig. 56a).





Figure 7. Fumigation chambers: – a) sedge warbler *Acrocephalus schoenbaenus* fumigated at Ottenby Bird Observatory; – b) boreal owl *Aegolius funereus* fumigated at Ottenby; larger birds like these need to be placed in lying-down jars to prevent strangulation if the bird moves around too much; – c) several birds can be fumigated at once, here at Hamatombetsu, Japan; – d) fumigated shorebirds protected from direct contact with the hot sand at Broome Bird Observatory, Australia, by using an insulating towel.

Avlusningsburkar: – a) sävsångare *Acrocephalus schoenbaenus* avlusas vid Ottenby Fågelstation, – b) pärluggla *Aegolius funereus* avlusas vid Ottenby; större fåglar som denna måste avlusas i liggande burkar för att förhindra att de hänger sig själva genom att roa sig för mycket, – c) flera fåglar kan avlusas samtidigt, som här vid Hamatombetsu, Japan, – d) vadarfåglar under avlusning skyddas från den varma sanden vid Broome Bird Observatory, Australien, genom att läggas på en isolerande handduk.

#### Preparation of specimens

Slide-mounted specimens are deposited at the following institutes: Göteborg Natural History Museum, Gothenburg, Sweden (GNM); Museum für Naturkunde, Berlin, Germany (MFNB); Moravian Museum Brno, Czechia Collections (MMBC); Natural History Museum, London, United Kingdom (NHML); Swedish Museum of

Natural History, Stockholm, Sweden (SMNH); Price Institute for Parasitological Research, University of Utah, Salt Lake City, United States (PIPeR); University of Minnesota, St. Paul, United States (UMSP); Yamashina Institute for Ornithology, Chiba, Japan (YIO).

Fresh specimens of lice were collected primarily from live hosts netted or trapped at ring-

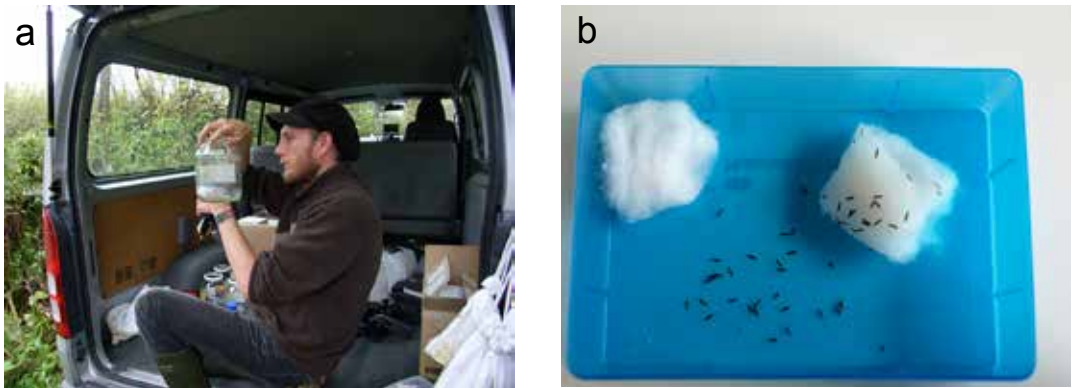


Figure 8. Checking for lice: – a) first author checking a fumigation chamber for chewing lice at Hamatombetsu, Japan, – b) chewing lice found in a fumigation chamber. Photo Fig. 8a: Francois Lemoine, Lyon, France.

Sök efter löss, – a) försteförfattaren letar efter löss i en avlusningsburk vid Hamatombetsu, Japan, – b) löss hittade i avlusningsburk.

ing stations across Sweden, using a variety of methods including mistnets, Heligoland traps, duck traps, and wilster-nets (Fig. 5). All collection was done in cooperation with licensed bird ringers, either at bird observatories or during shorter field trips. A map of all collection localities visited can be found in Fig. 6. A few collections were made at Skåne Zoological Park, Nordens Ark Zoological Park, or at Fågelcentralen in Hög outside Gothenburg, under the supervision of veterinary staff. In a few cases, already dead birds were searched for lice, notably in the collections of Gothenburg University and Ottenby Bird Observatory; the latter included some recently dead birds brought in by tourists or locals.

Lice were collected from live birds using a fumigation chamber, consisting of a wide-mouthed glass jar and an adjustable cloth collar that was fastened around the bird's neck and around the opening of the jar (Fig. 7). The plumage of the bird within the chamber was exposed to ethyl acetate, which kills the lice but does not harm the bird (as in Visnak & Dumbacher 1999, Clayton & Drown, 2001). The birds' heads, which protruded from the chamber, were examined manually. Following fumigation, the feathers of each bird were carefully ruffled to dislodge lice over a blank paper and the fumigation chamber searched for chewing lice, then cleaned (Fig. 8).

Larger hosts (size > Blackbird, *Turdus merula*) were generally examined only manually (Fig. 9). Birds were fumigated after ringing, which may reduce the number of lice obtained (Vas & Fuisz 2010). Birds were released after fumigation (Fig. 10).

Lice were preserved in 95% ethanol, then stored at  $-80^{\circ}\text{C}$  for molecular research. A small subsample of these freshly collected lice, as well as all material at the SMNH, were slide-mounted. The procedure for slide-mounting followed Gustafsson & Olsson (2012a), except that the head was not completely separated from the body, and in most cases the incision was made half-way through the mesometathorax rather than the prothorax. Exoskeletons were placed for 10 minutes in each of the following fluids: 95% alcohol, absolute alcohol, and oil of cloves. Then, exoskeletons were mounted in Canada balsam on microscope slides, covered with a cover slip, and let rest for at least 1 month at room temperature. Lice were then identified to genus and species using published keys and illustrations, as well as comparisons with previously identified material at the NHML and PIPEr.

In summary, this faunal survey of Swedish lice is based on our original collections, Mjöberg's collections, as well as extensive collections by A. Lundström and others, which are



Figure 9. Checking for lice manually: – a) first author checking the head of a black-headed gull *Chroicocephalus ridibundus* for chewing lice at Ottenby Bird Observatory, – b) last author checking a dead gull for chewing lice in Virginia, USA. Photo Fig. 9b: Dale Clayton, Salt Lake City, USA.

Manuellt sök efter löss: – a) försteförfattaren letar efter löss på huvudet på en skrattnås *Chroicocephalus ridibundus* vid Ottenby fågelstation, – b) sisteförfattaren letar efter löss på en död trut i Virginia, USA.

hitherto unpublished. These specimens are deposited mainly at SMNH; however another approximately ~2500 specimens we have collected from Sweden are deposited at PIPeR, where they are kept in a frozen state in 95% ethanol. Several of Mjöberg's samples were stored at the SMNH in glass jars marked "Sweden", but with no further locality data noted in the individual vials. These are listed as "No locality" in the checklist below. In many cases, the older SMNH specimens seem to correspond with the material Mjöberg (1910a) reported. However, many of the species he reported have not been found, and in many cases, only single specimens have been found despite Mjöberg (1910a) reporting that he had access to many.

All photographs were taken by Daniel Gustafsson, unless indicated otherwise.

#### Identification and key

The following published sources were used to identify the Swedish material and to construct the identification key: Adams *et al.* (2005), Ansari (1956a,b, 1957, 1968), Arnold (2005), Balát (1955a,b, 1981), Benítez-Rodríguez *et al.* (1985), Brinck (1950), Clay (1938, 1940, 1949, 1951, 1953, 1957, 1958, 1959, 1962, 1966a,b,c, 1967, 1969, 1970a, 1973, 1977, 1981), Clay & Hopkins (1950, 1951, 1954, 1960), Clayton & Price



Figure 10. Happy ruff being released after fumigation at Umedeltat Bird Observatory.

Glad brushhane släppt efter avlusning vid Umedeltats Fågelstation.

(1984), Dalgleish (1969, 1971, 1972), Dik *et al.* (2013), Edwards (1965), Eichler (1943, 1950, 1952), Eichler & Vasjukova (1980, 1981a,b), Emerson (1954, 1955a,b, 1956, 1962), Emerson & Johnson (1961), Emerson & Price (1975), Escalante *et al.* (2016), Eveleigh & Threlfall (1974), Fedorenko (1986), Ferris (1919, 1921, 1922, 1923, 1932, 1933b,c, 1934, 1935, 1951), Gállego *et al.* (1987), Grossi *et al.* (2014), Gustafsson & Bush (2017), Gustafsson & Olsson, 2012a,b, 2017), Hopkins & Timmermann (1954), Kim *et al.* (1986), Klockenhoff (1976, 1979, 1980), Kumar & Tandan (1971), Ledger (1980), Martens (1974), Mey (1988, 1998, 2004), Moreby (1978), Nelson (1972a,b), Nelson & Price (1965), Palma (1994, 2000), Palma & Price (2006), Pilgrim (1976), Price (1964, 1970a,b, 1974, 1975, 1977), Price & Beer (1963a,b,c, 1965a,b,c), Price & Clay (1972), Price & Emerson (1975), Price & Hellenenthal (1998), Price *et al.* (2003a,b), Quay (1950), Ryan & Price (1969), Scharf & Price (1965, 1983), Soler-Cruz *et al.* (1987), Tandan (1973), Tendeiro (1959, 1967b, 1969, 1973), Tendeiro *et al.* (1979), Timmermann (1949a,b, 1951a,b, 1952a,b,c, 1953a,b, 1954a,b,c,d,e,f, 1955, 1957, 1962, 1963, 1964, 1969, 1974), Tuff (1967), Ward (1955), Werneck (1936, 1941, 1948, 1950), Złotorzycka (1964a,b,c, 1966, 1967, 1968, 1970, 1974, 1976, 1997), Złotorzycka & Lucínska (1975). Illustrations and more detailed descriptions of most lice on the Swedish list can be found in these papers, as outlined by each genus entry.

No attempts to summarize all synonyms of any taxa have been made, as these in some cases (*e.g. Pediculus humanus*) would fill more than a page. References are made to the original description, and to notable publications that include illustrations or descriptions that may aid in identification of the species listed here. On the genus level references are made only to large-scale revisions of the genus, where more detailed keys and descriptions can be found, including descriptions of species expected from Sweden but not yet recorded. Most of the literature cited here can be obtained through [www.phthiraptera.info](http://www.phthiraptera.info). Authors of louse taxa are included in the reference list, but not authors of host taxa; these can be found in Wilson & Reeder (2005) for mammals and on <http://www.zoonomen.net/avtax/frame.html> for birds.

Many species of lice are economically important, and it may thus be of veterinary importance to identify these lice correctly. Few comprehensive keys to the lice on a given domestic host species have been published. Domestic mammals generally have a limited number of louse species (typically no more than one trichodectid and one anopluran species per host species), which should be identifiable at least to genus using the key provided here, even without specialized equipment. Kim *et al.* (1986) provide keys to and illustrations for all anoplurans of North America, including species from domestic hosts found in Sweden. Brinck (1950) includes brief descriptions and good illustrations of anoplura on Swedish mammals. Lice in the Trichodectidae can be identified to genus level in the keys of Price *et al.* (2003a), beyond which reference to the primary literature is often required, especially for exotic hosts. An outstanding resource for most mammal lice are the works of Werneck (1948, 1950), which includes extensive descriptions, literature references, and illustrations of most gyropids, trichodectids, and trimenoponids likely to be found in Sweden.

Domestic birds are typically parasitized by numerous louse species, and especially gamefowl (Galliformes) are often parasitized by several different species in the same genus. Those species known from Sweden should be identifiable using the key provided here, but may require at least light microscopy in some cases. A large number of louse species on domestic or captive hosts are not yet known from Sweden, and thus not included in our key. Keys have been published for the lice on domestic chicken (Emerson 1956), domestic turkey (Emerson 1962), domestic pigeon (Pilgrim 1976) and peafowl (Nasser *et al.* 2015). For other species of domestic birds, including guineafowl, quail, ducks, and parrots, it is generally necessary to consult the primary literature. The general keys to lice in Price *et al.* (2003a) can typically identify bird lice to genus level, and the keys of Ledger (1980) may be useful for birds from Africa. Clay (1938, 1940) and Kéler (1939) include descriptions and illustrations for many ischnoceran lice on gamefowl; however numerous species have been described in these genera since 1940.



*A note about prior studies of lice in Sweden*

Overgaard (1942, 1943) included references to several lice occurring in Sweden. These seem to be copied largely from Mjöberg (1910a). We have included these references below, except in a few cases where these reports cannot be found in Mjöberg (1910a). The sources of Overgaard's (1942) distribution records are untraceable, as none are stated within his reports. As many early collectors were careless about contaminations (see e.g. Palma, 1994), we have conservatively not included some of the species Overgaard claimed had been found in Sweden. We have been unable to ascertain where these records were originally published, and where the specimens, if any remain, can be found.

Brinck (1949) provided a summary of the species of Anoplura known from Sweden at the time. He did not provide new data; thus, this list is not included as a separate source in the checklist.

## Introduction to the morphology of Phthiraptera

### *Interpretation of illustrations*

Illustrations of all morphological characters mentioned below or in the key can be found in the illustration section on pages 346–394. Many illustrations provided here are longitudinally divided into a dorsal and a ventral view, including all full body and full head illustrations. The left-hand side of the illustration shows the dorsal side, whereas the right-hand side shows the ventral side. Thinner lines denote internal structures (nodi, carinae, etc.), whereas thicker lines denote external features. Dotted lines denote structures that are partially hidden. Roman numerals in grey circles along the midline denote segment number of the abdomen. Numbers and abbreviations in *italics* denote setal characters, whereas abbreviations in upper-case normal font denote structural characters. In general, only setal and structural characters that are prominent or taxonomically important are labeled in the illustrations. Illustrations are primarily based on Swedish material we examined. In some cases, such as poorly preserved old material or inaccessible specimens, illustrations are based wholly or in part on specimens of the same species collected outside Sweden, or illustrations in prior publica-



Figure 11. *Lunaceps incoenis* (Kellogg & Chapman, 1899).

tions. *Ricinus australis* (Fig. 22) is extralimital, but is included as this species shows characters used in the key for which no suitable Swedish material was available.

### *General overview*

The morphological diversity within the four suborders of Phthiraptera is considerable. The basic structure of the head and the fusion of various thoracic and abdominal plates vary greatly between and even within the families of these suborders. However, there are basic similarities in the general body plan between the suborders.

The body of most lice is dorso-ventrally flattened, however some lice such as “head lice” among the ischnocerans (e.g. *Philopterus*, Figs 34–35) and some amblycerans have swollen abdomens. Females are generally larger than males (e.g. Tryjanowski *et al.* 2007; Fig. 2), but overall size varies by an order of magnitude among the different species of lice, with the smaller species being shorter than 1 mm [*Microthoracicus* (as *Enderleinellus*) *uncinatus*, see Ferris 1916a; *Goniocotes*, see Lonc *et al.* 1992] to over 1 cm (e.g. *Laemobothrion*, see Nelson & Price 1965).

Pigmentation in lice is generally conservative, with little or no difference between different parts of the body (Fig. 11). Colouration ranges from almost all white (e.g. *Quadriceps punctatus*) through different shades of yellow and brown to almost black (e.g. many *Saemundssonina*). As a general rule, lice that live on parts of the host that are subject to preening (e.g. wings, body) are darker in darker hosts, and lighter in lighter hosts (Bush *et al.* 2010), but lice living on the host's head are typically dark. Pigmentation patterns may be useful characters



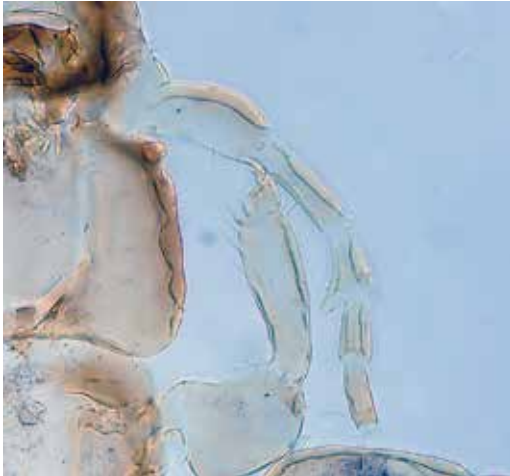


Figure 12. Antenna of male *Columbicola columbae* showing, from the head margin and outwards, the scape, the pedicel, and the three flagellomeres. Elongation of the scape and pedicel, and the short hook on flagellomere I, allows the male to grasp around the female pterothorax during and after copulation.

Antenn hos hane av *Columbicola columbae*, med de fem segmenten (innifrån och utåt) scapus, pedicel, och de tre flagellomererna. Scapus och pedicel är förlängda jämför med honans, och detta i combination med utskottet på flagellomere I tillåter att hanen greppar runt honans pterothorax under och efter parningen.

in differentiating closely related species. However, for species identifications, the pigmentation patterns are secondary to structural and setal characters.

Detailed overviews of louse morphology can be found in Clay (1951) and Johnson *et al.* (2012) for the Ischnocera, Clay (1970a) for the Amblycera, and Kim *et al.* (1986) for the Anoplura. Mey (1994b) has given a good overview of the relationship between adult and nymphal material in Ischnocera. A good overview of the internal morphology of all three suborders can be found in Symmons (1952).

#### Head characters

The head varies widely across Phthiraptera (Figs 18, 22–27, 29–30, 32–47, 54–57, 60a–c, 61a–b), and even basic characters such as the structure of the mouthparts and antennae cannot be generalized throughout the group. General terminology for structural head characters

can be found in Clay (1951 – Philopteridae and Goniodidae), Clay (1969, 1970a – Amblycera), Nelson (1972a – Ricinidae), Lyal (1985 – Trichodectidae), and Kim *et al.* (1986 – Anoplura).

Antennae are at most five-segmented, consisting of a basal scape, a pedicel, and 3 flagellomeres (Figs 12, 31, 48), but antennae are reduced to 4 segments in Amblycera (Fig 18; distal flagellomere may be weakly or clearly divided in some species), 3 segments in Trichodectidae (Figs 56–57) and are variable within Anoplura (Figs 60a, 61a–b). In Anoplura and Ischnocera, the antennae are large (sometimes longer than the head) and located laterally (Figs 42, 60a, 61a–b), whereas in the Amblycera antennae are much smaller, and located ventrally (Fig. 18). In many genera, particularly in the Ischnocera, antennae are sexually dimorphic (Figs 12, 31, 48, 56–68a), and the details of the male antennae may be very important in species level identification. However, the same genus may include both species with dimorphic and monomorphic antennae. Sexual dimorphism generally involves both the scape and the pedicel, both of which may be both elongated and swollen in the male (Figs 31b–e) compared to the female (Fig. 31a). In addition, the male antennae may have protruding horns on the scape, pedicel, or flagellomere I (*e.g.* Fig. 31b). The lateral margins of the postantennal head in many species are shaped to reflect the shape of the antennae when these are rested against the sides of the head; consequently, in species with markedly sexually dimorphic antennae, the postantennal head may look dissimilar in males and females. In addition, the area around the antennal socket, including the nodi and carinae in this area, is often displaced or distorted to accommodate the scape in sexually dimorphic species (Fig. 30). The setal characters of the antennae vary between different families of lice, and between different complexes within the Ischnocera, but no detailed large-scale studies of this variation have been conducted for most families of lice. Cicchino & Abrahamovich (1988) offer one of the most extensive investigations of the antennae in Ischnocera.

Mouthparts are either mandibulate (Amblycera, Ischnocera; Fig. 49e) or stylet-like (Anoplura; typically not easily seen and not illus-

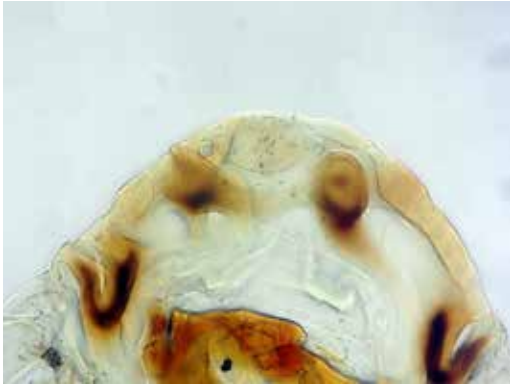


Figure 13. Asymmetrical preantennal area of *Struthiolipeurus struthionis*.

Asymmetrisk preantennalområde hos *Struthiolipeurus struthionis*.

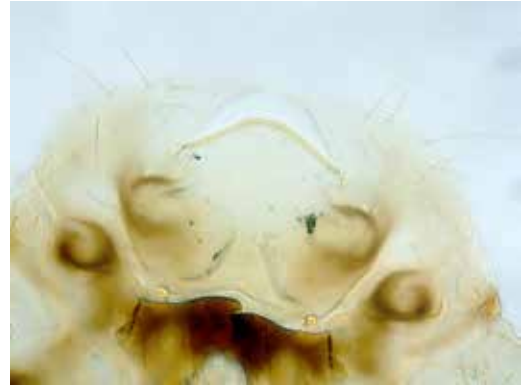


Figure 14. "False mandibles" of the preantennal area in *Ornithobius* sp.

"Falska mandibler" i preantennalområdet hos *Ornithobius* sp.

trated). Mandibulate lice also generally possess specialized structures around the mouth for water vapor uptake (Rudolph 1983), but these are absent in the Anoplura. The mandibles in Ricinidae are highly acute, and are used to draw blood from the host (Nelson 1972a). Ricinid lice also have large, membranous structures called palletes anterior to the mandibles (PAL in Figs 22–23), which may work as adhesive organs (Mjöberg 1910a; Nelson 1972a). For simplicity, most mouthparts are not included in the illustrations provided herein. Note that in the Amblycera, the shape of the hypopharynx and other mouthpart elements may be important species level characters. These mouthparts typically need to be dissected to be of use, and we have excluded these both in the illustrations and in the key.

All Amblycera have prominent maxillary palps anterior to the antennae (MXP in Fig. 18). These palps may be more prominent than the antennae in *e.g.* some *Ricinus* (Figs 22–23), but differ from the antennae in shape. The segments of the palps are more or less uniform, except that the distal segment is often longer than the others. By contrast, the segments of the antennae are strongly modified (Fig. 18), with flagellomere I typically being pedunculate ("wineglass-shaped"; Clay 1969: 8) and arising from the posterior end of the asymmetrical pedicel.

The structural characters of the head are

typically important for species- and genus-level identification, especially in the Ischnocera (see Figs 32–47 for a sample of the variability of the preantennal head in Ischnocera). This includes the presence or absence, as well as the location and shape of, carinae (internal band-like thickenings), nodi (internal rounded thickenings), and sutures (non-sclerotized areas separating different sclerotized areas). Of particular interest in the Philopteridae is the shape and structure of the preantennal area, including the shape and structure of the dorsal anterior plate (part of dorsal plate of head separated by the dorsal preantennal suture; Fig. 42a). In a few genera, this area is asymmetrical (Fig. 13) or possess paired anterior flaps, which may make the louse look like it has an extra set of mandibles (Fig. 14). Species in which the marginal carinae form an unbroken band around the preantennal area are said to be circumfasciate; species in which marginal carinae are broken are non-circumfasciate. Another important character in Philopteridae is the state of the ventral carina, which may be continuous across the head (Fig. 42b) or divided medianly into two sections that typically bend anteriorly to reach the anterior margin of the head (frons; Fig. 42a). Head dimensions and gross shape are important species-level characters in some groups, and occasionally used in the key as good proxies for markedly different head

shapes on the genus-level. Variation in head structure is much greater in the Ischnocera than in the other two suborders.

Head chaetotaxy can be standardized within Ischnocera (Fig. 42) and most of Anoplura (not illustrated), but differs among families in Amblycera (Figs 18, 22–25). Shape (Figs 18f–j), number, length, position, and presence or absence of individual setae are often important genus-level characters in all three suborders, but differences in gross head shape and structure often makes attempts to homologize setae between genera difficult. In the Ischnocera, some setae vary between being clearly dorsal, marginal, or clearly ventral, depending on the genus; in some cases their apparent position differs depending on mounting technique. General terminologies for head chaetotaxy can be found in Clay (1951) for the Ischnocera, Clay (1969) for the Menoponidae, Nelson (1972a) for the Ricinidae, and Kim *et al.* (1986) for the Anoplura. Additional head setal characters for the Ischnocera can be found in Valim & Silveira (2014) and Gustafsson *et al.* (2015).

#### *Thorax and legs*

The thoracic segments of all three suborders show evidence of fusion or reduction, but patterns differ among groups. In the Anoplura, all three thoracic segments are fused, and external plates are often much reduced (Figs 60a, 61a); the ventral side of the thorax is covered by one sternal plate (Fig. 61a), which may be absent (Fig. 60a). In the Ischnocera, the meso- and metanotum are always fused (typically referred to as the pteronotum), but the pronotum is separate (Figs 32–41). The sternal plates may all be separate, but in some groups the mesosternum is fused to the metasternum. The prosternum is absent in some genera. In the Menoponidae, the mesonotum is not fused to the metanotum, but may be much reduced (Figs 16–17); all three sternal plates are typically present. Most menoponids also have a small, rod-like postnotum anterior to the mesonotum (Figs 20a, g). In Ricinidae and Laemobothriidae, the mesonotum is fused to the metanotum, and the meso- and metasternal plates are fused (Figs 22–25).

In the Amblycera and Ischnocera, all legs are typically similar in size and shape, except the

first pair of legs is reversed to reach forward rather than backward (*e.g.* Figs 16, 32). The third pair of legs in Anoplura is typically much larger and stouter than the first pair of legs (Figs 60a, 61a); the second pair of legs may be either similar to the first or the third, or intermediate in size. In Philopteridae, Gonioididae, Trimenoponidae, Ricinidae, Laemobothriidae, and Menoponidae there are two claws on each leg (Figs 16–17, 22–25, 32–41). In Gyropidae, the second and third pairs of legs have only one claw (Fig. 19d; smaller in *Gliricola*). In Trichodectidae and Anoplura, all three pairs of legs have only one claw (Figs 54–55, 60a, 61a). In many groups the first tarsal segment is elongated distally to form a second, non-articulated, “claw” (TE in Fig. 54). In *Gyropus*, the gigantic claw folds against the distal margin of the femur to clasp hairs. Soler Cruz & Martín Mateo (2009) give an excellent overview of the distal leg structures of the Anoplura.

Wings are absent from all species of Phthiraptera.

Thoracic chaetotaxy differs among the suborders, but is usually rather conserved within each family. An introduction to the thoracic chaetotaxy of the avian Ischnocera can be found in Mey (1994b). Kim *et al.* (1986) includes a discussion of the important thoracic setae of the Anoplura, and Clay (1970a) discusses some features of thoracic chaetotaxy in the Amblycera. Leg chaetotaxy often differs between closely related genera, at least in the Ischnocera (Gustafsson & Bush 2017), but is generally poorly known. Presence or absence of dense, irregular patches of setae (setal patches; Fig. 19c) or comb-like rows of setae (ctenidia; Fig. 19a) on femora II–III are important characters for delimiting genera and species within the Menoponidae.

#### *Abdomen*

All three suborders show some fusion of the abdominal segments. In Ischnocera, segment I is reduced (Figs 32–41), but visible in some genera as anterior setae on dorsal or sternal plates (*e.g.* Figs 34–35). Typically, at least segments IX–X are fused in the Philopteridae and Trichodectidae (Figs 39, 55), but these are sometimes fused with XI as well (Fig. 33). Segments IX–XI are all fused in Gonioididae (Figs 26–27); how-

ever the identification of sclerites of this part of the abdomen in Goniodidae is not clear (Kéler 1939; Smith 2000). In Anoplura, segment I may be fused with segment II or entirely unsclerotized (Fig. 60a), but in some genera the segment is distinct (Fig. 61a). Fusion varies among and sometimes within families in Amblycera (see Clay 1970a). In Menoponidae and Laemobothriidae, segment I is free, but segments IX–XI are fused (Figs 16–17, 24–25). In Ricinidae, segment I is fused to the pterothorax, and the first visible segment is segment II (Figs 22–23).

Spiracular openings are present on segments III–VIII in Ischnocera, Anoplura, and most families in the Amblycera (e.g. Figs 16, 26), but absent on segment VIII in the Trimenoponidae (not illustrated). In many lice, a stigmatal scar is visible in the corresponding area on segment II (e.g. Fig. 32). In Trichodectidae the posterior spiracular openings are often reduced or absent, and some extralimital species do not have abdominal spiracles at all (Lyal 1985). The only species in the Swedish fauna with fewer than 6 pairs of abdominal spiracular openings is *Felicola subrostratus*, which has spiracular openings on segments III–IV or III–V.

Tergal, sternal, and pleural plates may be fused or separate, and in some cases absent, depending on family and genus. In the Ischnocera, tergal and pleural plates of the same segment are generally fused, forming tergopleurites that often reach the ventral side of the abdomen (Figs 32, 36, 38). In some Goniodidae, tergal plates II–III are partially fused. Antero-lateral corners of tergopleurites are often elongated to form re-entrant heads that extend into the preceding segment (Fig. 38). Postero-lateral corners may also be elongated to overlap the next segment (Fig. 34). Tergal plates may be transversally continuous (Fig. 50a), medially indented (Fig. 50e), or medianly interrupted (Fig. 50g); the same species may show different states on different segments, especially in the *Quadriceps*-complex. Sternal plates VII–VIII in females (Figs 33, 35, 37, 39) and VIII–XI in males (Figs 32, 34, 36) are typically fused to form a subgenital plate, but in some genera, this plate is much smaller (Figs 32, 40). Sternal plates may be present or absent posterior to the vulval margin (Figs 35, 39).

In the Amblycera, pleurites, sternites, and tergites are typically separate (Fig. 17), but tergites and pleurites may be fused (Fig. 1). Tergal plates are typically medially continuous, but may be separated medially as in some *Myrsidea* (Fig. 21h). Sternal plates VII–VIII in female and sternal plates VIII–IX may be at least partially fused to form subgenital plate (Figs 16–17). In the Anoplura, abdominal plates are often much reduced, and presence of abdominal plates may be sexually dimorphic. Pleurites are typically present at least in more anterior segments, and may be important for genus- and species-level identification (Figs 61d–f. Notably, tergal and sternal plates are often latitudinally divided in Anoplura, so that every abdominal segment has two apparent tergites and two apparent sternites (Fig. 61a).

Abdominal chaetotaxy varies among suborders, families, and genera. For the purposes of this key, the abdominal setae of Amblycera and Ischnocera can be roughly divided into *tergo-central* (sutural setae + tergal posterior setae), *post-spiracular* (principal post-spiracular setae + accessory post-spiracular setae), *pleural* (sometimes divided into dorsal pleural setae and ventral pleural setae; sometimes called paratergal setae), and *sternal setae* (Figs 16, 32). The tergo-central and postspiracular setae may be indistinguishable in species that have complete setal rows across the abdominal segments (e.g. *Philopterus* spp.; Figs 34–35), but are clearly identifiable in species with fewer setae (Fig. 37). Many Amblycera also have one or more anterior rows of setae situated on the tergal plates (Fig. 1); species of the same genus can often differ in this character. In many philopterids, abdominal segment II has at least one seta in the anterior end of both the tergal and the sternal plates (e.g. Fig. 34); this seta is the remnant of the reduced abdominal segment I. A more detailed nomenclature for abdominal setae in the Ischnocera is given by Cicchino & Castro (1996; modified by Gustafsson & Bush 2017).

As a general rule, the number of setae on any segment, and the presence or absence of sets of setae, are important genus- and species-level characters in the Ischnocera. Note, however, that many genera lack one or more of the sets of setae outlined above; in some genera, more

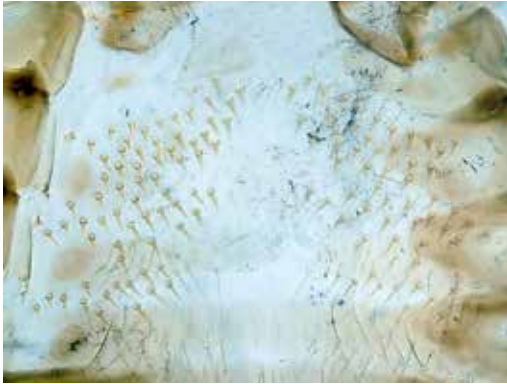


Figure 15. Spike-like setae of the ventral abdomen in the extralimital genus *Echinophilopterus* on parrots.

Spik-liknande borst på ventralsidan av abdome hos släktet *Echinophilopterus*, som lever på papegojor och således inte finns naturligt i Sverige, men skulle kunna påträffas hos tamfåglar.

posterior abdominal segments have more setae, representing more setal sets, than more anterior segments. In some genera, the shape of the setae may also be very distinctive (Fig. 15).

In the Amblycera, homogeneity in size of setae on the same segment, presence or absence of anterior tergal setae, and the number of rows formed by the anterior row of tergal setae are often important characters (Figs 21g–j). Many amblyceran genera are also recognized by the presence of dense comb-like sets of setae (*ctenidia*; Fig. 16), dense scattered sets of setae (*setal brushes*; Fig. 17), or enlarged groups of setae radiating from one area (*sternal asters*; Fig. 2) on particular segments.

Kim *et al.* (1986) discuss the taxonomically important setae of the Anoplura.

In many genera of lice, dorsal and ventral plates of the thorax and abdomen are ornamented. Ornamentations include reticulations, scale-patterns, striations, or small, dense crown-shaped markings (*i.e.* *Laemobothrion*; Fig. 24). These ornamentations are often present throughout a genus, but the intensity and extent of the ornamentations may vary among closely related species. In the illustrations used for this key, ornamentations are generally not included.

### Genitalia

Mating in lice is generally subfemoral, with the male positioned under the female, in all lice for which reports are known (*e.g.* Sikora & Eichler 1741; Oniki 1999), but exceptions have been reported by *e.g.* Sikora & Eichler (1941) and Lyal (1987). In addition, some species, particularly trichodectids, are known to reproduce asexually (Eichler 1946; Benítez-Rodríguez *et al.* 1987; Mey & González-Acuña 2007).

Male genital opening is normally dorsal (Schmutz, 1955), but some ischnoceran genera have terminal openings (*e.g.*, *Chelopistes*; not illustrated). The structure of the male genitalia varies significantly among and within all three suborders (Figs 21a, 28, 51, 59). This variation is often confusing, as the great variation in structure and shape even between closely related genera often makes it difficult to identify homologous structures. This problem is especially difficult in the Ischnocera: almost any genital element found in one genus of lice is absent in at least one other genus, and sclerites that are separate in one genus will be fused in another. A revision of these structures and the associated terminology is needed. To determine homology accurately is outside the scope of this study. Thus, we use terms as they are typically applied in recent literature of the genus in question. We hope this practice will facilitate use of the published literature in future studies of these lice. However, this means that what appears to be the same structure in two species of lice may be referred by different names in different parts of the key. In particular, the terms “endomere” and “mesosome” (and the derived terms “endomeral” and “mesosomal”) are sometimes used interchangeably, especially in genera where sclerites of the male genitalia are fused or absent. We refer to Figs 28c–f and 51 for some general schematics of male genitalia in Gonioididae and some of the large complexes within Philopteridae, but note that genera not illustrated may have very different male genitalia. General discussions on the male genitalia of chewing lice can be found in Clay (1970b), Lyal (1986), and Yoshizawa & Johnson (2006).

The male genitalia of the Amblycera are generally more similar across genera and families, at least for species in Sweden (Figs 21a,



28a–b). Nomenclature for the genital elements of Amblycera here follows Yoshizawa & Johnson (2006). Kim *et al.* (1986) outline the general structure of the genitalia in Anoplura.

The female genital opening is always ventral in Phthiraptera. The external female genitalia of lice are simple, consisting of a vulval opening or margin and a number of setae differing among orders and often among species of the same genus. The subgenital plate of the female may reach and follow the vulval margin in some genera, but not in others; in the *Brueelia*-complex, at least, this is often a good genus-level character (Gustafsson & Bush 2017; Fig. 37). In many genera, the number of setae located on the vulval margin is a good character to differentiate closely related species.

In the Philopteridae, five sets of ventral setae are generally found around the vulval margin (Figs 53c–e): one row of setae anterior typically associated with the posterior margin of the subgenital plate (and thus in some groups forming two convergent rows), one row of often thorn-like setae at the vulval margin, one row of often thin setae at the vulval margin, one set of setae on each side postero-lateral to the vulval margin, and three anal setae on each side located farther posterior. The thin and thorn-like setae of the vulval margin may be mixed together in some genera. In other genera, some or all the marginal setae are mesosetae. The variation in the vulval setae is often good a generic or specific character. In addition to the subgenital plate, some groups within Philopteridae also have subvulval and vulval sclerites (Fig. 53d);

The female terminalia in Amblycera are dominated by two rows of setae (dorsal and ventral anal fringe), the shape and number of which are important species-level characters in many genera (Fig. 21c–d).

Kim & Ludwig (1978) provide a good introduction to the female genitalia of the Anoplura.

## Results

With this report, the Swedish louse fauna has been increased from 201 to 332 species, with new geographic records for 12 genera that are newly reported from Sweden. We deal with each group separately below. Subspecies are rarely used in lice, with the exception of the

lice of some host groups such as shorebirds. In most cases, the morphological differences between subspecific taxa in these louse groups are roughly equivalent to the differences seen between species-level taxa on other host groups. The establishment of subspecific taxa in *e.g.* *Saemundsonia* thus typically reflects more an older understanding of species limits in lice, than an actual closer similarity between these taxa than between species-level taxa in the same genus. In most cases, modern revisions of these genera can be expected to elevate most or all valid subspecific taxa to species level, as was done for many genera by Price *et al.* (2003a). For this reason, and for simplicity, species and subspecies are here counted together.

## Anoplura

No new Anoplura for Sweden are reported here, and the number of known anoplurans in Sweden is 23. Judging from global louse records from mammals occurring naturally or in captivity in Sweden, another 30 species could potentially be found in Sweden (Durden & Musser 1994b). However, many of these potential species are limited to domestic animals in the tropics, and the actual number of undiscovered anoplurans in Sweden is likely much lower. Imported animals may add a few species of sucking lice to the Swedish list.

## Trimenoponidae and Gyropidae

No new trimenoponids or gyropids are reported here, and the number of known species in Sweden is one for Trimenoponidae and two for Gyropidae, all from imported hosts. As the hosts of these two louse families are exclusively Neotropical, we do not expect any other species of either family to be found on mammals native to Sweden. However, animals imported for zoos or as pets are a potential source of additional species for the Swedish list.

## Menoponidae

We report 37 new menoponid records for Sweden, which brings the number of known species in Sweden to 72. Three menoponid genera are reported for the first time in Sweden: *Gruimennon*, *Heleonomus*, and *Kurodaia*.

The scope for new records of menoponids in Sweden is great. At least 100 species of menoponids have been recorded from birds that breed in or regularly visit Sweden (Price *et al.* 2003a). The majority of these species belong to the following genera: *Actornithophilus*, *Austromenopon*, *Colpocephalum*, *Holomenopon*, *Kurodaia*, *Menacanthus*, and *Myrsidea*.

#### *Laemobothriidae and Ricinidae*

Four new ricinids and no new laemobothriids are reported here, bringing the total number of known species in Sweden to five ricinids and two laemobothriids. Judging from extralimital reports, at least an additional five laemobothriids and eight ricinids may be found in Sweden (Price *et al.* 2003a).

#### *Trichodectidae*

One new trichodectid for Sweden is reported here, bringing the total number of known species in Sweden to 12. This potentially represents less than half the diversity in Sweden, as 14 additional species have been reported from other countries from the wild mammals and most common pets or domesticated animals living in Sweden (Price *et al.* 2003a).

#### *Goniodidae*

We report five new species of goniodid from Sweden, bringing the total number of known species to 16. As goniodids are limited to hosts in the orders Galliformes (hens and pheasants) and Columbiformes (pigeons and doves), a large number of additional species could potentially be found from domesticated and captive hosts such as peacocks and pheasants. The number of such species is impossible to predict. From birds living wild in Sweden, an additional 12 species have been reported from abroad (Price *et al.* 2003a).

#### *Philopteridae*

The greatest number of new records for Sweden reported here concern philopterids, with 84 new records. This brings the total number of known philopterids in Sweden to 198. Nine philopterid genera are reported for the first time from Sweden: *Acronirmus*, *Austrogoniodes*, *Carduiceps*, *Mulcticola*, *Neophilopterus*, *Olivinirmus*, *Rallicola*, *Rostrinirmus*, and *Turdinirmus*.

Philopterids are the group with the largest potential for new records for Sweden. Judging from what has been reported from birds abroad that breed in or visit Sweden, at least 226 additional species of philopterids could potentially be found in Sweden (Price *et al.* 2003a). The majority of these species infest perching birds (Passeriformes). Of the 226 potential records for Sweden, 114 species belong to the *Philopterus*, *Penenirmus*, or *Brueelia* complexes. Another 44 species belong to the *Quadriceps*-complex (*Luniceps*, *Quadriceps*, *Rotundiceps*, *Saemundssonina*), most of which are found on shorebirds (Charadriiformes). Both of these host groups are dominated in Sweden by migrating birds, and both groups contain large numbers of vagrant species to Sweden. The list of louse species that could potentially occur in Sweden from passeriform and charadriiform hosts could thus be much higher, if rare vagrants are caught and examined for lice.

#### *Drost-effect*

Some lice exhibit a peculiar behaviour at the death of the host, termed the “Drost-effect” (Eichler 1970). Already an hour after the host’s death, lice from across the host’s body start moving towards the host’s head, where they aggregate. Stenram (1956) speculated that this may be because the lice are more exposed at the head, and thus more likely to be able to come in contact with a new host. The true causes of this behaviour is poorly understood, and Stenram considered the behaviour “irrational and without any importance to the continued existence of the species”. The Drost effect has been reported for *Columbicola* by Stenram (1956), for *Myrsidea*, *Menacanthus*, *Ricinus*, *Philopterus*, *Guimaraesiella* [as *Brueelia*] and *Turdinirmus* [as *Brueelia*] by Baum (1968), and for *Guimaraesiella* [as *Allobrueelia*] by Eichler (1970).

We can here add two additional reports of this phenomenon. In 2007, the first author observed the Drost-effect on a recently dead greater black-backed gull *Larus marinus* brought in to Ottenby Bird Observatory by tourists. Within an hour after the bird was brought in, *Quadriceps ornatus striolatus* started accumulating on the head. Likewise, *Anaticola rubromaculata* were observed migrating to the head on a freshly dead

eidler *Somateria mollissima* female at Ottenby Bird Observatory in 2013. In the latter case, migration to the head was visible about an hour after death, and continued for at least two hours of intermittent observation. In neither case were amblyceran lice observed migrating to the head; however no amblyceran lice were found elsewhere on the birds' bodies, and lice of this sub-order may have been absent on these particular host individuals.

Given the taxonomic range of lice reported to exhibit the Drost-effect, this effect may be more common than currently appreciated, and could be an easy way to collect large amount of lice in cases where freshly dead birds can be examined. It also means that studies on microhabitat choice of lice need to keep this effect in mind, as lice may move around on the host very soon after its death. The methodology of Choe & Kim (1988), in which freshly killed birds were cut into sections that were frozen separately, may be the only way to control for the Drost-effect.

## Discussion

### *Lice of the Nordic countries*

The louse fauna of the Nordic countries is poorly known. Only three areas have been surveyed extensively: Svalbard and surrounding areas (Hackman & Nyholm 1967; Mehl *et al.* 1982; Coulson *et al.* 2014), the Faroe Islands (Palma & Jensen 2006, 2016), and Finland (Eichler and Hackman 1973; Hackman 1994). Timmermann (*e.g.* Timmermann 1949a,b, 1950a,b,c) surveyed lice in Iceland, but the records from this country are still fragmentary. No large surveys have ever been published for Norway and Denmark, but Mehl (1970a,b, 1971, 1975) has provided a few records of lice in Norway.

Eichler and Hackman's survey of Finland is unreliable, as Eichler typically relied entirely on host associations for his identifications. In the future, individual records need to be checked against preserved material for confirmation of each identification.

The most extensive survey of the Svalbard area is Hackman & Nyholm (1968). They recorded 44 species of lice; however some of these were from the island of Bjørnøya, and the total number of lice recorded from Svalbard itself is 37 (Coulson *et al.* 2014). The Svalbard

louse fauna is naturally very limited by the small number of birds and mammals recorded there, and dominated by lice from Arctic and oceanic birds.

The louse fauna of the Faroe Islands is very well known, and comprises a total of 251 species. The Faroese louse fauna is remarkably similar to that of Sweden, with differences mainly found in the larger proportion of lice from oceanic birds on the Faroe Islands, and the larger proportion of lice from continental and boreal forest birds in Sweden. For instance, the louse genera *Halipeurus* Thompson, 1936, *Naubates* Bedford, 1930, *Paraclisis* Timmermann, 1965, and *Perineus* Thompson, 1936, parasitize tubenoses (Procellariiformes) and have been recorded on the Faroe Islands but not in Sweden (Palma & Jensen 2006, 2016). Conversely, *Goniodes* and *Goniocotes* parasitize gamefowl (Galliformes) and are represented by several species each in Sweden. On the Faroe Islands, only *Goniocotes gallinae* from the domestic chicken and a straggling *Goniodes lagopi* found on a gyrfalcon *Falco rusticolus* Linnaeus, 1758, are known.

### *Geographical distribution of chewing lice*

The Faroe Islands and Finnish louse lists include many more species in the *Brueelia*-complex than the Swedish list does. This is curious, as the vast majority of the more than 5000 birds we have examined over the last nine years in Sweden have been passerines (DRG, unpublished data). In both Finland and the Faroe Islands, the majority of the recorded lice in the *Brueelia*-complex are from non-migratory hosts, whereas our collection efforts in Sweden have primarily targeted migratory hosts. In general, prevalence and intensity of louse infestations in migratory birds seem to be less compared to non-migratory birds (Sychra *et al.* 2011, Literák *et al.* 2015). This may be due to factors such as patterns of feather moult and higher energy expenditure during migration. Whereas non-migratory birds may spend their whole lives in a relatively small area, migratory birds in Sweden have to cross or bypass the Baltic Sea, the Alps, the Mediterranean, and the Sahara Desert, only to return across these barriers a few months later. High intensities of chewing lice may thus impact migratory and non-migratory birds differently, and

avian migration may represent an important indirect selection pressure on louse populations.

Similarly, all the specifically known Swedish records for *Actornithophilus* and *Holomenopon* are from the southernmost provinces. *Actornithophilus* is at least partially a quill-boring louse genus, which has been associated with adventitious moult in its hosts (Taylor 1981), and *Holomenopon* has been suggested as the cause for “wet feather disease” in ducks (Humphreys 1975). Both of these conditions may severely impact birds living in colder climates or that are long-distance migrants. No *Holomenopon* are known from Svalbard, and *Actornithophilus* is only known as nymphs from Svalbard (Coulson *et al.* 2014). These nymphs were collected from host individuals that may have very recently arrived on their Arctic breeding grounds (Hackman & Nyholm 1968). Mehl *et al.* (1982) do not list any species of this genus for Svalbard. The records of *Actornithophilus* and *Holomenopon* from the Faroe Islands are both dominated by species parasitizing hosts that occur in the Faroe Islands or the nearby area all year round. In all these cases, environmental conditions in northern Europe may limit the geographical distribution of the lice even if it does not limit the distribution of the hosts.

The suggestion that the geographical distribution of a chewing louse is different from that of its host(s) is not uncontroversial. Chewing lice are often predicted to occur wherever their host occurs; any identification of a chewing louse to species based solely on host association relies partially on this assumption, for instance. However, this assumption is violated in a growing number of known cases. Genetically or morphologically different species of lice are often found on different host populations, including *Anaticola* duck lice (Escalante *et al.* 2016), *Aquanirmus* grebe lice (Edwards 1965), *Brueelia*-complex songbird lice (Toon & Hughes 2008), *Columbicola* pigeon lice (Johnson *et al.* 2002b), *Pectinopygus* cormorant lice (Clay 1964), *Philopterus* songbird lice (Toon & Hughes 2008), *Strigiphilus* owl lice (Clayton & Price 1984; Clayton 1990), and many other groups (summarized in Clay 1976). Light *et al.* (2016) showed that some *Myrsidea* species are genetically distinct on different sides of the

Congo River, which acts as a barrier to some bird species.

The causes of discrepancy between the geographical range of a host and its lice are generally poorly known. In some cases, macroevolutionary events such as “missing the boat” (Pateron & Gray 1997; Patterson *et al.* 1999; Clayton *et al.* 2016) may be inferred. This term denotes a process by which one or several parasite species are absent on the specific host individuals that found a new population. A classic example of “missing the boat” is the lack of some species of chewing lice on introduced populations of European starling *Sturnus vulgaris* in North America (Boyd 1951). The absence of some chewing louse species on Azorean Blackcaps *Sylvia atricapilla*, despite being present in mainland populations, may also be due to “missing the boat” (Literák *et al.* 2015).

Sweden is at the northern limit of the range of many host species, and lice on hosts that have only recently colonized Sweden may be the most limited by “missing the boat” events. However, fragmentation of host habitats is known to lower the species richness of parasites, even if this does not affect the host (Bush *et al.* 2013). This form of local extinction of lice on some host populations could be very common in liminal areas of the hosts’ range, but few studies of this effect has ever been published for lice.

Interactions between different species of lice on the same host are also poorly understood. *Columbicola* wing lice are negatively impacted by the presence of *Campanulotes* body lice (Bush & Malenke 2008), and there are occasional reports of chewing lice eating other lice (*e.g.* Nelson 1971). The effects of interspecific competition in chewing lice deserves further study, particularly in groups of birds such as passerines, where several closely related genera of chewing lice may co-occur on the same host species (Gustafsson & Bush 2017). In these cases, the available data suggests that even genera of chewing lice today considered “generalists” (*sensu* Johnson *et al.* 2012) have a very restricted topographic distribution on the host (*e.g.* Baum 1968; Mey 1982a, 1994a).

One environmental factor that has been studied for several groups of lice is ambient humidity. Chewing lice have a specialized water vapour

uptake system, which allows them to extract water from the air, as long as the ambient relative humidity is above about 40-50% (Williams 1970a, 1971; Rudolph 1983). Consequently, low ambient humidity is known to affect some chewing lice adversely (Moyer *et al.* 2002; Bush *et al.* 2009), but other chewing lice surprisingly appear to be unaffected, or even prefer low-humidity areas (Carrillo *et al.* 2007; Bush *et al.* 2009). In *Columbicola* on North American doves, closely related species of lice appear to have different tolerance levels for low ambient humidity (Malenke *et al.* 2011).

Rudolph (1983) could not detect any water vapour uptake system in the Anoplura, which presumably get their water through the host's blood. In addition, some groups of lice (mainly in the family Menoponidae) are known to drink eye secretions of their hosts (summarized in Mey 2013). Lice which can get access to water from other sources than the atmosphere may be less impacted by low ambient humidity in the short term; however the eggs would be unable to drink blood or secretions, and would thus still be vulnerable.

Temperature may also limit the geographical range of some chewing lice, though the effects are poorly known. Several studies on lice from domestic mammals reported that louse eggs fail to hatch at room temperatures (Matthysse 1944; Scott 1950, 1952). However, even adult lice appear to require higher temperatures to survive (Williams 1970b).

Our collection efforts have been centered around the larger ringing stations in southern Sweden, and detailed surveys of the northern parts of the Nordic countries have not yet been performed. In many cases, we may not have found all louse species occurring on a given host in Sweden, as too few host individuals have been examined. Speculations about the geographical distribution of chewing lice at the margins of their hosts' distribution may therefore be premature.

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## Svensk sammanfattning

En uppdaterad checklista över däggdjurs- och fågellöss (Phthiraptera: Amblycera, Anoplura, Ischnocera) påträffade i Sverige presenteras. Den omfattar 332 arter och 88 släkten, av vilka 128 arter och 12 släkten är nya för landet. Majoriteten av de svenska fynden är löss som förekommer på antingen sångfåglar (Passeriformes) eller vadarfåglar, måsfåglar och alkor (Charadriiformes).

Bland de mest intressanta nya fynden märks *Lunaceps rothkoi* från prärielöpare, en fågel som bara påträffats i Sverige ett fåtal gånger. Vi kan bekräfta att *Austromenopon lutescens* förekommer naturligt på grönben. Två tidigare opublicerade värdrelationer presenteras: *Phlopterus linariae* på grönsiska och *Actornithophilus sedes* på kärnsnäppa. Den senare har tidigare bara varit känd från vadarsvalor (*Glareola* spp.), och det är oklart vad den egentliga värdutbredningen av denna art är. *Actornithophilus grandiceps* som normalt återfinns på strandskator har hittats på kärnsnäppor vid minst två tillfällen i Sverige, men det är oklart om dessa är etablerade på den här värden.

Observationerna baserar sig dels på litteraturreporteringar, dels på tidigare opublicerade fynd i svenska museisamlingar, och dessutom på ett omfattande insamlingsarbete under 2007–2014. Insamlingarna gjordes främst vid fågelstationer där man ringmärker runt om i Sverige. Insamling har framför allt skett genom så kallade avlusningsburkar (se Fig. 7). Dessa är enkla att använda och säkra för fåglarna. De består av en glasburk och en justerbar tygkrage. I glasburken ligger en bomullstuss indränkt i etylacetat, vilket

dödar lössen inom några minuter. Tygkragen fästes runt fågelns hals, och fågelns kropp sänks ner i glasburken. Kragen fästs sedan i burken antingen med tjocka gummiband, eller med gångrorna från glasburkens lock. Fågelns huvud kan under tiden genomsökas manuellt med pincett. Avlusning pågår under 10–20 minuter beroende på fågelns storlek, varpå fjäderdräkten varsamt rufas om över ett vitt papper för att få fler löss att ramla av. Fågeln kan sedan släppas.

Större fåglar (> koltrast) kan i allmänhet inte avlusas på det här sättet, och måste genomsökas manuellt. Mängden löss erhållna från större fåglar blir därför i allmänhet något lägre, och vissa lusarter kan vara mycket svåra att hitta. Ett alternativ, om man handskas med nyligen dödade fåglar, kan vara att utnyttja den så kallade Drost-effekten. Denna effekt består i att löss naturligt rör sig mot fågelns huvud då denna dör. Försteförfattaren observerade detta två gånger under studierna i Sverige, vilka rapporteras om här.

Vi ger en introduktion till klassifikation, värdrelationer, geografisk utbredning, och morfologi hos Phthiraptera, tillika en illustrerad bestämningsnyckel till alla de svenska arterna. Detaljerade illustrationer av representanter för alla större grupper av löss påträffade i Sverige inkluderas, för att underlätta identifiering i framtida arbete. Vi hänvisar dessutom till betydande referenser där mer detaljerade beskrivningar och illustrationer av de svenska arterna återfinns. Vi sammanfattar också kunskapsläget i de övriga nordiska länderna, och jämfört kortfattat denna med den kända faunan i Sverige.

## Checklist of Swedish Phthiraptera

Apart from a reference to the original description, we include references to publications where good illustrations and redescriptions can be found. In many groups (particularly the lice of shorebirds and perching birds), the only published descriptions are cursory, and the only published illustrations are partial or unsatisfactory. Many prominent groups – *Anaticola*, *Brueelia*, Gonioididae, *Quadraceps*-complex – have never been revised completely, and identification to species level must presently be done through comparisons with type material.

The “Reports” section lists all previous publications we have found that explicitly includes species of chewing or sucking lice recorded from Sweden. We have attempted to go through all published revisions and descriptions for louse genera likely to be found in Sweden, and collect any published record here; doubtless we have overlooked some.

The “Material examined” section contains both material we have collected in Sweden during 2007–2014, material collected by Mjöberg (much of which was published in his monograph in 1910a), and material sent into the SMNH. In addition, we have examined material located at the following institutions: Göteborg Natural History Museum, Göteborg, Sweden (GNM); Museum für Naturkunde, Berlin, Germany (MFNB); Moravian Museum Brno Collections (MMBC); Natural History Museum, London, United Kingdom (NHML); Price Institute for Parasitological Research, University of Utah, Salt Lake City, United States (PIPeR); University of Minnesota, St. Paul, United States (UMSP); Yamashina Institute for Ornithology, Chiba, Japan (YIO). All this material is slide-mounted, apart from material we have collected during our own surveys. For this material, only a subsample has been slide-mounted, and much remains in 95% ethanol at PIPeR. Requests to access this material can be directed to Sarah Bush, University of Utah. To our knowledge, the alcohol material does not contain any species not recorded in this checklist, but material was generally not slide-mounted if adequate samples in the SMNH collection of the same species was

available. Material from our collections in Sweden has previously been published by Gustafsson & Olsson (2012a,b, 2017), Martinů *et al.* (2015), Catanach & Johnson (2015), Bush *et al.* (2016), and Escalante *et al.* (2016).

Geographical ranges are given for lice on mammals only, as the sampled area for all wild birds is too limited to draw any conclusions. Most lice on wild birds reported here were collected in southern Sweden, but the host range extends much further north. Unfortunately, our collection trips to northern Sweden have been very limited, both in number and in the range of birds caught. As discussed above, it cannot always be assumed that the range of a louse species corresponds to the range of the host, and further records from northern Sweden would be very welcome.

### Phthiraptera Haeckel, 1896

#### Amblycera Kellogg, 1896a

#### Gyropidae Kellogg, 1896a

#### *Gliricola* Mjöberg, 1910b

**Type species:** *Gyropus gracilis* Nitzsch, 1818 = *Pediculus porcelli* Schrank, 1781.

#### *Gliricola porcelli* (Schrank, 1781)

*Pediculus porcelli* Schrank, 1781: 500.

*Gliricola porcelli* (Linnaeus); Werneck 1936: 391.

**Reports:** [1] Mjöberg (1910a) as *Gliricola gracilis*; [2] Brinck (1946a); [3] This report.

**Type host:** *Cavia porcellus* (Linnaeus, 1758) – guinea pig – marsvin<sup>p</sup> [1, 2, 3].

**Material examined:** No locality: 1 , 1 , leg. Fleming (SMNH). **Up:** *Uppsala kommun*: Uppsala, 4 , leg. C. Videll (SMNH).

#### *Gyropus* Nitzsch 1818

**Type species:** *Gyropus ovalis* Nitzsch, 1818 *nomen nudum* = *Gyropus ovalis* Burmeister, 1838.

#### *Gyropus ovalis* Burmeister, 1838

*Gyropus ovalis* Burmeister, 1838: 443.

*Gyropus ovalis* Nitzsch; Werneck 1936: 419.

**Reports:** [1] Mjöberg (1910a); [2] Brinck (1946a); [3] This report.

**Type host:** *Cavia porcellus* (Linnaeus, 1758) – guinea pig – marsvin<sup>p</sup> [1, 2, 3].

**Material examined: No locality:** 3, 6 nymphs, leg. Flemming (SMNH).

### Laemobothriidae Mjöberg, 1910a

#### *Laemobothrion* Nitzsch, 1818

**Type species:** *Pediculus maximus* Scopoli, 1763.

The *Laemobothrion* species on falcons were reviewed by Nelson & Price (1965).

#### *Laemobothrion (Eulaemobothrion) atrum* (Nitzsch, 1818)

*Liotheum atrum* Nitzsch, 1818: 302.

**Report:** [1] Mjöberg (1910a).

**Type host:** *Fulica atra* Linnaeus, 1758 – Eurasian coot – sothöna<sup>h</sup> [1].

#### *Laemobothrion (Laemobothrion) tinnunculi* (Linnaeus, 1758)

*Pediculus tinnunculi* Linnaeus, 1758: 612.

*Laemobothrion tinnunculi* (Linnaeus); Nelson & Price, 1965: 252.

**Report:** [1] Linnaeus (1746); [2] Mjöberg (1910a); [3] Nelson & Price (1965); [4] This report.

**Type host:** *Falco tinnunculus* Linnaeus, 1758 – common kestrel – tornfalk<sup>h</sup> [1, 2, 3, 4].

**Additional host in Sweden:** *Falco columbarius* Linnaeus, 1758 – merlin – stenfalk<sup>h</sup> [4].

**Material examined:** Ex *Falco columbarius*: **Sk:** *Båstads kommun:* Hovs Hallar, 3, 2, 1 nymph, 27 Sep. 1939, leg. A. Lundström (SMNH). Ex *Falco tinnunculus*: **Jä:** *Bergs kommun:* Rätansbyn, 1, 1, 6 May 1955, Leg. O.S.L. Lundin (PIPÉR).

### Menoponidae Mjöberg, 1910a

#### *Actornithophilus Ferris*, 1916b

**Type species:** *Colpocephalum uniseriatum* Piaget, 1880.

A key to most of the species in this genus, as well as illustrations and redescriptions of several *Actornithophilus* species on the Swedish list, can be found in Clay (1962).

#### *Actornithophilus flumineus* Clay, 1962 New record

*Actornithophilus flumineus* Clay, 1962: 217.

**Report:** [1] This report.

**Type host:** *Actitis hypoleucos* (Linnaeus, 1758) – common sandpiper – drillsnäppa<sup>h</sup> [1].

**Material examined: Ö:** *Mörbylångå kommun:* Ot-

tenby Bird Observatory, 1, 27 Jul. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Actitis hypoleucos* (Linnaeus, 1758) likely belong to this species.

#### *Actornithophilus gracilis* (Piaget, 1880) New record

*Colpocephalum gracilis* Piaget, 1880: 555.

**Report:** [1] This report.

**Type host:** *Platalea alba* Scopoli, 1786 – African spoonbill – afrikansk skedstork<sup>e</sup>.

**Host in Sweden:** *Vanellus vanellus* (Linnaeus, 1758) – northern lapwing – tofsvipa<sup>h</sup> [1].

**Material examined: Sk:** *Lunds kommun:* Silvåkra, 2, 30 Mar. 1939, leg. A. Lundström (SMNH). Lund, 2, 1 nymph, 20 Mar. 1939, Leg. A. Lundström (SMNH). **Sm:** *Torsås kommun:* Ragnabo, 2, 4 Apr. 1940, leg. A. Lundström (SMNH).

**Remarks:** No material from the type host is known from Sweden. Clay (1962) considered the record from the type host erroneous, which is often the case with Piaget's material (see e.g. Gustafsson & Bush 2017).

#### *Actornithophilus grandiceps* (Piaget, 1880)

*Colpocephalum grandiceps* Piaget, 1880: 558.

*Actornithophilus grandiceps* (Piaget); Clay, 1962: 226.

**Reports:** [1] Mjöberg (1910a) as *Colpocephalum grandiceps*; [2] This report.

**Type host:** *Haematopus ostralegus* Linnaeus, 1758 – Eurasian oystercatcher – strandskata<sup>h</sup> [1, 2].

**Additional host in Sweden (stragglers?):** *Calidris alpina* (Linnaeus, 1758) – dunlin – kärnsnäppa<sup>h</sup> [2].

**Material examined:** Ex *Calidris alpina*: **Sk:** *Landskrona kommun:* Häljarp, 1, 1, 2 May 1939, leg. A. Lundström (SMNH). *Vellinge kommun:* Falsterbo, 3, 5, 1 Sep. 1963, Leg. F. Balát, 1277 (MMBC). Ex *Haematopus ostralegus*: **No locality:** 1, (SMNH).

**Remarks:** The species normally occurring on *C. alpina* is *Actornithophilus umbrinus* (Burmeister, 1838). The collection of specimens from *C. alpina* that key out to *A. grandiceps* on two different occasions may suggest that Swedish birds are parasitized by this species as well. This would mean that three different species of *Actornithophilus* live on Swedish dunlins: *A. grandiceps*, *A. sedes* Eichler, 1944, and *A. umbrinus*. The genus *Actornithophilus* has never been fully revised, and none of the specimens

examined during this study were sequenced for DNA. More collections and morphological studies of this genus are needed, to establish the natural host ranges and relationships of the species of *Actornithophilus*.

***Actornithophilus lyallpurensis* Ansari, 1955  
New record**

*Actornithophilus lyallpurensis* Ansari, 1955: 55.

*Actornithophilus lyallpurensis* Ansari, ? 1955; Clay, 1962: 217.

**Report:** [1] This report.

**Type host:** *Tringa ochropus* Linnaeus, 1758 – green sandpiper – skogssnäppa<sup>H</sup> [1].

**Material examined: Vg:** *Svenljunga kommun:* Ånarp, 3 , 25 Apr. 1940, leg. A. Lundström (SMNH).

***Actornithophilus multisetosus* Blagoveshtchensky, 1940 New record**

*Actornithophilus multisetosus* Blagoveshtchensky, 1940: 41.

**Report:** [1] This report.

**Type host:** *Lymnocyrtus minima* (Brünnich, 1764) – jack snipe – dvärgbeckasin<sup>H</sup> [1].

**Material examined: Sk:** *Landskrona kommun:* Häljarp 3 , 31. Oct. 1939, leg. A. Lundström (SMNH).

***Actornithophilus ochraceus* (Nitzsch, 1818)  
New record**

*Liotheum ochraceum* Nitzsch, 1818: 299.

*Actornithophilus ochraceus* (Nitzsch, 1818); Clay, 1962: 203.

**Report:** [1] This report.

**Type host:** *Pluvialis apricaria* (Linnaeus, 1758) – European golden plover – ljunpipare<sup>H</sup>.

**Hosts in Sweden:** *Charadrius hiaticula* Linnaeus, 1758 – common ringed plover – större strandpipare<sup>H</sup> [1]. *Pluvialis squatarola* (Linnaeus, 1758) – black-bellied plover – kustpipare<sup>F</sup> [1].

**Additional host in Sweden (straggler?):** *Calidris alba* Pallas, 1764 – sanderling – sandlöpare<sup>F</sup> [1].

**Material examined: Ex** *Calidris alba:* **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 , 7 Aug. 2007, leg. D. Gustafsson (SMNH).

**Ex** *Charadrius hiaticula:* **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 , 17 Sep. 2013, leg. D. Gustafsson (SMNH).

**Ex** *Pluvialis squatarola:* **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 5 , 3 , 30 Sep. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** No material from the type host is known from Sweden. Ash's (1960) unidentified *Actornithophilus* specimens likely belong to this species.

***Actornithophilus paludosus* Clay, 1962 New record**

*Actornithophilus paludosus* Clay, 1962: 219.

**Report:** [1] This report.

**Type host:** *Tringa nebularia* (Gunnerus, 1767) – greenshank – gluttsnäppa<sup>H</sup> [1].

**Material examined: Sk:** *Vellinge kommun:* Falsterbo, 2 , 2 , 9 nymphs, 5. Aug. 1963, leg. F. Balát, 1266 (MMBC). **No locality:** 2 , (SMNH).

***Actornithophilus patellatus* (Piaget, 1890)  
New record**

*Colpocephalum patellatum* Piaget, 1890: 254.

**Report:** [1] This report.

**Type host:** *Numenius arquata* (Linnaeus, 1758) – Eurasian curlew – storspov<sup>H</sup>.

**Host in Sweden (straggler?):** *Calidris canutus* (Linnaeus, 1758) – red knot – kustsnäppa<sup>H</sup> [1].

**Material examined: Up:** Stockholm: 1 , leg. E. Mjöberg (SMNH).

**Remarks:** No material from the type host is known from Sweden.

***Actornithophilus pediculoides* (Mjöberg, 1910a)**

*Colpocephalum pediculoides* Mjöberg, 1910a: 44.

**Report:** [1] Mjöberg (1910a) as *Colpocephalum pediculoides*.

**Type host:** *Arenaria interpres* (Linnaeus, 1758) – ruddy turnstone – roskarl<sup>H</sup> [1].

**Remarks:** Mjöberg (1910a) also reported this species as a straggler of *Falco tinnunculus* Linnaeus, 1758.

***Actornithophilus piceus lari* (Packard, 1870)  
New record**

*Colpocephalum lari* Packard, 1870: 96.

*Actornithophilus piceus lari* (Packard), 1870; Timmermann, 1954a: 839.

**Report:** [1] This report.

**Type host:** *Larus marinus* Linnaeus, 1758 – greater black-backed gull – havstrut<sup>H</sup>.

**Host in Sweden:** *Larus fuscus* Linnaeus, 1758 – lesser black-backed gull – silltrut<sup>H</sup> [1].

**Material examined: Sm:** *Kalmar kommun:* Kalmar, 1 , 29 Apr. 1939, leg. A. Lundström (SMNH).

**Remarks:** No material from the type host is known from Sweden.

***Actornithophilus piceus piceus* (Denny, 1842)  
New record**

*Liotheum piceum* Denny, 1842: 198.

*Actornithophilus piceus piceus* (Denny), 1842; Timmermann, 1954a: 839.

**Report:** [1] This report.

**Type host:** *Thalasseus sandvicensis* (Latham, 1787)

– Sandwich tern – kentsk tärna<sup>H</sup>.

**Host in Sweden:** *Sterna hirundo* Linnaeus, 1758 – common tern – fisktärna<sup>H</sup> [1].

**Material examined:** Ex *Sterna hirundo*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 27 Jul. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** No material from the type host is known from Sweden.

#### *Actornithophilus pustulosus* (Piaget, 1880)

*Colpocephalum pustulosum* Piaget, 1880: 559.

**Reports:** [1] Mjöberg (1910a) as *Colpocephalum pustulosum*; [2] This report.

**Type host:** *Calidris pugnax* (Linnaeus, 1758) – ruff – brushane<sup>H</sup> [1, 2].

**Material examined:** **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 1, 10 Sep. 2013, leg. D. Gustafsson (SMNH).

**Remarks:** Mjöberg (1910a) also reported this species as a straggler of *Falco tinnunculus* and *Limosa lapponica*. Ash's (1960) unidentified specimens from *Calidris pugnax* likely belong to this species.

#### *Actornithophilus sedes* Eichler, 1944 New record

*Actornithophilus sedes* Eichler, 1944: 56.

**Report:** [1] This report.

**Type host:** *Glareola pratincola* Linnaeus, 1766 – collared pratincole – rödvingad vadarsvala<sup>R</sup>.

**Host in Sweden:** *Calidris alpina alpina* (Linnaeus, 1758) – dunlin (*alpina*) – kärrensnäppa<sup>H</sup> [1] **new host record**.

**Material examined:** **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 1, 30 Sep. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** The specimens key to *A. sedes* in the key of Clay (1962), but there are no detailed descriptions or illustrations of this species, and we have been unable to confirm this identification. The two specimens we have examined come from different host individuals caught on the same day. No *Glareola* species was ever caught during the collection in Sweden, and no species of the genus breeds in Sweden. It is possible that the original type host is in error, or that the species naturally occurs on multiple host species. Alternatively, our material may originate in stragglers as both host species winter in the same regions.

#### *Actornithophilus totani* (Schrank, 1803) New record

*Pediculus totani* Schrank, 1803: 191.

*Actornithophilus totani* (Schrank, 1803); Clay, 1962: 215.

**Report:** [1] This report.

**Type host:** *Tringa totanus* (Linnaeus, 1758) – common redshank – rödbena<sup>H</sup> [1].

**Material examined:** **Sk:** Landskrona kommun: Häljarp, 2, 10 Apr. 1940, leg. A. Lundström (SMNH).

**Remarks:** One male was also collected at the same time as the two females listed above. This male exhibits a combination of characters unlike any of the species included in the key of Clay (1962) and cannot be identified. It may be a straggler or a contaminate from an unknown host. Ash's (1960) unidentified specimens from *Tringa glareola* Linnaeus, 1758, and *T. totanus* likely belong to this species.

#### *Actornithophilus umbrinus* (Burmeister, 1838) New record

*Colpocephalum umbrinum* Burmeister, 1838: 438.

*Actornithophilus umbrinus* (Burmeister, 1838); Clay, 1962: 212.

**Report:** [1] This report.

**Type host:** *Calidris ferruginea* (Pontoppidan, 1763) – curlew sandpiper – spovnsnäppa<sup>F</sup> [1].

**Additional host in Sweden:** *Calidris alpina schinzii* (Brehm & Schilling, 1822) – dunlin (*schinzii*) – sydlig kärrensnäppa<sup>H</sup> [1].

**Material examined:** Ex *Calidris alpina schinzii*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 1, 27 Jul. 2007, leg. D. Gustafsson (SMNH).

Ex *Calidris ferruginea*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2, 4 Sep. 2013, leg. D. Gustafsson (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Calidris alba* (Pallas, 1764) and *C. ferruginea* (Pontoppidan, 1763) likely belong to this species. His specimens from *Calidris alpina* may belong to either this species or *A. alpinum* Timmermann, 1954a.

#### *Actornithophilus* sp.

**Report:** [1] Ash (1960).

**Host:** *Calidris canutus* (Linnaeus, 1758) – red knot – kustsnäppa<sup>F</sup> [1].

**Remarks:** Two species of *Actornithophilus* are known from this host: *A. canuti* Price & Leibovitz, 1969, and *A. umbrinus* (Burmeister, 1838). We have not seen Ash's material, which



was never identified to species level, and thus cannot assign this material to either species.

***Actornithophilus* sp.**

**Report:** [1] This report.

**Host in Sweden:** *Tringa nebularia* (Gunnerus, 1767) – greenshank – gluttonsnäppa<sup>H</sup> [1].

**Material examined: No locality:** 3 , 1 (SMNH).

**Remarks:** Specimens are in poor condition and cannot be identified to species.

***Amysrsidea* Ewing, 1927**

**Type species:** *Menopon ventrale* Nitzsch [in Giebel], 1866.

Descriptions and illustrations of the Swedish species can be found in Scharf & Price (1993).

***Amysrsidea (Argimenopon) lagopi* (Grube, 1851)**

*Menopon lagopi* Grube, 1851: 491.

*Amysrsidea (Argimenopon) lagopi* (Grube); Scharf & Price, 1993: 445.

**Reports:** [1] Mjöberg (1910a); [2] Scharf & Price (1983); [3] This report.

**Type host:** *Lagopus muta pleskei* Serebrowski, 1926 – rock ptarmigan (*pleskei*) – fjällripa (*pleskei*)<sup>E</sup>.

**Hosts in Sweden:** *Lagopus lagopus lagopus* (Linnaeus, 1758) – willow ptarmigan – dalripa<sup>H</sup> [1]. *Tetrao urogallus* Linnaeus, 1758 – western capercaillie – tjäder<sup>H</sup> [2, 3].

**Material examined: Lapland:** *Gällivare kommun:* Malmberget, 1 , Sep. 1934, leg. S. Sjöberg, 97 (PIPeR). **Ån:** *Hudiksvalls kommun:* Djuped, 1 , 11 Jul. 1939, leg. A. Lundström (SMNH). **Unknown locality:** “Bosson” [= Bosön, Lidingö?], 1 , leg. O. Bergman (PIPeR).

**Remarks:** No material from the type host is known from Sweden.

***Amysrsidea (Argimenopon) perdicis* (Denny, 1842) New record**

*Menopon perdicis* Denny, 1842: 200.

*Amysrsidea (Argimenopon) perdicis* (Denny); Scharf & Price, 1993: 445.

**Report:** [1] This report.

**Type host:** *Perdix perdix* (Linnaeus, 1758) – grey partridge – raphhöna<sup>H</sup> [1].

**Material examined: Blekinge:** *Ronneby kommun:* Vambåsa, 1 , 2 , 5 Aug. 1938, leg. A. Lundström (SMNH)

***Austromenopon* Bedford, 1939**

**Type species:** *Menopon crocatum* Nitzsch [in Giebel], 1866.

A key to all Swedish species of *Austromenopon* except *A. paululum* can be found in Clay (1959). Species on the Procellariiformes were reviewed by Timmermann (1963) and Price & Clay (1972). Timmermann (1954a) included measurements and brief comments for some species of *Austromenopon*. Złotorzycka (1963) discussed two species that may occur in Sweden, but has not been reported yet. She also discussed some methods of identifying different species of *Austromenopon* based on head characters.

***Austromenopon aegialitidis* (Durrant, 1906) New record**

*Menopon aegialitidis* Durrant, 1906: 529.

**Report:** [1] This report.

**Type host:** *Charadrius vociferus* Linnaeus, 1758 – killdeer – skrikstrandpipare<sup>E</sup>.

**Hosts in Sweden:** *Charadrius hiaticula* Linnaeus, 1758 – common ringed plover – större strandpipare<sup>H</sup> [1]. *Vanellus vanellus* (Linnaeus, 1758) – northern lapwing – tofsvipa<sup>H</sup> [1].

**Material examined: Ex Charadius hiaticula:** **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 , 17 Sep. 2013, leg. D. Gustafsson (SMNH).

**Ex Vanellus vanellus:** **Sm:** *Torsås kommun:* Ragnabo, 1 , 4 Apr. 1940, leg. A. Lundström (SMNH).

**Remarks:** The type host is not recorded in Sweden, and thus no material from the type host is known from Sweden

***Austromenopon alpinum* Timmermann, 1954a New record**

*Austromenopon alpinum* Timmermann, 1954a: 202.

**Report:** [1] This report.

**Type host:** *Calidris alpina schinzii* (Brehm & Schilling, 1822) – dunlin (*schinzii*) – sydlig kärrsnäppa<sup>H</sup>.

**Host in Sweden:** *Calidris alpina alpina* (Linnaeus, 1758) – dunlin (*alpina*) – nordlig kärrsnäppa<sup>H</sup> [1].

**Material examined: Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 , 30 Sep. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** No material from the type host subspecies are known from Sweden. Ash’s (1960) unidentified specimens from *Calidris alpina* likely belong to this species.

***Austromenopon decorosum* Złotorzycka, 1968 New record**

*Austromenopon decorosum* Złotorzycka, 1968: 323.

**Report:** [1] This report.

**Type host:** *Tringa totanus* (Linnaeus, 1758) – common redshank – rödbena<sup>H</sup> [1].

**Material examined:** **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1 , 5 Aug. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Tringa totanus* (Linnaeus, 1758) likely belong to this species.

***Austromenopon hystriculum* Złotorzycka, 1968 New record**

*Austromenopon hystriculum* Złotorzycka, 1968: 326.

**Report:** [1] This report.

**Type host:** *Actitis hypoleucos* (Linnaeus, 1758) – common sandpiper – drillsnäppa<sup>H</sup> [1].

**Material examined:** **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1 , 4 Aug. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Actitis hypoleucos* (Linnaeus, 1758) likely belong to this species.

***Austromenopon lutescens* (Burmeister, 1838) New record**

*Menopon lutescens* Burmeister, 1838: 440.

**Report:** [1] This report.

**Type host:** *Calidris pugnax* (Linnaeus, 1758) – ruff – brushane<sup>H</sup>.

**Hosts in Sweden:** *Calidris canutus* (Linnaeus, 1758) – red knot – kustsnäppa<sup>F</sup> [1]. *Tringa glareola* (Linnaeus, 1758) – wood sandpiper – grönbena<sup>H</sup> [1].

**Material examined:** Ex *Calidris canutus*: **Sk:** Vellinge kommun: Falsterbo, 1 , 22 Aug. 1963, leg. F. Balát, 1270 (MMBC). **Up:** Stockholm, 1 , 2 , leg. E. Mjöberg (SMNH).

Ex *Tringa glareola*: **Sk:** Vellinge kommun: Falsterbo, 4 , 1 , 1 nymph, 6 Aug. 1963, leg. F. Balát, 1297 (MMBC).

**Remarks:** *Tringa glareola* is not mentioned as a host of *A. lutescens* in Price et al. (2003a), but Clay (1959: 165) mentioned *A. lutescens* s. l. from *Tringa*. Other records of this louse-host association are from Romania (Bechet, 1959: 132; 1961: 92) and former Yugoslavia (Breljih & Tovornik, 1962: 89). *Austromenopon* sp. is reported from *T. glareola* by Rékási & Kiss (1980: 76) and Dik et al. (2010: 870) from Romania and Turkey, respectively. We therefore consider *T. glareola* as a natural host of *A. lutescens*.

No material from the type host is known from Sweden, but Ash's (1960) unidentified specimens from *Calidris pugnax* likely belong to this species.

***Austromenopon meyeri* (Giebel, 1874)**

*Menopon meyeri* Giebel, 1874: 296.

*Austromenopon meyeri* (Giebel), 1874: Timmermann, 1954a: 202.

**Report:** [1] Mjöberg (1910a).

**Type host:** *Limosa lapponica* (Linnaeus, 1758) – bartailed godwit – myrspov<sup>H</sup> [1].

**Remarks:** Mjöberg (1910a) was not certain about the identification of this material. No material of this species remains at the SMNH, and we assume Mjöberg's specimens to be lost.

***Austromenopon nigropleurum* (Denny, 1842) New record**

*Menopon nigropleurum* Denny, 1842: 200.

*Austromenopon nigropleurum* (Denny, 1842); Eveleigh & Threlfall, 1974: 272.

**Report:** [1] This report.

**Type host:** *Alca torda* Linnaeus, 1758 – rasonbill – tordmule<sup>H</sup> [1].

**Additional hosts in Sweden:** *Uria aalge* (Pontoppidan, 1763) – common guillemot – sillgrissla<sup>H</sup> [1].

**Material examined:** Ex *Alca torda*: **No locality:** 1 (SMNH).

Ex *Uria aalge*: **No locality:** 3 , 4 , 13 nymphs, (SMNH).

***Austromenopon paululum* (Kellogg & Chapman, 1899)**

*Menopon paululum* Kellogg & Chapman, 1899: 119. *Austromenopon paululum* (Kellogg et Chapman), 1899; Timmermann, 1963: 416.

*Austromenopon paululum* (Kellogg & Chapman); Price & Clay, 1972: 494.

**Report:** [1] Price & Clay (1972).

**Type host:** *Puffinus opisthomelas* Coues, 1864 – black-vented shearwater – californialira<sup>E</sup>.

**Host in Sweden:** *Ardena grisea* (Gmelin, 1789) – sooty shearwater [1] – grållira<sup>T</sup>.

**Remarks:** The type host is not recorded in Sweden, and no material from the type host is thus known from Sweden.

***Austromenopon transversum* (Denny, 1842) New record**

*Menopon transversum* Denny, 1842: 201.

**Report:** [1] This report.

**Type host:** *Rissa tridactyla* (Linnaeus, 1758) – black-legged kittiwake – tretåig mäs<sup>H</sup>.

**Hosts in Sweden:** *Chroicocephalus ridibundus* (Linnaeus, 1758) – black-headed gull – skratmås<sup>H</sup> [1]. *Larus argentatus* Pontoppidan, 1763 – herring gull – gråtrut<sup>H</sup> [1].

**Material examined:** Ex *Chroicocephalus ridibundus*: **Sk:** Lunds kommun: Silvåkra, 1 , 5 , 9 nymphs, 24 Apr. 1939, leg. A. Lundström (SMNH).

Ex *Larus argentatus*: **Sm:** Kalmar kommun: Kalmar, 1 nymph, 22 Apr. 1940, leg. A. Lundström (SMNH); **Up:** Uppsala kommun: Uppsala, 2 nymphs, leg. C. Videll (SMNH).

**Remarks:** Nymphs from *L. argentatus* tentatively identified. No material from the type host is known from Sweden.

### *Austromenopon* sp.

**Report:** [1] This report.

**Host:** *Numenius arquata* (Linnaeus, 1758) – Eurasian curlew – storspov<sup>H</sup> [1].

**Material examined:** **Sk:** Lunds kommun: Silvåkra, 1 nymph, 23 Apr. 1939, leg. A. Lundström (SMNH).

**Remarks:** Specimen may be *A. crocatum* (Nitzsch [in Giebel], 1866), which is known from the host species, but could not be identified.

### *Austromenopon* sp.

**Report:** [1] Ash (1960).

**Host:** *Tringa glareola* Linnaeus, 1758 – wood sandpiper – grönbena<sup>H</sup> [1].

**Remarks:** No species of *Austromenopon* is known from this host, and Ash's material was not identified.

### *Ciconiphilus* Bedford, 1939

**Type species:** *Colpocephalum quadripustulatum* Burmeister, 1838.

Illustrations and descriptions of all Swedish species, as well as some species likely to occur in Sweden can be found in Price & Beer (1965c).

### *Ciconiphilus decimfasciatus* (Boisduval & Lacordaire, 1835)

*Liotheum 10-fasciatum* Boisduval & Lacordaire, 1835: 123.

*Ciconiphilus decimfasciatus* (Boisduval & Lacordaire); Price & Beer, 1965c: 661.

**Reports:** [1] Mjöberg (1910a) as *Colpocephalum importunum*; [2] This report.

**Type host:** *Ardea cinerea* Linnaeus, 1758 – grey heron – gråhäger<sup>H</sup> [1, 2].

**Material examined:** **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2 , 25 Sep. 2013, leg. D. Gustafsson (SMNH). **No locality:** 1 , (SMNH);

### *Ciconiphilus pectiniventris* (Harrison, 1916) New record

*Menopon pectiniventris* Harrison, 1916: 53.

*Ciconiphilus pectiniventris* (Harrison); Price & Beer, 1965c: 664.

**Report:** [1] This report.

**Type host:** *Anser anser* (Linnaeus, 1758) – greylag goose – grågås<sup>H</sup>.

**Host in Sweden:** *Anser fabalis* (Latham, 1787) – bean goose – sädgås<sup>H</sup> [1].

**Material examined:** **Sk:** Lunds kommun: Silvåkra, 1 , 1 , 1 nymph, 29 Mar. 1939, leg. A. Lundström (SMNH).

### *Colpocephalum* Nitzsch, 1818

**Type species:** *Colpocephalum zebra* Nitzsch *nomen nudum* = *Colpocephalum zebra* Burmeister, 1838.

*Colpocephalum* as currently defined occurs on numerous host orders, but Catanach *et al.* (2017) recently showed that this genus is paraphyletic, and in need of revision. Several revisions of groups of *Colpocephalum* have been published, delimited by host group. Price (1964) revised the species on woodpeckers, Price & Beer (1963b) the species on diurnal birds of prey, Price & Beer (1965a) the species on storks and allies, and Price & Beer (1965b) the species on crows and allies. Species of *Colpocephalum* on gamefowl could potentially be found on species kept in captivity, as none occur on wild gamefowl of Sweden; these are reviewed by Price & Beer (1964). A few species are known from owls, although the host relationships of the only species potentially living in Sweden – *Colpocephalum brachysomum* Kellogg & Chapman, 1902, on the long-eared owl *Asio flammeus* – are uncertain; the species of *Colpocephalum* found on owls were reviewed by Price & Beer (1963d). All the revisions of Price & Beer include excellent illustrations, detailed descriptions, and identification keys.

### *Colpocephalum apivorus* Tendeiro, 1958a

*Colpocephalum apivorus* Tendeiro, 1958a: 89.

*Colpocephalum apivorus* Tendeiro, 1958a; Price & Beer, 1963b: 751.

**Reports:** [1] Price & Beer (1963b); [2] This report.

**Type host:** *Pernis apivorus* (Linnaeus, 1758) – honey buzzard – bivräk<sup>H</sup> [1, 2].

**Material examined:** **Sk:** Lunds kommun: Håstad Mölla [as Hastad Malla], 1 , 1 , 9 Sep. 1953, leg. H. Johnson (PIPeR). **No locality:** 6 , 22 , 12 nymphs, (SMNH).

***Colpocephalum flavescens* (de Haan, 1829)  
New record***Liotheum flavescens* de Haan, 1829: 309.*Colpocephalum flavescens* (Haan, 1829); Price & Beer, 1963b: 744.**Report:** [1] This report.**Type host:** *Haliaeetus albicilla* (Linnaeus, 1758) – white-tailed eagle – havsörn<sup>H</sup>.**Host in Sweden:** *Aquila chrysaetos* (Linnaeus, 1758) – golden eagle – kungsörn<sup>H</sup> [1].**Material examined:** **Up:** Stockholm, 3 , 1909, leg. E. Mjöberg (SMNH). **No locality:** 9 , 5 , 1 nymph (SMNH).**Remarks:** No material from the type host is known from Sweden.***Colpocephalum fregili* Denny, 1842***Colpocephalum fregili* Denny, 1842: 198.*Colpocephalum fregili* Denny; Price & Beer, 1965b: 7.**Reports:** [1] Mjöberg (1910a) as *Colpocephalum subaequale*; [2] This report.**Type host:** *Pyrhocorax pyrrhocorax* (Linnaeus, 1758) – red-billed chough – alptråka<sup>E</sup>.**Hosts in Sweden:** *Corvus frugilegus* Linnaeus, 1758 – rook – råka<sup>H</sup> [1]. *Corvus corax corax* Linnaeus, 1758 – common raven – korp<sup>H</sup> [2].**Host in Sweden (stragglers?):** *Buteo lagopus* (Pontoppidan, 1763) – rough-legged buzzard – fjällvråk [2].**Material examined:** Ex *Buteo lagopus*: **No locality:** 2 (SMNH).Ex *Corvus corax corax*: **No locality:** 2 , 5 nymphs (SMNH).Ex *Corvus frugilegus*: **No locality:** 2 , 1 (SMNH).**Remarks.** Specimens from *B. lagopus* may be stragglers or contaminates. The same sample contains an unidentified and much distorted menoponid (possibly a *Trinoton* nymph), suggesting that the source of the error may be contamination rather than straggling. No material from the type host is known from Sweden.***Colpocephalum inaequale* Burmeister, 1838***Colpocephalum inaequale* Burmeister, 1838: 438.*Colpocephalum inaequale* Burmeister; Price, 1964: 162.**Reports:** [1] Mjöberg (1910a); [2] This report.**Type host:** *Dryocopus martius* (Linnaeus, 1758) – black woodpecker – spillkråka<sup>H</sup> [1, 2].**Material examined:** **Up:** *Håbo kommun*: Skokloster, 7 , 10 , 14 nymphs, 16 Mar. 1940, leg. A. Lundström (SMNH). **Vg:** *Svenljunga kommun*: Ånarp, 1 , 1 , 3 Apr. 1940, leg. A. Lundström, 118 (PIPÉR). **No locality:** 21 , 12 , 10 nymphs, 6 Nov. 1912, leg. H. Murchardt (SMNH).***Colpocephalum milvi* Tendeiro, Restivo & Demartis, 1979 New record***Colpocephalum milvi* Tendeiro, Restivo & Demartis, 1979: 30.**Report:** [1] This report.**Type host:** *Milvus milvus milvus* (Linnaeus, 1758) – red kite – rödgglada<sup>H</sup> [1].**Material examined:** **Up:** *Stockholms kommun*: Skansen, 9 , 16 , 9 nymphs, 10 Nov. (SMNH).***Colpocephalum nanum* Piaget, 1890 New record***Colpocephalum nanum* Piaget, 1890: 257.*Colpocephalum nanum* Piaget, 1890; Price & Beer, 1963b: 752.**Report:** [1] This report.**Type host:** *Larus canus* Linnaeus, 1758 – common gull – fiskmåsa<sup>H</sup>.**Hosts in Sweden:** *Accipiter gentilis* Linnaeus, 1758 – northern goshawk – duvhök<sup>H</sup> [1]. *Buteo buteo* (Linnaeus, 1758) – common buzzard – ornmvråk<sup>H</sup> [1]. *Buteo lagopus* (Pontoppidan, 1763) – rough-legged buzzard – fjällvråk<sup>H</sup> [1].**Material examined:** Ex *Accipiter gentilis*: **Vr:** *Molkoms kommun*: Lindfors, 4 , 3 , 2 nymphs, 28 Apr. & 3 May 1939, leg. A. Lundström (SMNH).Ex *Buteo buteo*: **Sk:** *Svedala kommun*: Börringe, 1 , 8 Nov. 1939, leg. A. Lundström (SMNH).Ex *Buteo lagopus*: **Sk:** *Svedala kommun*: Börringe, 3 , 8 Nov. 1939, leg. A. Lundström (SMNH). *Ystads kommun*: Högestad, 2 , 5 , 2 nymphs, Sk, 26 Feb. 1939, leg. A. Lundström (SMNH).**Remarks:** Two poorly preserved additional males from *B. lagopus* at the SMNH may also be representatives of this species. The type host is considered an error (Price & Beer 1963b), and no material from this host has been collected in Sweden.***Colpocephalum zebra* Burmeister, 1838 New record***Colpocephalum zebra* Burmeister, 1838: 438.*Colpocephalum zebra* Burmeister; Price & Beer, 1965a: 112.**Report:** [1] This report.**Type host:** *Ciconia ciconia* (Linnaeus, 1758) – white stork – vit stork<sup>H</sup> [1].**Material examined:** **Sk:** *Hässleholms kommun*: Hörja [as Horja], 1 , 1 , 13 Jun. 1954 (PIPÉR).***Cuculiphilus* Uchida, 1926****Type species:** *Pediculus fasciatus* Scopoli, 1763.Scharf & Price (1965) revised the genus *Cuculiphilus* and provided a description and illustrations of the only known Swedish species.

***Cuculiphilus fasciatus* (Scopoli, 1763)**

*Pediculus fasciatus* Scopoli, 1763: 383.

*Cuculiphilus fasciatus* [Scopoli, 1763]; Clay & Hopkins, 1951: 13.

**Reports:** [1] Mjöberg (1910a) as *Menopon phaneroostigma*; [2] This report.

**Type host:** *Cuculus canorus* Linnaeus, 1758 – common cuckoo – gök<sup>H</sup> [1, 2].

**Material examined: Ds:** *Bengtstors kommun:* Ödskolt [as Odsokolt], 1, 19 Aug. 1961, J. Bryntesson, 86 (PIPeR). **Gä:** *Gävle kommun:* Fällinge [as Fallinge], 1, 1 Aug. 1958, leg. O. Bergman, 84 (PIPeR). **Up:** *Uppsala kommun:* Uppsala, 1, 1, leg. C. Videll (SMNH).

***Dennyus Neumann, 1906***

**Type species:** *Nitzschia burmeisteri* Denny, 1842 = *Pediculus hirundinis* Linnaeus, 1761.

No complete revision of the genus *Dennyus* has ever been published, and most partial revisions concern only extralimital species unlikely to ever occur in Sweden (Emerson & Pratt 1956; Ledger 1970a; Clayton *et al.* 1996). Ledger (1971) provides the most complete description and illustration of the only species known from Sweden.

***Dennyus hirundinis* (Linnaeus, 1761)**

*Pediculus hirundinis* Linnaeus, 1761: 479.

*Dennyus hirundinis* [Linnaeus, 1761]; Clay & Hopkins 1950: 267.

*Dennyus hirundinis* (Linnaeus, 1761); Ledger, 1971: 38.

**Reports:** [1] Linnaeus (1761) as *Pediculus hirundinis*; [2] Mjöberg (1910a) as *Nitzschia tibialis*; [3] Ash (1960); [4] This report.

**Type host:** *Apus apus* (Linnaeus, 1758) – common swift – tornseglare<sup>H</sup> [1, 2, 3, 4].

**Material examined: Sk:** *Vellinge kommun:* Falsterbo, 1, 2, 26 Aug. 1963, leg. F. Balát, 1279 (MMBC). **No locality:** 1 (SMNH).

***Eidmanniella von Kéler, 1938***

**Type species:** *Menopon brevipalpe* Piaget, 1880 = *Menopon pellucida* Rudow, 1869a.

All Swedish species are described and illustrated by Ryan & Price (1969).

***Eidmanniella pellucida* (Rudow, 1869a) New record**

*Menopon pellucidum* Rudow, 1869a: 400.

*Eidmanniella pellucida* (Rudow); Ryan & Price, 1969: 819.

**Report:** [1] This report.

**Type host:** *Phalacrocorax capensis* (Sparman, 1789) – cape cormorant – kapskarv<sup>E</sup>.

**Host in Sweden:** *Phalacrocorax carbo* (Linnaeus, 1758) – great cormorant – storskarv<sup>H</sup> [1].

**Material examined: Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 2, 2, 7 Aug. 2007, leg. D. Gustafsson (SMNH).

**Remarks.** The type host is limited to southern Africa, and there are thus no Swedish records of *E. pellucida* from the type host.

***Eidmanniella pustulosa* (Nitzsch [in Giebel], 1866)**

*Menopon pustulosum* Nitzsch [in Giebel], 1866: 393. *Eidmanniella pustulosa* (Nitzsch); Ryan & Price, 1969: 821.

**Report:** [1] Mjöberg (1910a) as *Menopon pustulosum*.

**Type host:** *Morus bassanus* (Linnaeus, 1758) – northern gannet – havssula<sup>F</sup> [1].

**Remarks:** Mjöbergs specimens are not in the SMNH.

***Gruimenopon* Clay & Meinertzhagen, 1941**

**Type species:** *Menopon longum* Giebel, 1874.

Only two species of *Gruimenopon* are known (Price *et al.* 2003a), and no review of these have ever been published. The only other species is known from the sandhill crane *Antigone canadensis* (Linnaeus, 1758), which has recently been recorded for the first time in Sweden. Ledger (1980: 77) mentions several additional undescribed species from crane species that may be kept in captivity in Sweden.

***Gruimenopon longum* (Giebel, 1874) New record**

*Menopon longum* Giebel, 1874: 297.

*Gruimenopon longum* [Giebel, 1874]; Clay & Meinertzhagen, 1941: 340.

**Report:** [1] This report.

**Type host:** *Grus grus* (Linnaeus, 1758) – common crane – trana<sup>H</sup> [1].

**Material examined: Sk:** “Norra Sk”, 2, 18 Jul. 1931, leg. H. Murchardt (SMNH).

***Heleonomus Ferris, 1916b***

**Type species:** *Colpocephalum truncatum* Piaget, 1880 = *Colpocephalum macilentum* Nitzsch [in Giebel], 1866.

The genus *Heleonomus* was reviewed by Price (1970a), which includes a description and illustrations of the only species known from Sweden.

***Heleonomus macilentus* (Nitzsch [in Giebel], 1866) New record**

*Colpocephalum macilentum* Nitzsch [in Giebel], 1866: 394.

*Heleonomus macilentus* (Nitzsch); Price, 1970a: 1166.

**Report:** [1] This report.

**Type host:** *Grus grus* (Linnaeus, 1758) – common crane – trana<sup>H</sup> [1].

**Material examined: Sk:** “Norra Sk”, 1, 18 Jul. 1939, leg. H. Murcchardt (SMNH). **Vg:** *Tranemo kommun*: Månstad, 1, 3 Jul. 2014, leg. D. Gustafsson (SMNH).

***Holomenopon* Eichler, 1941**

**Type species:** *Menopon albofasciatum* Piaget, 1880 = *Menopon leucoxanthum* Burmeister, 1838.

The genus *Holomenopon* was reviewed by Price (1970b), which includes descriptions and illustrations of all Swedish species.

***Holomenopon clypeilargum* Eichler, 1943**

*Holomenopon clypeilargum* Eichler 1943: 236.

*Holomenopon clypeilargum* Eichler, sensu lato; Price, 1970: 643.

**Report:** [1] Price (1970b).

**Type host:** *Anas acuta* Linnaeus, 1758 – northern pintail – stjärtand<sup>H</sup>.

**Host in Sweden:** *Anas crecca* Linnaeus, 1758 – green-winged teal – kricka<sup>H</sup> [1].

**Remarks.** No specimens of this species have been collected from the type host in Sweden.

***Holomenopon leucoxanthum* (Burmeister, 1838)**

*Menopon leucoxanthum* Burmeister, 1838: 440.

*Holomenopon leucoxanthum* (Burmeister), sensu lato; Price, 1970b: 635.

**Reports:** [1] Mjöberg (1910a) as *Menopon albofasciatum*; [2] Price (1970b); [3] This report.

**Type host:** *Anas crecca* Linnaeus, 1758 – green-winged teal – kricka<sup>H</sup>.

**Hosts in Sweden:** *Melanitta nigra* (Linnaeus, 1758) – common scoter – sjöorre<sup>H</sup> [2]. *Tadorna tadorna* (Linnaeus, 1758) – common shelduck – gravand<sup>H</sup> [1, 2, 3].

**Material examined: No locality:** Ex *Tadorna tadorna*: 1 nymph (SMNH).

**Remarks:** Mjöberg (1910a) was uncertain if his specimens represented *M. albofasciatum*. We have examined one nymph of *Holomenopon* from *T. tadorna*, which may be the specimen to which Mjöberg referred. As the only available

key to *Holomenopon* does not include nymphal characters, we cannot positively identify this specimen, but provisionally list it under *H. leucoxanthum* because of its host association.

No material from the type host is known from Sweden.

***Holomenopon loomisii* (Kellogg, 1896b) New record**

*Menopon loomisii* Kellogg, 1896b: 162.

*Holomenopon loomisii* (Kellogg); Price, 1970b: 644.

**Report:** [1] This report.

**Host:** *Somateria mollissima* (Linnaeus, 1758) – common eider – ejder<sup>H</sup> [1].

**Material examined: Sk:** *Vellinge kommun*: Falsterbo, 1, 25 Aug. 1963, leg. F. Balát, 1311 (MMBC).

**Remarks:** Price (1970b) reported this species form ‘Lapland’, but gave no further details about which part of Lapland this was collected from. The host given is *Somateria spectabilis*, a rare vagrant to Sweden. We do not consider this to be a certain record of *H. loomisii* from Sweden; it seems likely that this is from the same collection trip to Lapland as the one reported by Meinertzhagen (1938), which did not include Sweden.

***Holomenopon* sp.**

**Report:** [1] This report.

**Host:** *Haematopus ostralegus* (Linnaeus, 1758) – Eurasian oystercatcher – strandskata<sup>H</sup> [1].

**Material examined: Sk:** *Vellinge kommun*: Falsterbo, 1 nymph, 1 Sep. 1963, leg. F. Balát, 1277 (MMBC).

**Remarks:** The genus normally occurs on ducks (Anseriformes), and this record most likely represents a straggler or a contamination. We have not included it in the checklist arranged by host.

***Kurodaia* Uchida, 1926**

**Type species:** *Colpocephalum haliaeeti* Denny, 1842.

The species of *Kurodaia* occurring on owls were reviewed by Price & Beer (1963c), which includes a description and illustrations of the only species of the genus known from Sweden. Several additional species of *Kurodaia* occur on other species of owls in Sweden, but have not yet been recorded. In addition, several species of *Kurodaia* on diurnal birds of prey may also occur in Sweden; these are reviewed and



illustrated by Price & Beer (1962), which also includes descriptions and illustrations.

***Kurodaia (Conciella) cryptostigmatia* (Nitzsch [in Giebel], 1861) New record**

*Menopon cryptostigmatia* Nitzsch [in Giebel], 1861: 529.

*Kurodaia cryptostigmatia* (Nitzsch, 1861); Price & Beer, 1963c: 850.

**Report:** [1] This report.

**Type host:** *Athene noctua* (Scopoli, 1769) – little owl – minervauggla<sup>R</sup>.

**Host in Sweden:** *Aegolius funereus* (Linnaeus, 1758) – boreal owl – pärluggla<sup>H</sup> [1].

**Material examined:** **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 2 , 2 , 2 Oct. 2007, leg. D. Gustafsson (SMNH).

**Remarks.** There are several records of the type host in Sweden, but no *Kurodaia* specimens have been collected from these.

***Menacanthus* Neumann, 1912**

Type species: *Menopon robustum* Kellogg, 1896a.

The genus *Menacanthus* has been reviewed by Price (1975, 1977) for species on perching birds and by Price & Emerson (1975) for species on woodpeckers. No complete revision of the *Menacanthus* species living on gamefowl has been published, but Emerson (1956) illustrates the species occurring on domestic chicken.

The genus includes one of the least host-specific species of louse known, *Menacanthus eurysternus*, which is known from almost 200 host species (Price *et al.* 2003a; Martinů *et al.* 2015). *Menacanthus* species from novel hosts should always be compared first with *M. eurysternus*, secondly with other widely distributed species of *Menacanthus* (e.g. *M. alaudae* or *M. takayamai*), and only after these have been ruled out, be considered as a potential new species. Numerous species in this genus have been described based mainly on host associations, most of which have subsequently been placed in synonymy (e.g. Price 1975, Palma *et al.* 1998, Krištofik 2000).

***Menacanthus alaudae* (Schrank, 1776)**

*Pediculus alaudae* Schrank, 1776: 115.

*Pediculus alaudae* [Schrank, 1776]; Clay & Hopkins, 1954: 226.

*Menacanthus alaudae* (Schrank); Price, 1977: 210.

**Report:** [1] Clay & Hopkins (1954).

**Type host:** *Alauda arvensis* Linnaeus, 1758 – Eurasian skylark – sånglärka<sup>H</sup> [1].

***Menacanthus camelinus* (Nitzsch [in Giebel], 1874)**

*Menopon camelinus* Nitzsch [in Giebel], 1874: 288.

*Menacanthus camelinus* (Nitzsch); Price, 1977: 210.

**Reports:** [1] Martinů *et al.* (2015); [2] This report.

**Type host:** *Lanius excubitor* Linnaeus, 1758 – great grey shrike – varfågel<sup>H</sup>.

**Host in Sweden:** *Lanius collurio* Linnaeus, 1758 – red-backed shrike – törnskata<sup>H</sup> [1, 2].

**Material examined:** **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 8 , 1 nymph, 28 May 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Martinů *et al.* (2015) also reported this species from *Turdus merula* Linnaeus, 1758, from Sweden; however this report is likely a straggler or contaminate. No specimens have been collected from the type host in Sweden.

***Menacanthus curuccae* (Schrank, 1776)**

*Pediculus curuccae* Schrank, 1776: 113.

*Menacanthus curuccae* (Schrank); Price, 1977: 215.

**Report:** [1] Martinů *et al.* (2015). [2] This report.

**Type host:** *Sylvia curruca curruca* (Linnaeus, 1758) – lesser whitethroat (*curruca*) – ärtsångare<sup>H</sup>.

**Hosts in Sweden:** *Acrocephalus scirpaceus* (Hermann, 1804) – Eurasian reed warbler – rörsångare<sup>H</sup> [1]. *Sylvia borin* (Boddaert, 1783) – garden warbler – trädgårdssångare<sup>H</sup> [2].

**Material examined:** Ex *Sylvia borin:* **Sk:** *Vellinge kommun:* Falsterbo, 2 nymphs, 12 Sep. 1963, leg. F. Balát, 1308 (MMBC).

**Remarks.** Nymphal characters are poorly known in *Menacanthus*, and the material examined was likely identified by Balát based on host associations. No specimens from the type host are known from Sweden.

***Menacanthus eurysternus* (Burmeister, 1838)**

*Menopon eurysternus* Burmeister, 1838: 439.

*Menacanthus eurysternus* (Burmeister) *sensu lato*; Price, 1975: 617.

**Reports:** [1] Mjöberg (1910a) and *Menopon picae*; [2] Martinů *et al.* (2015); [3] This report.

**Type host:** *Pica pica* (Linnaeus, 1758) – Eurasian magpie – skata<sup>H</sup> [1].

**Additional hosts in Sweden:** *Alauda arvensis* Linnaeus, 1758 – Eurasian skylark sånglärka<sup>H</sup> [2]; *Corvus monedula* Linnaeus, 1758 – Eurasian jackdaw – kaja<sup>H</sup> [3]; *Fringilla coelebs* Linnaeus, 1758

– common chaffinch – bofink<sup>H</sup> [2]; *Passer domesticus* (Linnaeus, 1758) – house sparrow – gråsparv<sup>H</sup> [2, 3]; *Sturnus vulgaris* Linnaeus, 1758 – European starling – stare<sup>H</sup> [2, 3]; *Turdus merula* Linnaeus, 1758 – common blackbird – koltrast<sup>H</sup> [2, 3]; *Turdus philomelos* Brehm, 1831 – song thrush – taltrast<sup>H</sup> [3]; *Turdus pilaris* Linnaeus, 1758 – fieldfare – björktrast<sup>H</sup> [2].

**Material examined:** Ex *Corvus monedula*: **Sk:** Sjöbo kommun: Sövdeborg, 3, 6, 7 nymphs, 30 Mar. 1939, leg. A. Lundström (SMNH).

Ex *Passer domesticus*: **Vr:** Eda kommun: Skönnerud, 1, 16 Feb. 1939, leg. A. Lundström (SMNH).

Ex *Sturnus vulgaris*: **Sk:** Vellinge kommun: Falsterbo, 3, 2, 3 nymphs, 23 Aug. 1963, leg. F. Balát, 1281 (MMBC). Same locality, 3 nymphs, 23 Aug. 1963, leg. F. Balát, 1282 (MMBC). **Vr:** Eda kommun: Skönnerud, 2, 2 nymphs, 13 Apr. 1939, leg. A. Lundström (SMNH).

Ex *Turdus merula*: **Sk:** Lunds kommun: Häckeberga, 1, 1, 8 nymphs, 28 Feb. 1939, leg. A. Lundström (SMNH).

Ex *Turdus philomelos*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 15 Sep. 2013, leg. D. Gustafsson (SMNH).

**Remarks:** The report from *A. arvensis* may refer to a straggler. Martinů et al. (2015) reported a specimen from *Periparus ater* (Linnaeus, 1758) that genetically falls within *M. eurysternus*, but it was not explicitly identified as such.

### ***Menacanthus gonophaeus* (Burmeister, 1838)**

*Menopon gonophaeum* Burmeister, 1838: 440.

*Menacanthus gonophaeus* (Burmeister); Price, 1977: 208.

**Report:** [1] Mjöberg (1910a).

**Type host:** *Corvus corax* Linnaeus, 1758 – common raven – korp<sup>H</sup> [1].

### ***Menacanthus pallidulus* (Neumann, 1912)**

*Menopon pallidulum* Neumann, 1912: 361.

*Menacanthus pallidulus* (Neumann); Emerson, 1956: 77.

**Report:** [1] Brinck (1946a) as *Uchida pallidula*.

**Type host:** *Gallus gallus* (Linnaeus, 1758) – red junglefowl (domestic chicken) – tamhöna<sup>D</sup> [1].

### ***Menacanthus phasiani* (Modrzejewska & Złotorzycka, 1977) New record**

*Uchida phasiani* Modrzejewska & Złotorzycka, 1977: 340.

**Report:** [1] This report.

**Type host:** *Phasianus colchicus* Linnaeus, 1758 – ring-necked pheasant – fasan<sup>H</sup> [1].

**Material examined:** **Sk:** Höörs kommun: Fodgarp, 1, 17 Oct. 1937, leg. A. Lundström (SMNH).

*Lomma kommun:* Lomma, 2, 1, 3 nymphs, 22 Mar. 1939, leg. A. Lundström (SMNH). *Lunds kommun:* Silvåkra, 1, 18 May, 1939, leg. A. Lundström (SMNH).

### ***Menacanthus pici* (Denny, 1842)**

*Menopon pici* Denny, 1842: 200.

*Menacanthus pici* (Denny); Price & Emeson, 1975: 779.

**Reports:** [1] Mjöberg (1910a); [2] Price & Emerson (1975); [3] Martinů et al. (2015); [4] This report.

**Type host:** *Picus viridis* Linnaeus, 1758 – European green woodpecker – gröngöling<sup>H</sup> [1, 3, 4].

**Additional host in Sweden:** *Dendrocopos major* (Linnaeus, 1758) – greater spotted woodpecker – större hackspett<sup>H</sup> [2].

**Material examined:** Ex *Picus viridis*: **Vr:** Eda kommun: Skönnerud, 2, 5, 4 nymphs, 13 Feb. 1939, leg. A. Lundström (SMNH). **Ög:** Mjölby kommun: Gottlösa, 5, 4, 6 nymphs, 27 Mar. 1940, leg. A. Lundström (SMNH). **No locality:** 4, 12, 1 nymph, leg. E. Mjöberg (SMNH).

### ***Menacanthus pusillus* (Nitzsch, 1866)**

*Menopon pusillus* Nitzsch, 1866: 120.

*Menacanthus pusillus* (Nitzsch); Price, 1977: 213.

**Report:** [1] Martinů et al. (2015). [2] This report.

**Type host:** *Motacilla alba* Linnaeus, 1758 – white wagtail – sädesärla<sup>H</sup> [1].

**Additional hosts in Sweden:** *Anthus trivialis* (Linnaeus, 1758) – tree pipit – trädpiplärka<sup>H</sup> [1, 2]. *Motacilla flava* Linnaeus, 1758 – western yellow wagtail – gulärla<sup>H</sup> [2].

**Material examined:** Ex *Anthus trivialis*: **Sk:** Vellinge kommun: Falsterbo, 3, 3, 17 Sep. 1963, leg. F. Balát, 1271 (MMBC). Same locality, 4, 5, 17 Sep. 1963, leg. F. Balát, 1302 (MMBC).

Ex *Motacilla flava*: **Sk:** Vellinge kommun: Falsterbo, 1, 22 Aug. 1963, leg. F. Balát, 1255 (MMBC).

**Remarks:** Ash's (1960) *Menacanthus* specimens from *A. trivialis*, *M. alba*, and *M. flava* were likely this species, but they were not identified to species level.

### ***Menacanthus sinuatus* (Burmeister, 1838)**

*Menopon sinuatum* Burmeister, 1838: 440.

*Menacanthus sinuatus* (Burmeister); Price, 1977: 217.

**Report:** [1] Martinů et al. (2015).

**Type host:** *Parus major* Linnaeus, 1758 – great tit – talgoxe<sup>H</sup> [1].

**Additional host in Sweden:** *Cyanistes caeruleus* (Linnaeus, 1758) – blue tit – blåmes<sup>H</sup> [1].

**Range in Sweden:** Öl, Vg [1].

***Menacanthus stramineus* (Nitzsch, 1818)***Liotheum stramineum* Nitzsch, 1818: 300.*Menacanthus stramineus* (Nitzsch); Emerson, 1956: 77.**Reports:** [1] Brinck (1946a); [2] Jansson *et al.* (2004).**Type host:** *Meleagris gallopavo* Linnaeus, 1758 – turkey – kalkon<sup>D</sup>.**Host in Sweden:** *Gallus gallus* (Linnaeus, 1758) – red junglefowl (domestic chicken) – tamhöna<sup>D</sup> [1, 2].**Remarks:** No specimens from the type host are known from Sweden. Emerson (1956, 1962) states that it is found across the world wherever turkeys have been introduced, and that “[d]omestic guineafowl, peafowl, quails and pheasants” kept with domestic chicken often acquire *M. stramineus*. Occasionally, the species may occur on waterfowl (Anseriformes) kept with domestic chicken, or even on wild birds (Martinů *et al.* 2015).***Menacanthus takayamai* Uchida, 1926***Menacanthus takayamai* Uchida, 1926: 22.*Menacanthus takayamai* Uchida; Price, 1977: 216.**Report:** [1] Martinů *et al.* (2015).**Type host:** *Horornis diphone cantans* (Temminck & Schlegel, 1847) – Japanese bush warbler – japansk cettia<sup>E</sup>.**Host in Sweden:** *Sylvia borin* (Boddaert, 1783) – garden warbler – trädgårdssångare<sup>H</sup> [1].**Remarks:** The type host has not been recorded in Sweden, and there are thus no Swedish records of *M. takayamai* from the type host.***Menacanthus* sp.****Report:** [1] Ash (1960).**Host:** *Oenanthe oenanthe* (Linnaeus, 1758) – northern wheatear -- stenskvätta<sup>H</sup> [1].**Remarks:** Two species of *Menacanthus* are listed from this host in the checklist of Price *et al.* (2003a): *M. affinis* Fedorenko & Belskaya, 1977, and *M. exilis* (Nitzsch, 1818). Ash (1960) did not identify his species, and we have not seen his material.***Menopon* Nitzsch, 1818****Type species:** *Pediculus gallinae* Linnaeus, 1758.The only published review of *Menopon* is Emerson (1954), who provided partial illustrations of the species known at the time, but no key. The male genitalia of both Swedish species are illustrated in Emerson’s review.***Menopon gallinae* (Linnaeus, 1758)***Pediculus gallinae* Linnaeus, 1758: 613.*Menopon gallinae* (Linnaeus, 1758); Emerson, 1954: 225.**Reports:** [1] Linnaeus (1746) as *Pediculus gallinae*; [2] Linnaeus (1758) as *Pediculus gallinae*; [3] Overgaard (1942) as *Menopon pallidum*; [4] Brinck (1946a); [5] Jansson *et al.* (2004).**Type host:** *Gallus gallus* (Linnaeus, 1758) – red junglefowl (domestic chicken) – tamhöna<sup>D</sup> [1, 2, 3, 4, 5].***Menopon pallens* Clay, 1949 New record***Menopon pallens* Clay, 1949: 901.*Menopon pallens* Clay, 1949; Emerson, 1954: 227.**Report:** [1] This report.**Type host:** *Perdix perdix* (Linnaeus, 1758) – grey partridge – raphhöna<sup>H</sup> [1].**Material examined:** **Sk:** *Lunds kommun:* Odarslöv, 1 , 2 Mar. 1939, leg. A. Lundström (SMNH). **Unidentified locality:** Tynaberg [= **Sö:** *Nyköpings kommun:* Tunaberg?], 1 , 1 , 7 Mar. 1955, 146 (PIPeR).***Myrsidea* Waterston, 1915****Type species:** *Myrsidea victrix* Waterston, 1915.The genus *Myrsidea* is among the most speciose of all louse genera, and probably the genus in which most species have been described in recent years, although these descriptions are entirely extralimital (*e.g.* Valim & Weckstein 2013). No comprehensive revision of the entire genus has ever been published, but a series of “contributions” to such a revision were published by Clay (1965, 1966a, 1968), Tandan & Clay (1971), and Tandan (1972), which laid the groundwork for the taxonomically important characters in the genus. Klockenhoff (*e.g.* 1976, 1979, 1980) provided a long series of comprehensive descriptions and illustrations of *Myrsidea* on crows and allies from across the world, including some Swedish species, and Price & Dalglish (2007) discussed some species that may occur on Swedish buntings. Attempts to divide the genus into smaller units (*e.g.* Złotorzycka 1964b, 1973) have all been based on limited material and a large amount of stragglers, and is generally disregarded (Clay 1966).***Myrsidea anaspila* (Nitzsch, 1866) New record***Menopon anaspilus* Nitzsch, 1866: 119.*Myrsidea anaspila* (Nitzsch, 1866); Klockenhoff, 1976: 303.**Report:** [1] This report.

**Type host:** *Corvus corax corax* Linnaeus, 1758 – common raven – korp<sup>H</sup> [1].

**Material examined:** No locality: 3 , 3 , 3 nymphs (SMNH).

***Myrsidea anathorax* (Nitzsch, 1866) New record**

*Menopon anathorax* Nitzsch, 1866: 120.

*Myrsidea anathorax* (Nitzsch, 1866); Klockenhoff, 1980a: 151.

**Report:** [1] This report.

**Type host:** *Corvus monedula* Linnaeus, 1758 – Eurasian jackdaw – kaja<sup>H</sup> [1].

**Material examined:** Sk: *Sjöbo kommun*: Sövdeborg, 1 , 30 Mar. 1939, leg. A. Lundström (SMNH). Vg: *Alingsås kommun*: Västre Bodarne, 1 , 1 , Jul. 2014, leg. D. Gustafsson (SMNH). No locality: 1 nymph (SMNH).

***Myrsidea cornicis* (de Geer, 1778)**

*Ricinus cornicis* de Geer, 1778: 76.

*Myrsidea cornicis* (De Geer, 1778); Klockenhoff, 1980b: 411.

**Reports:** [1] Mjöberg (1910a) as *Menopon mesoleucum*; [2] Clay & Hopkins (1954); [3] Klockenhoff (1979); [4] This report.

**Type host:** *Corvus cornix* Linnaeus, 1758 – hooded crow – gråkråka<sup>H</sup> [1, 2, 3, 4].

**Material examined:** Vr: *Eda kommun*: Skönnerud, 11 , 9 , 6 nymphs, 8 Mar. 1939, leg. A. Lundström (SMNH). *Torsby kommun*: Munkebol, 5 , 2 , 1 nymph, 1 Apr. 1939, leg. A. Lundström (SMNH). No locality: 3 (SMNH).

**Remarks:** Mjöberg (1910a) reported this species from *Falco peregrinus* Tunstall, 1771, and *Sciurus vulgaris* Linnaeus, 1758, but noted that these may be stragglers. No specimens of *M. mesoleucum* from either of these hosts have been found in the SMNH. Mjöberg's (1910a) material from *Corvus corax* is here reported under *Myrsidea anaspila*. Clay & Hopkins' (1954) and Klockenhoff's (1979) specimens include the neotypes series from Sweden.

***Myrsidea cucullaris* (Nitzsch, 1818)**

*Liotheum cucullaris* Nitzsch, 1818: 300.

**Reports:** [1] Mjöberg (1910a) as *Menopon cucullare*; [2] Clay & Hopkins (1960); [3] This report.

**Type host:** *Sturnus vulgaris* Linnaeus, 1758 – European starling – stare<sup>H</sup> [1, 2, 3].

**Material examined:** Dr: *Falun kommun*: Kyrkbyttjärn, 1 , 8 Jun. 2014, leg. D. Gustafsson (SMNH). Sk: *Lunds kommun*: Håckeberga, 1 , 15 Mar. 1939,

leg. A. Lundström (SMNH). *Vellinge kommun*: Falsterbo, 1 , 3 , 3 nymphs, 23 Aug. 1963, leg. F. Balát, 1282 (MMBC). Same locality, 4 nymphs, 23 Aug. 1963, leg. F. Balát, 1281 (MMBC). Vr: *Eda kommun*: Skönnerud, 3 , 2 nymphs, 13 Apr. 1939, leg. A. Lundström (SMNH).

***Myrsidea indivisa* (Nitzsch, 1866)**

*Menopon indivisum* Nitzsch, 1866: 120.

**Report:** [1] Mjöberg (1910a) as *Menopon indivisum*.

**Type host:** *Garrulus glandarius* (Linnaeus, 1758) – Eurasian jay – nötskrika<sup>H</sup> [1].

**Remarks:** We did not find Mjöberg's specimens in the SMNH.

***Myrsidea latifrons* (Carriker & Shull, 1910) New record**

*Nitzschia latifrons* Carriker & Shull, 1910: 56.

**Report:** [1] This report.

**Type host:** *Riparia riparia* (Linnaeus, 1758) – sand martin – backsvala<sup>H</sup> [1].

**Material examined:** Sk: *Vellinge kommun*: Falsterbo, 1 , 27 Aug. 1963, leg. F. Balát, 1253 (MMBC).

***Myrsidea picae* (Linnaeus, 1758) New record**

*Pediculus picae* Linnaeus, 1758: 612.

**Report:** [1] This report.

**Type host:** *Pica pica* (Linnaeus, 1758) – Eurasian magpie – skata<sup>H</sup> [1].

**Material examined:** Sm: *Jönköpings kommun*: Tenhult, 3 , 1 nymph, 22 Feb. 1939, leg. A. Lundström (SMNH). Vr: *Eda kommun*: Skönnerud, 1 , 13 Apr. 1939, leg. A. Lundström (SMNH). Vr: *Torsby kommun*: Munkebol, 2 , 2 , 2 nymphs, 14 Mar. 1939, leg. A. Lundström (SMNH). No locality: 2 nymphs (SMNH).

**Remarks.** The nymphs are unidentifiable, but presumably belong to this species.

Linnaeus (1746) mentions a "*Pediculus picae lapponica*" from "*Pica Lapponica Merula Saxatili*", which Harrison (1916) interpreted as being the same species as *Pediculus picae* Linnaeus, 1758. This is discussed by Clay & Hopkins (1950), who argue that these represent different species as *P. picae* Linnaeus, 1758, was based on a species Linnaeus marked as not having seen. To our knowledge, no new name for *Pediculus picae* Linnaeus, 1746 was ever proposed, and as the name predates the start of taxonomy, it has no taxonomic existence.

***Myrsidea rustica* (Giebel, 1874)***Menopon rusticum* Giebel, 1874: 288.*Myrsidea rustica* Giebel; Conci, 1941: 4.**Report:** [1] Mjöberg (1910a) as *Menopon rusticum*. [2] This report.**Type host:** *Hirundo rustica* Linnaeus, 1758 – barn swallow – ladusvala<sup>H</sup> [1, 2].**Material examined: Sk:** *Vellinge kommun*: Falsterbo, 1, 11 Sep. 1963, leg. F. Balát, 1259 (MMBC).**Remarks:** We did not find Mjöberg's specimens in the SMNH.***Myrsidea* sp.****Report:** [1] This report.**Host:** *Loxia curvirostra* Linnaeus, 1758 – red crossbill – mindre korsnäbb<sup>H</sup> [1].**Material examined: Sk:** *Vellinge kommun*: Falsterbo, 4 nymphs, 22 Aug. 1963, leg. F. Balát, 1287 (MMBC).**Remarks:** Probably *M. quadrimaculata* (Carriker, 1902), which is common on this host, but nymphs cannot be definitely identified.***Myrsidea* sp.****Report:** [1] This report.**Host:** *Poecile palustris* (Linnaeus, 1758) – marsh tit – entita<sup>H</sup> [1].**Material examined: Sk:** *Lunds kommun*: Häckeberga, 1, 16 Mar. 1939, leg. A. Lundström (SMNH).***Nosopon* Hopkins, 1950****Type species:** *Menopon fulvofasciatum minor* Piaget, 1880 = *Menopon lucidum* Rudow, 1869a.This small genus was revised by Tendeiro (1959), though this publication is hard to use as only poor photos are provided, and characters referred to in the text are hard to see. Tendeiro (1993) revised the genus again, but provided no identification key and only poor photographs. Apart from the species recorded below, one more species may occur in Sweden on black kites *Milvus migrans*: *Nosopon milvus* Tendeiro, 1959.***Nosopon clayae* Price & Beer, 1963a***Nosopon clayae* Price & Beer, 1963a: 522.**Report:** [1] Price & Beer (1963a).**Type host:** *Pernis apivorus* (Linnaeus, 1758) – honey buzzard – bivvråk<sup>H</sup> [1].**Range in Sweden:** Sk [1].***Nosopon lucidum* (Rudow, 1869a) New record***Menopon lucidum* Rudow, 1869a: 402.*Nosopon lucidum lucidum* (Rudow); Tendeiro, 1959: 194.*Nosopon lucidum* Rudow (1869a); Tendeiro, 1993: 48.**Report:** [1] This report.**Type host:** *Falco vespertinus* Linnaeus, 1766 – red-footed falcon – aftonfalk<sup>T</sup>.**Host in Sweden:** *Falco columbarius* Linnaeus, 1758 – merlin – stenfalk<sup>H</sup> [1].**Material examined: No locality:** 1, 1, 17 Sep. 1956, leg. Rike (PIPeR).**Remarks:** No specimens from the type host are known from Sweden.***Pseudomenopon* Mjöberg, 1910a****Type host:** *Menopon tridens* Burmeister, 1838 = *Pediculus pilosum* Scopoli, 1763.The revision of *Pseudomenopon* by Price (1974) contains illustrations and descriptions of both the Swedish species, as well as a few others that may occur in Sweden.***Pseudomenopon dolium* (Rudow, 1869a) New record***Colpocephalum dolium* Rudow, 1869a: 393.*Pseudomenopon dolium* (Rudow); Price, 1974: 77.**Report:** [1] This report.**Type host:** *Podiceps cristatus* Linnaeus, 1758 – great crested grebe – skäggdopping<sup>H</sup> [1].**Material examined: Sk:** *Sjöbo kommun*: Sövdeborg, 3, 4, 1 nymph, 5 Apr. 1939, leg. A. Lundström (SMNH).***Pseudomenopon pilosum* (Scopoli, 1763)***Pediculus pilosus* Scopoli, 1763: 384.*Pseudomenopon pilosum* (Scopoli); Price, 1974: 73.**Reports:** [1] Mjöberg (1910a) as *Pseudomenopon tridens*; [2] This report.**Type host:** *Fulica atra* Linnaeus, 1758 – Eurasian coot – sothöna<sup>H</sup> [1, 2].**Additional host in Sweden:** *Gallinula chloropus* (Linnaeus, 1758) – Eurasian moorhen – rörhöna<sup>H</sup> [1].**Additional host in Sweden (stragglers?):** *Bucephala clangula* (Linnaeus, 1758) – common goldeneye – knipa<sup>H</sup> [2].**Material examined:** Ex *Bucephala clangula*: **No locality:** 1, 1 (SMNH).Ex *Fulica atra*: **Sk:** *Sjöbo kommun*: Sövdeborg, 9, 9, 5 nymphs, Sk, 5 Apr. 1939, leg. A. Lundström (SMNH). **No locality:** 5, 8 (SMNH).

***Trinoton Nitzsch, 1818***

**Type species:** *Liotheum conspurcatum* Nitzsch, 1818 = *Pediculus anserinus* J.C. Fabricius 1805.

Eichler & Vasjukova (1981b) provide descriptions of both Swedish species of *Trinoton*, supplemented with illustrations gathered from the published literature and their own studies. The majority of the taxa recognized by Eichler & Vasjukova (1981b) on the basis of host associations are considered synonymous today (Price et al. 2003a). Tendeiro (1967) provide additional descriptions and photos.

***Trinoton anserinum* (J.C. Fabricius, 1805)**

*Pediculus anserinus* J.C. Fabricius, 1805: 345.

*Trinoton anserinum anserinum* (J.C. Fabricius, 1805); Eichler & Vasjukova, 1981b: 28.

**Report:** [1] Mjöberg (1910a) as *Trinoton conspurcatum*; [2] Overgaard (1942).

**Type host:** *Anser anser* (Linnaeus, 1758) – greylag goose – grågås<sup>H</sup>.

**Hosts in Sweden:** *Cygnus cygnus* (Gmelin, 1789) – whooper swan – sångsvan<sup>H</sup> [1]. *Cygnus olor* (Linnaeus, 1758) – mute swan – knölsvan<sup>H</sup> [1].

**Remarks:** Mjöberg's material has not been found at the SMNH. No specimens from the type host are known from Sweden.

***Trinoton querquedulae* (Linnaeus, 1758)**

*Pediculus querquedulae* Linnaeus, 1758: 612.

*Trinoton querquedulae querquedulae* (Linnaeus, 1758); Eichler & Vasjukova, 1981b: 37.

**Reports:** [1] Mjöberg (1910a) as *Trinoton luridum*; [2] Ash, 1960; [3] This report.

**Type host:** *Anas crecca* Linnaeus, 1758 – green-winged teal – kricka<sup>H</sup> [1, 2, 3].

**Additional hosts in Sweden:** *Anas penelope* Linnaeus, 1758 – Eurasian wigeon – bläsand<sup>H</sup> [1]. *Anas platyrhynchos* Linnaeus, 1758 – mallard – gräsand<sup>H</sup> [1]. *Anas strepera* Linnaeus, 1758 – gadwall – snatterand<sup>H</sup> [1]. *Bucephala clangula* (Linnaeus, 1758) – common goldeneye – knipa<sup>H</sup> [1]. *Melanitta nigra* (Linnaeus, 1758) – common scoter – sjöorre<sup>H</sup> [1]. *Mergus merganser* Linnaeus, 1758 – common merganser – storskrake<sup>H</sup> [3]. *Mergus serrator* Linnaeus, 1758 – red-breasted merganser – småskrake<sup>H</sup> [1, 3].

**Material examined:** Ex *Anas crecca*: **No locality:** 2 nymphs (SMNH).

Ex *Mergus merganser*: **No locality:** 2, 1 nymph, leg. C. Videll (SMNH).

Ex *Mergus serrator*: **No locality:** 1 nymph (SMNH); 1, 10 May 1905, leg. H. Murchardt (SMNH).

**Remarks.** Many of Mjöberg's specimens could not be found at the SMNH.

**Ricinidae Neumann, 1890*****Ricinus de Geer, 1778***

**Type species:** *Ricinus fringillae* de Geer, 1778.

Nelson (1972a) revised the New World *Ricinus*, many of which also occur in the Old World. Rheinwald (1968) revised the Old World species. Descriptions and illustrations of all *Ricinus* species known from Sweden, as well as many that can be expected, can be found in Nelson's revision, except *R. rubeculae*, which was partially illustrated and discussed by Clay & Hopkins (1954).

***Ricinus elongatus* (von Olfers, 1816) New record**

*Nirmus elongatus* von Olfers, 1816: 88.

*Ricinus elongatus* (Olfers, 1816); Nelson, 1972a: 66.

**Report:** [1] This report.

**Type host:** *Turdus viscivorus* Linnaeus, 1758 – mistle thrush – dubbeltrast<sup>H</sup>.

**Host in Sweden:** *Turdus merula* Linnaeus, 1758 – Eurasian blackbird – koltrast<sup>H</sup> [1].

**Material examined: Go:** *Gos kommun:* Grötlingbo, 2, 27 Jun. 2014, leg. D. Gustafsson (SMNH). **Sk:** *Lunds kommun:* Håckeberga, 1, 15 Mar. 1939, leg. A. Lundström (SMNH).

**Remarks:** No specimens from the type host are known from Sweden.

***Ricinus frenatus* (Burmeister, 1838) New record**

*Physostomum frenatum* Burmeister, 1838: 442.

*Ricinus frenatus* (Burmeister, 1838); Nelson, 1972a: 79.

**Report:** [1] This report.

**Type host:** *Regulus regulus* (Linnaeus, 1758) – goldcrest – kungsfågel<sup>H</sup> [1].

**Material examined: Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1, 2, 27 Sep. 2013, leg. D. Gustafsson (SMNH).

***Ricinus fringillae* de Geer, 1778 New record**

*Ricinus fringillae* de Geer, 1778: 71.

*Ricinus fringillae* DeGeer, 1778, *sensu lato*; Nelson, 1972a: 57.

**Report:** [1] This report.

**Type host:** *Emberiza citrinella* Linnaeus, 1758 – yellowhammer – gulsparv<sup>H</sup>.

**Host in Sweden:** *Fringilla coelebs* Linnaeus, 1758 – common chaffinch – bofink<sup>H</sup> [1].

**Material examined:** Ex *Fringilla coelebs*: **Vr:** *Torsby kommun:* Munkebol, 1, 24 Apr. 1939, leg. A.

Lundström (SMNH).

**Remarks:** No specimens from the type host are known from Sweden. Ash (1960) tentatively identified specimens from *Anthus petrosus* (Montagu, 1798) as *Ricinus japonicus* Uchida, 1915 = *R. fringillae* de Geer, 1778. We have not seen these specimens, and do not count this as a valid record, as the specimens were never definitively identified.

### ***Ricinus rubeculae* (Schrank, 1776) New record**

*Pediculus rubeculae* Schrank, 1776: 115.

*Ricinus rubeculae* [Schrank, 1776]; Clay & Hopkins, 1954: 18.

**Report:** [1] This report.

**Type host:** *Erithacus rubecula* (Linnaeus, 1758) – European robin – rödhake<sup>H</sup> [1].

**Additional host in Sweden:** *Phoenicurus phoenicurus* (Linnaeus, 1758) – common redstart – rödstjört<sup>H</sup> [1].

**Material examined:** Ex *Erithacus rubecula*: **Sk:** *Lunds kommun:* Häckeberga, 2 , 1 , 29 Apr.–4 May 1939, leg. A. Lundström (SMNH). *Vellinge kommun:* Falsterbo, 1 , 24 Sep. 1963, leg. F. Balát, 1256 (MMBC).

Ex *Phoenicurus phoenicurus*: **Sk:** *Vellinge kommun:* Falsterbo, 3 , 13 Sep. 1963, leg. F. Balát, 1313 (MMBC).

### ***Ricinus serratus* (Durrant, 1906)**

*Physostomum serratus* Durrant, 1906: 528.

*Ricinus serratus* (Durrant, 1906); Nelson, 1972a: 72.

**Report:** [1] Mjöberg (1910a) as *Physostomum clypeatum*.

**Type host:** *Eremophila alpestris* (Linnaeus, 1758) – horned lark – berglärka<sup>H</sup> [1].

**Remarks:** We did not find Mjöberg's specimens in the SMNH.

### **Trimenoponidae Harrison, 1915**

#### ***Trimenopon* Cummings, 1913**

**Type species:** *Trimoenopon echinoderma* Cummings, 1913 = *Gyropus hispidus* Burmeister, 1838.

The genus *Trimenopon* is monotypic. Cummings (1913) and Werneck (1936) provided good illustrations of this species.

#### ***Trimenopon hispidum* (Burmeister, 1838)**

*Gyropus hispidum* Burmeister, 1838: 443.

*Trimenopon echinoderma* Cummings, 1913: 40.

*Trimenopon jenningsi* (Kellogg & Paine); Werneck, 1936: 85.

**Report:** [1] Brinck (1946a) as *Trimenopon jenningsi*.

**Type host:** *Bradypus tridactylus* Linnaeus, 1758 – pale-throated sloth – tretåig sengångare<sup>E</sup>.

**Host in Sweden:** *Cavia porcellus* (Linnaeus, 1758) – guinea pig – marsvin<sup>D</sup> [1].

**Remarks:** No specimens from the type host are known from Sweden.

Neither host species are native to Sweden, and *T. hispidum* are only known from domestic pets.

### **Anoplura Leach, 1815**

Brinck (1950) summarized the knowledge of the geographical distribution and prevalence of lice on domestic mammals in Sweden up to that time. He included references to population fluctuations for many of the species he lists [e.g. *Haematopinus asini* (Linnaeus, 1758)]. No doubt changes in agricultural and veterinary standards since then have influenced the louse populations. Moreover, increased mobility of animals through the European Union, both regarding pets and animals in the food industry, may also have influenced the louse fauna of Swedish domestic mammals.

Unfortunately, very few studies have been published since 1950 to update our knowledge. Several studies have been published on the skin health of domestic camelids in Sweden (Bornstein & de Verdier 2010; de Verdier & Bornstein 2010; Eriksson *et al.* 2012), but all reported skin parasites in these studies have been mites. Anopluran lice of the genus *Microthoracius* Fahrénholz, 1916, are known from alpacas in their native range, and could perhaps be expected from Sweden as well. Introduced camels in Australia are known to be infested by the buffalo louse *Haematopinus tuberculatus* (Burmeister, 1839) (Johnston & Harrison, 1912). No domestic mammals were examined for lice during our survey, and the need to update our knowledge of many of the louse species listed below is great.

Most genera and species relevant to the Swedish list were illustrated by Kim *et al.* (1986). In a long series of papers, Ferris (1919, 1921, 1922, 1923, 1932, 1933b, 1934, 1935) redescribed and illustrated all Swedish species, as well as many species that may occur on exotic mammals kept in captivity in Sweden. These should be consulted if anopluran species not on the Swedish list are found.



**Echinophthiriidae Enderlein, 1904a*****Antarctophthirius* Enderlein, 1906**

**Type species:** *Antarctophthirius ogmorhini* Enderlein, 1906.

***Antarctophthirius trichechi* (Bohemann, 1865)**

*Haematopinus trichechi* Boheman, 1865: 557.

*Antarctophthirius trichechi* (Bohemann); Ferris, 1934: 492.

*Antarctophthirius trichechi* (Bohemann): Kim *et al.*, 1986: 49.

*Antarctophthirius trichechi* (Bohemann, 1865); Durden & Musser, 1994: 7.

**Report:** [1] Mjöberg (1910a) as *Arctophthirius trichechi*.

**Type host:** *Odobenus rosmarus* Linnaeus, 1758 – walrus – walross [1].

**Remarks:** Brinck (1950) did not list this species from Sweden, but noted that a walrus shot in Bo in 1927 was “infested with bugs”; this may be a reference to *E. trichechi*. Mjöberg’s specimens were taken from a walrus kept in captivity.

***Echinophthirius* Giebel, 1871**

**Type species:** *Pediculus horridus* von Olfers, 1816.

***Echinophthirius horridus* (von Olfers, 1816)**

*Pediculus horridus* von Olfers, 1816: 84.

*Echinophthirius horridus* (Olfers); Ferris, 1934: 476.

*Echinophthirius horridus* (von Olfers, 1816); Durden & Musser, 1994: 7.

**Reports:** [1] Mjöberg (1910a) as *Echinophthirius phocae*; [2] Koffmann (1944); [3] Brinck (1948); [4] Brinck (1950).

**Type host:** *Phoca vitulina* Linnaeus, 1758 – harbor seal – knubbsäl [1, 2, 3, 4].

**Additional hosts in Sweden:** *Pusa hispida* (Schreber, 1775) – ringed seal – vikare [3, 4].

**Range in Sweden:** Sk, Vg, Bo, Sö, Up, Vb, Nb [2].

**Enderleinellidae Ewing, 1929*****Enderleinellus* Fahrenholz, 1912**

**Type species:** *Pediculus sphaerocephalus* Nitzsch, 1818 = *Enderleinellus nitzschi* Fahrenholz, 1916.

***Enderleinellus nitzschi* Fahrenholz, 1916**

*Enderleinellus nitzschi* Fahrenholz, 1916: 29.

*Enderleinellus nitzschi* Fahrenholz; Ferris, 1919: 8.

*Enderleinellus nitzschi* Fahrenholz, 1916; Durden & Musser 1994: 12.

**Reports:** [1] Mjöberg (1910a) as *Polyplax sphaero-*

*cephala*; [2] Brinck (1948); [3] Brinck (1950).

**Type host:** *Sciurus vulgaris* Linnaeus, 1758 – Eurasian red squirrel – ekorre [1, 2, 3].

**Range in Sweden:** Sk, Up [2].

**Remarks:** One abdomen from a nymph in the SMNH from this host may belong to *E. nitzschi*.

**Haematopinidae Enderlein, 1904*****Haematopinus* Leach, 1815**

**Type species:** *Pediculus suis* Linnaeus, 1758.

***Haematopinus apri* Goureau, 1866**

*Haematopinus apri* Goureau, 1866: 205.

*Haematopinus aperis* Ferris, 1933b: 431.

*Haematopinus apri* Goureau, 1866; Durden & Musser, 1994: 15.

**Report:** [1] Brinck (1950).

**Type host:** *Sus scrofa* Linnaeus, 1758 – wild boar – vildsvin [1].

**Remarks:** Brinck (1948) found no specimens of this species from wild boars in Sweden, but Brinck (1950) collected some from boars held in animal parks. The host species was extinct in the wild in Sweden until the 1970s, but has since reestablished itself locally across southern Sweden (Björvall & Ullström 1985). It is unknown whether the present wild populations, derived from boars that have escaped from game parks, are infested by *H. apri*.

***Haematopinus asini* (Linnaeus, 1758)**

*Pediculus asini* Linnaeus, 1758: 612.

*Haematopinus asini* (Linnaeus); Ferris, 1933b: 464.

*Haematopinus asini* (Linnaeus); Kim *et al.*, 1986: 81.

*Haematopinus asini* (Linnaeus, 1758); Durden & Musser, 1994: 15.

**Reports:** [1] Brinck (1948); [2] Brinck (1950).

**Type host:** *Equus africanus asinus* Linnaeus, 1758 – ass – åsna<sup>D</sup>.

**Host in Sweden:** *Equus caballus* Linnaeus, 1758 – horse – häst<sup>D</sup> [1, 2].

**Range in Sweden:** Sk, Ha, Sm, Vg, Sö, Up, Jä, Vb, Nb [1].

**Remarks.** Lindqvist *et al.* (2007) states that this is one of the most important ectoparasites of domestic horses in Sweden, but no modern surveys have been published.

***Haematopinus eurysternus* (Nitzsch, 1818)**

*Pediculus eurysternus* Nitzsch, 1818: 305.

*Haematopinus eurysternus* (Nitzsch); Ferris, 1933b: 448.

*Haematopinus eurysternus* (Nitzsch); Kim *et al.*, 1986: 83.

*Haematopinus eurysternus* (Nitzsch, 1818); Durden & Musser, 1994: 15.

**Reports:** [1] Brinck (1948); [2] Brinck (1950); [3] Christensson *et al.* (1994).

**Type host:** *Bos taurus* Linnaeus, 1758 – cattle – nötboskap<sup>D</sup> [1, 2].

**Range in Sweden:** Sk, Blekinge, Ha, Sm, Vg, Ds, Up, Vr [1].

**Remarks.** This species may be close to extinction, as Christensson *et al.* (1994) only found it in one of over 400 examined hosts.

### *Haematopinus suis* (Linnaeus, 1758)

*Pediculus suis* Linnaeus, 1758: 611.

*Haematopinus suis* (Linnaeus); Ferris, 1933b: 425.

*Haematopinus suis* (Linnaeus); Kim *et al.*, 1986: 87.

*Haematopinus suis* (Linnaeus, 1758); Durden & Musser, 1994: 17.

**Reports:** [1] Linnaeus (1758) as *Pediculus suis*; [2] Mjöberg (1910a); [3] Brinck (1948); [4] Brinck (1950); [5] This report.

**Type host:** *Sus scrofa* Linnaeus, 1758 – domestic pig – tamsvin<sup>D</sup> [1, 2, 3, 4, 5].

**Material examined:** **Sm:** Jönköpings kommun: Flahult, 3, 5, Oct. 1926 (SMNH).

**Range in Sweden:** “All Swedish provinces” [3].

**Remarks:** Durden & Musser (1994) notes that *H. apri* parasitizes wild boards whereas *H. suis* is typically found on domestic pigs.

### Hoplopleuridae Ewing, 1929

#### *Hoplopleura* Enderlein, 1904b

**Type species:** *Pediculus acanthopus* Burmeister, 1839.

#### *Hoplopleura acanthopus* (Burmeister, 1839)

*Pediculus acanthopus* Burmeister, 1839: No. 5.

*Hoplopleura acanthopus* (Burm.); Ferris, 1921: 63.

*Hoplopleura acanthopus* (Burmeister); Kim *et al.*, 1986: 91.

*Hoplopleura acanthopus* (Burmeister, 1839); Durden & Musser, 1994: 19.

**Reports:** [1] Mjöberg (1910a); [2] Ferris (1921); [3] Brinck (1948); [4] Brinck (1950); [5] Lundqvist (1985) as *Hoplopleura edentula*; [6] This report.

**Type host:** *Microtus arvalis* (Pallas, 1778) – common vole – fältsork.

**Hosts in Sweden:** *Arvicola amphibius* (Linnaeus, 1758) – European water vole – vattensork [4]. *Microtus agrestis* (Linnaeus, 1761) – field vole – åkersork [1, 2, 3, 4, 5]. *Microtus oeconomus* (Pallas, 1776) –

root vole – mellansork [5]. *Mus musculus* Linnaeus, 1758 – house mouse – husmus [1, 2, 4]. *Myodes glareolus* (Schreber, 1780) – bank vole – långsvansad skogssork [3, 4, 5]. *Myodes rufocanus* (Sundevall, 1846) – grey red-backed vole – gråsidig [5]. *Myodes rutilus* (Pallas, 1779) – northern red-backed vole – rödsork [5].

**Material examined:** Ex *Myodes glareolus*: **Vr:** Torsby kommun: Munkebol, 4, 1, 5 nymphs, 20 May 1939, leg. A. Lundström (SMNH).

**Range in Sweden:** Sk, Ha, Sö, Up, Vr, Jä, Lappland [2, 3, 5].

**Remarks:** No specimens from the type host are known from Sweden.

### Linognathidae Webb, 1946

#### *Linognathus* Enderlein, 1905

**Type species:** *Pediculus setosus* von Olfers, 1816.

#### *Linognathus setosus* (von Olfers, 1816)

*Pediculus setosus* von Olfers, 1816: 80.

*Linognathus setosus* (Olfers); Ferris, 1932: 340.

*Linognathus setosus* (Olfers); Kim *et al.*, 1986: 131.

*Linognathus setosus* (von Olfers, 1816); Durden & Musser, 1994: 42.

**Reports:** [1] Mjöberg (1910a) as *Linognathus piliferus*; [2] Brinck (1946a); [3] Brinck (1948); [4] Brinck (1950); [5] Christensson *et al.* 1998; [6] Gunnarsson *et al.* 2005; [7] This report.

**Type host:** *Canis familiaris* Linnaeus, 1758 – domestic dog – hund<sup>D</sup> [1, 2, 3, 4, 5, 6, 7].

**Additional hosts in Sweden (stragglers):** *Vulpes vulpes* (Linnaeus, 1758) – red fox – rödräv [2]. *Mus musculus* Linnaeus, 1758 – house mouse – husmus [2]. *Oryctolagus cuniculus* (Linnaeus, 1758) – common rabbit – tamkanin<sup>D</sup> [2]. *Ovis aries* Linnaeus, 1758 – sheep – tamfår<sup>D</sup> [2]. *Apodemus sylvaticus* (Linnaeus, 1758) – long-tailed field mouse – mindre skogsms [3].

**Material examined:** Ex *Canis familiaris*: **Up:** Stockholm, 1, leg. E. Mjöberg (SMNH). **No locality:** 2, 3, 22 Oct. 1914 (SMNH).

**Range in Sweden:** Sk, Blekinge, Sm, Ög, Vg, Ha, Sö, Up, Vs, Nä, Gä, Hs, Vr, Dr, Hr, Jä, Me, Än, Vb, Nb [3].

**Remarks:** Brinck (1950) noted that this species rarely occur in fox farms and on “sheep and rodents (mice and rabbits)”. These latter three hosts are likely the result of straggling. Christensson *et al.* (1998) found this species to be the most common louse species on dogs across the country.

***Linognathus stenopsis* (Burmeister, 1838)***Pediculus stenopsis* Burmeister, 1838: No. 3.*Linognathus stenopsis* (Burmeister); Ferris, 1932: 349.*Linognathus stenopsis* (Burmeister); Kim et al., 1986: 133.*Linognathus stenopsis* (Burmeister, 1838); Durden & Musser, 1994: 43.**Reports:** [1] Mjöberg (1910a); [2] Brinck (1946a); [3] Brinck (1948); [4] Brinck (1950); [5] Persson et al. (2014).**Type host:** *Capra hircus* (Linnaeus, 1758) – goat – tamget<sup>D</sup> [1, 3, 5].**Additional hosts in Sweden:** *Ovis aries* Linnaeus, 1758 – sheep – tamfår<sup>D</sup> [2, 4].**Range in Sweden:** Sk, Up [3].

**Remarks.** Statens Veterinärmedicinska Anstalt (SVA) does not list *L. stenopsis* among the parasites known from Swedish domestic sheep on their homepage. Instead, they mention *L. ovillus* (Neumann, 1907), a species not listed by Brinck (1950). No reference to a published report of *L. ovillus* is given by SVA. *Linognathus ovillus* is commonly found in the face of the sheep (Murray 1955), and may be more common on certain breeds. Ferris (1932) considered all records from outside New Zealand and Australia to be dubious. Durden & Musser (1994) states that the range of this species is “[c]osmopolitan especially in cool or temperate regions”, and it is known from Scotland (Neumann 1907), New Zealand (Neumann 1907; Gilruth 1908; Palma 2017), Australia (Johnston & Harrison 1912; Murray 1963), Switzerland (Büttiker & Mahnert 1978), Nigeria (George et al. 1992), Libya (Gabaj et al. 1993), Turkey (Dik 2012), and elsewhere. This species may thus be expected from Sweden. Persson et al. (2014) states that *Linognathus stenopsis* occurs in “most goat herds, especially during the stabling season”, but gives no reference for this observation. No published reports of *Linognathus ovillus* from Sweden are known to us, and we do not list this species here.

***Linognathus vituli* (Linnaeus, 1758)***Pediculus vituli* Linnaeus, 1758: 611.*Linognathus vituli* (Linnaeus); Ferris, 1932: 356.*Linognathus vituli* (Linnaeus); Kim et al., 1986: 135.*Linognathus vituli* (Linnaeus, 1758); Durden & Musser, 1994: 44.**Reports:** [1] Linnaeus (1758) as *Pediculus vituli*; [2] Brinck (1948); [3] Brinck (1950); [4] Christensson et al. (1994).**Type host:** *Bos taurus* Linnaeus, 1758 – cattle – nötboskap<sup>D</sup> [1, 2, 3].**Range in Sweden:** Sk, Ha, Sm, Vg, Ds, Sö, Up, Hs, Gä, Me, Jä, Ån, Vb, Nottbotten, Ly, To [2].**Remarks.** Present on a quarter of examined cattle infested with lice (Christensson et al. 1994).***Solenopotes Enderlein, 1904*****Type species:** *Solenopotes capillatus* Enderlein, 1904.***Solenopotes capillatus* Enderlein, 1904***Solenopotes capillatus* Enderlein, 1904: 144.*Solenopotes capillatus* Enderlein; Ferris, 1932: 397.*Solenopotes capillatus* Enderlein; Kim et al., 1986: 139.*Solenopotes capillatus* Enderlein, 1904; Durden & Musser, 1994: 45.**Reports:** [1] Brinck (1948); [2] Brinck (1950).**Type host:** *Bos taurus* Linnaeus, 1758 – cattle – nötboskap<sup>D</sup> [1, 2].**Range in Sweden:** Vb, Lu [1].**Remarks:** Brinck (1950) stated that this species was brought to Sweden from Finland during the Second World War. The species is possibly rare or extinct today, as Christensson (1994) did not find any specimens in their survey.***Solenopotes tarandi* (Mjöberg, 1915)***Cervophthirius tarandi* Mjöberg, 1915: 283.*Solenopotes tarandi* (Mjöberg, 1915); Weisser & Kim, 1973: 124.*Solenopotes tarandi* (Mjöberg); Kim et al., 1986: 143.*Solenopotes tarandi* (Mjöberg, 1915); Durden & Musser, 1994: 46.**Reports:** [1] Mjöberg (1915); [2] Brinck (1948); [3] Brinck (1950); in all reports as *Cervophthirius tarandi*.**Type host:** *Rangifer tarandus* (Linnaeus, 1758) – reindeer – ren [1, 2, 3].**Range in Sweden:** To [2, 3].**Pediculidae Leach, 1817*****Pediculus* Linnaeus, 1758****Type species:** *Pediculus humanus* Linnaeus, 1758.**Remarks:** A table comparing the morphological characters of the two subspecies listed below can be found in Kim et al. (1986: 152).***Pediculus humanus capitis* de Geer, 1778***Pediculus humanus capitis* de Geer, 1778: 67.

*Pediculus humanus [capitis de Geer, 1778]; Durden & Musser, 1994: 50.*

**Reports:** [1] Linnaeus (1746); [2] Linnaeus (1758); [3] Mjöberg (1910a) as *Pediculus capitis*; [4] Brinck (1948); [5] Brinck (1950).

**Type host:** *Homo sapiens* Linnaeus, 1758 – human – människa<sup>D</sup> [1, 2, 3, 4, 5].

**Range in Sweden:** Throughout the country [2].

**Remarks:** The species is widely reported in the entomological and medical literature (e.g. Spirén *et al.* 2000), and no attempt to summarize these reports has been made here. Lindh *et al.* (2012) showed indirectly that the prevalence of human head lice is still high in Sweden. Raoult *et al.* (2008) indicated that head lice of haplo-type group B are found in Sweden, but neither of the cited references for this distribution map (Kittler *et al.* 2003; Reed *et al.* 2004) include Swedish material in their analyses, and we have been unable to verify this claim.

#### ***Pediculus humanus humanus* Linnaeus, 1758**

*Pediculus humanus* Linnaeus, 1758: 610.

*Pediculus humanus* Linnaeus; Ferris, 1935: 543.

*Pediculus humanus humanus* Linnaeus; Kim *et al.*, 1986: 151.

*Pediculus humanus [humanus]* Linnaeus, 1758; Durden & Musser, 1994: 50.

**Reports:** [1] Linnaeus (1746) as *Pediculus vestimenti*; [2] Linnaeus (1758) as *Pediculus vestimenti*; [3] Mjöberg (1910a) as *Pediculus vestimenti*; [4] Brinck (1948); [5] Brinck (1950).

**Type host:** *Homo sapiens* Linnaeus, 1758 – human – människa<sup>D</sup> [1, 2, 3, 4, 5].

**Range in Sweden:** Previously throughout the country, now presumed rare or possibly extinct. Ehrenborg *et al.* (2008) found no human body lice in populations of homeless people in Sweden.

#### ***Pediculus mjobergi* Ferris, 1916c**

*Pediculus mjobergi* Ferris, 1916c: 136.

*Pediculus mjobergi* Ferris; Ferris, 1935: 588.

*Pediculus mjobergi* Ferris, 1916c; Durden & Musser, 1994: 50.

**Report:** [1] Mjöberg (1910a) as *Pediculus affinis*.

**Type host:** *Ateles* sp. – spider monkey – spindelapa<sup>E</sup> [1].

**Remarks:** Mjöberg (1910a) collected his specimens of this species from a traveling menagerie, but did not explicitly state that this occurred in Sweden; Ferris (1916c) asserted

that the collection locality was “Europe”, but gave no more detailed locality. All other material Mjöberg himself collected is from Sweden, and we tentatively include this species here. No specimens of this species were found at the SMNH, and Mjöberg’s specimens are probably lost.

### **Polyplacidae Fahrenholz, 1912**

#### ***Haemodipsus* Enderlein, 1904**

**Type species:** *Pediculus lyriocephalus* Burmeister, 1839.

**Remarks:** A photo of the type species can be found in Dik & Uslu (2018).

#### ***Haemodipsus lyriocephalus* (Burmeister, 1839)**

*Pediculus lyriocephalus* Burmeister, 1839: No. 11.

*Haemodipsus lyriocephalus* (Burmeister); Ferris, 1932: 330.

*Haemodipsus lyriocephalus* (Burmeister, 1839); Durden & Musser, 1994: 56.

**Reports:** [1] Brinck (1948); [2] Brinck (1950).

**Type host:** *Lepus timidus* Linnaeus, 1758 – mountain hare – skogshare [1, 2].

**Range in Sweden:** Jä [1].

#### ***Haemodipsus ventricosus* (Denny, 1842)**

*Haematopinus ventricosus* Denny, 1842: 30.

*Haemodipsus ventricosus* (Denny); Ferris, 1932: 332.

*Haemodipsus ventricosus* (Denny); Kim *et al.*, 1986: 171.

*Haemodipsus ventricosus* (Denny, 1842); Durden & Musser, 1994: 57.

**Reports:** [1] Mjöberg (1910a); [2] Brinck (1946a); [3] Brinck (1948); [4] Brinck (1950); [5] This report.

**Type host:** *Oryctolagus cuniculus* (Linnaeus, 1758) – common rabbit – kanin [1, 2, 3, 4, 5].

**Material examined: Sk:** *Hässleholms kommun:* Vankiva, 2, 6, 1 nymph, 8 Feb. 1940, leg. A. Lundström (SMNH).

**Range in Sweden:** Sk, Sm, Up [3].

#### ***Polyplax* Enderlein, 1904**

**Type species:** *Pediculus spinulosus* Burmeister, 1839.

#### ***Polyplax borealis* Ferris, 1933c**

*Polyplax borealis* Ferris, 1933c: 127.

*Polyplax borealis* Ferris; Kim *et al.*, 1986: 203.

*Polyplax borealis* Ferris, 1933c; Durden & Musser, 1994: 66.

**Report:** [1] Lundqvist (1985).

**Type host:** *Myodes rufocanus* (Sundevall, 1846) – grey red-backed vole – gråsidning [1].

**Additional hosts in Sweden:** *Microtus agrestis* (Linnaeus, 1761) – field vole – åkersork [1]. *Myodes glareolus* (Schreber, 1780) – bank vole – långsvansad skogssork [1]. *Myodes rutilus* (Pallas, 1779) – northern red-backed vole – rödsork [1].

### ***Polyplax serrata* (Burmeister, 1839)**

*Pediculus serratus* Burmeister, 1839: No. 6.

*Polyplax serrata* (Burmeister); Ferris, 1923: 191.

*Polyplax serrata* (Burmeister); Kim *et al.*, 1986: 205.

*Polyplax serrata* (Burmeister, 1839); Durden & Musser, 1994: 73.

**Reports:** [1] O'Mahony (1944); [2] Brinck (1946a); [3] Brinck (1948); [4] Brinck (1950).

**Type host:** *Mus musculus* Linnaeus, 1758 – house mouse – husmus [2].

**Additional host in Sweden:** *Apodemus sylvaticus* (Linnaeus, 1758) – long-tailed field mouse – mindre skogsmus [1, 2, 3, 4].

**Range in Sweden:** Sk, Vg, Up [1, 3].

### ***Polyplax spinigera* (Burmeister, 1839)**

*Pediculus spiniger* Burmeister, 1839: No. 9.

*Polyplax spinigera* (Burmeister); Ferris, 1923: 193.

*Polyplax spinigera* (Burmeister, 1839); Durden & Musser, 1994: 73.

**Reports:** [1] Brinck (1948); [2] Brinck (1950).

**Type host:** *Arvicola amphibius* (Linnaeus, 1758) – European water vole – vattensork [1, 2].

**Range in Sweden:** Ha [1].

### ***Polyplax spinulosa* (Burmeister, 1839)**

*Pediculus spinulosus* Burmeister, 1839: No. 8.

*Polyplax spinulosa* (Burmeister); Ferris, 1923: 187.

*Polyplax spinulosa* (Burmeister); Kim *et al.*, 1986: 207.

*Polyplax spinulosa* (Burmeister, 1839); Durden & Musser, 1994: 73.

**Reports:** [1] Mjöberg (1910a); [2] Brinck (1946a); [3] Brinck (1948); [4] Brinck (1950).

**Type host:** *Rattus norvegicus* (Berkenhout, 1769) – brown rat – brunråtta [2, 4].

**Additional hosts in Sweden:** *Apodemus sylvaticus* (Linnaeus, 1758) – long-tailed field mouse – mindre skogsmus [3, 4]. *Mus musculus* Linnaeus, 1758 – house mouse – husmus [1, 3].

**Range in Sweden:** Sk, Ha [3].

## **Pthiridae Ewing, 1929**

### ***Pthirus* Leach, 1815**

**Type species:** *Pediculus pubis* Linnaeus, 1758.

### ***Pthirus pubis* (Linnaeus, 1758)**

*Pediculus pubis* Linnaeus, 1758: 611.

*Pthirus pubis* Linnaeus; Kim *et al.*, 1986: 211.

*Pthirus pubis* Linnaeus, 1758; Durden & Musser, 1994: 76.

**Reports:** [1] Mjöberg (1910a) as *Phthirus inguinalis*; [2] Brinck (1948); [3] Brinck (1950); [4] This report.

**Type host:** *Homo sapiens* Linnaeus, 1758 – human – människa<sup>D</sup> [1, 2].

**Material examined:** Up: Stockholm, 1 (SMNH).

**No locality:** 7 (SMNH).

**Range in Sweden:** Previously throughout the country [2, 3], but now presumed rare or possibly extinct.

**Remarks:** The species is occasionally reported, including outside the taxonomic literature (*e.g.* Edler 1971), and no attempt to summarize these reports has been made here. Armstrong & Wilson (2006) suggested that Brazilian waxing of the genital area may have been one of the causes of the drop in prevalence of pubic lice in some parts of the world. Perhaps in response to this, reports of pubic lice in the scalp and face of people have become common over the last few decades (*e.g.*, Schenone 2000; Contreras *et al.* 2001; Ikeda *et al.* 2003; Mumcuoglu 2015).

Note that the correct spelling of the name of this louse is *Pthirus pubis*, and the spellings *Phthirus pubis*, *Pthirus pubis*, and *Phthirus pubis* often seen online and in the published literature are incorrect.

## **Ischnocera Kellogg, 1896a**

### **Goniodidae Mjöberg, 1910a**

In many recent phylogenies (*e.g.* Cruickshank *et al.* 2001; Johnson *et al.* 2001a; Bush *et al.* 2016), Goniodidae is nested inside Philopteridae. The family has long been recognized as morphologically distinct within the Ischnocera (*e.g.* Smith 2000), and the placement of Goniodidae within Philopteridae reflects the need for a family-level revision of Philopteridae s. lat. Johnson *et al.* (2011) showed that many goniodid genera placed in synonymy by Price *et al.* (2003a) probably are valid.

### ***Campanulotes* von Kéler, 1939**

**Type species:** *Goniodotes compar* Burmeister, 1838.

The only revision of *Campanulotes* is Tendeiro (1969), which includes some drawings and generally poor photos.

***Campanulotes bidentatus* (Scopoli, 1763) New record**

*Pediculus bidentatus* Scopoli, 1763: 385.

*Campanulotes bidentatus bidentatus* (Scopoli); Tendeiro, 1969: 380.

**Report:** [1] This report.

**Type host:** *Columba palumbus* Linnaeus, 1758 – wood pigeon – ringduva<sup>H</sup> [1].

**Material examined:** **Sk:** *Lunds kommun:* Björnstorp, 2, 24 Oct. 1939, leg. A. Lundström (SMNH). **Vr:** *Torsby kommun:* Munkebol, 1, 3, 4 May 1939, leg. A. Lundström (SMNH). **Vg:** *Svenljunga kommun:* Ånarp, 3, 1, 3 nymphs, 24 Apr. 1940, leg. A. Lundström (SMNH).

***Campanulotes compar* (Burmeister, 1838)**

*Goniocotes compar* Burmeister, 1838: 431.

*Campanulotes bidentatus compar* (Burmeister); Tendeiro, 1969: 389.

**Reports:** [1] Mjöberg (1910a) as *Goniocotes compar*; [2] This report.

**Type host:** *Columba livia* Gmelin, 1789 – domestic pigeon – tamduva<sup>H</sup> [1, 2].

**Material examined:** **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 2, 10 Aug. 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 20 May 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 30 May 2007, leg. D. Gustafsson (SMNH). **No locality:** 2 (SMNH).

***Campanulotes drosti* Eichler, 1950 New record**

*Campanulotes drosti* Eichler, 1950: 2.

*Campanulotes bidentatus drosti* Eichler; Tendeiro, 1969: 395.

**Report:** [1] This report.

**Type host:** *Columba oenas* Linnaeus, 1758 – stock pigeon – skogsduva<sup>H</sup> [1].

**Material examined:** **Sm:** *Torsås kommun:* Ragnabo, 1, 4 Apr. 1940, leg. A. Lundström (SMNH). **Vr:** *Eda kommun:* Skönnerud, 3, 4 Apr. 1939, leg. A. Lundström (SMNH).

**Remarks:** *Campanulotes drosti* is extremely similar to *C. bidentatus*, and may not be a distinct species. The principal difference is the exact shape of the preantennal region of the head, which is slightly longer and more rounded in *C. drosti*, and shorter and more flattened in *C. bidentatus*. Both Eichler (1950) and Tendeiro (1969) treated *C. drosti* and *C. compar* as subspecies of *C. bidentatus*, but Price *et al.* (2003a) treated them as separate species. The small series of all three species of *Campanulotes* avail-

able to us can all be separated on the relative width of the marginal carina and the exact shape of the head, but these differences are so small, they may intergrade in a larger series. Johnson *et al.* (2011) included *C. bidentatus* and *C. compar* in a phylogenetic study based on molecular data. These specimens were placed as sisters species with high support; however no specimens of *C. drosti* were included. We provisionally consider all three groups as distinct species, but note that a revision of the genus is sorely needed.

***Campanulotes* sp.**

**Report:** [1] This report.

**Host:** *Streptopelia decaocto* (Frivaldszky, 1838) – Eurasian collared dove – turkduva<sup>H</sup> [1].

**Material examined:** **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1, 1, 28 Sep. 2007, leg. D. Gustafsson (SMNH).

***Coloceras* Taschenberg, 1882**

**Type species:** *Goniodes damicorne* Nitzsch, 1866: 119.

The only large-scale revision of *Coloceras* is Tendeiro (1973), who provided good drawings, poor photos, and a Portuguese redescription of the only Swedish species in the genus. Several other species of *Coloceras* may occur in Sweden, especially in captive host species. Most of these are included in the English key by Tendeiro (1973), but Tendeiro's keys are typically very hard to use.

***Coloceras damicorne* (Nitzsch, 1866)**

*Goniodes damicorne* Nitzsch, 1866: 119.

*Coloceras damicorne* (Nitzsch); Tendeiro, 1973: 224.

**Reports:** [1] Mjöberg (1910a) as *Goniodes damicornis*; [2] This report.

**Type host:** *Columba palumbus* Linnaeus, 1758 – wood pigeon – ringduva<sup>H</sup> [2].

**Additional host in Sweden:** *Columba livia* Gmelin, 1789 – domestic pigeon – tamduva<sup>H</sup> [1].

**Material examined:** Ex *Columba palumbus:* **Vg:** *Svenljunga kommun:* Ånarp, 1, 24 Apr. 1940, A. Lundström (SMNH). **Ög:** *Mjölby kommun:* Lindevad, 1, 2, 1 nymph, 3 Apr. 1940, leg. A. Lundström (SMNH).

***Goniocotes* Burmeister, 1838**

**Type species:** *Ricinus gallinae* de Geer, 1778.

No useful revision of *Goniocotes* has been published, and the primary literature needs to



be consulted for descriptions and illustrations even of many common species. Unfortunately, the primary literature is varying in quality, and many species of *Goniocotes*, particularly ones that may be found on exotic hosts kept in captivity in Sweden, are presently very hard to identify without comparison with type material. The genus is not monophyletic (Johnson *et al.* 2011).

### ***Goniocotes chrysocephalus* Giebel, 1874 New record**

*Goniocotes chrysocephalus* Giebel, 1874: 189.

**Report:** [1] This report.

**Type host:** *Phasianus colchicus* Linnaeus, 1758 – ring-necked pheasant – fasan<sup>H</sup> [1].

**Material examined:** **Ds:** *Bengtstors kommun:* Ödskolt [as Odsokolt], 1, 1961, leg. J. Bryntesson, 10 (PIPeR). **Sk:** *Lunds kommun:* Lund, 1, 9 Feb. 1934, leg. G. Rudebeck, 25 (PIPeR). *Silvåkra* [as *Silvåhra*], 18 May 1939, leg. M. Lundström, 7 (PIPeR).

### ***Goniocotes gallinae* (de Geer, 1778)**

*Ricinus gallinae* de Geer, 1778: 79.

**Reports:** [1] Mjöberg (1910a) as *Goniocotes hologaster*; [2] Brinck (1946a); [3] Overgaard (1943) as *Goniocotes hologaster*; [4] Jansson *et al.* (2004).

**Type host:** *Gallus gallus* (Linnaeus, 1758) – red junglefowl (domestic chicken) – tamhöna<sup>D</sup> [1, 2, 3, 4].

### ***Goniocotes microthorax* (Stephens, 1829)**

*Goniodes microthorax* Stephens, 1829: 333.

**Reports:** [1] Mjöberg (1910a) as *Goniocotes microgaster*; [2] This report.

**Type host:** *Perdix perdix* (Linnaeus, 1758) – grey partridge – raphhöna<sup>H</sup> [1, 2].

**Material examined:** **Sk:** *Hässleholms kommun:* Sösdala [as Sösdala], 1, 17 Mar. 1961, leg. S. Linder, 147 (PIPeR). **Unidentified locality:** *Tynaberg* [= **Sö:** *Nyköpings kommun:* Tunaberg?], 1, 1, 7 Mar. 1955, 146 (PIPeR).

### ***Goniocotes rotundiceps* Piaget, 1880 New record**

*Goniocotes rotundiceps* Piaget, 1880: 233.

**Report:** [1] This report.

**Type host:** *Syrnaticus reevesii* (Gray, 1829) – Reeves's pheasant – kungsfasan<sup>D</sup> [1].

**Material examined:** **No locality:** 1 (SMNH).

**Remarks:** The host is not native to Sweden, and the specimen was presumably collected from a captive bird.

### ***Goniodes Nitzsch, 1818***

**Type species:** *Pediculus pavonis* Linnaeus, 1758: 613.

The last useful revisions of *Goniodes* are Kéler (1939) and Clay (1940), but many species have been described since, including species that may be found on exotic hosts kept in captivity in Sweden. The primary literature often needs to be consulted, and many species descriptions are poor. Moreover, *Goniodes* is paraphyletic with regards to most other genera in the Gonioididae (Johnson *et al.* 2011), and it may be warranted to resurrect many of the genera first proposed by Kéler (1939) and Mey (1986, 1997, 1999).

### ***Goniodes bituberculatus* Rudow, 1869b**

*Goniodes bituberculatus* Rudow, 1869b: 27.

*Goniodes bituberculatus* Rudow, 1869b; Clay, 1940: 37.

**Reports:** [1] Mjöberg (1910a) as *Goniodes chelicornis*; [2] Overgaard (1952) as *Gonocephalus chelicornis*; [3] This report.

**Type host:** *Tetrao urogallus* Linnaeus, 1758 – western capercaillie – tjäder<sup>H</sup> [1, 3].

**Material examined:** **Lapland:** *Gällivare kommun:* Gällivare, 1, 25 Mar. 1934, leg. S. Sjöberg, 96 (PIPeR). **Sk:** *Höörns kommun:* Norra Rörum, 3, 4, 5 nymphs, 11 Apr. 1939, leg. A. Lundström (SMNH). *Örkelljunga kommun:* Åsljunga, 17, 14, 50 nymphs, 20 Apr. 1939, leg. A. Lundström (SMNH). **Up:** *Uppsala kommun:* Norrgarn, 4, 10, 6 nymphs, 10 Sep. 1926, leg. C. Videll (SMNH). *Uppsala*, 4, 2, leg. C. Videll (SMNH). *Östhammars kommun:* Harg [as Flarg], 1, 16 Nov. 1939, leg. A. Lundström, 69 (PIPeR). Same locality, 5, 2, 6 nymphs, 16 Nov. 1939, leg. A. Lundström (SMNH). **Vr:** *Torsby kommun:* Munkebol, 23, 13, 35 nymphs, 28 Apr. 1939, leg. A. Lundström (SMNH). **Än:** *Hudiksvalls kommun:* Djuped, 8, 9, 30 nymphs, 11 Jul. 1939, leg. A. Lundström (SMNH). **No locality:** 1, 1 nymph (SMNH).

### ***Goniodes colchici* Denny, 1842**

*Goniodes colchici* Denny, 1842: 56.

*Goniodes colchici* Denny, 1842; Clay, 1940: 50.

**Reports:** [1] Mjöberg (1910a) as *Goniodes colchicus*; [2] Nilsson (1976); [3] This report.

**Type host:** *Phasianus colchicus* Linnaeus, 1758 – ring-necked pheasant – fasan<sup>H</sup> [1, 2, 3].

**Material examined:** **Sk:** *Lomma kommun:* Lomma, 1, 2 nymphs, 22 Mar. 1939, leg. A. Lundström (SMNH). *Lunds kommun:* Silvåkra, 1, 1, 1 nymph, 3 May 1939, leg. A. Lundström (SMNH).

Same locality, 1 ♂, 2 nymphs, 30 Mar. 1939, leg. A. Lundström (SMNH).

***Goniodes dispar* Burmeister, 1838 New record**

*Goniodes dispar* Burmeister, 1838: 432.

*Goniodes dispar* Burmeister, 1838; Clay, 1940: 87.

**Report:** [1] This report.

**Type host:** *Perdix perdix* (Linnaeus, 1758) – grey partridge – raphhöna<sup>H</sup> [1].

**Material examined: Unidentified localities:** “St Kolm” [= ?], 1 ♂, 19 Feb. 1960, leg. S. Linder, 144 (PIPeR). **Unidentified locality:** Tynaberg [= **Sö:** Nyköpings kommun: Tunaberg?], 1 ♂, 7 Mar. 1955, 146 (PIPeR).

***Goniodes dissimilis* Denny, 1842**

*Goniodes dissimilis* Denny, 1842: 57.

*Goniodes dissimilis* Denny, 1842; Clay, 1940: 62.

**Report:** [1] Brinck (1946a) as *Oulocrepis dissimilis*.

**Type host:** *Gallus gallus* (Linnaeus, 1758) – red junglefowl (domestic chicken) – tamhöna<sup>D</sup> [1].

***Goniodes gigas* (Taschenberg, 1879)**

*Goniocotes gigas* Taschenberg, 1879: 104.

*Goniodes gigas* (Taschenberg), 1879; Clay, 1940: 33.

**Report:** [1] Brinck (1946a) as *Stenocrotaphus gigas*.

**Type host:** *Gallus gallus* (Linnaeus, 1758) – red junglefowl (domestic chicken) – tamhöna<sup>D</sup> [1].

***Goniodes lagopi* (Linnaeus, 1758)**

*Pediculus lagopi* Linnaeus, 1758: 614.

*Goniodes lagopi* (Linné), 1758; Clay, 1940: 46.

**Reports:** [1] Linnaeus (1746); [2] Brinck (1946b) as *Gonocephalus chelicornis*; [3] Overgaard (1952) as *Gonocephalus chelicornis*; [4] This report.

**Type host:** *Lagopus lagopus* (Linnaeus, 1758) – willow ptarmigan – dalripa<sup>H</sup> [1, 2, 3, 4].

**Material examined: Nb:** *Piteå kommun:* Hortlax, 1 ♂, 10 Jan. 1955, 152 (PIPeR).

***Goniodes pavonis* (Linnaeus, 1758)**

*Pediculus pavonis* Linnaeus, 1758: 613.

*Goniodes pavonis* (Linné), 1758; Clay, 1940: 5.

**Reports:** [1] Mjöberg (1910a) as *Goniodes falcicornis*; [2] Overgaard (1943); [3] This report.

**Type host:** *Pavo cristatus* Linnaeus, 1758 – Indian peafowl – påfågel<sup>D</sup> [1, 2].

**Additional host in Sweden (likely stragglers):** *Tetrao urogallus* Linnaeus, 1758 – western capercaillie – tjäder [3].

**Material examined: Ex** *Pavo cristatus:* **Up:** Stockholm, 3 ♂, leg. E. Mjöberg (SMNH).

**Ex** *Tetrao urogallus:* **Sk:** Örkelljunga kommun: Ås-

ljunga, 1 ♂, 20 Apr. 1939, leg. A. Lundström (SMNH).

**Remarks:** The type host is not native to Sweden, but sometimes kept in captivity.

***Goniodes tetraonis* (Linnaeus, 1761)**

*Pediculus tetraonis* Linnaeus, 1761: 478.

*Goniodes tetraoni* (Linné), 1761; Clay, 1940: 40.

**Reports:** [1] Linnaeus (1761) as *Pediculus tetraonis*; [2] Overgaard (1952) as *Gonocephalus tetraonis*; [3] This report.

**Type host:** *Tetrao tetrax* (Linnaeus, 1758) – black grouse – orre<sup>H</sup> [1, 2, 3].

**Material examined: Blekinge:** 1 ♂, 3 nymphs, 26 Aug. 1939, leg. A. Lundström (SMNH). **Sk:** Hässleholms kommun: Röslöv, 1 ♂, 1 ♀, 16 Oct. 1940, leg. A. Lundström (SMNH). **Up:** Östhammars kommun: Harg, 1 ♂, 29 Apr. 1940, leg. A. Lundström, 104 (PIPeR). **Vr:** Arvika kommun: Arvika, 1 ♂, 10 May 1936, leg. T. Hansson, 111 (PIPeR).

**Phloptoridae Burmeister, 1838**

The family Phloptoridae contains almost all ischnoceran lice on birds, and is in urgent need of revision. Eichler (1963) outlined such a revision, but provided no morphological arguments for most of his groups. For this reason, these proposed groups have subsequently been used mainly by Eichler himself and some of the people he taught, notably Złotorzycka. Cruickshank *et al.* (2001) showed that many of these groups actually are monophyletic. Until a large-scale family-level revision of Phloptoridae has been published, the most common way to divide the family is into a series of “complexes”, which roughly parallel Eichler’s proposed families.

The most important complexes for the Swedish list are the *Bruelia*-complex, *Degeeriella*-complex, *Phlopterus*-complex, *Quadriceps*-complex, and the *Esthiopterum*-complex, and these terms are used in the key and elsewhere in this checklist. There is reason to believe that all of these complexes are monophyletic (Johnson *et al.* 2002a; Mey 2004; Gustafsson 2012; Gustafsson & Bush 2017; Gustafsson & Olsson 2017); however, deeper nodes in the ischnoceran tree of life are notoriously hard to recover with good support (*e.g.* Cruickshank *et al.* 2001).

Representatives of these complexes are all illustrated in Figs 32–41, and we have noted under each genus which complex it belongs to, if any. Many genera on the Swedish list do not

fit into any of these complexes, however, and the limits of some complexes are hard to define. For instance, *Rallicola* is closely related to the *Quadriceps*-complex, and may be part of it (Gustafsson 2012), and many extralimital genera are very close to the *Brueelia*-complex (Bush et al. 2016; Gustafsson & Bush 2017). By contrast, genera like *Struthiolipeurus* and *Falcolipeurus* are extremely different in their morphology compared to all other Philopteridae (Figs 44a–b), and hard to place morphologically. Large-scale revisions using morphological and genetic data are needed to solve this highly unsatisfactory state of affairs.

### **Acronirmus Eichler, 1953**

**Type species:** *Nirmus gracilis* Burmeister, 1838.

The genus *Acronirmus* was considered a synonym of *Brueelia* until the revision of this complex by Gustafsson & Bush (2017). It is part of the *Brueelia*-complex.

### **Acronirmus gracilis (Burmeister, 1838) New record**

*Nirmus gracilis* Burmeister, 1838: 429.

*Acronirmus gracilis* (Burmeister, 1838); Gustafsson & Bush, 2017: 60.

**Report:** [1] This report.

**Type host:** *Delichon urbicum* (Linnaeus, 1758) – common house martin – hussvala<sup>H</sup> [1].

**Additional host in Sweden:** *Hirundo rustica* Linnaeus, 1758 – barn swallow – ladusvala<sup>H</sup> [1].

**Material examined:** Ex *Delichon urbicum*: **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 , 1 , 20 Aug. 2013, leg. D. Gustafsson (SMNH).

Ex *Hirundo rustica*: **Sk:** *Vellinge kommun:* Falsterbo, 3 , 5 , 3 nymphs, 11 Sep. 1963, leg. F. Balát, 1260 (MMBC). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 , 24 Aug. 2013, leg. D. Gustafsson (SMNH).

**Remarks:** Bush et al. (2016) included an unidentified *Brueelia* from *D. urbicum* from Sweden in their phylogeny. This specimen is conspecific with the material reported above.

### **Anaticola Clay, 1936**

**Type species:** *Pediculus crassicornis* Scopoli, 1763.

Mjöberg (1910a) reported *Lipeurus jejunos* Nitzsch, 1818, *L. squalidus* Nitzsch, 1818, and *L. temporalis* Nitzsch, 1818, from a number of species of ducks in Sweden. These species are today considered synonyms of either *Anaticola*

*anseris* (Linnaeus, 1758) or *Anaticola crassicornis* (Scopoli, 1763) (Price et al. 2003a). Escalante et al. (2016) recently showed that many species in this genus are paraphyletic. These species can likely be separated on morphological grounds (Escalante et al. 2016, fig. 1), but there is no detailed revision of the genus and the primary literature is generally inadequate.

The *Anaticola* revision of Eichler & Vasjukova (1980) is better seen as a list of the species of the genus, with some illustrations collected from the literature. Eichler's idiosyncratic taxonomy often prevents identification of the different species, which are typically based mainly on host associations, and descriptions are generally vague and uninformative. Most species are here identified based on comparisons with extralimital material, or through genetic similarity with specimens in the phylogeny of Escalante et al. (2016). However, Escalante et al. (2016) showed that several species of *Anaticola* are in fact divided into numerous smaller clades. A revision of *Anaticola* is urgently needed, and we expect such a revision to affect several of the records on the Swedish list.

Mjöberg's material at the SMNH contains only three species of *Anaticola*: *Anaticola crassicornis* from *Anas platyrhynchos*, *Anaticola mergiserrati* from *Aythya ferina*, and *Anaticola tadornae* from *Tadorna tadorna*. Mjöberg (1910a) refers to material from the first host as *L. jejunos*, *L. squalidus*, and *L. temporalis*, material from the second host as *L. jejunos*, and material from the third host as *L. lacteus* N. [= Giebel, 1874]. However, all the material we have examined from Mjöberg's collections from these three hosts is undated and has no other collection data that could tie these specimens to Mjöberg's entries. Thus, it is unknown whether or not these specimens are the ones referred to by Mjöberg (1910a).

Moreover, species of *Anaticola* have been described from several of the other hosts listed by Mjöberg (1910a) under *L. jejunos*, *L. squalidus*, and *L. temporalis*. Mjöberg's material from these hosts has not been found. Conceivably, the following species could belong on the Swedish list, based on Mjöberg's (1910a) report: *Anaticola angustolimbatus* (Giebel, 1866) from *Melanitta nigra* (Linnaeus, 1758) and *Anaticola*

*klockenhoffi* Eichler & Vasjukova, 1980, from *Polysticta stelleri* (Pallas, 1769). However, as we have not found Mjöberg's material from these hosts, no detailed revision of the genus exists, and Mjöberg (1910a) does not describe his material except by reference to older publications, we do not accept these records for the Swedish list.

*Anaticola* is part of the *Esthiopterum*-complex (Gustafsson & Olsson 2017).

### ***Anaticola anseris* (Linnaeus, 1758)**

*Pediculus anseris* Linnaeus, 1758: 612.

**Reports:** [1] Mjöberg (1910a) as *Lipeurus jejunus*, *L. squalidus*, and *L. temporalis*; [2] This report.

**Type host:** *Anser anser* (Linnaeus, 1758) – greylag goose – grågås<sup>H</sup>.

**Hosts in Sweden:** *Anser albifrons* (Scopoli, 1769) – greater white-fronted goose – bläsgås<sup>F</sup> [1]. *Anser fabalis* (Latham, 1787) – bean goose – sädgås<sup>H</sup> [1, 2]. *Branta leucopsis* (Bechstein, 1803) – barnacle goose – vitkindad gås<sup>H</sup> [1].

**Material examined:** Ex *Anser fabalis*: **Sk:** *Lunds kommun:* Silvåkra, 2, 3, 29 Apr. 1939, leg. A. Lundström (SMNH).

**Remarks:** Escalante *et al.* (2016) showed that *A. anseris* is paraphyletic, and consists of at least three distinct molecular clades. All specimens included in their study were from *Branta* spp.; the position of *Anaticola* from *Anser* spp. is thus unknown. The preantennal area of the examined specimens from *A. fabalis* is unlike that of any of the clades illustrated by Escalante *et al.* (2016), and it seems likely that none of the clades in this phylogeny actually represent *A. anseris* s. str. Six published names were treated as synonyms of *A. anseris* in the checklist of Price *et al.* (2003a). We have examined very few specimens of *A. anseris* from *Anser* spp. other than those listed above, and provisionally list the material from *A. fabalis* as *A. anseris*.

### ***Anaticola branderi* Eichler & Hackman, 1973** **New record**

*Anaticola branderi* Eichler & Hackman, 1973: 88.

**Report:** [1] This report.

**Type host:** *Clangula hyemalis* (Linnaeus, 1758) – long-tailed duck – alfågel<sup>H</sup> [1].

**Material examined:** **Sk:** *Trelleborgs kommun:* Trelleborg, 2, 13 Apr. 1939, leg. A. Lundström (SMNH).

### ***Anaticola crassicornis* (Scopoli, 1763)**

*Pediculus crassicornis* Scopoli, 1763: 383.

*Anaticola crassicornis* [Scopoli, 1763]; Clay & Hopkins, 1951: 17.

**Reports:** [1] Mjöberg (1910a) as *Lipeurus jejunus*, *L. squalidus*, and *L. temporalis*; [2] Ash (1960) as *Anaticola sordidus*; [3] Escalante *et al.* (2016); [4] This report.

**Type host:** *Anas platyrhynchos* Linnaeus, 1758 – mallard – gräsand<sup>H</sup> [1, 3, 4].

**Additional hosts in Sweden:** *Anas acuta* Linnaeus, 1758 – northern pintail – stjärtand<sup>H</sup> [3]. *Anas crecca* Linnaeus, 1758 – green-winged teal – kricka<sup>H</sup> [2, 3, 4]. *Anas penelope* Linnaeus, 1758 – Eurasian wigeon – bläsand<sup>H</sup> [1, 3, 4]. *Anas strepera* Linnaeus, 1758 – gadwall – snatterand<sup>H</sup> [3, 4].

**Material examined:** Ex *Anas crecca*: **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1, 1, 28 Sep. 2007, leg. D. Gustafsson (SMNH).

Ex *Anas penelope*: **Sk:** *Kävlinge kommun:* Barsebäck, 1, 1 nymph, 5 Apr. 1939, leg. A. Lundström (SMNH). **Up:** *Uppsala kommun:* Uppsala, 1, leg. C. Videll (SMNH). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 2, 4 Oct. 2007, leg. D. Gustafsson (SMNH).

Ex *Anas platyrhynchos*: **Up:** *Uppsala kommun:* Uppsala, 1, leg. C. Videll (SMNH). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1, 26 Jul. 2007, leg. D. Gustafsson (SMNH).

Ex *Anas strepera*: **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory 1, 1, 11 Oct. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Escalante *et al.* (2016) showed that *A. crassicornis* is paraphyletic, consisting of six distinct molecular clades. Material from Sweden belongs to two of these clades: material from *A. platyrhynchos* to clade *crassicornis* 3, and material from *A. acuta*, *A. crecca*, *A. penelope*, and *A. strepera* to clade *crassicornis* 5. One female of *A. penelope* appears to be more similar to clade *crassicornis* 3, and may be a straggler. A total of 14 published names were treated as synonyms of *A. crassicornis* in the checklist of Price *et al.* (2003a). As no recent review of the genus has been published to establish which name belongs to which clade, we here provisionally list all material from these hosts under *A. crassicornis*.

Mjöberg (1910a) reported this species from *Uria aalge* (Pontoppidan, 1763), which likely is a straggler.

***Anaticola mergiserrati* (de Geer, 1778)**

*Ricinus mergi serrati* de Geer, 1778: 78.

*Anaticola mergiserrati* [de Geer, 1778]; Clay & Hopkins, 1954: 240.

**Reports:** [1] Mjöberg (1910a) as *Lipeurus jejunos*, *L. squalidus*, and *L. temporalis*; [2] This report.

**Type host:** *Mergus serrator* Linnaeus, 1758 – red-breasted merganser – småskrake<sup>H</sup> [1, 2].

**Additional hosts in Sweden:** *Aythya ferina* (Linnaeus, 1758) – common pochard – bergand<sup>H</sup> [1, 2].

**Material examined:** Ex *Aythya ferina*: **Up:** Uppsala kommun: Uppsala, 1, leg. C. Videll (SMNH).

Ex *Mergus serrator*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 29 May 2007, leg. D. Gustafsson (SMNH). **No locality:** 1, 5 (SMNH).

**Remarks:** Escalante *et al.* (2016) showed that *A. mergiserrati* is paraphyletic, consisting of five distinct molecular clades. The Swedish material we have examined belong to two of these clades: material from *M. serrator* and *A. ferina* represents clade *mergiserrati* 2, and material from *S. mollissima* represents clade *mergiserrati* 4. Specimens from *A. fuligula* represent a morphological group not included in the phylogeny of Escalante *et al.* (2016). A total of 10 published names were treated as synonyms of *A. mergiserrati* in the checklist of Price *et al.* (2003a). We here provisionally list the material from *A. fuligula* as *A. pseudofuligulae* and the material from *S. mollissima* as *A. rubromaculatus*.

***Anaticola pseudofuligulae* Eichler & Vasjukova, 1980 New record**

*Anaticola pseudofuligulae* Eichler & Vasjukova, 1980: 350.

**Report:** [1] This report.

**Type host:** *Aythya fuligula* (Linnaeus, 1758) – tufted duck – vigg<sup>H</sup> [1].

**Material examined:** **Sm:** Torsås kommun: Ragnabo, 2, 20 Apr. 1940, leg. A. Lundström (SMNH).

**Remarks:** *Anaticola pseudofuligulae* was synonymized with *A. mergiserrati* by Price *et al.* (2003a). No representative of this species was included in the phylogeny of Escalante *et al.* (2016), but the examined specimens are most similar to *A. rubromaculata* (“*mergiserrati* 4” in Escalante *et al.* 2016; fig. 1), differing in the shape and structure of the preantennal area. We here tentatively recognize *A. pseudofuligulae* as a valid species, pending a revision of the genus.

***Anaticola rheinwaldi* Eichler & Vasjukova, 1980**

*Anaticola rheinwaldi* Eichler & Vasjukova, 1980: 356.

**Reports:** [1] Escalante *et al.* (2016); [2] This report.

**Type host:** *Branta bernicla* (Linnaeus, 1758) – brant – prutgås<sup>H</sup> [1, 2, 3].

**Material examined:** **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2, 6 Oct. 2007, leg. D. Gustafsson (SMNH).

***Anaticola rubromaculata* (Rudow, 1869b)****New record**

*Lipeurus rubro maculatus* Rudow, 1869b: 43.

**Report:** [1] This report.

**Type host:** *Somateria mollissima* (Linnaeus, 1758) – common eider – ejder<sup>H</sup> [1, 2].

**Material examined:** **Sk:** Trelleborgs kommun: Trelleborg, 3, 2 nymphs, 13 Apr. 1939, leg. A. Lundström (SMNH). **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 1, 11 Oct. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Identification to species level is tentative, as type material of *A. rubromaculatus* has not been seen. *Anaticola rubromaculatus* was placed as a synonym to *A. mergiserrati* by Price *et al.* (2003a), but differs markedly from this species in the structure of the preantennal area (Escalante *et al.* 2016; fig. 1, “*mergiserrati* 4”). *Anaticola rubromaculata* and *A. pseudofuligulae* are the only *Anaticola* in Sweden in which the dorsal anterior plate is not divided from the main head plate by the dorsal preantennal suture, and the examined material is very similar to that illustrated by Eichler (1956).

***Anaticola tadornae* (Denny, 1842)**

*Lipeurus tadornae* Denny, 1842: 58.

**Reports:** [1] Mjöberg (1910a) as *Lipeurus lacteus*; [2] This report.

**Type host:** *Tadorna tadorna* (Linnaeus, 1758) – common shelduck – gravand<sup>H</sup> [1, 2].

**Material examined:** **Sk:** Vellinge kommun: Skanörs Ljung, 1, 2, 1 nymph, 21 Apr. 1939, leg. A. Lundström (SMNH). **Up:** Stockholm, 2, 1 nymph, leg. E. Mjöberg (SMNH). **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 21 May 2007, leg. D. Gustafsson (SMNH). **No locality:** 6, 4, 3 nymphs (SMNH).

***Anaticola* sp.**

**Report:** [1] This report.

**Host:** *Geronticus eremita* (Linnaeus 1758) – northern bald ibis – eremitibis<sup>D</sup> [1].

**Material examined:** **Bo:** Sotenäs kommun: Nordens

Ark, 1 , 23 Mar. 2011, leg. D. Gustafsson (SMNH).

**Remarks:** This specimen is most likely a straggler from an anseriform host; however it is dissimilar to all other *Anaticola* known from Sweden in the shape and structure of the anterior head and the very thick tergal setae. It cannot presently be identified.

### *Anatoecus Cummings, 1916*

**Type species:** *Philopterus icterodes* Nitzsch, 1818 = *Pediculus dentatus* Scopoli, 1763.

As with *Anaticola*, a large number of species and subspecies of *Anatoecus* have been proposed based almost entirely on host associations (Kéler, 1960; Złotorzycka, 1970). These taxa have been almost universally rejected, and placed as synonyms of a small handful of species, notably *A. dentatus* and *A. icterodes*. Grossi *et al.* (2014) showed that even these two species were genetically identical, despite the large differences in the male genitalia. The various older names for populations on different host species are thus most likely correctly regarded as synonyms of *A. dentatus*, except species occurring on swans and geese. No detailed revision of the genus has been published, but Kéler (1960) provided good illustrations of most morphological characters in the genus, spread out over numerous subspecies. *Anatoecus* is part of the *Esthiopterum*-complex (Gustafsson & Olsson 2017).

### *Anatoecus cygni* (Denny, 1842)

*Docophorus cygni* Denny, 1842: 46.

*Anatoecus cygni cygni* (Denny); Kéler, 1960: 323.

**Reports:** [1] Mjöberg (1910a) as *Docophorus cygni*; [2] This report.

**Type host:** *Cygnus columbianus bewicki* Yarrel, 1831 – Bewick's tundra swan – mindre sångsvan<sup>F</sup>.

**Hosts in Sweden:** *Cygnus olor* (Gmelin, 1789) – mute swan – knölsvan<sup>H</sup> [1]. *Cygnus* sp. [2].

**Material examined:** Ex *Cygnus* sp.: **No locality:** 1 , 5 nymphs (SMNH).

**Remarks:** This species does not normally occur on the reported host. No specimens of *Anatoecus* from *C. olor* has been found in the Mjöberg collection at the SMNH. No specimens from the type host are known from Sweden.

### *Anatoecus dentatus* (Scopoli, 1763)

*Pediculus dentatus* Scopoli, 1763: 383.

*Anatoecus dentatus* [Scopoli, 1763]; Clay & Hopkins, 1951: 15.

*Anatoecus dentatus dentatus* (Scopoli); Kéler, 1960: 298.

**Reports:** [1] Mjöberg (1910a) as *Docophorus icterodes*; [2] Overgaard (1942) as *Docophorus icterodes*; [3] This report.

**Type host:** *Anas platyrhynchos* Linnaeus, 1758 – mallard – gräsand<sup>H</sup> [1, 3].

**Additional hosts in Sweden:** *Anas crecca* Linnaeus, 1758 – green-winged teal – kricka<sup>H</sup> [1, 3]. *Anas penelope* Linnaeus, 1758 – Eurasian wigeon – bläsand<sup>H</sup> [3]. *Aythya ferina* (Linnaeus, 1758) – common pochard – bergand<sup>H</sup> [3]. *Aythya fuligula* (Linnaeus, 1758) – tufted duck – vigg<sup>H</sup> [3]. *Branta bernicla* (Linnaeus, 1758) – brant – prutgåås<sup>F</sup> [3]. *Bucephala clangula* (Linnaeus, 1758) – common goldeneye – knipa<sup>H</sup> [1, 3]. *Clangula hyemalis* (Linnaeus, 1758) – long-tailed duck – alfågel<sup>H</sup> [3]. *Melanitta fusca* (Linnaeus, 1758) – white-winged scoter – svärta<sup>H</sup> [1]. *Melanitta nigra* (Linnaeus, 1758) – common scoter – sjöorre<sup>H</sup> [1]. *Mergus merganser* Linnaeus, 1758 – common merganser – storskrake<sup>H</sup> [3]. *Polysticta stelleri* (Pallas, 1769) – Steller's eider – alförrädare<sup>T</sup> [1]. *Somateria mollissima* (Linnaeus, 1758) – common eider – ejder<sup>H</sup> [1, 3]. *Tadorna tadorna* (Linnaeus, 1758) – common shelduck – gravand<sup>H</sup> [1, 3].

**Material examined:** Ex *Anas crecca*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2 , 28 Sep. 2007, leg. D. Gustafsson (SMNH). Same locality, 1 , 30 Sep. 2007, leg. D. Gustafsson (SMNH).

Ex *A. penelope*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2 , 4 Oct. 2007, leg. D. Gustafsson (SMNH).

Ex *A. platyrhynchos*: **Up:** Uppsala kommun: Uppsala, 1 , leg. C. Videll (SMNH). **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1 , 30 Jul. 2007, leg. D. Gustafsson (SMNH). Same locality, 1 , 27 Sep. 2007, leg. D. Gustafsson (SMNH).

Ex *Aythya ferina*: **Ög:** Ödeshög kommun: Glänås, 2 , 2 , 30 Apr. 1940, leg. A. Lundström (SMNH).

Ex *A. fuligula*: **Sm:** Torsås kommun: Ragnabo, 2 , 11 , 20 Apr. 1940, leg. A. Lundström (SMNH).

Ex *Branta bernicla*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2 , 6 Oct. 2007, leg. D. Gustafsson (SMNH). Same locality, 2 , 11 Oct. 2007, leg. D. Gustafsson (SMNH).

Ex *Bucephala clangula*: **Bo:** Tanums kommun: Röo, 4 , 3 , 9 Apr. 1940, leg. A. Lundström (SMNH). **No locality:** 1 (SMNH).

Ex *Clangula hyemalis*: **Sk:** Trelleborgs kommun: Trelleborg, 3 , 13 Apr. 1939, leg. A. Lundström (SMNH).

Ex *Mergus merganser*: **No locality:** 1 (SMNH). 11 , leg. C. Videll (SMNH).

Ex *Somateria mollissima*: **Sk:** Trelleborgs kommun: Trelleborg, 1 , 1 , 13 Apr. 1939, leg. A. Lund-



ström (SMNH). *Vellinge kommun*: Falsterbo, 10 , 1 nymph, 11 Sep. 1963, leg. F. Balát, 1273 (MMBC). Same locality, 9 , 11 Sep. 1963, leg. F. Balát, 1274 (MMBC). Same locality, 13 , 53 , 11 nymphs, 11 Sep. 1963, leg. F. Balát, 1298 (MMBC). **Öl**: *Mörbylånga kommun*: Ottenby Bird Observatory, 1 , 11 Oct. 2007, leg. D. Gustafsson (SMNH). **No locality**: 2 , 1 (SMNH).

Ex *Tadorna tadorna*: **Sk**: *Vellinge kommun*: Skanörs Ljung, 2 , 2 nymphs, 21 Apr. 1939, leg. A. Lundström (SMNH). **No locality**: 5 (SMNH).

**Remarks**: *Anatoecus icterodes* (Nitzsch) was recently synonymized with *A. dentatus* (Grossi et al. 2014). Mjöberg also reported this species from *Colymbus septentrionalis* [= *Gavia stellata* (Pontoppidan, 1763)], which likely refers to a straggler or a member of the genus *Craspedonirmus* Thompson, 1940.

### *Anatoecus penicillatus* Kéler, 1960 New record

*Anatoecus penicillatus* Kéler, 1960: 235.

**Report**: [1] This report.

**Type host**: *Cygnus olor* (Gmelin, 1789) – mute swan – knölsvan<sup>H</sup> [1].

**Material examined**: **Öl**: *Mörbylånga kommun*: Ottenby Bird Observatory, 1 , 1 , 5 Aug. 2007, leg. D. Gustafsson (SMNH).

### *Ardeicola Clay, 1936*

**Type species**: *Pediculus ardeae* Linnaeus, 1758.

No comprehensive revision of *Ardeicola* has been published, but Kumar & Tandan (1971) reviewed the species occurring on storks, and Tuff (1967) the North American hosts. Haleja & Tandan (1970) reviewed the species on ibises. These reviews may be consulted for species of *Ardeicola* occurring on exotic species kept in captivity. Clay & Hopkins (1950) provided partial illustrations of both the species known from Sweden.

*Ardeicola* is part of the *Esthiopterum*-complex (Gustafsson & Olsson 2017).

### *Ardeicola ardeae* (Linnaeus, 1758)

*Pediculus ardeae* Linnaeus, 1758: 613.

*Ardeicola ardeae* [Linnaeus, 1758]; Clay & Hopkins, 1950: 247.

**Reports**: [1] Mjöberg (1910a) as *Lipeurus leucopygus*; [2] This report.

**Type host**: *Ardea cinerea* Linnaeus, 1758 – grey heron – gråhäger<sup>H</sup> [1, 2].

**Material examined**: **No locality**: 1 , 2 (SMNH).

### *Ardeicola ciconiae* (Linnaeus, 1758) New record

*Pediculus ciconiae* Linnaeus, 1758: 613.

*Ardeicola ciconiae* [Linnaeus, 1758]; Clay & Hopkins, 1950: 252.

*Ardeicola ciconiae* (Linnaeus, 1758); Kumar & Tandan, 1971: 152.

**Report**: [1] This report.

**Type host**: *Ciconia ciconia* (Linnaeus, 1758) – white stork – vit stork<sup>H</sup> [1].

**Material examined**: **Sk**: *Hässleholms kommun*: Hörja [as Horja], 2 , 2 , 13 Jun. 1954, 78 (PIPÉR).

### *Austrogoniodes Harrison, 1915*

**Type species**: *Goniocotes waterstoni* Cummings, 1914.

It seems unlikely that any other species of *Austrogoniodes* should be found in Sweden, and the record below is doubtful. A key to the genus is provided by Clay (1967).

### *Austrogoniodes demersus* Kéler, 1952 New record

*Austrogoniodes demersus* Kéler, 1952: 233.

**Report**: [1] This report.

**Type host**: *Spheniscus demersus* (Linnaeus, 1758) – African penguin – sydafrikansk pingvin<sup>E</sup>.

**Host in Sweden (straggler)**: *Mergus merganser* Linnaeus, 1758 – common merganser – storskrake<sup>H</sup> [1].

**Material examined**: **No locality**: 1 , leg. C. Videll (SMNH).

**Remarks**: The single examined specimen comes from a sample of *Anatoecus* from *M. merganser*. Mjöberg obtained his specimens from Cyrus Videll, a taxidermist in Uppsala, and the specimen may represent a contamination from Videll's workshop. Mjöberg (1910a: 108) reported several specimens of *Goniocotes* [= *Austrogoniodes*] *bifasciatus* (Piaget, 1885) from *Spheniscus magellanicus* (Forster, 1781) [= *demersus*] collected by Walter Kaudern in Africa. We tentatively include this species on the Swedish list, as *S. demersus* is sometimes kept in captivity in Sweden (e.g. the aviary in Slottsskogen, Gothenburg), and we have no positive evidence that the specimen originated from the Kaudern collection.

### *Brueelia von Kéler, 1936*

**Type species**: *Brueelia rossittensis* Kéler, 1936 = *Nirmus brachythorax* Giebel, 1874.

Gustafsson & Bush (2017) recently revised the *Brueelia*-complex, and many species on

the Swedish list were transferred to the genera *Acronirmus*, *Corvonirmus*, *Guimaraesiella*, *Hecatrishula*, *Olivinirmus*, or *Turdinirmus*. Many species of *Brueelia s. str.* are known from Sweden, and many more can be expected based on records from the rest of Europe. However, virtually all *Brueelia* species in Europe have been described primarily based on host associations, and very few are adequately described or illustrated. Identification to species level thus requires comparison with type material for the majority of Swedish *Brueelia* species. The species listed below have all be identified based on comparisons with extralimital material. Species-level revisions of *Brueelia* are under preparation for many of the species listed below.

### ***Brueelia ferianci* Balát, 1955a New record**

*Brueelia ferianci* Balát, 1955a: 508.

**Report:** [1] This report.

**Type host:** *Anthus trivialis* (Linnaeus, 1758) – tree pipit – trädpiplärka<sup>H</sup> [1].

**Material examined: Sk:** *Vellinge kommun:* Falsterbo, 1 ♀, 2 ♂, 1 nymph, 17 Sep. 1963, leg. F. Balát, 1272 (MMBC).

**Remarks:** Ash (1960) reported unidentified specimens of *Brueelia* from this host.

### ***Brueelia kluzi* Balát, 1955a New record**

*Brueelia kluzi* Balát, 1955a: 512.

**Report:** [1] This report.

**Type host:** *Fringilla coelebs* Linnaeus, 1758 – chaffinch – bofink<sup>H</sup> [1].

**Material examined: Sk:** *Vellinge kommun:* Skanör, 1 ♀, 1 ♂, 1 nymph, 12 Sep. 1963, leg. F. Balát, 1315 (MMBC).

### ***Brueelia kratochvili* Balát, 1958 New record**

*Brueelia kratochvili* Balát, 1958: 413.

**Report:** [1] This report.

**Type host:** *Motacilla flava* Linnaeus, 1758 – western yellow wagtail – gulärkla<sup>H</sup> [1].

**Material examined: Sk:** *Vellinge kommun:* Falsterbo, 2 ♀, 1 nymph, 22 Aug. 1963, leg. F. Balát, 1309 (MMBC).

### ***Brueelia limbata* (Burmeister, 1838)**

*Nirmus limbatus* Burmeister, 1838: 429.

**Report:** [1] Gustafsson & Bush (2017).

**Type host:** *Loxia curvirostra curvirostra* Linnaeus, 1758 – red crossbill – mindre korsnäbb<sup>H</sup> [1].

**Material examined: Sk:** *Vellinge kommun:* Skanör, 2 ♀, 2 ♂, 12 Sep. 1963, leg. F. Balát, 1267 (MFNB).

**Remarks:** Balát's notes state that one additional females and one nymph were collected from the same host individual, but these have not been found.

### ***Brueelia nebulosa* (Burmeister, 1838)**

*Nirmus nebulosus* Burmsietar, 1838: 429.

**Reports:** [1] Mjöberg (1910a) as *Nirmus nebulosus*; [2] This report.

**Type host:** *Sturnus vulgaris* Linnaeus, 1758 – European starling – stare<sup>H</sup> [1, 2].

**Material examined: Sk:** *Lunds kommun:* Häckeberga, 1 ♀, 1 ♂, 15 Mar. 1939, leg. A. Lundström (SMNH). **Vr:** *Eda kommun:* Skönerud, 5 ♀, 15 ♂, 6 nymphs, 13 Apr. 1939, leg. A. Lundström (SMNH).

**Remarks:** Bush *et al.* (2016) included an unidentified *Brueelia* from a Swedish starling, which likely represents *B. nebulosa*, but was not identified to species level.

### ***Brueelia pyrrhularum* Eichler, 1954**

*Brueelia pyrrhularum* Eichler, 1954: 62.

**Reports:** [1] Mjöberg (1910a) as *Nirmus densilimbus*; [2] This report.

**Type host:** *Pyrrhula pyrrhula* (Linnaeus, 1758) – Eurasian bullfinch – domherre<sup>H</sup> [1, 2].

**Material examined: Sm:** *Växjö kommun:* Räppe, 2 ♀, 16 Feb. 1939, leg. A. Lundström (SMNH). **No locality:** 1 ♀, 1 nymph (SMNH).

### ***Brueelia sibirica* Mey, 1982b New record**

*Brueelia sibirica* Mey, 1982b: 174.

**Report:** [1] This report.

**Type host:** *Acanthis flammea* (Linnaeus, 1758) – common redpoll – gråsiska<sup>H</sup> [1].

**Material examined: No locality:** 1 ♀, 3 nymphs, Oct. 1946, leg. R. Meinertzhagen, 16078 (NHML).

### ***Brueelia straminea* (Denny, 1842) New record**

*Nirmus stramineus* Denny, 1842: 53.

*Brueelia straminea* (Denny, 1842); Dalgleish, 1971: 144.

**Reports:** [1] Gustafsson & Bush, 2017; [2] This report.

**Type host:** *Dendrocopos major* (Linnaeus, 1758) – greater spotted woodpecker – större hackspett<sup>H</sup> [1, 2].

**Material examined: Ha:** *Hylte kommun:* Torup, 2 ♀, 2 ♂, 30 Jan. 1957, leg. S. Linder (UMSP). **Sk:** *Hässleholms kommun:* Vankiva, 1 nymph, 14 Mar. 1939, leg. A. Lundström (SMNH).

***Brueelia* sp.****Report:** [1] Ash (1960).**Host:** *Emberiza hortulana* Linnaeus, 1758 – ortolan bunting – ortolansparv<sup>H</sup> [1].**Remarks:** No *Brueelia* species is known from this host, and both *Brueelia* and *Guimaraesiella* are known from hosts in the Emberizidae (Gustafsson & Bush 2017). We tentatively list this record under *Brueelia* rather than *Guimaraesiella*, as we have seen extralimital material of *Brueelia* from *E. hortulanus*. Ash's (1960) material was not identified to species level.***Brueelia* sp.****Report:** [1] Bush et al. (2016).**Host:** *Emberiza schoeniclus* (Linnaeus, 1758) – common reed bunting – sävsparv<sup>H</sup> [1].**Remarks:** *Brueelia blagovescenskyi* Balát, 1955a, is known from the host, and Bush's et al. (2016) specimen likely represents this species, however it was not identified to species. No good redescription of *B. blagovescenskyi* has been published, and the *Brueelia* species on emberizids are very similar morphologically.***Brueelia* sp.****Report:** [1] Ash (1960).**Host:** *Sylvia nisoria* (Bechstein, 1792) – barred warbler – höksångare<sup>H</sup> [1].**Remarks:** *Brueelia rosickyi* Balát, 1955a, is known from this host, but Ash's (1960) material was not identified to species.***Carduiceps* Clay & Meinertzhagen, 1939****Type species:** *Nirmus complexivus* Kellogg & Chapman, 1899 = *Nirmus zonarius* Nitzsch [in Giebel], 1866.*Carduiceps* was reviewed by Timmermann (1954c), whose morphological species limits correspond well with genetic data (Gustafsson & Olsson 2017). *Carduiceps* may be part of the *Esthiopterum*-complex, but this placement is tentative as genetic data is ambiguous (Gustafsson & Olsson 2017).Ash (1960) reported unidentified *Carduiceps* specimens from *Charadrius hiaticula* Linnaeus, 1758, *Arenaria interpres* (Linnaeus, 1758), *Actitis hypoleuca* (Linnaeus, 1758), and *Tringa totanus* Linnaeus, 1758. We have not seen Ash's material, but *Carduiceps* are not normally found on any of these hosts. We consider these records

to be either misidentifications or stragglers, and do not include them below.

***Carduiceps lapponicus* Emerson, 1953 New record***Carduiceps lapponicus* Emerson: 1953: 209.**Report:** [1] This report.**Type host:** *Limosa lapponica* (Linnaeus, 1758) – barred-tailed godwit – myrspov<sup>H</sup> [1].**Material examined:** **Up:** *Uppsala kommun:* Uppsala, 1, 5, leg. C. Videll (SMNH).***Carduiceps meinertzhageni* Timmermann, 1954c New record***Carduiceps meinertzhageni* Timmermann, 1954c: 44.**Report:** [1] Gustafsson & Olsson, 2017; [2] This report.**Type host:** *Calidris alpina alpina* (Linnaeus, 1758) – dunlin (*alpina*) – kärnsnäppa<sup>H</sup> [1, 2].**Host in Sweden:** *Calidris alpina schinzii* (C.L. Brehm & Schilling, 1822) – dunlin (*schinzii*) – sydlig kärnsnäppa<sup>H</sup> [1, 2].**Material examined:** Ex *Calidris alpina alpina:* **Sk:** *Landskrona kommun:* Häljarp, 1, 2 May, 1939, leg. A. Lundström (SMNH). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 2, 1, 10 May 2007, leg. D. Gustafsson (SMNH).Ex *C. a. schinzii:* **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 2, 27 Jul. 2007, leg. D. Gustafsson (SMNH).Ex *C. alpina* ssp.: **Sk:** *Vellinge kommun:* Falsterbo, 9, 1 nymph, 22 Aug. 1963, leg. F. Balát, 1263 (MMBC). Same locality, 4, 22 Aug. 1963, leg. F. Balát, 1288 (MMBC).**Remarks:** Ash's (1960) unidentified specimens from *Calidris alpina* likely belong to this species.***Carduiceps scalaris* (Piaget, 1880) New record***Nirmus scalaris* Piaget, 1880: 190.*Carduiceps scalaris* (Piaget), 1880; Timmermann, 1954c: 46.**Report:** [1] Gustafsson & Olsson, 2017; [2] This report.**Type host:** *Calidris pugnax* (Linnaeus, 1758) – ruff – brushane<sup>H</sup> [1, 2].**Material examined:** **Vb:** *Umeå kommun:* Stöcke, 1, 1, 9 May 2008, leg. D. Gustafsson (SMNH). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 2, 7 Aug. 2007, leg. D. Gustafsson (SMNH).**Remarks:** Ash's (1960) unidentified specimens from *Calidris pugnax* likely belong to this species.

***Carduiceps zonarius* (Nitzsch [in Giebel], 1866) New record**

*Nirmus zonarius* Nitzsch [in Giebel], 1866: 374.

*Carduiceps zonarius* (Nitzsch); Timmermann, 1954c: 44.

**Report:** [1] Gustafsson & Olsson, 2017; [2] This report.

**Type host:** *Calidris minuta* (Leisler, 1812) – little stint – småsnäppa<sup>F</sup> [1, 2].

**Hosts in Sweden:** *Calidris canutus canutus* (Linnaeus, 1758) – red knot – kustsnäppa<sup>F</sup> [1, 2]. *Calidris ferruginea* (Pontoppidan, 1763) – curlew sandpiper – spovsnäppa<sup>F</sup> [1, 2]. *Lymnocyrtes minimus* (Brünnich, 1764) – jack snipe – dvärgbeckasin<sup>H</sup> [1, 2].

**Material examined:** Ex *Calidris canutus canutus*: **Sk:** Vellinge kommun: Falsterbo, 6, 12, 24 Aug. 1963, leg. F. Balát, 1300 (MMBC); **Up:** Stockholm, 2, leg. E. Mjöberg (SMNH); **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 2 Aug. 2007, leg. D. Gustafsson (SMNH).

Ex *C. ferruginea*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 23 Jul. 2007, leg. D. Gustafsson (SMNH).

Ex *C. minuta*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 10 Aug. 2007, leg. D. Gustafsson (SMNH).

Ex *Lymnocyrtes minimus*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 29 Sep. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Calidris temminckii* (Leisler, 1812), *C. canutus*, *C. ferruginea*, and *C. alba* likely belong to this species.

***Chelopistes von Kéler, 1939***

**Type species:** *Philoaterus stylifer* Nitzsch, 1818 = *Pediculus meleagridis* Linnaeus, 1758.

No comprehensive revision of *Chelopistes* has been published. Additional species may occur on New World gamefowl (Cracidae, Odontophoridae) kept in captivity in Sweden, in which case the primary literature must be consulted. *Chelopistes* is superficially similar to many genera in the Gonioididae, but is more closely related to genera like *Oxylpeurus* (e.g. Cruickshank *et al.* 2001).

***Chelopistes meleagridis* (Linnaeus, 1758)**

*Pediculus meleagridis* Linnaeus, 1758: 613.

*Chelopistes meleagridis* (Linné); Kéler, 1939: 181.

*Chelopistes meleagridis* [Linnaeus, 1758]; Clay & Hopkins, 1950: 261.

**Reports:** [1] Linnaeus (1746) as *Pediculus meleagri-*

*dis*; [2] Linnaeus (1758) as *Pediculus meleagridis*; [3] Mjöberg (1910a) as *Goniodes stylifer*; [4] Overgaard (1943); [5] This report.

**Type host:** *Meleagris gallopavo* Linnaeus, 1758 – turkey – kalkon<sup>D</sup> [1, 2, 3, 4, 5].

**Material examined: No locality:** 1, 10 Feb. 1905, leg. H. Murchardt (SMNH).

**Remarks:** Mjöberg's (1910a) report does not explicitly state that his material of this species was collected in Sweden.

***Cirrophthirus Timmermann, 1953a***

**Type species:** *Pediculus recurvirostrae* Linnaeus, 1758.

The *Quadriceps*-complex species on the pied avocet, including *Cirrophthirus*, were beautifully illustrated by Timmermann (1953a).

***Cirrophthirus recurvirostrae* (Linnaeus, 1758)**

*Pediculus recurvirostrae* Linnaeus, 1758: 613.

*Cirrophthirus recurvirostrae* L.; Timmermann, 1953a: 330.

**Reports:** [1] Linnaeus (1746) as *Pediculus recurvirostrae*; [2] Linnaeus (1758) as *Pediculus recurvirostrae*; [3] This report.

**Type host:** *Recurvirostra avosetta* Linnaeus, 1758 – pied avocet – skärfläcka<sup>H</sup> [1, 2, 3].

**Material examined: Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 2 Jul. 2010, leg. D. Gustafsson (SMNH). Same locality, 1, 2, 3 Jul. 2010, leg. D. Gustafsson (SMNH).

***Columbicola Ewing, 1929***

**Type species:** *Pediculus columbae* Linnaeus, 1758.

Adams *et al.* (2009) revised the *Columbicola* species of Old World hosts, and included partial illustrations and short descriptions of all Swedish species. Their key of Adams *et al.* (2009) should identify all new species of *Columbicola* found in Sweden, but is often vague and difficult to use. New World species of this genus were revised by Clayton & Price (1999), which includes descriptions and illustrations of additional species that may occur in captivity in Sweden.

*Columbicola* is the most well-studied genus of chewing lice, and much of our current knowledge of louse ecology and evolution derives from studies of this genus. A summary of this research can be found in Clayton *et al.* (2016). *Columbicola* may be part of the *Esthiopterum*-complex (Gustafsson & Olsson 2017), but if so

it is an aberrant member of this complex, with no known close relatives.

### ***Columbicola bacillus* (Giebel, 1866)**

*Lipeurus bacillus* Giebel, 1866: 379.

*Columbicola bacillus* (Giebel); Adams et al., 2009: 3549.

**Reports:** [1] Mjöberg (1910a) – as *Lipeurus baculus*; [2] This report.

**Type host:** *Streptopelia turtur* (Linnaeus, 1758) – European turtledove – turturduva<sup>T</sup> [1].

**Additional host in Sweden:** *Streptopelia decaocto* (Fivaldszky, 1838) – Eurasian collared dove – turkduva [2].

**Material examined:** Ex *Streptopelia decaocto*: **Up:** Uppsala kommun: Uppsala, 3, leg. C. Videll (SMNH). **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 28 Sep. 2007, leg. D. Gustafsson (SMNH).

### ***Columbicola claviformis* (Denny, 1842) New record**

*Nirmus claviformis* Denny, 1842: 51.

*Columbicola claviformis* (Denny); Adams et al., 2009: 3555.

**Report:** [1] This report.

**Type host:** *Columba palumbus* Linnaeus, 1758 – wood pigeon – ringduva<sup>H</sup> [1].

**Material examined:** **Ha:** Falkenberg kommun: Årstad, 2, 5, 2013, leg. U. Olsson (SMNH). **Ög:** Mjölby kommun: Lindevad, 3, 1, 30 Apr. 1940, leg. A. Lundström (SMNH). **Ög:** Nyköpings kommun: Kärrboda, 4, 6, 3 Apr. 1940, leg. A. Lundström (SMNH)

### ***Columbicola columbae* (Linnaeus, 1758)**

*Pediculus columbae* Linnaeus, 1758: 614,

*Columbicola columbae* (L.); Adams et al., 2009: 3548.

**Reports:** [1] Mjöberg (1910a) as *Lipeurus baculus*; [2] Stenram (1956); [3] This report.

**Type host:** *Columba livia* (Gmelin, 1789) – domestic pigeon – tamduva<sup>H</sup> [1, 2, 3].

**Additional host in Sweden:** *Columba oenas* Linnaeus, 1758 – stock pigeon – skogsduva<sup>H</sup> [1, 2, 3].

**Material examined:** Ex *Columba livia domestica*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2, 30 May 2007, leg. D. Gustafsson (SMNH). **No locality:** 8, 11, 5 nymphs 9SMNH).

Ex *C. oenas*: **Sm:** Torsås kommun: Ragnabo, 1, 2, 2 nymphs, 4 Apr. 1940, leg. A. Lundström (SMNH).

**Vr:** Eda kommun: Skönnerud, 1, 2 nymphs, 4 Apr. 1939, leg. A. Lundström (SMNH).

### ***Corvonirmus Eichler, 1944***

The genus *Corvonirmus* was previously regarded as a synonym of *Brueelia* Kéler, 1936, and both species listed under *Corvonirmus* here were placed in this genus. Gustafsson & Bush (2017) resurrected *Corvonirmus* as a valid genus in their revision of the *Brueelia*-complex, which we follow here. *Corvonirmus* was revised by Ansari (1957) as *Brueelia*, including both Swedish species.

### ***Corvonirmus argulus* (Burmeister, 1838) New record**

*Nirmus argulus* Burmeister, 1838: 430.

*Brüelia argula* (Burmeister), 1838; Ansari, 1957: 145.

**Report:** [1] This report.

**Type host:** *Corvus corax corax* (Burmeister, 1838) – common raven – korp<sup>H</sup> [1].

**Material examined:** **Sm:** “Västra Sm”, 3, 15 Nov. 1939, leg. A. Lundström (SMNH). **No locality:** 1, 3 nymphs (SMNH).

### ***Corvonirmus uncinus* (Burmeister, 1838)**

*Nirmus uncinus* Burmeister, 1838: 430.

*Brüelia uncinosa* (Burmeister), 1838; Ansari, 1957: 156.

*Corvonirmus uncinus* (Burmeister, 1838); Gustafsson & Bush, 2017: 195.

**Reports:** [1] Mjöberg (1910a) as *Nirmus uncinus*; [2] This report.

**Type host:** *Corvus corone* Linnaeus, 1758 – carrion crow – svartkråka<sup>T</sup>.

**Host in Sweden:** *Corvus cornix* Linnaeus, 1758 – hooded crow – gråkråka<sup>H</sup> [1, 2].

**Material examined:** **Sk:** Höörs kommun: Fodgarp, 1, 1, 26 Oct. 1937, leg. A. Lundström (SMNH).

**Vr:** Eda kommun: Skönnerud, 1, 3, 2 nymphs, 8 Apr. 1939, leg. A. Lundström (SMNH). *Torsby kommun:* Munkebol, 1, 1 Apr. 1939, leg. A. Lundström (SMNH). **Vg:** Göteborgs kommun: Slottskogen, 1, 1, 13 Jan. 1951, leg. K.W. Popscoff, KW578, PIPeR #143 (PIPeR). **No locality:** 2 nymphs (SMNH).

**Remarks:** No specimens from the type host are known from Sweden.

### ***Craspedonirmus Thompson, 1940a***

**Type species:** *Nirmus frontatus* Nitzsch [in Giebel], 1866 = *Docophorus colymbinus* Denny, 1842.

No revision of *Craspedonirmus* including illustrations and complete descriptions has been published. Emerson (1955a) provided some characters, but mainly nomenclatural notes. Nelson

(1972b) provided some illustrations to recognize the genus, but his species is extralimital. *Craspedonirmus* may be part of the *Esthiopterum*-complex, and possibly closely related to *Carduiceps* and *Columbicola* (Gustafsson & Olsson 2017); however genetic data is ambiguous.

### ***Craspedonirmus colymbinus* (Denny, 1842)**

*Docophorus colymbinus* Denny, 1842: 43.

**Reports:** [1] Mjöberg (1910a) as *Docophorus colymbinus*; [2] This report.

**Type host:** *Gavia stellata* (Pontoppidan, 1763) – red-throated loon – smålom<sup>H</sup> [1, 2].

**Additional host in Sweden:** *Gavia arctica* (Linnaeus, 1758) – Arctic loon – storlom<sup>H</sup> [1, 2].

**Material examined:** Ex *Gavia arctica*: **Up:** *Uppsala kommun*: Uppsala, 1, 1, leg. C. Videll (SMNH). Ex *Gavia stellata*: **Up:** Stockholm, 1, leg. E. Mjöberg (SMNH). **No locality:** 1 nymph (SMNH).

### ***Craspedorrhynchus von Kéler, 1938***

**Type species:** *Docophorus platysomus* Burmeister, 1838.

No complete revision of *Craspedorrhynchus* has been published, but Gállego *et al.* (1987) provided good illustrations and Spanish descriptions for many of the species found in Sweden. Eichler (1963) placed this genus close to *Philopterus*, and we here include it tentatively in the *Philopterus*-complex in the key.

### ***Craspedorrhynchus aquilinus* (Denny, 1842)**

*Docophorus aquilinus* Denny, 1842: 43.

*Craspedorrhynchus aquilinus* (Denny, 1842); Gállego *et al.*, 1987: 34.

**Reports:** [1] Mjöberg (1910a) as *Docophorus platyrhynchus*; [2] This report.

**Type host:** *Aquila chrysaetos* (Linnaeus, 1758) – golden eagle – kungsörn<sup>H</sup> [1, 2].

**Material examined:** **Up:** Stockholm, 9, 22, 1 nymph, 1909, leg. E. Mjöberg (SMNH). **No locality:** 6, 16, 23 nymphs (SMNH).

### ***Craspedorrhynchus dilatatus* (Rudow, 1869b)**

*Docophoru dilatatus* Rudow, 1869b: 14.

**Reports:** [1] Mjöberg (1910a) as *Docophorus platyrhynchus*; [2] This report.

**Type host:** *Buteo lagopus* (Pontoppidan, 1763) – rough-legged buzzard – fjällvråk<sup>H</sup> [1, 2].

**Material examined:** **Sk:** *Hässleholms kommun*: Farstorp, 1, 1, 14 Oct. 1954 (PIPeR). **Up:** *Uppsala kommun*: Uppsala, 1, 2, 2 nymphs, leg. C. Videll (SMNH). **Öl:** *Mörbylånga kommun*: Ottenby Bird

Observatory, 1, 10 Oct. 2007, leg. D. Gustafsson (SMNH). **No locality:** 6, 9, 2 nymphs (SMNH).

**Remarks:** One nymph from this host at the SMNH may also represent this species.

### ***Craspedorrhynchus haematopus* (Scopoli, 1763)**

*Pediculus haematopus* Scopoli, 1763: 381.

*Craspedorrhynchus haematopus* [Scopoli, 1763]; Clay & Hopkins, 1951: 4.

**Reports:** [1] Mjöberg (1910a) as *Docophorus asturinus*; [2] This report.

**Type host:** *Accipiter gentilis* (Linnaeus, 1758) – northern goshawk – duvhök<sup>H</sup> [1, 2].

**Material examined:** **Bo:** *Göteborgs kommun*: Hög, 2, 1, 29 Aug. 2007, leg. D. Gustafsson (SMNH).

**Sk:** *Helsingborgs kommun*: Helsingborg, 13, 14, 3 nymphs, 2 Oct. 1912, leg. H. Murchardt (SMNH).

**Up:** *Håbo kommun*: Skokloster, 1, 4 Oct. 1954, leg. Kolthoff, B.N. Naturaliemag[asin] (PIPeR). *Uppsala kommun*: Uppsala, 1, 15 Feb. 1955, leg. Kolthoff (PIPeR). Same locality, 2, 2, leg. C. Videll (SMNH).

**Vr:** *Molkoms kommun*: Lindfors, 9, 13, 9 nymphs, 28 Apr. & 3 May 1939, leg. A. Lundström (SMNH). **No locality:** 2, 2 (SMNH). 2, 1, 2 nymphs, 10 Nov. 1885 (SMNH).

### ***Craspedorrhynchus melittoscopus* (Nitzsch [in Giebel], 1874)**

*Docophorus melittoscopus* Nitzsch [in Giebel], 1874: 71.

*Craspedorrhynchus melittoscopus* (Nitzsch); Gállego *et al.*, 1987: 38.

**Reports:** [1] Mjöberg (1910a) as *Docophorus platyrhynchus*; [2] This report.

**Type host:** *Pernis apivorus* (Linnaeus, 1758) – honey buzzard – bivvråk<sup>H</sup> [1, 2].

**Material examined:** **Sk:** *Osby kommun*: Visseltofta, 1, 4 Sep. 1954 (PIPeR). **Up:** *Uppsala kommun*: Uppsala, 4, 2, leg. C. Videll (SMNH). **Unidentified locality:** Tinja [= **Vb:** *Timrå kommun*: Timrå?], 1, 6 Sep. 1955, 39 (PIPeR). **No locality:** 1, 1, 4 nymphs (SMNH).

**Material examined:** **Sk:** *Osby kommun*: Visseltofta, 1, 4 Sep. 1954 (PIPeR). **Up:** *Uppsala kommun*: Uppsala, 4, 2, leg. C. Videll (SMNH). **Unidentified locality:** Tinja [= **Vb:** *Timrå kommun*: Timrå?], 1, 6 Sep. 1955, 39 (PIPeR). **No locality:** 1, 1, 4 nymphs (SMNH).

### ***Craspedorrhynchus nisi* (Denny, 1842) New record**

*Docophorus nisi* Denny, 1842: 48.

*Craspedorrhynchus nisi* (Denny, 1842); Gállego *et al.*, 1987: 41.

**Report:** [1] This report.

**Type host:** *Accipiter nisus* Linnaeus, 1758 – Eurasian sparrowhawk – sparvhök<sup>H</sup> [1].

**Material examined:** **Vr:** *Molkoms kommun*: Lindfors, 1, 28 Apr. 1939, leg. A. Lundström (PIPeR).

**Unidentified locality:** “Heafferios” [= ?], 1, 30 Aug. 1957 (PIPeR).

***Craspedorrhynchus platystomus* (Burmeister, 1838)**

*Docophorus platystomus* Burmeister, 1838: 426.

*Craspedorrhynchus platystomus* (Burmeister, 1838); Gállego et al., 1987: 43.

*Craspedorrhynchus platystomus* (Burmeister, 1838); Dik et al. 2013:739.

**Reports:** [1] Mjöberg (1910a) as *Docophorus platyrhynchus*; [2] This report.

**Type host:** *Buteo buteo* (Linnaeus, 1758) – common buzzard – ormvråk<sup>H</sup> [1, 2].

**Material examined:** **Sk:** Hässleholms kommun: Vankiva [as “Van Viva”], 1 , 18 Oct. 1955 (PIPeR).

**Sk:** Lunds kommun: Håckeberga, 2 , 1 nymph, 2 Mar. 1939, leg. A. Lundström (SMNH). **Unidentified locality:** “Frisleholm” [= ?], 1 , 5 Apr. 1958 (PIPeR). **No locality:** 1 , 2 , 5 nymphs, 20 Dec. 1904, leg. H. Murchardt (SMNH).

***Craspedorrhynchus spathulatus* (Giebel, 1874)**

*Docophorus spathulatus* Giebel, 1874: 73.

*Craspedorrhynchus spathulatus* (Giebel, 1874); Gállego et al., 1987: 48.

**Reports:** [1] Mjöberg (1910a) as *Docophorus platyrhynchus*; [2] This report.

**Type host:** *Milvus migrans* (Boddaert, 1783) – black kite – brunglada<sup>b</sup> [1].

**Additional host in Sweden:** *Milvus milvus* (Linnaeus, 1758) – red kite – rödglada<sup>H</sup> [2].

**Material examined:** Ex *Milvus milvus*: **Up:** Uppsala kommun: Uppsala, 2 , leg. C. Videll (SMNH).

***Cuclotogaster Carriker, 1936***

**Type species:** *Cuclotogaster laticorpus* Carriker, 1936 = *Lipeurus heterographus* Nitzsch [in Giebel], 1866.

Clay (1938) reviewed the species known at the time, including both Swedish species and many species that may be found from exotic hosts kept in captivity in Sweden. Many species have been described since, and no revision of the genus has been published. Tendeiro (1958b) revised some species of African gamefowl, which may occur in captivity in Sweden.

***Cuclotogaster heterogrammicus* (Nitzsch [in Giebel], 1866) New record**

*Lipeurus heterogrammicus* Nitzsch [in Giebel], 1866: 379.

*Gallipeurus heterogrammicus* (Giebel); Clay, 1938: 142.

**Report:** [1] This report.

**Type host:** *Perdix perdix* (Linnaeus, 1758) – grey

partridge – raphhöna<sup>H</sup> [1].

**Material examined:** **Unidentified locality:** Tynaberg [= **Sö:** Nyköpings kommun: Tunaberg?], 1 , 1 , 7 Mar. 1955, 146 (PIPeR).

***Cuclotogaster heterographus* (Nitzsch [in Giebel], 1866)**

*Lipeurus heterographus* Nitzsch [in Giebel], 1866: 381.

*Gallipeurus heterographus heterographus* Giebel; Clay, 1938: 136.

**Reports:** [1] Brinck (1946a) as *Gallipeurus heterographus*; [2] Jansson et al. (2004) as *Cuclotogaster heteropalpus*.

**Type host:** *Gallus gallus* (Linnaeus, 1758) – red junglefowl (domestic chicken) – tamhöna<sup>D</sup> [1, 2].

***Cuculicola* Clay & Meinertzhagen, 1939**

**Type species:** *Nirmus latirostris* Burmeister, 1838.

No revision of the genus *Cuculicola* has been published. The genus belongs to the *Degeeriella*-complex, and is known to be paraphyletic (Johnson et al. 2002a). It is in need of revision.

***Cuculicola latirostris* (Burmeister, 1838)**

*Nirmus latirostris* Burmeister, 1838: 429.

**Reports:** [1] Mjöberg (1910a) as *Nirmus fenestratus*; [2] Ash (1960); [3] This report.

**Type host:** *Cuculus canorus* Linnaeus, 1758 – common cuckoo – gök<sup>H</sup> [1, 2, 3].

**Material examined:** **Sk:** Hässleholms kommun: Stoby, 1 , 4 Sep. 1955, 88 (PIPeR). **Up:** Uppsala kommun: Uppsala, 1 , leg. C. Videll (SMNH). **Unidentified locality:** Tjarlov [= **Sk:** Hässleholms kommun: Tjärön?], 1 , 29 Jun. 1960, leg. S. Linder, 83 (PIPeR).

***Cuculoecus* Ewing, 1926a**

**Type species:** *Docophorus coccygi* Osborn, 1896.

There is no published revision of *Cuculoecus*. Eichler (1963) placed this genus close to *Philopterus*, and we here include it tentatively in the *Philopterus*-complex in the key.

***Cuculoecus latifrons* (Denny, 1842)**

*Docophorus latifrons* Denny, 1842: 46.

**Reports:** [1] Mjöberg (1910a) as *Docophorus latifrons*; [2] This report.

**Type host:** *Cuculus canorus* Linnaeus, 1758 – common cuckoo – gök<sup>H</sup> [1, 2].

**Material examined:** **Sk:** Ystads kommun: Ystad, 1 , 9 Jun. 1959, leg. H. Lundgren, 85 (PIPeR). **Up:** Stockholm, 2 nymphs, leg. E. Mjöberg (SMNH). **Un-**



**identified locality:** Stockey [ = **Vb:** Umeå: Stöcke? ], 1 , 19 Jul. 1961, leg. G. Noreus, 81 (PIPeR). **No locality:** 1 (SMNH).

### **Cummingsiella Ewing, 1930**

**Type species:** *Docophorus testudinarius* Denny, 1842 = *Pediculus ovalis* Scopoli, 1763.

Timmermann (1972) argued that the genus *Cummingsiella* cannot be reliably separated from *Quadriceps*, and that the former genus has priority over the latter. Nevertheless, subsequent checklists [e.g. Ledger (1980); Price *et al.* (2003a)] have kept these two genera separate. We have not separated these two genera in the key. See *Quadriceps* for further information on the *Quadriceps*-complex, to which *Cummingsiella* belongs. No revision of *Cummingsiella* as circumscribed here has been published, but Timmermann (1957) provides an illustration and some comments.

### **Cummingsiella ambigua (Burmeister, 1838) New record**

*Docophorus ambiguus* Burmeister, 1838: 426.

**Report:** [1] This report.

**Type host:** *Gallinago gallinago* (Linnaeus, 1758) – common snipe – enkelbeckasin<sup>H</sup> [1].

**Material examined: Sk:** Vellinge kommun: Falsterbo, 1 , 2 , 1 nymph, 5 Aug. 1963, leg. F. Balát, 1285 (MMBC); **Up:** Uppsala kommun: Uppsala, 1 nymph, leg. C. Videll (SMNH).

### **Cummingsiella aurea Hopkins, 1949**

*Cummingsiella aurea* Hopkins, 1949: 31.

**Reports:** [1] Mjöberg (1910a) as *Docophorus auratus*; [2] This report.

**Type host:** *Scolopax rusticola* Linnaeus, 1758 – Eurasian woodcock – morkulla<sup>H</sup> [1, 2].

**Material examined: Sk:** Hässleholms kommun: Vankiva, 1 , 7 May, 1939, leg. A. Lundström (SMNH). **Vr:** Torsby kommun: Munkebol, 13 , 12 , 38 nymphs, 5 May, 1940, leg. A. Lundström (SMNH). **Vg:** Borås kommun: Borås, 2 , 12 , 14 nymphs, leg. 19 Apr. 1939, A. Lundström (SMNH). **Svenljunga kommun:** Ånarp, 2 , 2 , 3 nymphs, 9 May, 1940, leg. A. Lundström (SMNH). **No locality:** 1 , 3 (SMNH).

### **Cummingsiella ovalis (Scopoli, 1763)**

*Pediculus ovalis* Scopoli, 1763: 384.

*Cummingsiella ovalis* [Scopoli, 1763]; Clay & Hopkins, 1951: 21.

**Reports:** [1] Mjöberg (1910a) as *Docophorus testudinarius*; [2] This report.

**Type host:** *Numenius arquata* (Linnaeus, 1758) – Eurasian curlew – storspov<sup>H</sup> [1, 2].

**Material examined: Sk:** Lunds kommun: Silvåkra, 16 , 11 , 9 nymphs, 23 Apr. 1939, leg. A. Lundström (SMNH). Same locality, 6 , 5 , 10 nymphs, 15 & 18 May 1940, leg. A. Lundström (SMNH). **Up:** Uppsala kommun: Uppsala, 4 , 3 , 4 nymphs, leg. C. Videll (SMNH). **No locality:** 1 , 2 , 1 nymph (SMNH).

### **Degeeriella Neumann, 1906**

**Type species:** *Nirmus discocephalus* Burmeister, 1838.

*Degeeriella* forms the core of the *Degeeriella*-complex, and is known to be paraphyletic (Johnson *et al.* 2002a; Catanach & Johnson 2015). Clay's (1958) revision of *Degeeriella* includes illustrations and descriptions of all Swedish species.

### **Degeeriella aquilarum Eichler, 1943 New record**

*Degeeriella aquilarum* Eichler, 1943: 92.

*Degeeriella discocephalus aquilarum* Eichler, 1943; Clay, 1958: 170.

**Report:** [1] This report.

**Type host:** *Spizaetos nipalensis nipalensis* Hodgson, 1836 – mountain hawk-eagle – berghökörn<sup>E</sup>.

**Host in Sweden:** *Aquila chrysaetos* (Linnaeus, 1758) – golden eagle – kungsörn<sup>H</sup> [1].

**Material examined: Bo:** Kungälv kommun: Marstrand, 1 , 10 Feb. 1957, leg. Enemyr (PIPeR). **Up:** Stockholm, 1 , 1909, leg. E. Mjöberg (SMNH). **No locality:** 1 , 3 Feb. 1957, leg. [H.] Stenram (PIPeR).

**Remarks:** The type host does not occur in Sweden, and no specimens of *D. aquilarum* is thus known from the type host in Sweden.

### **Degeeriella fulva (Giebel, 1874)**

*Nirmus fulvus* Giebel, 1874: 124.

*Degeeriella fulva* (Giebel), 1874; Clay, 1958: 144.

**Reports:** [1] Mjöberg (1910a) as *Nirmus fuscus*; [2] This report.

**Type host:** *Buteo buteo* (Linnaeus, 1758) – common buzzard – ornvårk<sup>H</sup> [1, 2].

**Additional host in Sweden:** *Buteo lagopus* (Pontopidan, 1763) – rough-legged buzzard – fjällvråk<sup>H</sup> [2].

**Material examined: Ex Buteo buteo: Sk:** Lunds kommun: Häckeberga, 1 , 1 nymph, 2 Mar. 1939, leg. A. Lundström (SMNH). *Svedala kommun:* Börtinge, 1 , 2 , 1 nymph, 8 Nov. 1939, leg. A. Lundström

(SMNH). **No locality:** 2 ♀, 2 nymphs, 20 Dec. 1904, leg. H. Murchardt (SMNH). 16 ♀, 29 ♀, 5 nymphs (SMNH).

Ex *B. lagopus*: **Sk:** *Svedata kommun*: Börringe, 1 ♀, 1 ♀, 8 Nov. 1939, leg. A. Lundström (SMNH).

**Remarks:** 1 nymph collected from *Aquila chrysaetos* and 1 nymph from *B. buteo* at SMNH may belong to this species.

### *Degeeriella nisus* (Giebel, 1866)

*Nirmus nisus* Giebel, 1866: 364.

*Degeeriella nisus* (Giebel); Clay, 1958: 155.

**Reports:** [1] Mjöberg (1910a) as *Nirmus rufus*; [2] Catanach & Johnson (2015); [3] This report.

**Type host:** *Accipiter nisus* (Linnaeus, 1758) – Eurasian sparrowhawk – sparvhök<sup>H</sup> [1, 2, 3].

**Material examined:** **Sk:** *Helsingborgs kommun*: Helsingborg, 4 ♀, 2 nymphs, 15 Apr. 1913, leg. H. Murchardt (SMNH); **Öl:** *Mörbylånga kommun*: Ottenby Bird Observatory, 2 ♀, 24 Sep. 2007, leg. D. Gustafsson (SMNH).

### *Degeeriella phlyctopygus* (Nitzsch [in Giebel], 1861) New record

*Nirmus phlyctopygus* Nitzsch [in Giebel], 1861: 526.

*Degeeriella phlyctopygus* (Nitzsch); Clay, 1957: 340.

*Degeeriella phlyctopygus* (Nitzsch), 1861; Clay, 1958: 193.

**Report:** [1] This report.

**Type host:** *Pernis apivorus* (Linnaeus, 1758) – honey buzzard – bivvråk<sup>H</sup> [1].

**Material examined:** **Nä:** *Örebro kommun*: Garpshyttan [as Sarpshyttan], 1 ♀, 1 Sep. 1954, leg. T. Hansson, 40 (PIPeR). **Up:** *Uppsala kommun*: Uppsala, 1 ♀, leg. C. Videll (SMNH).

### *Degeeriella regalis* (Giebel, 1866)

*Nirmus regalis* Giebel, 1866: 364.

*Degeeriella regalis regalis* (Giebel), 1866; Clay, 1958: 186.

**Reports:** [1] Mjöberg (1910a) as *Nirmus fuscus*; [2] This report.

**Type host:** *Milvus milvus* (Linnaeus, 1758) – red kite – rödgglada<sup>H</sup> [1, 2].

**Material examined:** **Up:** *Uppsala kommun*: Uppsala, 1 ♀, 2 ♀, leg. C. Videll (SMNH). **No locality:** 2 nymphs (SMNH).

### *Degeeriella rufa* (Burmeister, 1838)

*Nirmus rufus* Burmeister, 1838: 430.

*Degeeriella rufa rufa* (Burmeister), 1838; Clay, 1958: 180.

**Reports:** [1] Mjöberg (1910a) as *Nirmus rufus*; [2] This report.

**Type host:** *Falco tinnunculus* Linnaeus, 1758 – Eurasian kestrel – tornfalk<sup>H</sup> [1, 2].

**Additional hosts in Sweden:** *Falco columbarius* Linnaeus, 1758 – merlin – stenfalk<sup>H</sup> [1, 2]. *Falco peregrinus* Tunstall, 1771 – peregrine falcon – pilgrimsfalk<sup>H</sup> [2]. *Falco subbuteo* Linnaeus, 1758 – Eurasian hobby – lärkfalk<sup>H</sup> [1, 2].

**Additional hosts in Sweden (stragglers?):** *Accipiter nisus* (Linnaeus, 1758) – Eurasian sparrowhawk – sparvhök [2].

**Material examined:** Ex *Accipiter nisus*: **Up:** *Uppsala kommun*: Uppsala, 2 ♀, 1 nymph, leg. C. Videll (SMNH).

Ex *Falco columbarius*: **Sk:** *Trelleborg kommun*: Anderslöv, 3 ♀, 8 ♀, 1 nymph, 21 Mar. 1939, leg. A. Lundström (SMNH). **No locality:** 11 ♀, 35 ♀, 10 nymphs, (SMNH).

Ex *Falco peregrinus*: **Sk:** *Vellinge kommun*: Vellinge, 2 ♀, 1 ♀, 20 Oct. 1939, leg. A. Lundström (SMNH).

Ex *Falco subbuteo*: **No locality:** 1 ♀, 1 ♀ (SMNH).

Ex *Falco tinnunculus*: **Sk:** *Vellinge kommun*: Falsterbo, 1 nymph, 27 Aug. 1963, leg. F. Balát, 1254 (MMBC); **Up:** *Uppsala kommun*: Uppsala, 2 ♀, 2 nymphs, leg. C. Videll (SMNH).

**Remarks:** Nine females from *F. columbarius* and ten specimens from *F. subbuteo* at the SMNH may be this species, but specimens are too poorly preserved to be identified accurately. The specimens from *A. nisus* keyed out to *D. rufa* in the key of Clay (1958), and may represent stragglers, contaminates, or host misidentifications.

### *Degeeriella vagans* (Giebel, 1874)

*Nirmus vagans* Giebel, 1874: 126.

*Degeeriella nisus vagans* (Giebel), 1874; Clay, 1958: 157.

**Report:** [1] Catanach & Johnson (2015); [2] This report.

**Type host:** *Accipiter gentilis* (Linnaeus, 1758) – northern goshawk – duvhök<sup>H</sup> [1, 2].

**Material examined:** **Up:** *Uppsala kommun*: Uppsala, 3 ♀, 12 ♀, 5 nymphs, leg. C. Videll (SMNH). **Vg:** *Askersunds kommun*: Aspa Bruk [as Aspa Brul], 1 ♀, 20 Oct. 1959, leg. S.L. (PIPeR). *Göteborgs kommun*: Göteborg, 1 ♀, 17 Feb. 1957, leg. Enemyr (PIPeR).

### *Esthiopterum* Harrison, 1916

**Type species:** *Philoapterus ebraeus* Nitzsch = *Pediculus gruis* Linnaeus, 1758.

No revision of *Esthiopterum* has been published. It belongs to the *Esthiopterum*-complex.

***Esthiopterum gruis* (Linnaeus, 1758)**

*Pediculus gruis* Linnaeus, 1758: 613.

*Esthiopterum gruis* [Linnaeus, 1758]; Clay & Hopkins, 1950: 248.

**Reports:** [1] Linnaeus (1746) as *Pediculus gruis*; [2] Mjöberg (1910a) as *Lipeurus hebraeus*; [3] This report.

**Type host:** *Grus grus* (Linnaeus, 1758) – common crane – trana<sup>H</sup> [1, 2, 3].

**Material examined: Sk:** “North Sk”, 11 , 5 , 9 nymphs, 18 Jul. 1931, leg. H. Murchardt (SMNH).

**Up:** *Uppsala kommun*: Uppsala, 1 , leg. C. Videll (SMNH). **No locality:** 1 , 2 , 1 nymph (SMNH).

***Falcolipeurus Bedford, 1931***

**Type species:** *Lipeurus secretarius* Giebel, 1874.

No useful revision of *Falcolipeurus* has been published. Tandan (1964) provides some photos and descriptive notes of the only species of the genus known from Sweden.

***Falcolipeurus suturalis* (Rudow, 1869b)**

*Lipeurus suturalis* Rudow, 1869b: 44.

**Reports:** [1] Mjöberg (1910a) as *Lipeurus quadri-pustulatus*; [2] This report.

**Type host:** *Aquila chrysaetos* (Linnaeus, 1758) – golden eagle – kungsörn<sup>H</sup> [1, 2].

**Material examined: Up:** Stockholm, 10 , 18 , 7 nymphs, 1909, leg. E. Mjöberg (SMNH).

***Fulicoffula Clay & Meinertzhagen, 1938a***

**Type species:** *Philopterus luridus* Nitzsch, 1818.

No revision of *Fulicoffula* has been published. It is part of the *Esthiopterum*-complex (Gustafsson & Olsson 2017).

***Fulicoffula lurida* (Nitzsch, 1818)**

*Philopterus luridus* Nitzsch, 1818: 292.

**Reports:** [1] Mjöberg (1910a) as *Lipeurus luridus*; [2] This report.

**Type host:** *Fulica atra* Linnaeus, 1758 – Eurasian coot – sothöna<sup>H</sup> [1, 2].

**Material examined: Sk:** *Sjöbo kommun*: Sövdeborg, 1 , 30 Mar. 1939, leg. A. Lundström (SMNH).

***Guimaraesiella Eichler, 1949a***

**Type species:** *Docophorus subalbicans* Piaget, 1885 = *Docophorus papuanus* Giebel, 1879.

The genus *Guimaraesiella* is a member of the *Brueelia*-complex, and was treated as a synonym of *Brueelia* Kéler, 1936, by Price (*et al.* 2003a). It was resurrected as a valid genus by Bush *et al.* (2016) and Gustafsson & Bush (2017) on ge-

netic and morphological grounds. *Guimaraesiella* was originally described for a louse species parasitizing a bird-of-paradise (Paradisaeidae), and never gained much acceptance. In much of the literature of the 20<sup>th</sup> century, species now placed in *Guimaraesiella* were placed in either *Brueelia* or *Allobrueelia* Eichler, 1951, including the two species known from Sweden.

*Guimaraesiella* is a highly variable genus, in which virtually no species have ever been satisfactorily described. It has a global distribution, and species of *Guimaraesiella* can be expected from almost any host family among the Old World passerines, but is more restricted in the New World (Gustafsson & Bush 2017; unpublished data). Several species have very wide host ranges (Bush *et al.* 2016), and many of the *Brueelia*-complex species known to be phoretic (able to hitch-hike between host on hippoboscid flies; Bartlow *et al.* 2016) belong in *Guimaraesiella* (Gustafsson & Bush 2017).

No comprehensive revision of the genus has ever been published, and many species are separated on measurements or host associations alone in the original descriptions. Identification to species level in this genus must presently not be attempted without comparison with published descriptions, identified genetic sequences, or identified slide-mounted specimens. Identification based on host associations is inadequate, and novel host associations do not automatically imply novel species, as has been assumed for much of the 20<sup>th</sup> and early 21<sup>st</sup> centuries. Redescriptions of many species in *Guimaraesiella*, including the two species on the Swedish list, are under preparation (Gustafsson & Bush, *in prep.*).

***Guimaraesiella marginata* (Burmeister, 1838)**

*Nirmus marginatus* Burmeister, 1838: 429.

**Reports:** [1] Mjöberg (1910a) as *Nirmus marginatus*; [2] Thompson (1935a) as *Degeeriella marginalis*; [3] Gustafsson & Bush (2017); [4] This report.

**Type host:** *Turdus pilaris* Linnaeus, 1758 – fieldfare. – björktrast<sup>H</sup> [1, 2, 3]

**Material examined: Dr:** *Falun kommun*: Kyrkbyttjärn, 2 , 2 , 15 Jun. 2014, leg. D. Gustafsson (SMNH). Haga, 1 , 1 , 12 Jun. 2014, leg. D. Gustafsson (SMNH). **Up:** *Uppsala kommun*: Uppsala, 4 , 4 , Oct. 1946, leg. R. Meinertzhagen, 16097 (NHML).

**Remarks:** Thompson's report concerns a specimen taken from the abdomen of the hippoboscid fly *Ornithomyia chloropus* Bergroth, 1901. The NHML specimens examined includes the neotype, neoallotype, and neoparatypes of the species.

### *Guimaraesiella turdinulae* (Ansari, 1956a)

#### New record

*Brueelia turdinulae* Ansari, 1956a: 126.

**Report:** [1] This report.

**Type host:** *Turdus philomelos philomelos* Brehm, 1831 – song thrush – taltrast <sup>H</sup> [1].

**Material examined: Vg:** *Svenljunga kommun:* Ånarp, 1 , 2 , 1 nymph, 15 Apr. 1940, leg. A. Lundström (SMNH).

### *Hecatrishula* Gustafsson & Bush, 2017

**Type species:** *Brueelia atherae* Ansari, 1957.

The species here included in *Hecatrishula* were previously considered part of *Brueelia* Kéler, 1936, and are listed under this genus in the checklist of Price *et al.* (2003a). Both Swedish species were described and illustrated by Ansari (1957).

### *Hecatrishula atherae* (Ansari, 1957)

*Brueelia atherae* Ansari, 1957: 161.

*Hecatrishula atherae* (Ansari, 1957); Gustafsson & Bush, 2017: 89.

**Report:** [1] Mjöberg (1910a) as *Nirmus varius*.

**Type host:** *Corvus corax tibetanus* Hodgson, 1849 – common raven – korp <sup>H</sup>.

**Host in Sweden:** *Corvus corax corax* Linnaeus, 1758 – common raven (*corax*) – korp [1].

### *Hecatrishula varia* (Burmeister, 1838)

*Nirmus varius* Burmeister, 1838: 430.

*Brüelia varia* (Burmeister), 1838; Ansari, 1957: 166.

**Reports:** [1] Mjöberg (1910a) as *Nirmus varius*; [2] Gustafsson & Bush (2017); [3] This report.

**Type host:** *Corvus monedula* Linnaeus, 1758 – Eurasian jackdaw – kaja <sup>H</sup> [1, 2].

**Material examined: Sk:** *Sjöbo kommun:* Sövdeborg, 1 , 30 Mar. 1939, leg. A. Lundström (SMNH). **No locality:** 2 , 1 , Oct. 1946, leg. R. Meinertzhagen, 16109 (NHML).

### *Incidifrons* Ewing, 1929

**Type species:** *Docophorus pertusus* Burmeister, 1838 = *Pediculus fulicae* Linnaeus, 1758.

No revision of *Incidifrons* has been published,

but good illustrations were published by Clay & Hopkins (1950). It belongs to the *Quadriceps*-complex.

### *Incidifrons fulicae* (Linnaeus, 1758)

*Pediculus fulicae* Linnaeus, 1758: 613.

*Incidifrons fulicae* [Linnaeus, 1758]; Clay & Hopkins, 1950: 255.

**Reports:** [1] Mjöberg (1910a) as *Docophorus pertusus*; [2] This report.

**Type host:** *Fulica atra* Linnaeus, 1758 – Eurasian coot – sothöna <sup>H</sup> [1, 2].

**Material examined: Up:** Stockholm: 1 , leg. E. Mjöberg (SMNH).

### *Lagopoecus* Waterston, 1922

**Type species:** *Nirmus cameratus* Burmeister, 1838 = *Lagopoecus lyrurus* Clay, 1938.

The genus *Lagopoecus* was revised by Clay (1938) for most Swedish species, as well as many that may occur on exotic hosts kept in captivity in Sweden.

### *Lagopoecus affinis* (Children, 1836)

*Nirmus affinis* Children, 1836: 537.

*Lagopoecus affinis* (Children); Clay, 1938: 190.

**Reports:** [1] Brinck (1946b); [2] Overgaard (1952); [3] This report.

**Type host:** *Lagopus lagopus* (Linnaeus, 1758) – willow ptarmigan – dalripa <sup>H</sup> [1, 2, 3].

**Additional host in Sweden:** *Lagopus muta* (Montin, 1781) – rock ptarmigan – fjällripa <sup>H</sup> [1, 2, 3].

**Material examined: Jä:** *Åre kommun:* Undersåker, 1 , 11 Feb. 1957, leg. E. Regnell, 156 (PIPeR). **Unidentified locality:** “Nat-teshorn” [= ?], 1 , 15 Dec. 1957, leg. O. Bergman, 163 (PIPeR).

Ex *Lagopus muta:* **Lapland:** *Jokkmokks kommun:* Virihaure, 1 , 1 , Jul.-Aug. 1944, leg. P. Brinck & K.G. Wingstrand, 169 (PIPeR).

### *Lagopoecus colchicus* Emerson, 1949 New record

*Lagopoecus colchicus* Emerson, 1949: 78.

**Report:** [1] This report.

**Type host:** *Phasianus colchicus torquatus* Gmelin, 1789 – ring-necked pheasant (*torquatus*) -- fasan <sup>H</sup>.

**Host in Sweden:** *Phasianus colchicus* Linnaeus, 1758 – ring-necked pheasant – fasan <sup>H</sup> [1].

**Material examined: Sk:** *Lomma kommun:* Lomma, 1 , 22 Mar. 1939, leg. A. Lundström, 2 (PIPeR). 4 , 3 , 6 nymphs, 22 Mar. 1939, leg. A. Lundström (SMNH). *Trelleborgs kommun:* Alstad, 1 , 20 Nov. 1960, leg. H. Lundgren, 9 (PIPeR).

**Remarks:** The hosts of the examined specimens were not identified to subspecies level, and several subspecies occur in Sweden.

### ***Lagopoecus lyrurus* Clay, 1938**

*Lagopoecus lyrurus* Clay, 1938: 188.

**Reports:** [1] Mjöberg (1910a) as *Nirmus quadrulatus*; [2] This report.

**Type host:** *Tetrao tetrix* (Linnaeus, 1758) – black grouse – orre<sup>H</sup> [1, 2].

**Material examined: Vr:** *Eda kommun:* Skönnerud, 4, 1, 9 nymphs, 8 Apr. 1939, leg. A. Lundström (SMNH). *Torsby kommun:* Munkebol, 1, 10 May 1939, leg. A. Lundström, 110 (PIPeR). 20, 22, 21 nymphs, 10 May, 1939, leg. A. Lundström (SMNH). **Ög:** *Boxholms kommun:* Sandvik, 2, 3, 2 nymphs, 9 Apr. 1940, leg. A. Lundström (SMNH). **Unidentified locality:** Ferstop [= **Sk:** *Perstorps kommun:* Perstop?], 1, 3 Dec. 1962, leg. S. Linder, 99 (PIPeR).

### ***Lagopoecus pallidovittatus* (Grube, 1851)**

*Nirmus pallidovittatus* Grube, 1851: 474.

*Lagopoecus pallidovittatus* (Grube); Clay, 1938: 191.

**Report:** [1] Mjöberg (1910a) as *Nirmus quadrulatus*; [2] This report.

**Type host:** *Tetrao urogallus* Linnaeus, 1758 – western capercaillie – tjäder<sup>H</sup> [1, 2].

**Material examined: Sk:** *Örkelljunga kommun:* Åsljunga, 3, 4, 1 nymph, 20 Apr. 1939, leg. A. Lundström (SMNH). **Up:** *Uppsala kommun:* Norrgarn, 8, 10, 23 nymphs, 10 Sep. 1926, leg. C. Videll (SMNH). *Östhammars kommun:* Harg, 15, 11, 4 nymphs, 16 Nov. 1939, leg. A. Lundström (SMNH). **Vr:** *Säffle kommun:* Vrsnäs, 1, 5 Apr. 1958, leg. Enemyr, 23 (PIPeR). *Torsby kommun:* Munkebol, 7, 17, 1 nymph, 28 Apr. 1939, leg. A. Lundström (SMNH). **Än:** *Hudiksvalls kommun:* Djuped, 2, 3 nymphs, 11 Jul. 1939, leg. A. Lundström (SMNH). **Unidentified locality:** Taxån [= **Ds:** *Dals-Ed kommun:* Taxån?], 1, leg. O. Bergman, 91 (PIPeR). **No locality:** 2, 2 (SMNH).

### ***Lagopoecus tetrastei* Bechet, 1963 New record**

*Lagopoecus tetrastei* Bechet, 1963: 250.

**Report:** [1] This report.

**Type host:** *Bonasa bonasia* Linnaeus, 1758 – hazel grouse – järpe<sup>H</sup> [1].

**Material examined: Ds:** *Bengtsfors kommun:* Bengtsfors, 1, 25 Mar. 1958, 182 (PIPeR).

### ***Lipeurus Nitzsch, 1818***

**Type species:** *Pediculus caponis* Linnaeus, 1758.

The genus *Lipeurus* was revised by Clay (1938), which includes illustrations and descriptions of both Swedish species.

### ***Lipeurus caponis* (Linnaeus, 1758)**

*Pediculus caponis* Linnaeus, 1758: 614.

*Lipeurus caponis* (Linné); Clay, 1938: 111.

**Reports:** [1] Linnaeus (1746) as *Pediculus gallinae*; [2] Linnaeus (1758: 614); [3] Mjöberg (1910a) as *Lipeurus variabilis*; [4] Brinck (1946a); [5] This report.

**Type host:** *Gallus gallus* (Linnaeus, 1758) – red junglefowl (domestic chicken) – tamhöna<sup>D</sup> [1, 2, 3, 4, 5].

**Material examined: No locality:** 3, 15 Jan. 1908, leg. Ekblom (SMNH).

### ***Lipeurus maculosus* Clay, 1938 New record**

*Lipeurus maculosus* Clay, 1938: 116.

**Report:** [1] This report.

**Type host:** *Phasianus colchicus* Linnaeus, 1758 – ring-necked pheasant – fasan<sup>H</sup> [1].

**Additional host in Sweden:** *Perdix perdix* (Linnaeus, 1758) – grey partridge – raphhöna<sup>H</sup> [1].

**Material examined:** Ex *Perdix perdix:* Blekinge: *Ronneby kommun:* Vambåsa, 3, 5 Aug. 1938, leg. A. Lundström (SMNH).

Ex *Phasianus colchicus:* Sk: *Lomma kommun:* Lomma, 4, 1 nymph, 22 Mar. 1939, leg. A. Lundström (SMNH). *Lunds kommun:* Silvåkra, 2, 3, 3 May 1939, leg. A. Lundström (SMNH). *Ystads kommun:* Ystad, 1, 3 May 1939, leg. A. Lundgren, 19 (PIPeR). Up: *Uppsala kommun:* Rasbo, 1, 20 Oct. 1954, leg. Koltoffs Naturaliemag[asin], 15 (PIPeR).

### ***Lunaceps* Clay & Meinertzhagen, 1939**

**Type species:** *Nirmus actophilus* Kellogg & Chapman, 1899.

The genus *Lunaceps* was revised by Timmermann (1954d) and Gustafsson & Olsson (2012b). References are made below only to the latter revision, as this provided more complete illustrations to all Swedish species, and is based partially on Swedish material. *Lunaceps* is part of the *Quadriceps*-complex, and may be nested inside *Lunaceps* (Gustafsson 2012).

### ***Lunaceps actophilus* (Kellogg & Chapman, 1899)**

*Nirmus actophilus* Kellogg & Chapman, 1899: 78.

*Lunaceps actophilus* (Kellogg & Chapman, 1899); Gustafsson & Olsson, 2012b: 11.

**Reports:** [1] Gustafsson & Olsson (2012a); [2] Gustafsson & Olsson (2012b); [3] This report.

**Type host:** *Calidris alba* (Pallas, 1764) – sanderling – sandlöpare<sup>F</sup> [1, 2, 3].

**Material examined: Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1, 30 Jul. 2007, leg. D. Gustafsson (GNM). Same locality, 1, 31 Jul. 2007, leg. D. Gustafsson (GNM). Same locality, 1, 30 Jul. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Calidris alba* likely belong to this species.

### *Lunaceps drosti* Timmermann, 1954d

*Lunaceps drosti* Timmermann, 1954d: 627.

*Lunaceps drosti* Timmermann, 1954d; Gustafsson & Olsson, 2012b: 19.

**Reports:** [1] Gustafsson & Olsson (2012a); [2] Gustafsson & Olsson (2012b); [3] This report.

**Type host:** *Calidris canutus* (Linnaeus, 1758) – red knot – kustsnäppa<sup>F</sup> [1, 2, 3].

**Material examined:** **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 27 Jul. 2007, leg. D. Gustafsson (GNM). Same locality, 1, 24 Jul. 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 23 Jul. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Calidris canutus* likely belong to this species.

### *Lunaceps falcinellus* Timmermann, 1954d

*Lunaceps falcinellus* Timmermann, 1954d: 627.

*Lunaceps falcinellus* Timmermann, 1954d; Gustafsson & Olsson, 2012b: 24.

**Reports:** [1] Gustafsson & Olsson (2012a) as *Lunaceps timmermanni*; [2] Gustafsson & Olsson (2012b); [3] This report.

**Type host:** *Calidris falcinellus falcinellus* (Pontoppidan, 1763) – broad-billed sandpiper – myrsnäppa<sup>H</sup> [1, 2, 3].

**Additional hosts in Sweden:** *Calidris ferruginea* (Pontoppidan, 1763) – curlew sandpiper – spovsnäppa<sup>F</sup> [1, 2, 3]. *Calidris minuta* (Leisler, 1812) – little stint – småsnäppa<sup>F</sup> [1, 2, 3].

**Material examined:** Ex *Calidris ferruginea*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2, 30 Jul. 2007, leg. D. Gustafsson (YIO). Same locality, 1, 23 Jul. 2007, leg. D. Gustafsson (YIO). Same locality, 1, 23 Jul. 2007, leg. D. Gustafsson (GNM). Same locality, 1, 23 Jul. 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 25 Jul. 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 30 Jul. 2007, leg. D. Gustafsson (SMNH). Same locality, 1 nymph, 26 Jul. 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 21 May 2007, leg. D. Gustafsson (GNM). Same locality, 1, 1, 24 Jul. 2007, leg. D. Gustafsson (GNM). Same locality, 1, 1, 25 Jul. 2007, leg. D. Gustafsson (GNM). Same locality, 1, 30 Jul. 2007, leg. D. Gustafsson (GNM). Same locality, 1, 2 Aug. 2007, leg. D. Gustafsson (GNM).

Ex *Calidris minuta*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2, 21 May 2007, leg. D. Gustafsson (SMNH). Same locality, 2, 21 May

2007, leg. D. Gustafsson (GNM).

Ex *Limicola falcinellus*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 1, 25 May 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 29 May 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 1, 25 May 2007, leg. D. Gustafsson (GNM). Same locality, 1, 29 May 2007, leg. D. Gustafsson (GNM).

**Remarks:** Mjöberg (1910a) reported *Nirmus furvus* Burmeister, 1838, from *C. ferruginea*, which may be a reference to *L. falcinellus*.

### *Lunaceps holophaeus* (Burmeister, 1838)

*Nirmus holophaeus* Burmeister, 1838: 427.

*Lunaceps holophaeus* (Denny, 1842); Gustafsson & Olsson, 2012b: 28.

**Reports:** [1] Gustafsson & Olsson (2012a); [2] Gustafsson & Olsson (2012b); [3] This report.

**Type host:** *Calidris pugnax* (Linnaeus, 1758) – ruff – brushane<sup>H</sup> [1, 2, 3].

**Material examined:** **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 7 Aug. 2007, leg. D. Gustafsson (SMNH).

### *Lunaceps limosella* Timmermann, 1954d

*Lunaceps limosella* Timmermann, 1954d: 629.

*Lunaceps limosella* Timmermann, 1954d; Gustafsson & Olsson, 2012b: 42.

**Reports:** [1] Mjöberg (1910a) as *Nirmus phaeopi*; [2] This report.

**Type host:** *Limosa lapponica* (Linnaeus, 1758) – bartailed godwit – myrspov<sup>H</sup> [1, 2].

**Material examined:** **Up:** Uppsala kommun: Uppsala, 1, leg. C. Videll (SMNH).

### *Lunaceps numenii numenii* (Denny, 1842)

*Nirmus numenii* Denny, 1842: 53.

*Lunaceps numenii numenii* (Denny, 1842); Gustafsson & Olsson, 2012b: 51.

**Reports:** [1] Mjöberg (1910a) as *Nirmus inaequalis*; [2] This report.

**Type host:** *Numenius arquata* (Linnaeus, 1758) – Eurasian curlew – storspov<sup>H</sup> [1, 2].

**Material examined:** **Sk:** Lunds kommun: Silvåkra, 4, 3 nymphs, 23 Apr. 1939, leg. A. Lundström (SMNH). Same locality, 7, 6, 3 nymphs, 15 & 18 May 1939, leg. A. Lundström (SMNH). **Up:** Stockholms kommun: Skansen, 5, 6, 1 nymph, leg. E. Mjöberg (SMNH). **Uppsala kommun:** Uppsala, 2, leg. C. Videll (SMNH). **No locality:** 1 (SMNH).

### *Lunaceps numenii phaeopi* (Denny, 1842)

*Nirmus phaeopi* Denny, 1842: 54.

*Lunaceps numenii phaeopi* (Denny, 1842); Gustafsson

son & Olsson, 2012b: 57.

**Reports:** [1] Overgaard (1942) as *Nirmus phaeopi*; [2] Gustafsson & Olsson (2012a) as *Lunaceps phaeopi*; [3] Gustafsson & Olsson (2012b); [4] This report.

**Type host:** *Numenius phaeopus* (Linnaeus, 1758) – whimbrel – småspov<sup>H</sup> [1, 2, 3, 4].

**Material examined: ÖI:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 nymph, 4 Aug. 2007, leg. D. Gustafsson (SMNH).

**Remarks.** Nymphal material identified by comparison with other nymphal material, and by genetic similarities to extralimital adult material (Gustafsson & Olsson 2012a) of the same species (Gustafsson & Olsson 2012a).

### ***Lunaceps rothkoi* Gustafsson & Olsson, 2012b**

*Lunaceps rothkoi* Gustafsson & Olsson, 2012b: 66.

**Reports:** [1] Gustafsson & Olsson (2012a) as *Lunaceps falcinellus*; [2] Gustafsson & Olsson (2012b); [3] This report.

**Type host:** *Calidris subruficollis* (Vieillot, 1819) – buff-breasted sandpiper – prärielöpare<sup>R</sup> [1, 2, 3].

**Material examined: ÖI:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 , 12 Oct. 2007, leg. D. Gustafsson (SMNH).

### ***Lunaceps schismatus* Gustafsson & Olsson, 2012b**

*Lunaceps schismatus* Gustafsson & Olsson, 2012b: 68.

**Reports:** [1] Gustafsson & Olsson (2012a) as *Lunaceps actophilus*; [2] Gustafsson & Olsson (2012b); [3] This report.

**Type host:** *Calidris alpina alpina* (Linnaeus, 1758) – dunlin (*alpina*) – kärnsnäppa<sup>H</sup> [1, 2, 3].

**Additional host in Sweden:** *Calidris alpina schinzii* (C.L. Brehm & Schilling, 1822) – dunlin (*schinzii*) – sydlig kärnsnäppa<sup>H</sup> [1, 2, 3].

**Material examined: Ex *Calidris alpina alpina*: ÖI:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 , 10 May 2007, leg. D. Gustafsson (SMNH). Same locality, 1 , 10 May 2007, leg. D. Gustafsson (GNM). Same locality, 1 , 25 May 2007, leg. D. Gustafsson (SMNH). Same locality, 1 , 25 May 2007, leg. D. Gustafsson (GNM). Same locality, 1 , 11 May 2007, leg. D. Gustafsson (YIO). Same locality, 1 , 11 May 2007, leg. D. Gustafsson (GNM).

**Ex *C. a. schinzii*: ÖI:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 , 22 May 2007, leg. D. Gustafsson (SMNH). Same locality, 1 , 22 May 2007, leg. D. Gustafsson (GNM).

**Ex *C. alpina* ssp.:** **Sk:** *Vellinge kommun:* Falsterbo, 3 , 10 , 5 nymphs, 22 Aug. 1963, leg. F. Balát, 1262

(MMBC). Same locality, 6 , 4 , 5 Aug. 1963, leg. F. Balát, 1294 (MMBC).

**Remarks:** Mjöberg (1910a) reported *Nirmus furvus* Burmeister, 1838, and *Nirmus phaeopi* Denny, 1842, from this host, which may be references to *L. schismatus*. Ash's (1960) unidentified specimens from *Calidris alpina* likely belong to this species.

### ***Muldicola Clay & Meinertzhagen, 1938a***

**Type species:** *Nirmus hypoleucus* Denny, 1842.

No revision of the genus *Muldicola* has been published. It is part of the *Quadriceps*-complex (Gustafsson 2012).

### ***Muldicola hypoleucus* (Denny, 1842)**

*Nirmus hypoleucus* Denny, 1842: 53.

**Report:** [1] Ash (1960); [2] This report.

**Type host:** *Caprimulgus europaeus* Linnaeus, 1758 – European nightjar – nattskärna<sup>H</sup> [1, 2].

**Material examined: ÖI:** *Mörbylånga kommun:* Ottenby Bird Observatory, 2 , 15 May 2007, leg. D. Gustafsson (SMNH). Same locality, 1 , 1 Jun. 2007, leg. D. Gustafsson (SMNH).

### ***Neophilopterus Cummings, 1916***

**Type species:** *Docophorus tricolor* Burmeister, 1838.

No revision of *Neophilopterus* has been published. It is part of the *Esthiopterum*-complex (Gustafsson & Olsson 2017).

### ***Neophilopterus incompletus* (Denny, 1842)**

**New record**

*Docophorus incompletus* Denny, 1842: 47.

**Report:** [1] This report.

**Type host:** *Ciconia ciconia* (Linnaeus, 1758) – white stork – vit stork<sup>H</sup> [1].

**Material examined: Sk:** *Hässleholms kommun:* Hörja [as Horja], 1 , 1 , 13 Jun. 1954, 28 (PIPeR).

### ***Olivinirmus Złotorzycka, 1964a***

**Type species:** *Nirmus glandarii* Denny, 1842.

*Olivinirmus* was previously regarded as a synonym of *Brueelia* Kéler, 1936 (e.g. in Price *et al.* 2003a), but considered a valid genus in our recent revision of the *Brueelia*-complex (Gustafsson & Bush 2017). Most species of *Olivinirmus* were described and illustrated (as *Brueelia*) by Ansari (1956b), including some species that may be expected in Sweden.

***Olivinirmus glandarii* (Denny, 1842) New record**

*Nirmus glandarii* Denny, 1842: 51.

*Brüelia glandarii* (Denny), 1842; Ansari, 1956b: 372.

*Olivinirmus glandarii* (Denny, 1842); Gustafsson & Bush, 2017: 202.

**Report:** [1] This report.

**Type host:** *Garrulus glandarius rufitergum* Hartert, 1903 – Eurasian jay (*rufitergum*) – nötskrika<sup>E</sup>.

**Host in Sweden:** *Garrulus glandarius glandarius* Linnaeus, 1758 – Eurasian jay (*glandarius*) – nötskrika<sup>H</sup> [1].

**Material examined: Sk:** Hässleholms kommun: Vankiva, 1 , 19 Apr. 1939, leg. A. Lundström (SMNH). **Vr:** *Eda kommun:* Skönnerud, 1 , 1 nymph, 14 Feb. 1939, leg. A. Lundström (SMNH).

***Ornithobius* Denny, 1842**

**Type species:** *Pediculus cygni* Linnaeus, 1758

The genus *Ornithobius* was reviewed by Timmermann (1962) and Arnold (2005), both of which includes all species likely to be found in Sweden.

***Ornithobius bucephalus* (Giebel, 1874)**

*Lipeurus bucephalus* Giebel, 1874: 239.

*Ornithobius bucephalus bucephalus* (Giebel), 1874; Timmermann, 1962: 136.

*Ornithobius bucephalus* (Giebel); Arnold, 2005: 159.

**Reports:** [1] Mjöberg (1910a); [2] Overgaard (1942); [3] This report.

**Type host:** *Cygnus olor* (Gmelin, 1783) – mute swan – knölsvan<sup>H</sup> [1, 3].

**Material examined: Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 4 , 18 Sep. 2013, leg. D. Gustafsson (SMNH).

***Ornithobius waterstoni* Timmermann, 1962 New record**

*Ornithobius waterstoni waterstoni* Timmermann, 1962: 139.

*Ornithobius waterstoni* Timmermann; Arnold, 2005: 165.

**Report:** [1] This report.

**Type host:** *Cygnus buccinator* Richardson, 1832 – trumpeter swan -- trumpetarsvan<sup>E</sup>.

**Host in Sweden:** *Cygnus* sp. [likely *C. columbianus* (Ord, 1815) – tundra swan – mindre sångsvan<sup>F</sup> [1].

**Material examined:** Ex *Cygnus* sp.: **No locality:** 3 , 3 nymphs (SMNH).

***Oxylipeurus* Mjöberg, 1910a**

**Type species:** *Lipeurus inaequalis* Piaget, 1880.

*Oxylipeurus* was revised by Clay (1938), but over half the species accepted in this genus by Price et al. (2003a) species have been described after this revision, and the genus is in need of further revision. Clay's revision includes descriptions and illustrations of all Swedish species except *O. minor*.

***Oxylipeurus colchicus* Clay, 1938**

*Oxylipeurus colchicus* Clay, 1938: 177.

**Report:** [1] Nilsson (1968) as *Oxylipeurus mesopelios*.

**Type host:** *Phasianus colchicus* Linnaeus, 1758 – ring-necked pheasant – fasan<sup>H</sup> [1].

**Remarks.** *Oxylipeurus colchicus* was originally described as a subspecies of *O. mesopelios*. We have not seen Nilsson's material, but as *O. mesopelios* does not occur on this host, we have assumed his material, if relocated, would be identified as *O. colchicus*. The morphological differences between the two species are mainly based on dimensions (Clay 1938).

***Oxylipeurus minor* (Złotorzycka, 1966) New record**

*Reticulipeurus tetraonis minor* Złotorzycka, 1966: 113.

**Report:** [1] This report.

**Type host:** *Tetrao tetrix* Linnaeus, 1758 – black grouse – orre<sup>H</sup> [1].

**Material examined: Bl:** 1 , 3 , 1 nymph, 26 Aug. 1939, leg. A. Lundström (SMNH).

***Oxylipeurus tetraonis* (Grube, 1851)**

*Lipeurus tetraonis* Grube, 1851: 485.

*Oxylipeurus tetraonis* (Grube); Clay, 1938: 179.

**Reports:** [1] Mjöberg (1910a) as *Lipeurus ochraceus*; [2] This report.

**Type host:** *Tetrao urogallus* Linnaeus, 1758 – western capercaillie – tjäder<sup>H</sup> [1, 2].

**Material examined: Sk:** Hässleholms kommun: Hästveda [as Hastveda], 1 , 1 , 7 Oct. 1954, 66 (PIPER). **Höörs kommun:** Norra Rörum, 1 , 1 nymph, 11 Apr. 1939, leg. A. Lundström (SMNH). **Örkelljunga kommun:** Åsljunga, 10 , 8 , 10 nymphs, 20 Apr. 1939, leg. A. Lundström (SMNH). **Sm:** Lessebo kommun: Lessebo, 3 , 1 , 1 Jan. 1940, leg. A. Lundström (SMNH). **Up:** Stockholm, 6 , 9 , leg. E. Mjöberg (SMNH). **Uppsala kommun:** Norrgarn, 3 , 9 , 6 nymphs, 10 Sep. 1926, leg. C. Videll (SMNH). Uppsala, 1 , leg. C. Videll (SMNH). **Östhammars kommun:** Harg, 1 nymph, 16 Nov. 1939, leg. A. Lundström (SMNH). **Vr:** Torsby kommun: Munkebol, 4 ,



7, 2 nymphs, 28 Apr. 1939, leg. A. Lundström (SMNH). **No locality:** 11, 19 (SMNH).

**Remarks:** Mjöberg (1910a) reported three stragglers from *Pernis apivorus* (Linnaeus, 1758).

### ***Pectinopygus* Mjöberg, 1910a**

**Type species:** *Lipeurus pullatus* Nitzsch [in Giebel], 1866 = *Pediculus bassani* O. Fabricius, 1780.

The genus *Pectinopygus* was revised by Timmermann (1964) and Clay (1973), however neither revision provides good illustrations or descriptions for the Swedish species. Thompson (1940b) provided illustrations and a redescription of *P. bassani*.

### ***Pectinopygus bassani* (O. Fabricius, 1780)**

*Pediculus bassani* O. Fabricius, 1780: 218.

*Pectinopygus (Pectinopygus) bassani* (O. Fabricius); Thompson, 1940b: 372.

**Reports:** [1] Mjöberg (1910a) as *Pectinopygus pullatus*; [2] Overgaard (1942) as *Pectinopygus pullatus*; [3] This report.

**Type host:** *Morus bassanus* (Linnaeus, 1758) – northern gannet – havvsula<sup>F</sup> [1, 3].

**Material examined: Bo:** 1, 1 nymph (SMNH)

### ***Pectinopygus gyricornis* (Denny, 1842) New record**

*Lipeurus gyricornis* Denny, 1842: 58.

*Pectinopygus gyricornis* (Denny), 1842; Timmermann, 1964: 273.

**Report:** [1] This report.

**Type host:** *Sterna hirundo* Linnaeus, 1758 – common tern -- fisktärna<sup>H</sup>.

**Host in Sweden:** *Phalacrocorax carbo* (Linnaeus, 1758) – great cormorant – storskarv<sup>H</sup> [1].

**Material examined: Up:** *Uppsala kommun:* Uppsala, 4, leg. C. Videll (SMNH). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 3, 3, 30 Jul. 2007, leg. D. Gustafsson (SMNH). Same locality, 5, 3, 31 Jul. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** The type host is most likely in error due to straggling or contamination. No records are known from this host in Sweden.

### ***Penenirmus* Clay & Meinertzhagen, 1938b**

**Type species:** *Pediculus albiventris* Scopoli, 1763.

No comprehensive revision of *Penenirmus* has been published, but Dalglish (1972) revised the species occurring on woodpeckers. A phylogeny of some species of *Penenirmus* was published by Johnson *et al.* (2001b), showing that despite

the large morphological differences between some groups within this genus, it is monophyletic. Several generic names for some of these subgroups were proposed by Złotorzycka (1964a), but these cannot be separated based on her account.

### ***Penenirmus affectator* (Złotorzycka, 1976)**

*Pleurinirmus affectator* Złotorzycka, 1976: 210.

**Report:** [1] Balát (1981). [2] This report.

**Type host:** *Sylvia borin* (Boddaert, 1773) – garden warbler – trädgårdssångare<sup>H</sup> [1, 2].

**Material examined: Sk:** *Vellinge kommun:* Skanör, 3, 1, 18 nymphs, 13 Sep. 1963, leg. F. Balát, 1310 (MMBC).

**Remarks:** Ash's (1960) unidentified *Penenirmus* specimens from this host probably belongs to *P. affectator*, but were never identified to species.

### ***Penenirmus auritus* (Scopoli, 1763) New record**

*Pediculus auritus* Scopoli, 1763: 383.

*Penenirmus auritus* (Scopoli, 1763); Dalglish, 1972: 88.

**Report:** [1] This report.

**Type host:** *Dendrocopos major* (Linnaeus, 1758) – greater spotted woodpecker – större hackspett<sup>H</sup> [1].

**Material examined: Sk:** *Hässleholms kommun:* Vankiva, 2, 1, 14 Mar. 1939, leg. A. Lundström (SMNH). *Lunds kommun:* Håckeberga, 1, 21 Mar. 1939, leg. A. Lundström (SMNH). **Sm:** *Tingsryds kommun:* Konga, 1, 3 Nov. 1954, leg. T. Hansson, 129 (PIPeR). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 nymph, 2 Oct. 2007, leg. D. Gustafsson (SMNH). **Ög:** *Mjölby kommun:* Gottlösa [as Gottlösa], 1, 27 Mar. 1940, leg. A. Lundström, 132 (PIPeR). Same locality, 2, 5, 10 nymphs, 27 Mar. 1940, leg. A. Lundström (SMNH).

### ***Penenirmus gulosus* (Nitzsch, 1866) New record**

*Nirmus gulosus* Nitzsch, 1866: 117.

**Report:** [1] This report.

**Type host:** *Certhia familiaris* Linnaeus, 1758 – Eurasian treecreeper – trädkrypare<sup>H</sup> [1].

**Material examined: Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1, 23 Sep. 2013, leg. D. Gustafsson (SMNH).

### ***Penenirmus pici* (J.C. Fabricius, 1798)**

*Pediculus pici* J.C. Fabricius, 1798: 571.

*Penenirmus pici* (Fabricius, 1798); Dalglish, 1972: 97.

**Reports:** [1] Mjöberg (1910a) as *Docophorus superciliosus*; [2] Dalgleish (1972); [3] This report.

**Type host:** *Picus viridis* Linnaeus, 1758 – green woodpecker – grön göling<sup>H</sup> [1, 2, 3].

**Material examined:** **Vr:** *Eda kommun:* Skönnerud, 2, 13 Feb. 1939, leg. A. Lundström (SMNH). *Forshaga kommun:* Övre Ullerud, 1, 4 Nov. 1939, leg. A. Lundström, 32 (PIPeR). **Unidentified locality:** “Elkrallen” [= ?], 1, 1954, leg. C.W. Carlsson, 31 (PIPeR). **No locality:** 1, 1 nymph (SMNH).

**Remarks:** Mjöberg (1910a) reported *Docophorus superciliosus* Burmeister, 1838, from *Picus viridis*. This species was synonymized with *Penenirmus auritus* (Scopoli, 1763) by Hopkins & Clay (1952); however, the only *Penenirmus* specimens at the SMNH from this host are *P. pici* according to the key of Emerson & Johnson (1961). We therefore list Mjöberg’s report under this species.

***Penenirmus serrilimbus* (Burmeister, 1838)  
New record**

*Docophorus serrilimbus* Burmeister, 1838: 427.

*Penenirmus serrilimbus* (Burmeister, 1838); Dalgleish, 1972: 87.

**Reports:** [1] This report.

**Type host:** *Jynx torquilla* Linnaeus, 1758 – Eurasian wryneck – göktyta<sup>H</sup> [1].

**Material examined:** **Vr:** *Eda kommun:* Skönnerud, 1, 30 May 1939, leg. A. Lundström, 151 (PIPeR).

***Penenirmus* sp.**

**Report:** [A1] Ash (1960).

**Host:** *Phylloscopus trochilus* (Linnaeus, 1758) – willow warbler – lövsångare<sup>H</sup> [1].

**Remarks:** Ash’s (1960) material was never identified to species, and we have not seen this material. *Penenirmus phylloscopi* (Złotorzycka, 1976) is known from the same host.

***Penenirmus* sp.**

**Report:** [1] Ash (1960).

**Host:** *Sylvia curruca* (Linnaeus, 1758) – lesser white-throat – ärtsångare<sup>H</sup> [1].

**Remarks:** Ash’s (1960) material was never identified to species, and we have not seen this material. *Penenirmus speciosus* Mey, 1982b, is known from the same host.

***Philopterus* Nitzsch, 1818**

**Type species:** *Pediculus ocellatus* Scopoli, 1763.

No comprehensive revision of *Philopterus* has

been published, and most species are poorly described and illustrated in the primary literature. For most of the species on the Swedish list, comparisons with identified material or DNA sequences may be necessary; this is how most of the records below were identified. Złotorzycka (1964c) provided notes and sketches of some species of European *Philopterus*, but cannot be used to identify most species included in her list even to genus level. Mey (2004) published a genus-level revision of the *Philopterus*-complex, but most of his species and genera are extralimital; some could conceivably be found on exotic birds kept in captivity in Sweden. Species believed to be *Philopterus* but differing too much from those illustrated here (Figs 34–35) should be keyed with Mey’s key. The genus *Cincloecus* Złotozycka, 1964c, likely occurs on wild dippers *Cinclus cinclus* (Linnaeus, 1758) in Sweden, but none were examined in this study; this genus can easily be identified from the description and illustrations of Mey (1994c). Some species have been redescribed, and references to these can be found below. Price & Hellenthal (1998) revised the species of *Philopterus* occurring on the Corvidae.

Mjöberg (1910a: 118) reported *Docophorus communis* Nitzsch, 1818 [= *Philopterus citrinellae* Schrank, 1776] from a long list of hosts. His material was partially collected by himself (presumably in Sweden), partially sent to him by his various colleagues and from the SMNH and GNM, and partially obtained from the Vega Expedition to the Arctic Ocean and elsewhere. In no case is it stated explicitly where the material from any host comes from. All the hosts occur in Sweden. We include only those species we have been able to verify to have been collected in Sweden based on the localities stated for the material at the SMNH, but note that we were unable to find material from some of the hosts listed by Mjöberg (1910a).

***Philopterus atratus* Nitzsch, 1818**

*Philopterus atratus* Nitzsch, 1818: 290.

*Philopterus atratus* Nitzsch; Price & Hellenthal, 1998: 786.

**Reports:** [1] Mjöberg (1910a) as *Docophorus atratus*; [2] This report.

**Type host:** *Corvus frugilegus* Linnaeus, 1758 – rook

– råka<sup>H</sup> [1, 2].

**Material examined:** No locality: 1 nymph, 9 Jan. 1913, leg. H. Murchardt (SMNH). 2 (SMNH).

**Remarks.** The nymph we have examined is tentatively identified as this species based on host associations.

***Philopterus bischoffi* (Eichler, 1951) New record**

*Docophorus bischoffi* Eichler, 1951: 33.

**Report:** [1] This report.

**Type host:** *Turdus pilaris* Linnaeus, 1758 – fieldfare – björktrast<sup>H</sup> [1].

**Material examined:** **Dr:** Falun kommun: Haga, 1, 2, 12 Jun. 2014, leg. D. Gustafsson (SMNH). **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 11 May 2007, leg. D. Gustafsson (SMNH). **No locality:** 1 (SMNH).

***Philopterus citrinellae* (Schränk, 1776)**

*Pediculus citrinellae* Schränk, 1776: 116.

*Philopterus citrinellae* [Schränk, 1776]; Clay & Hopkins, 1954: 227.

*Philopterus citrinellae* (Schränk, 1776); Palma & Price, 2006: 2.

**Reports:** [1] Mjöberg (1910a) as *Docophorus communis*; [2] Clay & Hopkins (1954) as *Philopterus pyrrhulae*; [3] Palma & Price (2006); [4] This report.

**Type host:** *Emberiza citrinella* Linnaeus, 1758 – yellowhammer – gulsparv<sup>H</sup> [1, 4].

**Additional hosts in Sweden:** *Chloris chloris* (Linnaeus, 1758) – European greenfinch – grönfink<sup>H</sup> [4]. *Emberiza schoeniclus* (Linnaeus, 1758) – reed bunting – sävsparv<sup>H</sup> [3, 4]. *Pyrrhula pyrrhula* (Linnaeus, 1758) – bullfinch – domherre<sup>H</sup> [2, 4].

**Material examined:** Ex *Chloris chloris*: **Sm:** Aneby Kommun: Ralången Bird Observatory, 1, 30 May 2014, leg. D. Gustafsson (SMNH). **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 11 May 2007, leg. D. Gustafsson (SMNH).

Ex *Emberiza citrinella*: **Sk:** Hässleholms kommun: Vankiva, 1, 2 nymphs, 20 Feb. 1939, leg. A. Lundström (SMNH). **Up:** Stockholm, 2 nymphs, leg. E. Mjöberg (SMNH). **Vr:** Torsby kommun: Munkebol, 1, 2 nymphs, 24 Apr. 1939, leg. A. Lundström (SMNH). **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 14 May 2007, leg. D. Gustafsson (SMNH).

Ex *Emberiza schoeniclus*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2 nymphs, 10 Oct. 2007, leg. D. Gustafsson (SMNH).

Ex *Pyrrhula pyrrhula*: **Sm:** Växjö kommun: Räfte, 2 nymphs, 16 Feb. 1939, leg. A. Lundström (SMNH).

**Remarks.** The nymphs from *E. schoeniclus*

and *P. pyrrhula* have been tentatively identified as this species, based on host associations.

***Philopterus coarctatus* (Scopoli, 1763)**

*Pediculus coarctatus* Scopoli, 1763: 382.

*Philopterus coarctatus* [Scopoli, 1763]; Clay & Hopkins, 1951: 6.

**Reports:** [1] Mjöberg (1910a) as *Docophorus communis* var. *fuscicollis*; [2] Clay & Hopkins (1951); [3] Ash (1960); [4] This report.

**Type host:** *Lanius collurio* Linnaeus, 1758 – red-backed shrike – törnskata<sup>H</sup> [1, 2, 3, 4].

**Material examined:** **Up:** Stockholm, 1, 2, E. Mjöberg (SMNH). **No locality:** 1 (SMNH).

***Philopterus corvi* (Linnaeus, 1758)**

*Pediculus corvi* Linnaeus, 1758: 612.

*Philopterus corvi* [Linnaeus, 1758]; Clay & Hopkins, 1950: 231.

*Philopterus corvi* (L.); Price & Hellenthal, 1998: 784.

**Reports:** [1] Linnaeus (1746) as *Pediculus corvi*; [2] Mjöberg (1910a) as *Docophorus ocellatus*; [3] Overgaard (1942) as *Docophorus semisignatus*; [4] Clay & Hopkins (1950); [5] This report.

**Type host:** *Corvus corax* Linnaeus, 1758 – common raven – korp<sup>H</sup> [1, 2, 3, 4, 5].

**Material examined:** **Sm:** “West Sm”, 3, 4, 2 nymphs, 15 Nov. 1939, leg. A. Lundström (SMNH).

***Philopterus curvirostrae* (Schränk, 1776)**

*Pediculus curvirostrae* Schränk, 1776: 117.

*Philopterus curvirostrae* [Schränk, 1776]; Clay & Hopkins, 1954: 229.

**Reports:** [1] Mjöberg (1910a) as *Docophorus compar*; [2] This report.

**Type host:** *Loxia curvirostra* Linnaeus, 1758 – red crossbill – mindre korsnäbb<sup>H</sup> [1, 2].

**Material examined:** **Sk:** Vellinge kommun: Falsterbo, 1, 1, 5 nymphs, 22 Aug. 1963, leg. F. Balát, 1286 (MMBC). Same locality, 2, 4, 1 nymph, 11 Sep. 1963, leg. F. Balát, 1304 (MMBC). Same locality, 2, 5, 8 nymphs, 11 Sep. 1963, leg. F. Balát, 1306 (MMBC). Skanör, 2, 2, 4 nymphs, 12 Sep. 1963, leg. F. Balát, 1264 (MMBC). Same locality, 1, 1, 12 Sep. 1963, leg. F. Balát, 1299 (MMBC); **Up:** Stockholm, 1, leg. E. Mjöberg (SMNH). **Uppsala kommun:** Uppsala, 1, leg. C. Videll (SMNH); **No locality:** 2 nymphs (SMNH).

***Philopterus desertus* (Złotorzycka, 1964c) New record**

*Docophorus desertus* Złotorzycka, 1964c: 412.

**Report:** [1] This report.

**Type host:** *Muscicapa striata* (Pallas, 1764) – spotted

flycatcher – grå flugsnappare<sup>H</sup> [1].

**Material examined: Sk:** Vellinge kommun: Falsterbo, 5 nymphs, 4 Sep. 1963, leg. F. Balát, 1291 (MMBC).

**Remarks.** These specimens are tentatively identified, as no thorough revision of nymphal characters of *Philoaterus* has been published and the adult species cannot be identified from the original description. *Philoaterus desertus* is the species normally found on this host. Ash (1960) reported unidentified specimens of *Philoaterus* from the same host.

***Philoaterus erythrini* (Mey, 1982b) New record**

*Docophorus erythrini* Mey, 1982b: 184.

**Report:** [1] This report.

**Type host:** *Carpodacus erythrini* (Pallas, 1770) – common rosefinch – rosenfink<sup>H</sup> [1].

**Material examined: Ö:** Mörbylånga kommun: Ottenby Bird Observatory, 2 , 27 May 2007, leg. D. Gustafsson (SMNH). Same locality, 1 , 2 Aug. 2007, leg. D. Gustafsson (SMNH).

***Philoaterus excisus* Nitzsch, 1818**

*Philoaterus excisus* Nitzsch, 1818: 290.

*Philoaterus excisus excisus*; Tandan 1955: 424.

**Reports:** [1] Clay & Hopkins (1960); [2] This report.

**Type host:** *Delichon urbicum* (Linnaeus, 1758) – common house martin – hussvala<sup>H</sup> [1, 2].

**Material examined: Ö:** Mörbylånga kommun: Ottenby Bird Observatory, 1 , 2 , 28 May 2007, leg. D. Gustafsson (SMNH).

***Philoaterus fortunatus* (Złotorzycka, 1964c) New record**

*Docophorus fortunatus* Złotorzycka, 1964c: 413.

**Report:** [1] This report.

**Type host:** *Fringilla coelebs* Linnaeus, 1758 – common chaffinch – bofink<sup>H</sup> [1].

**Material examined: Sk:** Lunds kommun: Häckeberga, 2 nymphs, 21 Mar. 1939, leg. A. Lundström (SMNH). Vellinge kommun: Falsterbo, 1 , 24 Sep. 1963, leg. F. Balát, 1307 (MMBC). **Vb:** Umeå kommun: Stora Fjäderägg: 1 , 1 , 7 Sep. 2013, leg. E. DiBlasi (SMNH).

***Philoaterus fringillae* (Scopoli, 1772) New record**

*Pediculus fringillae* Scopoli, 1772: 125.

*Philoaterus fringillae* [Scopoli, 1772]; Clay & Hopkins, 1951: 32.

**Report:** [1] This report.

**Type host:** *Passer domesticus* (Linnaeus, 1758) –

house sparrow – gråsparv<sup>H</sup> [1].

**Material examined: Vr:** Eda kommun: Skönerud, 1 , 1 , 1 nymph, 16 Feb. 1939, leg. A. Lundström (SMNH). **Ö:** Mörbylånga kommun: Ottenby Bird Observatory, 1 , 1 , 1 nymph, 2 Oct. 2007, leg. D. Gustafsson (SMNH). **No locality:** 1 , 1 (SMNH).

***Philoaterus garruli* Boisduval & Lacordaire, 1835**

*Philoaterus garruli* Boisduval & Lacordaire, 1835: 120.

*Philoaterus garruli* Boisduval & Lacordaire; Price & Hellenthal, 1998: 796.

**Reports:** [1] Mjöberg (1910a) as *Docophorus communis*; [2] This report.

**Type host:** *Garrulus glandarius* Linnaeus, 1758 – Eurasian jay – nötskrika<sup>H</sup> [1, 2].

**Material examined: No locality:** 4 , 10 , 1 nymph (SMNH).

***Philoaterus guttatus* (Denny, 1842)**

*Docophorus guttatus* Denny, 1842: 41.

*Philoaterus guttatus* (Denny); Price & Hellenthal, 1998: 789.

**Reports:** [1] Mjöberg (1910a) as *Docophorus guttatus*; [2] This report.

**Type host:** *Corvus monedula* Linnaeus, 1758 – Eurasian jackdaw – kaja<sup>H</sup> [1, 2].

**Material examined: Sk:** Sjöbo kommun: Sövdeborg, 2 , 1 , 3 nymphs, 30 Mar. 1939, leg. A. Lundström (SMNH). **Ög:** Mjölby kommun: Gottlösa, 1 , 3 , 2 nymphs, 27 Mar. 1940, leg. A. Lundström (SMNH). **No locality:** 2 , 20 nymphs (SMNH).

***Philoaterus hansmuenchi* (Eichler & Vasjukova, 1981a)**

*Docophorus hansmuenchi* Eichler & Vasjukova, 1981a: 620.

**Reports:** [1] Mjöberg (1910a) as *Docophorus compar*; [2] This report.

**Type host:** *Loxia leucoptera bifasciata* (C.L. Brehm, 1827) – white-winged crossbill (*bifasciata*) – bändelkorsnäbb<sup>H</sup> [1, 2].

**Material examined: Up:** Uppsala kommun: Uppsala, 1 , leg. C. Videll (SMNH). **Vb:** Umeå kommun: Stora Fjäderägg, 1 , 12 Sep. 2013, leg. E. DiBlasi (SMNH). Same locality, 1 , 1 , 14 Sep. 2013, leg. E. DiBlasi (SMNH).

***Philoaterus linariae* (Piaget, 1885) New record**

*Docophorus linariae* Piaget, 1885: 5.

**Report:** [1] This report.

**Type host:** *Acanthis flammea* (Linnaeus, 1758) – common redpoll – gråsiska<sup>H</sup> [1].

**Additional host in Sweden:** *Spinus spinus* (Linnaeus, 1758) – Eurasian siskin – grönsiska<sup>H</sup> [1] **new host record.**

**Material examined:** Ex *Acanthis flammea*: **Lapland:** *Jokkmokk kommun:* Padjelanta National Park, Staloluokta, 1 nymph, 2 Jul. 2008, leg. D. Gustafsson (SMNH). **Vb:** *Umeå kommun:* Umeå, 1 , 17 Apr. 2009, leg. D. Gustafsson (SMNH). Same locality, 2 , 1 , 17 Apr. 2009, leg. D. Strasevicius (SMNH). Stora Fjäderägg, 1 , 14 Sep. 2014, leg. E. DiBlasi (SMNH). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 nymph, 2 Oct. 2007, leg. D. Gustafsson (SMNH).

Ex *Spinus spinus*: **Vg:** *Göteborgs kommun:* Gothenburg Botanical Garden, 1 , 1 , 11 Feb. 2008, leg. D. Gustafsson (SMNH)

**Remarks.** Nymphal material from Padjelanta and Ottenby has been tentatively identified based on host relationships. Specimens collected from *Spinus spinus* are genetically identical to specimens collected from the type host (unpublished data). As both species regularly occur in mixed-species flocks, especially during the winter months, we consider *S. spinus* to be a natural host of *P. lineariae*.

### *Phlopterus microsomaticus* Tandan, 1955 New record

*Phlopterus excisus microsomaticus* Tandan, 1955: 421.  
**Report:** [1] This report.

**Type host:** *Hirundo rustica* Linnaeus, 1758 – barn swallow – ladusvala<sup>H</sup> [1].

**Material examined:** **Sk:** *Vellinge kommun:* Falsterbo, 1 nymph, 11 Sep. 1963, leg. F. Balát, 1261 (MMBC). Same locality, 1 , 2 , 4 Aug. 1963, leg. F. Balát, 1289 (MMBC). Same locality, 1 , 2 , 4 Aug. 1963, leg. F. Balát, 1290 (MMBC). Same locality, 1 , 4 Aug. 1963, leg. F. Balát, 1305 (MMBC). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 nymph, 25 May 2007, leg. D. Gustafsson (SMNH).

**Remarks.** Nymphal material has been identified tentatively based on host associations.

### *Phlopterus modularis* (Denny, 1842) New record

*Docophorus modularis* Denny, 1842: 47.

**Report:** [1] This report.

**Type host:** *Prunella modularis* (Linnaeus, 1758) – dunnock – järnsparv<sup>H</sup> [1].

**Material examined:** **Vr:** *Torsby kommun:* Munkebol, 2 , 4 , 4 nymphs, 3 May, 1939, leg. A. Lundström (SMNH). **Vb:** *Umeå kommun:* Stöcke, 1 , 6 Sep. 2013, leg. E. DiBlasi (SMNH).

### *Phlopterus ocellatus* (Scopoli, 1763)

*Pediculus ocellatus* Scopoli, 1763: 382.

*Phlopterus ocellatus* [Scopoli, 1763]; Clay & Hopkins, 1951: 8.

*Phlopterus ocellatus* (Scopoli); Price & Hellenthal, 1998: 791.

**Reports:** [1] Mjöberg (1910a) as *Docophorus ocellatus*; [2] Clay & Hopkins (1951); [3] This report.

**Type host:** *Corvus corone* Linnaeus, 1758 – carrion crow – svartkråka<sup>†</sup>.

**Host in Sweden:** *Corvus cornix* Linnaeus, 1758 – hooded crow – gråkråka<sup>H</sup> [1, 2, 3].

**Material examined:** Ex *Corvus cornix*: **Sk:** *Helsingborgs kommun:* Helsingborg, 1 , 1 nymph, 15 Sep. 1912, leg. H. Murchardt (SMNH). **Vr:** *Eda kommun:* Skönnerud, 5 , 1 , 16 nymphs, 8 Apr. 1939, leg. A. Lundström (SMNH). *Torsby kommun:* Munkebol, 3 nymphs, 1 Apr. 1939, leg. A. Lundström (SMNH). **No locality:** 1 (SMNH).

**Remarks.** Nymphal material has been identified tentatively based on host associations. No specimens from the type host have been recorded from Sweden.

### *Phlopterus passerinus* (Denny, 1842)

*Docophorus passerinus* Denny, 1842: 47.

**Report:** [1] Ash (1960); [2] This report.

**Type host:** *Motacilla alba* Linnaeus, 1758 – white wagtail – sädesärta<sup>H</sup> [1, 2].

**Material examined:** **Sk:** *Vellinge kommun:* Falsterbo, 1 , 11 Sep. 1963, leg. F. Balát, 1251 (MMBC).

**Remarks:** No good descriptions or illustrations of this species has been published; it is identified tentatively here based on host records.

### *Phlopterus picae* (Denny, 1842)

*Docophorus picae* Denny, 1842: 41.

*Phlopterus picae* (Denny); Price & Hellenthal, 1998: 794.

**Reports:** [1] Mjöberg (1910a) as *Docophorus subcrassipes*; [2] This report.

**Type host:** *Pica pica* (Linnaeus, 1758) – Eurasian magpie – skata<sup>H</sup> [1, 2].

**Material examined:** **Dr:** *Falun kommun:* Kyrkbyttjärn, 1 , 8 Jun. 2014, leg. D. Gustafsson (SMNH). **Sm:** *Jönköpings kommun:* Tenhult, 1 , 22 Feb. 1939, leg. A. Lundström (SMNH). **Vr:** *Eda kommun:* Skönnerud, 2 , 4 , 5 nymphs, 13 Apr. 1939, leg. A. Lundström (SMNH). Same locality, 5 , 5 , 15 nymphs, 20 Feb. 1940, leg. A. Lundström (SMNH). **No locality:** 2 , 2 , 3 nymphs (SMNH).

***Philopterus rapax* (Złotorzycka, 1964c) New record**

*Docophorulus rapax* Złotorzycka, 1964c: 421.

**Report:** [1] This report.

**Type host:** *Fringilla montifringilla* Linnaeus, 1758 – brambling – bergfink<sup>H</sup> [1].

**Material examined:** **Vb:** Umeå kommun: Stora Fjäderägg, 1, 1, 14 Sep. 2013, leg. E. DiBlasi (SMNH). Umeå, 1, 17 Apr. 2009, leg. D. Strasevicius (SMNH). **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 7 Oct. 2007, leg. D. Gustafsson (SMNH).

***Philopterus reguli* (Denny, 1842)**

*Docophorus reguli* Denny, 1842: 45.

**Report:** [1] Ash (1960).

**Type host:** *Regulus regulus* (Linnaeus, 1758) – goldcrest – kungsfågel<sup>H</sup> [1].

***Philopterus sittae* Fedorenko, 1978 New record**

*Philopterus sittae* Fedorenko, 1978: 55.

**Report:** [1] This report.

**Type host:** *Sitta europaea* Linnaeus, 1758 – Eurasian nuthatch – nötväcka<sup>H</sup> [1].

**Material examined:** **Sm:** Jönköpings kommun: Strömsbergsskogen Nature Preserve, 1, 2, 27 May 2014, leg. D. Gustafsson (SMNH).

***Philopterus thuringiacus* (Mey, 1988) New record**

*Docophorulus thuringiacus* Mey, 1988: 75.

**Report:** [1] This report.

**Type host:** *Parus major* Linnaeus, 1758 – great tit – talgoxe<sup>H</sup> [1].

**Material examined:** **Sm** Aneby kommun: Ralången Bird Observatory, 1, 1, 30 May 2014, leg. D. Gustafsson (SMNH).

***Philopterus timmermanni* (Złotorzycka, 1964c)**

*Docophorulus timmermanni* Złotorzycka, 1964c: 422.

**Reports:** [1] Mjöberg (1910a) as *Docophorus communis*; [2] This report.

**Type host:** *Turdus iliacus coburni* Sharpe, 1901 – redwing (*coburni*) – rödvingetrast<sup>E</sup>.

**Host in Sweden:** *Turdus iliacus iliacus* Linnaeus, 1758 – redwing (*iliacus*) – rödvingetrast<sup>H</sup> [1, 2].

**Material examined:** **Sk:** Lunds kommun: Håckeberga, 1, 3, 2 nymphs, 15 Mar. 1939, leg. A. Lundström (SMNH). **Up:** Stockholm, 2, 1 nymph, leg. E. Mjöberg (SMNH). **No locality:** 1, 2, 4 nymphs (SMNH).

***Philopterus troglodytis* Fedorenko, 1986**

*Philopterus troglodytis* Fedorenko, 1986: 5.

**Reports:** [1] Mjöberg (1910a) as *Docophorus communis*; [2] This report.

**Type host:** *Troglodytes troglodytes* (Linnaeus, 1758) – Eurasian wren – gärdsmyg<sup>H</sup> [1, 2].

**Material examined:** **Up:** Uppsala kommun: Uppsala, 3, leg. C. Videll (SMNH).

***Philopterus turdi* (Denny, 1842)**

*Docophorus turdi* Denny, 1842: 43.

**Reports:** [1] Mjöberg (1910a) as *Docophorus communis*; [2] This report.

**Type host:** *Turdus philomelos* C.L. Brehm, 1831 – song thrush – taltrast<sup>H</sup> [1, 2].

**Additional host in Sweden:** *Turdus merula* Linnaeus, 1758 – Eurasian blackbird – koltrast [2].

**Material examined:** Ex *Turdus merula*: **Bo:** Sotenäs kommun: Grosshamn Bird Observatory, 2, 16 May 2014, leg. D. Gustafsson (SMNH). **Sk:** Lunds kommun: Håckeberga, 2, 3, 9 nymphs, 15 Mar. 1939, leg. A. Lundström (SMNH). **Sm:** Jönköpings kommun: Landsjön Bird Observatory, 1, 23 May 2014, leg. D. Gustafsson (SMNH). Ex *Turdus philomelos*: **Up:** Stockholm, 1, leg. E. Mjöberg (SMNH).

***Philopterus vernus* (Złotorzycka, 1964c) New record**

*Docophorulus vernus* Złotorzycka, 1964c: 424.

**Report:** [1] This report.

**Type host:** *Turdus viscivorus* Linnaeus, 1758 – mistle thrush – dubbeltrast<sup>H</sup> [1].

**Material examined:** **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 9 Oct. 2007, leg. D. Gustafsson (SMNH).

***Philopterus* sp.**

**Report:** [1] Ash (1960).

**Host:** *Anthus petrosus* (Montagu, 1798) – rock pipit – skärpiplärka<sup>H</sup> [1].

**Remarks:** No species of *Philopterus* is known from this host, however *Philopterus hanzaki* Balát, 1955b, is known from *Anthus spinoletta* (Linnaeus, 1758), which was previously considered conspecific with *A. petrosus*.

***Philopterus* sp.**

**Report:** [1] Ash (1960).

**Host:** *Calcarius lapponicus* (Linnaeus, 1758) – Lapland longspur – lappsparv<sup>H</sup> [1].

**Remarks:** No species of *Philopterus* is known from this host.

***Philopterus* sp.****Report:** [1] Ash (1960).**Host:** *Ficedula parva* (Bechstein, 1792) – red-breasted flycatcher – mindre flugsnappare<sup>H</sup> [1].**Remarks:** Ash's material may represent *Philopterus markevichi* Fedorenko & Volkov, 1977, but was not identified. We have not seen Ash's material.***Philopterus* sp.****Report:** [1] Ash (1960).**Host:** *Phoenicurus phoenicurus* (Linnaeus, 1758) – common redstart – rödstjärt<sup>H</sup> [1].**Remarks:** No species of *Philopterus* is known from this host.***Picicola* Clay & Meinertzhagen, 1938b****Type species:** *Picicola praeposterus* Clay & Meinertzhagen, 1938 = *Lipeurus snodgrassi* Kellogg, 1896a.Dalglish (1969) revised the species of *Picicola* occurring on woodpeckers, including descriptions and illustrations of both the Swedish species.***Picicola candidus* (Nitzsch, 1866)***Nirmus candidus* Nitzsch, 1866: 117.*Picicola candidus* (Nitzsch, 1866); Dalglish, 1969: 106.**Reports:** [1] Mjöberg (1910a) as *Nirmus candidus*; [2] Dalglish (1969); [3] This report.**Type host:** *Picus canus* Gmelin, 1788 – grey-headed woodpecker – gråspett<sup>H</sup>.**Host in Sweden:** *Picus viridis* Linnaeus, 1758 – green woodpecker – gröngöling<sup>H</sup> [1, 2, 3].**Material examined:** **Vr:** *Eda kommun:* Skönnerud, 1, 13 Feb. 1939, leg. A. Lundström (SMNH). *Karlskoga kommun:* Valåsen, 1, 1, 8 Nov. 1954, leg. T. Hansson, 38 (PIPEr).**Remarks:** One poorly preserved nymph at the SMNH may also represent this species. No specimens from the type host are known from Sweden.***Picicola snodgrassi* (Kellogg, 1896a) New record***Lipeurus snodgrassi* Kellogg, 1896a: 502.*Picicola snodgrassi* (Kellogg, 1896a); Dalglish, 1969: 111.**Report:** [1] This report.**Type host:** *Selasphorus rufus* (Gmelin, 1788) – rufous hummingbird – rostkolibri<sup>E</sup>.**Host in Sweden:** *Dendrocopos major* (Linnaeus, 1758) – greater spotted woodpecker – större hackspett<sup>H</sup> [1].**Material examined:** **Sk:** *Hässleholms kommun:* Vankiva, 1, 14 Mar. 1939, leg. A. Lundström (SMNH).**Remarks:** The type host is most likely an error, as Kellogg rarely separated birds shot at the same time. No hummingbirds occur in Sweden, and there are thus no Swedish records of *P. snodgrassi* from the type host.***Quadriceps* Clay & Meinertzhagen, 1939****Type species:** *Nirmus vanelli* Denny, 1842 = *Nirmus hospes* Nitzsch, [in Giebel], 1866.Timmermann (1972) argued that *Quadriceps* could not be reliably separated from *Cummingsiella*. Gustafsson (2012) showed that *Quadriceps* is likely highly paraphyletic, and should include *Saemundssonina*, *Lunaceps*, *Incidifrons*, *Cummingsiella* and possibly *Cirroptirius* to be monophyletic. Tendeiro (1967a) further showed that it might be impossible to separate *Quadriceps* clearly from *Alcedoffula* Clay & Meinertzhagen, 1939 (no species known in Sweden). If all these genera are synonymized with the oldest available name for the group (*Incidifrons*), that would result in a genus that is extremely variable, and impossible to characterise morphologically.Gustafsson (2012) suggested that instead of lumping all these genera into *Incidifrons*, *Quadriceps* should be split into smaller, morphologically and genetically distinct genera. The phylogeny published by Gustafsson (2012) did not include all type species of the several already proposed genera within this complex, and the phylogeny was based only on the mitochondrial COI region, resulting in few well-supported clades.The only published large-scale revision of *Quadriceps* is that of Złotorzycka (1967), which relies partially on pigmentation patterns of the individual species, rather than structural or setal characters. The descriptions in this revision are useless, but it includes partial photos of most species and a key to species-groups within the *Quadriceps* (treated as genera). Almost all genera proposed as valid by Złotorzycka (1967) were placed as synonyms of *Quadriceps* in the checklist of Price *et al.* (2003a). The division of *Quadriceps* into smaller units will have to await a more robust analysis of the group. We there-

fore retain all species placed in *Quadriceps* in the checklist of Price et al. (2003a) in this genus.

Numerous smaller revisions or redescrptions of parts of *Quadriceps* have been published by Timmermann. These redescrptions typically include at least illustrations of the male genitalia and measurements; however, several different publications may need to be consulted to get a more comprehensive overview of the morphology of the species. We have therefore typically listed more than one of Timmermann's papers under the same species heading. The publications relevant for the Swedish list are: Timmermann (1949b, 1952a) for species on gulls, Timmermann (1949b, 1952b) for species on terns, Timmermann (1953a) for species of avocets, Timmermann (1953b) for species on plovers, Timmermann (1954f) for species on lapwings, Hopkins & Timmermann (1954) for species on *Tringa* sandpipers, Timmermann (1974) for species on auks, and Timmermann (1950b, 1952c, 1954e) for species on various charadriiforms. For migrant or vagrant hosts that have not yet been sampled from Sweden, other publications by Timmermann may need to be consulted. Timmermann (1957) provides a good overview of the variation of the male genitalia in most genera of shorebird lice.

*Quadriceps* is naturally a part of the *Quadriceps*-complex, which is sometimes referred to as the *Cummingsiella*-complex (e.g. Ledger 1980).

Ash (1960) reported unidentified *Quadriceps* species from a number of *Calidris* sandpipers. No *Quadriceps* species normally occur on *Calidris* sandpipers, other than *Q. lahorensis* Ansari, 1955, on the ruff. We have not seen Ash's specimens, and consider it likely that these are all stragglers, misidentifications, or contaminations. They are not treated further here.

### ***Quadriceps aethereus* (Giebel, 1874)**

*Nirmus aethereus* Giebel, 1874: 301.

*Quadriceps klatti* Timmermann, 1954e: 172.

*Cummingsiella aetherea klatti* Timmermann, 1954e; Timmermann, 1974: 175.

*Mjoberginirmus klatti* (Timmermann); Złotorzycka, 1967: 745.

**Report:** [1] Mjöberg (1910a) as *Nirmus obliquus*.

**Type host:** *Aethia pusilla* (Pallas, 1811) – least auklet.

**Host in Sweden:** *Alle alle* (Linnaeus, 1758) – dovekie – alkekung<sup>F</sup> [1].

### ***Quadriceps alcae* (Denny, 1842)**

*Nirmus alcae* Denny, 1842: 52.

*Cummingsiella alcae* (Denny), 1842; Timmermann, 1974: 166.

*Mjoberginirmus alcae* (Denny); Złotorzycka, 1967: 745.

**Reports:** [1] Mjöberg (1910a) as *Nirmus citrinus*; [2] Overgaard (1942) as *Nirmus citrinus*; [3] This report.

**Type host:** *Alca torda* Linnaeus, 1758 – razorbill – tordmule<sup>H</sup> [1].

**Additional host in Sweden:** *Cephus grylle* (Linnaeus, 1758) – black guillemot – tobisgrissla<sup>H</sup> [3].

**Material examined:** Ex *Cephus grylle*: **No locality:** 1, 3, 1 nymph (SMNH).

**Remarks:** Overgaard (1942) stated that this species is known from Sweden, but does not state from which hosts.

### ***Quadriceps auratus* (de Haan, 1829)**

*Philopterus auratus* de Haan, 1829: 310.

*Quadriceps auratus* (De Haan); Hopkins, 1949: 30.

*Quadriceps haematopi* (Denny), 1842; Timmermann, 1950b: 2.

*Haematophagus auratus* (Haan); Złotorzycka, 1967: 748.

**Reports:** [1] Mjöberg (1910a) as *Nirmus ochropygos*; [2] Overgaard (1942) as *Nirmus ochropygos*; [3] This report.

**Type host:** *Haematopus ostralegus* Linnaeus, 1758 – Eurasian oystercatcher – strandskata<sup>H</sup> [1, 2, 3].

**Material examined: Bo:** *Tanums kommun:* Tanum, 1, 5 Apr. 1940, leg. A. Lundström (SMNH). *Öckerö kommun:* Björkö, 2, 1, 11 Apr. 1940, leg. A. Lundström (SMNH). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 2, 2 Aug. 2007, leg. D. Gustafsson (SMNH).

### ***Quadriceps charadrii* (Linnaeus, 1758) New record**

*Pediculus charadrii* Linnaeus, 1758: 613.

*Quadriceps charadrii* (Linnaeus), 1758; Timmermann, 1950b: 4.

*Quadriceps charadrii charadrii* (Linnaeus), 1758; Timmermann, 1953b: 183.

*Quadriceps charadrii charadrii* (Linnaeus); Złotorzycka, 1967: 711.

**Report:** [1] This report.

**Type host:** *Pluvialis apricaria* (Linnaeus, 1758) – European golden plover – ljunpipare<sup>H</sup> [1].

**Material examined: Vb:** *Umeå kommun:* Stöcke, 1, 1, 9 May 2008, leg. D. Gustafsson (SMNH).



***Quadriceps decipiens* (Denny, 1842) New record**

*Nirmus decipiens* Denny, 1842: 50.

*Cistellatrix decipiens* (Denny), 1842; Timmermann, 1953a: 331.

*Cistellatrix decipiens* (Denny), 1842; Timmermann, 1954e: 164.

*Cistellatrix decipiens* (Nitzsch); Złotorzycka, 1967: 735.

**Report:** [1] This report.

**Type host:** *Recurvirostra avosetta* Linnaeus, 1758 – pied avocet – skärfläcka<sup>H</sup> [1].

**Material examined: Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2, 2, 3 Jul. 2010, leg. D. Gustafsson (SMNH).

***Quadriceps fissus* (Burmeister, 1838)**

*Nirmus fissus* Burmeister, 1838: 427.

*Cummingsiella fissa* (Burmeister), 1838; Timmermann, 1950b: 4.

*Quadriceps fissus* (Burmeister), 1838; Timmermann, 1953b: 180.

*Quadriceps fissus* (Burmeister); Złotorzycka, 1967: 714.

**Reports:** [1] Overgaard (1952) as *Degeeriella hiaticulae*; [2] This report.

**Type host:** *Charadrius hiaticula* Linnaeus, 1758 – common ringed plover – större strandpipare<sup>H</sup> [1, 2].

**Material examined: Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 1, 17 May 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Charadrius hiaticula* may belong to this or the following species.

***Quadriceps hiaticulae* (O. Fabricius, 1780)**

*Pediculus hiaticulae* O. Fabricius, 1780: 220.

*Quadriceps hiaticulae* (O. Fabricius), 1780; Timmermann, 1950b: 4.

*Quadriceps hiaticulae hiaticulae* (Linnaeus) 1758; Timmermann, 1953b: 184.

*Chadriceps hiaticulae hiaticulae* (O. Fabricius); Złotorzycka, 1967: 729.

**Reports:** [1] Overgaard (1952) as *Degeeriella bicuspis*; [2] This report.

**Type host:** *Charadrius hiaticula* Linnaeus, 1758 – common ringed plover – större strandpipare<sup>H</sup> [1, 2].

**Material examined: Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 1, 25 May 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Overgaard (1952) reported this species from *Calidris maritima* Brünnich, 1764, which may refer to stragglers.

***Quadriceps hospes* (Nitzsch [in Giebel], 1866) New record**

*Nirmus hospes* Nitzsch [in Giebel], 1866: 371.

*Quadriceps charadrii hospes* (Nitzsch). In Giebel, 1866; Timmermann, 1953b: 184.

*Quadriceps charadrii hospes* (Nitzsch); Złotorzycka, 1967: 712.

**Report:** [1] This report.

**Type host:** *Pluvialis squatarola* (Linnaeus, 1758) – grey plover – kustpipare<sup>F</sup> [1].

**Material examined: Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 1, 28 Sep. 2007, leg. D. Gustafsson (SMNH).

***Quadriceps houri* Hopkins, 1949 New record**

*Quadriceps houri* Hopkins, 1949: 52.

*Quadriceps sellatus houri* Hopkins, 1949; Timmermann, 1952b: 79.

*Koeniginirmus (Laminonirmus) houri* (Hopkins); Złotorzycka, 1967: 758.

**Report:** [1] This report.

**Type host:** *Sterna paradisaea* Pontoppidan, 1763 – Arctic tern – silvertärna<sup>H</sup> [1].

**Material examined: Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 1, 27 Jul. 2007, leg. D. Gustafsson (SMNH).

***Quadriceps junceus* (Scopoli, 1763) New record**

*Nirmus junceus* Scopoli, 1763: 384.

*Quadriceps junceus* (Scopoli), 1763; Timmermann, 1954f: 195.

*Quadriceps junceus* (Scopoli); Złotorzycka, 1967: 717.

**Reports:** [1] This report.

**Type host:** *Vanellus vanellus* (Linnaeus, 1758) – northern lapwing – tofsvipa<sup>H</sup> [1].

**Material examined: Sk:** Lunds kommun: Lund, 2, 2, 20 Mar. 1939, leg. A. Lundström (SMNH). **Sm:** Torsås kommun: Ragnabo, 1, 4 Apr. 1940, leg. A. Lundström (SMNH). **Vr:** Eda kommun: Skönnerud, 1, 3, 4 Apr. 1939, leg. A. Lundström (SMNH). **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 30 Sep. 2007, leg. D. Gustafsson (SMNH).

***Quadriceps latus* (Nitzsch [in Giebel], 1866)**

*Nirmus latus* Nitzsch [in Giebel], 1866: 371.

*Quadriceps lotus* [sic] (Nitzsch). In Giebel, 1866; Timmermann, 1952c: 1030.

*Glareolites lotus* [sic] (Nitzsch); Złotorzycka, 1967: 742.

**Reports:** [1] Mjöberg (1910a) as *Nirmus cursorius*; [2] This report.

**Type host:** *Cursorius cursor* Latham, 1787 – cream-colored courser – ökenlöpare<sup>R</sup> [1, 2].

**Material examined: Bo:** Öckerö kommun: Rörö, 2 (SMNH).

**Remarks:** The two specimens examined are only partial, and poorly preserved. The host is an extremely rare vagrant in Sweden, and *Q. latus* is unlikely to be recovered from Sweden again.

### ***Quadriceps lineatus* (Piaget, 1880)**

*Nirmus lineatus* Piaget, 1880: 204.

*Quadriceps eugrammicus lineatus* (Piaget), 1880; Timmermann, 1952a: 222.

*Koeniginirmus (Laminonirmus) eugrammicus lineatus* (Piaget); Złotorzycka, 1967: 758.

**Report:** [1] Mjöberg (1910a) as *Nirmus lineolatus*.

**Type host:** *Xema sabini* (Sabine, 1819) – Sabine's gull – tärmås<sup>T</sup> [1].

### ***Quadriceps longicollis* (Rudow, 1869b) New record**

*Nirmus longicollis* Rudow, 1869b: 19.

*Koeniginirmus (Laminonirmus) sellatus longicollis* (Rudow); Złotorzycka, 1967: 766.

**Report:** [1] This report.

**Type host:** *Thalasseus sandvicensis* (Latham, 1787) – Sandwish tern – kentsk tärna<sup>H</sup> [1].

**Material examined: Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 27 Jul. 2007, leg. D. Gustafsson (SMNH).

### ***Quadriceps normifer* (Grube, 1851)**

*Nirmus normifer* Grube, 1851: 478.

*Koeniginirmus normifer* (Grube), 1851; Timmermann, 1949b: 88.

*Koeniginirmus (Laminonirmus) normifer normifer* (Grube); Złotorzycka, 1967: 760.

**Reports:** [1] Mjöberg (1910a) as *Nirmus triangulatus*; [2] Overgaard (1942) as *Nirmus triangulatus*; [3] This report.

**Type host:** *Stercorarius parasiticus* (Linnaeus, 1758) – parasitic jaeger – kustlabb<sup>H</sup> [1, 3].

**Material examined: No locality:** 1 (SMNH).

### ***Quadriceps nyctemerus* (Burmeister, 1838) New record**

*Nirmus nyctemerus* Burmeister, 1838: 428.

*Quadriceps nyctemerus* (Burmeister), 1838; Timmermann, 1952b: 78.

*Koeniginirmus (Laminonirmus) nyctemerus nyctemerus* [sic] (Burmeister); Złotorzycka, 1967: 762.

**Report:** [1] This report.

**Type host:** *Sternula albifrons* Pallas, 1764 – little tern – småtärna<sup>H</sup> [1].

**Material examined: Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 6 Aug. 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 27 Jul. 2007, leg. D. Gustafsson (SMNH).

### ***Quadriceps obliquus* (Mjöberg, 1910a)**

*Nirmus obliquus* Mjöberg, 1910a: 148.

*Quadriceps obliquus* (Mjöberg), 1910; Timmermann, 1954e: 170.

*Cummingsiella obliqua obliqua* (Mjöberg), 1910; Timmermann, 1974: 170.

*Mjoberginirmus obliquus* (Mjöberg); Złotorzycka, 1967: 746.

**Reports:** [1] Mjöberg (1910a) as *Nirmus obliquus*; [2] This report.

**Type host:** *Uria aalge* (Pontoppidan, 1763) – common murre – sillgrissla<sup>H</sup> [1, 2].

**Material examined: No locality:** 3, 3 (SMNH).

### ***Quadriceps obscurus* (Burmeister, 1838) New record**

*Nirmus obscurus* Burmeister, 1838: 427.

*Quadriceps obscurus* (Burmeister), 1838; Hopkins & Timmermann, 1954: 135.

*Quadriceps obscurus* (Burmeister); Złotorzycka, 1967: 719.

**Report:** [1] This report.

**Type host:** *Tringa glareola* (Linnaeus, 1758) – wood sandpiper – grönbena<sup>H</sup> [1].

**Material examined: Sk:** Vellinge kommun: Falsterbo, 3, 6 Aug. 1963, leg. F. Balát, 1296 (MMBC).

**Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2, 3 Aug. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Tringa glareola* likely belong to this species.

### ***Quadriceps obtusus* (Kellogg & Kuwana, 1902) New record**

*Nirmus obtusus* Kellogg & Kuwana, 1902: 468.

*Quadriceps obtusus* (Kellogg & Kuwana); Złotorzycka, 1967: 727.

*Quadriceps obtusus* (Kellogg & Kuwana, 1902); Palma, 1994: 268.

**Report:** [1] This report.

**Type host:** *Onychoprion fuscatus crissalis* (Linnaeus, 1766) – sooty tern (*crissalis*) – söttärna<sup>R</sup>.

**Host in Sweden:** *Tringa totanus totanus* (Linnaeus 1758) – common redshank – rödbena<sup>H</sup> [1].

**Material examined:** Ex *Tringa totanus totanus*: **Sk:** Landskrona kommun: Häljarp, 3, 1, 2 nymphs, 10 Apr. 1940, leg. A. Lundström (SMNH). **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 2, 21 May 2007, leg. D. Gustafsson (SMNH). Same

locality, 1 nymph, 1 Aug. 2007, leg. D. Gustafsson (SMNH). **No locality:** 1, 2 (SMNH).

**Remarks.** Nymphal material tentatively identified as this species based on host associations. No specimens are known from Sweden from the type host, which is an extremely rare vagrant. None are expected, as the type host is an error (Palma 1994). Ash's (1960) unidentified specimens from *Tringa totanus* likely belong to this species.

### ***Quadriceps ochropi* (Denny, 1842)**

*Nirmus ochropi* Denny, 1842: 52.

*Quadriceps ochropi* (Denny), 1842; Hopkins & Timmermann, 1954: 142.

*Quadriceps ochropi* (Denny); Złotorzycka, 1967: 719.

**Reports:** [1] Mjöberg (1910a) as *Nirmus furvus*; [2] This report.

**Type host:** *Tringa ochropus* Linnaeus, 1758 – green sandpiper – skogssnäppa<sup>H</sup> [1, 2].

**Material examined:** **Vg:** *Svenljunga kommun:* Ånarp, 2, 3, 1 nymph, 25 Apr. 1940, leg. A. Lundström (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Tringa ochropus* likely belong to this species.

### ***Quadriceps ornatus lineolatus* (Nitzsch [in Giebel], 1866)**

*Nirmus lineolatus* Nitzsch [in Giebel], 1866: 376.

*Koeniginirmus (Laminonirmus) lineolatus* (Nitzsch); Złotorzycka, 1967: 759.

**Reports:** [1] Mjöberg (1910a); [2] Overgaard (1942); in both as *Nirmus lineolatus*.

**Type host:** *Rissa tridactyla* (Linnaeus, 1758) – black-legged kittiwake – tretåig mås<sup>H</sup> [1].

**Remarks.** Two subspecies of *Q. ornatus* are said to occur on this host: *Q. o. lineolatus* and *Q. o. paulschulzei* (Timmermann, 1949b). Timmermann (1949b) makes no comparison between these two subspecies, and we have found no subsequent treatment of either subspecies. The two may be synonymous, but if not, the Swedish material collected by Mjöberg may be either subspecies. This material was not found at the SMNH, and is assumed to be lost.

### ***Quadriceps ornatus ornatus* (Grube, 1851)**

*Nirmus ornatus* Grube, 1851: 477.

*Koeniginirmus ornatus* (Grube), 1843; Timmermann, 1949b: 83.

*Quadriceps ornatus ornatus* (Grube), 1851; Timmermann, 1952a: 219.

*Koeniginirmus (Laminonirmus) ornatus ornatus* (Grube); Złotorzycka, 1967: 765.

**Report:** [1] Mjöberg (1910a) as *Nirmus lineolatus*.

**Type host:** *Larus canus* Linnaeus, 1758 – common gull – fiskmå<sup>s</sup><sup>H</sup> [1].

### ***Quadriceps ornatus striolatus* (Nitzsch [in Giebel], 1866)**

*Nirmus striolatus* Nitzsch [in Giebel], 1866: 377.

*Quadriceps ornatus striolatus* (Nitzsch). In Giebel, 1866; Timmermann, 1952a: 219.

*Koeniginirmus (Laminonirmus) ornatus striolatus* (Nitzsch); Złotorzycka, 1967: 765.

**Reports:** [1] Mjöberg (1910a) as *Nirmus lineolatus*; [2] This report.

**Type host:** *Larus argentatus* Pontoppidan, 1763 – herring gull – gråtrut<sup>H</sup> [1, 2].

**Additional host in Sweden:** *Larus marinus* Linnaeus, 1758 – greater black-backed gull – havstrut<sup>H</sup> [2].

**Material examined:** Ex *Larus argentatus:* **Sk:** *Vellinge kommun:* Falsterbo, 15, 20, 7 nymphs, 27 Aug. 1963, leg. F. Balát, 1258 (MMBC). Same locality, 1, 24 Aug. 1963, leg. F. Balát, 1293 (MMBC). **Sm:** *Kalmar kommun:* Kalmar, 1 nymph, 29 Apr. 1939, leg. A. Lundström (SMNH).

Ex *Larus marinus:* **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1, 30 Jul. 2007, leg. D. Gustafsson (SMNH).

**Remarks.** Nymphal material tentatively identified as this species based on host associations.

### ***Quadriceps phaeonotus* (Nitzsch [in Giebel], 1866) New record**

*Nirmus phaeonotus* Nitzsch [in Giebel], 1866: 375.

*Quadriceps phaeonotus* (Nitzsch). In Giebel, 1866; Timmermann, 1952b: 84.

*Koeniginirmus (Laminonirmus) nychthemerus* [sic] *phaeonotus* (Nitzsch); Złotorzycka, 1967: 763.

**Report:** [1] This report.

**Type host:** *Chlidonias niger* (Linnaeus, 1758) – black tern – svarttärna<sup>H</sup> [1].

**Material examined:** **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 2, 7 Aug. 2007, leg. D. Gustafsson (SMNH).

### ***Quadriceps punctatus punctatus* (Burmeister, 1838) New record**

*Nirmus punctatus* Burmeister, 1838: 428.

*Quadriceps punctatus punctatus* (Burmeister), 1838; Timmermann, 1952a: 215.

*Koeniginirmus (Koeniginirmus) punctatus punctatus*

(Burmeister); Złotorzycka, 1967: 753.

**Report:** [1] This report.

**Type host:** *Chroicocephalus ridibundus* (Linnaeus, 1758) – black-headed gull – skrattnäs<sup>H</sup> [1].

**Material examined:** **Sk:** *Lunds kommun:* Silvåkra, 1, 2, 24 Apr. 1939, leg. A. Lundström (SMNH).

**Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 2, 6 Aug. 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 1 nymph, 30 Jul. 2007, leg. D. Gustafsson (SMNH).

***Quadriceps punctatus regressus* Timmermann, 1952a New record**

*Quadriceps punctatus regressus* Timmermann, 1952a: 215.

*Koeniginirmus (Koeniginirmus) punctatus regressus* (Timmermann); Złotorzycka, 1967: 754.

**Report:** [1] This report.

**Type host:** *Larus argentatus argentatus* Pontoppidan, 1763 – herring gull (*argentatus*) – gråtrut<sup>H</sup>.

**Host in Sweden:** *Larus fuscus fuscus* Linnaeus, 1758 – lesser black-backed gull (*fuscus*) – silltrut<sup>H</sup> [1].

**Material examined:** Ex *Larus fuscus fuscus:* **Sm:** *Kalmar kommun:* Kalmar, 1, 1, 29 Apr. 1939, leg. A. Lundström (SMNH).

**Remarks:** No specimens from the type host are known from Sweden.

***Quadriceps ravus* (Kellogg, 1899)**

*Nirmus furvus* var. *ravus* Kellogg, 1899: 14.

*Quadriceps ravus* (Kellogg), 1899; Hopkins & Timmermann, 1954: 145.

*Quadriceps ravus* (Kellogg); Złotorzycka, 1967: 721.

**Reports:** [1] Mjöberg (1910a) as *Nirmus obscurus*;

[2] This report.

**Type host:** *Actitis hypoleucos* (Linnaeus, 1758) – common sandpiper – drillsnäppa<sup>H</sup> [1, 2].

**Material examined:** **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 3, 1, 12 May 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Actitis hypoleucos* likely belong to this species.

***Quadriceps sellatus* (Burmeister, 1838)**

*Nirmus sellatus* Burmeister, 1838: 428.

*Koeniginirmus sellatus* (Burmeister), 1838; Timmermann, 1949b: 87.

*Quadriceps sellatus sellatus* (Burmeister), 1838; Timmermann, 1952b: 80.

*Koeniginirmus (Laminonirmus) sellatus sellatus* (Burmeister); Złotorzycka, 1967: 767.

**Reports:** [1] Mjöberg (1910a) as *Nirmus selliger*; [2] This report.

**Type host:** *Sterna hirundo* Linnaeus, 1758 – common tern – fisktärna<sup>H</sup> [1, 2].

**Material examined:** **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1, 27 Jul. 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 1, 31 Jul. 2007, leg. D. Gustafsson (SMNH). **No locality:** 1 (SMNH).

***Quadriceps signatus* (Piaget, 1880) New record**

*Nirmus signatus* Piaget, 1880: 186.

*Proneptis semifissus* (Nitzsch); Timmermann, 1953a: 331.

*Proneptis signata* (Piaget); Złotorzycka, 1967: 733.

**Report:** [1] This report.

**Type host:** *Recurvirostra avosetta* Linnaeus, 1758 – pied avocet – skärfläcka<sup>H</sup> [1].

**Material examined:** **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1, 1, 2 Jul. 2010, leg. D. Gustafsson (SMNH).

***Quadriceps similis* (Giebel, 1866)**

*Nirmus similis* Giebel, 1866: 374.

*Quadriceps similis* (Giebel), 1866; Hopkins & Timmermann, 1954: 139.

*Quadriceps similis* (Giebel); Złotorzycka, 1967: 723.

**Reports:** [1] Mjöberg (1910a) as *Nirmus obscurus*;

[2] This report.

**Type host:** *Tringa nebularia* (Gunnerus, 1767) – common greenshank – gluttsnäppa<sup>H</sup> [1, 2].

**Material examined:** **No locality:** 1 (SMNH).

***Quadriceps strepsilaris* (Denny, 1842) New record**

*Nirmus strepsilaris* Denny, 1842: 52.

*Quadriceps strepsilaris* (Denny), 1842; Timmermann, 1950b: 2.

*Quadriceps strepsilaris* (Denny); Złotorzycka, 1967: 724.

**Report:** [1] This report.

**Type host:** *Arenaria interpres* (Linnaeus, 1758) – ruddy turnstone – roskarl<sup>H</sup> [1].

**Material examined:** **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 2, 10 May 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 1, 15 May 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Arenaria interpres* likely belong to this species.

***Quadriceps* sp.**

**Report:** [1] This report.

**Host:** *Calidris canutus* (Linnaeus, 1758) – red knot – kustsnäppa<sup>F</sup> [1].

**Material examined:** **Sk:** *Vellinge kommun:* Falster-

bo, 19 , 19 , 1 nymph, 22 Aug. 1963, leg. F. Balát, 1268 (MMBC).

**Remarks:** There are no species of *Quadriceps* reported to occur on this host, and these records likely represent stragglers or contaminants.

### *Quadriceps* sp.

**Report:** [1] Ash (1960).

**Host:** *Calidris pugnax* (Linnaeus, 1758) – ruff – brushane<sup>H</sup> [1].

**Remarks:** Ash's (1960) unidentified specimens from *Calidris pugnax* likely belongs to *Quadriceps lahorensis* Ansari, 1955. However, we have not seen Ash's specimens, and the same report contains a large amount of unidentified *Quadriceps* species from *Calidris* sandpipers, which are probably stragglers or contaminations. As the specimens were not identified, we do not add *Q. lahorensis* to the Swedish list. No *Q. lahorensis* have been found on Swedish ruffs during our survey.

### *Quadriceps* sp.

**Report:** [1] This report.

**Host:** *Calidris temminckii* (Leisler, 1812) – Temminck's stint – mosnäppa<sup>H</sup> [1].

**Material examined: Sk:** Vellinge kommun: Falsterbo, 1 , 5 Aug. 1963, leg. F. Balát, 1295 (MMBC).

**Remarks:** There are no species of *Quadriceps* reported to occur on this host, and these records likely represent stragglers or contaminants.

### *Rallicola* Johnston & Harrison, 1911

**Type species:** *Nirmus attenuatus* Burmeister, 1838 = *Nirmus ortygometrae* Schrank, 1781.

*Rallicola* was revised by Clay (1953), which includes partial illustrations of the only species known from Sweden. Emerson (1955b) provided a short description and an illustration of the male genitalia of the only Swedish species. Both revisions provide keys that include additional species that may occur in Sweden.

The genus forms the core of the *Rallicola*-complex, but all proposed genera of this complex other than *Rallicola* are extralimital.

### *Rallicola fulicae* (Denny, 1842) New record

*Nirmus fulicae* Denny, 1842: 50.

*Rallicola fulicae* (Denny); Clay, 1953: figs 18, 25.

*Rallicola fulicae* (Denny); Emerson, 1955b: 285.

**Report:** [1] This report.

**Type host:** *Fulica atra* Linnaeus, 1758 – Eurasian coot – sothöna<sup>H</sup> [1].

**Material examined: Sk:** Sjöbo kommun: Sövdeborg, 2 , 3 nymphs, 30 Mar. 1939, leg. A Lundström (SMNH). **No locality:** 1 , 4 (SMNH).

### *Rhynonirmus* Thompson, 1935b

**Type species:** *Lipeurus infusctaus* Osborn, 1896.

No complete revision of *Rhynonirmus* has been published.

### *Rhynonirmus helvolus* (Burmeister, 1838)

*Lipeurus helvolus* Burmeister, 1838: 433.

*Rhynonirmus helvolus* (Burmeister), 1838; Timmermann, 1955: 529.

**Reports:** [1] Mjöberg (1910a) as *Nirmus truncatus*; [2] This report.

**Type host:** *Scolopax rusticola* Linnaeus, 1758 – Eurasian woodcock – morkulla<sup>H</sup> [1, 2].

**Material examined: Sk:** Hässleholms kommun: Vankiva, 3 , 4 , 1 nymph, 7 May 1939, leg. A. Lundström (SMNH). **Vg:** Borås kommun: Borås, 1 , 19 Apr. 1939, leg. A. Lundström (SMNH).

### *Rhynonirmus scolopacis* (Denny, 1842)

*Nirmus scolopacis* Denny, 1842: 54.

*Rhynonirmus scolopacis* (Denny), 1842; Timmermann, 1955: 529.

**Reports:** [1] Mjöberg (1910a) as *Nirmus truncatus*; [2] This report.

**Type host:** *Gallinago gallinago* (Linnaeus, 1758) – common snipe – enkelbeckasin<sup>H</sup> [1, 2].

**Material examined: Sk:** Vellinge kommun: Falsterbo, 1 , 17 , 1 nymph, 5 Aug. 1963, leg. F. Balát, 1284 (MMBC). **Up:** Uppsala kommun: Uppsala, 3 , 1 nymph, leg. C. Videll (SMNH). **Öi:** Mörbylånga kommun: Ottenby Bird Observatory, 1 , 1 , 9 Sep. 2007, leg. D. Gustafsson (SMNH). Same locality, 1 , 5 Aug. 2007, leg. D. Gustafsson (SMNH).

### *Rostrinirmus* Złotorzycka, 1964a

**Type species:** *Rostrinirmus refractoriolus* Złotorzycka, 1964a = *Nirmus ruficeps* Nitzsch [in Giebel], 1866.

*Rostrinirmus* was considered a synonym of *Sturridoeucus* Eichler, 1944, by Price *et al.* (2003a), but considered a valid genus in the recent revision of the *Brueelia*-complex (Gustafsson & Bush 2017). The single Swedish species was illustrated by Gustafsson & Bush (2017).

***Rostrinirmus ruficeps* (Nitzsch [in Giebel], 1866) New record**

*Nirmus ruficeps* Nitzsch [in Giebel], 1866: 367.

*Rostrinirmus ruficeps* (Nitzsch [in Giebel], 1866); Gustafsson & Bush, 2017: 265.

**Report:** [1] This report.

**Type host:** *Passer montanus* (Linnaeus, 1758) – tree sparrow – pilfink<sup>H</sup>.

**Host in Sweden:** *Passer domesticus* (Linnaeus, 1758) – house sparrow – gråsparv<sup>H</sup> [1].

**Material examined: Sk:** *Vellinge kommun:* Falsterbo, 2, 3 nymphs, 5 Aug. 1963, leg. F. Balát 1252 (MMBC). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1, 4 Sep. 2013, leg. D. Gustafsson (SMNH). Same locality, 1, 8 Sep. 2013, leg. D. Gustafsson (SMNH). Same locality, 2, 21 Sep. 2013, leg. D. Gustafsson (SMNH). **No locality:** 1 (SMNH).

**Remarks:** No specimens from the type host are known from Sweden.

***Saemundssonina* Timmermann, 1936**

**Type species:** *Docophorus gonothorax* Giebel, 1874 = *Pediculus lari* O. Fabricius, 1780.

No complete revision of *Saemundssonina* has been published, but Timmermann has revised several groups within this genus in a series of publications. Those relevant for the Swedish list include: Timmermann (1951a) for species on gulls, Timmermann (1951b, 1969) for species on sandpipers and allies, and Timmermann (1949a) for species from various hosts. In addition, the following revisions delimited by host groups should be consulted, including for species occurring on vagrants and other hosts not listed below: Clay (1949) for the species on terns; Martens (1974) for the species on sandpipers and allies; Palma (2000) for the species of jaegers; Price *et al.* (2003b) for species on auks. Ward (1955) also reviewed the species found on terns, but added little new to the species included by Clay (1949).

Note that the original publication of *Saemundssonina* has the date “15.4.1935” printed on it. This is a printing error (Weidner 1983), and the correct year for this publication is 1936, which is the year that has been used by all subsequent workers, except Hopkins & Clay (1952).

***Saemundssonina* (*Saemundssonina*) *calva* (Kellogg, 1896b)**

*Docophorus calvus* Kellogg, 1896b: 79

*Saemundssonina calva* (Kellogg), 1896; Timmermann, 1949a: 31.

*Saemundssonina calva* (Kellogg); Price *et al.*, 2003b: 922.

**Report:** [1] Mjöberg (1910a) as *Docophorus celidoxus*.

**Type host:** *Uria aalge* (Pontoppidan, 1763) – common murre – sillgrissla<sup>H</sup> [1].

***Saemundssonina* (*Saemundssonina*) *celidoxa* (Burmeister, 1838)**

*Docophorus celidoxus* Burmeister, 1838: 426.

*Saemundssonina celidoxa* (Nitzsch in Burmeister), 1838; Timmermann, 1949a: 24.

*Saemundssonina celidoxa* (Burmeister); Price *et al.*, 2003b: 920.

**Reports:** [1] Mjöberg (1910a); [2] Overgaard (1942); [3] This report.

**Type host:** *Alca torda* Linnaeus, 1758 – razorbill – tordmule<sup>H</sup> [1, 3].

**Material examined: No locality:** 2, 3 (SMNH).

**Remarks:** Both Mjöberg (1910a) and Overgaard (1942) list several other alcids as hosts of this species, most of which likely represent other species of *Saemundssonina*. We have not found any specimens from these hosts in Mjöberg’s collection in Stockholm. Overgaard (1942) mentions this species from Sweden, but does not give any Swedish hosts.

***Saemundssonina* (*Saemundssonina*) *cephalus* (Denny, 1842)**

*Docophorus cephalus* Denny, 1842: 44.

*Saemundssonina* (*Saemundssonina*) *cephalus* (Denny, 1842); Palma 2000: 122.

**Reports:** [1] Mjöberg (1910a) as *Docophorus pustulosus*; [2] This report.

**Type host:** *Stercorarius parasiticus* (Linnaeus, 1758) – parasitic jaeger – kustlabb<sup>H</sup> [1, 2].

**Material examined: No locality:** 2 (SMNH).

***Saemundssonina* (*Saemundssonina*) *conica conica* (Denny, 1842)**

*Docophorus conicus* Denny, 1842: 45.

*Saemundssonina conica* (Denny), 1842: 18.

**Reports:** [1] Mjöberg (1910a) as *Docophorus temporalis*; [2] This report.

**Type host:** *Pluvialis apricaria* (Linnaeus, 1758) – Eurasian golden plover – ljungpipare<sup>H</sup> [1, 2].

**Material examined: Up:** *Uppsala kommun:* Uppsala, 2, leg. C. Videll (SMNH).

***Saemundssonina (Saemundssonina) fraterculae (Overgaard, 1942)***

*Docophorus fraterculae* Overgaard, 1942: 10.  
*Saemundssonina fraterculae* (Overgaard), 1942; Timmermann, 1949a: 25.  
*Saemundssonina fraterculae* (Overgaard); Price *et al.* 2003b: 919.

**Report:** [1] Mjöberg (1910a) as *Docophorus cel-edoxus*.

**Type host:** *Fratercula arctica* (Linnaeus, 1758) – Atlantic puffin – lunnefågel<sup>T</sup> [1].

***Saemundssonina (Saemundssonina) grylle (O. Fabricius, 1780)***

*Pediculus grylle* O. Fabricius, 1780: 218.  
*Saemundssonina grylle* (Fabricius), 1780; Timmermann, 1949a: 28.  
*Saemundssonina grylle* (O. Fabricius); Price *et al.* 2003b: 920.

**Report:** [1] Mjöberg (1910a) as *Docophorus cel-edoxus*.

**Type host:** *Cephus grylle* (Linnaeus, 1758) – black guillemot – tobisgrissla<sup>H</sup> [1].

***Saemundssonina (Saemundssonina) haematopi (Linnaeus, 1758)***

*Pediculus haematopi* Linnaeus, 1758: 613.  
*Saemundssonina haematopi* (Linnaeus), 1758; Timmermann, 1949a: 23.

**Reports:** [1] Linnaeus (1746) as *Pediculus haematopi*; [2] Mjöberg (1910a) as *Docophorus acanthus*; [3] This report.

**Type host:** *Haematopus ostralegus* Linnaeus, 1758 – Eurasian oystercatcher – strandskata<sup>H</sup> [1, 2, 3].

**Material examined: Bo:** *Tanums kommun:* Tanum, 2, 5 Apr. 1940, leg. A. Lundström (SMNH). *Öckerö kommun:* Björkö, 5 nymphs, 11 Apr. 1940, leg. A. Lundström (SMNH). **Sk:** *Vellinge kommun:* Falsterbo, 2, 5, 3 nymphs, 1 Sep. 1963, leg. F. Balát, 1283 (MMBC). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1, 2 Aug. 2007, leg. D. Gustafsson (SMNH). **No locality:** 1 nymph (SMNH).

**Remarks.** Nymphal material is identified tentatively based on host associations.

***Saemundssonina (Saemundssonina) inexpectata Timmermann, 1951***

*Saemundssonina inexpectata* Timmermann, 1951: 9.  
*Saemundssonina (Saemundssonina) inexpectata* Timmermann, 1951a; Palma 2000: 125.

**Report:** [1] Palma (2000).

**Type host:** *Hydrocoloeus minutus* Pallas, 1776 – little gull – dvärgmåås<sup>H</sup>.

**Host in Sweden:** *Stercorarius longicaudus* Vieillot, 1819 – long-tailed jaeger – fjällabb<sup>H</sup> [1].

**Remarks.** No specimens from the type host are known from Sweden. This host is an error (Palma 2000), and no specimens should be expected from little gulls caught in the future.

***Saemundssonina (Saemundssonina) integer (Nitzsch [in Giebel], 1866)***

*Docophorus integer* Nitzsch [in Giebel], 1866: 360.

**Reports:** [1] Mjöberg (1910a) as *Docophorus integer*; [2] This report.

**Type host:** *Grus grus* (Linnaeus, 1758) – common crane – trana<sup>H</sup> [1, 2].

**Material examined: Sk:** “North Sk”, 4, 3, 2 nymphs, 18 Jul. 1931, leg. H. Murchardt (SMNH). **Up:** Stockholm, 1, leg. E. Mjöberg (SMNH). *Uppsala kommun:* Uppsala, 1 nymph, leg. C. Videll (SMNH). **Vg:** *Tranemo kommun:* Månstad, 1, 1, 3 Jul. 2014, leg. D. Gustafsson (SMNH).

***Saemundssonina (Saemundssonina) lari (O. Fabricius, 1780)***

*Pediculus lari* O. Fabricius, 1780: 219.  
*Saemundssonina gonothorax* (Giebel), 1871; Timmermann, 1949a: 4.

*Saemundssonina lari* (Fabricius), 1780; Timmermann, 1951a: 1.

**Reports:** [1] Mjöberg (1910a) as *Docophorus lari*; [2] Overgaard (1942) as *Docophorus lari*; [3] This report.

**Type host:** *Larus hyperboreus* Gunnerus, 1767 – glaucous gull – vittrut<sup>T</sup>.

**Hosts in Sweden:** *Chroicocephalus ridibundus* (Linnaeus, 1758) – black-headed gull – skrattnåås<sup>H</sup> [3]. *Larus argentatus* Pontoppidan, 1763 – herring gull – gråtrut<sup>H</sup> [1, 3]. *Larus canus* Linnaeus, 1758 – common gull – fiskmåås<sup>H</sup> [1, 3]. *Larus fuscus* Linnaeus, 1758 – lesser black-backed gull – silltrut<sup>H</sup> [3]. *Larus marinus* Linnaeus, 1758 – greater black-backed gull – havstrut<sup>H</sup> [1, 3].

**Material examined: Ex Chroicocephalus ridibundus: Sk:** *Lunds kommun:* Silvåkra, 2, 7, 3 nymphs, 24 Apr. 1939, leg. A. Lundström (SMNH). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1, 30 Jul. 2007, leg. D. Gustafsson (SMNH). Same locality, 1, 31 Jul. 2007, leg. D. Gustafsson (SMNH).

**Ex Larus argentatus: Sk:** *Vellinge kommun:* Falsterbo, 14, 29, 17 nymphs, 27 Aug. 1963, leg. F. Balát, 1257 (MMBC). Same locality, 5, 7, 5 nymphs, 24 Aug. 1963, leg. F. Balát, 1292 (MMBC).

**Sm:** *Kalmar kommun:* Kalmar, 4, 3, 4 nymphs, 29 Apr. 1939, leg. A. Lundström (SMNH). **Up:** *Uppsala kommun:* Uppsala, 15, 19, 2 nymphs, leg.

C. Videll (SMNH).

Ex *Larus canus*: **Up**: Uppsala kommun: Uppsala, 6, 7, leg. C. Videll (SMNH).

Ex *Larus fuscus*: **Up**: Uppsala kommun: Uppsala, 8, 8, leg. C. Videll (SMNH).

Ex *Larus marinus*: **Öl**: Mörbylånga kommun: Ottenby Bird Observatory, 1, 30 Jul. 2007, leg. D. Gustafsson (SMNH). **No locality**: 3, 5 (SMNH).

**Remarks**: No specimens are known from the type host in Sweden. The glaucous gull is a seasonal migrant to Sweden, and *S. lari* most likely occur on birds in Sweden. On white-headed gulls, *S. lari* can sometimes be seen with binoculars or the naked eye (Fig. 4).

***Saemundssonina (Saemundssonina) laticaudata (Rudow, 1869) New record***

*Docophorus laticaudatus* Rudow, 1869b: 12.

*Saemundssonina laticaudata* (Rudow), 1869b; Clay, 1949: 14.

**Report**: [1] This report.

**Type host**: *Thalasseus sandvicensis* (Latham, 1787) – Sandwich tern – kentsk tärna<sup>H</sup> [1].

**Material examined**: **Öl**: Mörbylånga kommun: Ottenby Bird Observatory, 1, 1, 27 Jul. 2007, leg. D. Gustafsson (SMNH).

***Saemundssonina (Saemundssonina) limosae (Denny, 1842)***

*Docophorus limosae* Denny, 1842: 44.

*Saemundssonina limosae* (Denny), 1842: 395.

**Reports**: [1] Mjöberg (1910a) as *Docophorus limosae* and *Docophorus acanthus*; [2] This report.

**Type host**: *Limosa lapponica* (Linnaeus, 1758) – bar-tailed godwit – myrspöv<sup>H</sup> [1, 2].

**Material examined**: **No locality**: 1 nymph (SMNH).

**Remarks**. Nymphal material examined by us is identified tentatively based on host associations.

***Saemundssonina (Saemundssonina) lobaticeps (Giebel, 1874) New record***

*Docophorus lobaticeps* Giebel, 1874: 109.

*Saemundssonina lobaticeps* (Giebel), 1874; Clay, 1949: 15.

**Report**: [1] This report.

**Type host**: *Chlidonias niger* (Linnaeus, 1758) – black tern – svarttärna<sup>H</sup> [1].

**Material examined**: **Öl**: Mörbylånga kommun: Ottenby Bird Observatory, 1, 7 Aug. 2007, leg. D. Gustafsson (SMNH).

***Saemundssonina (Saemundssonina) lockleyi Clay, 1949 New record***

*Saemundssonina lockleyi* Clay, 1949: 11.

**Report**: [1] This report.

**Type host**: *Sterna vittata georgiae* Reichenow, 1904 – Antarctic tern – antarktistärna<sup>E</sup>.

**Host in Sweden**: *Sterna paradisaea* Pontoppidan, 1763 – Arctic tern – silvertärna<sup>H</sup> [1].

**Material examined**: **Öl**: Mörbylånga kommun: Ottenby Bird Observatory, 2, 27 Jul. 2007, leg. D. Gustafsson (SMNH).

**Remarks**: The type host does not occur in Sweden, and there are thus no Swedish records of *S. lockleyi* from the type host.

***Saemundssonina (Saemundssonina) melanocephalus (Burmeister, 1838) New record***

*Docophorus melanocephalus* Burmeister, 1838: 426.

*Saemundssonina melanocephalus* (Burmeister), 1838; Clay, 1949: 11.

**Report**: [1] This report.

**Type host**: *Sternula albifrons* Pallas, 1764 – little tern – småtärna<sup>H</sup> [1].

**Material examined**: **Öl**: Mörbylånga kommun: Ottenby Bird Observatory, 1, 1, 27 Jul. 2007, leg. D. Gustafsson (SMNH).

**Remarks**: Overgaard (1942) reported this species from a number of hosts, and noted that the known distribution included Sweden. Clay (1949) noted that, as the species of *Saemundssonina* on terns are so similar that most reports of *S. melanocephalus* from before her revision are “valueless”. Overgaard (1942) did not mention where his records of *S. melanocephalus* from Sweden were published, and we have been unable to find any such report. Therefore we consider the present report of *S. melanocephalus* to constitute the first confirmed report from Sweden.

***Saemundssonina (Saemundssonina) platygaster cordiceps (Giebel, 1874)***

*Docophorus cordiceps* Giebel, 1874: 103.

*Saemundssonina platygaster glareolae* (Giebel), 1866; Timmermann, 1969: 243.

**Reports**: [1] Overgaard (1942) as *Docophorus cordiceps*; [2] Timmermann (1969) as *Saemundssonina platygaster glareolae*.

**Type host**: *Tringa glareola* (Linnaeus, 1758) – wood sandpiper – grönbena<sup>H</sup> [1].

**Remarks**: Ash’s (1960) unidentified specimens from *Tringa glareola* likely belong to this species.



***Saemundssonina (Saemundssonina) platygaster frater (Giebel, 1874)***

*Docophorus frater* Giebel, 1874: 103.

*Saemundssonina platygaster frater* (Giebel), 1874; Timmermann, 1969: 242.

**Report:** [1] Timmermann (1969).

**Type host:** *Actitis hypoleucos* (Linnaeus, 1758) – common sandpiper – drillsnäppa<sup>H</sup> [1].

**Remarks:** Ash's (1960) unidentified specimens from *Actitis hypoleucos* likely belong to this species.

***Saemundssonina (Saemundssonina) platygaster mollis (Nitzsch [in Giebel], 1874)***

*Docophorus mollis* Nitzsch [in Giebel], 1874: 103.

*Saemundssonina platygaster mollis* (Nitzsch). In Giebel, 1874; Timmermann, 1969: 243.

**Reports:** [1] Mjöberg (1910a) as *Docophorus cordiceps*; [2] Timmermann (1969); [3] This report.

**Type host:** *Tringa totanus* (Linnaeus, 1758) – common redshank – rödbena<sup>H</sup> [1, 2, 3].

**Material examined:** No locality: 1 , 5 nymphs (SMNH).

**Remarks:** Ash's (1960) unidentified specimens from *Tringa totanus* likely belong to this species.

***Saemundssonina (Saemundssonina) platygaster platygaster (Denny, 1842)***

*Docophorus platygaster* Denny, 1842: 44.

*Saemundssonina platygaster* (Denny), 1842; Timmermann, 1949a: 22.

*Saemundssonina sc.-ph. platygaster* (Denny), 1842; Timmermann, 1951b: 393.

*Saemundssonina platygaster platygaster* (Denny), 1842; Timmermann, 1969: 240.

**Reports:** [1] Mjöberg (1910a) as *Docophorus temporalis*; [2] Overgaard (1952) as *Philoaterus* sp.

**Type host:** *Charadrius hiaticula* Linnaeus, 1758 – common ringed plover – större strandpipare<sup>H</sup> [2].

**Additional host in Sweden:** *Charadrius dubius* Scopoli, 1763 – lesser ringed plover – mindre strandpipare<sup>H</sup> [1].

**Remarks:** Overgaard's (1952) identification was only tentative. Ash's (1960) unidentified specimens from *Charadrius hiaticula* likely belong to this species.

***Saemundssonina (Saemundssonina) platygaster temporalis (Giebel, 1874)***

*Docophorus temporalis* Giebel, 1874: 102.

*Saemundssonina platygaster temporalis* (Giebel), 1874; Timmermann, 1969: 241.

**Reports:** [1] Mjöberg (1910a) as *Docophorus cordiceps*; [2] This report.

**Type host:** *Vanellus vanellus* (Linnaeus, 1758) – northern lapwing – tofsvipa<sup>H</sup> [1, 2].

**Material examined:** Sk: *Lunds kommun*: Silvåkra, 3 , 1 nymph, 30 Mar. 1939, leg. A. Lundström (SMNH). Up: *Uppsala kommun*: Uppsala, 1 , leg. C. Videll (SMNH).

***Saemundssonina (Saemundssonina) scolopacisphaeopodis humeralis (Denny, 1842) New record***

*Docophorus humeralis* Denny, 1842: 45.

*Saemundssonina scolopacisphaeopodis humeralis* (Denny), 1842; Timmermann, 1969: 233.

**Report:** [1] This report.

**Type host:** *Numenius arquata* (Linnaeus, 1758) – Eurasian curlew – storspov<sup>H</sup> [1].

**Material examined:** Sk: *Lunds kommun*: Silvåkra, 2 , 15 & 18 May 1940, leg. A. Lundström (SMNH).

Up: *Stockholms kommun*: Skansen, 1 , leg. E. Mjöberg (SMNH). *Uppsala kommun*: Uppsala, 1 , leg. C. Videll (SMNH). Ög: *Ödeshög kommun*: Glänås, 4 , 5 nymphs, 30 Apr. 1940, leg. A. Lundström (SMNH).

***Saemundssonina (Saemundssonina) scolopacisphaeopodis scolopacisphaeopodis (Schrank, 1803)***

*Pediculus scolopacisphaeopodis* Schrank, 1803: 191.

*Saemundssonina scolopacisphaeopodis* (Schrank), 1803; Timmermann, 1949a: 20.

*Saemundssonina sc.-ph. scolopacisphaeopodis* (Schrank), 1803; Timmermann, 1951b: 392.

*Saemundssonina scolopacisphaeopodis scolopacisphaeopodis* (Schrank), 1803; Timmermann, 1969: 233.

**Report:** [1] Mjöberg (1910a) as *Docophorus acanthus*.

**Type host:** *Numenius phaeopus* (Linnaeus, 1758) – whimbrel – småspov<sup>H</sup> [1].

***Saemundssonina (Saemundssonina) sternae (Linnaeus, 1758)***

*Pediculus sternae* Linnaeus, 1758: 612.

*Saemundssonina sternae* (Linné), 1758; Clay, 1949: 4.

**Reports:** [1] Linnaeus (1746) as *Pediculus sternae*; [2] Mjöberg (1910a) as *Docophorus melanocephalus*; [3] Clay (1949); [4] This report.

**Type host:** *Sterna hirundo* Linnaeus, 1758 – common tern – fisktärna<sup>H</sup> [1, 2, 3, 4].

**Material examined:** Öl: *Mörbylånga kommun*: Ottenby Bird Observatory, 3 , 27 Jul. 2007, leg. D. Gustafsson (SMNH). No locality: 1 (SMNH).

***Saemundssonina (Saemundssonina) tringae* (O. Fabricius, 1780)**

*Pediculus tringae* O. Fabricius, 1780: 219.

*Saemundssonina variabilis* (Denny), 1842; Timmermann, 1949a: 16.

*Saemundssonina variabilis* (Denny), 1842; Timmermann, 1951b: 400.

*Saemundssonina tringae* (O. Fabricius, 1780); Martens, 1974: 142.

**Reports:** [1] Mjöberg (1910a) as *Docophorus fusiiformis*; [2] Martens (1974); [3] This report.

**Type host:** *Calidris maritima* (Brünnich, 1764) – purple sandpiper – skärnsnäppa<sup>H</sup>.

**Hosts in Sweden:** *Calidris alpina* (Linnaeus, 1758) – dunlin – kärrensnäppa<sup>H</sup> [3]. *Calidris canutus* (Linnaeus, 1758) – red knot – kustsnäppa<sup>F</sup> [1]. *Calidris minuta* (Leisler, 1812) – little stint – småsnäppa<sup>F</sup> [3]. *Calidris temminckii* (Leisler, 1812) – Temminck's stint – mosnäppa<sup>H</sup> [2]. *Phalaropus lobatus* (Linnaeus, 1758) – red-necked phalarope – småsnäppa [2].

**Material examined:** Ex *Calidris alpina*: **Sk:** Landskrona kommun: Häljarp, 2, 1, 2 May 1939, leg. A. Lundström (SMNH).

Ex *Calidris minuta*: **Öl:** Mörbylånga kommun: Ottenby Bird Observatory, 1, 30 Sep. 2007, leg. D. Gustafsson (SMNH).

**Remarks:** Overgaard (1952) reported “(*Onophorus*) sp.” from *C. maritima*, but was unable to identify this material. This record may refer to *S. tringae* from the type host. No specimens from the type host are known from Sweden. Ash's (1960) unidentified specimens from *Calidris temminckii* (Leisler, 1812), *C. alpina*, and *C. alba* likely belong to this species.

***Saemundssonina* sp.**

**Report:** [1] Ash (1960).

**Host:** *Calidris pugnax* (Linnaeus, 1758) – ruff – brushane<sup>H</sup> [1].

**Remarks:** Ash (1960) reported unidentified *Saemundssonina* specimens from Swedish ruffs. Two species of *Saemundssonina* are known from ruffs: *S. tringae* and *S. platygaster ashi* Timmermann, 1955. As we have not seen Ash's specimens, we cannot identify these to species, and do not include them on the Swedish list.

***Strigiphilus* Mjöberg, 1910a**

**Type species:** *Docophorus heterocerus* Grube, 1851. Clay (1966b) defined species groups within *Strigiphilus*, and provided a key to these and photos of the male genitalia of many species. The fol-

lowing species groups occur in Sweden: *crenulatus*, *cursitans*, *cursor*, *heterocerus*, *rostratus*, and *strigis*. *Strigiphilus portigi* and *S. remotus* were not included in Clay's list; Clay (1966b) suggested the latter may be a synonym of *S. syrni*. Both may be close to the *heterocerus* species group, and are placed near this group in our key; Clayton & Price (1984) established that it is not in the *cursitans* group, but did not comment further. Clay (1966c) included good illustrations of *S. rostratus*. Clay (1977) provided some additional illustrations of the *cursitans* species group, and discussed the group. The *cursitans* species group was more thoroughly revised by Clayton & Price (1984). A good overview of head shapes is given by Ledger (1970b); this character can often identify different species of *Strigiphilus* living on the same host species, but not all Swedish species are illustrated. No comprehensive revision has been published for the other species groups within *Strigiphilus*.

Eichler (1963) placed this genus close to *Philoaterus*, and we here include it tentatively in the *Philoaterus*-complex in the key.

***Strigiphilus barbatus* (Osborn, 1902) New record**

*Docophorus barbatus* Osborn, 1902: 201.

**Reports:** [1] This report.

**Type host:** *Euphagus carolinus* (Muller, 1776) – rusty blackbird – myrtrupial<sup>E</sup>.

**Host in Sweden:** *Asio otus* (Linnaeus, 1758) – long-eared owl – hornuggla<sup>H</sup> [1].

**Material examined:** Ex *Asio otus*: **Sk:** Hässleholms kommun: Norra Mellby [as N Miellby], 1, 1, 2 May 1964, leg. S. Linder, 164 (PIPeR).

**Remarks:** There are no records of the type host from Sweden, and thus no Swedish material from the type host, which is likely an error due to contamination or straggling.

***Strigiphilus ceblebrachys* (Denny, 1842) New record**

*Docophorus ceblebrachys* Denny, 1842: 45.

*Strigiphilus ceblebrachys* (Denny); Clay, 1966b: figs. 5, 28.

*Strigiphilus ceblebrachys* (Denny, 1842); Ledger, 1970b: fig. 8.

*Strigiphilus ceblebrachys* (Denny); Clayton & Price, 1984: 353.

**Report:** [1] This report.

**Type host:** *Bubo scandiaca* (Linnaeus, 1758) – snowy owl – fjälluggla<sup>h</sup> [1].

**Material examined: No locality:** 6 , 4 , 1 nymph, 14 Oct. 1884, leg. Lampa (SMNH). 2 , 1 (SMNH).

***Strigiphilus crenulatus* (Giebel, 1874) New record**

*Docophorus crenulatus* Giebel, 1864: 78.

*Strigiphilus crenulatus* (Giebel); Clay, 1966b: fig. 29.

**Report:** [1] This report.

**Type host:** *Surnia ulula* (Linnaeus, 1758) – northern hawk owl – hökuggla<sup>h</sup> [1].

**Material examined: Up:** *Uppsala kommun:* Uppsala, 1 , 1 , leg. C. Videll (SMNH). **Vb:** *Umeå kommun:* Stora Fjäderägg, 2 , 28 Oct. 2008, leg. D. Strasevicius (SMNH). **No locality:** 4 , 1 , 1 nymph, 20 Dec. 1904, leg. H. Murchardt (SMNH). 4 , 15 , 16 Nov. 1865 (SMNH).

***Strigiphilus cursor* (Burmeister, 1838)**

*Docophorus cursor* Burmeister, 1838: 426.

*Strigiphilus cursor* (Burm.); Clay, 1966b: fig. 15.

**Reports:** [1] Mjöberg (1910a) as *Docophorus cursor*; [2] This report.

**Type host:** *Asio flammeus* (Pontoppidan, 1763) – short-eared owl – jorduggla<sup>h</sup> [1, 2].

**Material examined: Sk:** *Lunds kommun:* Lund, 1 , Nov. 1923, leg. K. Ander[son?], 11 (PIPeR). **Sk:** *Trelleborgs kommun:* Trelleborg, 3 , 3 , 13 Dec. 1939, leg. A. Lundström (SMNH). **Unidentified locality:** V[ästra] Sandby, 1 , 18 Oct. 1954 (PIPeR).

**Remarks:** Mjöberg (1910a) also reported this species from *Bubo bubo* (Linnaeus, 1758), but these specimens have not been located.

***Strigiphilus goniodicerus* Eichler, 1949b New record**

*Strigiphilus goniodicerus* Eichler, 1949b: 11.

**Report:** [1] This report.

**Type host:** *Bubo bubo* (Linnaeus, 1758) – Eurasian eagle owl – berguv<sup>h</sup> [1].

**Material examined: No locality:** 3 , 11 , 3 nymph (SMNH).

***Strigiphilus heterocerus* (Grube, 1851) New record**

*Docophorus heterocerus* Grube, 1951: 469.

*Strigiphilus heterocerus* (Grube); Clay, 1966b: fig. 14.

**Report:** [1] This report.

**Type host:** *Strix uralensis* Pallas, 1771 – Ural owl – slaguggla<sup>h</sup> [1].

**Material examined: Dr:** *Ludvika kommun:* Ludvi-

ka, 1 , 12 Apr. 1955 (PIPeR). **Vr:** *Torsby kommun:* Höljes, 1 , 21 Oct. 1958, leg. T. H[ansso]n. (PIPeR).

***Strigiphilus laticephalus* (Uchida, 1949) New record**

*Philopterus laticephalus* Uchida, 1949: 543.

**Report:** [1] This report.

**Type host;** *Strix aluco* Linnaeus, 1758 – tawny owl – kattuggla<sup>h</sup> [1].

**Material examined: Blekinge:** *Karlskrona kommun:* Sturkö, Bredvik, 3 , 14 , 7 nymphs, 22 Mar. 1939, leg. A. Lundström (SMNH). **Bo:** *Strömstad kommun:* Skee, 1 , 1 , 3 Jun. 1936, leg. T. Hansson (PIPeR). **No locality:** 3 (SMNH).

***Strigiphilus pallidus* (Giebel, 1874)**

*Docophorus pallidus* Giebel, 1874: 78.

*Strigiphilus pallidus* (Giebel, 1874); Ledger, 1970b: fig. 10.

*Strigiphilus pallidus* (Giebel); Clayton & Price, 1984: 349.

**Reports:** [1] Mjöberg (1910a) as *Docophorus clypeatus*; [2] Clayton & Price (1984); [3] This report.

**Type host:** *Aegolius funereus* (Linnaeus, 1758) – boreal owl – pärluggla<sup>h</sup> [1, 2].

**Material examined: Sk:** *Lunds kommun:* Dalby, 4 , 2 , 1 nymph, 18 Apr. 1939, leg. A. Lundström (SMNH). **Vs:** *Ljusnarsbergs kommun:* Kopparberg, 1 , 23 Mar. 1960, leg. T. H[ansso]n, 57 (PIPeR). **Ån:** *Umeå kommun:* Norrbyskärr, 1 , 21 Mar. 1962, leg. G. Noreus (PIPeR).

**Remarks:** Mjöberg (1910a) also reported *Strigiphilus ceblebrachys* (Denny, 1842) from this host, but these specimens have not been located.

***Strigiphilus portigi* Eichler, 1952 New record**

*Strigiphilus portigi* Eichler, 1952: 154.

**Report:** [1] This report.

**Host:** *Strix aluco* Linnaeus, 1758 – tawny owl – kattuggla<sup>h</sup> [1].

**Material examined: No locality:** 2 , 6 Jun. 1912 (SMNH).

***Strigiphilus remotus* (Kellogg & Chapman, 1899) New record**

*Oncophorus remotus* Kellogg & Chapman, 1899: 107.

**Report:** [1] This report.

**Type host:** *Strix nebulosa* Forster, 1772 – great grey owl – lappuggla<sup>h</sup> [1].

**Material examined: Jä:** *Strömsund kommun:* Gäddede, 1 , 1 Apr. 1959, leg. O. Bergman (PIPeR). *Karlsbäcken*, 1 , 30 Oct. 1958, leg. O. Bergman (PIPeR).

***Strigiphilus rostratus* (Burmeister, 1838) New record**

*Docophorus rostratus* Burmeister, 1838: 427.

*Strigiphilus rostratus* 9Burm.); Clay, 1966b: fig. 13.

*Strigiphilus rostratus* (Burmeister, 1838); Clay, 1966c: 10.

**Reports:** [1] This report.

**Type host:** *Tyto alba guttata* (C.L. Brehm, 1831) – barn owl (*guttata*) – tornuggla<sup>h</sup> [1].

**Additional host in Sweden (stragglers?):** *Asio flammeus* (Postoppidan, 1763) – short-eared owl – jorduggla [1].

**Material examined:** Ex *Tyto alba guttata*: **Sk:** *Kävlinge kommun:* Löddeköpinge, 1 , 1 , 19 Jan. 1954, leg. H. Johnsson (PIPÉR).

Ex *Asio flammeus*: **No locality:** 1 , 2 (SMNH)

***Strigiphilus strigis* (Pontoppidan, 1763) New record**

*Pediculus strigis* Pontoppidan, 1763: 699.

*Strigiphilus strigis* [Pontoppidan, 1763]; Hopkins & Clay, 1951: 29.

*Strigiphilus strigis* (Pontoppidan); Clay, 1966b: fig. 24.

**Report:** [1] This report.

**Type host:** *Bubo bubo* (Linnaeus, 1758) – Eurasian eagle owl – bergu<sup>h</sup> [1].

**Material examined: Up:** *Uppsala kommun:* Uppsala, 15 , 7 nymphs, leg. C. Videll (SMNH). **No locality:** 2 , 2 , 8 nymphs (SMNH).

***Struthiolepeurus Cummings, 1916***

**Type species:** *Lipeurus asymmetricus* Piaget, 1885 = *Philopterus struthionis* Gervais, 1844.

*Struthiolepeurus* was revised by Mey (1998).

***Struthiolepeurus struthionis* (Gervais, 1844)**

*Philopterus struthionis* Gervais, 1844: 354.

*Struthiolepeurus struthionis* (Gervais, 1844); Mey, 1998: 78.

**Report:** [1] Jansson & Höglund (1997); [2] Jansson & Christensson (2000); [3] This report.

**Type host:** *Struthio camelus* Linnaeus, 1758 – ostrich – struts<sup>d</sup> [1, 2, 3].

**Material examined: Vg:** *Götene kommun:* Källby: Broby Strutsfarm, 1 , 26 May 2014, leg. D. Gustafsson (SMNH).

**Remarks.** The ostrich is not native to Sweden, but can be found in several ostrich farms in the southern parts of the country. The owner of Broby Ostrich Farm, from whose captive population our specimens are collected, told us that *Struthiolepeurus struthionis* is very common on farmed ostriches in all ostrich farms in Sweden.

Jansson & Christensson (2000) report that the species was “relatively common” on Swedish ostriches.

***Sturnidoecus Eichler, 1944***

**Type species:** *Docophorus leontodon* Nitzsch, 1818 = *Pediculus sturni* Schrank, 1776.

No comprehensive revision of *Sturnidoecus* has been published, but Ansari (1968) provided a key to the species on starlings known at the time. The key, unfortunately, is very hard to use in practice. Gustafsson & Bush (2017) divided the genus into 12 species groups. All except one species are extralimital, but some may occur on rare vagrants or exotic birds kept in captivity in Sweden.

*Sturnidoecus* is part of the *Brueelia*-complex.

***Sturnidoecus sturni* (Schrank, 1776)**

*Pediculus sturni* Schrank, 1776: 118.

*Sturnidoecus sturni* (Schrank, 1776); Gustafsson & Bush, 2017: 241.

**Reports:** [1] Mjöberg (1910a) as *Docophorus leontodon*; [2] This report.

**Type host:** *Sturnus vulgaris* Linnaeus, 1758 – European starling – stare<sup>h</sup> [1, 2].

**Material examined: Dr:** *Falun kommun:* Kyrkbyttjärn, 1 , 2 , 8 Jun. 2014, leg. D. Gustafsson (SMNH). **Sk:** *Lunds kommun:* Häckeberga, 6 , 6 , 4 nymphs, 15 Mar. 1939, leg. A. Lundström (SMNH). *Vellinge kommun:* Falsterbo, 4 nymphs, 23 Aug. 1963, leg. F. Balát, 1280 (MMBC). **Sm:** *Aneby kommun:* Ralängen Bird Observatory, 1 , 27 May 2014, leg. D. Gustafsson (SMNH). **Vr:** *Eda kommun:* Skönnerud, 6 , 6 , 3 nymphs, 13 Apr. 1939, leg. A. Lundström (SMNH). **Öl:** *Mörbylånga kommun:* Ottenby Bird Observatory, 1 nymph, 28 May 2007, leg. D. Gustafsson (SMNH). **No locality:** 1 (SMNH).

***Turdinirmus Eichler, 1951***

**Type species:** *Nirmus merulensis* Denny, 1842.

*Turdinirmus* was considered a synonym of *Brueelia* Kéler, 1936, in the checklist of Price et al. (2003a), but considered as a separate genus in the revision of the *Brueelia*-complex by Gustafsson & Bush (2017). No comprehensive revision of *Turdinirmus* has been published.

***Turdinirmus merulensis* (Denny, 1842) New record**

*Nirmus merulensis* Denny, 1842: 51.

*Turdinirmus merulensis* (Denny, 1842); Gustafsson &

Bush, 2017: 119.

**Report:** [1] This report.

**Type host:** *Turdus merula* Linnaeus, 1758 – Eurasian blackbird – koltrast<sup>H</sup> [1].

**Material examined:** **Bo:** *Sotenäs kommun:* Grosshamns Bird Observatory, 1 , 1 , 16 May 2014, leg. D. Gustafsson (SMNH). **Go:** *Gos kommun:* Grötlingbo, 1 , 27 Jun. 2014, leg. D. Gustafsson (SMNH). **Sk:** *Lunds kommun:* Håckeberga, 2 , 1 nymph, 15 Mar. 1939, leg. A. Lundström (SMNH). **Sm:** *Jönköpings kommun:* Dumme Mosse Nature Preserve, 2 , 29 May 2014, leg. D. Gustafsson (SMNH).

### Trichodectidae Kellogg, 1896a

The only summary of trichodectid lice on domestic mammals in Sweden was published by Brinck (1946), and little is known about the geographical range and prevalence of Swedish trichodectids today. Improvements in veterinary and agricultural methods have no doubt influenced the trichodectid fauna in Sweden. The greater mobility of domestic animals across Europe since 1946, and the introduction of new domestic animals may have introduced novel species to the Swedish fauna. For instance, introduced domestic alpaca in New Zealand are known to be parasitized by *Bovicola breviceps* Rudow, 1866 (Palma *et al.* 2006), but this species has not yet been reported from Sweden (Bornstein & de Verdier 2010; de Verdier & Bornstein 2010; Eriksson *et al.* 2012). It is illustrated and discussed by Mey & González-Acuña (2007). No domestic mammals were examined for lice during our survey, and the need to update our knowledge of many of the louse species listed below is great.

Apart from the taxa listed below, Werneck (1948, 1950) provided excellent illustrations and detailed descriptions (in Spanish) of a number of trichodectid genera and species that may occur on wild or captive mammals in Sweden.

### *Bovicola* Ewing, 1929

**Type species:** *Trichodectes caprae* Gurlt, 1843.

Werneck (1950) illustrated and described all Swedish species except *B. tarandi* and *B. equi*. The latter was redescribed and illustrated by Moreby (1978). Both these publications contain illustrations of species that may occur on exotic mammals kept in captivity in Sweden, and should be consulted if any specimens from such hosts are found.

### *Bovicola (Bovicola) bovis* (Linnaeus, 1758)

*Pediculus bovis* Linnaeus, 1758: 611.

*Bovicola bovis* (Linnaeus); Werneck, 1950: 63.

**Reports:** [1] Linnaeus (1746) as *Pediculus tausi*; [2] Linnaeus (1758); [3] Linnaeus (1761); [4] Mjöberg (1910a) as *Trichodectes scalaris*; [5] Brinck (1948); [6] Christensson *et al.* 1994.

**Type host:** *Bos taurus* Linnaeus, 1758 – cattle – nötboskap<sup>D</sup> [1, 2, 3, 4, 5, 6].

**Remarks.** Present in more than half of examined cattle infested with lice (Christensson *et al.* 1994).

### *Bovicola (Bovicola) caprae* (Gurlt, 1843)

*Trichodectes caprae* Gurlt, 1843: 3.

*Bovicola caprae* (Gurlt); Werneck, 1950: 60.

**Reports:** [1] Brinck (1946a) as *Bovicola climax*; [2] Persson *et al.* (2014); [3] This report.

**Type host:** *Capra hircus* Linnaeus, 1758 – goat – tamget<sup>D</sup> [1, 2, 3].

**Material examined:** **No locality:** 2 , 4 , 3 nymphs (SMNH).

**Remarks.** Persson *et al.* (2014) states that *Bovicola caprae* occurs in “most goat herds, especially during the stabling season”, but gives no reference for this observation. Much has been written about the differences between *B. caprae* and *B. limbatus*, including Benítez-Rodríguez *et al.* (1985) and Soler Cruz *et al.* (1987), which should be consulted for further information.

### *Bovicola (Bovicola) limbatus* (Gervais, 1844)

#### New record

*Trichodectes limbatus* Gervais, 1844: 313.

*Bovicola limbatus* (Gervais); Werneck, 1950: 62.

**Report:** [1] This report.

**Type host:** *Capra hircus* Linnaeus, 1758 – goat – tamget<sup>D</sup> [1].

**Material examined:** **No locality:** 1 , 12 , 15 nymphs (SMNH).

### *Bovicola (Bovicola) ovis* (Schrank, 1781)

*Pediculus ovis* Schrank, 1781: 502.

*Bovicola ovis* (Linnaeus); Werneck, 1950: 73.

**Report:** [1] Brinck (1946a).

**Type host:** *Ovis aries* Linnaeus, 1758 – sheep – tamfår<sup>D</sup> [1].

### *Bovicola (Bovicola) tarandi* (Mjöberg, 1910a)

*Trichodectes tarandi* Mjöberg, 1910a: 66.

*Bovicola tarandi* (Mjöberg); Werneck, 1950: 79.

**Reports:** [1] Mjöberg (1910a) as *Trichodectes tarandi*; [2] This report.

**Type host:** *Rangifer tarandus* (Linnaeus, 1758) – reindeer – ren [1, 2].

**Material examined: Lappland:** 21 , 1 nymph, 2 Oct. 1909, leg. E. Mjöberg (SMNH).

### ***Bovicola (Werneckiella) equi* (Denny, 1842)**

*Trichodectes equi* Denny, 1842: 61.

*Bovicola equi* (Linnaeus); Werneck, 1950: 79.

*Werneckiella equi* (Denny); Moreby, 1978: 399.

**Reports:** [1] Linnaeus (1758) as *Pediculus equi* [nomen nudum]; [2] Mjöberg (1910a) as *Trichodectes parumpilosus* and *T. pilosus*; [3] Overgaard (1942).

**Type host:** *Equus caballus* Linnaeus, 1758 – horse – häst<sup>D</sup> [1, 2, 3].

**Remarks:** One nymph from *Equus africanus asinus* Linnaeus, 1758, at the SMNH may represent this species. Lindqvist et al. (2007) states that this is one of the most important ectoparasites of domestic horses in Sweden, but no modern surveys have been published.

### ***Damalinea Mjöberg, 1910a***

**Type species:** *Trichodectes crenulatus* Piaget, 1880. Werneck (1950) provided voluminous notes of this species, but did not illustrate it beyond a line drawing of the outline. Better illustrations may be present in Werneck (1947), but we have not seen this article.

### ***Damalinea (Cervicola) meyeri* (Taschenberg, 1882)**

*Trichodectes meyeri* Taschenberg, 1882: 22.

*Damalinea meyeri* (Taschenberg); Werneck, 1950: 135.

**Reports:** [1] Mjöberg (1910a) as *Trichodectes tibialis*; [2] Aguirre et al. (1999) as *Damalinea cervi*; [3] This report.

**Type host:** *Capreolus capreolus* (Linnaeus, 1758) – western roe deer – rådjur [1, 2].

**Material examined: Sk:** Svalövs kommun: Svalöv, 26 , 2 nymphs, 22 Mar. 1940, leg. A. Lundström (SMNH). **Up:** Stockholms kommun: Skansen, 2 , 2 , 3 nymphs, leg. E. Mjöberg (SMNH).

**Remarks:** Ten nymphs from the same host without locality data at the SMNH may belong to this species.

### ***Felicola Ewing, 1929***

**Type species:** *Trichodectes subrostratus* Burmeister, 1838.

Werneck (1948) illustrated and described the only Swedish species.

### ***Felicola subrostratus* (Burmeister, 1838)**

*Trichodectes subrostratus* Burmeister, 1838: 436.

*Felicola subrostratus* (Burmeister); Werneck, 1948: 194.

**Report:** [1] Brinck (1946a).

**Type host:** *Felis catus* Linnaeus, 1758 – domestic cat – tamkatt<sup>D</sup> [1].

**Remarks.** Both Brinck (1946a) and Läkemedelsverket (2014) claim that cat lice are rare in Sweden, but do not refer to any published studies.

### ***Stachiella von Kéler, 1938***

**Type species:** *Trichodectes pusillus* Nitzsch [in Giebel], 1861 = *Pediculus mustelae* Schrank, 1803.

Werneck (1948) includes illustrations and descriptions of the only Swedish species of *Trichodectes*, as well as many that may occur on exotic species kept in captivity in Sweden

### ***Stachiella erminae* Hopkins, 1941**

*Stachiella erminae* Hopkins, 1941: 38.

**Reports:** [1] Mjöberg (1910a) as *Trichodectes retusus*; [2] This report.

**Type host:** *Mustela erminea* Linnaeus, 1758 – stoat – hermelin [1, 2].

**Material examined: No locality:** 3 , 2 nymphs (SMNH).

### ***Trichodectes Nitzsch, 1818***

**Type species:** *Trichodectes canis* de Geer, 1778.

Werneck (1948) includes illustrations and descriptions of all Swedish species of *Trichodectes*, as well as many that may occur on exotic species kept in captivity in Sweden

### ***Trichodectes canis* (de Geer, 1778)**

*Trichodectes canis* de Geer, 1778: 81.

*Trichodectes canis* (De Geer); Werneck, 1948: 111.

**Reports:** [1] Mjöberg (1910a) as *Trichodectes latis*; [2] Brinck (1946a); [3] Brinck (1948); [4] Christensson et al. (1998); [5] This report.

**Type host:** *Canis familiaris* Linnaeus, 1758 – domestic dog – tamhund<sup>D</sup> [1, 2, 3, 4, 5].

**Material examined: No locality:** 1 (SMNH).

**Remarks:** A second slide at the SMNH contains one unidentifiable trichodectid nymph that may represent this species. Both Brinck (1946a) and Läkemedelsverket (2014) claim that this species is rare in Sweden, but do not refer to any published studies. Christensson et al. (1994)

reported that *T. canis* was rare in their samples, with most specimens taken from sled dogs.

***Trichodectes melis* (J.C. Fabricius, 1805)**

*Pediculus melis* J.C. Fabricius, 1805: 341.

*Trichodectes melis* (Fabricius); Werneck, 1948: 115.

**Reports:** [1] Mjöberg (1910a) as *Trichodectes crassus*; [2] This report.

**Type host:** *Meles meles* (Linnaeus, 1758) – European badger – grävling [1, 2].

**Material examined: Sk:** *Lunds kommun:* Silvåkra, 14 , 20 , 23 nymphs, 3 Mar. 1939, leg. A. Lundström (SMNH). *Örkelljunga kommun:* Åsljunga, 4 nymphs, 11 May 1939, leg. A. Lundström (SMNH).

**Up:** Stockholm, 15 , 15 , 75 nymphs, 16 Jun. 1923 (SMNH). *Uppsala kommun:* Jumkil, 4 , 3 , 13 nymphs, 17 Jun. 1927 (SMNH). **Vg:** *Svenljunga kommun:* Ånarp, 5 , 9 , 12 nymphs, 30 Mar. 1940, leg. A. Lundström (SMNH). **No locality:** 2 , 4 , 26 nymphs (SMNH).

***Trichodectes pinguis* Burmeister, 1838**

*Trichodectes pinguis* Burmeister, 1838: 435.

*Trichodectes pinguis* Burmeister; Werneck, 1948: 117.

**Report:** [1] Esteruelas *et al.* (2016) as *Trichodectes pinguis pinguis*.

**Type host:** *Ursus arctos* Linnaeus, 1758 – brown bear – brunbjörn [1].

## Species removed from the Swedish list

***Lunaceps nereis* Timmermann, 1954**

*Lunaceps nereis* Timmermann, 1954:628.

**Report:** [1] Gustafsson & Olsson (2012b).

**Type host:** *Calidris maritima* (Brünnich, 1764) – purple sandpiper – skärsnäppa [1].

**Remarks:** Gustafsson & Olsson (2012b) mistakenly assumed that Meinertzhagen's material from Lapland was collected in Sweden. However, Meinertzhagen (1938) reported only localities in Finland.

***Quadraceps furvus* (Burmeister, 1838)**

*Nirmus furvus* Burmeister, 1838: 427.

**Report:** [1] Mjöberg (1910a) as *Nirmus furvus*.

**Remarks:** Mjöberg (1910a) reported this species from five different host species, none of which are the type host of *Q. furvus*. We have only found material from one of these hosts, *Tringa totanus* (see *Q. obtusus* above); there are no other specimens of *Q. furvus* in Mjöberg's collection in Stockholm. It is conceivable that one or more of his specimens represents *Q. furvus*. The specimens he reported are all from non-type hosts that are either known to be infested by other *Quadraceps* species hard to separate from *Q. furvus*, or not parasitized by any known species of *Quadraceps*. In the absence of extant specimens, we hereby remove *Q. furvus* from the Swedish list.

## Checklist by host

### Aves Linnaeus, 1758

#### Acciptridae Vieillot, 1816

*Accipiter gentilis* Linnaeus, 1758 – northern goshawk – duvhök<sup>H</sup>

*Colpocephalum nanum* Piaget, 1890 [Ambl.: Menopon.]

*Craspedorrhynchus haematopus* (Scopoli, 1763) [Ischn.: Philopter.]

*Degeeriella vagans* (Giebel, 1874) [Ischn.: Philopter.]

*Accipiter nisus* Linnaeus, 1758 – Eurasian sparrowhawk – sparvhök<sup>H</sup>

*Craspedorrhynchus nisi* (Denny, 1842) [Ischn.: Philopter.]

*Degeeriella nisus* (Giebel, 1866) [Ischn.: Philopter.]

*Aquila chrysaetos* (Linnaeus, 1758) – golden eagle – kungsörn<sup>H</sup>

*Colpocephalum flavescens* (de Haan, 1829) [Ambl.: Menopon.]

*Craspedorrhynchus aquilinus* (Denny, 1842) [Ischn.: Philopter.]

*Degeeriella aquilarum* Eichler, 1953 [Ischn.: Philopter.]

*Falcolipeurus suturalis* (Rudow, 1869b) [Ischn.: Philopter.]

*Buteo buteo* (Linnaeus, 1758) – common buzzard – ormvråk<sup>H</sup>

*Colpocephalum nanum* Piaget, 1890 [Ambl.: Menopon.]

*Craspedorrhynchus platystomus* (Burmeister, 1838) [Ischn.: Philopter.]

*Degeeriella fulva* (Giebel, 1874) [Ischn.: Philopter.]

*Buteo lagopus* (Pontoppidan, 1763) – rough-legged buzzard – fjällvråk<sup>H</sup>

*Colpocephalum nanum* Piaget, 1890 [Ambl.: Menopon.]

*Craspedorrhynchus dilatatus* (Rudow, 1869b) [Ischn.: Philopter.]

*Degeeriella fulva* (Giebel, 1874) [Ischn.: Philopter.]

*Milvus migrans* (Boddaert, 1783) – black kite – brunglada<sup>H</sup>

*Craspedorrhynchus spathulatus* (Giebel, 1874) [Ischn.: Philopter.]

*Milvus milvus milvus* (Linnaeus, 1758) – red kite – rödglada<sup>H</sup>

*Colpocephalum milvi* Tendeiro, Restivo & Demartis, 1979 [Ambl.: Menopon.]

*Craspedorrhynchus spathulatus* (Giebel, 1874) [Ischn.: Philopter.]

*Degeeriella regalis* (Giebel, 1866) [Ischn.: Philopter.]

*Pernis apivorus* (Linnaeus, 1758) – honey buzzard – bivvråk<sup>H</sup>

*Colpocephalum apivorus* Tendeiro, 1958a [Ambl.: Menopon.]

*Craspedorrhynchus melittoscopus* (Nitzsch [in Giebel], 1874) [Ischn.: Philopter.]

*Degeeriella phlyctopygus* (Nitzsch [in Giebel], 1861) [Ischn.: Philopter.]

*Nosopon clayae* Price & Beer, 1963 [Ambl.: Menopon.]

#### Anatidae Vigors, 1825

*Anas acuta* Linnaeus, 1758 – pintail – stjärtand<sup>H</sup>

*Anaticola crassicornis* (Scopoli, 1763) [Ischn.: Philopt.]

*Anas crecca* Linnaeus, 1758 – green-winged teal – kricka<sup>H</sup>

*Anaticola crassicornis* (Scopoli, 1763) [Ischn.: Philopt.]

*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]

*Holomenopon clypeilargum* Eichler, 1943 [Ambl.: Menopon.]

*Trinoton querquedulae* Linnaeus, 1758 [Ambl.: Menopon.]

*Anas penelope* Linnaeus, 1758 – Eurasian wigeon – bläsand<sup>H</sup>

*Anaticola crassicornis* (Scopoli, 1763) [Ischn.: Philopt.]

*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]

*Trinoton querquedulae* Linnaeus, 1758 [Ambl.: Menopon.]

*Anas platyrhynchos* Linnaeus, 1758 – mallard – gräsand<sup>H</sup>

*Anaticola crassicornis* (Scopoli, 1763) [Ischn.: Philopt.]

*Trinoton querquedulae* Linnaeus, 1758 [Ambl.: Menopon.]

*Anas strepera* Linnaeus, 1758 – gadwall – snatterand<sup>H</sup>

*Anaticola crassicornis* (Scopoli, 1763) [Ischn.: Philopt.]



- Trinoton querquedulae* Linnaeus, 1758 [Ambl.: Menopon.]
- Anser albifrons* (Scopoli 1769) – greater white-fronted goose – bläsgås<sup>F</sup>  
*Anaticola anseris* (Linnaeus, 1758) [Ischn.: Philopt.]
- Anser fabalis* (Latham, 1787) – bean goose – sädgås<sup>H</sup>  
*Ciconiphilus pectiniventris* (Harrison, 1916) [Ambl.: Menopon.]  
*Aythya ferina* (Linnaeus, 1758) – common pochard – bergand<sup>H</sup>  
*Anaticola mergiserrati* (de Geer, 1778) [Ischn.: Philopt.]  
*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]
- Aythya fuligula* (Linnaeus, 1758) – tufted duck – vigg<sup>H</sup>  
*Anaticola pseudofuligulae* Eichler & Vasjukova, 1980 [Ischn.: Philopt.]  
*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]
- Branta bernicla* (Linnaeus, 1758) – brant – prutgås<sup>F</sup>  
*Anaticola rhinwaldi* Eichler & Vasjukova, 1980 [Ischn.: Philopt.]  
*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]
- Branta leucopsis* (Bechstein, 1803) – barnacle goose – vitkindad gås<sup>H</sup>  
*Anaticola anseris* (Linnaeus, 1758) [Ischn.: Philopt.]  
*Bucephala clangula* (Linnaeus, 1758) – common goldeneye – knipa<sup>H</sup>  
*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]  
*Trinoton querquedulae* Linnaeus, 1758 [Ambl.: Menopon.]
- Clangula hyemalis* (Linnaeus, 1758) – long-tailed duck – alfågel<sup>H</sup>  
*Anaticola branderi* Eichler & Hackman, 1973 [Ischn.: Philopt.]  
*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]
- Cygnus cygnus* (Gmelin, 1789) – whooper swan – sånsgvan<sup>H</sup>  
*Trinoton anserinum* (J.C. Fabricius, 1805) [Ambl.: Menopon.]
- Cygnus olor* (Linnaeus, 1758) – mute swan – knölsvan<sup>H</sup>  
*Anatoecus cygni* (Denny, 1842) [Ischn.: Philopt.]  
*Anatoecus penicillatus* Kéler, 1960 [Ischn.: Philopt.]  
*Ornithobius bucephalus* (Giebel, 1874) [Ischn.: Philopt.]
- Trinoton anserinum* (J.C. Fabricius, 1805) [Ambl.: Menopon.]
- Cygnus* sp.  
*Ornithobius waterstoni* Timmermann, 1962 [Ischn.: Philopt.]
- Melanitta fusca* (Linnaeus, 1758) – white-winged scoter – svärta<sup>H</sup>  
*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]
- Melanitta nigra* (Linnaeus, 1758) – common scoter – sjöorre<sup>H</sup>  
*Anaticola angustolimbatus* (Giebel, 1866) [Ischn.: Philopt.]  
*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]  
*Holomenopon leucoxanthum* (Burmeister, 1838) [Ambl.: Menopon.]  
*Trinoton querquedulae* Linnaeus, 1758 [Ambl.: Menopon.]
- Mergus merganser* Linnaeus, 1758 – common merganser – storskrake<sup>H</sup>  
*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]  
*Trinoton querquedulae* Linnaeus, 1758 [Ambl.: Menopon.]
- Mergus serrator* Linnaeus, 1758 – red-breasted merganser – småskrake<sup>H</sup>  
*Anaticola mergiserrati* (de Geer, 1778) [Ischn.: Philopt.]  
*Trinoton querquedulae* Linnaeus, 1758 [Ambl.: Menopon.]
- Polysticta stelleri* (Pallas, 1769) – Steller's eider – alförrädare<sup>T</sup>  
*Anaticola kloekenhoffi* Eichler & Vasjukova, 1980 [Ischn.: Philopt.]  
*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]
- Somateria mollissima* (Linnaeus, 1758) – common eider – ejder<sup>H</sup>  
*Anaticola rubromaculatus* (Rudow, 1869b) [Ischn.: Philopt.]  
*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]  
*Holomenopon loomisii* (Kellogg, 1896b) [Ambl.: Menopon.]
- Tadorna tadorna* (Linnaeus, 1758) – common shelduck – gravand<sup>H</sup>  
*Anaticola tadornae* (Denny, 1842) [Ischn.: Philopt.]  
*Anatoecus dentatus* (Scopoli, 1763) [Ischn.: Philopt.]  
*Holomenopon leucoxanthum* (Burmeister, 1838) [Ambl.: Menopon.]

**Apodidae Hartert, 1897**

*Apus apus* (Linnaeus, 1758) – common swift – tornsegflare<sup>H</sup>

*Dennyus hirundinis* (Linnaeus, 1758) [Ambl.: Menopon.]

**Caprimulgidae Vigors, 1825**

*Caprimulgus europaeus* Linnaeus, 1758 – European nightjar – nattskärå<sup>H</sup>

*Mulcticola hypoleucum* (Denny, 1842) [Ischn.: Philopter.]

**Alcidae Leach, 1820**

*Alca torda* Linnaeus, 1758 – razorbill – tordmule<sup>H</sup>

*Austromenopon nigropleurum* (Denny, 1842) [Ambl.: Menopon.]

*Quadriceps alcae* (Denny, 1842) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *celidoxa* (Burmeister, 1838) [Ischn.: Philopter.]

*Alle alle* (Linnaeus, 1758) – dovekie – alkekung<sup>F</sup>

*Quadriceps aethereus* (Giebel, 1874) [Ischn.: Philopter.]

*Cephus grylle* (Linnaeus, 1758) – black guillemot – tobisgrissla<sup>H</sup>

*Quadriceps alcae* (Denny, 1842) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *grylle* (O. Fabricius, 1758) [Ischn.: Philopter.]

*Fratercula arctica* (Linnaeus, 1758) – Atlantic puffin – lunnefågel<sup>T</sup>

*Saemundssonina* (*Saemundssonina*) *fraterculae* (Overgaard, 1942) [Ischn.: Philopter.]

*Uria aalge* (Pontoppidan, 1763) – common murre – sillgrissla<sup>H</sup>

*Quadriceps obliquus* (Mjöberg, 1910a) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *calva* (Kellogg, 1896b) [Ischn.: Philopter.]

**Charadriidae Vigors, 1825**

*Charadrius dubius* Scopoli, 1763 – lesser ringed plover – mindre strandpipare<sup>H</sup>

*Saemundssonina* (*Saemundssonina*) *platygaster platygaster* (Denny, 1842) [Ischn.: Philopter.]

*Charadrius hiaticula* Linnaeus, 1758 – common ringed plover – större strandpipare<sup>H</sup>

*Actornithophilus ochraceus* (Nitzsch, 1818) [Ambl.: Menopon.]

*Austromenopon aegialitidis* (Durrant, 1906) [Ambl.: Menopon.]

*Quadriceps fissus* (Burmeister, 1838) [Ischn.: Philopter.]

*Quadriceps hiaticulae* (O. Fabricius, 1780) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *platygaster platygaster* (Denny, 1842) [Ischn.: Philopter.]

*Pluvialis apricaria* (Linnaeus, 1758) – European golden plover – ljustpipare<sup>H</sup>

*Quadriceps charadrii* (Linnaeus, 1758) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *conica conica* (Denny, 1842) [Ischn.: Philopter.]

*Pluvialis squatarola* (Linnaeus, 1758) – black-bellied plover – kustpipare<sup>F</sup>

*Actornithophilus ochraceus* (Nitzsch, 1818) [Ambl.: Menopon.]

*Quadriceps hospes* (Nitzsch [in Giebel], 1866) [Ischn.: Philopter.]

*Vanellus vanellus* (Linnaeus, 1758) – northern lapwing – tofsvipa<sup>H</sup>

*Actornithophilus gracilis* (Piaget, 1880) [Ambl.: Menopon.]

*Austromenopon aegialitidis* (Durrant, 1906) [Ambl.: Menopon.]

*Quadriceps junceus* (Scopoli, 1763) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *platygaster temporalis* (Giebel, 1874) [Ischn.: Philopter.]

**Glareolidae C.L. Brehm, 1831**

*Cursorius cursor* Latham, 1787 – cream-coloured courser – ökenlöpare<sup>R</sup>

*Quadriceps latus* (Nitzsch [in Giebel], 1866) [Ischn.: Philopter.]

**Haematopodidae Bonaparte, 1838**

*Haematopus ostralegus* Linnaeus, 1758 – Eurasian oystercatcher – strandskata<sup>H</sup>

*Actornithophilus grandiceps* (Piaget, 1880) [Ambl.: Menopon.]

*Quadriceps auratus* (de Haan, 1829) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *haematopi* (Linnaeus, 1758) [Ischn.: Philopter.]

**Laridae Vigors, 1825**

*Chlidonias niger* (Linnaeus, 1758) – black tern – svarttärna<sup>H</sup>

*Quadriceps phaeonotus* (Nitzsch [in Giebel], 1866) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *lobaticeps* (Giebel, 1874) [Ischn.: Philopter.]

*Chroicocephalus ridibundus* (Linnaeus, 1758) – black-headed gull – skratmås<sup>H</sup>

*Austromenopon transversum* (Denny, 1842) [Ambl.: Menopon.]

*Quadriceps punctatus punctatus* (Burmeister, 1838) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *lari* (O. Fabricius, 1780) [Ischn.: Philopter.]

*Larus argentatus* Pontoppidan, 1763 – herring gull – gråtrut<sup>H</sup>

*Austromenopon transversum* (Denny, 1842) [Ambl.: Menopon.]

*Quadriceps ornatus striolatus* (Nitzsch [in Giebel], 1866) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *lari* (O. Fabricius, 1780) [Ischn.: Philopter.]

*Larus canus* Linnaeus, 1758 – common gull – fiskmås<sup>H</sup>

*Quadriceps ornatus ornatus* (Grube, 1851) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *lari* (O. Fabricius, 1780) [Ischn.: Philopter.]

*Larus fuscus* Linnaeus, 1758 – lesser black-backed gull – silltrut<sup>H</sup>

*Actornithophilus piceus lari* (Packard, 1870) [Ambl.: Menopon.]

*Quadriceps punctatus regressus* Timmermann, 1952 [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *lari* (O. Fabricius, 1780) [Ischn.: Philopter.]

*Larus marinus* Linnaeus, 1758 – greater black-backed gull – havstrut<sup>H</sup>

*Quadriceps ornatus striolatus* (Nitzsch [in Giebel], 1866) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *lari* (O. Fabricius, 1780) [Ischn.: Philopter.]

*Rissa tridactyla* (Linnaeus, 1758) – black-legged kittiwake – tretåig mås<sup>H</sup>

*Quadriceps ornatus lineolatus* (Nitzsch [in Giebel], 1866) [Ischn.: Philopter.]

*Sterna hirundo* Linnaeus, 1758 – common tern – fisktärna<sup>H</sup>

*Actornithophilus piceus piceus* (Denny, 1842) [Ambl.: Menopon.]

*Quadriceps sellatus* (Burmeister, 1838) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *sternae* (Linnaeus, 1758) [Ischn.: Philopter.]

*Sterna paradisaea* Pontoppidan, 1763 – Arctic tern – silvertärna<sup>H</sup>

*Quadriceps houri* Hopkins, 1949 [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *lockleyi* Clay, 1949 [Ischn.: Philopter.]

*Sternula albifrons* Pallas, 1764 – little tern – småtärna<sup>H</sup>

*Quadriceps nyctemerus* (Burmeister, 1838) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *melanocephalus* (Burmeister, 1838) [Ischn.: Philopter.]

*Thalasseus sandvicensis* (Latham, 1787) – Sandwich tern – kentsk tärna<sup>H</sup>

*Quadriceps longicollis* (Rudow, 1869b) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *laticaudata* (Rudow, 1869b) [Ischn.: Philopter.]

*Xema sabini* (Sabine, 1819) – Sabine's gull – tärnmås<sup>T</sup>

*Quadriceps lineatus* (Piaget, 1880) [Ischn.: Philopter.]

### Recurvirostridae Bonaparte, 1854

*Recurvirostra avosetta* Linnaeus, 1758 – pied avocet – skärfläcka<sup>H</sup>

*Cirrophthirius recurvirostrae* (Linnaeus, 1758) [Ischn.: Philopt.]

*Quadriceps decipiens* (Denny, 1842) [Ischn.: Philopter.]

*Quadriceps signatus* (Piaget, 1880) [Ischn.: Philopter.]

### Scolopacidae Rafinesque, 1815

*Actitis hypoleucos* (Linnaeus, 1758) – common sandpiper – drillsnäppa<sup>H</sup>

*Actornithophilus flumineus* Clay, 1962 [Ambl.: Menopon.]

*Austromenopon hystriculum* Złotorzycka, 1968 [Ambl.: Menopon.]

*Quadriceps ravus* (Kellogg, 1899) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *platygaster frater* (Giebel, 1874) [Ischn.: Philopter.]

*Arenaria interpres* (Linnaeus, 1758) – ruddy turnstone – roskarl<sup>H</sup>

*Actornithophilus pediculoides* (Mjöberg, 1910a) [Ambl.: Menopon.]

*Quadriceps strepsilaris* (Denny, 1842) [Ischn.: Philopter.]

- Calidris alba* Pallas, 1764 – sanderling – sandlöpare<sup>F</sup>  
*Actornithophilus ochraceus* (Nitzsch, 1818)  
 [Ambl.: Menopon.]  
*Lunaceps actophilus* (Kellogg & Chapman, 1899)  
 [Ischn.: Philopter.]
- Calidris alpina alpina* (Linnaeus, 1758) – dunlin (*alpina*) – kärrensnäppa<sup>H</sup>  
*Actornithophilus grandiceps* (Piaget, 1880)  
 [Ambl.: Menopon.]  
*Actornithophilus sedes* Eichler, 1944 [Ambl.: Menopon.]  
*Austromenopon alpinum* Timmermann, 1954a  
 [Ambl.: Menopon.]  
*Carduiceps meinertzhageni* Timmermann, 1954b  
 [Ischn.: Philopt.]  
*Lunaceps schismatus* Gustafsson & Olsson, 2012  
 [Ischn.: Philopter.]  
*Saemundssonina (Saemundssonina) tringae* (O. Fabricius, 1780) [Ischn.: Philopter.]
- Calidris alpina schinzii* (Brehm & Schilling, 1822) – dunlin (*shinzii*) – sydlig kärrensnäppa<sup>H</sup>  
*Actornithophilus umbrinus* (Burmeister, 1838)  
 [Ambl.: Menopon.]  
*Carduiceps meinertzhageni* Timmermann, 1954b  
 [Ischn.: Philopt.]  
*Lunaceps schismatus* Gustafsson & Olsson, 2012  
 [Ischn.: Philopter.]
- Calidris canutus* (Linnaeus, 1758) – red knot – kustsnäppa<sup>F</sup>  
*Actornithophilus patellatus* (Piaget, 1890) [Ambl.: Menopon.]  
*Austromenopon lutescens* (Burmeister, 1838)  
 [Ambl.: Menopon.]  
*Carduiceps zonarius* (Nitzsch [in Giebel], 1866)  
 [Ischn.: Philopt.]  
*Lunaceps drosti* Timmermann, 1954c [Ischn.: Philopter.]  
*Saemundssonina (Saemundssonina) tringae* (O. Fabricius, 1780) [Ischn.: Philopter.]
- Calidris falcinellus falcinellus* (Pontoppidan, 1763) – broad-billed sandpiper – myrsnäppa<sup>H</sup>  
*Lunaceps falcinellus* Timmermann, 1954c [Ischn.: Philopter.]
- Calidris ferruginea* (Pontoppidan, 1763) – curlew sandpiper – spovsnäppa<sup>F</sup>  
*Actornithophilus umbrinus* (Burmeister, 1838)  
 [Ambl.: Menopon.]  
*Carduiceps zonarius* (Nitzsch [in Giebel], 1866)  
 [Ischn.: Philopt.]
- Lunaceps falcinellus* Timmermann, 1954c [Ischn.: Philopter.]
- Calidris minuta* (Leisler, 1812) – little stint – småsnäppa<sup>F</sup>  
*Carduiceps zonarius* (Nitzsch [in Giebel], 1866)  
 [Ischn.: Philopt.]  
*Lunaceps falcinellus* Timmermann, 1954c [Ischn.: Philopter.]  
*Saemundssonina (Saemundssonina) tringae* (O. Fabricius, 1780) [Ischn.: Philopter.]
- Calidris pugnax* (Linnaeus, 1758) – ruff – brushane<sup>H</sup>  
*Actornithophilus pustulosus* (Piaget, 1880)  
 [Ambl.: Menopon.]  
*Carduiceps scalaris* (Piaget, 1880) [Ischn.: Philopt.]  
*Lunaceps holophaeus* (Burmeister, 1838) [Ischn.: Philopter.]
- Calidris subruficollis* (Vieillot, 1819) – buff-breasted sandpiper – prärielöpare<sup>R</sup>  
*Lunaceps rothkoi* Gustafsson & Olsson, 2012 [Ischn.: Philopter.]
- Calidris temminckii* (Leisler, 1812) 00 Temminck's stint – mosnäppa<sup>H</sup>  
*Saemundssonina (Saemundssonina) tringae* (O. Fabricius, 1780) [Ischn.: Philopter.]
- Gallinago gallinago* (Linnaeus, 1758) – common snipe – enkelbeckasin<sup>H</sup>  
*Cummingsiella ambigua* (Burmeister, 1838)  
 [Ischn.: Philopter.]  
*Rhynonirmus scolopacis* (Denny, 1842) [Ischn.: Philopter.]
- Limosa lapponica* (Linnaeus, 1758) – bar-tailed godwit – myrspov<sup>H</sup>  
*Austromenopon meyeri* (Giebel, 1874) [Ambl.: Menopon.]  
*Carduiceps lapponicus* Emerson, 1953 [Ischn.: Philopt.]  
*Lunaceps limosella* Timmermann, 1954c [Ischn.: Philopter.]  
*Saemundssonina (Saemundssonina) limosae* (Denny, 1842) [Ischn.: Philopter.]
- Lymnocyptes minimus* (Brünnich, 1764) – jack snipe – dvärgbeckasin<sup>H</sup>  
*Actornithophilus multisetosus* Blagoveshchensky, 1940 [Ambl.: Menopon.]  
*Carduiceps zonarius* (Nitzsch [in Giebel], 1866)  
 [Ischn.: Philopt.]

*Numenius arquata* (Linnaeus, 1758) – Eurasian curlew – storspov<sup>H</sup>

*Cummingsiella ovalis* (Scopoli, 1763) [Ischn.: Philopter.]

*Lunaceps numenii numenii* (Denny, 1842) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *scolopacisphaeopodis humeralis* (Denny, 1842) [Ischn.: Philopter.]

*Numenius phaeopus* (Linnaeus, 1758) – whimbrel – småspov<sup>H</sup>

*Lunaceps numenii phaeopi* (Denny, 1842) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *scolopacisphaeopodis scolopacisphaeopodis* (Schrank, 1803) [Ischn.: Philopter.]

*Phalaropus lobatus* (Linnaeus, 1758) – red-necked phalarope – smalnäbbad simsnäppa<sup>H</sup>

*Saemundssonina* (*Saemundssonina*) *tringae* (O. Fabricius, 1780) [Ischn.: Philopter.]

*Scolopax rusticola* Linnaeus, 1758 – Eurasian woodcock – morkulla<sup>H</sup>

*Cummingsiella aurea* Hopkins, 1949 [Ischn.: Philopter.]

*Rhynonirmus helvolus* (Burmeister, 1838) [Ischn.: Philopter.]

*Tringa glareola* (Linnaeus, 1758) – wood sandpiper – grönbena<sup>H</sup>

*Austromenopon lutescens* (Burmeister, 1838) [Ambl.: Menopon.]

*Quadriceps obscurus* (Burmeister, 1838) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *platygaster cordiceps* (Giebel, 1874) [Ischn.: Philopter.]

*Tringa nebularia* (Gunnerus, 1767) – green-shank – gluttsnäppa<sup>H</sup>

*Actornithophilus paludosus* Clay, 1962 [Ambl.: Menopon.]

*Quadriceps similis* (Giebel, 1866) [Ischn.: Philopter.]

*Tringa ochropus* Linnaeus, 1758 – green sandpiper – skogssnäppa<sup>H</sup>

*Actornithophilus lyallpurensis* Ansari, 1955 [Ambl.: Menopon.]

*Quadriceps ochropi* (Denny, 1842) [Ischn.: Philopter.]

*Tringa totanus* (Linnaeus, 1758) – common red-shank – rödbena<sup>H</sup>

*Actornithophilus totani* (Schrank, 1803) [Ambl.: Menopon.]

*Austromenopon decorosum* Zlotorzycska, 1968 [Ambl.: Menopon.]

*Quadriceps obtusus* (Kellogg & Kuwana, 1902) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *platygaster mollis* (Nitzsch [in Giebel], 1866) [Ischn.: Philopter.]

### **Stercorariidae Gray, 1871**

*Stercorarius longicauda* Vieillot, 1819 – long-tailed jaeger – fjällabb<sup>H</sup>

*Saemundssonina* (*Saemundssonina*) *inexpectata* Timmermann, 1951 [Ischn.: Philopter.]

*Stercorarius parasiticus* (Linnaeus, 1758) – parasitic jaeger – kustlabb<sup>H</sup>

*Quadriceps normifer* (Grube, 1851) [Ischn.: Philopter.]

*Saemundssonina* (*Saemundssonina*) *cephalus* (Denny, 1842) [Ischn.: Philopter.]

### **Ciconiidae Gray, 1840**

*Ciconia ciconia* (Linnaeus, 1758) – white stork – vit stork<sup>H</sup>

*Ardeicola ciconiae* (Linnaeus, 1758) [Ischn.: Philopt.]

*Colpocephalum zebra* Burmeister, 1838 [Ambl.: Menopon.]

*Neophilopterus incompletus* (Denny, 1842) [Ischn.: Philopter.]

### **Columbidae Illiger, 1811**

*Columba livia* Gmelin, 1789 – domestic pigeon – tamduva<sup>H</sup>

*Campanulotes compar* (Burmeister, 1838) [Ischn.: Goniod.]

*Coloceras damicorne* (Nitzsch, 1866) [Ischn.: Goniod.]

*Columbicola columbae* (Linnaeus, 1758) [Ischn.: Philopt.]

*Columba oenas* Linnaeus, 1758 – stock pigeon – skogsduva<sup>H</sup>

*Campanulotes drosti* Eichler, 1950 [Ischn.: Goniod.]

*Columbicola columbae* (Linnaeus, 1758) [Ischn.: Philopt.]

*Columba palumbus* Linnaeus, 1758 – wood pigeon – ringduva<sup>H</sup>

*Campanulotes bidentatus* (Scopoli, 1763) [Ischn.: Goniod.]

*Coloceras damicorne* (Nitzsch, 1866) [Ischn.: Goniod.]

*Columbicola claviformis* (Denny, 1842) [Ischn.: Philopt.]

*Streptopelia decaocto* (Fivaldszky, 1838) – Eurasian collared dove – turkduva<sup>H</sup>

*Columbicola bacillus* (Giebel, 1866) [Ischn.: Philopt.]

*Streptopelia turtur* (Linnaeus, 1758) – European turtledove – turturduva<sup>T</sup>

*Columbicola bacillus* (Giebel, 1866) [Ischn.: Philopt.]

### Cuculidae Vigors, 1825

*Cuculus canorus* Linnaeus, 1758 – common cuckoo – gök<sup>H</sup>

*Cuculicola latirostris* (Burmeister, 1838) [Ischn.: Philopt.]

*Cuculiphilus fasciatus* (Scopoli, 1763) [Ambl.: Menopon.]

*Cuculoecus latifrons* (Denny, 1842) [Ischn.: Philopt.]

### Falconidae Vigors, 1824

*Falco columbarius* Linnaeus, 1758 – merlin – stenfalk<sup>H</sup>

*Degeeriella rufa* (Burmeister, 1838) [Ischn.: Philopt.]

*Laemobothrion (Laemobothrion) tinnunculi* (Linnaeus, 1758) [Ambl.: Laemobothri.]

*Nosopon lucidum* (Rudow, 1869a) [Ambl.: Menopon.]

*Falco peregrinus* Tunstall, 1771 – peregrine falcon – pilgrimsfalk<sup>H</sup>

*Degeeriella rufa* (Burmeister, 1838) [Ischn.: Philopt.]

*Falco subbuteo* Linnaeus, 1758 – Eurasian hobby – lärkfalk<sup>H</sup>

*Degeeriella rufa* (Burmeister, 1838) [Ischn.: Philopt.]

*Falco tinnunculus* Linnaeus, 1758 – common kestrel – tornfalk<sup>H</sup>

*Degeeriella rufa* (Burmeister, 1838) [Ischn.: Philopt.]

*Laemobothrion (Laemobothrion) tinnunculi* (Linnaeus, 1758) [Ambl.: Laemobothri.]

### Meleagriniidae Gray, 1840

*Meleagris gallopavo* Linnaeus, 1758 – turkey – kalkon<sup>D</sup>

*Chelopistes meleagridis* (Linnaeus, 1758) [Ischn.: Goniod.]

### Phasianidae Horsfield, 1821

*Bonasa bonasia* Linnaeus, 1758 – hazel grouse – järpe<sup>H</sup>

*Lagopoeus tetrastei* Bechet, 1963 [Ischn.: Philopt.]

*Gallus gallus* (Linnaeus, 1758) – red junglefowl (domestic chicken) – tamhöna<sup>D</sup>

*Cuclotogaster heterographus* (Nitzsch [in Giebel], 1866) [Ischn.: Philopt.]

*Goniocotes gallinae* (de Geer, 1778) [Ischn.: Goniod.]

*Goniodes dissimilis* Denny, 1842 [Ischn.: Goniod.]

*Goniodes gigas* (Taschenberg, 1879) [Ischn.: Goniod.]

*Lipeurus caponis* (Linnaeus, 1758) [Ischn.: Philopt.]

*Menacanthus pallidulus* (Neumann, 1912) [Ambl.: Menopon.]

*Menacanthus stramineus* (Nitzsch, 1818) [Ambl.: Menopon.]

*Menopon gallinae* (Linnaeus, 1758) [Ambl.: Menopon.]

*Lagopus lagopus lagopus* (Linnaeus, 1758) – willow ptarmigan – dalripa<sup>H</sup>

*Amyrsidea (Argimenopon) lagopi* (Grube, 1851) [Ambl.: Menopon.]

*Goniodes lagopi* (Linnaeus, 1758) [Ischn.: Goniod.]

*Lagopoeus affinis* (Childre, 1836) [Ischn.: Philopt.]

*Lagopus muta* (Montin, 1781) – rock ptarmigan – fjällripa<sup>H</sup>

*Lagopoeus affinis* (Children, 1836) [Ischn.: Philopt.]

*Pavo cristatus* Linnaeus, 1758 – Indian peafowl – påfågel<sup>D</sup>

*Goniodes pavonis* (Linnaeus, 1758) [Ischn.: Goniod.]

*Perdix perdix* (Linnaeus, 1758) – grey partridge – raphhöna<sup>H</sup>

*Amyrsidea (Argimenopon) perdicis* (Denny, 1842) [Ambl.: Menopon.]

*Cuclotogaster heterogrammicus* (Nitzsch [in Giebel], 1866) [Ischn.: Philopt.]

*Goniocotes microthorax* (Stephens, 1829) [Ischn.: Goniod.]

*Goniodes dispar* Burmeister, 1838 [Ischn.: Goniod.]

*Lipeurus maculosus* Clay, 1938 [Ischn.: Philopt.]

*Menopon pallens* Clay, 1949 [Ambl.: Menopon.]

*Phasianus colchicus* Linnaeus, 1758 – ring-necked pheasant – fasan<sup>H</sup>

*Goniocotes chrysocephalus* Giebel, 1874 [Ischn.: Goniod.]

*Goniodes colchici* Denny, 1842 [Ischn.: Goniod.]

*Lagopoeus colchicus* Emerson, 1949 [Ischn.: Philopt.]

*Lipeurus maculosus* Clay, 1938 [Ischn.: Philopt.]

*Menacanthus phasianii* (Modrzejewska & Złotorzycka, 1977) [Ambl.: Menopon.]

*Oxylipeurus colchicus* Clay, 1938 [Ischn.: Philopt.]

*Syrmaticus reevesii* (Gray, 1829) – Reeves's pheasant – kungsfasan<sup>D</sup>

*Goniocotes rotundiceps* Piaget, 1880 [Ischn.: Goniod.]

*Tetrao tetrix* (Linnaeus, 1758) – black grouse – orre<sup>H</sup>  
*Goniodes tetraonis* (Linnaeus, 1758) [Ischn.: Gonioid.]  
*Lagopoecus lyrurus* Clay, 1938 [Ischn.: Philopter.]  
*Oxylpeurus minor* (Zlotorzycska, 1966) [Ischn.: Philopter.]

*Tetrao urogallus* Linnaeus, 1758 – western capercaillie – tjäder<sup>H</sup>

*Goniodes bituberculatus* Rudow, 1869b [Ischn.: Gonioid.]

*Lagopoecus pallidovittatus* (Grube, 1851) [Ischn.: Philopter.]

*Oxylpeurus tetraonis* (Grube, 1851) [Ischn.: Philopter.]

### Gaviidae Coues, 1903

*Gavia arctica* (Linnaeus, 1758) – Arctic loon – storlom<sup>H</sup>

*Craspedonirmus colymbinus* (Denny, 1842) [Ischn.: Philopter.]

*Gavia stellata* (Pontoppidan, 1763) – red-throated loon – smålom<sup>H</sup>

*Craspedonirmus colymbinus* (Denny, 1842) [Ischn.: Philopter.]

### Gruidae Vigors, 1825

*Grus grus* (Linnaeus, 1758) – common crane – trana<sup>H</sup>

*Esthiopterum gruis* (Linnaeus, 1758) [Ischn.: Philopter.]

*Gruimenopon longum* (Giebel, 1874) [Ambl.: Menopon.]

*Heleonomus macilentus* (Nitzsch [in Giebel], 1866) [Ambl.: Menopon.]

*Saemundssonina (Saemundssonina) integer* (Nitzsch [in Giebel], 1866) [Ischn.: Philopter.]

### Rallidae Vigors, 1825

*Fulica atra* Linnaeus, 1758 – Eurasian coot – sothöna<sup>H</sup>

*Fulicoffula lurida* (Nitzsch, 1818) [Ischn.: Philopter.]

*Incidifrons fulicae* (Linnaeus, 1758) [Ischn.: Philopter.]

*Laemobothrion (Eulaemobothrion) atrum* (Nitzsch, 1818) [Ambl.: Laemobothri.]

*Pseudomenopon pilosum* (Scopoli, 1763) [Ambl.: Menopon.]

*Rallicola fulicae* (Denny, 1842) [Ischn.: Philopter.]

*Gallinula chloropus* (Linnaeus, 1758) – Eurasian moorhen – rörhöna<sup>H</sup>

*Pseudomenopon pilosum* (Scopoli, 1763) [Ambl.: Menopon.]

### Alaudidae Vigors, 1825

*Alauda arvensis* Linnaeus, 1758 – Eurasian skylark – sånglärka<sup>H</sup>

*Menacanthus alaudae* (Schrank, 1776) [Ambl.: Menopon.]

*Menacanthus eurysternus* (Burmeister, 1838) [Ambl.: Menopon.]

*Eremophila alpestris* (Linnaeus, 1758) – horned lark – berglärka<sup>H</sup>

*Ricinus serratus* (Durrant, 1906) [Ambl.: Ricin.]

### Certhiidae Leach, 1820

*Certhia familiaris* Linnaeus, 1758 – Eurasian treecreeper – trädkryp<sup>H</sup>

*Penenirmus gulosus* (Nitzsch, 1866) [Ischn.: Philopter.]

### Corvidae Vigors, 1825

*Corvus corax corax* Linnaeus, 1758 – common raven – korp<sup>H</sup>

*Colpocephalum fragili* Denny, 1842 [Ambl.: Menopon.]

*Corvonirmus argulus* (Burmeister, 1838) [Ischn.: Philopter.]

*Hecatrishula atherae* (Ansari, 1957) [Ischn.: Philopter.]

*Menacanthus gonophaeus* (Burmeister, 1838) [Ambl.: Menopon.]

*Myrsidea anaspila* (Nitzsch, 1866) [Ambl.: Menopon.]

*Philopterus corvi* (Linnaeus, 1758) [Ischn.: Philopter.]

*Corvus cornix* Linnaeus, 1758 – hooded crow – gråkråka<sup>H</sup>

*Myrsidea cornicis* (de Geer, 1778) [Ambl.: Menopon.]

*Philopterus ocellatus* (Scopoli, 1763) [Ischn.: Philopter.]

*Corvus frugilegus* Linnaeus, 1758 – rook – råka<sup>H</sup>

*Colpocephalum fragili* Denny, 1842 [Ambl.: Menopon.]

*Philopterus atratus* Nitzsch, 1818 [Ischn.: Philopter.]

*Corvus monedula* Linnaeus, 1758 – Eurasian jackdaw – kaja<sup>H</sup>

*Hecatrishula varia* (Burmeister, 1838) [Ischn.: Philopter.]

*Menacanthus eurysternus* (Burmeister, 1838) [Ambl.: Menopon.]

*Myrsidea anathorax* (Nitzsch, 1866) [Ambl.: Menopon.]

*Philopterus guttatus* (Denny, 1842) [Ischn.: Philopter.]

*Garrulus glandarius* (Linnaeus, 1758) – Eurasian jay – nötskrika<sup>H</sup>

*Myrsidea indivisa* (Nitzsch, 1866) [Ambl.: Menopon.]

*Olivinirmus glandarii* (Denny, 1842) [Ischn.: Philopter.]

*Philopterus garruli* Boisduval & Lacordaire, 1835 [Ischn.: Philopter.]

*Pica pica* (Linnaeus, 1758) – Eurasian magpie – skata<sup>H</sup>

*Menacanthus eurysternus* (Burmeister, 1838) [Ambl.: Menopon.]

*Myrsidea picae* (Linnaeus, 1758) [Ambl.: Menopon.]

*Philopterus picae* (Denny, 1842) [Ischn.: Philopter.]

### Emberizidae Vigors, 1831

*Emberiza citrinella* Linnaeus, 1758 – yellowhammer – gulsparv<sup>H</sup>

*Philopterus citrinellae* (Schrank, 1776) [Ischn.: Philopter.]

*Emberiza schoeniclus* (Linnaeus, 1758) – reed bunting – sävsparv<sup>H</sup>

*Philopterus citrinellae* (Schrank, 1776) [Ischn.: Philopter.]

### Fringillidae Leach, 1820

*Acanthis flammea* (Linnaeus, 1758) – common redpoll – gråsiska<sup>H</sup>

*Brueelia sibirica* Mey, 1982b [Ischn.: Philopt.]

*Philopterus linariae* (Piaget, 1885) [Ischn.: Philopter.]

*Fringilla coelebs* Linnaeus, 1758 – common chaffinch – bofink<sup>H</sup>

*Brueelia kluzi* Balát, 1955a [Ischn.: Philopter.]

*Menacanthus eurysternus* (Burmeister, 1838) [Ambl.: Menopon.]

*Philopterus fortunatus* (Złotorzycka, 1964c) [Ischn.: Philopter.]

*Ricinus fringillae* de Geer, 1778 [Ambl.: Ricin.]

*Fringilla montifringilla* Linnaeus, 1758 – brambling – bergfink<sup>H</sup>

*Philopterus rapax* (Złotorzycka, 1964c) [Ischn.: Philopter.]

*Loxia curvirostra curvirostra* Linnaeus, 1758 – red crossbill – mindre korsnäbb<sup>H</sup>

*Brueelia limbata* (Burmeister, 1838) [Ischn.: Philopt.]

*Philopterus curvirostrae* (Schrank, 1776) [Ischn.: Philopter.]

*Loxia leucoptera bifasciata* (C.L. Brehm, 1827) – white-winged crossbill (*bifasciata*) – bändelkorsnäbb<sup>H</sup>

*Philopterus hansmuenchi* (Eichler & Vasjukova, 1981) [Ischn.: Philopter.]

*Pyrrhula pyrrhula* (Linnaeus, 1758) – Eurasian bullfinch – domherre<sup>H</sup>

*Brueelia pyrrhularum* Eichler, 1954 [Ischn.: Philopt.]

*Philopterus citrinellae* (Schrank, 1776) [Ischn.: Philopter.]

*Spinus spinus* (Linnaeus, 1758) – Eurasian siskin – grönsiska<sup>H</sup>

*Philopterus linariae* (Piaget, 1885) [Ischn.: Philopter.]

### Hirundinidae Vigors, 1825

*Delichon urbicum* (Linnaeus, 1758) – house martin – hussvala<sup>H</sup>

*Acronirmus gracilis* (Burmeister, 1838) [Ischn.: Philopt.]

*Philopterus excisus* Nitzsch, 1818 [Ischn.: Philopter.]

*Hirundo rustica* Linnaeus, 1758 – barn swallow – ladusvala<sup>H</sup>

*Acronirmus gracilis* (Burmeister, 1838) [Ischn.: Philopt.]

*Myrsidea rustica* (Giebel, 1874) [Ambl.: Menopon.]

*Philopterus microsomaticus* Tandan, 1955 [Ischn.: Philopter.]

*Riparia riparia* (Linnaeus, 1758) – sand martin – backsvala<sup>H</sup>

*Myrsidea latifrons* (Carraker & Schull, 1910) [Ambl.: Menopon.]

### Laniidae Rafinesque, 1815

*Lanius collurio* Linnaeus, 1758 – red-backed shrike – törnskata<sup>H</sup>

*Menacanthus camelinus* (Nitzsch [in Giebel], 1866) [Ambl.: Menopon.]

*Philopterus coarctatus* (Scopoli, 1763) [Ischn.: Philopter.]

### Motacillidae Horsfield, 1821

*Anthus trivialis* (Linnaeus, 1758) – tree pipit – trädpiplärka<sup>H</sup>

*Brueelia ferianci* Balát, 1955a [Ischn.: Philopter.]

*Menacanthus pusillus* (Nitzsch, 1866) [Ambl.: Menopon.]



*Motacilla alba* Linnaeus, 1758 – white wagtail – sädesäråla<sup>H</sup>

*Menacanthus pusillus* (Nitzsch, 1866) [Ambl.: Menopon.]

*Philoaterus passerines* (Denny, 1842) [Ischn.: Philoater.]

*Motacilla flava* Linnaeus, 1758 – western yellow wagtail – guläråla<sup>H</sup>

*Brueelia kratochvili* Balát, 1958 [Ischn.: Philoater.]

*Menacanthus pusillus* (Nitzsch, 1866) [Ambl.: Menopon.]

### Muscicapidae Fleming, 1822

*Erithacus rubecula* (Linnaeus, 1758) – European robin – rödhåke<sup>H</sup>

*Ricinus rubeculae* (Schrank, 1776) [Ambl.: Ricin.]

*Muscicapa striata* (Pallas, 1764) – spotted flycatcher – grå flugsnappare<sup>H</sup>

*Philoaterus desertus* (Złotorzycka, 1964c) [Ischn.: Philoater.]

*Phoenicurus phoenicurus* (Linnaeus, 1758) – common redstart – rödstjårt<sup>H</sup>

*Ricinus rubeculae* (Schrank, 1776) [Ambl.: Ricin.]

### Paridae Vigors, 1825

*Cyanistes caeruleus* (Linnaeus, 1758) – blue tit – blåmes<sup>H</sup>

*Menacanthus sinuatus* (Burmeister, 1838) [Ambl.: Menopon.]

*Parus major* Linnaeus, 1758 – great tit – talgoxe<sup>H</sup>

*Menacanthus sinuatus* (Burmeister, 1838) [Ambl.: Menopon.]

*Philoaterus thuringianus* (Mey, 1988) [Ischn.: Philoater.]

### Passeridae Illiger, 1811

*Passer domesticus* (Linnaeus, 1758) – house sparrow – gråsparv<sup>H</sup>

*Menacanthus eurysternus* (Burmeister, 1838) [Ambl.: Menopon.]

*Philoaterus fringillae* (Scopoli, 1772) [Ischn.: Philoater.]

*Rostrinirmus ruficeps* (Nitzsch [in Giebel], 1866) [Ischn.: Philoater.]

### Prunellidae Richmond, 1908

*Prunella modularis* (Linnaeus, 1758) – dunnoek – järnsparv<sup>H</sup>

*Philoaterus modularis* (Denny, 1842) [Ischn.: Philoater.]

### Regulidae Vigors, 1825

*Regulus regulus* (Linnaeus, 1758) – goldcrest – kungsfågel<sup>H</sup>

*Ricinus frenatus* (Burmeister, 1838) [Ambl.: Ricin.]

### Sittidae Lesson, 1828

*Sitta europaea* Linnaeus, 1758 – Eurasian nut-hatch – nötvåcka<sup>H</sup>

*Philoaterus sittae* Fedorenko, 1978 [Ischn.: Philoater.]

### Sturnidae Rafinesque, 1815

*Sturnus vulgaris* Linnaeus, 1758 – European starling – stare<sup>H</sup>

*Brueelia nebulosa* (Burmeister, 1838) [Ischn.: Philoater.]

*Menacanthus eurysternus* (Burmeister, 1838) [Ambl.: Menopon.]

*Myrsidea cucullare* (Nitzsch, 1818) [Ambl.: Menopon.]

*Sturnidoecus sturni* (Schrank, 1776) [Ischn.: Philoater.]

### Sylviidae Vigors, 1825

*Sylvia borin* (Boddaert, 1783) – garden warbler – trädgårdssångare<sup>H</sup>

*Menacanthus curuccae* (Schrank, 1776) [Ambl.: Menopon.]

*Menacanthus takayamai* Uchida, 1926 [Ambl.: Menopon.]

*Penenirmus affectator* (Złotorzycka, 1976) [Ischn.: Philoater.]

*Sylvia curruca curruca* (Linnaeus, 1758) – årtsångare<sup>H</sup>

*Menacanthus curuccae* (Schrank, 1776) [Ambl.: Menopon.]

### Troglodytidae Swainson, 1832

*Troglodytes troglodytes* (Linnaeus, 1758) – Eurasian wren – gårdsmåg<sup>H</sup>

*Philoaterus troglodytis* Fedorenko, 1986 [Ischn.: Philoater.]

### Turdidae Rafinesque, 1815

*Turdus iliacus iliacus* Linnaeus, 1758 – redwing – rödvingetrast

*Philoaterus timmermanni* (Złotorzycka, 1964c) [Ischn.: Philoater.]

*Turdus merula* Linnaeus, 1758 – common blackbird – koltrast<sup>H</sup>

*Menacanthus eurysternus* (Burmeister, 1838) [Ambl.: Menopon.]

*Philoaterus turdi* (Denny, 1842) [Ischn.: Philoater.]

*Ricinus elongatus* (von Olfers, 1816) [Ambl.: Ricin.]

*Turdinirmus merulensis* (Denny, 1842) [Ischn.: Philoater.]

*Turdus philomelos* Brehm, 1831 – song thrush – taltrast<sup>H</sup>

- Guimaraesiella turdinulae* (Ansari, 1956a) [Ischn.: Philopter.]  
*Menacanthus eurysternus* (Burmeister, 1838) [Ambl.: Menopon.]  
*Philopterus turdi* (Denny, 1842) [Ischn.: Philopter.]

*Turdus pilaris* Linnaeus, 1758 – fieldfare – björktrast<sup>H</sup>

- Guimaraesiella marginata* (Burmeister, 1838) [Ischn.: Philopter.]  
*Menacanthus eurysternus* (Burmeister, 1838) [Ambl.: Menopon.]  
*Philopterus bischoffi* (Eichler, 1951) [Ischn.: Philopter.]

*Turdus viscivorus* Linnaeus, 1758 – mistle thrush – dubbeltrast<sup>H</sup>

- Philopterus vernus* (Złotorzycka, 1964c) [Ischn.: Philopter.]

### Ardeidae Leach, 1820

*Ardea cinerea* Linnaeus, 1758 – grey heron – gråhäger

- Ardeicola ardeae* (Linnaeus, 1758) [Ischn.: Philopt.]  
*Ciconiphilus decimfasciatus* (Boisduval & Lacordaire, 1835) [Ambl.: Menopon.]

### Picidae Vigors, 1825

*Dendrocopos major* (Linnaeus, 1758) – greater spotted woodpecker – större hackspett<sup>H</sup>

- Brueelia straminea* (Denny, 1842) [Ischn.: Philopt.]  
*Menacanthus pici* (Denny, 1842) [Ambl.: Menopon.]  
*Penenirmus auritus* (Scopoli, 1763) [Ischn.: Philopter.]  
*Picicola snodgrassi* (Kellogg, 1896a) [Ischn.: Philopter.]

*Dryocopos martius* (Linnaeus, 1758) – black woodpecker – spillkråka<sup>H</sup>

- Colpocephalum inaequale* Burmeister, 1838 [Ambl.: Menopon.]

*Jynx torquilla* Linnaeus, 1758 – Eurasian wry-neck – göktyta<sup>H</sup>

- Penenirmus serrilimbus* (Burmeister, 1838) [Ischn.: Philopter.]

*Picus viridis* Linnaeus, 1758n – green woodpecker – grön göling<sup>H</sup>

- Menacanthus pici* (Denny, 1842) [Ambl.: Menopon.]  
*Penenirmus pici* (J.C. Fabricius, 1789) [Ischn.: Philopter.]  
*Picicola candidus* (Nitzsch, 1866) [Ischn.: Philopter.]

### Podicipedidae Bonaparte, 1831

*Podiceps cristatus* Linnaeus, 1758 – great crested grebe – skäggdopping<sup>H</sup>

- Pseudomenopon dolium* (Rudow, 1869a) [Ambl.: Menopon.]

### Procellariidae Leach, 1820

*Ardenna grisea* (Gmelin, 1789) – sooty shearwater – grålira<sup>T</sup>

- Austroromenopon paululum* (Kellogg & Chapman, 1899) [Ambl.: Menopon.]

### Strigidae Vigors, 1825

*Aegolius funereus* (Linnaeus, 1758) – boreal owl – pärluggla

- Kurodaia (Conciella) cryptostigmatia* (Nitzsch [in Giebel], 1861) [Ambl.: Menopon.]  
*Strigiphilus pallidus* (Giebel, 1874) [Ischn.: Philopt.]

*Asio flammeus* (Pontoppidan, 1763) – short-eared owl – jorduggla<sup>H</sup>

- Strigiphilus cursor* (Burmeister, 1838) [Ischn.: Philopt.]

*Asio otus* (Linnaeus, 1758) – long-eared owl – hornuggla<sup>H</sup>

- Strigiphilus barbatus* (Osborn, 1902) [Ischn.: Philopt.]

*Bub bubo* (Linnaeus, 1758) – Eurasian eagle owl – berguv<sup>H</sup>

- Strigiphilus goniodicerus* Eichler, 1949b [Ischn.: Philopt.]  
*Strigiphilus striges* (Pontoppidan, 1763) [Ischn.: Philopt.]

*Bubo scandiaca* (Linnaeus, 1758) – snowy owl – fjälluggla<sup>H</sup>

- Strigiphilus ceblebrachys* (Linnaeus, 1758) [Ischn.: Philopt.]

*Strix aluco* Linnaeus, 1758 – tawny owl – kattuggla<sup>H</sup>

- Strigiphilus laticephalus* (Uchida, 1949) [Ischn.: Philopt.]  
*Strigiphilus portigi* Eichler, 1952 [Ischn.: Philopt.]

*Strix nebulosa* Forster, 1772 – great grey owl – lappuggla<sup>H</sup>

- Strigiphilus remotus* (Kellogg & Chapman, 1899) [Ischn.: Philopt.]

*Strix uralensis* Pallas, 1771 – Ural owl – slaguggla<sup>H</sup>

- Strigiphilus heterocerus* (Grube, 1851) [Ischn.: Philopt.]

*Surnia ulula* (Linnaeus, 1758) – northern hawk owl – hökuggla<sup>H</sup>

*Strigiphilus crenulatus* (Giebel, 1874) [Ischn.: Philopt.]

### Tytonidae Ridgway, 1914

*Tyto alba guttata* (C.L. Brehm, 1831) – barn owl (guttata) – tornuggla<sup>H</sup>

*Strigiphilus rostratus* (Burmeister, 1838) [Ischn.: Philopt.]

### Struthionidae Vigors, 1825

*Struthio camelus* Linnaeus, 1758 – ostrich – struts<sup>D</sup>

*Struthiolipeurus struthionis* (Gervais, 1844) [Ischn.: Philopt.]

### Phalacrocoracidae Reichenbach, 1850

*Phalacrocorax carbo* (Linnaeus, 1758) – great cormorant – storskarv<sup>H</sup>

*Eidmaniella pellucida* (Rudow, 1869a) [Ambl.: Menopon.]

*Pectinopygus gyricornis* (Denny, 1842) [Ischn.: Philopt.]

### Sulidae Reichenbach, 1849

*Morus bassanus* (Linnaeus, 1758) – northern gannet – havssula<sup>F</sup>

*Eidmanniella pustulosa* (Nitzsch [in Giebel], 1866) [Ambl.: Menopon.]

*Pectinopygus bassani* (O. Fabricius, 1780) [Ischn.: Philopt.]

### Mammalia Linnaeus, 1758

#### Bovidae Gray, 1821

*Bos taurus* Linnaeus, 1758 – cattle – nötboskap<sup>D</sup>

*Bovicola (Bovicola) bovis* (Linnaeus, 1758) [Ischn.: Trichodect.]

*Haematopinus eurysternus* (Nitzsch, 1818) [Anopl.: Haematopin.]

*Linognathus vituli* (Linnaeus, 1758) [Anopl.: Linognath.]

*Solenopotes capillatus* Enderlein, 1904 [Anopl.: Linognath.]

*Capra hircus* (Linnaeus, 1758) – goat – tamget<sup>D</sup>

*Bovicola (Bovicola) limbatus* (Gervais, 1844) [Ischn.: Trichodect.]

*Linognathus stenopsis* (Burmeister, 1838) [Anopl.: Linognath.]

*Ovis aries* Linnaeus, 1758 – sheep – tamfår<sup>D</sup>

*Bovicola (Bovicola) ovis* (Schrank, 1781) [Ischn.: Trichodect.]

*Linognathus stenopsis* (Burmeister, 1838) [Anopl.: Linognath.]

#### Cervidae Goldfuss, 1820

*Capreolus capreolus* (Linnaeus, 1758) – western roe deer – rådjur

*Damalinea (Cervicola) meyeri* (Taschenberg, 1882) [Ischn.: Trichodect.]

*Rangifer tarandus* (Linnaeus, 1758) – reindeer – ren  
*Bovicola (Bovicola) tarandi* (Mjöberg, 1910a) [Ischn.: Trichodect.]

*Solenopotes tarandi* (Mjöberg, 1915) [Anopl.: Linognath.]

#### Suidae Gray, 1821

*Sus scrofa* Linnaeus, 1758 – wild boar – vildsvin, tamgris<sup>D</sup>

*Haematopinus apri* Goureau, 1866 [Anopl.: Haematopin.]

*Haematopinus suis* (Linnaeus, 1758) [Anopl.: Haematopin.]

#### Canidae Fischer de Waldheim, 1817

*Canis lupus familiaris* Linnaeus, 1758 – dog – tamhund<sup>D</sup>

*Linognathus setosus* (von Olfers, 1816) [Anopl.: Linognath.]

*Trichodectes canis* (de Geer, 1778) [Ischn.: Trichodect.]

*Vulpes vulpes* (Linnaeus, 1758) – red fox – rödräv<sup>D</sup>

*Linognathus setosus* (von Olfers, 1816) [Anopl.: Linognath.]

#### Felidae Linnaeus, 1758

*Felis catus* Linnaeus, 1758 – domestic cat – tamkatt<sup>D</sup>

*Felicola subrostratus* (Burmeister, 1838) [Ischn.: Trichodect.]

#### Mustelidae Fischer de Waldheim, 1817

*Meles meles* (Linnaeus, 1758) – badger – grävling

*Trichodectes melis* (J.C. Fabricius, 1805) [Ischn.: Trichodect.]

*Mustela erminea* Linnaeus, 1758 – stoat – hermelin

*Stachiella erminae* Hopkins, 1941 [Ischn.: Trichodect.]

**Odobenidae Allen, 1880**

*Odobenus rosmarus* Linnaeus, 1758 – walrus – valross

*Antarctophthirius trichechi* (Bohemann, 1865)  
[Anopl.: Echinophthiri.]

**Phocidae Gray, 1821**

*Phoca vitulina* Linnaeus, 1758 – harbor seal – knubbsäl

*Echinophthirius horridus* (von Olfers, 1816)  
[Anopl.: Echinophthiri.]

*Pusa hispida* (Schreber, 1775) – ringed seal – vikare

*Echinophthirius horridus* (von Olfers, 1816)  
[Anopl.: Echinophthiri.]

**Ursidae Fischer de Waldheim, 1817**

*Ursus arctos* Linnaeus, 1758 – brown bear – brunbjörn

*Trichodectes pinguis pinguis* (Burmeister, 1838)  
[Ischn.: Trichodect.]

**Leporidae Fischer de Waldheim, 1817**

*Lepus timidus* Linnaeus, 1758 – mountain hare – skogshare

*Haemodipsus lyriocephalus* (Burmeister, 1838)  
[Anopl.: Polyplac.]

*Oryctolagus cuniculus* (Linnaeus, 1758) – common rabbit – kanin, tamkanin<sup>D</sup>

*Haemodipsus ventricosus* (Denny, 1842) [Anopl.: Polyplac.]

**Equidae Gray, 1821**

*Equus caballus* Linnaeus, 1758 – horse – häst<sup>D</sup>

*Bovicola (Werneckiella) equi* (Denny, 1842)  
[Ischn.: Trichodect.]

*Haematopinus asini* (Linnaeus, 1758) [Anopl.: Haematopin.]

**Atelidae Gray, 1825**

*Ateles* sp.

*Pediculus mjoebergi* Ferris, 1916c [Anopl.: Pedicul.]

**Hominidae Gray, 1825**

*Homo sapiens* Linnaeus, 1758 – human – människa<sup>D</sup>

*Pediculus humanus capitis* de Geer, 1778 [Anopl.: Pedicul.]

*Pediculus humanus humanus* Linnaeus, 1758  
[Anopl.: Pedicul.]

*Pthirus pubis* (Linnaeus, 1758) [Anopl.: Pthir.]

**Caviidae Fischer von Waldheim, 1817**

*Cavia porcellus* (Linnaeus, 1758) – guinea pig – marsvin<sup>D</sup>

*Gliricola porcelli* (Schrank, 1781) [Ambl.: Gyrop.]

*Gyropus ovalis* Burmeister, 1838 [Ambl.: Gyrop.]

*Trimenopon hispidum* (Burmeister, 1838) [Ambl.: Trimenopon.]

**Cricetidae Fischer, 1817**

*Arvicola amphibius* (Linnaeus, 1758) – European water vole – vattensork

*Hoplopleura acanthopus* (Burmeister, 1838)  
[Anopl.: Hoplopleur.]

*Polyplax spinigera* (Burmeister, 1839) [Anopl.: Polyplac.]

*Microtus agrestis* (Linnaeus, 1758) – field vole – åkersork

*Hoplopleura acanthopus* (Burmeister, 1838)  
[Anopl.: Hoplopleur.]

*Polyplax borealis* Ferris, 1933c [Anopl.: Polyplac.]

*Microtus oeconomus* (Pallas, 1776) – root vole – mellansork

*Hoplopleura acanthopus* (Burmeister, 1838)  
[Anopl.: Hoplopleur.]

*Myodes glareolus* (Schreber, 1780) – bank vole – långsvansad skogssork

*Hoplopleura acanthopus* (Burmeister, 1838)  
[Anopl.: Hoplopleur.]

*Polyplax borealis* Ferris, 1933c [Anopl.: Polyplac.]

*Myodes rufocanus* (Sundevall, 1846) – grey red-backed vole – gråsidig

*Hoplopleura acanthopus* (Burmeister, 1838)  
[Anopl.: Hoplopleur.]

*Polyplax borealis* Ferris, 1933c [Anopl.: Polyplac.]

*Myodes rutilus* (Pallas, 1779) – northern red-back vole – rödsork

*Hoplopleura acanthopus* (Burmeister, 1838)  
[Anopl.: Hoplopleur.]

*Polyplax borealis* Ferris, 1933c [Anopl.: Polyplac.]

**Muridae Illiger, 1811**

*Apodemus sylvaticus* (Linnaeus, 1758) – long-tailed field mouse – mindre skogsmus

*Polyplax serrata* (Burmeister, 1839) [Anopl.: Polyplac.]

*Polyplax spinulosa* (Burmeister, 1839) [Anopl.: Polyplac.]

*Mus musculus* Linnaeus, 1758 – house mouse – husmus

*Hoplopleura acanthopus* (Burmeister, 1838)  
[Anopl.: Hoplopleur.]  
*Polyplax serrata* (Burmeister, 1839) [Anopl.: Polyplac.]  
*Polyplax spinulosa* (Burmeister, 1839) [Anopl.:  
Polyplac.]

*Rattus norvegicus* (Berkenhout, 1769) – brown  
rat – brunråtta  
*Polyplax spinulosa* (Burmeister, 1839) [Anopl.:  
Polyplac.]

**Sciuridae Fischer de Waldheim, 1817**

*Sciurus vulgaris* Linnaeus, 1758 – Eurasian red  
squirrel – ekorre  
*Enderleiniellus nitzschi* Fahrenholz, 1916 [Ano-  
pl.: Enderleiniell.]

## Key to species of lice in Sweden (Phthiraptera)

Suborders, families, and morphologically distinct complexes of genera marked in **bold** for easy reference.

We have deliberately avoided using measurements in most of the key. Published measurements are often based on few specimens, and it is often unclear between which points measurements have been taken. While measurements may be useful in some cases (*e.g.* the *Philopterus* spp. of corvid hosts), the reliability and accuracy of published measurements are often unknown. We have therefore tried to use only morphological characters, unless a recent revision has revealed that the measurements are reliable.

1. Mandibulate mouth parts visible on ventral side of head (Figs 18, 42).....2
  - Stylet mouthparts retracted into head and not generally visible .....**Anoplura**, 280
- 2 (1). Maxillary palpi present (Figs 18a–b); most of antennae on ventral side of head (Figs 18a–b) .....
  - .....**Amblycera**, 3
  - Maxillary palpi absent (Figs 42a–b); most of antennae visible lateral to head margin (Figs 42a–b) ....
    - .....**Ischnocera**, 85
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 - Frons rounded; female gonopods with slight tooth (Fig. 61h)..*Linognathus stenopsis* (Burmeister, 1838)
- 293 (289). Abdominal spiracles on pronounced dorso-laterally protruding sclerotized tubercles (TS in Fig. 60d)..*Solenopotes capillatus* Enderlein, 1904  
 - Abdominal spiracles not on pronounced tubercles (SP in Fig. 60e)..*Solenopotes tarandi* (Mjöberg, 1915)
- 294 (289). Sternal plate II extended laterally to reach paratergites (Fig. 60g).....  
 ...**Hoplopleuridae** [only Swedish representative *Hoplopleura acanthopus* (Burmeister, 1838)]  
 - Sternal plate II not reaching paratergites (Figs 61a, 61c).....**Polyplacidae**, 295
- 295 (294). All paratergites very small (PAT in Fig. 61i).....296  
 - Some paratergites at least half as long as thoracic sternal plate (TSP in Fig. 61a).....297
- 296 (295). Thoracic sternal plate wider than long (Fig. 60j).....*Haemodipsus ventricosus* (Denny, 1842)  
 - Thoracic sternal plate longer than wide (Fig. 60i).....  
 ...*Haemodipsus lyriocephalus* (Burmeister, 1838)
- 297 (295). Setae of paratergite IV of similar size (Figs 61d,f).....298  
 - One seta of paratergite IV much longer than the other (Fig. 61e).....*Polyplax serrata* (Burmeister, 1839)
- 298 (297). Posterior angle of paratergites III–V produced into point both dorsally and ventrally (Fig. 61d).....299  
 - Posterior angle of paratergites III–V produced into point only dorsally (Fig. 61f).....  
 .....*Polyplax spinulosa* (Burmeister, 1839)<sup>18</sup>
- 299 (298). Postero-lateral corners of first abdominal sternite elongated posteriorly (PE in Fig. 61c).....*Polyplax borealis* Ferris, 1933c  
 Postero-lateral corners of first abdominal sternite not elongated posteriorly (Fig. 61a).....  
 .....*Polyplax spinigera* (Burmeister, 1839)<sup>18</sup>

## Footnotes to key

<sup>1</sup> We are not aware of any reliable characters to separate these two species, and they may in fact be conspecific. Carriker & Shull (1910) did not compare *M. latifrons* with *M. rustica* in their description. The genus is in need of a thorough revision, and we have here identified these species based on host records.

<sup>2</sup> See text.

<sup>3</sup> Apart from the genera here included in the *Esthiopterum*-complex, the genera *Carduiceps*, *Columbicola*, and *Craspedonirmus* were also included in the proposed family Esthiopteridae by Eichler (1963). Gustafsson & Olsson (2017) found this family to be monophyletic with high support in some analyses, however not all genera in Eichler's Esthiopteridae were included, and the outgroup sampling was limited. All three genera would be somewhat aberrant in Esthiopteridae, but share two morphological characters that, to our knowledge, are not found in any other genera: the presence of a complete transverse carina between the antennae (ANC in Figs 45a,c,e) and presence of a complete transverse suture immediately posterior to this carina (DPOS in Figs 45a,c,e). We presently do not include these three genera in the Esthiopterum-complex, but note that they may be closely related.

<sup>4</sup> These two species are very similar morphologically, but separated from all other *Anaticola* on this key character. The material available to us is not sufficient to separate these two species reliably. *Anaticola pseudofuligulae* has a longer and more narrow preantennal area, whereas *A. rubromaculata* is as illustrated in Escalante *et al.* (2016; fig. 1 "mergiserrati 4").

<sup>5</sup> Most populations of *Anaticola* can be separated on the shape of the preantennal area (Escalante *et al.* 2016) and the preantennal setae (Eichler, 1954), but the taxonomy is confused, and differences are in some cases small. In addition, Escalante *et al.* (2016) showed that several of the species accepted by Price *et al.* (2003a) are paraphyletic, with genetically distinct lineages occurring on the same host species. The genus is in need of a thorough revision before any more detailed key to the different species can be given.

<sup>6</sup> The *Philopterus*-complex is here interpreted as the subfamilies Philopterinae and Strigiphilinae of Eichler (1963), except the extralimital genus *Meropoeus* which is part of the *Brueelia*-complex. This circumscription is somewhat arbitrary, and may not reflect true relationships. No phylogeny including all the genera in the *Philopterus*-complex *s. lat.* has been published, and published phylogenies give contradictory results. In the phylogeny of Cruickshank *et al.* (2001), *Strigiphilus* is



placed with *Philopterus* (*Craspedorrhynchus* was not included in the study). However, placement of *Strigiphilus*+*Craspedorrhynchus* varied between datasets in the analysis of Smith *et al.* (2004); either near *Philopterus* and the *Quadriceps*-complex, together with the extralimital *Alcedoecus*, together with the Goniodidae, or, as in their strict consensus phylogeny (*ibid.*, fig. 9) as an isolated clade in a large polytomy. In all cases, *Strigiphilus* and *Craspedorrhynchus* are closely related. The placement of these genera in the *Philopterus*-complex *s. lat.* is thus not entirely satisfactory, but gives a general idea of morphological similarities.

Species in the genus *Philopterus* are often very similar, and hard to tell apart, especially on closely related host species. No general revision or overview of the genus has ever been published, and many species are poorly described. Emerson (1972) stated that many of the species, especially those from hosts in the Fringillidae, may be better regarded as conspecific. Differences between species are often evident only when large series from the same host are studied, and often involve measurements and the amount of abdominal chaetotaxy, but there is often overlap between closely related species in both these character sets. Key characters for this genus are tentative and based on the limited material available to us. Several species are best separated on the precise shape and dimensions of the dorsal anterior plate and the male genitalia, and these are treated as closely related species pairs in this key. Until a thorough revision of the genus has been published, these species can typically not be identified to species level without comparison to published measurements or other material.

*Philopterus desertus* is not included in the key, as there are no good descriptions or illustrations of this species, and we have only seen tentatively identified nymphs. The one female of *Ph. passerinus* we have examined is poorly preserved, and there are no good descriptions or illustrations; this species is also excluded from the key. *Philopterus reguli* is not included in the key, as we have not seen any specimens of this species, and no good illustrations or descriptions have been published.

<sup>7</sup>Złotorzycka (1966) stated that these two species could be separated by measurements and shapes, particularly by the shape of the stylus. We cannot see these differences in the material examined by us, and cannot presently separate these two species in the key. However, only one male of *O. minor* was examined by us. A larger series from both hosts in combination with genetic data may prove sufficient to separate these two species, and we have included both as valid species here, following Price *et al.* (2003a).

<sup>8</sup> Presumably there are more useful characters to differentiate these two species, but neither have been satisfactorily described or illustrated. We have seen one poorly preserved female of *P. gulosus* and no specimen of *P. affectator*. A revision of the *Penenirrus* on passeriform hosts is sorely needed.

<sup>9</sup> *Quadriceps latus* is not included in the key, as the two examined specimens are partial, poorly preserved, and no good descriptions or illustrations have been published. The species is found on the cream-coloured courser *Cursorius cursor* (Latham, 1787), an extremely rare bird in Sweden with only three accepted records, and is thus unlikely to be found in Sweden again.

*Quadriceps lineatus* is not included in the key, as no material has been examined. According to Timmermann (1952a), the original type specimens have been lost, and we are not aware of any redescriptions of this species. The host is Sabine's gull *Xema sabini* (Sabine, 1819), which is a seasonal vagrant in Sweden. We expect *Q. lineatus* may be collected in Sweden in the future.

<sup>10</sup> These two species can be separated on the basis of head shape and dimensions (Balát, 1955a), but are otherwise similar. The following species of *Brueelia* on fringillid hosts are unrecorded in Sweden, but may occur on common Swedish hosts: *Brueelia breueri* Balát, 1955a on *Chloris chloris* (Linnaeus, 1758), *Brueelia chrysostris* (Blagoveshchensky, 1940) on *Spinus spinus* (Linnaeus, 1758), *Brueelia densilimba* (Nitzsch [in Giebel], 1866) on *Carduelis carduelis* (Linnaeus, 1758), *Brueelia glizi* Balát, 1955a on *Fringilla montifringilla* Linnaeus, 1758, *Brueelia juno* (Giebel, 1874) on *Coccothraustes coccothraustes* (Linnaeus, 1758), *Brueelia mongolica* Mey, 1982b on *Carduelis flavirostris* (Linnaeus, 1758), *Brueelia propinqua* (Giebel, 17874) on *Loxia pytyopsittacus* Borkhausen, 1793, *Brueelia sexytanum* (Soler Cruz, Rodríguez, Florido-Navío & Muñoz Parra, 1987) on *Serinus serinus* (Linnaeus, 1766), and *Brueelia stadleri* Eichler, 1954, on *Carduelis cannabina* (Linnaeus, 1758). Separation of these species presently relies on head shapes and dimensions, but they are otherwise very similar. A revision of the *Brueelia* from European fringillids is sorely needed.

<sup>11</sup> No characters apart from head shape that reliably separated these two species are known. *Guimaraesiella marginata* generally has a broader head with more evenly rounded preantennal area than *Guimaraesiella turdinulae*, and the male abdomen of *G. marginata* is generally more rounded than that of *G. turdinulae*. Comparison of large series of specimens with type material is necessary for accurate determination. In addition to these two species, *Guimarae-*

*siella haftorni* (Balát, 1981) on *Turdus iliacus* Linnaeus, 1758, *Guimaraesiella amsel* (Eichler, 1951) on *Turdus merula* Linnaeus, 1758, and *Guimaraesiella viscivori* (Denny, 1842) on *Turdus viscivorus* Linnaeus, 1758, are likely to occur in Sweden. These species are also best separated by comparing large series of specimens with type material, and no reliable characters that separate them apart from head shape and dimensions are known. We have seen several examples of these species occurring on the “wrong” host, and host associations alone do not accurately predict louse species. This appears to be more common for the large-headed *G. marginata*.

<sup>12</sup>The different subspecies of *Saemundssonina platygaster* and *S. scolopacisphaeopodis* are separated mainly on measurements and dimensions, and there is often much overlap between specimens from different host species (Timmermann 1969). Few, if any, attempts have been made to separate these subspecies on chaetotaxy or morphological characters apart from those related to measurements. We do not include these subspecies in the key, as these two species (and *S. lari*, also previously divided into a large number of host-specific subspecies) are sorely in need of revision to determine whether or not populations on different hosts represent different subspecies or even species.

<sup>13</sup>Subspecies of *Quadriceps ornatus* are separated by the extent of dark pigmentation. Timmermann (1952a: 219) stated that there is variation among specimens of what he considered *Q. o. ornatus*: “The decorations are developed very differently. In this respect there are realized all intermediate stages between specimens hardly to be distinguished from *paulschulzei* [a darker subspecies] on one hand and resembling *striolatus* [a lighter subspecies] on the other.” It is unknown whether these patterns in pigmentation are taxonomically relevant or not, and we do not include key characters to separate the three subspecies reported from Sweden.

<sup>14</sup>It seems unlikely that *Quadriceps houri*, *Q. selatus*, and *Q. longicollis* can be reliably separated to species level, and it may be better to treat the populations on these three hosts as subspecies of the same species. We here follow the taxonomy of Price et al. (2003a) in treating them as separate species, but note that the characters that separate these three species may not be very useful when larger series of specimens have been examined.

<sup>15</sup>The genera in the *Degeeriella*-complex (in Sweden: *Cuculicola*, *Degeeriella*, *Lagopoecus*, and *Picicola*) are poorly delimited morphologically, and at least *Degeeriella* and *Picicola* are paraphyletic (Johnson et al. 2002a). Consequently, *Picicola* and *Degeeriella* are mixed in this key.

<sup>16</sup>The morphological differences between *B. caprae* and *B. limbatus* are poorly known, and there seems to be a considerable variation in the shape of the male genitalia and the relationship between this character and other characters proposed to diagnose the two species. That both species occur on the same host species, and that male are very rare, exacerbates this situation. We have identified specimens based on the shape of the male genitalia according to Soler-Cruz et al. (1987), but recognize that this may be in error. Much of the Swedish material available to us is in poor condition, but the one male of *B. limbatus* has genitalia exactly as illustrated for this species by Soler-Cruz et al. (1987; fig 1L), whereas one of the males of *B. caprae* has male genitalia intermediate between figs 1A and 1K in the same study; the genitalia of a second male from the same host individual are too distorted for accurate comparison.

<sup>17</sup>Two species belonging to the Pediculidae are on the Swedish list: *Pediculus humanus* and *Pediculus mjoebergi*. Ferris (1951) has summarized the complicated taxonomic history of the *Pediculus* species on New World monkeys. Ewing (1926b) considered *P. mjoebergi* to be a synonym of *P. consobrinus* Piaget, 1880, but later (Ewing 1938) considered it a synonym of *P. humanus*. Kim & Emerson (1968) stated that *P. mjoebergi* “should be reexamined for their validity”, but Durden & Musser (1994) accepted it as valid. *Pediculus mjoebergi* cannot be identified from Mjöberg’s (1910a) description. Ferris (1935) illustrated *P. mjoebergi* from South American material, and discussed the few morphological characters that differ between *P. humanus* and *P. mjoebergi*. No material of *P. mjoebergi* has been found at the SMNH, and we consider Mjöberg’s specimens lost. As this species is Neotropical in origin, and unlikely to be found in Sweden again, we do not provide more detailed characters to separate it from *P. humanus* in this key, but refer to Ferris (1935, 1951). Nor do we include the differences between the two subspecies of *P. humanus*, which have been summarized by Kim et al. (1986).

<sup>18</sup>We have not seen any specimens of *Polyplax spinigera*. Ferris (1951) considered Neumann’s (1909) redescription uninformative. The species was reported several times during the 20th century (e.g. Garde et al. 1999; Křištofík & Dudich 2000), seemingly without ever having been redescribed. No specimens of this species were found in Mjöberg’s collections at the SMNH. Ferris (1951) suggested that this species is a senior synonym of *P. alaskensis* Ewing, 1927, and we have here assumed that he is correct, and used characters published for *P. alaskensis* to place *P. spinigera* in the key, following Quay (1950).

## References

- Adams, R.J., Price, R.D. & Clayton, D.H. 2005. Taxonomic revision of Old World members of the feather louse genus *Columbicola* (Phthiraptera: Ischnocera), including descriptions of eight new species. – *Journal of Natural History* 39: 3545–3618.
- Aguirre, A.A., Bröjer, C. & Mörner, T. 1999. Descriptive epidemiology of roe deer mortality in Sweden. – *Journal of Wildlife Diseases* 35: 753–762.
- Ansari, R.A.M. 1955. Studies on the ischnoceron [sic] Mallophaga infesting birds in Pakistan. – Proceedings of the Seventh Pakistan Scientific Conference, Biology, Bahawalpur: 5–59.
- Ansari, R.A.M. 1956a. Studies on *Brueelia* species (Mallophaga) occurring on true thrushes. – *Biologia (Lahore)* 2: 102–143.
- Ansari, R.A.M. 1956b. A revision of the *Brüelia* (Mallophaga) species infesting the Corvidae. Part I. – *Bulletin of the British Museum (Natural History) Entomology* 4: 369–406.
- Ansari, R.A.M. 1957. A revision of the *Brüelia* (Mallophaga) species infesting the Corvidae. Part II. – *Bulletin of the British Museum (Natural History) Entomology* 5: 143–182.
- Ansari, R.A.M. 1968. A review of the biting lice of the genus *Sturnidoecus* Elchler [sic], 1944 (Phlopteridae: Mallophaga) found on the bird family Sturnidae (Passeriformes). – *Pakistani Journal of Health* 17: 1–40.
- Armstrong, N.R. & Wilson, J.D. 2006. Did the “Brazilian” kill the pubic louse? – *Sexually Transmitted Infections* 82: 265–266.
- Arnold, D.C. 2005. Review of the genus *Ornithobius* (Phthiraptera: Ischnocera: Phlopteridae), with descriptions of two new species. – *Journal of the Kansas Entomological Society* 78: 158–166.
- Ash, J.S. 1960. A study of the Mallophaga of birds with particular reference to their ecology. – *Ibis* 102: 93–110.
- Balát, F. 1955a. Beitrag zur Kenntnis der Mallophagengattung *Brueelia* I. – *Práce Brneské Zakladny Ceskoslovenské Akademie Ved* 30: 397–422.
- Balát, F. 1955b. Mallophaga aus dem Nationalpark in der Hohen Tatra. – *Folia Zoologica et Entomologica* 4: 389–398.
- Balát, F. 1981. New species of biting lice (Mallophaga) of the genera *Penenirmus* and *Rostrinirmus*. – *Folia Parasitologica (Praha)* 28: 161–168.
- Baum, H. 1968. Biologie und Ökologie der Amsfeldlerlinge. – *Angewandte Parasitologie* 9: 129–176.
- Barker, S.C., Whiting, M., Johnson, K.P. & Murrell, A. 2003. Phylogeny of the lice (Insecta, Phthiraptera) inferred from small subunit rRNA. – *Zoologica Scripta* 32: 407–414.
- Bartlow, A.W., Villa, S.M., Thompson, M.W., & Bush, S.E. 2016. Walk or ride? Phoretic behaviour of amblyceran and ischnoceran lice. – *International Journal for Parasitology* 46: 221–227.
- Bechet, I. 1959. Contribuții la cunoașterea malofagelor din Republica Populară Română (II). – *Studii și Cercetări de Biologie (Cluj)* 10: 129–136.
- Bechet, I. 1961. Malofage din Republica Populară Română. – *Studii și Cercetări de Biologie (Cluj)* 12: 91–102.
- Bechet, I. 1963. Specii de *Lagopoecus* (Mallophaga) din fauna Republicii Populare Române. – *Studii și Cercetări de Biologie (Cluj)* 14: 257–263.
- Bedford, G.A.H. 1930. New genera and species of Mallophaga from South African hosts. – *Report to the Director of Veterinary Services and Animal Industry* 16: 153–173.
- Bedford, G.A.H. 1931. New genera and species of Mallophaga. – *Report to the Director of Veterinary Services and Animal Industry, Union of South Africa* 17: 283–297.
- Bedford, G.A.H. 1939. Notes on Menoponidae (Mallophaga) with descriptions of new genera and species. – *Ondersetpoort Journal of Veterinary Science and Animal Industry* 12: 121–152.
- Benítez-Rodríguez, R., Soler-Cruz, M.D., & Guevara-Benítez, D.C. 1985. Morphologische Unterscheidende von *Bovicola caprae* und *B. limbata* (Mallophaga). – *Angewandte Parasitologie* 26: 241–243.
- Benítez-Rodríguez, R., Soler-Cruz, M.D., Nuñez-Sevilla, C., Pérex-Jiménez, J., & Díaz-López, M. 1987. Biologie de *Bovicola limbata* (Mallophaga), parasite de *Capra hircus*. Fécondation au troisième stade larvaire, parthénogenèse, influence du mâle sur l’ovoposition. – *Cahiers ORSTOM, Entomologie Médicale et Parasitologie* 25: 13–16.
- Björvall, A. & Ullström, S. 1985. Däggdjur. Alla Europas arter. – *Wahlström & Widstrand, Stockholm*, 240 pp.
- Blagoveshtchensky, D.I. 1940. Mallophaga from birds of the Talysh lowlands. – *Magasin de parasitologie de l’Institut zoologique de l’Académie des Sciences de l’URSS* 8: 25–90.
- Boheman, C.H. 1865. Bidrag til kannedom om Spetsbergens insektfauna. – *Vetenskaps-Akademins förhandlingar Köbenhavn* 22: 563–577.
- Boisduval, J.B.A. de & Lacordaire, J.T. 1835. Anoploures. – In: *Faune entomologiques des environs de Paris; ou species général des insectes qui se*

- trouvent dans un rayon de quinze a vingt lienes aux alentours de Paris. pp. 117–125. Méquingnon-Marvis, Pere & Fils, paris.
- Bornstein, S. & de Verdier, K. 2010. Some important ectoparasites of Alpaca (*Vicugna pacos*) and Llama (*Lama glama*). – *Journal of Camelid Science* 3: 49–61.
- Boyd, E.M. 1951. A survey of parasitism of the starling *Sturnus vulgaris* in North America. – *Journal of Parasitology* 31: 56–84.
- Brelj, S. & Tovornik, D. 1962. Prispevek k poznavanju tekutov (Mallophaga) Jugoslavije II. – *Biološki Vestnik* 10: 85–100.
- Brinck, P. 1946a. Ohyran på svenska husdjur, dess skadegörelse och bekämpning. – *Publikationer från Philips-Pharmacias Vetenskapliga Samarbetsnämnd* 4: 1–35.
- Brinck, P. 1946b. Resultatet av en undersökning av parasitfaunan hos dalripa och fjällripa inom Virihaure-området i Lule Lappmark. – *Svensk Veterinärtidskrift* 6: 277–283.
- Brinck 1948. Notes on Anoplura. – *Opuscula Entomologica* 13: 129–156.
- Brinck, P. 1949. Den nordiska lusfaunan med särskild hänsyn till husdjurens löss och dessas bekämpande. – *Annale Entomologici Fennici* 14 [Suppl.]: 56–61.
- Brinck, P. 1950. Löss. Anoplura. [Part 5 in *Svensk Insektsfauna*]. – *Entomologiska Föreningen i Stockholm, Stockholm*. 73pp.
- Burmeister, H. 1838. Mallophaga Nitzsch. – *Handbuch der Entomologie, Berlin* 2: 418–443.
- Burmeister, H. 1839. Genera quaedam insectorum. Vol. I. – Berlin. 124pp.
- Bush, S.E., Harbison, C.W., Slager, D.L., Peterson, A.T., Price, R.D., & Clayton, D.H. 2009. Geographic variation in the community structure of lice on western scrub-jays. – *Journal of Parasitology* 95: 10–13.
- Bush, S.E., Kim, D., Reed, M. & Clayton, D.H. 2010. Evolution of cryptic coloration in ectoparasites. – *The American Naturalist* 176: 529–535.
- Bush, S.E. & Malenke, J. 2008. Host defence mediates interspecific competition in ectoparasites. – *Journal of Animal Ecology* 77: 558–564.
- Bush, S.E., Reed, M., & Maher, S. 2013. Impact of forest size on parasite biodiversity: implications for conservation of hosts and parasites. – *Biodiversity Conservation* 22: 1391–1404.
- Bush, S.E., Weckstein, J.D., Gustafsson, D.R., Allen, J., DiBlasi, E., Shreve, S.M., Boldt, R., Skeen, H.R., & Johnson, K.P. 2016. Unlocking the black box of feather louse diversity: A molecular phylogeny of the hyper-diverse genus *Brueelia*. – *Molecular Phylogenetics and Evolution* 94: 737–751.
- Büttiker, W. & Mahner, V. 1978. Vorläufige Liste der Anoplura (Insecta) der Schweiz. – *Mitteilungen der schweizerischen entomologischen Gesellschaft* 51: 299–306.
- Carriker, M.A., Jr. 1936. Studies in Neotropical Mallophaga, Part I. – *Lice of the tinamous*. – *Proceedings of the Academy of Natural Sciences of Philadelphia* 88: 45–218.
- Carriker, M.A. Jr. & Shull, C.A. 1910. Some new species of Mallophaga from Michigan. – *Entomological News* 21: 51–57.
- Carrillo, C.M., Valera, F., Barbosa, A., & Moreno, E. 2007. Thriving in an arid environment: high prevalence of avian lice in low humidity conditions. – *Écoscience* 14: 241–249.
- Catanach, T.A. & Johnson, K. P. 2015. Independent origins of the feather lice (Insecta: *Degeeriella*) of raptors. – *Biological Journal of the Linnean Society* 114: 837–847.
- Catanach, T.A., Valim, M.P., Weckstein, J.D., & Johnson, K.P. 2017. Cophylogenetic analysis of the lice in the *Colpocephalum* complex (Phthiraptera: Amblycera). – *Zoologica Scripta*, DOI: 10.1111/zsc.12262.
- Children, J.G. 1836. Catalogue of Arachnida and insects collected by Mr. King, Surgeon and Naturalist to the Expedition. – In: Back, G. (ed). *Narrative of the Arctic Land Expedition to the mouth of the Great Fish River in the years 1833, 1834, and 1835*. pp. 536–539. Chas. E. Tuttle Co. Publisher.
- Choe, J.C. & Kim, K.C. 1988. Microhabitat preference and coexistence of ectoparasite arthropods on Alaskan seabirds. – *Canadian Journal of Zoology* 66: 987–997.
- Christensson, D., Gyllensvaan, C., Skiöldebrand, E., & Viring, S. 1994. Löss på nötkreatur i Sverige – en inventering. – *Svensk Veterinärtidning* 46: 119–121.
- Christensson, D., Zackrisson, G., Holm, B., & Gunnarsson, L. 1998. Lus hos hund i Sverige. – *Svensk Veterinärtidning* 50: 189–191.
- Cicchino, A.C. & Abrahamovich, A.H. 1988. Contribution to the knowledge of the cephalic sensilla and water-uptake system of adults and nymphs of *Vernoniella bergi* (Kellogg 1906) (Insecta: Phthiraptera: Ischnocera). – *Microscopia Electronica y Biologia Celular* 12: 121–147.
- Cicchino, A.C. & Castro, D.C. 1996. Revisión preliminar de las especies del género *Brueelia* Kéler, 1936 (Phthiraptera, Philoptera) parásitas de Icterinae (Aves, Passeriformes, Fringillidae). – *Graellsia* 52: 3–30.
- Clay, T. 1936. Two new genera of Mallophaga. – *Proceedings of the Zoological Society of London* 1935: 615–618.

- Clay, T. 1938. A revision of the genera and species of Mallophaga occurring on gallinaceous hosts. – Part I. *Lipeurus* and related genera. – Proceedings of the Zoological Society of London, Series B 108: 109–204 + 14 plates.
- Clay, T. 1940. Genera and species of Mallophaga occurring on gallinaceous hosts – Part II. *Goniodes*. – Proceedings of the Zoological Society of London, Series B 110: 1–120.
- Clay, T. 1949. Species of the genus *Saemundssonina* (Mallophaga) from the Sterninae. – American Museum Novitates 1409:1–25.
- Clay, T. 1951. An introduction to the classification of the avian Ischnocera (Mallophaga). – Transactions of the Royal Entomological Society of London 102: 171–195.
- Clay, T. 1953. Revisions of the genera of Mallophaga. – I. The *Rallicola*-complex. – Proceedings of the Zoological Society of London 123: 563–587.
- Clay, T. 1957. The *Degeeriella* [Insecta: Mallophaga] parasitic on *Pernis* [Aves: Falconiformes]. – Proceedings of the Zoological Society, Calcutta, Mookerjee Memorial Volume, 339–346 + 1 plate.
- Clay, T. 1958. Revisions of Mallophaga genera. *Degeeriella* from the Falconiformes. – Bulletin of the British Museum (Natural History) Entomology 7: 125–207 + 9 plates.
- Clay, T. 1959. Key to the species of *Austromenopon* Bedford (Mallophaga) parasitic on the Charadriiformes. – Proceedings of the Royal Entomological Society (Series B) 28: 157–168.
- Clay, T. 1962. A key to the species of *Actornithophilus* Ferris with notes and descriptions of new species. – Bulletin of the British Museum (Natural History) Entomology 11: 189–244 + 7 plates.
- Clay, T. 1964. Geographical distribution of the Mallophaga (Insecta). – Bulletin of the British Ornithologists' Club 84: 14–16.
- Clay, T. 1965. Contributions towards a revision of *Myrsidea* Waterston (Mallophaga: Menoponidae). II. – Proceedings of the Royal Entomological Society of London, Series B 34: 117–122.
- Clay, T. 1966a. Contributions towards a revision of *Myrsidea* Waterston (Menoponidae: Mallophaga) I. – Bulletin of the British Museum (Natural History) Entomology 17: 327–395 + 2 plates.
- Clay, T. 1966b. A new species of *Strigiphilus* (Philopteridae: Mallophaga). – Pacific Insects 8: 835–847.
- Clay, T. 1966c. The species of *Strigiphilus* (Mallophaga: Philopteridae) parasitic on the barn owls *Tyto* (Tytonidae). – Journal of the Entomological Society of Queensland 5: 10–17.
- Clay, T. 1967. Mallophaga (biting lice) and Anoplura (sucking lice). Part I: *Austrogoniodes* (Mallophaga) parasitic on penguins (Sphenisciformes). – Antarctic Research Series 10: 149–155.
- Clay, T. 1968. Contributions towards a revision of *Myrsidea* (Menoponidae: Mallophaga) III. – Bulletin of the British Museum (Natural History) Entomology 21: 203–243.
- Clay, T. 1969. A key to the genera of the Menoponidae (Amblycera: Mallophaga: Insecta). – Bulletin of the British Museum (Natural History) Entomology 24: 1–26 + 7 plates.
- Clay, T. 1970a. The Amblycera (Phthiraptera: Insecta). – Bulletin of the British Museum (Natural History) Entomology, 25: 75–98.
- Clay, T. 1970b. Phthiraptera. In – Tuxen, S.L. (ed.). Taxonomist's glossary of genitalia in insects. 176–179. Munksgaard, Copenhagen.
- Clay, T. 1973. The species groups of *Pectinopygus* (Phthiraptera: Philopteridae). – Bulletin of the British Museum (Natural History) Entomology 29: 203–223.
- Clay, T. 1976. Geographical distribution of the avian lice (Phthiraptera): a review. – Journal of the Bombay Natural History Society 71: 536–547.
- Clay, T. 1977. The *Strigiphilus cursitans* group (Phthiraptera: Insecta). – Records of the Queen Victoria Museum 56: 1–4.
- Clay, T. 1981. The ischnoceran lice (Phthiraptera) of the oystercatchers (Aves: Haematopodidae) – Canadian Journal of Zoology 59: 933–938.
- Clay, T. & Hopkins, G.H.E. 1950. The early literature on Mallophaga. Part I. 1758–1762. – Bulletin of the British Museum (Natural History) Entomology 1: 221–272 + 2 plates.
- Clay, T. & Hopkins, G.H.E. 1951. The early literature on Mallophaga. Part II. 1763–1775. – Bulletin of the British Museum (Natural History) Entomology 2: 1–36 + 3 plates.
- Clay, T. & Hopkins, G.H.E. 1954. The early literature on Mallophaga. Part III. 1776–1786. – Bulletin of the British Museum (Natural History) Entomology 3: 221–266 + 2 plates.
- Clay, T. & Hopkins, G.H.E. 1960. The early literature on Mallophaga. Part IV. 1787–1818. – Bulletin of the British Museum (Natural History) Entomology 9: 1–61 + 6 plates.
- Clay, T. & Meinertzhagen, R. 1938a. New genera and species of Mallophaga. – The Entomologist 71: 275–279.
- Clay, T. & Meinertzhagen, R. 1938b. Two new genera of Mallophaga. – The Entomologist 71: 73–76.
- Clay, T. & Meinertzhagen, R. 1939. Three new genera of Mallophaga from Charadriiformes. – Annals and Magazine of Natural History 11: 450–454 + 1 plate.
- Clay, T. & Meinertzhagen, R. 1941. Mallophaga miscellany. – No. 2. – Annals and Magazine of Natural History 40: 329–346.

- Clayton, D.H. 1990. Host specificity of *Strigiphilus* owl lice (Ischnocera: Philopteridae), with the description of new species and host associations. – *Journal of Medical Entomology* 27: 257–265.
- Clayton, D.H. & Drown, D.M. 2001. Critical evaluation of five methods for quantifying chewing lice (Insecta: Phthiraptera). – *Journal of Parasitology* 87: 1291–1300.
- Clayton, D.H. & Price, R.D. 1984. Taxonomy of the *Strigiphilus cursitans* group (Ischnocera: Philopteridae), parasites of owls (Strigiformes). – *Annals of the Entomological Society of America* 77: 340–363.
- Clayton, D.H. & Price, R.D. 1999. Taxonomy of New World *Columbicola* (Phthiraptera: Philopteridae) from the Columbiformes (Aves), with descriptions of five new species. – *Annals of the Entomological Society of America* 92: 675–685.
- Clayton, D.H., Price, R.D., & Page, R.D.M. 1996. Revision of *Dennyus* (*Collodennyus*) lice (Phthiraptera: Menoponidae) from swiftlets, with descriptions of new taxa and a comparison of host-parasite relationships. – *Systematic Entomology* 21: 179–204.
- Clayton, D.H., Bush, S.E., & Johnson, K.P. 2016. Co-evolution of life on hosts. Integrating ecology and history. The University of Chicago Press, London. xiv+294 pp.
- Clements, J.F., Schulenberg, T.S., Iliff, M.J., Roberson, D., Fredericks, T.A., Sullivan, B.L. & Wood, C.L. 2018. The eBird/Clements checklist of birds of the world: v2018. Available from: <http://www.birds.cornell.edu/clementschecklist/download/> (Accessed 2018-10-28).
- Conci, C. 1942. Il genere *Myrsidea* Waterston. I. Ridescrizione della *Myrsidea rustica* Giebel (Mallophaga). – *Rivista della "Società di Studi per la Venezia Tridentina"* 23: 3–8.
- Contreras, N., Isla Garcia, M., & Vega Correa, E. 2001. Infestación del cabello por *Phthirus pubis* (Anoplura; Pediculidae). – *Revista Cubana de Medicina Tropical* 53: 63–65.
- Coulson, S.J., Convey, P., Aakra, K., Aarvik, L., Ávila-Jiménez, M.L., Babenko, A., Biersma, E.M., Boström, S., Brittain, J.E., Carlsson, A.M., Christoffersen, K., De Smet, W.H., Ekrem, T., Fjellberg, A., Füreder, L., Gustafsson, D.R., Gwiazdowicz, D.J., Hansen, L.O., Holmstrup, M., Hullé, M., Kaczmarek, Ł., Kolicka, M., Kuklin, V., Lakka, H.-K., Lebedeva, N., Makarova, O., Maraldo, K., Melekchina, E., Ødegaard, F., Pilskog, H.E., Simon, J.C., Sohlenius, B., Solhøy, Y., Sølvi, G., Stur, E., Tanasevitch, A., Taskaeva, A., Velle, G., Zawierucha, K., Zmudczyńska-Skarbek, K. 2014. The terrestrial and freshwater invertebrate biodiversity of the archipelagoes of the Barents Sea: Svalbard, Franz Josef Land and Novaya Zemlya. – *Soil Biology and Biodiversity* 68: 440–470.
- Cruickshank, R.H., Johnson, K.P., Smith, V.S., Adams, R.J., Clayton, D.H., & Page, R.D.M. 2001. Phylogenetic analysis of partial sequences of elongation factor 1 $\alpha$  identifies major groups of lice (Insecta: Phthiraptera). – *Molecular Phylogenetics and Evolution* 19: 202–215.
- Cummings, B.F. 1913. On some nondescript Anoplura and Mallophaga. – *Bulletin of Entomological Research* 4: 35–45.
- Cummings, B.F. 1914. Descriptions of five new species of Anoplura and Mallophaga. – *Bulletin of Entomological Research* 5: 155–177.
- Cummings, B.F. 1916. Studies on the Anoplura and Mallophaga, being a report upon a collection from the mammals and birds in the society's garden. Part I. With a preface. – *Proceedings of the Zoological Society of London* 1916: 253–295.
- Dalgleish, R.C. 1969. The *Picicola* (Mallophaga: Ischnocera) of the Picidae (Aves: Piciformes). – *Proceedings of the Royal Entomological Society of London, Series B* 38: 101–113.
- Dalgleish, R.C. 1971. The *Brueelia* (Mallophaga: Ischnocera) of the Picidae (Aves: Piciformes). – *Journal of the New York Entomological Society* 79: 139–146.
- Dalgleish, R.C. 1972. The *Penenirmus* (Mallophaga: Ischnocera) of the Picidae (Aves: Piciformes). – *Journal of the New York Entomological Society* 80: 83–104.
- Denny, H. 1842. *Monographia anoplurorum Britanniae*. – Henry G. Bohn, London. xxvi+262 pp.
- Dik, B. 2012. Lice infestations in cattle and sheep [in Turkish]. – *Türkiye Klinikleri Journal of Veterinary Sciences* 3: 45–50.
- Dik, B., Halajian, A., & Turner, M. 2013. The morphology of *Craspedorrhynchus platystomus* (Burmeister, 1838), a louse commonly found on the long-legged buzzard *Buteo rufinus* (Phthiraptera: Ischnocera: Philopteridae). – *Turkish Journal of Zoology* 37: 739–745.
- Dik, B., Şekercioglu, Ç.H., Kirpik, M.A., Inak, S., & Uslu, U. 2010. Chewing lice (Phthiraptera) species found on Turkish shorebirds (Charadriiformes). – *Kafkas Üniversitesi Veteriner Fakültesi Dergisi* 16: 867–874.
- Dik, B. & Uslu, U. 2018. Ectoparasites of hares (*Lepus europaeus pallas*) in Konya Province, Turkey. – *Turkish Journal of Veterinary and Animal Sciences* 42: 65–72.
- Durden, L.A. & Musser, G.G. 1994a. The sucking lice (Insecta: Anoplura) of the world: a taxonomic checklist with records of mammalian hosts and geographical distribution. – *Bulletin of the American Museum of Natural History* 218: 1–90.

- Durden, L.A. & Musser, G.G. 1994b. The mammalian hosts of the sucking lice (Anoplura) of the world: a host-parasite list. – *Bulletin of the Society for Vector Ecology* 19: 130–168.
- Durrant, E.P. 1906. Descriptions of new Mallophaga. – *The Ohio Naturalist* 6: 528–530.
- Edler, A. 1971. Flatlus i ögonfransar. – *Läkartidningen* 68: 1701.
- Edwards, R.L. 1965. Revision of the genus *Aquanirmus* (Mallophaga: Philopteridae), parasitic on grebes (Podicipidae). – *The Canadian Entomologist* 97: 920–935.
- Ehrenborg, C., Byström, R., Hjelm, E., Friman, G., & Holmberg, M. 2008. High *Bartonella* spp. seroprevalence in a Swedish homeless population but no evidence of trench fever. – *Scandinavian Journal of Infectious Disease* 40: 208–215.
- Eichler, W. 1943. Mallophagen-Synopsis. IX. Genus *Holomenopon*. – *Mitteilungen der Münchener Entomologischen Gesellschaft* 33: 236–239.
- Eichler, W. 1946. Parthenogenese und Oviviviparier als Entwicklungseigentümlichkeiten bei Läusen unter Federlingen. – *Tierärztliche Umschau* 1: 10.
- Eichler, W. 1949a. Phthirapterorum nova genera. – *Bolletina di Societas Entomologica di Italia* 79: 11–13.
- Eichler, W. 1949b. Die Eulenfederlinge. Gruppen-Studien bei Mallophagen Nr. 5. – *Beiträge zur Taxonomischen Zoologie* 1: 7–22.
- Eichler, W. 1950. Notulae mallophagologicae. XIII. Neue Gonioididae. – *Annali del Museo Civico di Storia Naturali "G. Doria"* 1: 1–8.
- Eichler, W. 1951. Die Federling der Drosseln. – In: Bedeutung der Vogelwelt in Forschung und Praxis. Vorträge der I. Ornithologische Tagung der DDR am 21–22 October 1950 in Leipzig, 3, pp. 29–47.
- Eichler, W. 1952. *Strigiphilus portigi* nov. spec. (Malloph.). – *Der Zoologische Garten, Zeitschrift für gesamte Tiergärten* 19: 154.
- Eichler, W. 1954. Die Entwicklung der vordersten Saumborste bei *Anaticola*-Arten als Peitschenborste und zum fühlernanalogen Tastsinneorgan. – *Zoologischer Anzeiger* 152: 32–35.
- Eichler, W. 1956. Federlinge. Die neue Brehm-Bucherei. – A. Ziemsen Verlag, Wittenberg Lutherstadt, 44pp.
- Eichler, W. 1963. Arthropoda. Insecta. Phthiraptera I. Mallophaga. – In: Bronns, H.G. (ed.). Klassen und Ordnungen des Tierreichs. III. Insecta. 7b Phthiraptera. Verlagsgesellschaft Geost & Portig K.G., Leipzig.
- Eichler, W. 1970. Mallophagen-Sammeltechnik und Drost-Effekt bei *Allobrueelia amsel*. – *Ange wandte Parasitologie* 11: 111–112.
- Eichler, W. & Hackman, W. 1973. Finnische Mallophagen. I. Geschichtlicher Überblick über die Mallophagenforschung in Finnland, enumeration Mallophagorum Fenniae, Bibliographie der gesamten finnischen Mallophagenliteratur. – *Lounais-Hämeen Luonto* 46: 78–100.
- Eichler, W. & Vasjukova, T.T. 1980. Die Mallophagen-gattung *Anaticola* (Phthiraptera, Mallophaga). – *Deutsche entomologische Zeitschrift, Neue Folge* 27: 335–375.
- Eichler, W. & Vasjukova, T.T. 1981a. A new species of the genus *Docophorulus* Eichler, 1944 (Mallophaga, Philopteridae) from the white-winged crossbill *Loxia leucoptera bifasciata* Brehm. – *Entomologisches Obozrenie* 60: 620–622.
- Eichler, W. & Vasjukova, T.T. 1981b. Die Mallophagen-gattung *Trinoton*. – *Mitteilungen der zoologischen Museum Berlin* 57: 23–62.
- Emerson, K.C. 1949. Three new species of Mallophaga. – *Journal of the Kansas Entomological Society* 22: 75–78.
- Emerson, K.C. 1953. A new species of *Carduceps* (Mallophaga, Philopteridae). – *Proceedings of the Entomological Society of Washington* 55: 209–211.
- Emerson, K.C. 1954. Review of the genus *Menopon* Nitzsch, 1818 (Mallophaga). – *Annals and Magazine of Natural History* 12: 225–232.
- Emerson, K.C. 1955a. A new Mallophaga from a loon. – *Annals and Magazine of Natural History* 12: 718–720.
- Emerson, K.C. 1955b. A review of the genus *Rallicola* (Philopteridae, Mallophaga) found on Aramididae, Psophiidae and Rallidae. – *Annals of the Entomological Society of America* 48: 284–299.
- Emerson, K.C. 1956. Mallophaga (chewing lice) occurring on the domestic chicken. – *Journal of the Kansas Entomological Society* 29: 63–79.
- Emerson, K.C. 1962. Mallophaga (chewing lice) occurring on the turkey. – *Journal of the Kansas Entomological Society* 35: 196–201.
- Emerson, K.C. 1972. Checklist of the Mallophaga of North America (North of Mexico). Part 1. Suborder Ischnocera. – *Deseret Test Center, Dugway Proving Ground, Dugway, Utah*, 200 pp.
- Emerson, K.C. & Johnson, J.C. 1961. The genus *Penenirmus* (Mallophaga) found on North American woodpeckers. – *Journal of the Kansas Entomological Society* 34: 34–43.
- Emerson, K.C. & Pratt, H.D. 1956. The Menoponidae (Mallophaga) found on North American swifts. – *Journal of the Kansas Entomological Society* 29: 21–28.

- Emerson, K.C. & Price, R.D. 1975. Mallophaga of Venezuelan mammals. – Brigham Young University Science Bulletin, Biological Series 20: 1–77.
- Enderlein, G. 1904a. Läuse-Studien. I. Über die Morphologie, Klassifikation und systematische Stellung der Anopluren nebst Bemerkungen zur Systematik der Insektenordnungen. – Zoologischer Anzeiger 28: 121–147.
- Enderlein, G. 1904b. Läuse-Studien. II Nachtrag. – Zoologischer Anzeiger 28: 220–223.
- Enderlein, G. 1905. Läuse-Studien. III. Zur Morphologie des Läusekopfes. – Zoologischer Anzeiger 28: 626–638.
- Enderlein, G. 1906. Läuse-Studien V. Schuppen als sekundäre Atmungsorgane, sowie eine neue antarktische Echinophthiriiden-Gattung, 12. Beitrag zur Kenntnis der antarktischen Fauna. – Zoologischer Anzeiger 29: 659–665.
- Eriksson, H., Lindström, L., Olesen, L., & de Verdier, K. 2012. Skabb hos svenska alpäckor. – Svensk Veterinär Tidning 2012 (13): 11–16.
- Escalante, G.C., Sweet, A.D., McCracken, K.G., Gustafsson, D.R., Wilson, R.E. & Johnson, K.P. 2016. Patterns of cryptic host specificity in duck lice based on molecular data. – Medical and Veterinary Entomology 30: 200–208.
- Esteruelas, N.F., Malmsten, J., Bröjer, C., Grandi, G., Lindström, A., Brown, P., Swenson, J.E., Evans, A.L., & Arnemo, J.M. 2016. Chewing lice *Trichodectes pinguis pinguis* in Scandinavian brown bears (*Ursos arctos*). – International Journal for Parasitology: Parasites and Wildlife 5: 134–138.
- Eveleigh, E.S. & Threlfall, W. 1974. A new species, and notes on a previously described species, of *Austromenopon* Bedford, 1939 (Mallophaga: Amblycera) from alcids (Aves: Charadriiformes). – Proceedings of the Entomological Society of Washington 76: 270–277.
- Ewing, H.E. 1926a. Some recent derivatives of the Mallophagan genus *Philopterus* Nitzsch (Philopteridae). – Proceedings of the Entomological Society of Washington 28: 145–150.
- Ewing, H.E. 1926b. A revision of the American lice in the genus *Pediculus*, together with a consideration of the significance of their geographical and host distribution. – Proceedings of the Academy of United States National Museum 69: 1–30.
- Ewing, H.E. 1927. Descriptions of new genera and species of Mallophaga, together with keys to some related genera of Menoponidae and Philopteridae. – Journal of the Washington Academy of Science 17: 86–96.
- Ewing, H.E. 1929. A manual of external parasites. Charles C. Thomas, Springfield & Baltimore.
- Ewing, H.E. 1930. Two new generic names and three new species of Mallophaga. – Proceedings of the Biological Society of Washington 43: 125–128.
- Ewing, H.E. 1938. The sucking lice of American monkeys. – Journal of Parasitology 24: 13–33.
- Fabricius, J.C. 1805. Mallophaga – In: Systema antliatorum secundum ordines, genera, species adiectis synonymis, locis, observationibus, descriptionibus. pp. 341–351. Reichard, Braunschweig.
- Fabricius, O. 1780. Mallophaga. – In: Fauna Groenlandica. pp. 215–220. J.G. Rothe.
- Fahrenholz, H. 1912. Diagnosen neuer Anopluren. – Zoologischer Anzeiger 39: 54–56.
- Fahrenholz, H. 1916. Weitere Beiträge zur Kenntnis der Anopluren. – Archiv für Naturgeschichte 81A: 1–34.
- Fedorenko, I.A. 1978. Materials on the Mallophaga fauna on Passeriformes of the Ukraine. Communication IV. Philopterinae (Mallophaga, Ischnocera). – Vestniv Zoologii 1978: 55–60.
- Fedorenko, I.A. 1986. New *Philopterus* species (Mallophaga: Philopteridae) – parasites of prunellid and troglodytid birds. – Vestnik Zoologii 2: 3–6.
- Fedorenko, I.A. & Belskaya, G.S. 1977. New and seldom species of *Menacanthus* (Mallophaga, Menoponidae) parasites on *Oenanthe oenanthe*. – Izvestiia Akademi Nauk Turkmenistan SSR (Series Biologia) 1977: 56–59.
- Fedorenko, I.A. & Volkov, V.I. 1977. On studying bird lice of the *Philopterus* genus parasitizing flycatchers. – Vestnik Zoologii 1977: 60–70.
- Ferris, G.F. 1916a. Notes on Anoplura and Mallophaga, from mammals, with descriptions of four new species and a new variety of Anoplura. – Psyche 23: 98–120.
- Ferris, G.F. 1916b. Some generic groups in the Mallophagan family Menoponidae. – The Canadian Entomologist 48: 301–311.
- Ferris, G.F. 1916c. A catalogue and host list of the Anoplura. – Proceedings of the California Academy of Science 6: 129–213.
- Ferris, G.F. 1919. Contributions towards a monograph of the sucking lice. Part I. – Leland Stanford Junior University Publications 2: 1–51.
- Ferris, G.F. 1921. Contributions towards a monograph of the sucking lice. Part II. – Stanford University Publications, University Series, Biological Series 2: 52–133.
- Ferris, G.F. 1922. Contributions towards a monograph of the sucking lice. Part III. – Stanford University Publications, University Series, Biological Series 2: 134–178.
- Ferris, G.F. 1923. Contributions towards a monograph of the sucking lice. Part IV. – Stanford University Publications, University Series, Biological Series 2: 179–270.



- Ferris, G.F. 1932. Contributions towards a monograph of the sucking lice. Part V. – Stanford University Publications, University Series, Biological Series 2: 271–413.
- Ferris, G.F. 1933a. The Mallophagan genus *Trichophliopterus*. – Parasitology 25: 468–471.
- Ferris, G.F. 1933b. Contributions towards a monograph of the sucking lice. Part VI. – Stanford University Publications, University Series, Biological Series 2: 415–470.
- Ferris, G.F. 1933c. A new species of *Polyplax*. – Parasitology 25: 127–129.
- Ferris, G.F. 1934. Contributions towards a monograph of the sucking lice. Part VII. – Stanford University Publications, University Series, Biological Series 2: 471–526.
- Ferris, G.F. 1935. Contributions towards a monograph of the sucking lice. Part VIII. – Stanford University Publications, University Series, Biological Sciences 2: 527–634.
- Ferris, G.F. 1951. The sucking lice. – Memoirs of the Pacific Coast Entomological Society (Volume 1), California Academy of Sciences, San Francisco, ix+320 pp.
- Gabaj, M.M., Beesley, W.N. & Awan, M.A.Q. 1993. Lice of farm animals in Libya. – Medical and Veterinary Entomology 7: 138–140.
- Gállego, J., Martín Mateo, M.P. & Aguirre, J.M. 1987. Malófagos de rapaces españolas. II. Las especies del género *Craspedorrhynchus* Kéler, 1938 parásitas de Falconiformes, con descripción de tres especies nuevas. – Eos 63: 31–66.
- Garde, J.M., Escala, M.C. & Moraza, M.L. 1999. Infestation of *Arvicola sapidus* Miller, 1908 (Rodentia: Arvicolidae) by *Polyplax spiniger* Burmeister, 1839 (Insecta: Anoplura) in southern Navarra (Spain). – Research and Reviews in Parasitology 59: 113–116.
- George, J.B.D., Ootobo, S., Ogunleye, J., & Adedimiyi, B. 1992. Louse and mite infestation in domestic animals in northern Nigeria. – Tropical Animal Health and Production 24: 121–124.
- Gervais, F.L.P. 1944. Epizoïques Ricins. Histoire Naturelle des Insectes 3: 307–361.
- Giebel, C. 1861. Die Federlinge der Raubvögel. Aus Chr. L. Nitzsch's handschriftlichem Nachlaß zusammengestellt von Chr. G. Giebel. – Zeitschrift für die gesammten Naturwissenschaften 17: 515–529.
- Giebel, C. 1866. Die im zoologischen Museum der Universität Halle aufgestellten Epizoen nebst Beobachtungen über dieselben. – Zeitschrift für die Gesammten Naturwissenschaften 28: 353–397.
- Giebel, C. 1874 Insecta epizoïca. – Otto Wigand, Leipzig. xiv + 308 pp.
- Gilruth, J.A. 1908. *Haematopinus* (blood-sucking louse) of sheep. – Annual Report of Agriculture New Zealand 16: 194–197.
- Goureau, 1866. Les insectes nuisibles a l'homme, aux animaux et a l'economic domestique. – Bulletin du Societé du Sciences et Histoire Naturelle de l'Yonne 20: 1–258.
- Grossi, A.A., Sharanowski, B.J. & Galloway, T.D. 2014. *Anatoecus* species (Phthiraptera: Philopteridae) from Anseriformes in North America and taxonomic status of *Anatoecus dentatus* and *Anatoecus icterodes*. – The Canadian Entomologist 146: 598–608.
- Grube, A.W. 1851. Parasitae. Fam. Mallophaga. – In: Middendorf, T.A. von (ed). Reise in den aussersten Norden und Osten Sibiriens während der Jahre 1843–1844: Zoologie. Teil I. pp. 467–497. Petersburg.
- Gunnarsson, L., Christensson, D., & Palmér, E. 2005. Clinical efficacy of selamectin in the treatment of naturally acquired infection of sucking lice (*Linognathus setosus*) in dogs. – Journal of the American Animal Hospital Association 41: 388–394.
- Gurlt, E.F. 1843. Über die auf den Haus-Säugethieren uns Haus-vögeln lebenden Schmarotzer Insekten und Arachniden. – Magazine für die gesamte Tierheilkunde 9: 1–24.
- Gustafsson, D.R. 2012. Tales of the Flying Earth: the effect of host flyway on the phylogeny of shorebird lice (Phthiraptera: Ischnocera). – Dissertation for the degree of Doctor of Philosophy, University of Gothenburg. Ineko, Gothenburg. 372 pp.
- Gustafsson, D.R. & Bush, S.E. 2017. Morphological revision of the hyperdiverse *Brueelia*-complex (Insecta: Phthiraptera: Ischnocera: Philopteridae) with new taxa, checklists and generic key. – Zootaxa 4313: 1–443.
- Gustafsson, D.R. & Olsson, U. 2012a. Flyway homogenization or differentiation? Insights from the phylogeny of the sandpiper (Charadriiformes: Scolopacidae: Calidrinae) wing louse genus *Lunaceps* (Phthiraptera: Ischnocera). – International Journal for Parasitology 42: 93–102.
- Gustafsson, D.R. & Olsson, U. 2012b. The “very thankless task”: revision of *Lunaceps* Clay & Meinertzhagen, 1939 (Insecta: Phthiraptera: Ischnocera: Philopteridae), with descriptions of six new species and one new subspecies. – Zootaxa 3377: 1–85.
- Gustafsson, D.R. & Olsson, U. 2017. Unexpected distribution patterns of *Carduiceps* feather lice (Phthiraptera: Ischnocera: Philopteridae) on sandpipers (Aves: Charadriiformes: Scolopacidae). – Systematic Entomology 42: 509–522.

- Gustafsson, D.R., Tsurumi, M. & Bush, S.E. 2015. The chewing lice (Insecta: Phthiraptera: Ischnocera, Amblycera) of Japanese pigeons and doves (Columbiformes), with descriptions of three new species. – *Journal of Parasitology* 101: 304–313.
- de Haan, W.M. 1829. Mallophaga. – In: Lyonet, P. (ed.). *Anatomie de différentes espèces d'insectes*. Vol. 18. pp. 309–311 + 3 plates. *Memoires du Museum d'Histoire Naturelle*, Paris.
- Hackman, W. 1994. Mallofager (Phthiraptera: Mallophaga) som parasiterar på Finlands fågelarter. – *Memoranda Societatis pro Fauna et Flora Fennica* 70: 35–70.
- Hackman, W. & Nyholm, E.S. 1968. Notes of the arthropod fauna of Spitsbergen II. Mallophaga from Spitsbergen and Bear Island. – *Annales Entomologici Fennici* 34: 75–82.
- Haeckel, E. 1896. *Systematische Phylogenie*. 2. Teil. *Systematische Phylogenie der wirbellose Thiere (Invertebrata)*. – Verlag von Georg Reimer, Berlin, 720 pp.
- Hajela, K.P. & Tandan, B.K. 1970. Species of *Ardeicola* (Insecta: Mallophaga) parasitic on birds of the family Threskiornithidae. – *Zoological Journal of the Linnean Society* 49: 309–334.
- Harrison, L. 1915. On a new family and five new genera of Mallophaga. – *Parasitology* 7: 383–407 + 2 plates.
- Harrison, L. 1916. The genera and species of Mallophaga. – *Parasitology* 9: 1–156.
- Hopkins, G.H.E. 1941. Stray notes on Mallophaga – III. – *Annals and Magazine of Natural History* 11: 35–50.
- Hopkins, G.H.E. 1949. Stray notes on Mallophaga – IX. – *Annals and Magazine of Natural History* 12: 29–54.
- Hopkins, G.H.E. 1950. Stray notes on Mallophaga – X. – *Annals and Magazine of Natural History* 12: 230–242.
- Hopkins, G.H. & Clay, T. 1952. A check list of the genera and species of Mallophaga. – *British Museum (Natural History)*, London. 362pp.
- Hopkins, G.H.E. & Timmermann, G. 1954. A revision of the species of *Quadriceps* (Mallophaga) parasitic on Tringinae. – *Transactions of the Royal Entomological Society of London* 105: 131–150 + 2 plates.
- Humphreys, P.N. 1975. Wet-feather associated with *Holomenopon leucoanthum* in a duck. – *Veterinary Record* 97: 96–97.
- Ikeda, N., Nomoto, H., Hayasaka, S., & Nagaki, Y. 2003. *Phthirus pubis* infestations of the eyelashes and scalp hairs in a girl. – *Pediatric Dermatology* 20: 356–357.
- Jansson, D.S. & Christensson, D. 2000. Strutsar och andra ratiter, del 3 Gastrointestinala parasiter hos strutsfåglar i Sverige. – *Svensk Veterinärtidning* 12: 621–626.
- Jansson, D., Fossum, O., Etterlin Engelsen, P., Christensson, B., Andersson, B. & Christensson, D. 2004. Parasitförekomst hos tamhöns i svenska hobbyflockar. – *Svensk Veterinärtidning* 11: 11–17.
- Johnson, K.P. & Whiting, M.F. 2002. Multiple genes and the monophyly of Ischnocera (Insecta: Phthiraptera). – *Molecular Phylogenetics and Evolution* 22: 101–110.
- Johnson, K.P., Adams, R.J., & Clayton, D.H. 2001a. Molecular systematics of Gonioididae (Insecta: Phthiraptera). – *Journal of Parasitology* 87: 862–869.
- Johnson, K.P., Moyle, R.G., Witt, C.C., Faucett, R.C., & Weckstein, J.D. 2001b. Phylogenetic relationships in the louse genus *Penenirmus* based on nuclear (EF-1 $\alpha$ ) and mitochondrial (COI) DNA sequences. – *Systematic Entomology* 26: 491–497.
- Johnson, K.P., Weckstein, J.D., Witt, C.C., Faucett, R.C. & Moyle, R.G. 2002a. The perils of using host relationships in parasites taxonomy: phylogeny of the *Degeeriella* complex. – *Molecular Phylogenetics and Evolution* 23: 150–157.
- Johnson, K.P., Williams, B.L., Drown, D.M., Adams, R.J., & Clayton, D.H. 2002b. The population genetics of host specificity: genetic differentiation in dove lice (Insecta: Phthiraptera). – *Molecular Ecology* 11: 25–38.
- Johnson, K.P., Weckstein, J.D., Meyer, M.J. & Clayton, D.H. 2011. There and back again: switching between host orders by avian body lice (Ischnocera: Gonioididae). – *Biological Journal of the Linnean Society* 102: 614–625.
- Johnson, K.P., Shreve, S.M. & Smith, V.S. 2012. Repeated adaptive divergence of microhabitat specialization in avian feather lice. – *BMC Biology* 10: 1–11.
- Johnston, T.H. & Harrison, L.J.S. 1912. A note on Australian pediculids. – *Proceedings of the Royal Society of Queensland* 24: 105–109.
- Kéler, S. von 1936. Über einige Mallophagen aus Rossitten. – *Arbeiten in morphologische und taxonomische Entomologie von Berlin-Dahlem* 3: 256–264.
- Kéler, S. von 1938. Baustoffe zu einer Monographie der Mallophagen. II. Teil: Überfamilie der Trichodectoidea. – *Nova Acta Leopoldina (neue Folge)* 5: 393–467.
- Kéler, S. von 1939. Baustoffe zu einer Monographie der Mallophagen. II. Teil: Überfamilie der Nirmoidea (1). – *Nova Acta Leopoldina (neue Folge)* 8: 1–254.

- Kéler, S. von 1960. Über die dualistische Differenzierung der Gattung *Anatococcus* Cummings (Mallophaga). – *Zeitschrift für Parasitenkunde* 20: 207–316.
- Kellogg, V.L. 1896a. New Mallophaga II, from land birds, together with an account of mallophagous mouth-parts. – *Proceedings of the California Academy of Science* 2: 431–548.
- Kellogg, V.L. 1896b. New Mallophaga I, –with special reference to a collection made from maritime birds of the Bay of Monterey, California. – *Proceedings of the California Academy of Sciences* 6: 31–168 + 15 plates.
- Kellogg, V.L. 1899. Mallophaga from birds of Panama, Baja California and Alaska. – *Occasional Papers of the California Academy of Sciences* 6: 1–52 + 2 plates.
- Kellogg, V.L. & Chapman, B.L. 1899. Mallophaga from birds in California. – *Occasional Papers from the California Academy of Sciences* 6: 53–143.
- Kellogg, V.L. & Kuwana, S.I. 1902. Papers from the Hopkins Stanford Galapagos Expedition, 1898–1899. X. Entomological results (8). Mallophaga from birds. – *Proceedings of the Washington Academy of Sciences* 4: 457–499 + 4 plates.
- Kim, K.C. & Emerson, K.C. 1968. Descriptions of two species of Pediculidae (Anoplura) from great apes (Primates, Pongidae). – *Journal of Parasitology* 54: 690–695.
- Kim, K.C. & Ludwig, H.W. 1978. The family classification of the Anoplura. – *Systematic Entomology* 3: 249–284.
- Kim, K.C., Pratt, H.D. & Stojanovich, C.J. 1986. The sucking lice of North America. An illustrated handbook for identification. – Pennsylvania State University Press, University Park and London, xii+241 pp.
- Kittler, R., Kayser, M., & Stoneking, M. 2003. Molecular evolution of *Pediculus humanus* and the origin of clothing. – *Current Biology* 13: 1414–1417.
- Klockenhoff, H. 1976. Zur Taxonomie der Myrsideen (*Myrsidea* Waterston, 1915; Menoponidae: Phthiraptera) von *Corvus corax* und *Corvus ruficollis*. – *Bonner zoologische Beiträge* 27: 300–335.
- Klockenhoff, H. 1979. Populationsstudien an Tierläusen (Phthiraptera) II. *Myrsidea cornicis* (De Geer 1778) (Menoponidae: Amblycera). – *Bonner zoologische Beiträge* 30: 410–430.
- Klockenhoff, H. 1980. Zur Taxonomie von *Myrsidea anathorax* (Nitzsch, 1866) und *Myrsidea isostoma* (Nitzsch, 1866) (Menoponidae, Phthiraptera). – *Bonner zoologische Beiträge* 31: 151–167.
- Koffmann, M. 1944. Bidrag till kännedomen om ekto-parasiter hos säldjur. – *Skandinavisk Veterinärtidskrift* 34: 137–156.
- Krištofik, J. 2000. Synonymical notes to the *Menacanthus* species (Phthiraptera, Menoponidae) living on Passeriformes. – *Acta Parasitologica* 45: 57–58.
- Krištofik, J. & Dudich, A. 2000. Sucking lice of the *Polyplax* genus (Phthiraptera) on small mammals (Insectivora, Rodentia) in Slovakia. – *Biológia* 55: 133–142.
- Kumar, P. & Tandan, B.K. 1971. The species of *Ardeicola* (Phthiraptera: Ischnocera) parasitic on the Ciconiidae. – *Bulletin of the British Museum (Natural History) Entomology* 26: 119–158 + 2 plates.
- Leach, W.E. 1815. Entomology. – In: Brewster (ed). *Edinburgh Encyclopaedia*. Vol. 9. pp. 57–172. Blackwood and Waugh, Edinburgh.
- Leach, W.E. 1817. On the families, stirpes, and genera of the order Anoplura. – *The Zoological Miscellany* 3: 64–67.
- Ledger, J.A. 1970a. A preliminary review of *Dennyus* (Mallophaga: Menoponidae) parasitic on swiftlets. – *Journal of the Entomological Society of South Africa* 33: 239–260.
- Ledger, J.A. 1970b. A new species of *Strigiphilus* Mjöberg (Mallophaga: Philopteridae) from the giant eagle-owl *Bubo lacteus*. – *Journal of the Entomological Society of South Africa* 1: 119–128.
- Ledger, J.A. 1971. A review of *Dennyus* (Phthiraptera: Menoponidae) parasitic on the avian genera *Apus* and *Cypsiurus*. – *Journal of the Entomological Society of South Africa* 34: 37–56.
- Ledger, J.A. 1980. The arthropod parasites of vertebrates in Africa south of the Sahara. Volume IV. Phthiraptera (Insecta). – *Publications of the South African Institute for Medical Research* 56: 1–327.
- Light, J.E., Nessner, C.E., Gustafsson, D.R., Wise, S.R., & Voelker, G. 2016. Remarkable levels of avian louse (Insecta: Phthiraptera) diversity in the Congo Basin. – *Zoologica Scripta* 45: 538–551.
- Lindh, J., Magnusson, M., Grünewald, M., & Hulth, A. 2012. Head lice surveillance on a deregulated OTC-sales market: a study using web query data. – *PLOS One* 7: 1–4.
- Lindqvist, Å., Osterman Lind, E., & Bendroth, M. 2007. Hästens parasiter. Jordbruksinformation 8. – Jordbruksverket [Swedish Board of Agriculture], Jönköping. 40 pp.
- Linnaeus, C. von. 1746. *Fauna Svecica, sistens animalia Sveciae regni: Quadrapedia, Aves, Amphibia, Pisces, Insecta, Vermes, distribute per classes & ordines, genera & species, com differentiis specierum, synonymis autorum, nominibus incolarum, locis habitationum, descriptionibus insectorum.* – Salvius, Stockholm. xxvi+411 pp.

- Linnaeus, C. von 1758. *Systema naturae per Regna Tria Naturae, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis*. 10th Edition. – Salvius, Stockholm. iv+824 pp.
- Linnaeus, C. von 1761. *Fauna Svecica, sistens animalia Sveciae regni: Quadrupedia, Aves, Amphibia, Pisces, Insecta, Vermes, distribute per classes & ordines, genera & species, com differentiis specierum, synonymis autorum, nominibus incolarum, locis habitationum, descriptionibus insectorum*. – Salvius, Stockholm. xxxviii+578 pp.
- Literák, I., Sychra, O., Resendes, R. & Rodrigues, P. 2015. Chewing Lice in Azorean Blackcaps (*Sylvia atricapilla*): A Contribution to Parasite Island Syndromes. – *Journal of Parasitology* 101: 252–254.
- Lonc, E., Modrzejewska, M., Saxena, A.K., Zlotorzycska, J. & Trivedi, M.C. 1992. Morphometric variability of the mallophagan populations (Insecta, Phthiraptera, Amblycera and Ischnocera) from the Polish and Indian domestic fowl (*Gallus gallus* F. dom.). – *Rudolstädter naturhistorische Schriften* 4: 59–70.
- Lyal, C.H.C. 1985. Phylogeny and classification of the Psocodea, with particular reference to the lice (Psocodea: Phthiraptera). – *Systematic Entomology* 10: 145–165.
- Lyal, C.H.C. 1986. External genitalia of Psocodea, with particular reference to lice (Phthiraptera). – *Zoologische Jahrbücher, Abteilung für Anatomie und Ontogenie der Tiere* 114: 277–292.
- Lyal, C.H.C. 1987. Structure and function of the male genitalia of the badger louse, *Trichodectes melis* (Fabricius) (Phthiraptera: Ischnocera: Trichodectidae). – *Entomologist's Monthly Magazine* 123: 55–58.
- Lundqvist, L. 1985. Life tactics and distribution of small mammal ectoparasites (Anoplura, Siphonaptera and Acari) in northernmost Fennoscandia. – *Doctoral Thesis, Department of Biology, University of Lund*. 104 pp.
- Läkemedelsverket. 2014. Ekto- och endoparasiter hos hund och katt – behandlingsrekommendation. – *Information från Läkemedelsverket Supplement* 2014: 4–23.
- Malenke, J.R., Newbold, N., & Clayton, D.H. 2011. Condition-specific competition governs the geographic distribution and diversity of ectoparasites. – *The American Naturalist* 177: 522–534.
- Martens, J.M. 1974. Zur Taxonomie der Gattung *Saemundssonia* Timmermann (Mallophaga: Ischnocera) aus Schnepfen (Scolopacinae) und Strandläufer (Erolinae). – *Mitteilungen aus dem Hamburger Zoologische Museum Institut* 70: 119–163.
- Martinů, J., Sychra, O., Literák, I., Čapek, M., Gustafsson, D.L., Stefka, J. 2015. Host generalists and specialists emerging side by side: an analysis of evolutionary patterns in the cosmopolitan chewing louse genus *Menacanthus*. – *International Journal for Parasitology* 45: 63–73.
- Matthysse, J.G. 1944. Biology of the cattle biting louse and notes on cattle sucking lice. – *Journal of Economic Entomology* 37: 438–442.
- Meinertzhagen, R. 1938. Winter in Arctic Lapland. – *Ibis* 14: 754–759.
- Mehl, R. 1970a. Records of ectoparasitic insects and mites on birds and mammals in Norway. – *Norsk Entomologisk Tidsskrift* 17: 109–113.
- Mehl, R. 1970b. Om innsamling av insekter og midd på fugler og pattedyr. – *Fauna* 23: 237–252.
- Mehl, R. 1971. Ektoparasitter på ekorn, *Sciurus vulgaris*, i Norge. – *Fauna* 24: 69–83.
- Mehl, R. 1975. Rypenes ektoparasitter i Norge. – *Fauna* 28: 208–215.
- Mehl, R., Bang, C., Kjos-Hanssen, B. & Lie, H. 1982. Mallophaga from Svalbard. – *Fauna Norvegica, Series B* 29: 19–23.
- Mey, E. 1982a. Mallophagen-Befall bei mongolischen Vögeln. – *Mitteilungen der zoologische Museum Berlin* 58 [Suppl.]: 55–75.
- Mey, E. 1982b. Mongolische Mallophagen I. – *Mitteilungen der zoologische Museum Berlin* 58: 155–195.
- Mey, E. 1986. Ischnozere mallophagen (Insecta: Phthiraptera) von *Leipoa ocellata* Gould, 1840 (Aves: Galliformes: Megapodiidae). – *Zoologische Jahrbücher, Systematik* 113: 525–539.
- Mey, E. 1988. Zur taxonomie der auf Meisen (Paridae) parasitierenden *Docophorulus*-Arten (Insecta, Phthiraptera, Philopteridae). – *Rudolstädter naturhistorische Schriften* 1: 71–77.
- Mey, E. 1994a. Über den Mallophagen-Befall bei mongolischen Vögeln im Winter. – *Ornithologische Jahresbericht Museum Heineanum* 12: 115–129.
- Mey, E. 1994b. Beziehungen zwischen Larvenmorphologie und Systematik der Adulti bei den Vogel-Ischnozeren (Insecta, Phthiraptera, Ischnocera). – *Mitteilungen der Zoologische Museum, Berlin* 70: 3–84.
- Mey, E. 1994c. Die Federlingsgattung *Cincoecus* (Insecta, Phthiraptera, Ischnocera). – *Rudolstädter naturhistorische Schriften* 6: 57–78.
- Mey, E. 1997. Die Goniodiden (Insecta, Phthiraptera, Ischnocera) der Großfußhühner (Megapodiidae). – *Rudolstädter naturhistorische Schriften* 8: 19–44.
- Mey, E. 1998. Zur Taxonomie, Lebensweise und parasitophyletischen Evidenz der Federlingsgattung *Struthiolipeurus* sensu lato (Insecta, Phthiraptera, Ischnocera). – *Mitteilungen aus dem Museum für Naturkunde, Berlin, Zoologische Reihe* 74: 65–93.

- Mey, E. 1999. Neue, auf Großfußhühnern (Megapodiidae) lebende und zumeist aus Indonesien stammende Federlinge (Insecta, Phthiraptera: Amblycera & Ischnocera). – Rudolstädter naturhistorische Schriften, Supplement 3: 119–137.
- Mey, E. 2004. Zur taxonomie, Verbreitung und parasitophyletischer Evidenz des *Philopterus*-komplexes (Insecta, Phthiraptera, Ischnocera). – Ornithologischer Anzeiger 43: 149–203.
- Mey, E. 2013. Ein Phänomen besonders bei Vögeln: Trinken von Tränenflussigkeit (Lachrymophagie) durch Tierläuse (Insecta, Phthiraptera). – Vogelwarte 51: 15–23.
- Mey, E. & González-Acuña, D. 2007. Über ein Massenbefall von *Bovicola (Lepikentron) breviceps* (Rudow) (Insecta, Phthiraptera, Ischnocera, Bovicolidae) auf einem Alpaka *Vicugna vicugna* forma *pacos* in Thüringen (Deutschland), mit Anmerkungen zur Parthenogenese bei Tierläuse. – Rudolstädter naturhistorische Schriften 14: 71–82.
- Mjöberg, E. 1910a. Studien über Mallophagen und Anopluren. – Arkiv för Zoologi 6: 1–196.
- Mjöberg, E. 1910b. Studien über Pediculiden und Mallophagen. – Zoologischer Anzeiger 35: 287–293.
- Mjöberg, E. 1915. Über eine neue Gattung und Art von Anopluren. – Entomologisk Tidskrift 36: 282–285.
- Modrzejewska, M. & Złotorzycka, J. 1977. Eine neue Art der Gattung *Uchida* Ewing (Mallophaga, Menoponidae, Menacanthinae). – Polskie Pismo Entomologiczne 44: 339–344.
- Moreby, C. 1978. The biting louse genus *Werneckiella* (Phthiraptera: Trichodectidae) ectoparasitic on the horse family Equidae (Mammalia: Perissodactyla). – Journal of Natural History 12: 395–412.
- Moyer, B.R., Drown, D.M., & Clayton, D.H. 2002. Low humidity reduces ectoparasite pressure: implications for host life history evolution. – Oikos 97: 223–228.
- Mumcuoglu, K.Y. 2015. Pubic louse (*Phthirus pubis*) infestation of the scalp in a 4-years old infant. – Cumhuriyet Medical Journal 37: 241–243.
- Murray, M.D. 1955. Infestation of sheep with the face louse (*Linognathus ovillus*). – The Australian Veterinary Journal 31: 22–26.
- Murray, M.D. 1963. The ecology of lice on sheep. III. Differences between the biology of *Linognathus pedalis* (Osborne) and *L. ovillus* (Neumann). – Australian Journal of Zoology 11: 153–156.
- Nasser, M., Al-Ahmed, A., Shobrak, M. & Aldryhim, Y. 2014. Identification key for chewing lice (Phthiraptera: Amblycera, Ischnocera) infesting the Indian peafowl (*Pavo cristatus*) with one new country record and new host record for Saudi Arabia. – Turkish Journal of Zoology 38: 1–7.
- Nelson, B.C. 1971. Successful rearing of *Colpocephalum turbinatum* (Phthiraptera). – New Biology 232: 255–256.
- Nelson, B.C. 1972a. A revision of the New World species of *Ricinus* (Mallophaga) occurring on Passeriformes (Aves). – University of California Publications in Entomology 68: 1–175.
- Nelson, B.C. 1972b. Resurrection of *Craspedonirmus atricolor* (Kellohgg) (Phthiraptera: Philopteridae) from *Brachyramphus marmoratum* (Aves: Alcidae). – Journal of Medical Entomology 9: 505–508.
- Nelson, R.C. & Price, R.D. 1965. The *Laemobothrion* (Mallophaga: Laemobothriidae) of the Falconiformes. – Journal of Medical Entomology 2: 249–257.
- Neumann, L.G. 1890. Contribution a l'étude des Ricinidae parasites des oiseaux de la famille des Psittacidae. – Bulletin de Société d'Histoire Naturelle de Toulouse 2: 55–69.
- Neumann, L.G. 1906. Notes sur les Mallophages. – Bulletin de Société Zoologique de France 31: 54–60.
- Neumann, L.G. 1907. Nouveau pou du mouton (*Haematopinus ovillus*, n. sp.). – Revue Vétérinaire 32: 520–524.
- Neumann, L.G. 1912. Notes sur les Mallophages. – II. – Archives de Parasitologie 15: 353–384.
- Nilsson, B. 1968. A gynandromorphy of *Oxylipeurus mesopelios* (Nitzsch) (Mallophaga) from *Phasianus colchicus* L. – Opuscula Entomologica 33: 80–81.
- Nilsson, B. 1976. A gynandromorphy of the mallophagan *Goniodes colchici* from *Phasianus colchicus*. – Angewandte Parasitologie 17: 223–225.
- Nitzsch, C.L. 1818. Die Familien und Gattungen der Thierinsekten (insecta epizoica); als prodromus einer Naturgeschichte derselben. – Magazin der Entomologie 3: 261–316.
- Nitzsch, C.L. 1866. Die Federlinge der Sing-, Schrei-, Kletter-, und Taubenvögel. – Zeitschrift für die Gesamten Naturwissenschaften 27: 115–122.
- Olfers, J.F. M. von . 1816. De vegetativis et Animalis corporibus in corporibus animatis reperiundis commentariuss. Pars I. – Taberna Libraria Maueri-ana, Berlin.
- O'Mahony, E. 1944. A note on some British and foreign Anoplura. – Entomologist's Monthly Magazine 80: 60.
- Oniki, Y. 1999. The mating behaviour of *Oxylipeurus variegatus* (Mallophaga: Lipeuridae). – Garcia de Orta, Séries Zoologia 23: 91–92.
- Osborn, H. 1896. Insects affecting domestic animals. Suborder Mallophaga. – Bulletin of the U.S. Department of Agriculture, Division of Entomology 5: 189–249.

- Osborn, H. 1902. Mallophagan records and descriptions. – *The Ohio Naturalist* 2: 201–204.
- Overgaard, C. 1942. Mallophaga and Anoplura. – *Zoology of Iceland* 42: 1–22.
- Overgaard, C. 1943. Mallophaga from gallinaceous birds. – *Entomologiske Meddelelser udgivne af Entomologiske Forening* 23: 1–17.
- Overgaard, C. 1952. Mallophaga. – In: Brinck, P & Wingstrand, K.G. (Eds) *The mountain fauna of the Virihaure area in Swedish Lapland*. *Acta Universitatis Lund* 46: 133–134.
- Packard, A.S. 1870. Certain parasitic insects. – *American Naturalist* 4: 83–99.
- Palma, R.L. 1994. The identity of *Nirmus obtusus* and other *Quadraceps* species (Phthiraptera: Philopteridae) from Clipperton Island and the Galápagos Islands. – *Journal of the Royal Society of New Zealand* 24: 267–276.
- Palma, R.L. 2000. The species of *Saemundssonina* (Insecta: Phthiraptera: Philopteridae) from skuas (Aves: Stercorariidae). – *New Zealand Journal of Zoology* 27: 121–128.
- Palma, R.L. 2017. Phthiraptera (Insecta): a catalogue of parasitic lice from New Zealand. – *Fauna of New Zealand* 76, 400 pp.
- Palma, R.L. & Jensen, J.-K. 2006. Lice (Insecta: Phthiraptera) and their host associations in the Faroe Islands. – *Steenstrupia* 29: 49–73.
- Palma, R.L. & Jensen, J.-K. 2016. Additional records of lice (Insecta, Phthiraptera) from the Faroe Islands. – *Norwegian Journal of Entomology* 63: 50–57.
- Palma, R.L., MCKenna, P.B., & Aitken, P. 2006. Confirmation of the occurrence of the chewing louse *Bovicola (Lepikentron) breviceps* (Insecta: Phthiraptera: Trichodectidae) on alpacas (*Lama pacos*) in New Zealand. – *New Zealand Veterinary Journal* 54: 253–254.
- Palma, R.L. & Price, R.D. 2006. Lice of the genus *Philopterus* Nitzsch (Phthiraptera: Ischnocera: Philopteridae) parasitic on hosts of the genus *Emberiza* (Passeriformes: Emberizidae). – *New Zealand Journal of Zoology* 33: 1–6.
- Palma, R.L., Price, R.D., & Hellenthal, R.A. 1998. New synonymies and host records for lice of the genus *Menacanthus* (Phthiraptera: Menoponidae) from the Passeriformes. – *Journal of the Royal Society of New Zealand* 28: 309–320.
- Paterson, A.H. 1954. A new record of the quill-boring habit in Mallophaga. – *Entomologist's Monthly Magazine* 90: 158.
- Paterson, A.M. & Gray, R.D. 1997. Host-parasite co-speciation, host switching and missing the boat. – In: Clayton D.H. & Moore, J. (eds). *Host-Parasite Evolution: General Principles and Avian Models*. Pages 236–250. Oxford University Press, Oxford.
- Paterson, A.M., Palma, R.L., & Gray, R.D. 1999. How frequently do avian lice miss the boat? Implications for coevolutionary studies. – *Systematic Biology* 48: 214–223.
- Persson, Y., Aspenström-Fagerlund, B., & Tervell, M. 2014. Behandling av exktoparasiter hos get. – *Svensk Veterinärtidning* 2014(14): 26–27.
- Piaget, E. 1880. *Les Pédiculines*. Essai monographique. – E.J. Brill, Leide. xxxix + 714 pp.
- Piaget, E. 1885. *Les Pédiculines*. Essai monographique. Supplement. – E.J. Brill, Leide. xii + 200 pp.
- Piaget, E. 1890. Quelques pédiculines nouvelles. – *Tijdschrift van Entomologie* 31: 223–259.
- Pilgrim, R.L.C. 1976. Mallophaga on the rock pigeon (*Columba livia*) in New Zealand, with a key to their identification. – *The New Zealand Entomologist* 6: 160–164.
- Pontoppidan, E. 1763. Mallophaga. – In: *Den Danske Atlas*. Vol. 1. p. 699. Kiöbenhavn.
- Price, R.D. 1964. *Colpocephalum* (Mallophaga: Menoponidae) from the Piciformes. – *Journal of the New York Entomological Society* 72: 162–167.
- Price, R.D. 1970a. A review of the genus *Heleonomus* (Mallophaga: Menoponidae) from the cranes. – *Annals of the Entomological Society of America* 63: 1163–1174.
- Price, R.D. 1970b. A review of the genus *Holomenopon* (Mallophaga: Menoponidae) from the Anseriformes. – *Annals of the Entomological Society of America* 64: 633–646.
- Price, R.D. 1974. A review of the genus *Pseudomenopon* (Mallophaga: Menoponidae). – *Annals of the Entomological Society of America* 67: 73–84.
- Price, R.R. 1975. The *Menacanthus eurysternus* complex (Mallophaga: Menoponidae) of the Passeriformes and Piciformes (Aves). – *Annals of the Entomological Society of America* 68: 617–622.
- Price, R.D. 1977. The *Menacanthus* (Mallophaga: Menoponidae) of the Passeriformes (Aves). – *Journal of Medical Entomology* 14: 207–220.
- Price, R.D. & Beer, J.D. 1962. The genus *Kurodaia* (Mallophaga: Menoponidae) from Falconiformes, with elevation of the subgenus *Falcomenopon* to generic rank. – *Annals of the Entomological Society of America* 56: 379–385.
- Price, R.D. & Beer, J.R. 1963a. *Nosopon clayae* sp. n. (Mallophaga: Menoponidae) from *Pernis apivorus*. – *Journal of Parasitology* 49: 522–523.
- Price, R.D. & Beer, J.R. 1963b. Species of *Colpocephalum* (Mallophaga: Menoponidae) parasitic upon the Falconiformes. – *The Canadian Entomologist* 95: 731–763.

- Price, R.D. & Beer, J.R. 1963c. The *Kurodaia* (Mallophaga: Menoponidae) parasitic on the Strigiformes, with a key to the species of the genus. – Annals of the Entomological Society of America 56: 849–857.
- Price, R.D. & Beer, J.R. 1963d. The species of *Colpocephalum* (Mallophaga: Menoponidae) known to occur on the Strigiformes. – Journal of the Kansas Entomological Society 36: 58–64.
- Price, R.D. & Beer, J.R. 1964. Species of *Colpocephalum* (Mallophaga: Menoponidae) parasitic upon the Galliformes. – Annals of the Entomological Society of America 57: 391–402.
- Price, R.D. & Beer, J.R. 1965a. The *Colpocephalum* (Mallophaga: Menoponidae) of the Ciconiiformes. – Annals of the Entomological Society of America 58: 111–131.
- Price, R.D. & Beer, J.R. 1965b. A review of the *Colpocephalum* of the Corvidae with the description of a new species (Mallophaga: Menoponidae). – Proceedings of the Entomological Society of Washington 67: 7–14.
- Price, R.D. & Beer, J.R. 1965c. A review of *Ciconiphilus* Bedford (Mallophaga: Menoponidae). – The Canadian Entomologist 97: 657–666.
- Price, R.D. & Clay, T. 1972. A review of the genus *Austromenopon* (Mallophaga: Menoponidae) from the Procellariiformes. – Annals of the Entomological Society of America 65: 487–504.
- Price, R.D. & Dalglish, R.C. 2007. *Myrsidea* Waterston (Phthiraptera: Menoponidae) from the Emberizidae (Passeriformes), with descriptions of 13 new species. – Zootaxa 1467: 1–18.
- Price, R.D. & Emerson, K.C. 1975. The *Menacanthus* (Mallophaga: Menoponidae) of the Piciformes (Aves). – Annals of the Entomological Society of America 68: 779–785.
- Price, R.D. & Hellenthal, R.A. 1998. The taxonomy of *Phlopterus* (Phthiraptera: Phlopterae) from the Corvidae (Passeriformes), with descriptions of nine new species. – Annals of the Entomological Society of America 91: 782–799.
- Price, R.D. & Leibovitz, L. 1969. A new species of *Actornithophilus* (Mallophaga: Menoponidae) from the knot. – The Canadian Entomologist 101: 997–999.
- Price, R.D., Hellenthal, R.A. & Palma, R.L. (2003) World checklist of chewing lice with host associations and keys to families and genera. – In: Price, R.D., Hellenthal, R.A., Palma, R.L., Johnson, K.P. & Clayton, D.H. (2003) The Chewing lice: world checklist and biological overview. Illinois Natural History Survey Special Publication 24. x + 501 pp.
- Price, R.D., Palma, R.L. & Clayton, D.H. 2003b. Review of the genus *Saemundssonina* Timmermann (Phthiraptera: Phlopterae) from the Alcidae (Aves: Charadriiformes), including a new species and host records. – Proceedings of the Entomological Society of Washington 105: 915–924.
- Quay, W.B. 1950. Further description of *Polyplax alaskensis* Ewing (Anoplura). – Psyche, 56, 180–183.
- Raoult, D., Reed, D.L., Dittmar, K., Kirchman, J.J., Rolain, J.-M., Guillens, S., & Light, J. 2008. Molecular identification of lice from Pre-Columbian mummies. – Journal of Infectious Diseases 197: 535–543.
- Reed, D.L., Smith, V.S., Hammond, S.L., Rogers, A.R., & Clayton, D.H. 2004. Genetic analysis of lice supports direct contact between modern and archaic humans. – PLoS Biology 2, e340: 1–12.
- Rékási, J. & Kiss, J.B. 1980. Weitere Beiträge zur Kenntnis der Federlinge (Mallophaga) von Vögeln der Nord-Dobrudscha. – Parasitologia Hungarica 13: 67–93.
- Rheinwald, G. 1968. Die Mallophagengattung *Ricinus* De Geer, 1778. Revision der außeramerikanischen Arten. – Mitteilungen der Hamburger Zoologische Museum Institut 65: 181–326.
- Rudolph, D. 1983. The water-vapor uptake system of the Phthiraptera. – Journal of Insect Physiology 29: 15–25.
- Rudow, F. 1866. Charakteristik neuer Federlinge. – Zeitschrift für der gesammten Naturwissenschaften 27: 465–477.
- Rudow, F. 1869a. Neue Mallophagen. – Zeitschrift für den gesammten Naturwissenschaften 34: 387–407.
- Rudow, F. 1869b. Beitrag zur Kenntnis der Mallophagen oder Pelzfresser. Neue exotische Arten der Familie Phlopterus. – Dissertation, Universität Leipzig, 47 pp.
- Ryan, S.O. & Price, R.D. 1969. A review of the genus *Eidmanniella* (Mallophaga, Menoponidae) from the Pelecaniformes. – Annals of the Entomological Society of America 62: 815–823.
- Scharf, W.C. & Price, R.D. 1965. A taxonomic study of the genus *Cuculiphilus* (Mallophaga: Menoponidae). – Annals of the Entomological Society of America 58: 546–555.
- Scharf, W.C. & Price, R.D. 1983. Review of the *Myrsidea* in the subgenus *Agrimenopon* (Mallophaga: Menoponidae). – Annals of the Entomological Society of America 76: 441–451.
- Schenone, H. 2000. Eyelids infestation by *Phthirus pubis* in a boy [in Spanish]. – Boletín Chileno de Parasitología 55: 25–26.
- Schrank, F.v.P. 1776. Mallophaga. – In: Beyträge zur Naturgeschichte. P. 111–120 + 1 plate. Vieth, Augsburg.
- Schrank, F.v.P. 1781. Pediculus. – In: Enumeratio insectorum Austriae indigenorum. p. 499–507. Augustae Vindelicorum.

- Schrank, F.v.P. 1803. Thierlaus. – in: Durchgedachte Geschichte der in Baiern einheimischen und zahmen Thiere. Fauna Boica. pp. 186–194. Ph Krull, Landshut.
- Scopoli, J.A. 1763. Pediculus. – In: Entomologia carniolica exhibens insecta carnioliae indigena et distribute in ordines, genera, species, varietates. pp. 381–386, Wien.
- Scott, M.T. 1950. Observations on the bionomics of *Linognathus pedalis*. – Australian Journal of Agricultural Research 1: 465–470.
- Scott, M.T. 1952. Observations on the bionomics of the sheep body louse (*Damalinia ovis*). – Australian Journal of Agricultural Research 3: 60–67.
- Séguy, E. 1944. Insectes Ectoparasites (Mallophages, Anoplouresm Siphonapteres). Vol. 43 of Fauna France. Paul Lechevalier et fils, Paris. 684 pp.
- Sikora, H. & Eichler, W. 1941. Beobachtungen über biologische Eigentümlichkeiten bei mallophagen. III. Über Kopulations-eigentümlichkeitin der Mallophagen. – Zeitschrift für Morphologie und Ökologie der Tiere 38: 80–84.
- Smith, V.S. 2000. Basal ischnoceran louse phylogeny (Phthiraptera: Ischnocera: Gonioididae and Hep-tapsogastridae). – Systematic Entomology 25: 73–94.
- Smith, V.S., Page, R.D.M., & Johnson, K.P. 2004. Data incongruence and the problem of avian louse phylogeny. – Zoologica Scripta 33: 239–259.
- Soler-Cruz, M.D., Benítez-Rodríguez, R., Florido-Navío, A.M. & Muñoz-Parra, S. 1987. Zur Morphologie der Männchen von *Bovicola caprae* und *Bovicola limbatus* (Mallophaga: Bovicolidae). – Angewandte Parasitologie 28: 109–112.
- Soler Cruz, M.D. & Martín Mateo, M. P. 2009. Scanning electron microscopy of legs of two species of sucking lice (Anoplura: Phthiraptera). – Micron 40: 401–408.
- Spirén, A., Svensson, Å., & Jörgensen, E. 2000. Simmande löss på förskola – om lusbehandlingens ABC. – Läkartidningen 97: 590–591.
- Stenram, H. 1956. The ecology of *Columbicola columbae* L. (Mallophaga). – Opuscula Entomologica 21: 170–190.
- Stenram, H. 1964. Mallophagevolution och värddjursfylogeni. – Zoologisk Revy 26: 23–32.
- Stephens, J.F. 1829. Mallophaga. – In: A systematic catalogue of British Insects: being an attempt to arrange all the hitherto discovered indigenous insects into accordance with their natural affinities. pp. 330–335. Baldwin & Cradock.
- Stobbe, R. 1913. Mallophagen. 1. Beitrag: Neue Formen von Säugetieren (*Trichophilopterus* und *Eurytrichodectes* nn. gg.). – Entomologischen Rundschau 30: 105–106, 111–112.
- Sveriges Ornitologiska Förening 2017. Förteckning över Sveriges fågeltaxa. Available from <http://birdlife.se/rk/sveriges-fageltaxa> (retrieved 2017-11-28).
- Sychra, O., Literák, I., Podzemný, P., Harmat, P. & Hrabák, R. 2011. Insect ectoparasites on wild birds in the Czech Republic during the pre-breeding period. – Parasite 18: 13–19.
- Symmons, S. 1952. Comparative anatomy of the Mallophagan head. – Transactions of the Zoological Society of London 27: 349–436.
- Tandan, B.K. 1955. Mallophagan parasites from Indian birds. Part IV. Species belonging to the genera *Philopterus*, *Capraiaella* and *Pectinopygus* (Superfamily Ischnocera). – Annals and Magazine of Natural History 12: 417–433.
- Tandan, B.K. 1964. Mallophaga from birds of the Indian region. Part VI. *Falcolipeurus* Bedford. – Proceedings of the Royal Entomological Society of London, Series B 33: 173–180.
- Tandan, B.K. 1972. Contributions towards a revision of *Myrsidea* Waterston. VII. (Phthiraptera: Amblycera: Menoponidae). – Bulletin of the British Museum (Natural History) Entomology 27: 369–410.
- Tandan, B.K. 1973. The genus *Esthiopterum* (Phthiraptera: Ischnocera). – Journal of Entomology 42: 85–101.
- Tandan, B.K. & Clay, T. 1971. Contributions towards a revision of *Myrsidea* Waterston. VI. (Phthiraptera, Amblycera: Menoponidae). – Transactions of the Royal Entomological Society of London 123: 209–246.
- Taschenberg, O. 1879. Über die Synonymie von *Goniocotes hologaster*. – Zeitschrift für die gesamten Naturwissenschaften (Halle) 52: 104–107.
- Taschenberg, O. 1882. Die Mallophagen mit besonderer Berücksichtigung der von Dr. Meyer gesammelten Arten. – Nova Acta der Kaiserlichen Leopoldinisch-Carolinischen Deutschen Akademie der Naturforscher 44: 1–231 + 22 plates.
- Taylor, A.L. 1981. Adventitious molt in Red Knot possibly caused by *Actornithophilus* (Mallophaga: Menoponidae). – Journal of Field Ornithology 52: 241.
- Tendeiro, J. 1958a. Études sur les Mallophages. Quelques mallophages du Musée de Dundo (Angola). – Publicações Culturais da Companhia de Diamantes de Angola 40: 81–110.
- Tendeiro, J. 1958b. Études sur les Mallophages. Observations sur les *Cuclotogaster* (Ischnocera, Philopteridae) parasites des Galliformes des genres *Francolinus* et *Pternistis*. – Junta de Investigações Científicas do Ultramar. Estudos, Ensaios e Documentos (Portugal) 44: 1–126.



- Tendeiro, J. 1959. Études sur les Mallophages. Sur quelques espèces et sous-espèces du genre *Nosopon* Hopkins (Amblycera, Menoponidae), parasites de Falconiformes. – Do Boletim Cultural da Guiné Portuguesa 54: 193–211, 10 plates.
- Tendeiro, J. 1967a. Études sur les Mallophages parasites des Alcédinidés. II. Genre *Alcedoffula* Th. Clay et Meinertzhagen, 1939. Considérations finales. – Revista dos Estudos Gerais Universitários de Moçambique 4: 195–295.
- Tendeiro, J. 1967b. Études sur les Mallophages. Sur trois espèces du genre *Trinoton* Nitzsch, 1818 (Amblycera, Menoponidae). – Revista dos Estudos Gerais Universitários de Moçambique 4: 27–70.
- Tendeiro, J. 1969. Estudos sobre os Goniodídeos (Mallophaga, Ischnocera) dos Columbiformes. IV – Género *Campanulotes* Kéler, 1939. – Revista de Ciências Veterinárias, Universidade de Lourenço Marques, Série A 2: 365–466.
- Tendeiro, J. 1973. Estudos sobre os Goniodídeos (Mallophaga: Ischnocera) dos Columbiformes. – Revista de Ciências Veterinárias, Universidade de Lourenço Marques, Série A 6: 201–524.
- Tendeiro, J. 1993. Nouvelles études sur le genre *Nosopon* Hopkins, 1942 (Mallophaga, Menoponidae), avec description de deux espèces nouvelles. – Garcia de Orta, Série Zoologia 19: 47–54.
- Tendeiro, J., Restivo, A. de M., & Demartis, A.M. 1979. Sur trois espèces du genre *Colpocephalum* Nitzsch (Mallophaga, Menoponidae), parasites de Falconiformes de la Sardaigne. – Garcia de Orta, Séries Zoologia 8: 29–38.
- Thompson, G.B. 1935a. Two further records of the association of Hippoboscidae ad Mallophaga. – Annals and Magazine of Natural History 10: 162–163.
- Thompson, G.B. 1935b. New genera of Mallophaga. I. *Rhynonirmus* n. gen. – Parasitology 27: 281–287.
- Thompson, G.B. 1936. Three new genera of Mallophaga (Subfam. Esthiopterinae). – Annals and Magazine of Natural History 10: 40–43.
- Thompson, G.B. 1940a. Notes on the Mallophaga from aquatic birds. – I. Mallophaga from divers (Gaviiformes). – Annals and Magazine of Natural History 11: 513–522.
- Thompson, G.B. 1940b. Notes on the species of the genus *Pectinopygus* (s. lat.) (Mallophaga). – Annals and Magazine of Natural History 11: 429–432.
- Timmermann, G. 1936 [“1935”]. *Saemundssonina* nov. gen., ein neues Mallophagengenus, aufgestellt für *Philopterus gonothorax* (Giebel) und verwandte Arten. – Zoologischer Anzeiger 114: 97–100.
- Timmermann, G. 1949a. Beiträge zur Kenntnis der Ektoparasitenfauna isländischer Sägetiere und Vögel. 1. Mitteilung. Das Mallophagengenus *Saemundssonina* Timmermann, 1936. – Vísindafélag Íslandinga 2: 1–32.
- Timmermann, G. 1949b. Beiträge zur Kenntnis der Ektoparasitenfauna isländischer Säugtiere und Vögel. 2. Mitteilung. Das mallophagengenus *Koeniginirmus* Eichler, 1940. – Vísindafélag Íslandinga 2: 83–88.
- Timmermann, G. 1950a. Beiträge zur Kenntnis der Ektoparasitenfauna isländischer Säugtiere und Vögel. 3. Mitteilung. Fortgesetzte Untersuchungen an isländischen Kletterfederlingen. – Fauna Islandica 1: 1–8.
- Timmermann, G. 1950b. Beiträge zur Kenntnis der Ektoparasitenfauna isländischer Säugtiere und Vögel. 4. Mitteilung. Die Gattung *Quadriceps* Clay & Meinertzhagen und verwandte Genera Mallophagorum. – Fauna Islandica 2: 1–8.
- Timmermann, G. 1950c. Um íslenzkar ránfuglalýs. – Nátturufraeðingnum 4:177–182.
- Timmermann, G. 1951a. Die Mövenkneifer. Eine Revision sämtlicher bei echten Möven schmarotzenden Federlinge der Gattung *Saemundssonina* Tim., 1936. – Parasitological News 2: 1–12.
- Timmermann, G. 1951b. Investigations on some ischnoceran bird lice (genus *Saemundssonina*) parasitic on waders. – Annals and Magazine of Natural History 12: 390–401.
- Timmermann, G. 1952a. The species of the genus *Quadriceps* (Mallophaga) from the Larinae, with some remarks on the systematics and the phylogeny of the gulls. – Annals and Magazine of Natural History 12: 209–222, 1 plate.
- Timmermann, G. 1952b. Revision der bei Seeschwalben schmarotzenden Kletterfederlinge der Gattung *Quadriceps* (Clay u. Meinertzhagen). – Zoologischer Anzeiger 148: 71–87.
- Timmermann, G. 1952c. New and little-known species of *Quadriceps* (Mallophaga) from pratincoles, coursers and other plover-like birds. – Annals and Magazine of Natural History 12: 1026–1037.
- Timmermann, G. 1953a. Die Federläuse des Säbelschnäblers. – *Bombus*, Faunistische Mitteilungen aus Nordwestdeutschland 78/79: 329–333.
- Timmermann, G. 1953b. Die *Quadriceps*-Arten (Mallophaga) der Regenpfeifer (Unterfamilie Charadriinae). – Zoologischer Anzeiger 150: 178–190.
- Timmermann, G. 1954a. Studien über Mallophagen aus den Sammlungen des britischen Museums (Nat. Hist.), London. II. Das Amblycerengattung *Actornithophilus* Ferris, 1916. – Annals and Magazine of Natural History 12: 829–841.
- Timmermann, G. 1954b. Vorläufige Übersicht über das Amblyceren-Genus *Austromenopon* Bedford, 1939 (Mallophaga). – Bonner zoologische Beiträge 5: 195–206.

- Timmermann, G. 1954c. A revision of the genus *Car-duiceps* Clay & Meinertzhagen, 1939 (Mallophaga). – *Annals and Magazine of Natural History* 12: 40–48.
- Timmermann, G. 1954d. Studies on the Mallophaga from the collections of the British Museum (Nat. Hist.), London. – *Annals and Magazine of Natural History* 12: 623–637.
- Timmermann, G. 1954e. Neue und wenig bekannte Kletterfederlinge von charadriiformen Wirten. – *Zoologischer Anzeiger* 152: 163–177.
- Timmermann, G. 1954f. Die *Quadraceps*-arten (Mallophaga) der Kiebitze. – *Zeitschrift für Parasitenkunde* 16: 195–208.
- Timmermann, G. 1955. Studien über Mallophagen aus den Sammlungen des Britischen Museums (Nat. Hist.), London. 3 Mitteilung. Beschreibungen neuer und unzulänglich bekannter, zumeist bei Regenpeiferfervögeln schmarotzender Federlingsarten. – *Annals and Magazine of Natural History*, 12: 513–534.
- Timmermann, G. 1957. Studien zu einer vergleichen Parasitologie der Charadriiformes oder Regenpeiferfervogel. Teil 1. Mallophaga. – *Parasitologische Schriftenreihe* 8: 1–204.
- Timmermann, G. 1962. Gruppen-Revisionen bet Mallophagen. V. Zur näheren Kennzeichnung des *Ornithobius*-Komplexes (Phlopteridae), parasitisch bei Entenvögeln. – *Zeitschrift für Parasitenkunde* 22: 133–147.
- Timmermann, G. 1963. Gruppen-Revisionen bei Mallophagen. VI. Die *Austroripon*-Arten der Sturmvoegel. – *Zeitschrift für Parasitenkunde* 22: 401–427.
- Timmermann, G. 1964. Gruppen-Revisionen bei Mallophagen. VII. Die *Pectinopygus*-Arten der Großkormoran (Gen. *Phalacrocorax* Brisson, 1760 s. str.). – *Mitteilungen der Hamburg Zoologische Museum Institut, Kosswig-Festschrift*: S271–S284.
- Timmermann, G. 1965. Die Federlingsfauna der Sturmvoegel und die Phylogenese des procellariiformen Vogelstammes. – *Abhandlungen und Verhandlungen des Naturwissenschaftlichen Verein in Hamburg, neue Folge*, 8, Supplement: 249pp + 12 plates.
- Timmermann, G. 1969. Gruppen-Revisionen bei Mallophagen. VIII. Die Formkreise *Saemundssoniascolopacis-phaeopodis* (Schrank), 1903, *Saemundssonias platygaster* (Denny), 1842 und *Saemundssonias africana* Timmermann, 1951. – *Zoologischer Anzeiger* 183: 225–256.
- Timmermann, G. 1972. Gruppen-Revision bei Mallophagen. IX. Versuch über den *Cummingsiella*-Komplex. 1. Teil: Die Entwicklung des Systems. – *Mitteilungen der Hamburger Zoologische Museum Institut* 68: 95–105.
- Timmermann, G. 1974. Grupperrevisionen bei Mallophagen. X. Die *Cummingsiella* (früher *Quadraceps*) – Arten der Alcidae. – *Mitteilungen der Hamburger Zoologische Museum Institut* 70: 165–180.
- Toon, A. & Hughes, J.M. 2008. Are lice good proxies for host history? A comparative analysis of the Australian magpie, *Gymnorhina tibicen*, and two species of feather lice. – *Hereditas* 127–135.
- Tryjanowski, P., Szczykutowicz, A. & Adamski, Z. 2007. Size variation in chewing lice *Docophorus coarctatus*: how host size and louse population density vary together. – *Evolutionary Ecology* 21: 739–749.
- Tuff, D.W. 1967. A review of the North American *Ardeicola* (Mallophaga: Phlopteridae). – *Journal of the Kansas Entomological Society* 40: 241–263.
- Uchida, S. 1926. Studies on the amblycerous Mallophaga of Japan. – *Journal of the College of Agriculture, Tokyo* 9: 1–56.
- Uchida, S. 1949. Studies on the biting-lice (Mallophaga) of Japan and adjacent territories (Suborder Ischnocera Pt. II). – *Japanese Medical Journal* 1: 535–556.
- Valim, M.P. & Silveira, L.F. 2014. A new species and five new records of chewing lice (Insecta: Phthiraptera: Ischnocera) from an isolated population of the solitary tinamou *Tinamus solitarius* (Aves: Tinamiformes). – *Zootaxa* 3838: 127–142.
- Valim, M.P. & Weckstein, J.D. 2013. A drop in the bucket of the megadiverse chewing louse genus *Myrsidea* (Phthiraptera, Amblycera, Menoponidae): ten new species from Amazonian Brazil. – *Folia Parasitologica* 60: 377–400.
- Vas, Z. & Fuisz, T.I. (2010) Ringing procedure can reduce the burden of feather lice in Barn Swallows *Hirundo rustica*. – *Acta Ornithologica* 45: 203–207.
- De Verdier, K. & Bornstein, S. 2010. Alpackor i Sverige – en ny utmaning. – *Svensk Veterinärtidning* 2010(1): 19–23.
- Visnak, R.M. & Dumbacher, J.P. 1999. Comparison of four fumigants for removing avian lice. – *Journal of Field Ornithology* 70: 42–48.
- Ward, R.A. 1955. Biting lice of the genus *Saemundssonias* (Mallophaga: Phlopteridae) occurring on terns. – *Proceedings of the United States National Museum* 105: 83–100.
- Waterston, J. 1915. On two new species of Mallophaga (Menoponidae): *Menacanthus balfouri* n. sp. and *Myrsidea victrix* n. sp. from Colombia. – *Entomologist's Monthly Magazine* 51: 12–16.

- Waterston, J. 1922. On the Ischnocera (bird-lice or Mallophaga) parasitic upon the British grouse. – The Scottish Naturalist 1922: 101–104.
- Webb, J.E. 1946. Spiracle structure as a guide to the phylogenetic relationships of the Anoplura (biting and sucking lice), with notes on the affinities of the mammalian hosts. – Proceedings of the Zoological Society of London 116: 49–119.
- Weidner, H. 1983. Günther Timmermann zum Gedächtnis. – Mitteilungen der Hamburger zoologische Museum Institut 80: 7–16.
- Weissner, C.F. & Kim, K.C. 1973. Rediscovery of *Solenopotes tarandi* (Mjöberg, 1915) (Linognathidae: Anoplura), with ectoparasites of the Barren Ground Caribou. – Parasitology 66: 123–232.
- Werneck, F.L. 1936. Contribuição ao conhecimento dos Mallophagos encontrados nos mamíferos sul-americanos. – Memórias do Instituto Oswaldo Cruz 31: 391–589.
- Werneck, F.L. 1941. Os Malófaos de boi e do cavalo. – Revista Brasileira de Biologia 1: 195–199.
- Werneck, F.L. 1948. Os Malófaos de Mamíferos. Parte I: Amblycera e Ischnocera (Phlopteridae e parte de Trichodectidae). – Revista Brasileira de Biologia, special publication, Rio de Janeiro, 243 pp.
- Werneck, F.L. 1950. Os Malófaos de Mamíferos. Parte II: Ischnocera (continuacao de Trichodectidae) e Rhynchophthirina. – Memórias do Instituto Oswaldo Cruz, special publication, 207 pp.
- Williams, R.T. 1970a. *In vitro* studies on the environmental biology of *Goniodes colchici* (Denny) (Mallophaga: Ischnocera). II. The effects of temperature and humidity on water loss. – The Australian Journal of Zoology 18: 391–398.
- Williams, R.T. 1970b. *In vitro* studies on the environmental biology of *Goniodes colchici* (Denny) (Mallophaga: Ischnocera). I. The effect of temperature and humidity on the bionomics of *G. colchici*. – The Australian Journal of Zoology 18: 379–389.
- Williams, R.T. 1971. *In vitro* studies on the environmental biology of *Goniodes colchici* (Denny) (Mallophaga: Ischnocera). III. The effects of temperature and humidity on the uptake of water vapour. – Journal of Experimental Biology 55: 553–568.
- Wilson, D.E. & Reeder, D.A.M. (editors) 2005. Mammal species of the world. A taxonomic and geographic reference (3<sup>rd</sup> edition). – Johns Hopkins University Press, 2142 pp.
- Yoshizawa, K. & Johnson, K.P. 2006. Morphology of male genitalia in lice and their relatives and phylogenetic implications. – Systematic Entomology 31: 350–361.
- Złotorzycka, J. 1963. Comparative study of the species *Austromenopon icterum* (Burm.) and *Austromenopon durisetosum* (Blag.) (Mallophaga). – Acta Zoologica Cracoviensia 8: 463–474 + 2 plates.
- Złotorzycka, J. 1964a. Mallophaga parasitizing Passeriformes and Pici. II. Brueeliinae. – Acta Parasitologica Polonica 12: 239–282, 4 plates.
- Złotorzycka, J. 1964b. Mallophaga parasitizing Passeriformes and Pici. I. Subfamilies Dennyinae, Machaerilaemidnae, Colpocephalinae. – Acta Parasitologica Polonica 12: 165–192.
- Złotorzycka, J. 1964c. Mallophaga parasitizing Passeriformes and Pici. III. Philopterinae. – Acta Parasitologica Polonica 12: 401–430.
- Złotorzycka, J. 1966. Systematische Bemerkungen über die Gattung *Reticulipeurus* Kéler mit Beschreibung von *R. tetraonis minor* ssp. n. (Mallophaga, Lipeuridae). – Polskie Pismo Entomologiczne 36: 111–115.
- Złotorzycka, J. 1967. Studien über *Quadriceps* s. l. (Mallophaga, Quadraceptinae). Übersicht der Arten und systematische Revision mit besonderer Berücksichtigung der synhospitalen und allohospitalen Arten. – Polskie Pismo Entomologiczne 36: 705–785, 17 plates.
- Złotorzycka, J. 1968. Systematische Studien an den mitteleuropäischen Arten der Gattung *Austromenopon* Bedford (Mallophaga: Austromenoponinae). – Polskie Pismo Entomologiczne 38: 301–340.
- Złotorzycka, J. 1970. Studien an den mitteleuropäischen Arten der Gattung *Anatoecus* Cumm. (Esthipteridae, Mallophaga). – Polskie Pismo Entomologiczne 40: 7–67 + 12 photos.
- Złotorzycka, J. 1974. Revision der europäischen Strigiphilini (Mallophaga, Strigiphilinae). – Polskie Pismo Entomologiczne 44: 319–358.
- Złotorzycka, J. 1976. Europäische Arten der Mallophagen-Gattung *Pleurinirmus*. – Angewandte Parasitologie 17: 208–214.
- Złotorzycka, J. 1997. Lice (Mallophaga). Specific part Gonioididae and Philopteridae. – Acta Universitatis Wratislaviensis No. 1989. Wrocław Scientific Printing, Wrocław, 308pp.
- Złotorzycka, J. & Lucínska, A. 1975. Systematische Studien an europäischen Arten der Gattungen *Philopterus* und *Docophorus* (Mallophaga, Philopteridae). I. Teil. Die Gattung *Philopterus* Nitzsch. – Polskie Pismo Entomologiczne 45: 547–563.

# Figures

## Sources

All illustrations are drawn from examined specimens, with the following exceptions that have been redrawn based on published sources: Fig. 21f from Clay & Hopkins (1960); Fig. 52e from Hopkins & Timmermann (1954; no scale in original); Fig. 52g and h from Gustafsson & Bush (2017); Fig. 52i–k from Clay (1949); Fig. 52l from Timmermann (1974; no scale in original); Fig. 52u–x from Adams *et al.* (2005); Fig. 59d from Soler-Cruz *et al.* (1987; no scale in original); Fig. 59e from Moreby (1978; no scale in original); Figs 60–61 are redrawn from Kim *et al.* (1986; no scales in original), except Fig. 60f, which is from Ferris (1919; no scale in original).

## Abbreviations used in figures

A = abdomen  
*a1* = anterior seta 1 (part of *a-series setae* or *anterior setae*)  
*a4* = anterior seta 4 (part of *a-series setae* or *anterior setae*)  
 ACN = accessory nodus  
*ads* = anterior dorsal seta  
*afs* = anal fringe setae  
*ams* = anterior mesonotal setae  
 AN = antenna  
 ANC = antennal carina  
 ANN = antennal nodus  
 APHP = apophysial pit  
*aps* = accessory post-spiracular seta  
*ars* = anterior row of setae  
 AS = antennal socket  
*as1–3* = anterior setae 1–3  
 ASGP = accessory subgenital plate  
*ass* = anterior subocular setae  
*avs1–3* = anterior ventral setae 1–3  
 BA = basal apodeme  
 BP = basal plate  
 C = conus  
 CB = cross-bar  
 CL = copulatory lobe  
 CLS = clypeo-labral suture  
 CMC = clypeal marginal carina  
 CP = cross-piece  
 CS = curved sclerite  
 CST = central sternal plate  
*ct* = *ctenidia*  
 CX = coxa  
*d* = *d-series setae* (*dorsal setae*)  
*daf* = dorsal anal fringe  
 DAP = dorsal anterior plate  
 DBP = distal bulbous projections  
*dlas* = dorsal lateral abdominal setae  
 DMH = distal median hook  
*dmas* = dorsal marginal abdominal setae

*dpls* = dorsal pleural setae  
 DPOS = dorsal postantennal suture  
 DPS = dorsal preantennal suture  
*dps* = dorsal pronotal setae  
*dsb* = dorsal setal brush  
*dsms* = dorsal submarginal seta  
 DT = distal thorn  
 E = eye  
 EM = endomere  
 EP = endophallus  
 ETP = endomerale tooth process  
 F = femur  
*f* = *f-series setae* (*frontal setae*)  
 FL-I = flagellomere I  
 FL-II = flagellomere II  
 FL-III = flagellomere III  
 FN = fenestra (in Fig. 50f perforated that is continuous with non-sclerotised part of abdomen)  
 FP = forked prolongation  
 FS = flagellomere spur  
 G = gonopod VIII  
 GP = gular plate  
 GS = genital sac  
 H = head  
 HL = hyaline lobes  
 HM = hyaline margin  
 ITP = intertergal plates  
 LA = labrum  
 LAD = lower apodeme  
 LAN = lateral anterior nodi  
 LAP = lateral anterior plate  
 LB = lateral bulge of occipital process  
 LCS = lateral cervical sclerite  
 LN = lunar nodus  
 LP = labial palp  
 LPB = longitudinal pleural bar  
*ls* = *labial setae*  
 LST = lateral sternal plates  
*lst* = *lateral set of tergoventral setae*  
 M = mandible  
*m* = *m-series setae* (*marginal setae*)  
 MB = median broadening (of clypeal marginal carina)  
 MC = marginal carina  
*mds* = *mandibular seta*  
 MES = metepisternum  
 MET = mesothorax  
 MFP = mesofurcal pit  
 MM = mesomere  
*mms* = *mesometanotal anterior setae*  
 MMN = mesometanotum  
 MMS = mesometasternal plate  
*mms* = *marginal metathoracic setae*  
 MMT = mesometathorax  
 MP = median process  
 MS = mesosome  
*ms* = *median set of tergoventral setae*  
 MSCP = mesothoracic coxal process  
 MSN = mesonotum  
 MSPA = mesothoracic pleural apophysis

- MTC = marginal temporal carina  
 MTCP = metathoracic coxal process  
 MTN = metanotum  
 MTPA = metathoracic pleural apophysis  
 MTS = metasternal plate  
*mts1–5* = marginal temporal setae 1–5  
 MTT = metathorax  
 MXP = maxillary palp  
 O = osculum  
 OCC = occipital carina  
 ON = occipital nodus  
 OP = occipital process  
 OPO = ocular point  
 OR = occipital ring  
*os* = ocular seta  
 P = pleural plate  
*pa* = *pa-series setae (para-antennal setae)*  
 PAL = palette  
 PAN = preantennal nodus  
*pas* = preantennal setae  
 PAT = paratergal plates  
 PB = posterior bulge  
 PCP = prothoracic coxal process  
*pcs* = precoxal seta  
 PDS = paired dorsal sclerites  
 PE = posterior elongation  
 PED = pedicle  
 PEM = proepimeron  
 PES = proepisternum  
 PL = pleural lobe  
 PLE = poster-lateral extensions  
 PLET = postero-lateral extensions of tergites (triangular corner overlapping with following segment)  
 PLP = proximal lateral projections  
 PM = paramere  
*pms* = postmental setae  
*pnms* = pronotal marginal setae  
*pns* = postnodal seta  
 PO = postnotum  
 PON = postocular nodus  
*pos* = preocular seta  
 PPA = prothoracic pleural apophysis  
 PPP = postpalpal process  
*ppss* = pronotal post-spiracular seta  
 PRN = preocular nodus  
 PRON = preocular notch  
 PROS = preocular slit  
 PRS = prosternal plate  
 PRT = proximal thorn  
 PS = penile sclerite  
*ps* = pleural setae  
*psps* = principal post-spiracular seta  
*pss* = post-spiracular sensilla  
 PT = prothorax  
*pts* = post-temporal seta  
 PUS = penultimate sternal plate  
 PW = pleural wedge-shaped thickening  
 RLL = rounded lateral lobes  
*s* = sensillus  
*s1–7* = sensilla 1–7  
  
*sa* = setal aster  
*sas* = secondary marginal seta (this seta is a diagnostic character for the genus *Cuculoecus*, and not found in any other philopterid lice in Sweden)  
 SBT = seta-bearing tubercle  
*sb* = setal brush  
 SC = scape  
 SCP = scaly process  
 SDAP = spur of dorsal anterior plate  
 SGP = subgenital plate  
*slg* = sublateral group of marginal mesometanotal setae  
*soc* = subocular comb row  
 SP = spiracular opening  
 SS = stigmatal scar  
*ss* = sutural setae (innermost seta)  
 ST = sternal plates  
*sts* = sternal setae  
*sus* = subocular seta  
 SVS = subvulval sclerites  
 SY = stylet  
 T = tergal plates  
*t* = *t-series setae (temporal setae)*  
 TA = tarsus  
*tas* = tergal abdominal setae  
 TB = tibia  
 TC = tarsal claws  
*tcs* = tergo-central setae  
 TE = triangular extension of preantennal head margin.  
 TEB = tergal bar  
 TEM = telomeres  
*tes* = tergal setae  
 TH = tergal heads (antero-lateral corner of tergal plate re-entrant into preceding segment)  
 THO = triangular horns  
 TM = temple  
 TMH = temporal horn  
 TN = tentorial nodus  
 TPC = transverse pronotal carina  
*tps* = tergal posterior setae  
 TR = trochanter  
 TRB = trabeculum  
 TRC = transverse carina  
 TS = tubercular spiracular openings  
*ts* = trichoid seta of abdominal segment VIII  
*tsp* = temporal setal patch (short setae within grey polygon)  
*tsr* = transverse setal row: TT = transverse thickening  
 TU = tubercles  
 UT = U-shaped thickening  
*vaf* = ventral anal fringe  
 VAP = ventral anterior plate  
 VC = ventral carina  
 VCN = ventral carinal nodus  
 VM = vulval margin  
*vmas* = ventral marginal abdominal setae  
*vms* = vulval marginal setae (slender)  
*vos* = vulval oblique setae  
 VS = vulval sclerite  
*vsm1–2* = ventral submarginal setae 1–2; *vss* = vulval sub-marginal setae (thorn-like in 53c, slender in 53e)  
 YT = Y-shaped thickening.

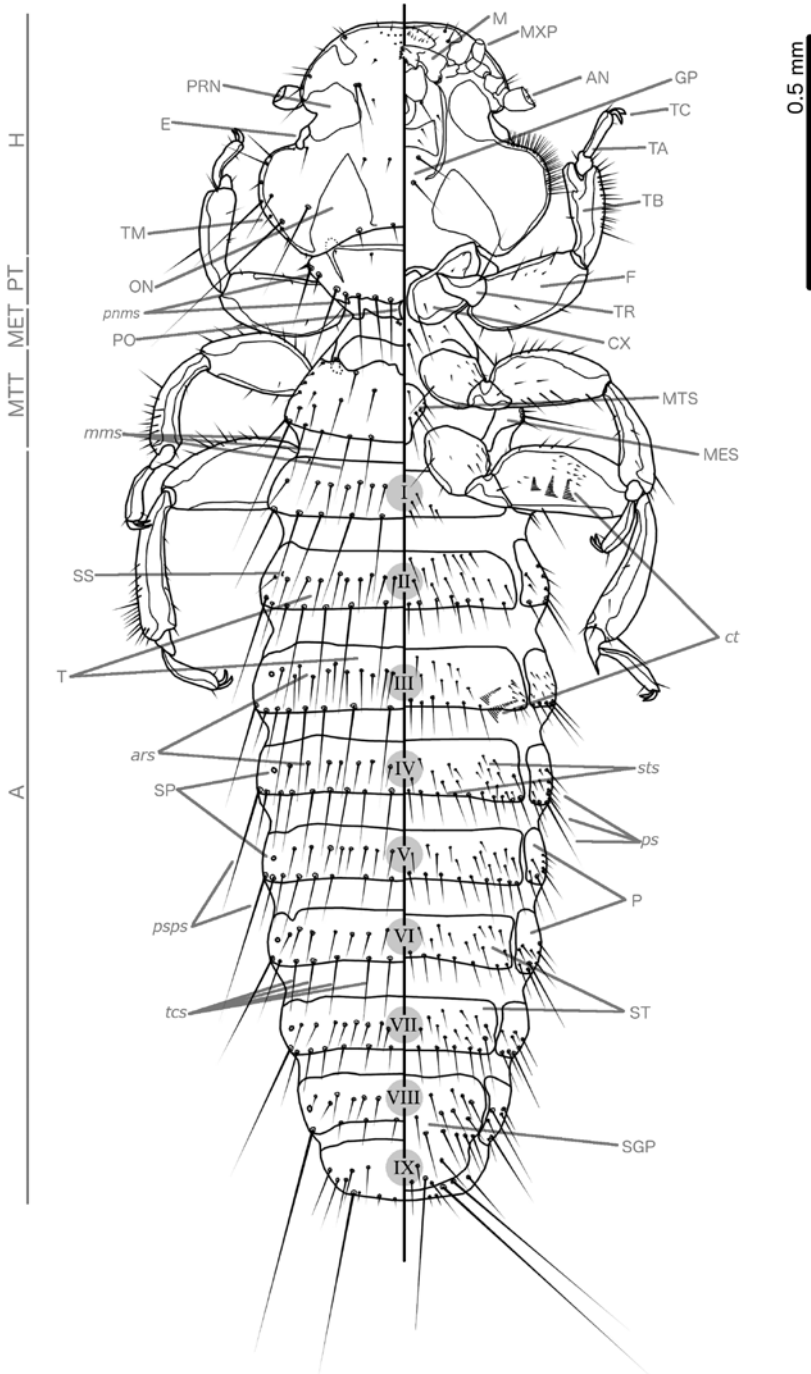


Figure 16. Male of *Colpocephalum zebra* (Menoponidae). Lines on left-hand side delimit body parts.  
 Hane av *Colpocephalum zebra* (Menoponidae). De grå linjerna till vänster betecknar de olika kroppsdelarna.

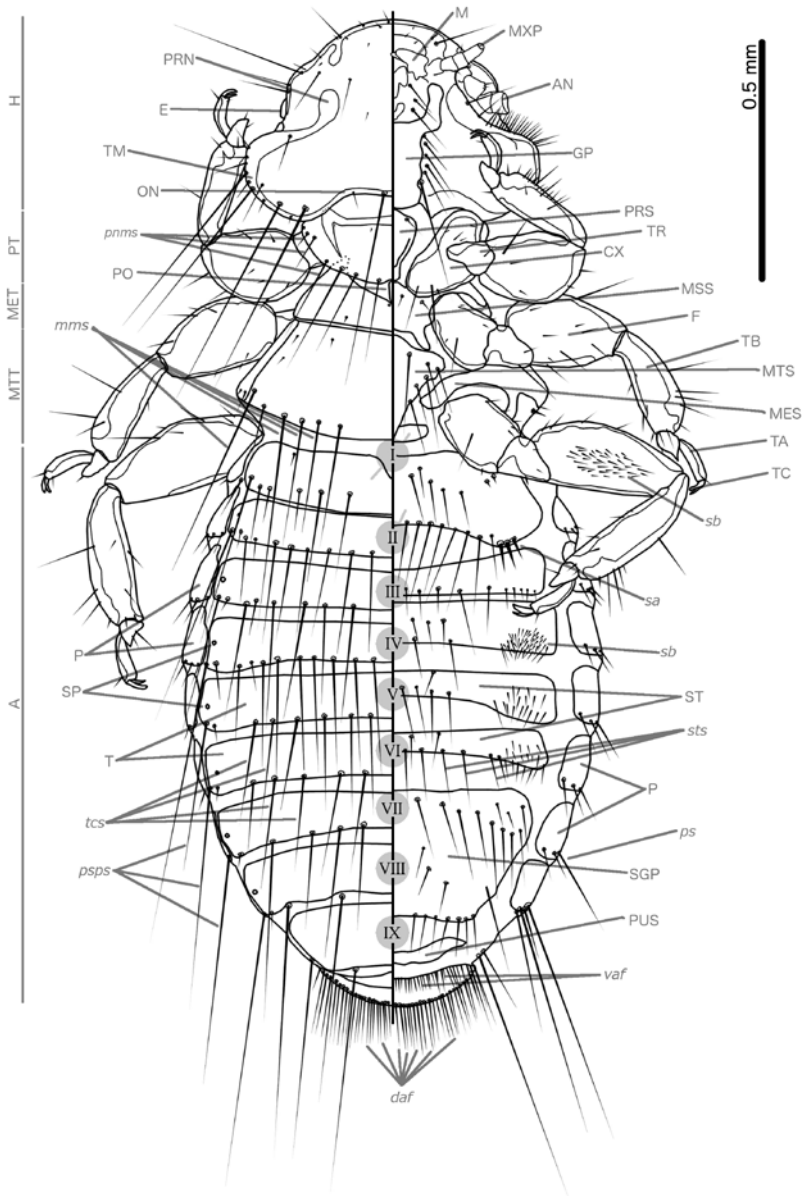


Figure 17. Female of *Myrsidea indivisa* (Menoponidae). Density of setae in setal brush on sternal plate IV has been increased compared to studied material, to show variation in this character throughout the Menoponidae. Setal brushes on sternal plates IV–VI similar in *M. indivisa*. Note that sternal plate I is displaced anteriorly compared to tergal plate I, and partially overlapped by metasternal plate. Lines on left-hand side delimit body parts.

Hona av *Myrsidea indivisa* (Menoponidae). Borsttäteten i borstgruppen på sternit IV har ökat jämfört med studerat material för att visa variationen i den här karaktären inom Menoponidae; i verkligheten är borstgrupperna på sterniterna IV–VI snarlika. Notera att sternit I är framskjuten i jämförelse med tergit I hos den här arten, så att sternit I delvis överlappar metasternalplattan. De grå linjerna till vänster betecknar de olika kroppsdelarna.

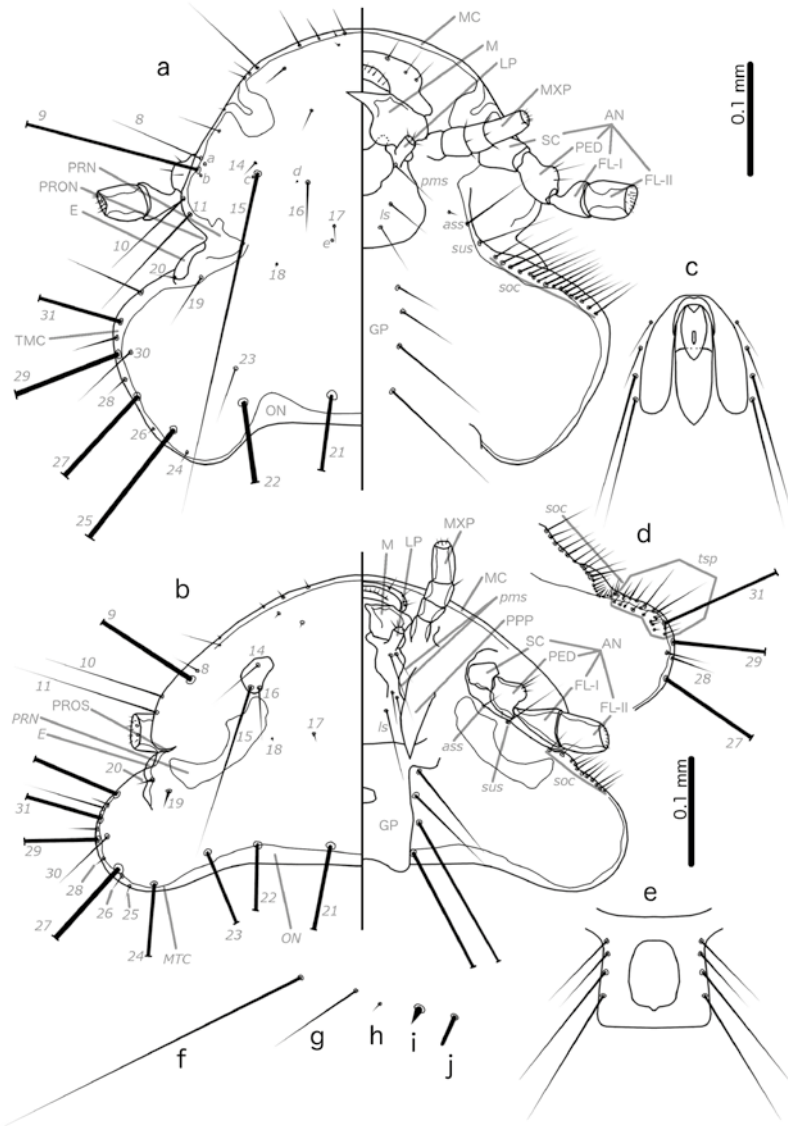


Figure 18. Head morphology and chaetotaxy in Menoponidae. Longer setae cut off distally. Numbers (8–11, 14–31) and letters (a–e) in *italics* denote taxonomically important setae and sensilla following Clay (1969, 1970a); setae and sensilla considered taxonomically unimportant by Clay not named or numbered. – a) head of *Actornithophilus pustulosus*. – b) head of *Menacanthus eurysternus*. – c) tripartite gular plate of *Pseudomenopon dolium*. – d) ventral temple of *Cuculiphilus fasciatus*, with ventral submarginal patch of setae (setae 27–29 and 31 included for clarity). – e) gular plate of *Menacanthus curuccae*. – f) macroseta (long seta). – g) mesoseta. – h) microseta. – i) thorn-like seta. – j) peg-like seta.

Huvudmorfologi och borstnomenklatur hos Menoponidae. Längre borst avkortade. Nummer (8–11, 14–31) och bokstäver (a–e) i *kursiv stil* betecknar taxonomiskt viktiga borst respektive sensilla enligt Clay (1969, 1970a); borst och sensilla som Clay inte ansåg vara taxonomiskt viktiga är inte utmärkta. – a) huvud av *Actornithophilus pustulosus*. – b) huvud av *Menacanthus eurysternus*. – c) tredelad gularplatta hos *Pseudomenopon dolium*. – d) ventralsidan av postantennala huvudet hos *Cuculiphilus fasciatus*, med ventral borstgrupp inom grå polygon (borst 27–29 och 31 inritade för lokalisering). – e) gularplattan hos *Menacanthus curuccae*. – f) makroborst. – g) mesoborst. – h) microborst. – i) tagglik borst. – j) tapplik borst.



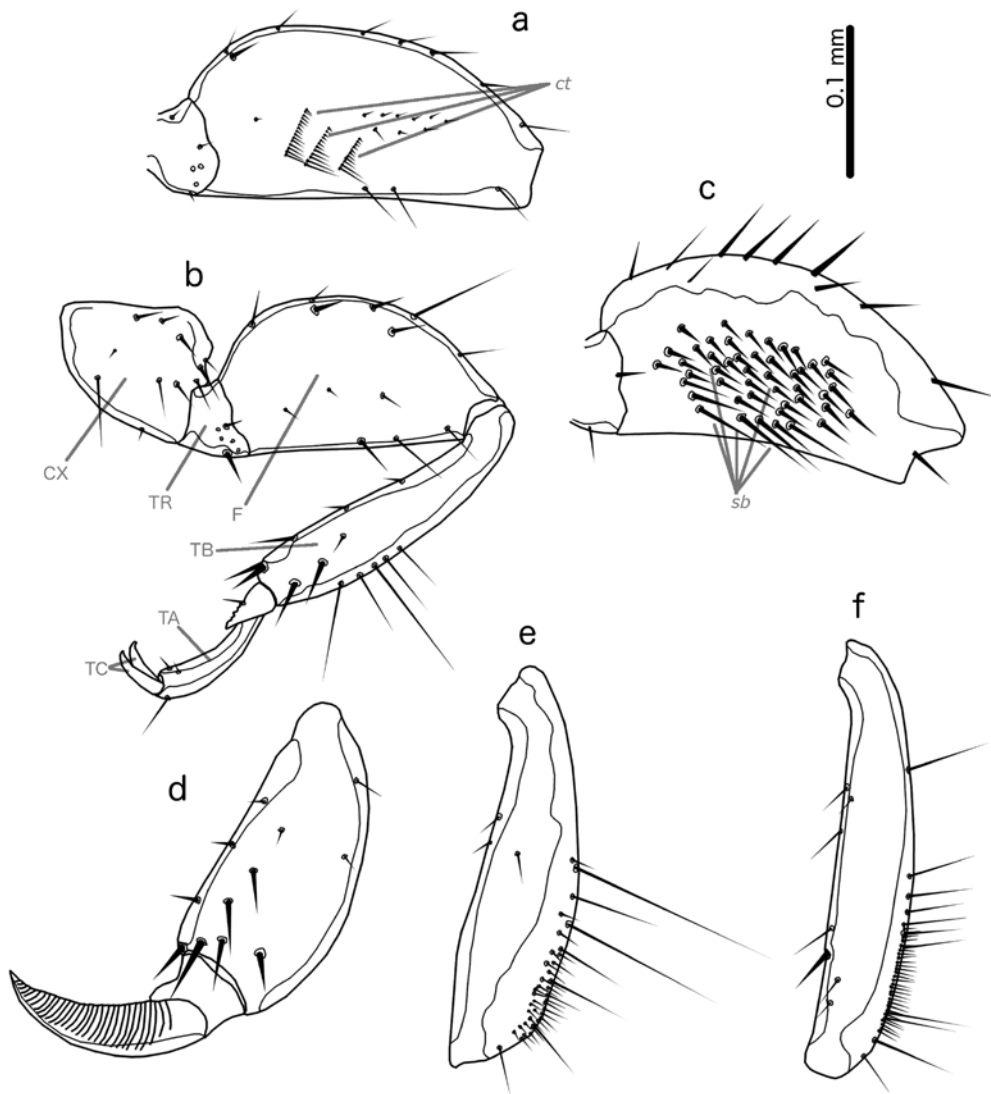


Figure 19. Leg characters in Menoponidae and Gyropidae. – a) femur III with ctenidia of *Ciconiphilus decimfasciatus*, ventral view. – b) leg III of *Nosopon lucidum*, ventral view. – c) femur III with setal brush of *Actornithophilus grandiceps*, ventral view. – d) distal leg III of *Gyropus ovalis*, ventral view. – e) tibia III of *Gruimenopon canadense*, dorsal view. – f) tibia III of *Heleonomus assimilis*, dorsal view.

Benkaraktärer i Menoponidae och Gyropidae. – a) ventral aspekt av femur III med ctenidier hos *Ciconiphilus decimfasciatus*. – b) ventral aspekt av ben III hos *Nosopon lucidum*. – c) ventral aspekt av femur III with borstgrupp hos *Actornithophilus grandiceps*. – d) ventral aspekt av tibia och tarsi III hos *Gyropus ovalis*. – e) dorsal aspekt av tibia III hos *Gruimenopon canadense*. – f) dorsal aspekt av tibia III hos *Heleonomus assimilis*.

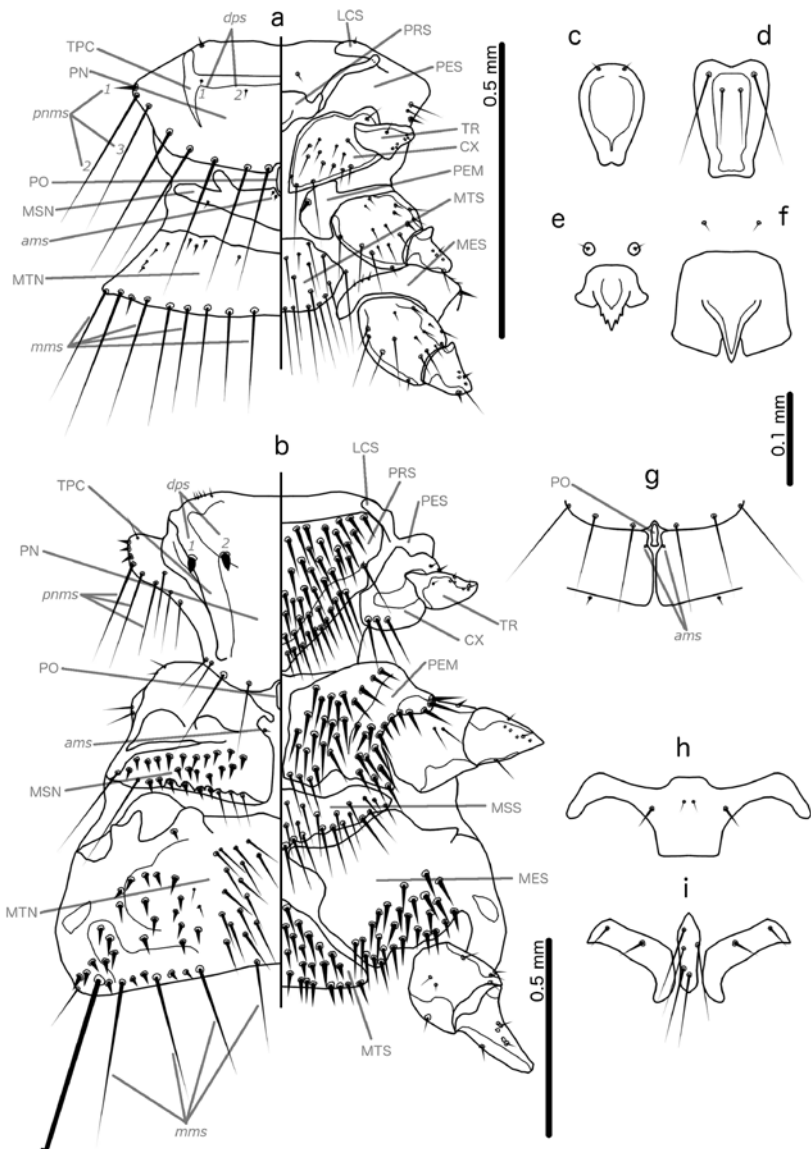


Figure 20. Thoracic characters in Menoponidae. – a) thoracic segments of *Austromenopon transversum*, dorsal and ventral views; distal legs not illustrated. – b) thoracic segments of *Trinoton querquedulae*, dorsal and ventral views; distal legs not illustrated. – c) prosternal plate of *Myrsidea rustica*. – d) prosternal plate of *Dennyus hirundinis*. – e) prosternal plate of *Holomenopon leucoxanthum*. – f) prosternal plate of *Eidmanniella pellucida*. – g) postnotal sclerite and anterior mesonotal setae of *Myrsidea rustica*. – h) mesosternal plate of *Cuculiphilus fasciatus*. – i) mesosternal plate of *Actornithophilus pustulosus*. Figures 21–27 in same scale.

Thorax-karaktärer hos Menoponidae. – a) thorax hos *Austromenopon transversum*, yttre bensegmenten inte illustrerade. – b) thorax hos *Trinoton querquedulae*, yttre bensegmenten inte illustrerade. – c) prosternalplattan hos *Myrsidea rustica*. – d) prosternalplattan hos *Dennyus hirundinis*. – e) prosternalplattan hos *Holomenopon leucoxanthum*. – f) prosternalplattan hos *Eidmanniella pellucida*. – g) posnotumskleriten och främre mesonotalborsten hos *Myrsidea rustica*. – h) mesosternum hos *Cuculiphilus fasciatus*. – i) mesosternum hos *Actornithophilus pustulosus*. Figur 21–27 i samma skala.

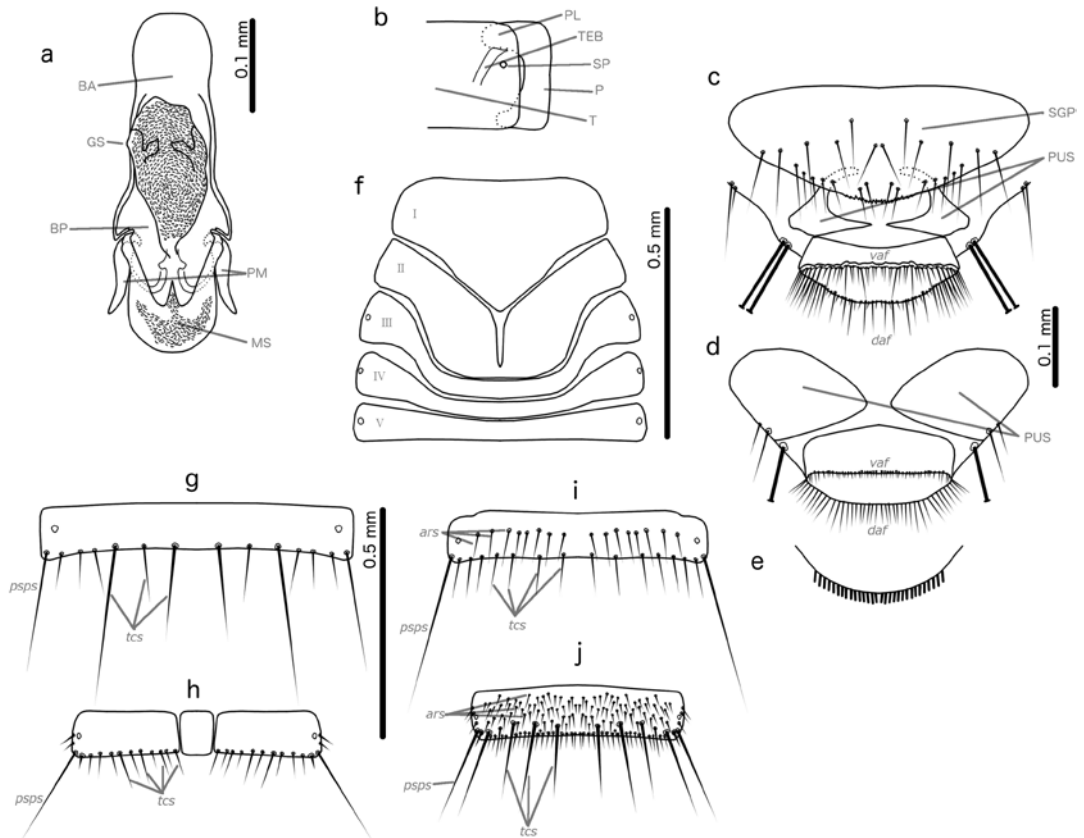


Figure 21. Abdominal and genital characters in Menoponidae. – a) male genitalia of *Cuculiphilus fasciatus*, dorsal view. – b) schematic illustration of pleural lobes and tergal bars. – c) female terminalia of *Menacanthus eurysternus*, ventral view. – d) female terminalia of *Actornithophilus umbrinus*, ventral view. – e) ventral anal fringe of *Holomenopon clypeilargum*. – f) tergal plates I–V of *Myrsidea cucullaris*; setae not shown. – g) tergal plate IV of *Ciconiphilus decimfasciatus* continuous, with anterior setae absent. – h) tripartite tergal plate IV of *Colpocephalum pygidiale*. – i) tergal plate IV of *Colpocephalum zebra*, with anterior setae in single row. – j) tergal plate VI of *Actornithophilus umbrinus*, with scattered anterior setae. Longer setae cut off distally.

Abdominala karaktärer och genitalkaraktärer hos Menoponidae. – a) dorsal aspekt av hanliga genitalier hos *Cuculiphilus fasciatus*. – b) schematisk illustration av pleurallober och tergalbalkar. – c) ventral aspekt av honliga terminalia hos *Menacanthus eurysternus*. – d) ventral aspekt av honliga terminalia hos *Actornithophilus umbrinus*. – e) ventrala analkammen hos *Holomenopon clypeilargum*. – f) tergalplattor I–V hos *Myrsidea cucullaris*; borst ej inritade. – g) hel tergalplatta IV hos *Ciconiphilus decimfasciatus*, hos vilken främre borst saknas. – h) tredelad tergalplatta IV hos *Colpocephalum pygidiale*. – i) tergalplatta IV hos *Colpocephalum zebra*, med främre borst i enkel rad. – j) tergalplatta VI hos *Actornithophilus umbrinus*, med strödda borst. Längre borst avkortade.

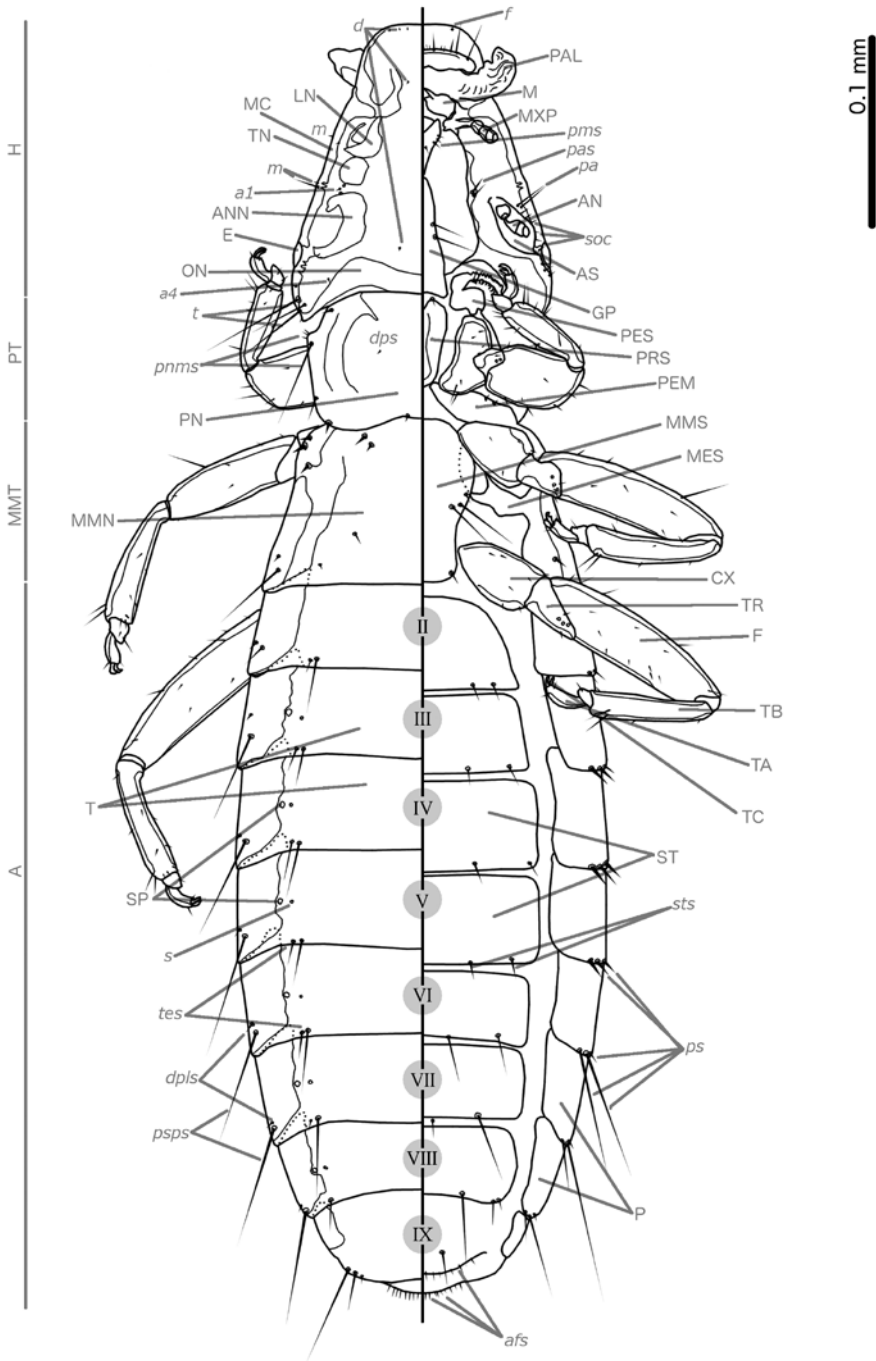


Figure 22. Male of *Ricinus australis* (Ricinidae). Lines on left-hand side delimit body parts. Hane av *Ricinus australis* (Ricinidae). De grå linjerna till vänster betecknar de olika kroppsdelarna.

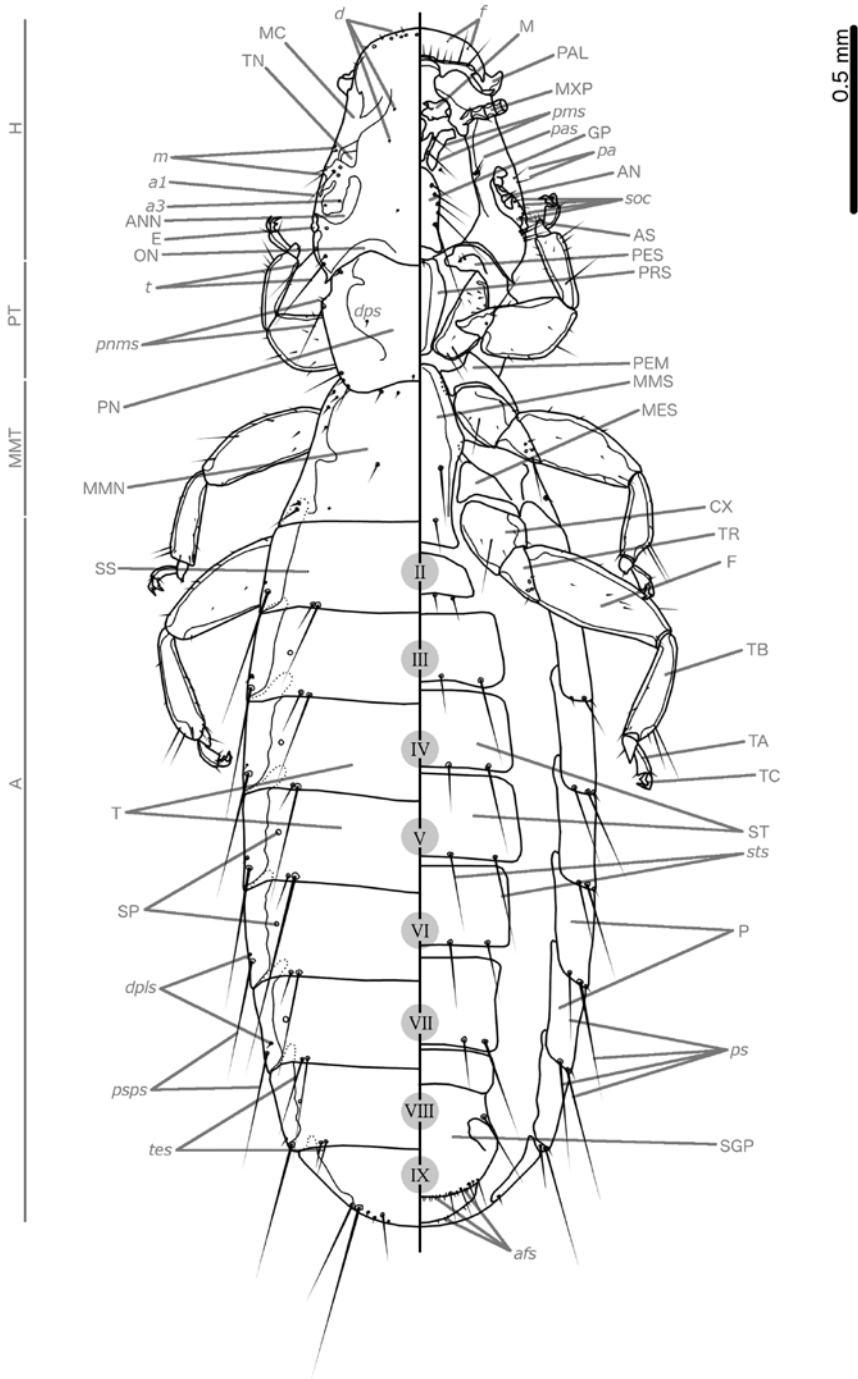


Figure 23. Female of *Ricinus fringillae* (Ricinidae). Lines on left-hand side delimit body parts.  
 Hona av *Ricinus fringillae* (Ricinidae). De grå linjerna till vänster betecknar de olika kroppsdelarna.

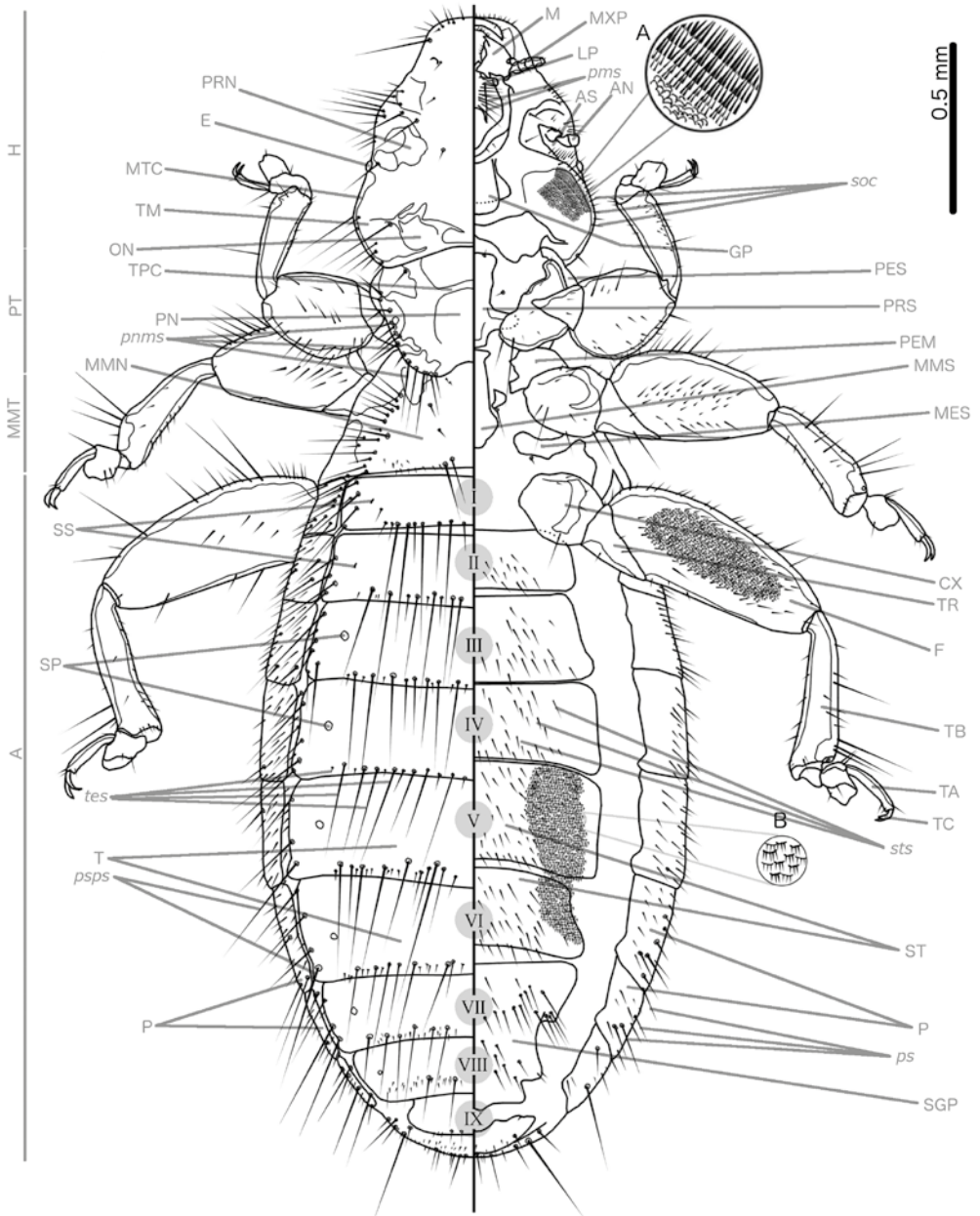


Figure 24. Male of *Laemobothrion* (*Laemobothrion*) *tinnunculi*. Lines on left-hand side delimit body parts. Inset A: structure of ventral microsetae on temples. Inset B: generalized structure of ventral microsetae of sternal plates V–VI and femur III.

Hane av *Laemobothrion* (*Laemobothrion*) *tinnunculi*. De grå linjerna till vänster betecknar de olika kroppsdelarna. Förstoring A: mikroborst på ventralsidan av postantennalhuvudet. Förstoring B: generaliserad bild av mikroborst på ventralsidan av femur III och sternalplattorna V–VI.

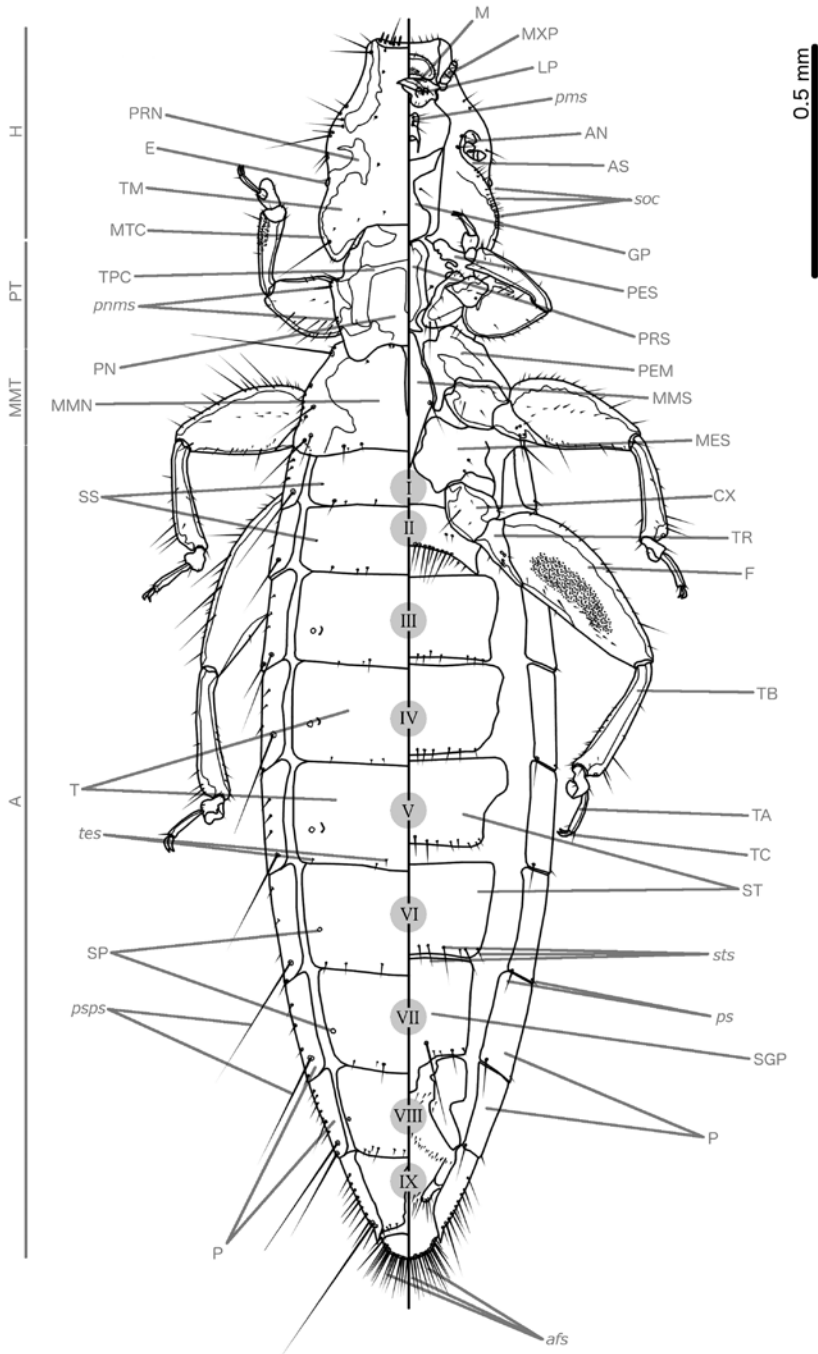


Figure 25. Female of *Laemobothrion (Eulaemobothrion) atrum* (Laemobothriidae). Lines on left-hand side delimit body parts. Hona av *Laemobothrion (Eulaemobothrion) atrum* (Laemobothriidae). De grå linjerna till vänster betecknar de olika kroppsdelarna.

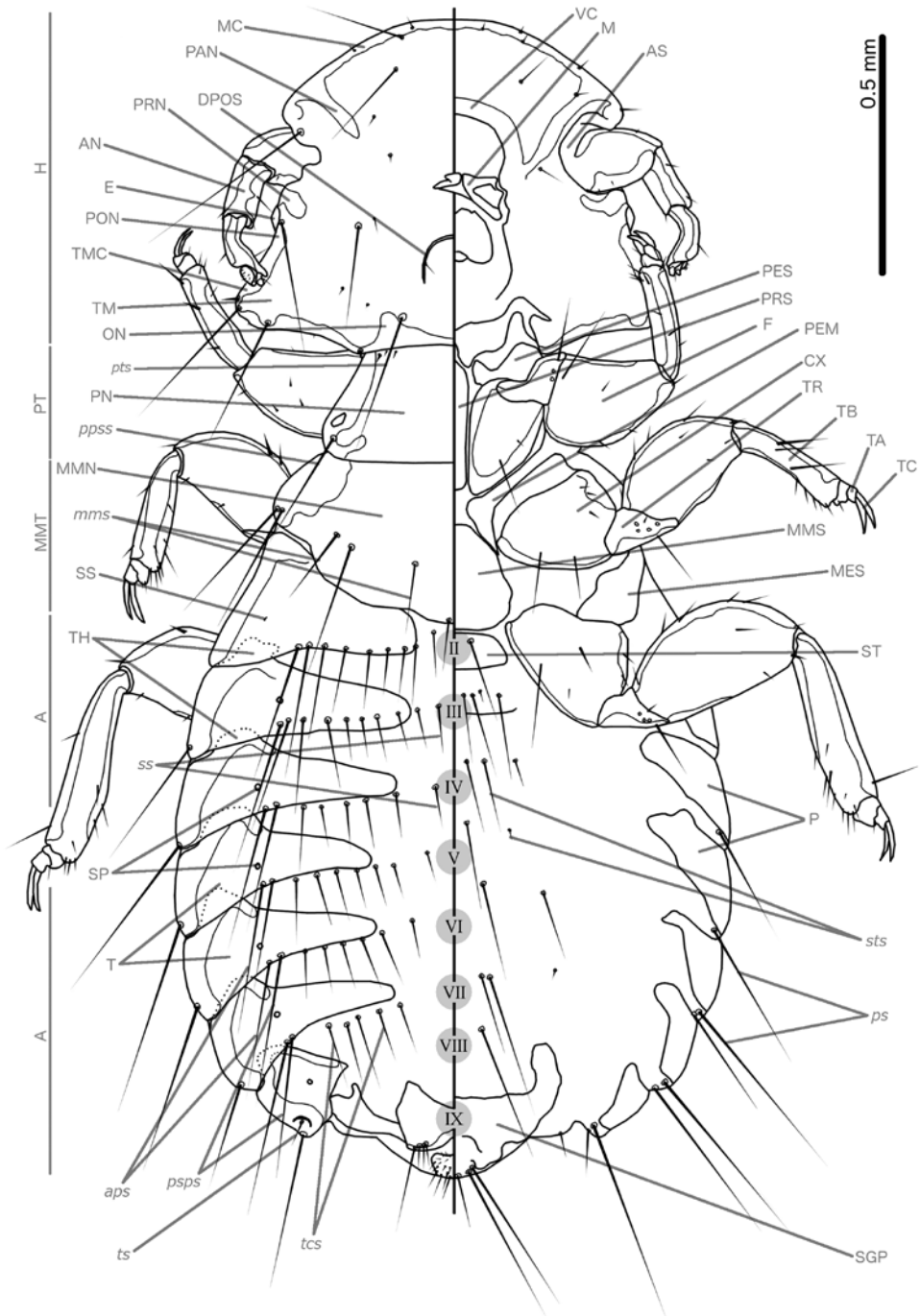


Figure 26. Male of *Coloceras damicorne* (Goniodidae). Lines on left-hand side delimit body parts.

Hane av *Coloceras damicorne* (Goniodidae). De grå linjerna till vänster betecknar de olika kroppsdelarna.



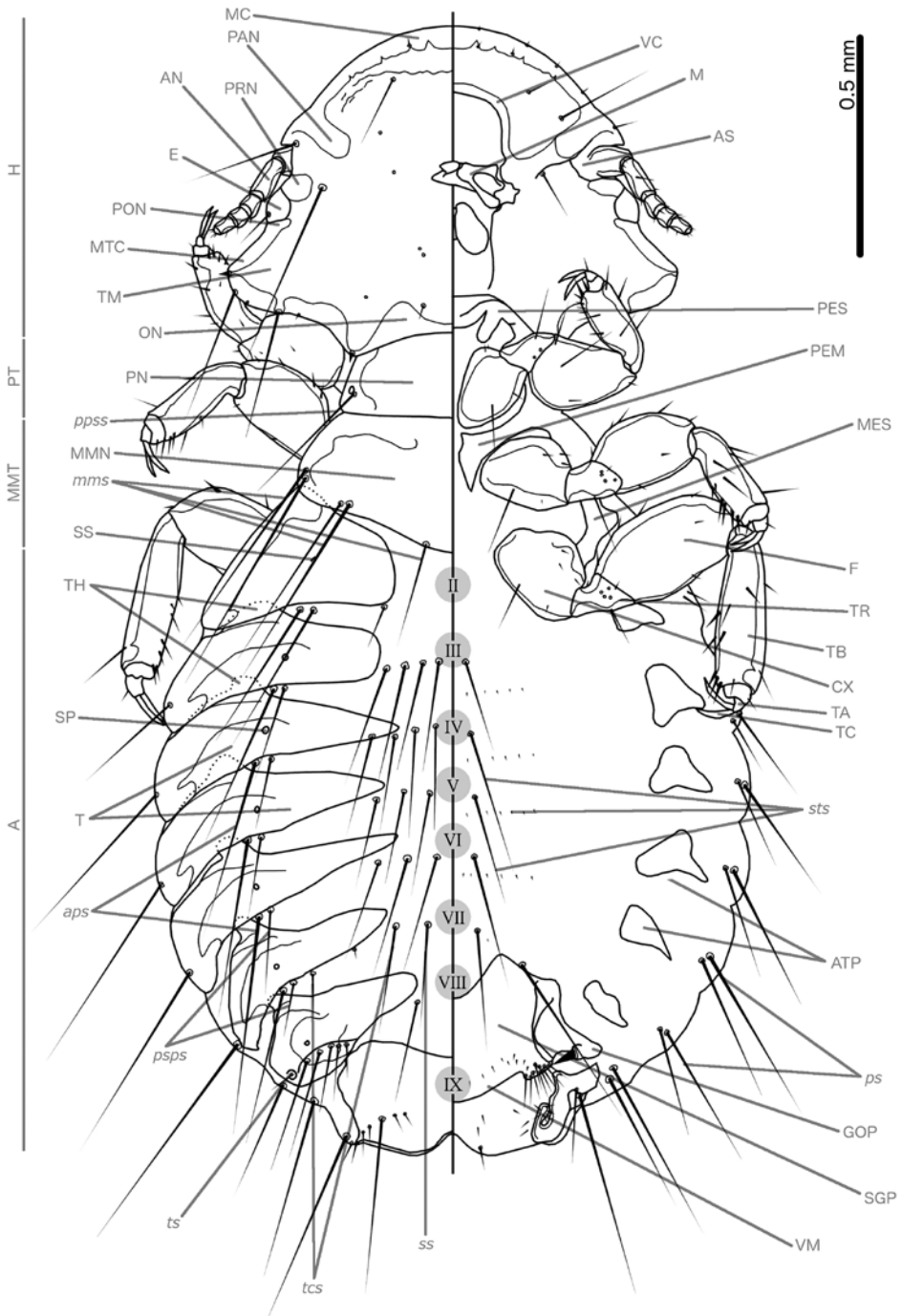


Figure 27. Female of *Goniodes lagopi* (Goniodidae). Lines on left-hand side delimit body parts.

Hona av *Goniodes lagopi* (Goniodidae). De grå linjerna till vänster betecknar de olika kroppsdelarna.

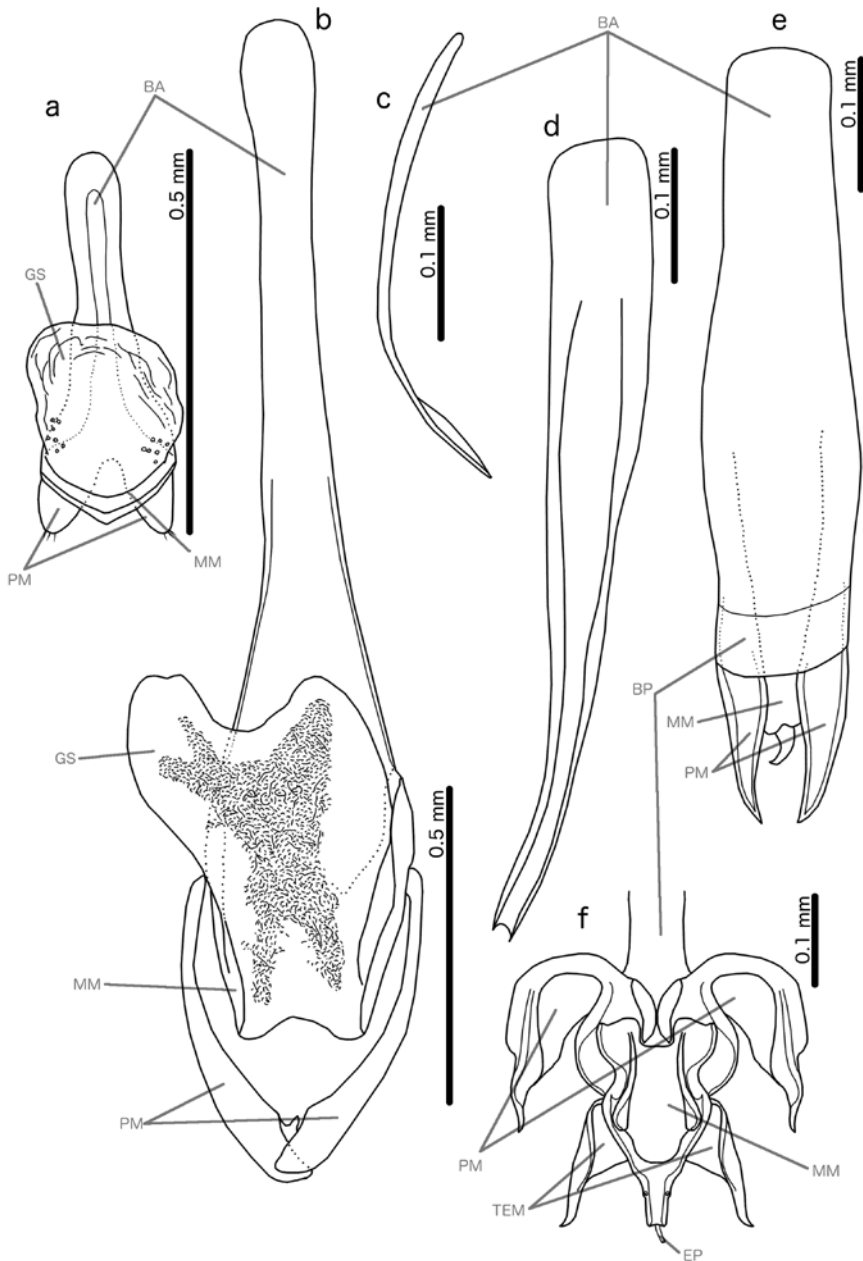


Figure 28. Male genitalia in Ricinidae, Laemobothriidae, and Goniodidae, dorsal views. – a) *Ricinus australis* (Ricinidae). – b) *Laemobothrion (Laemobothrion) tinnunculi* (Laemobothriidae). – c) *Campanulotes compar* (Goniodidae). – d) *Goniodes dispar* (Goniodidae). – e) *Goniocotes microthorax* (Goniodidae). – f) *Goniodes colchici* (Goniodidae), distal section.

Dorsala aspekter av hanliga genitalier hos Ricinidae, Laemobothriidae, och Goniodidae. – a) *Ricinus australis* (Ricinidae). – b) *Laemobothrion (Laemobothrion) tinnunculi* (Laemobothriidae). – c) *Campanulotes compar* (Goniodidae). – d) *Goniodes dispar* (Goniodidae). – e) *Goniocotes microthorax* (Goniodidae). – f) *Goniodes colchici* (Goniodidae), distala delen.

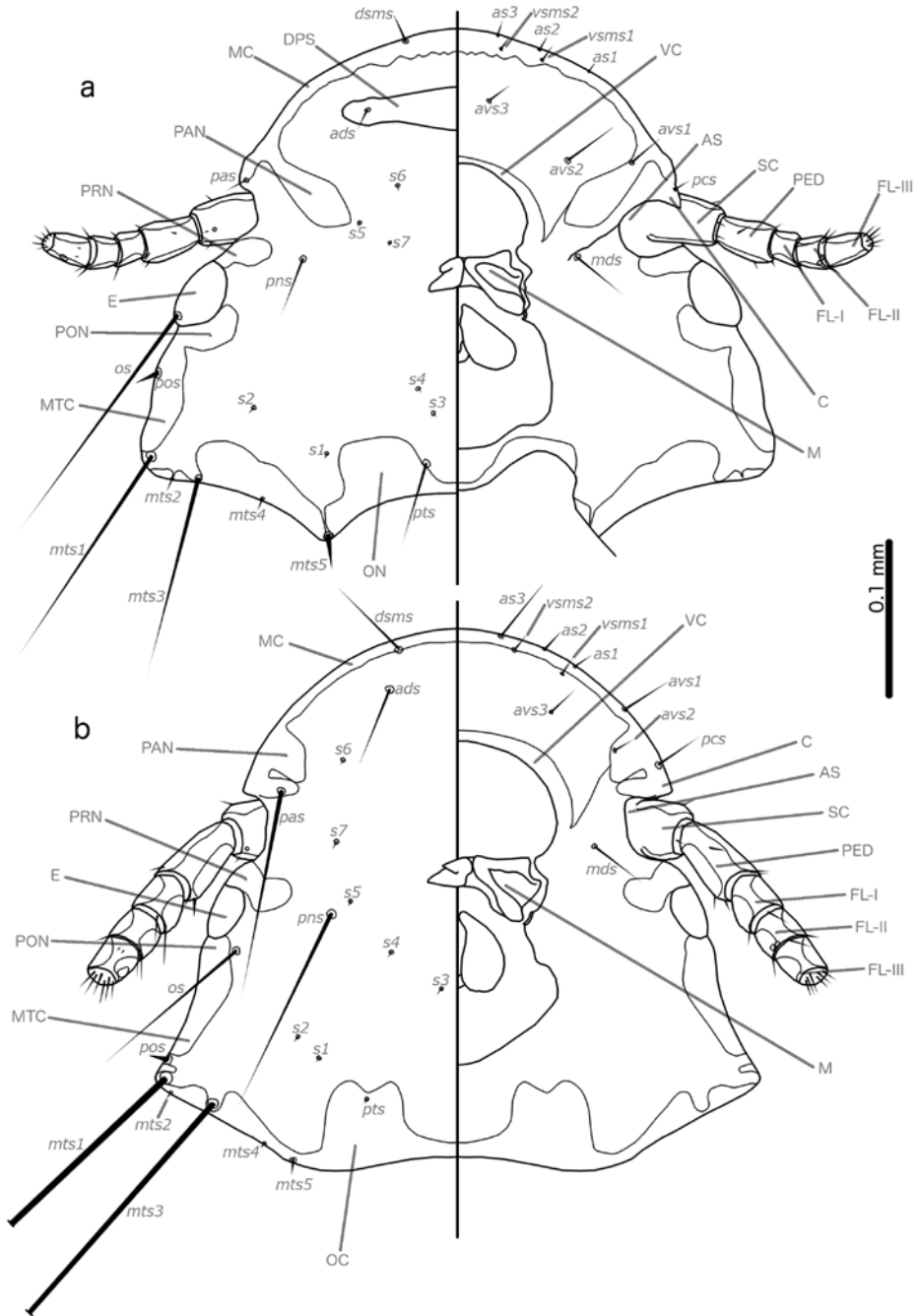


Figure 29. Head morphology in Goniodidae. – a) male *Gonicotes microthorax*. – b) male *Campanulotes compar*. Long setae cut off distally.

Huvudstruktur hos Goniodidae. – a) hane av *Gonicotes microthorax*. – b) hane av *Campanulotes compar*. Längre borst avkortade.

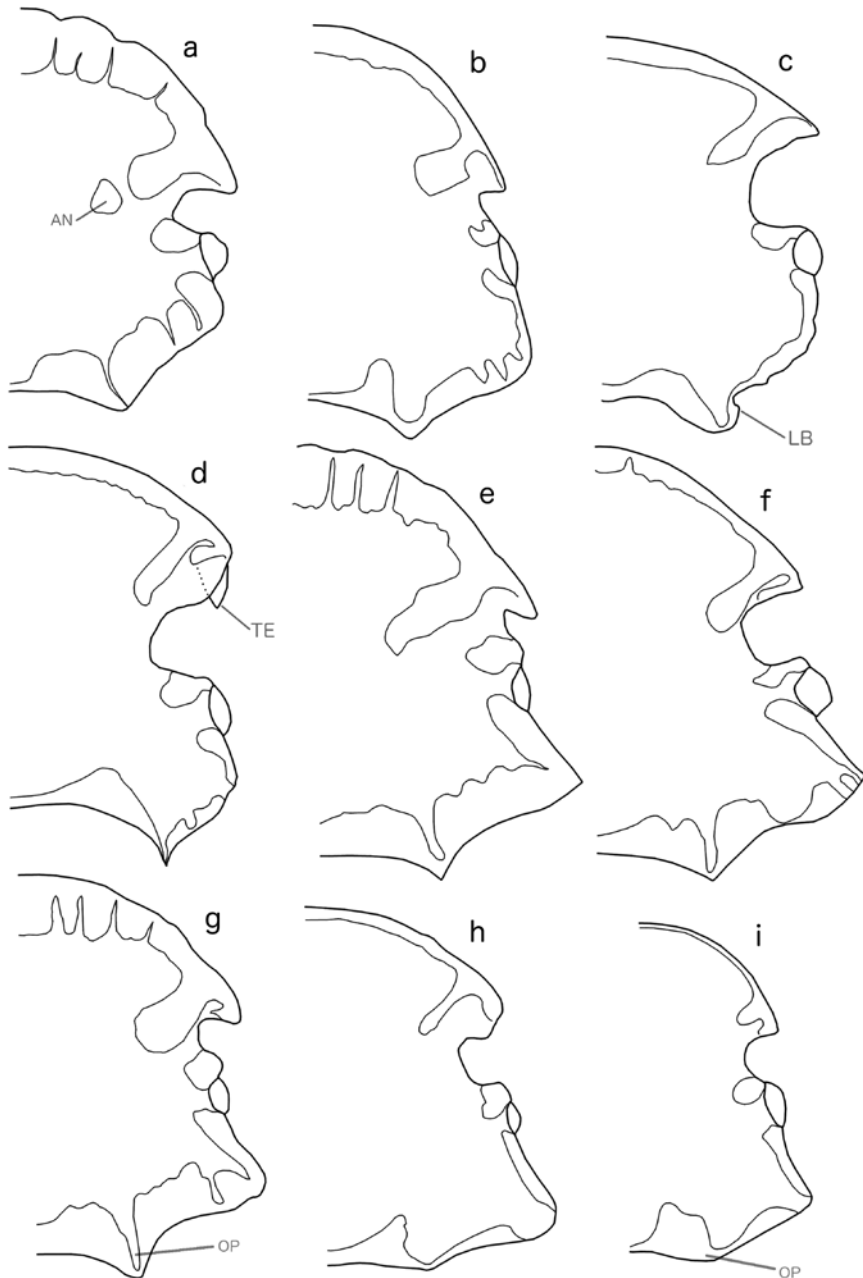


Figure 30. Outlines of male heads showing variation in carinae and nodi in Gonioidae. Illustrations are not to scale. – a) *Goniodes gigas*. – b) *Goniocotes chrysocephalus*. – c) *Goniodes bituberculatus*. – d) *Goniodes pavonis*. – e) *Goniodes dissimilis*. – f) *Goniodes dispar*. – g) *Goniodes colchici*. – h) *Coloceras damicorne*. – i) *Campanulotes compar*.

Huvudkonturer hos hanar inom Gonioidae, med skillnader i carinae och nodi. Illustrationerna är inte i samma skala. – a) *Goniodes gigas*. – b) *Goniocotes chrysocephalus*. – c) *Goniodes bituberculatus*. – d) *Goniodes pavonis*. – e) *Goniodes dissimilis*. – f) *Goniodes dispar*. – g) *Goniodes colchici*. – h) *Coloceras damicorne*. – i) *Campanulotes compar*.

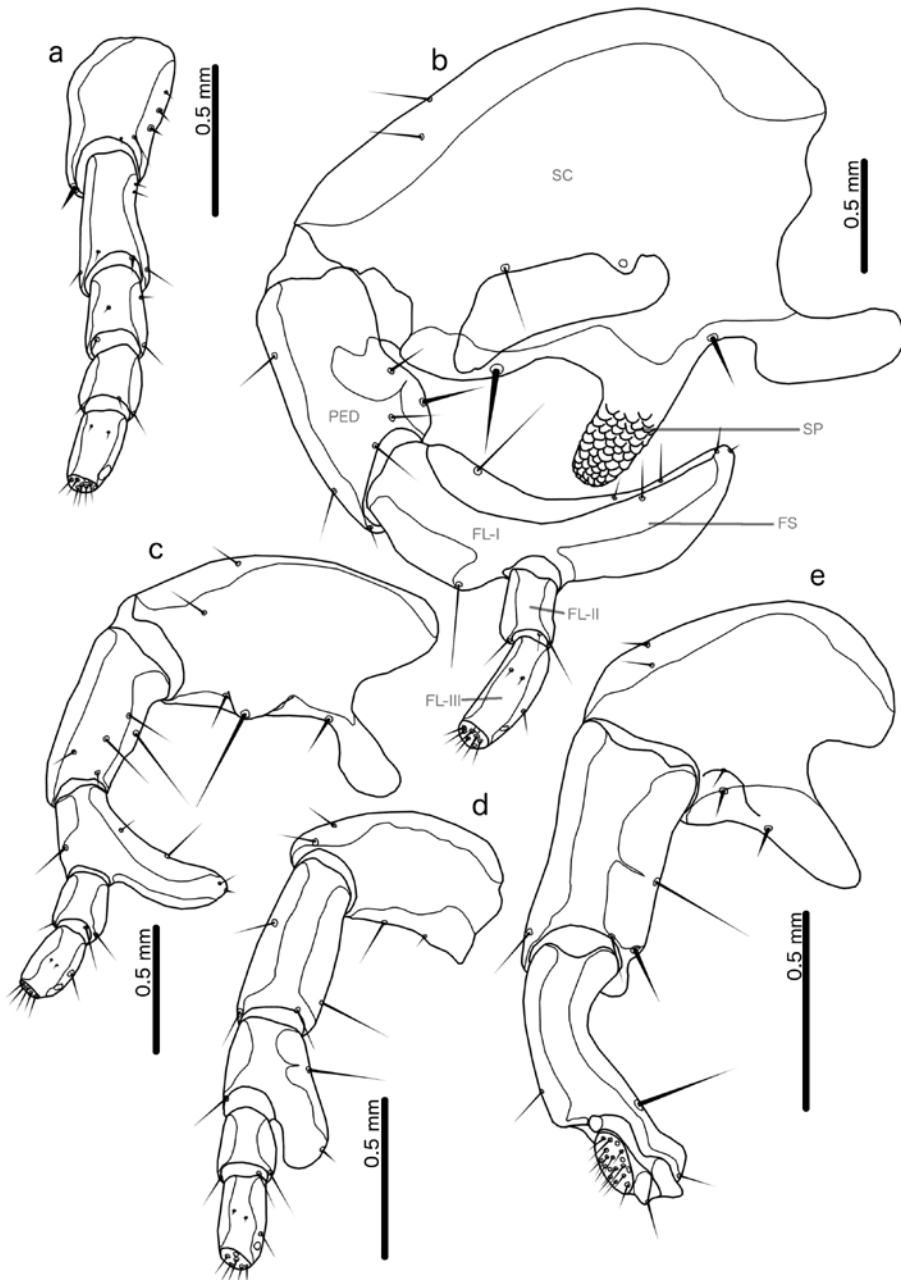


Figure 31. Sexually dimorphic antennae in Gonioididae, dorsal views. – a) female antenna of *Goniodes colchici* (female antennae similar in all species illustrated). – b) male antenna of *Goniodes pavonis*. – c) male antenna of *Goniodes lagopi*. – d) male antenna of *Goniodes dispar*. – e) male antenna of *Coloceras damicorne*.

Sexuella skillnader i antennerna inom Gonioididae, dorsala aspekter. – a) honlig antenn hos *Goniodes colchici* (honliga antennerna är snarlika hos alla arterna i figuren). – b) hanlig antenn hos *Goniodes pavonis*. – c) hanlig antenn hos *Goniodes lagopi*. – d) hanlig antenn hos *Goniodes dispar*. – e) hanlig antenn hos *Coloceras damicorne*.

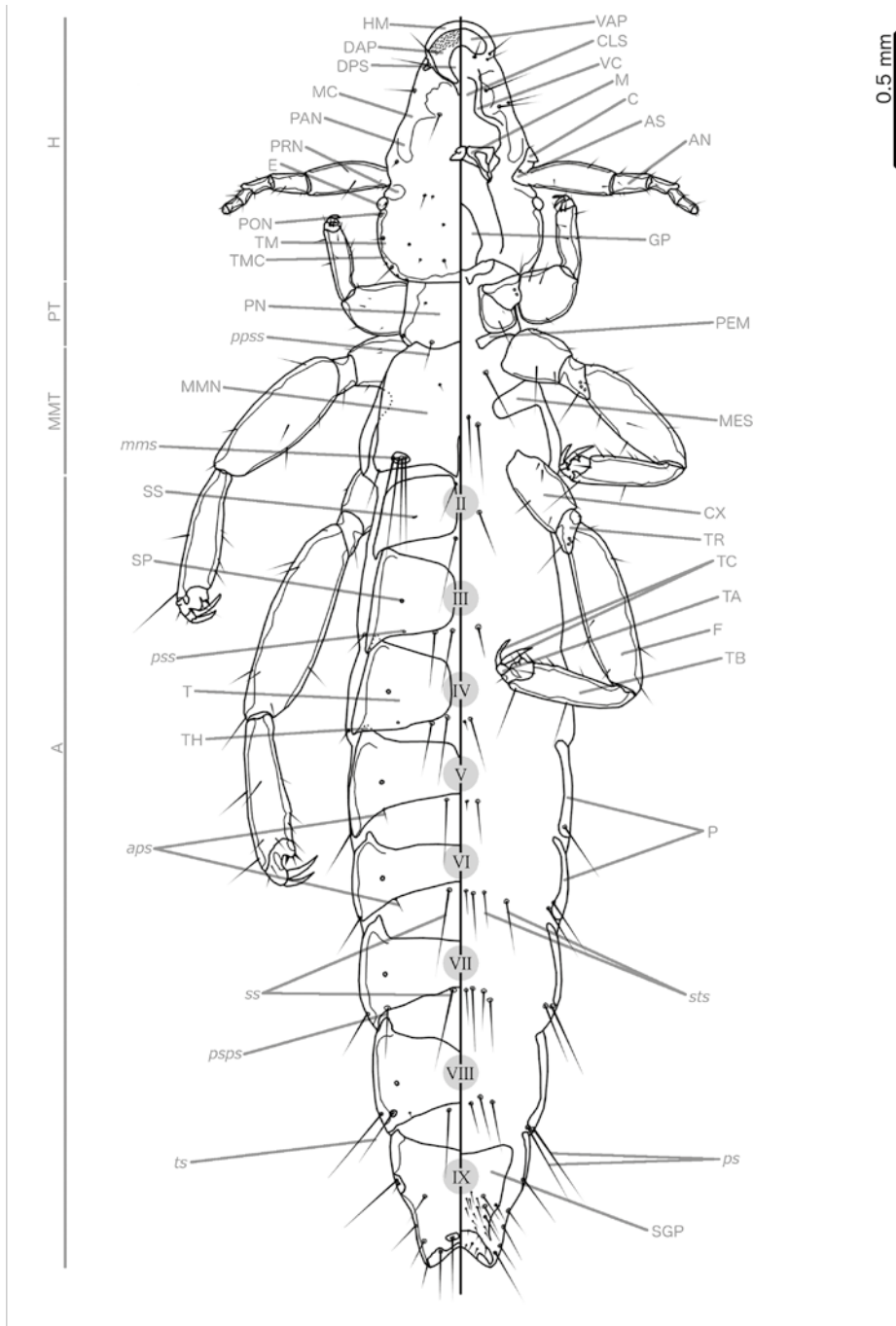


Figure 32. Male of *Ardeicola ciconiae* representing the *Esthiopterum*-complex. Lines on left-hand side delimit body parts. Hane av *Ardeicola ciconiae* som representerar *Esthiopterum*-komplexet. De grå linjerna till vänster betecknar de olika kroppsdelarna.

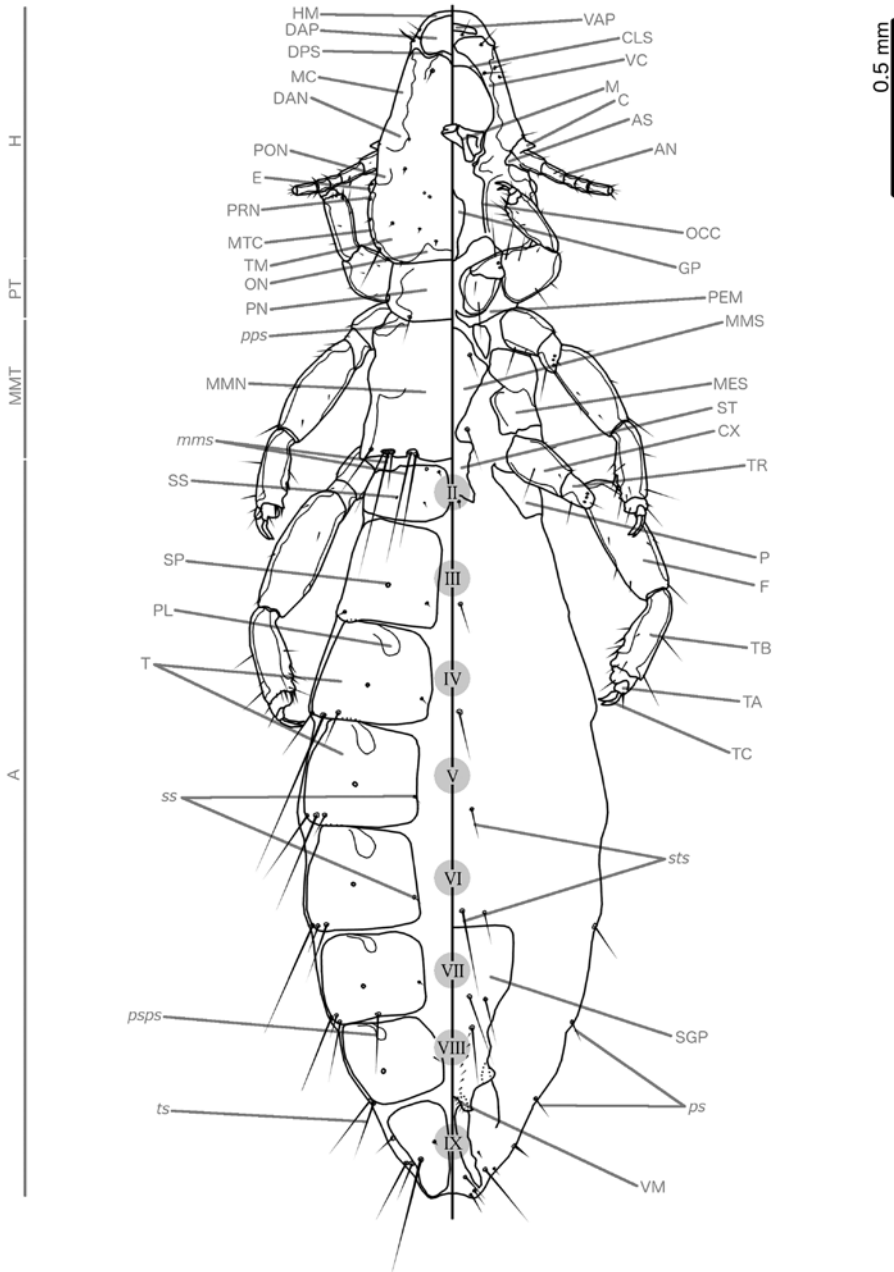


Figure 33. Female of *Anaticola mergiserrati*, representing the *Esthiopterum*-complex. Lines on left-hand side delimit body parts.

Hona av *Anaticola mergiserrati*, som representerar *Esthiopterum*-komplexet. De grå linjerna till vänster betecknar de olika kroppsdelarna.

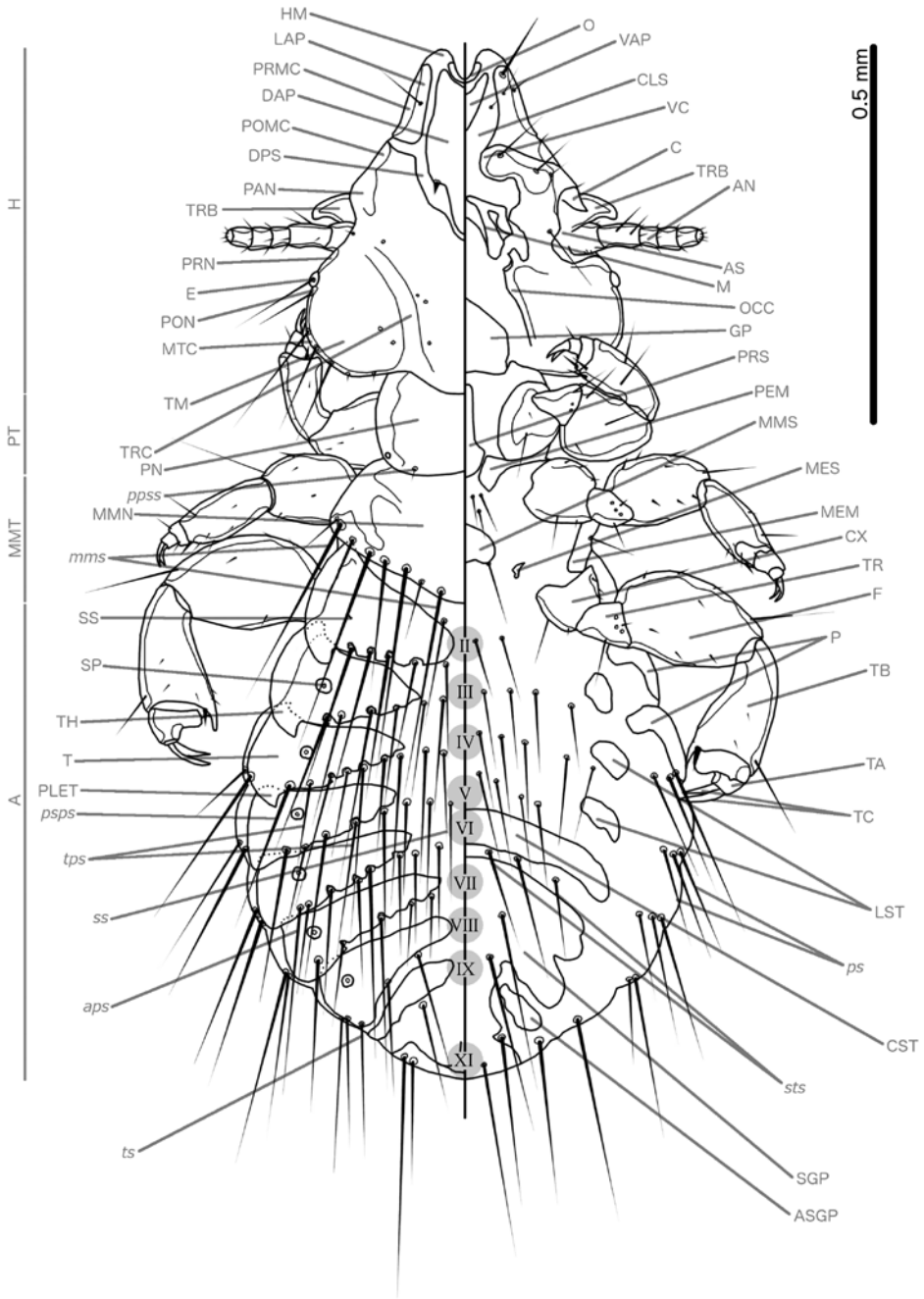


Figure 34. Male of *Philopterus excisus*, representing the *Philopterus*-complex. Lines on left-hand side delimit body parts. Hane av *Philopterus excisus*, som representerar *Philopterus*-komplexet. De grå linjerna till vänster betecknar de olika kroppsdelarna.



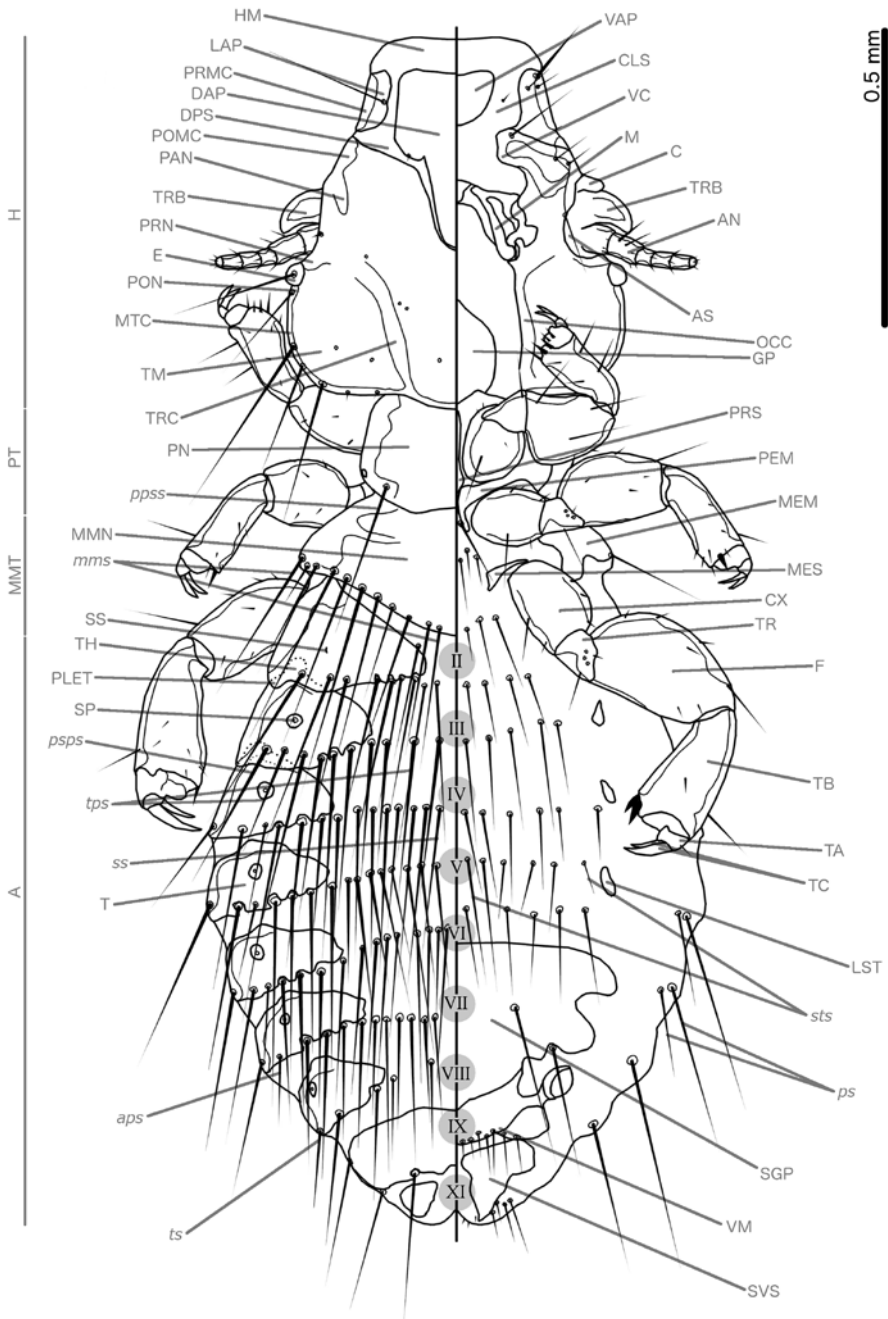


Figure 35. Female of *Philopterus bischoffi*, representing the *Philopterus*-complex. Lines on left-hand side delimit body parts. Hona av *Philopterus bischoffi*, som representerar *Philopterus*-komplexet. De grå linjerna till vänster betecknar de olika kroppsdelarna.



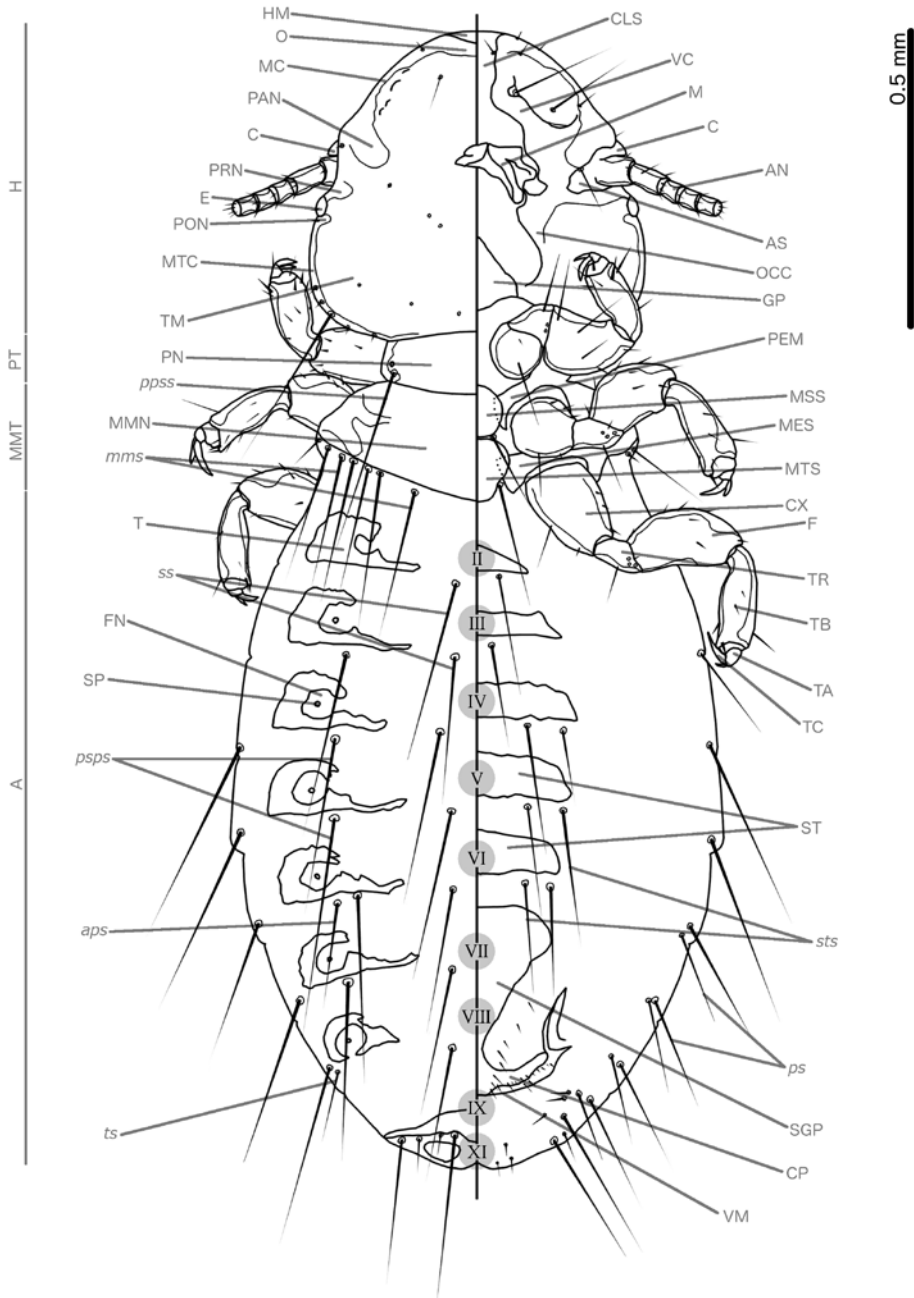


Figure 37. Female of *Corvonirmus uncinusus*, representing the *Brueelia*-complex. Lines on left-hand side delimit body parts. Hona av *Corvonirmus uncinusus*, som representerar *Brueelia*-komplexet. De grå linjerna till vänster betecknar de olika kroppsdelarna.

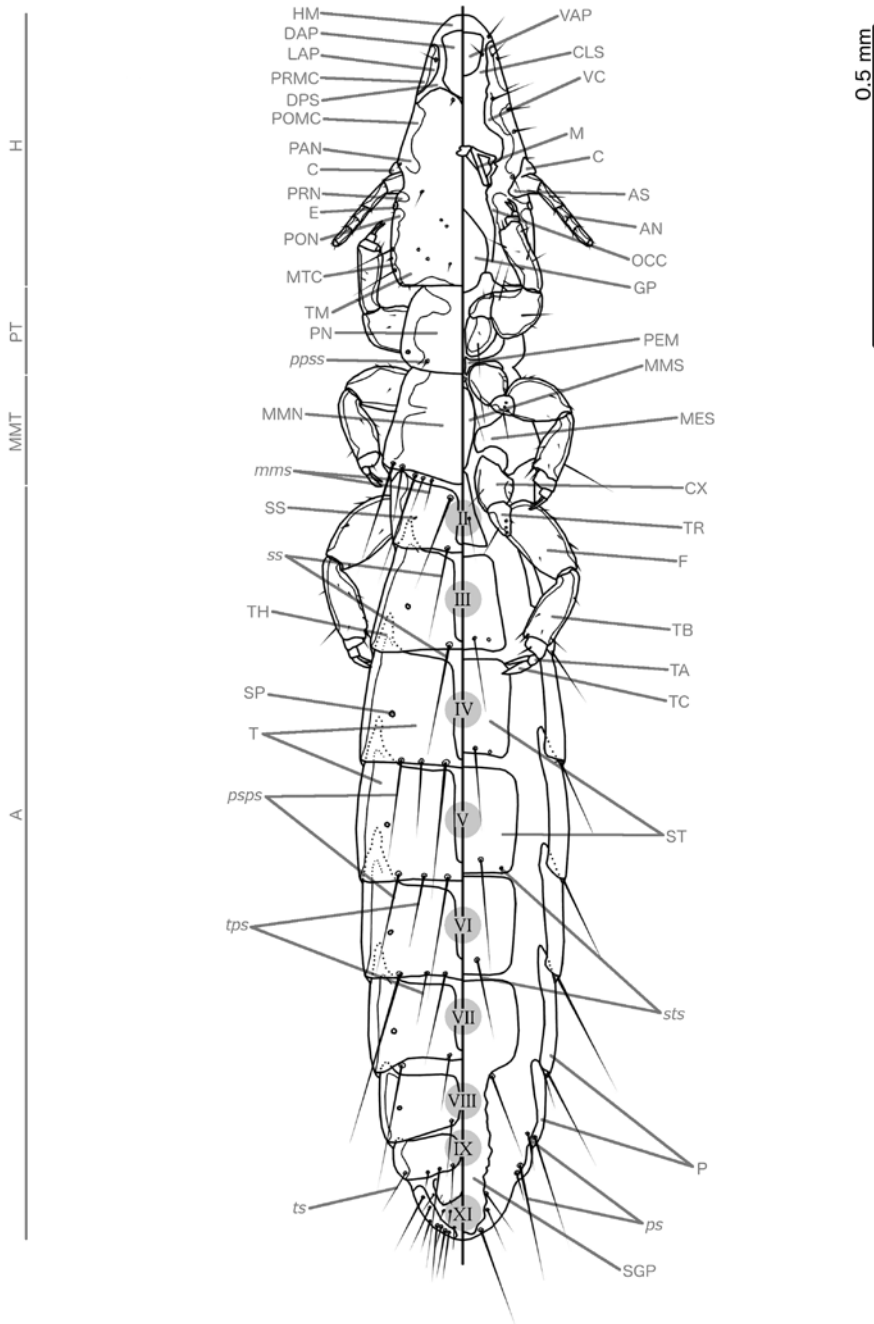


Figure 38. Male of *Quadraceps fissus*, representing the *Quadraceps*-complex. Lines on left-hand side delimit body parts. Hane av *Quadraceps fissus*, som representerar *Quadraceps*-komplexet. De grå linjerna till vänster betecknar de olika kroppsdelarna.

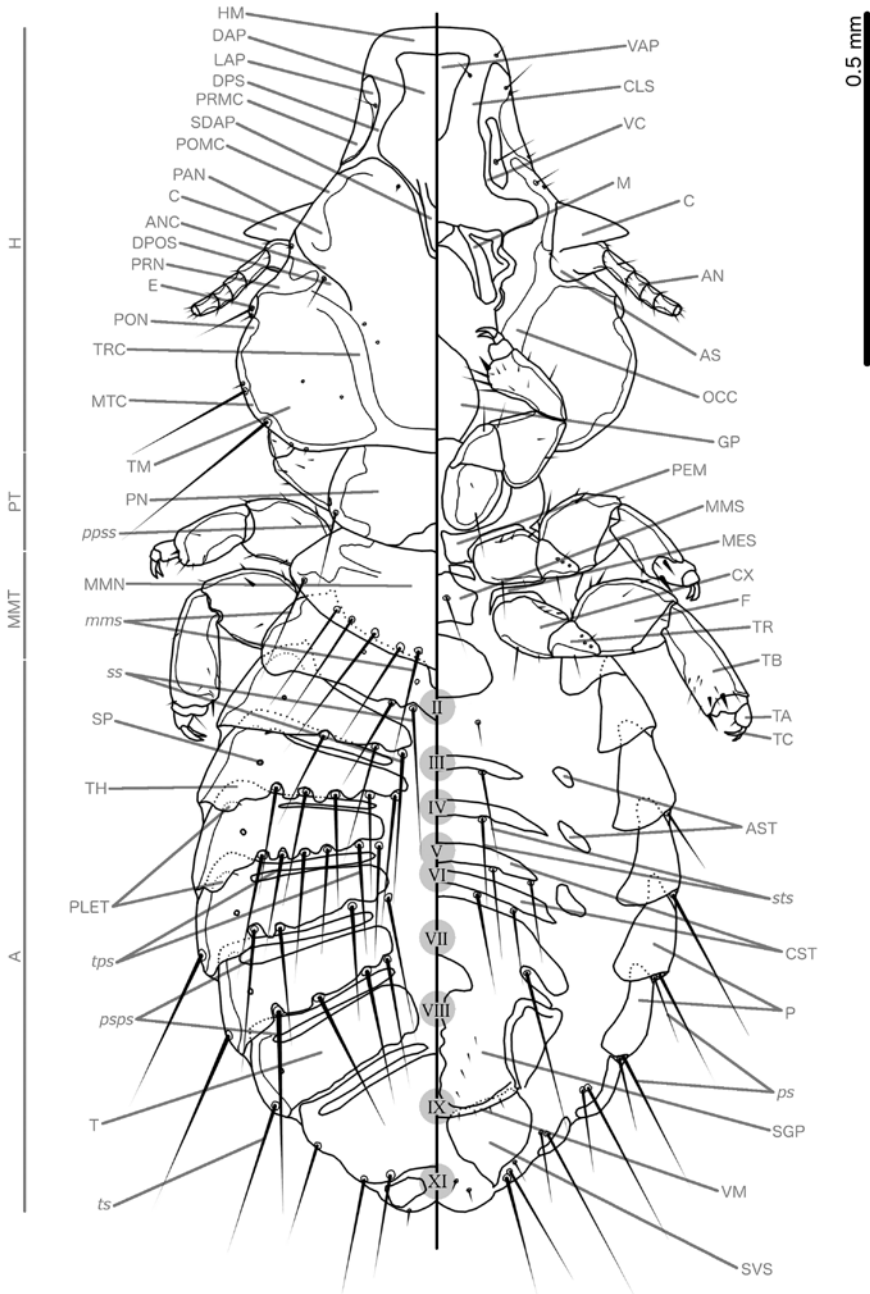


Figure 39. Female of *Saemundssonsonia lockleyi*, representing the *Quadriceps*-complex. Lines on left-hand side delimit body parts.

Hona av *Saemundssonsonia lockleyi*, som representerar *Quadriceps*-komplexet. De grå linjerna till vänster betecknar de olika kroppsdelarna.

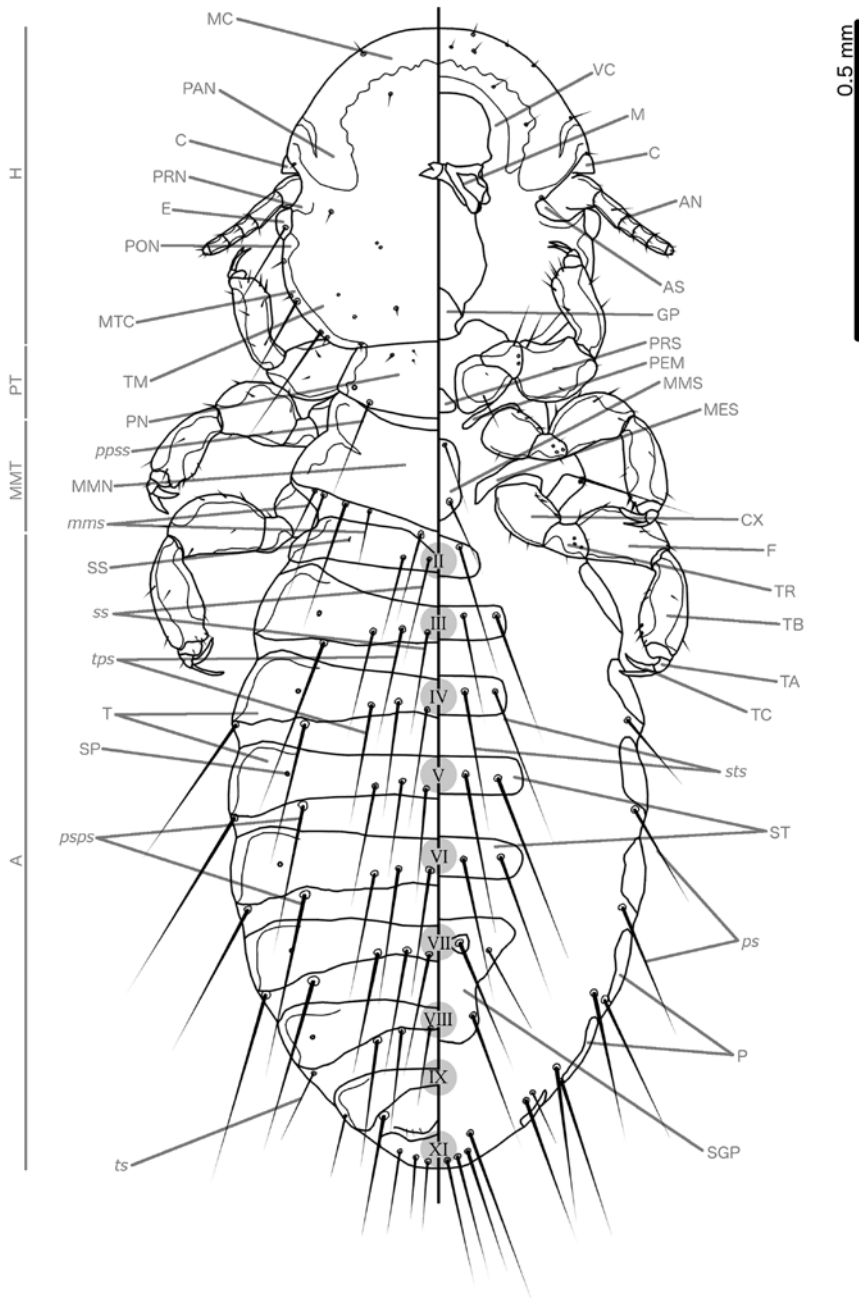


Figure 40. Male of *Degeeriella aquilarum*, representing the *Degeeriella*-complex. Lines on left-hand side delimit body parts. Hane av *Degeeriella aquilarum*, som representerar *Degeeriella*-komplexet. De grå linjerna till vänster betecknar de olika kroppsdelarna.

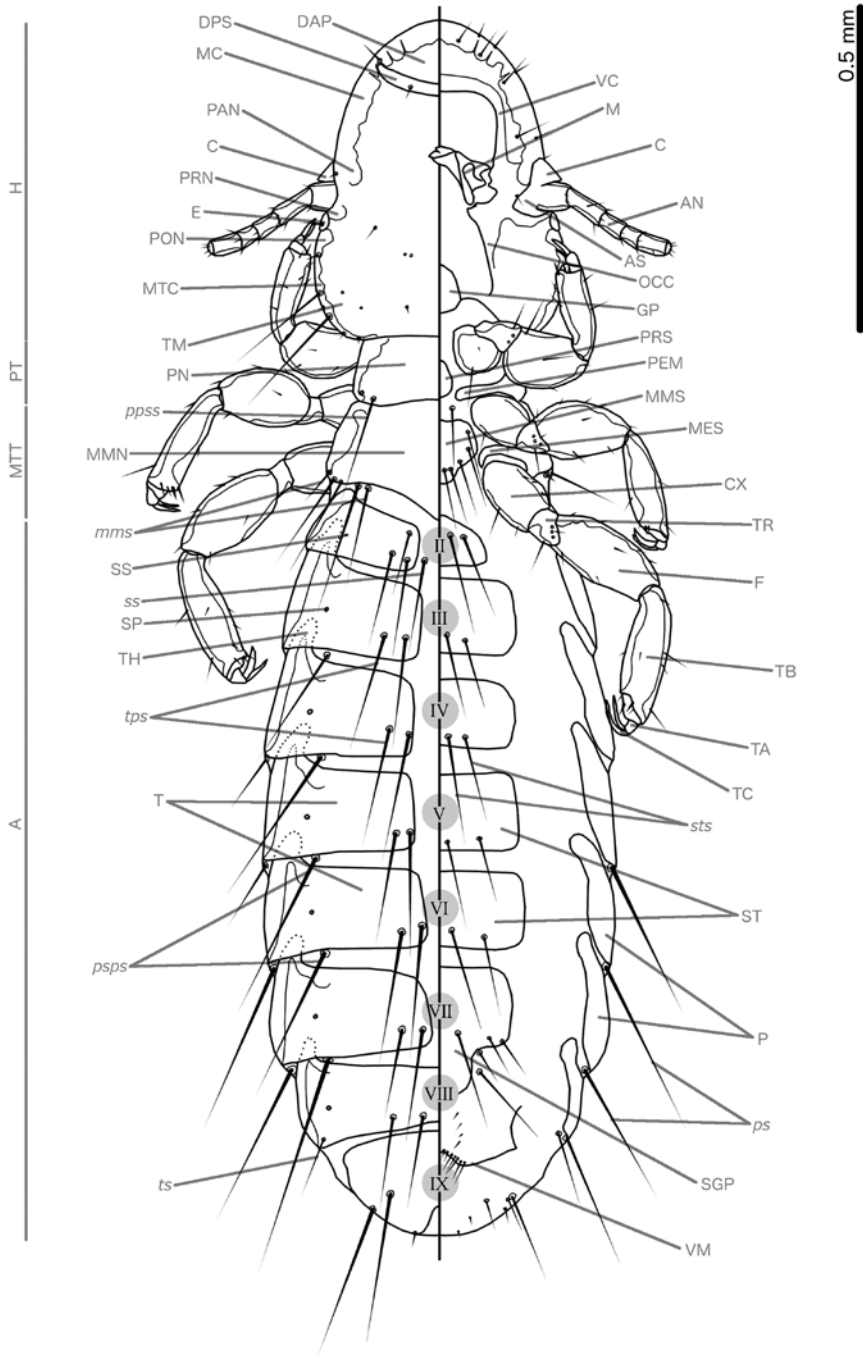


Figure 41. Female of *Cuculicola latirostris*, representing the *Degeeriella*-complex. Lines on left-hand side delimit body parts. Hona av *Cuculicola latirostris*, som representerar *Degeeriella*-komplexet. De grå linjerna till vänster betecknar de olika kroppsdelarna.

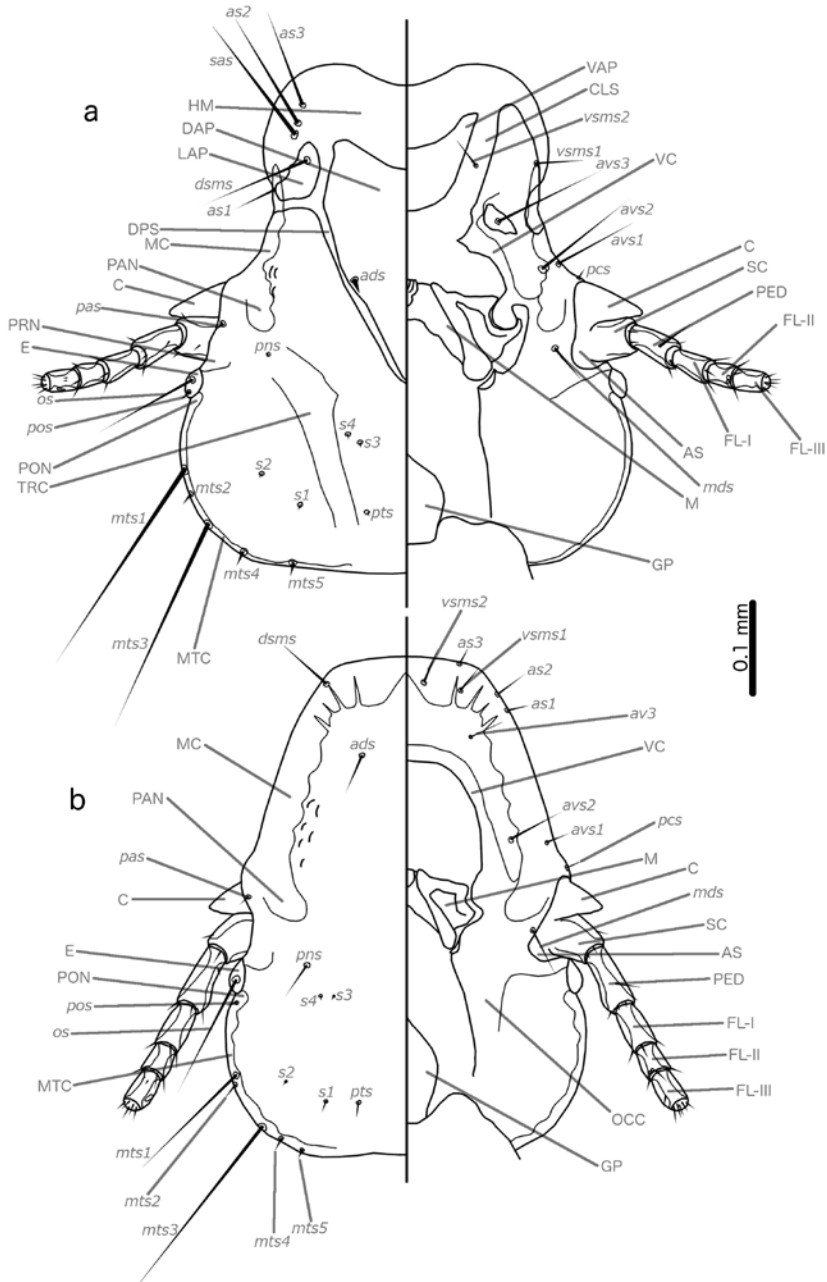


Figure 42. Head morphology and chaetotaxy in Philopteridae. – a) male *Cuculoecus latifrons*, a non-circumfasciate species in which the marginal and ventral carinae are broken medially. – b) male *Degeeriella regalis*, a circumfasciate species in which the marginal and ventral carinae completely encircle the preantennal area.

Huvudmorfologi och borstnomenklatur hos Philopteridae. – a) hane av *Cuculoecus latifrons*, en icke-circumfasciat art hos vilken marginalcarinan och ventralcarinan är avbrutna medialt. – b) hane av *Degeeriella regalis*, en circumfasciat art hos vilken ventralcarinan och marginalcarinan bildar en komplett "cirkel" kring preantennalområdet.



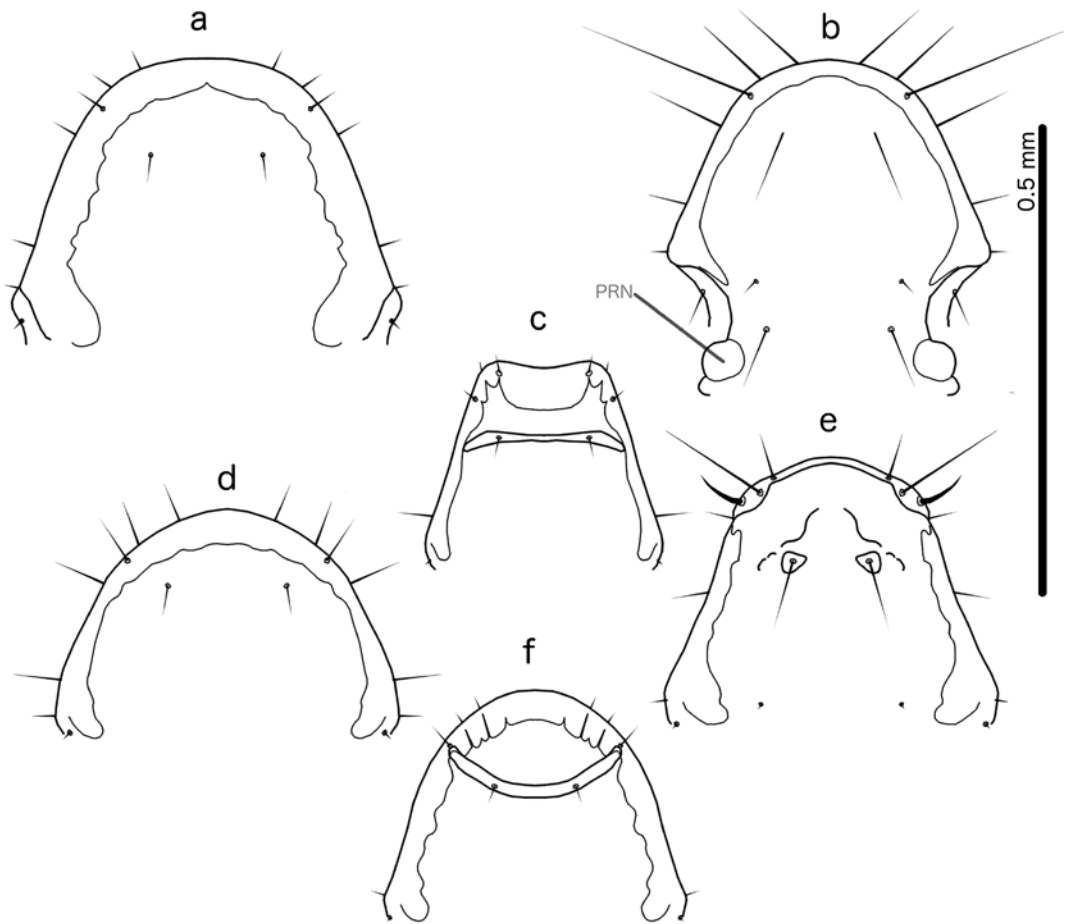


Figure 43. Variation in preantennal structure in Philopterae, dorsal views.

Variation i preantennalområdet hos Philopterae; samtliga bilder visar dorsal aspekt.

– a) *Degeeriella vagans*. – b) *Lipeurus maculosus*. – c) *Rhynonirmus scolopacis*. – d) *Rhynonirmus helvolus*. – e) *Anaticola rubromaculata*. – f) *Cuculicola latirostris*.

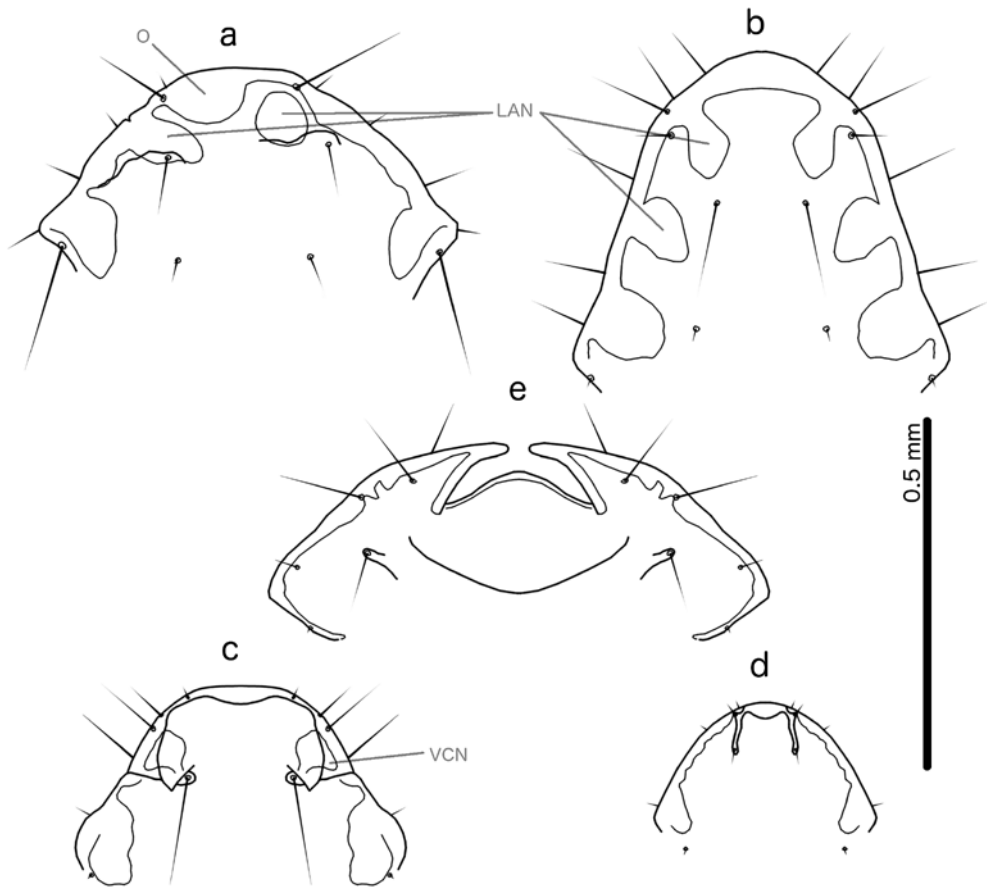


Figure 44. Variation in preantennal structure in Philopteridae, dorsal views.

Variation i preantennalområdet hos Philopteridae; samtliga bilder visar dorsal aspekt.

– a) *Struthiolepeurus struthionis*. – b) *Falcollepeurus suturalis*. – c) *Neophilopterus incompletus*. – d) *Guimaraesiella marginata*. – e) *Ornithobius bucephalus*.

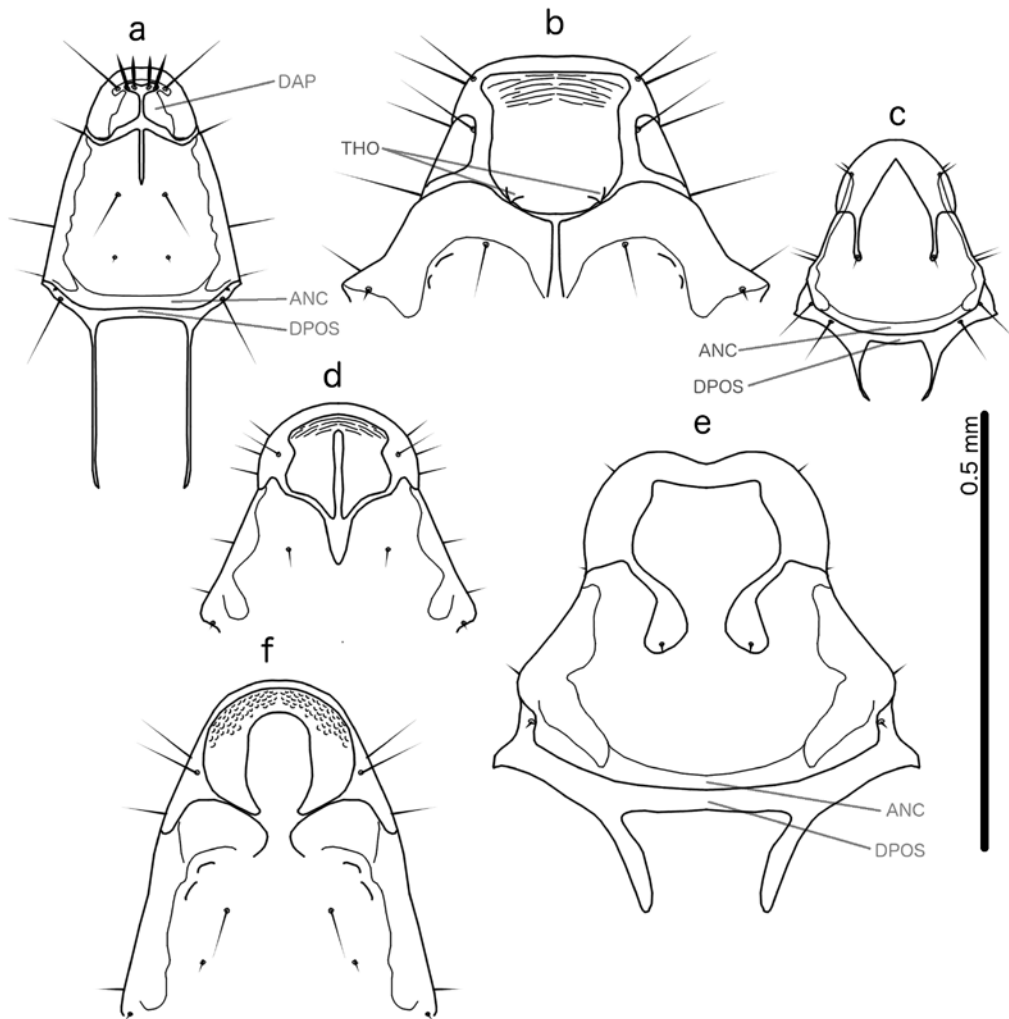


Figure 45. Variation in preantennal structure in Philopteridae, dorsal views.

Variation i preantennalområdet hos Philopteridae; samtliga bilder visar dorsal aspekt.

– a) *Columbicola columbae*. – b) *Pectinopygus bassani*. – c) *Carduiceps zonarius*. – d) *Fulicoffula lurida*. – e) *Craspedonirmus colymbinus*. – f) *Ardeicola ardeae*.

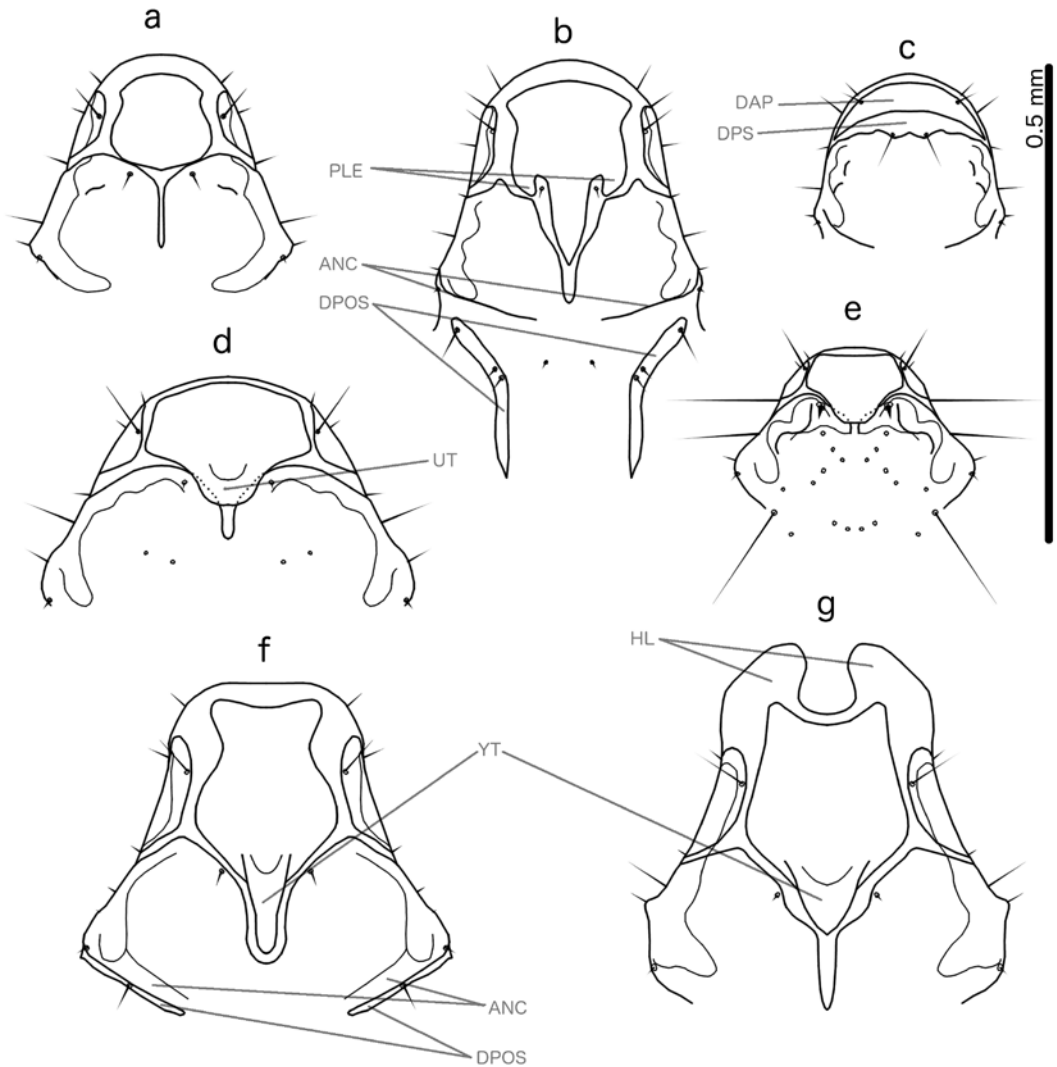


Figure 46. Variation in preantennal structure in Philopteridae, dorsal views.

Variation i preantennalområdet hos Philopteridae; samtliga bilder visar dorsal aspekt.

– a) *Quadriceps strepsilaris*. – b) *Quadriceps signatus*. – c) *Luniceps actophilus*. – d) *Cirrophthirius recurvirostrae*. – e) *Quadriceps decipiens*. – f) *Saemundssonina (Saemundssonina) sternae*. – g) *Incidifrons transpositus*.

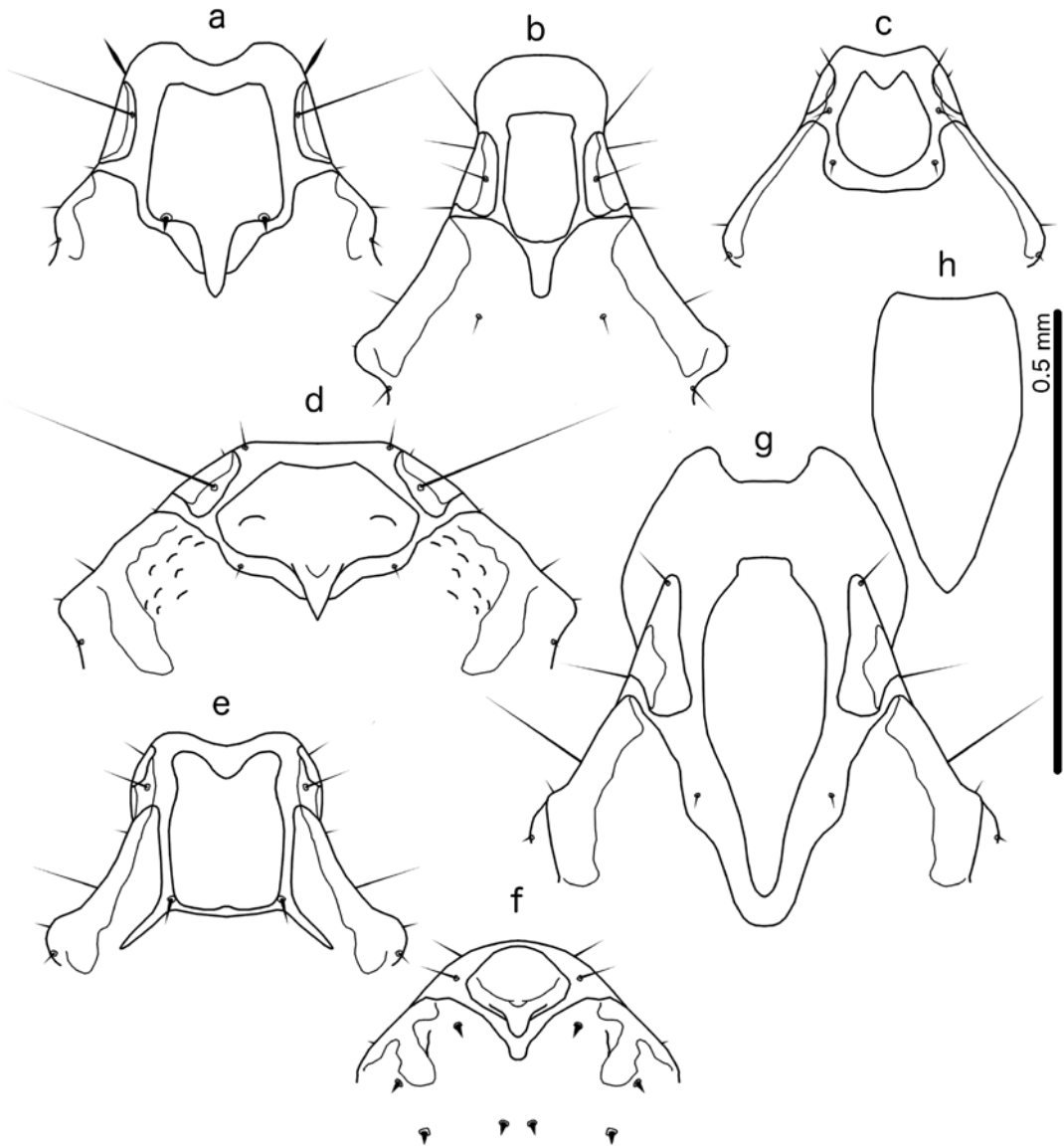


Figure 47. Variation in preantennal structure in Philopteridae, dorsal views.

Variation i preantennalområdet hos Philopteridae; samtliga bilder visar dorsal aspekt.

– a) *Philopterus fringillae*. – b) *Strigiphilus rostratus*. – c) *Rostrinirmus ruficeps*. – d) *Strigiphilus ceblebrachys*. – e) *Sturnidoecus sturni*. – f) *Anatoecus cygni*. – g) *Craspedorrhynchus melittoscopus*. – h) dorsal anterior plate of *Craspedorrhynchus platystomus*.

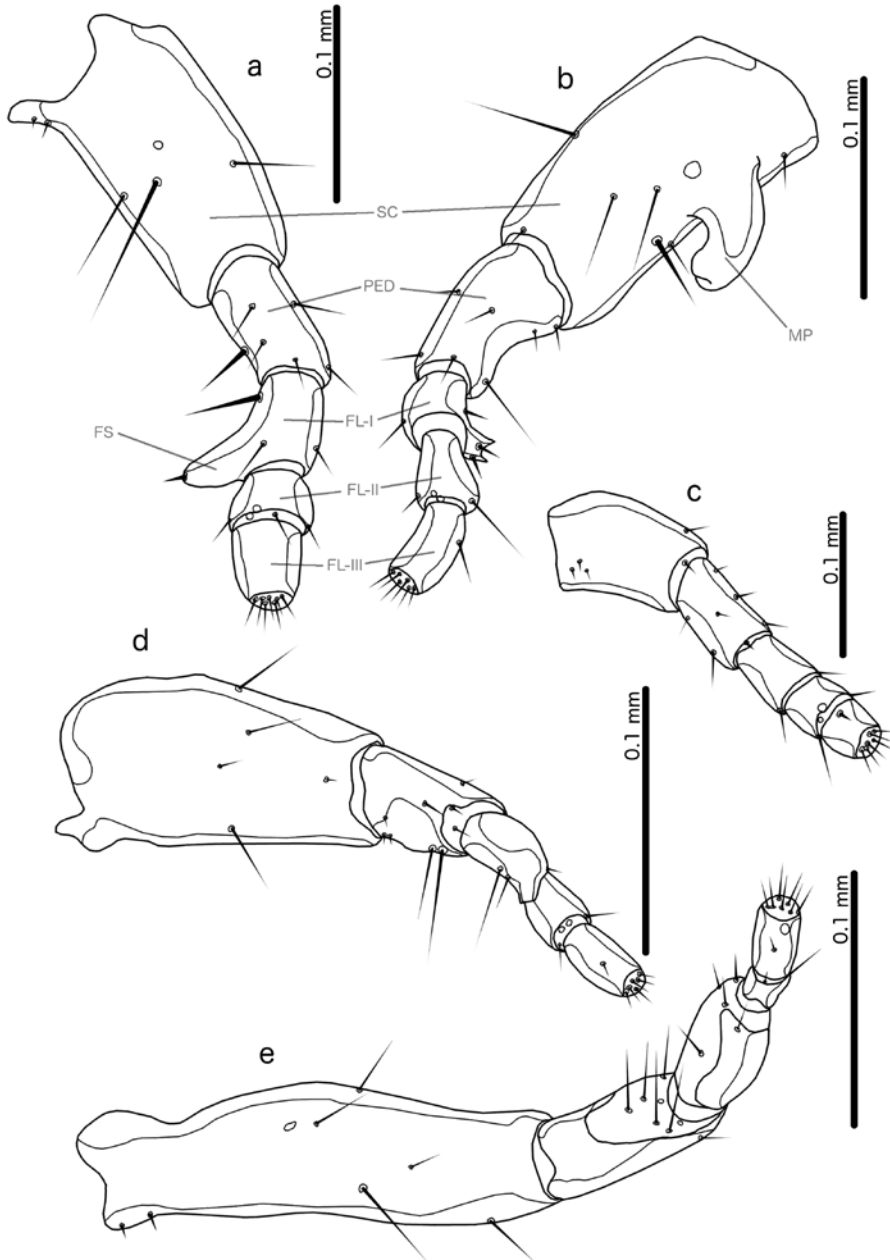


Figure 48. Male antennae in Philopteridae. Female antennae in all illustrated species similar to Fig. 31a. – a) *Strigiphilus heterocerus*, ventral view. – b) *Lipeurus maculosus*, ventral view. – c) *Corvonirmus uncinus*, ventral view. – d) *Cuclotogaster heterographus*, dorsal view. – e) *Pectinopygus gyricornis*, ventral view.

Hanliga antennerna hos grupper av Philopteridae där antennerna är sexuellt dimorfa. Honliga antennerna är hos alla avbildade arterna snarlika de i Fig. 31a. – a) ventral aspekt av *Strigiphilus heterocerus*. – b) ventral aspekt av *Lipeurus maculosus*. – c) ventral aspekt av *Corvonirmus uncinus*. – d) dorsal aspekt av *Cuclotogaster heterographus*. – e) ventral aspekt av *Pectinopygus gyricornis*.

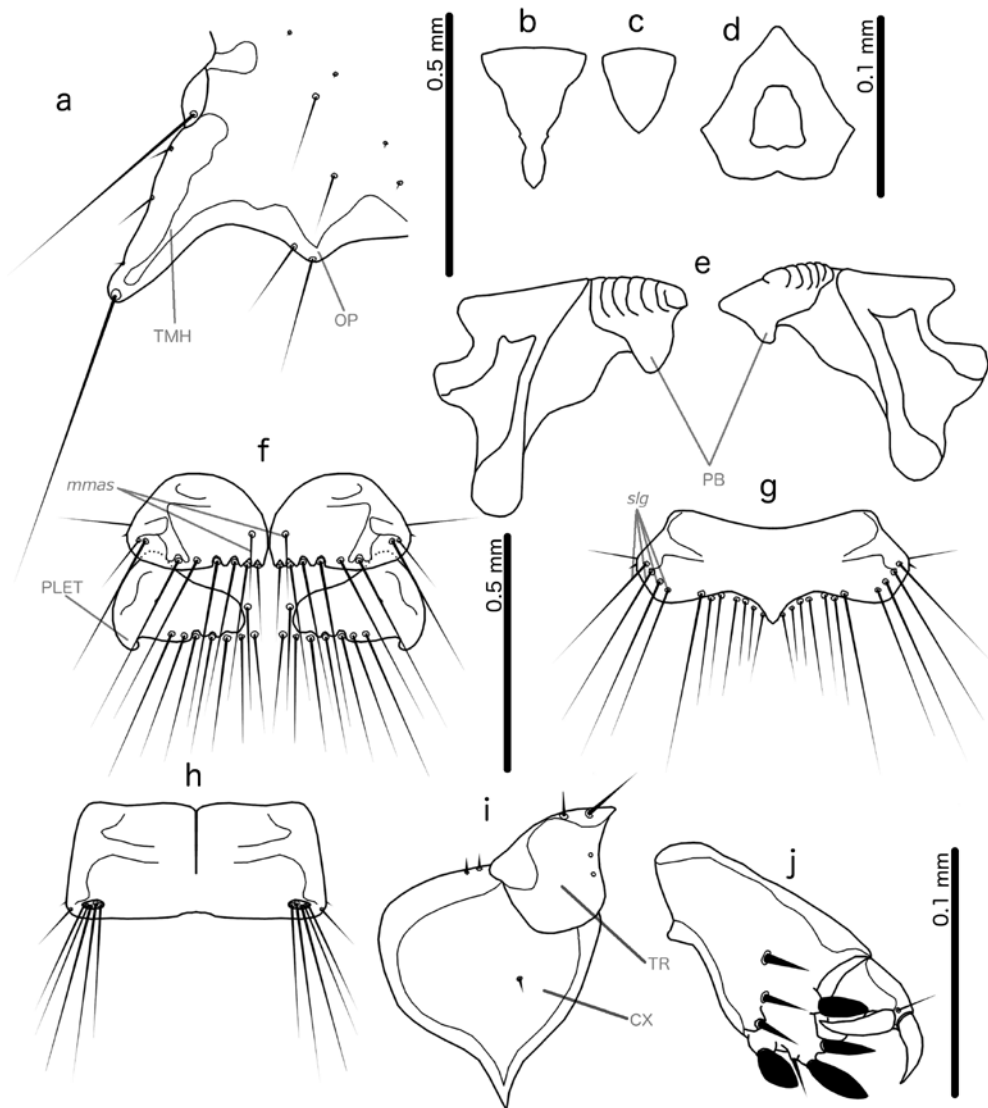


Figure 49. Morphological variation within Philopteridae. – a) temporal margin of *Chelopistes meleagridis*. – b) ventral anterior plate of *Lunaceps rothkoi*. – c) ventral anterior plate of *Lunaceps falcinellus*. – d) gular plate of *Quadraceps charadrii*, with central translucent fenestra. – e) mandibles of *Saemundssonina lari*, separated for clarity. – f) pteronotum medianly divided as in *Cuculoecus latifrons*, and tergopleurite II with postero-lateral hook-like extensions. – g) pteronotum of *Strigiphilus remotus*. – h) pteronotum of *Pectinopygus bassani*. – i) coxa I and trochanter I of *Austrogoniodes demersus*. – j) tibia III and tarsi III of *Austrogoniodes demersus*.

Morfologisk variation inom Philopteridae. – a) ytterkant av postantennalområdet hos *Chelopistes meleagridis*. – b) ventrala frontplattan hos *Lunaceps rothkoi*. – c) ventrala frontplattan hos *Lunaceps falcinellus*. – d) gularplattan hos *Quadraceps charadrii*, med central fenestrat genomskinligt. – e) mandibler hos *Saemundssonina lari*, separerade för tydlighets skull, i verkligheten överlappande. – f) medial delat pteronotum och tergopleurite II med postero-laterala krokar hos *Cuculoecus latifrons*. – g) pteronotum hos *Strigiphilus remotus*. – h) pteronotum hos *Pectinopygus bassani*. – i) coxa I och trochanter I hos *Austrogoniodes demersus*. – j) tibia III och tarsi III hos *Austrogoniodes demersus*.

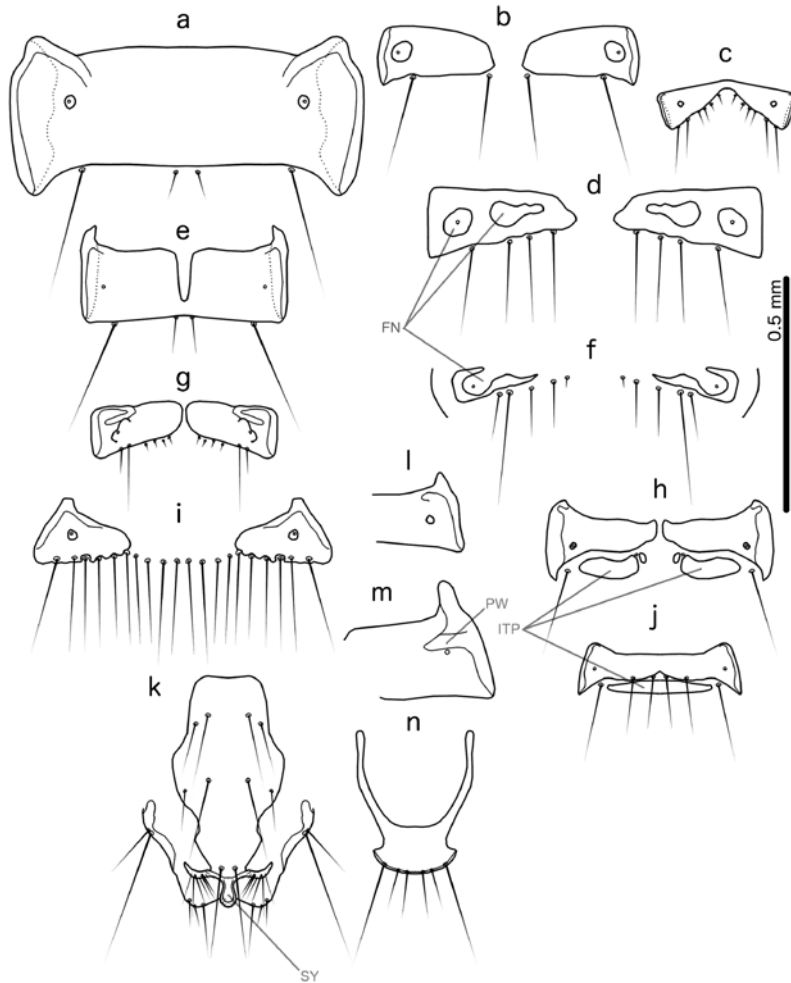


Figure 50. Tergopleurites and subgenital plates in Philopteridae. All tergopleurites in dorsal view, all subgenital plates in ventral view. – a) continuous and not indented in *Pectinopygus bassani*. – b) medially separated, with fenestrae in *Corvonirmus argulus*. – c) medially continuous, concave posteriorly in *Carduceps meinertzhageni*. – d) medially separated, with two fenestrae in *Hecatrishula varia*. – e) continuous and medially indented in *Quadraceps hospes*. – f) much reduced in *Corvonirmus uncinus*. – g) medially separated, roughly rectangular in *Brueelia nebulosa*. – h) paired intertergal sclerites in *Anaticola mergiserrati*. – i) medially separated, triangular in *Philopterus fringillae*. – j) medially continuous intertergal sclerite in *Rhynonirmus scolopacis*. – k) terminalia of male *Oxylipeurus tetraonis*, ventral view. – l) pleural thickening of *Quadraceps houri*. – m) pleural thickening of *Quadraceps normifer*. – n) antero-lateral extensions of male subgenital plate in *Anatoecus dentatus*, ventral view.

Tergopleuriter och subgenitalplattor hos Philopteridae. Tergopleuriter i dorsal aspekt och subgenitalplattor i ventral aspekt. – a) kontinuerlig utan inbuktning hos *Pectinopygus bassani*. – b) medial delad med fenestrae runt spirakelöppningarna hos *Corvonirmus argulus*. – c) kontinuerlig med inbuktning i bakänden hos *Carduceps meinertzhageni*. – d) medial delad med två fenestrae per tergopleurite hos *Hecatrishula varia*. – e) kontinuerlig med medial inbuktning i framkanten hos *Quadraceps hospes*. – f) starkt reducerad hos *Corvonirmus uncinus*. – g) medial delad men i stort sett rectangular hos *Brueelia nebulosa*. – h) med pariga intertergalskleriter hos *Anaticola mergiserrati*. – i) medial delade och triangulära hos *Philopterus fringillae*. – j) med medialt kontinuerlig intertergalsklerit hos *Rhynonirmus scolopacis*. – k) terminalia hos hane av *Oxylipeurus tetraonis*, – l) pleuralförtjockning hos *Quadraceps houri*. – m) pleuralförtjockning hos *Quadraceps normifer*. – n) anterolaterala förgreningar av subgenitalplattan hos *Anatoecus dentatus*.



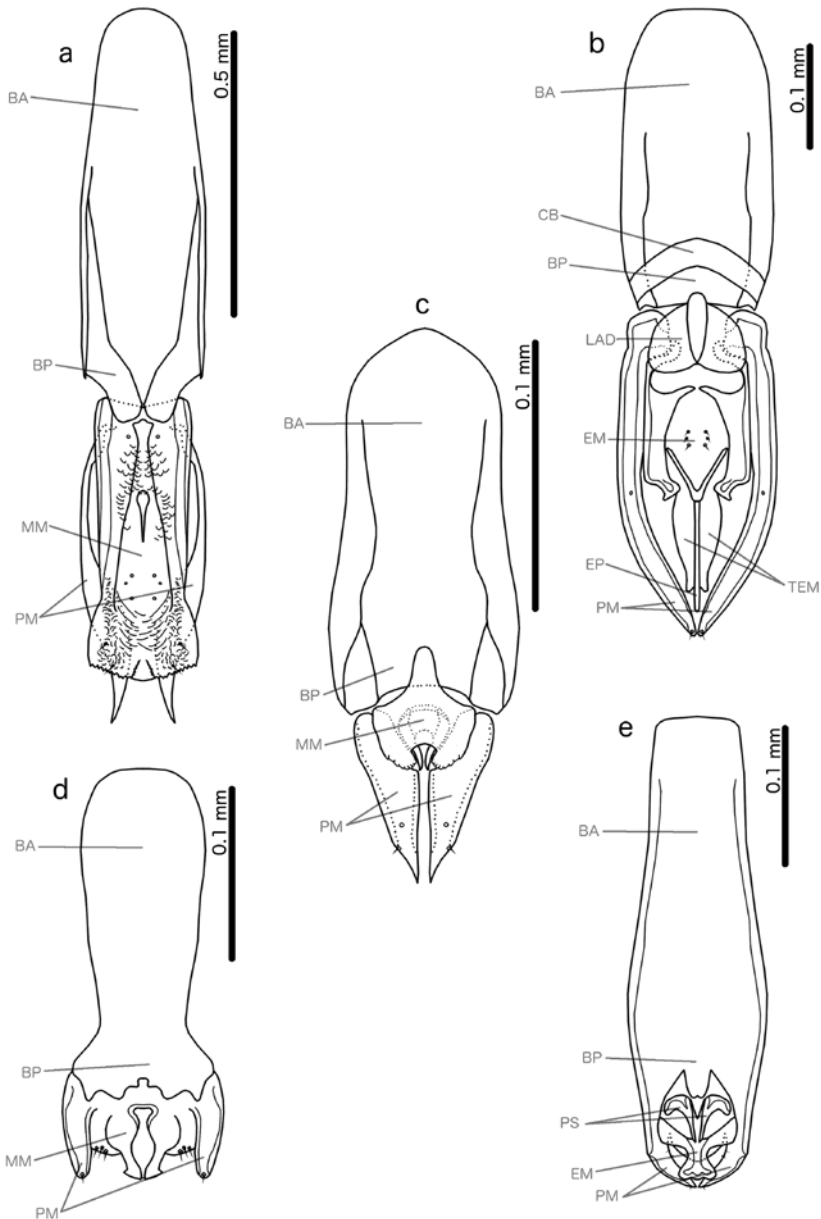


Figure 51. Male genitalia in Philopteridae. – a) *Ardeicola ciconiae*, representing the *Esthiopterum*-complex, ventral view. – b) *Saemundssonina (Saemundssonina) tringae*, representing the *Quadriceps*-complex, ventral view. – c) *Brueelia limbata*, representing the *Brueelia*-complex, dorsal view. – d) *Philopterus coarctatus*, representing the *Philopterus*-complex, ventral view. – e) *Degeeriella aquilarum*, representing the *Degeeriella*-complex, ventral view.

Hanliga genitalier hos Philopteridae. – a) ventral aspekt av *Ardeicola ciconiae*, representant för *Esthiopterum*-komplexet. – b) ventral aspekt av *Saemundssonina (Saemundssonina) tringae*, representant för *Quadriceps*-komplexet. – c) dorsal aspekt av *Brueelia limbata*, representant för *Brueelia*-komplexet. – d) ventral aspekt av *Philopterus coarctatus*, representant för *Philopterus*-komplexet. – e) ventral aspekt av *Degeeriella aquilarum*, representant för *Degeeriella*-komplexet.

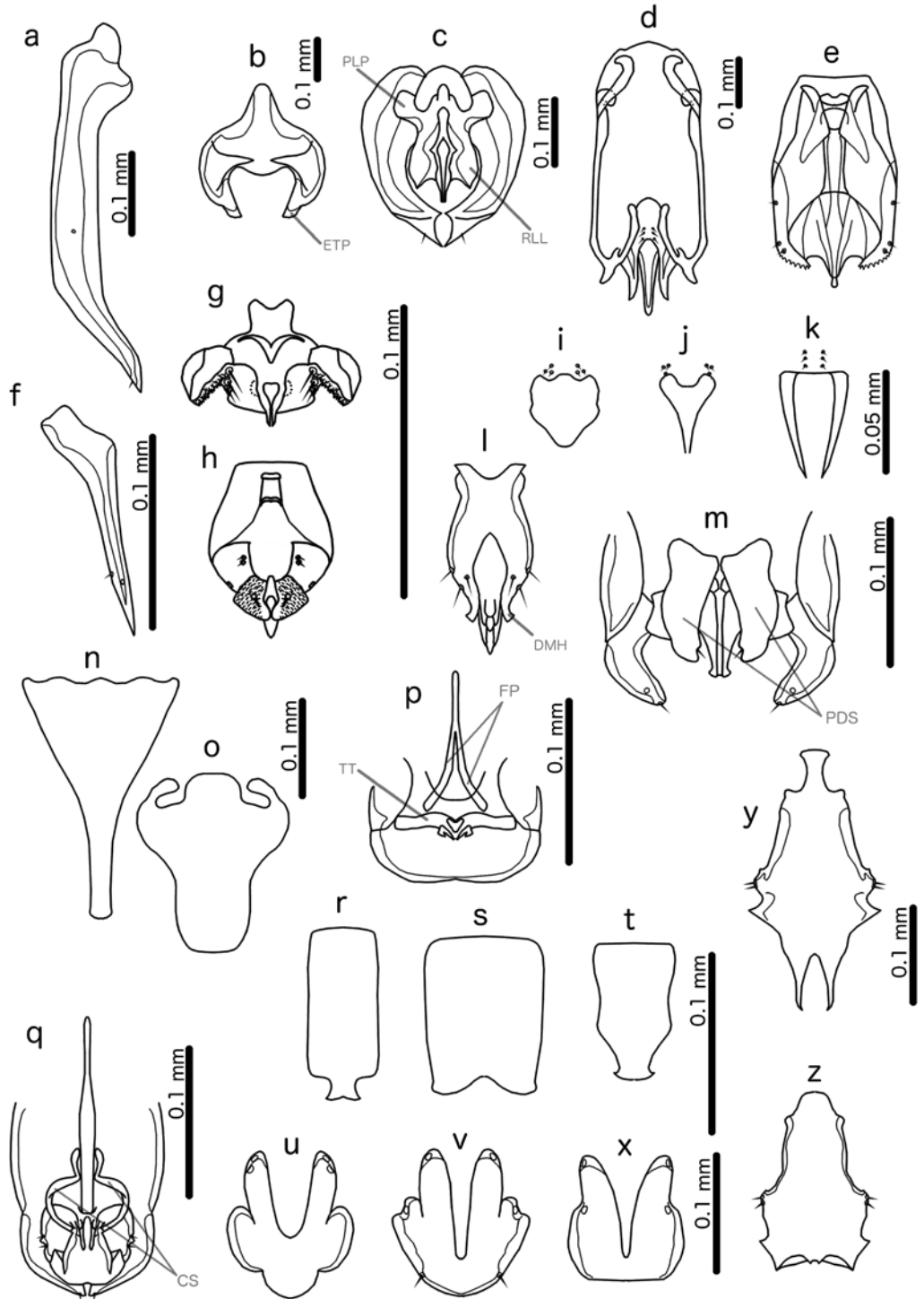


Figure 52. Variation in male genitalia in Philopteridae. – a) paramere of *Saemundssonina* (*Saemundssonina*) *lobaticeps*, ventral view. – b) endomere of *Saemundssonina* (*Saemundssonina*) *melanocephalus*, ventral view. – c) mesosome and parameres of *Quadriceps obtusus*, ventral view. – d) mesosome of *Quadriceps auratus*, ventral view. – e) mesosome of *Quadriceps similis*, ventral view (redrawn from Hopkins & Timmermann, 1954; scale not given in original). – f) paramere of *Brueelia nebulosa*, ventral view. – g) mesosome of *Hecatrishula atherae*, ventral view (redrawn from Gustafsson & Bush 2017). – h) mesosome of *Corvonirmus uncinus*, ventral view (redrawn from Gustafsson & Bush 2017). – i) anterior mesosome and mesosomal setae of *Saemundssonina* (*Saemundssonina*) *sternae* (redrawn from Clay 1949). – j) anterior mesosome and mesosomal setae of *Saemundssonina* (*Saemundssonina*) *lockleyi* (redrawn from Clay 1949). – k) anterior mesosome and mesosomal setae of *Saemundssonina* (*Saemundssonina*) *laticaudata* (redrawn from Clay 1949). l) mesosome of *Quadriceps alcae* (redrawn from Timmermann 1974; no scale in original). – m) distal genitalia of *Craspedorrhynchus melittoscopus*, ventral view. – n) outline of mesosome of *Cuclotogaster heterogrammicus*. – o) outline of mesosome of *Cuclotogaster heterographicus*. – p) distal genitalia of *Strigiphilus crenulatus*, ventral view. – q) mesosome of *Degeeriella regalis*, ventral view. – r) outline of endomere of *Carduiceps scalaris*. – s) outline of endomere of *Carduiceps lapponicus*. – t) outline of endomere of *Carduiceps zonarius*. – u) mesosome of *Columbicola columbae* (redrawn from Adams *et al.* 2005). – v) mesosome of *Columbicola bacillus* (redrawn from Adams *et al.* 2005). – x) mesosome of *Columbicola claviformis* (redrawn from Adams *et al.* 2005). – y) mesosome of *Ornithobius waterstoni*, ventral view. – z) mesosome of *Ornithobius bucephalus*, ventral view.

Variation i de hanliga genitalierna hos Philopteridae. – a) ventral aspekt av paramer hos *Saemundssonina* (*Saemundssonina*) *lobaticeps*. – b) ventral aspekt av endomer hos *Saemundssonina* (*Saemundssonina*) *melanocephalus*. – c) ventral aspekt av mesosom och paramer hos *Quadriceps obtusus*. – d) ventral aspekt av mesosom hos *Quadriceps auratus*. – e) ventral aspekt av mesosom hos *Quadriceps similis* (omritat efter Hopkins & Timmermann, 1954; ingen skala i original). – f) ventral aspekt av paramer hos *Brueelia nebulosa*. – g) ventral aspekt av mesosom hos *Hecatrishula atherae* (omritat efter Gustafsson & Bush 2017). – h) ventral aspekt av mesosom hos *Corvonirmus uncinus* (omritat efter Gustafsson & Bush 2017). – i) främre del av mesosom och mesosomala borst hos *Saemundssonina* (*Saemundssonina*) *sternae* (omritat efter Clay 1949). – j) främre del av mesosom och mesosomala borst hos *Saemundssonina* (*Saemundssonina*) *lockleyi* (omritat efter Clay 1949). – k) främre del av mesosom och mesosomala borst hos *Saemundssonina* (*Saemundssonina*) *laticaudata* (omritat efter Clay 1949). l) mesosom hos *Quadriceps alcae* (omritat efter Timmermann 1974; ingen skala i original). – m) ventral aspekt av distala delarna av genitalierna hos *Craspedorrhynchus melittoscopus*. – n) kontur av mesosomen hos *Cuclotogaster heterogrammicus*. – o) kontur av mesosomen hos *Cuclotogaster heterographicus*. – p) ventral aspekt av de distala genitalierna hos *Strigiphilus crenulatus*. – q) ventral aspekt av mesosom hos *Degeeriella regalis*. – r) kontur av endomer hos *Carduiceps scalaris*. – s) kontur av endomer hos *Carduiceps lapponicus*. – t) kontur av endomer hos *Carduiceps zonarius*. – u) mesosom hos *Columbicola columbae* (omritat efter Adams *et al.* 2005). – v) mesosom hos *Columbicola bacillus* (omritat efter Adams *et al.* 2005). – x) mesosom hos *Columbicola claviformis* (omritat efter Adams *et al.* 2005). – y) ventral aspekt av mesosom hos *Ornithobius waterstoni*. – z) ventral aspekt av mesosom hos *Ornithobius bucephalus*.

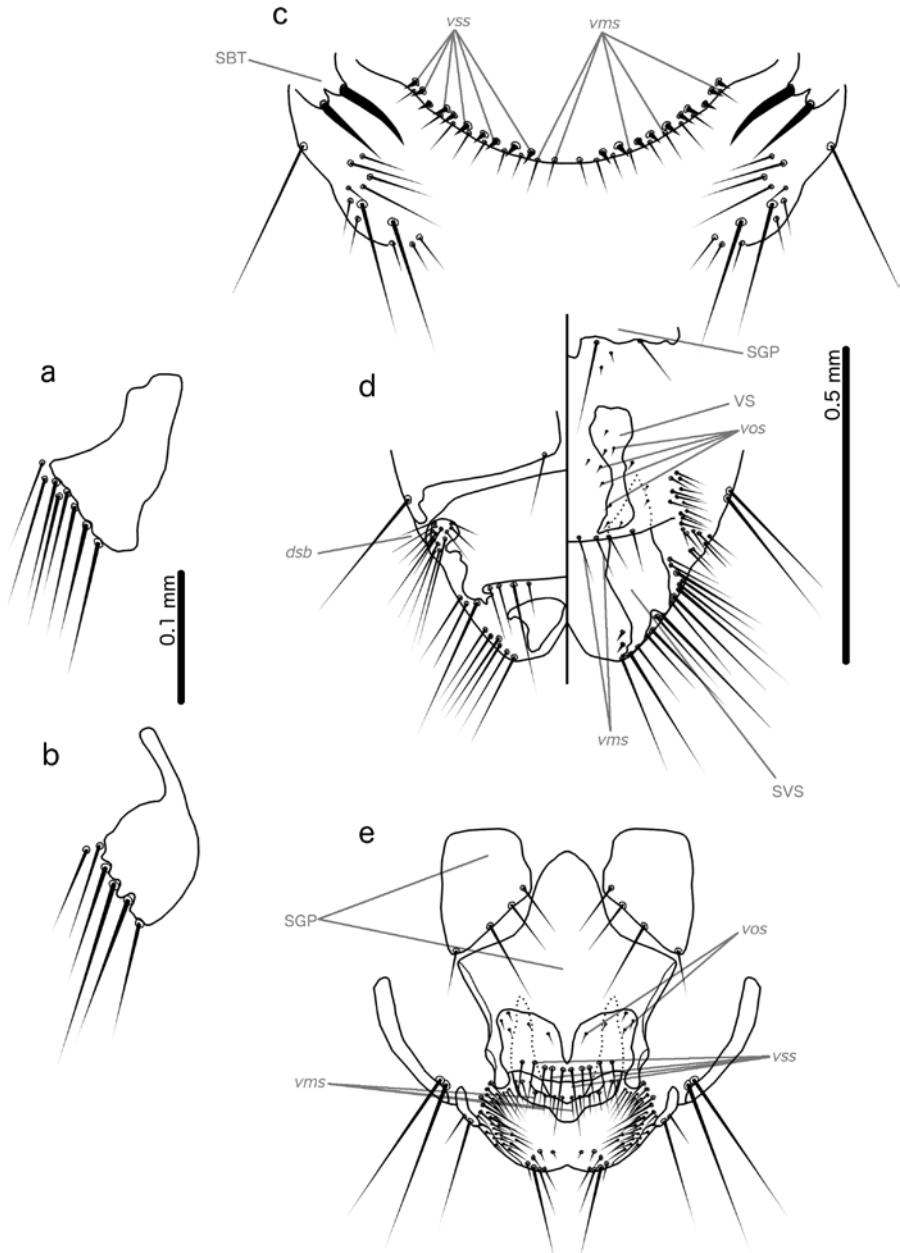


Figure 53. Female terminalia and genitalia in Philopteridae. – a) left subvulval sclerite of *Strigiphilus cursor*. – b) left subvulval sclerite of *Strigiphilus heterocerus*. – c) terminalia of *Rallicola minutus*, ventral view. – d) terminalia of *Cirrophthirus recurvirostrae*. – e) terminalia of *Pectinopygus bassani*, ventral view.

Honliga terminalia och genitalier hos Philopteridae. – a) vänster subvulvularsklerit hos *Strigiphilus cursor*. – b) vänster subvulvularsklerit hos *Strigiphilus heterocerus*. – c) ventral aspekt av terminalia hos *Rallicola minutus*. – d) terminalia hos *Cirrophthirus recurvirostrae*. – e) ventral aspekt av terminalia hos *Pectinopygus bassani*.

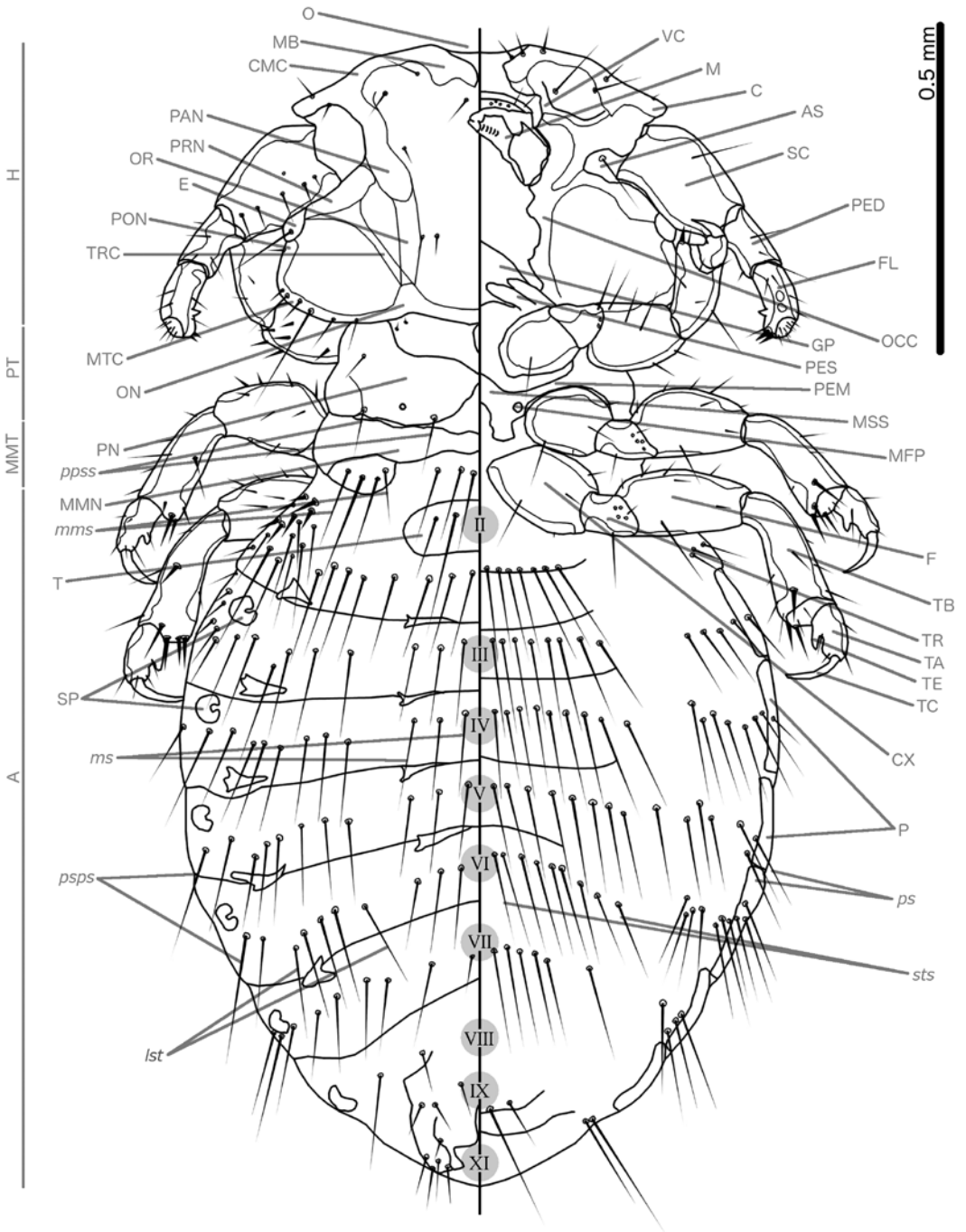


Figure 54. Male *Trichodectes canis* (Trichodectidae). Lines on left-hand side delimit body parts.

Hane av *Trichodectes canis* (Trichodectidae). De grå linjerna till vänster betecknar de olika kroppsdelarna.

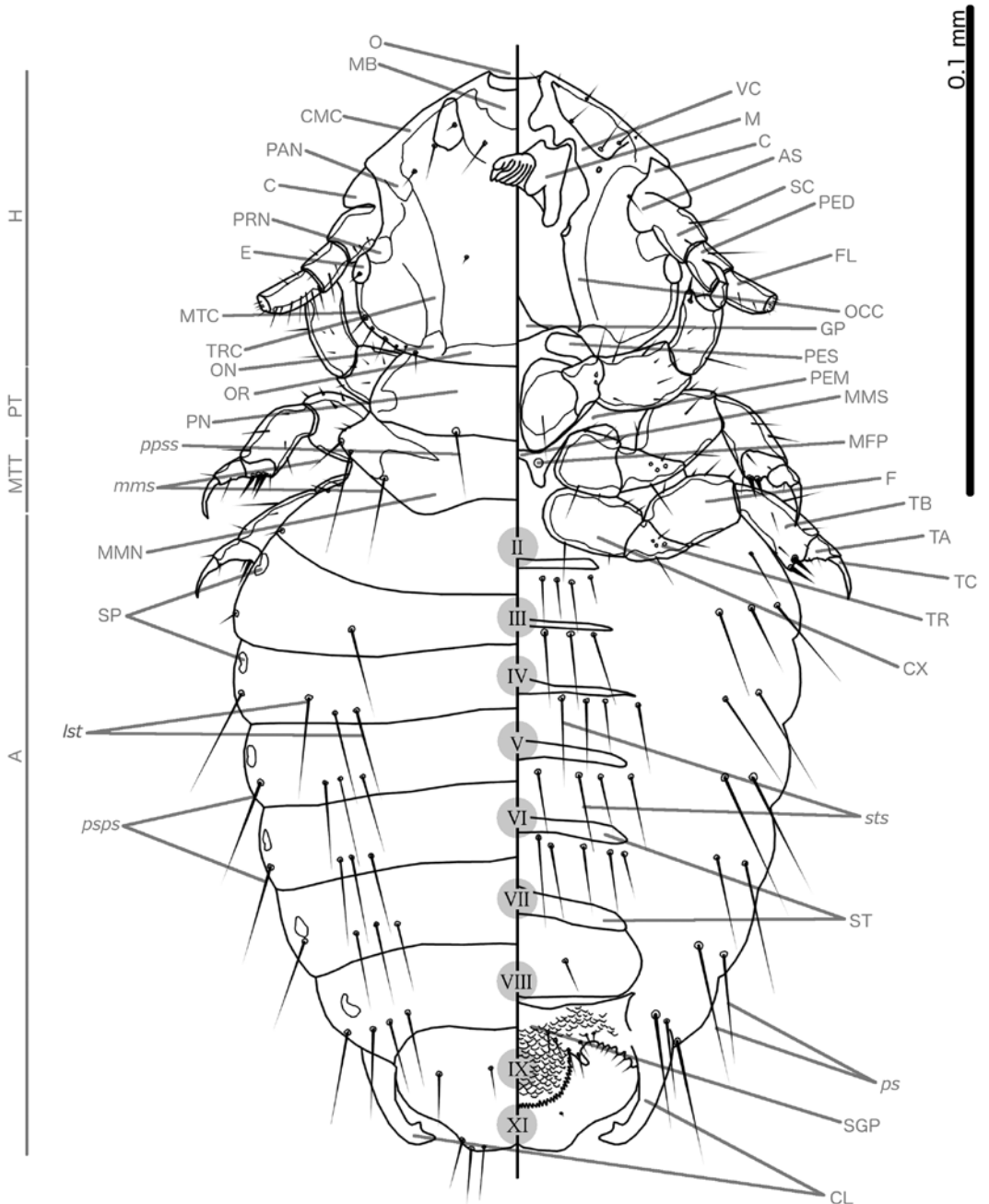


Figure 55. Female *Stachiella erminae* (Trichodectidae). Lines on left-hand side delimit body parts.

Hona av *Stachiella erminae* (Trichodectidae). De grå linjerna till vänster betecknar de olika kroppsdelarna.

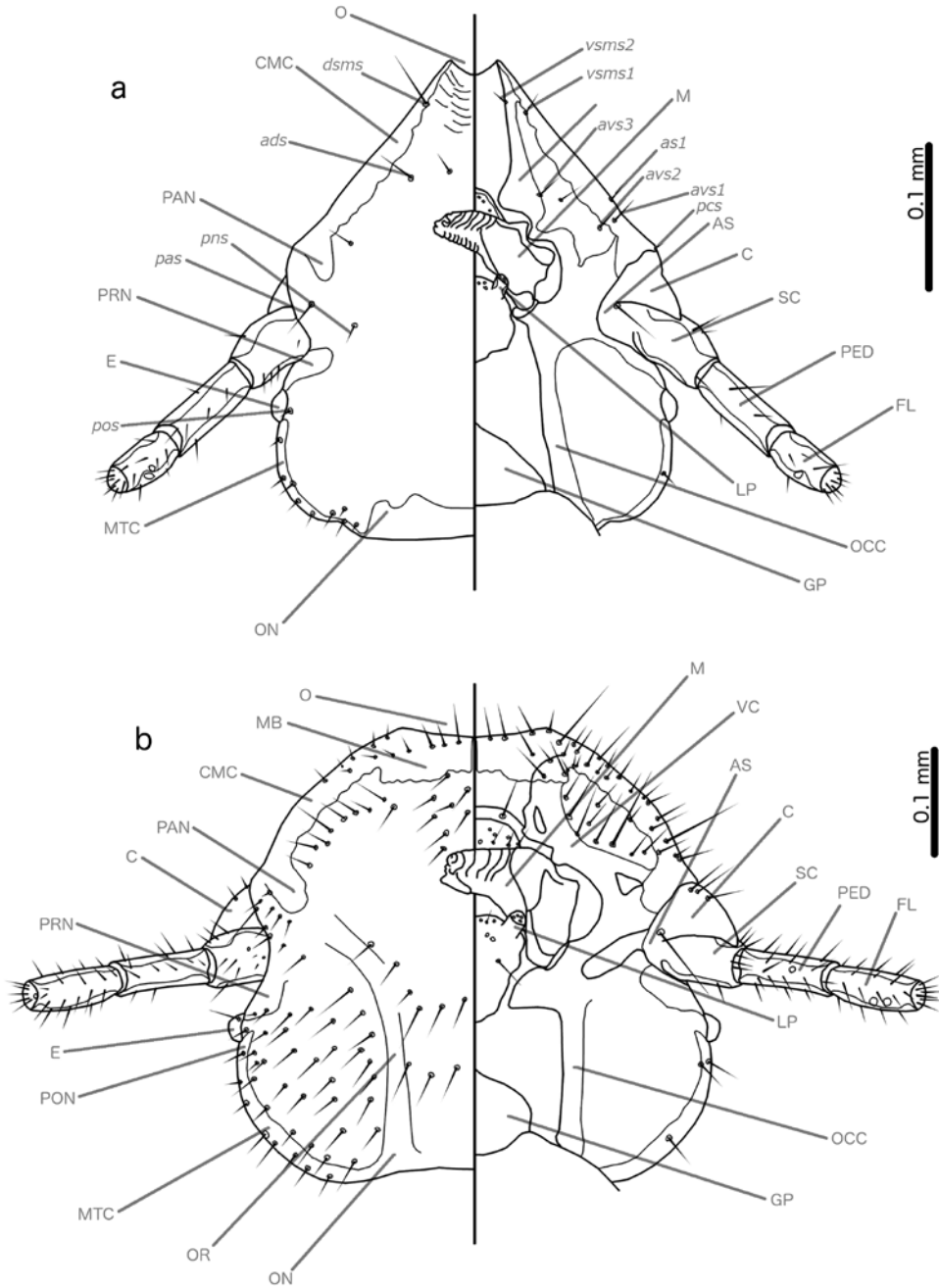


Figure 56. Head morphology and chaetotaxy of Trichodectidae. – a) male *Felicola subrostratus*. – b) female *Bovicola (Bovicola) caprae*.

Huvudmorfologi och borstnomenklatur hos Trichodectidae. – a) hane av *Felicola subrostratus*. – b) hona av *Bovicola (Bovicola) caprae*.

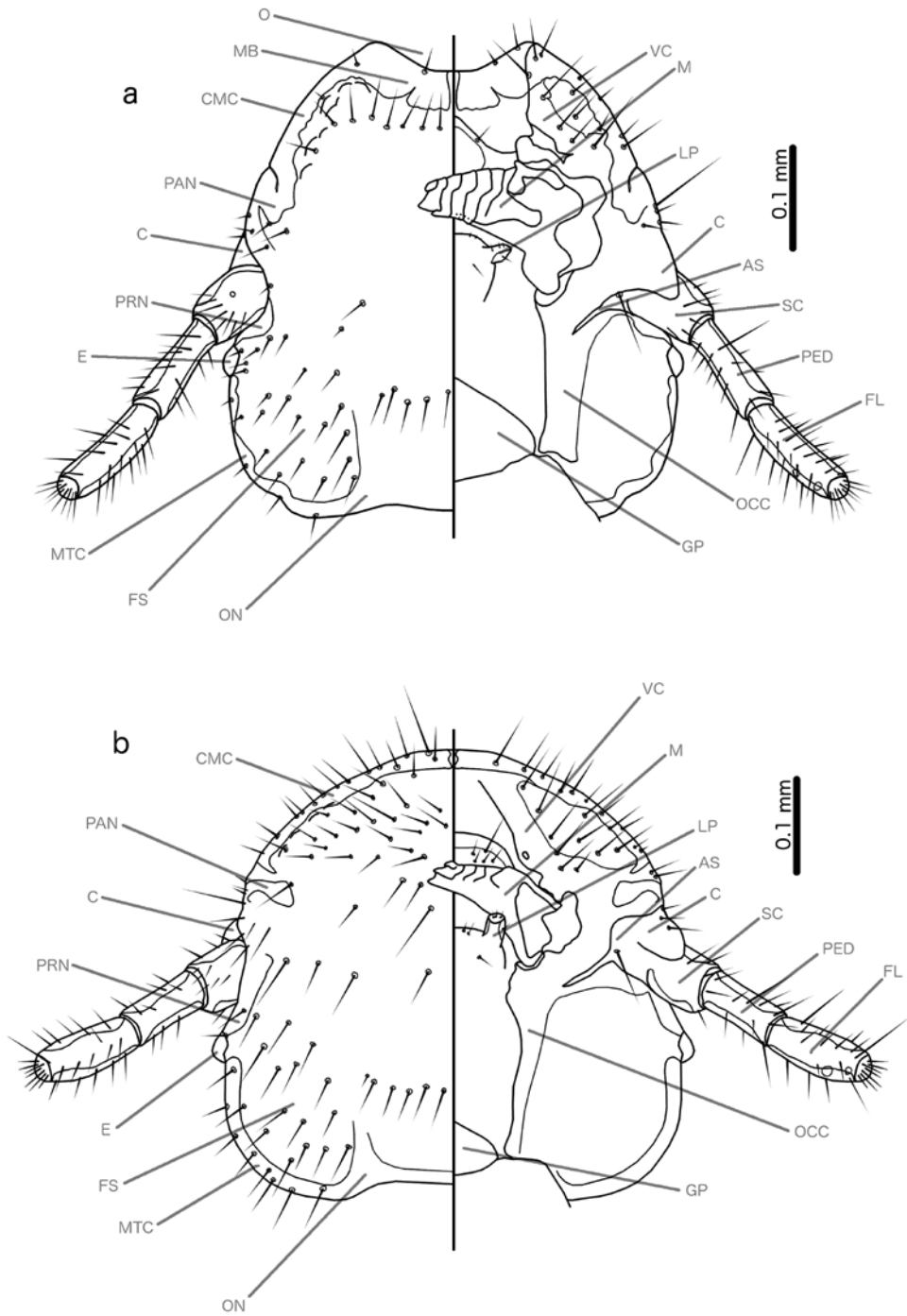


Figure 57. Head morphology in Trichodectidae. – a) female *Damalinia meyeri*. – b) female *Bovicola (Werneckiella) equi*.  
 Huvudmorfologi hos Trichodectidae. – a) hona av *Damalinia meyeri*. – b) hona av *Bovicola (Werneckiella) equi*.



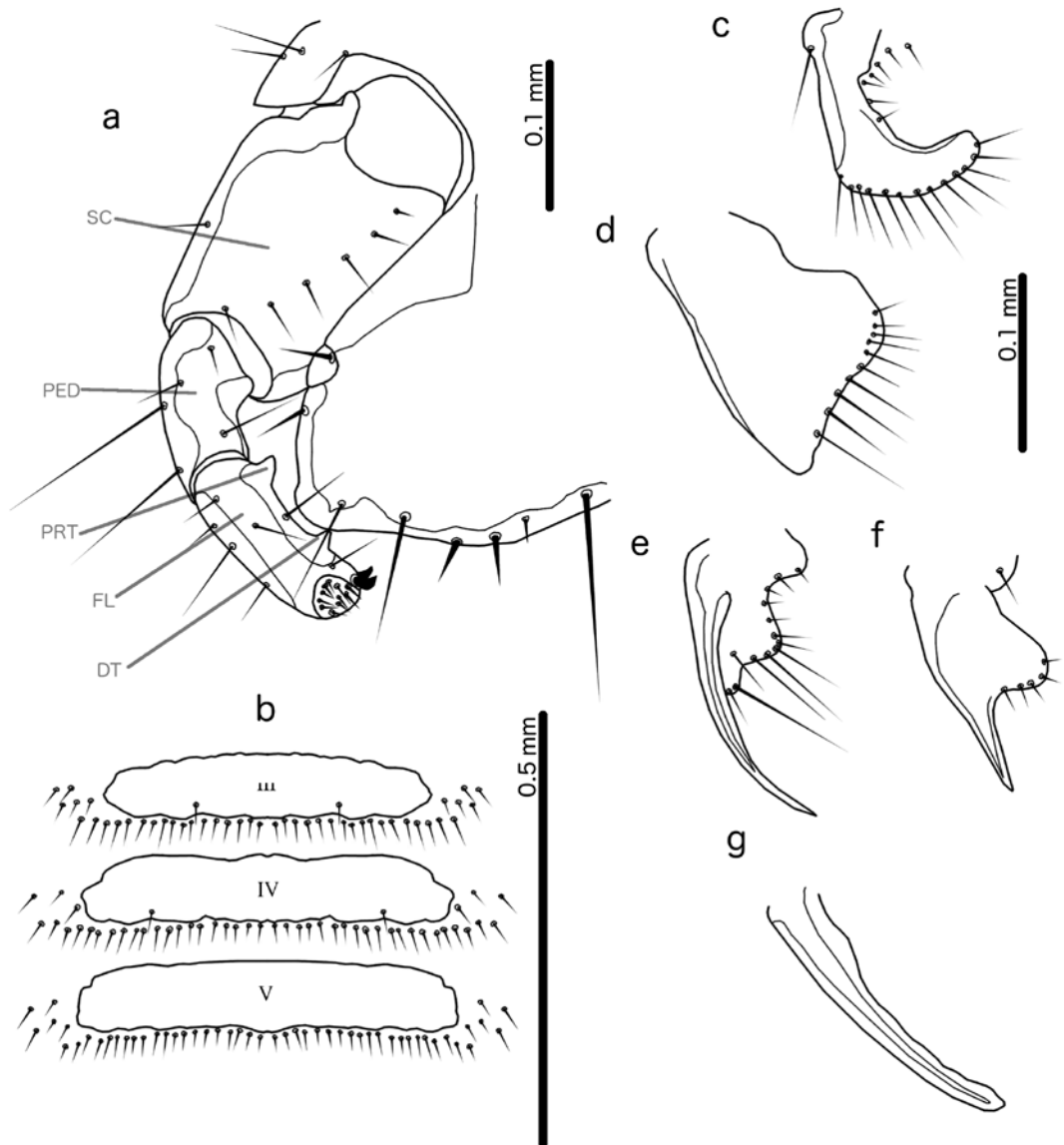


Figure 58. Morphological variation in Trichodectidae. – a) antenna and temple of male *Trichodectes melis*, dorsal view. – b) abdominal tergites III–V of female *Bovicola (Bovicola) caprae*, dorsal view. – c) copulatory lobe of *Damalinia meyeri*, ventral view. – d) copulatory lobe of *Felicola subrostratus*, ventral view. – e) copulatory lobe of *Trichodectes canis*, ventral view. – f) copulatory lobe of *Bovicola (Bovicola) caprae*, ventral view. – g) copulatory lobe of *Bovicola (Werneckiella) equi*, ventral view.

Morfologisk variation inom Trichodectidae. – a) dorsal aspekt av postantennalområdet och antennen hos hane av *Trichodectes melis*. – b) dorsal aspekt av tergiterna III–V hos hona av *Bovicola (Bovicola) caprae*. – c) ventral aspekt av kopuleringslob hos *Damalinia meyeri*, ventral view. – d) ventral aspekt av kopuleringslob hos *Felicola subrostratus*. – e) ventral aspekt av kopuleringslob hos *Trichodectes canis*. – f) ventral aspekt av kopuleringslob hos *Bovicola (Bovicola) caprae*. – g) ventral aspekt av kopuleringslob hos *Bovicola (Werneckiella) equi*.

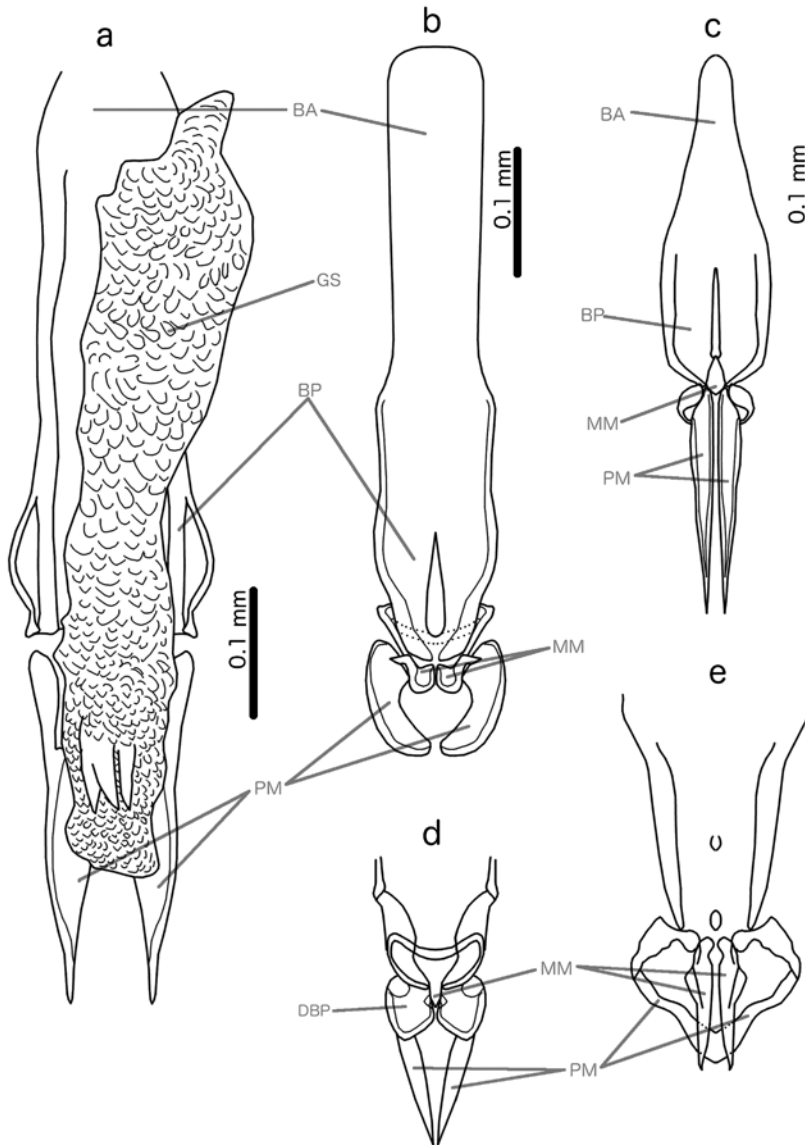


Figure 59. Male genitalia of Trichodectidae, all in ventral views. – a) *Trichodectes canis*. – b) *Bovicola (Bovicola) caprae*. – c) *Felicola subrostratus*. – d) *Bovicola (Bovicola) limbatus* (redrawn from Soler-Cruz et al. 1987; no scale in original). – e) *Bovicola (Werneckiella) equi* (redrawn from Moreby, 1978; no scale in original).

Hanliga genitalier inom Trichodectidae, samtliga i ventral aspekt. – a) *Trichodectes canis*. – b) *Bovicola (Bovicola) caprae*. – c) *Felicola subrostratus*. – d) *Bovicola (Bovicola) limbatus* (omritad efter Soler-Cruz et al. 1987; ingen skala i original). – e) *Bovicola (Werneckiella) equi* (omritad efter Moreby, 1978; ingen skala i original).

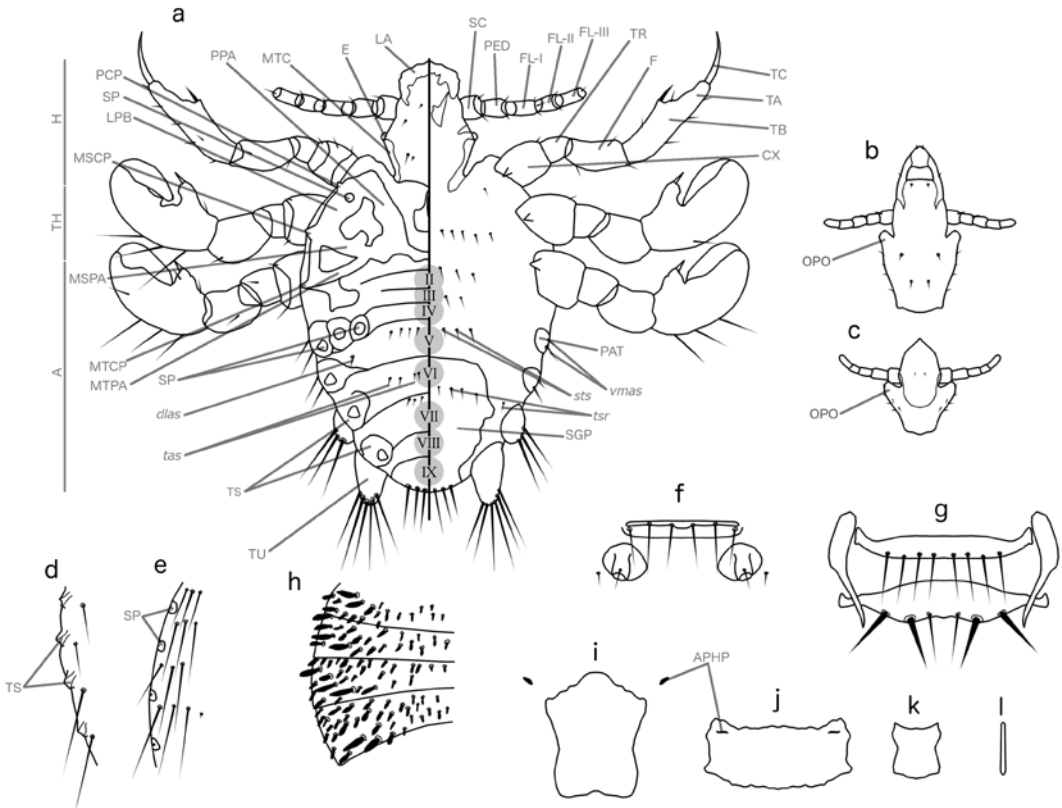


Figure 60. Morphology of Anoplura. Lines on left-hand side delimit body parts. – a) male *Pthirus pubis*. – b) head of *Haematopinus asini*, dorsal view. – c) head of *Haematopinus eurysternus*, dorsal view. – d) lateral margin of abdominal segments III–VI of male *Solenopotes capillatus*, dorsal view. – e) lateral margin of abdominal segments III–VI of *Solenopotes tarandi*, dorsal view. – f) ventral plates of abdominal segment II of *Enderleinellus nitzschi*. – g) ventral plates of abdominal segment II *Hoplopleura acanthopus*. – h) lateral margin of abdominal segments III–VI of male *Antarctophthirus trichechi*, dorsal view. – i) thoracic sternal plate of male *Haematopinus eurysternus*. – j) thoracic sternal plate of male *Haematopinus suis*. – k) thoracic sternal plate of male *Solenopotes capillatus*. l) thoracic sternal plate of male *Linognathus stenopsis*. All figures redrawn from Kim *et al.* (1986) except Fig. 197, which is redrawn from Ferris (1919); no scale given in originals.

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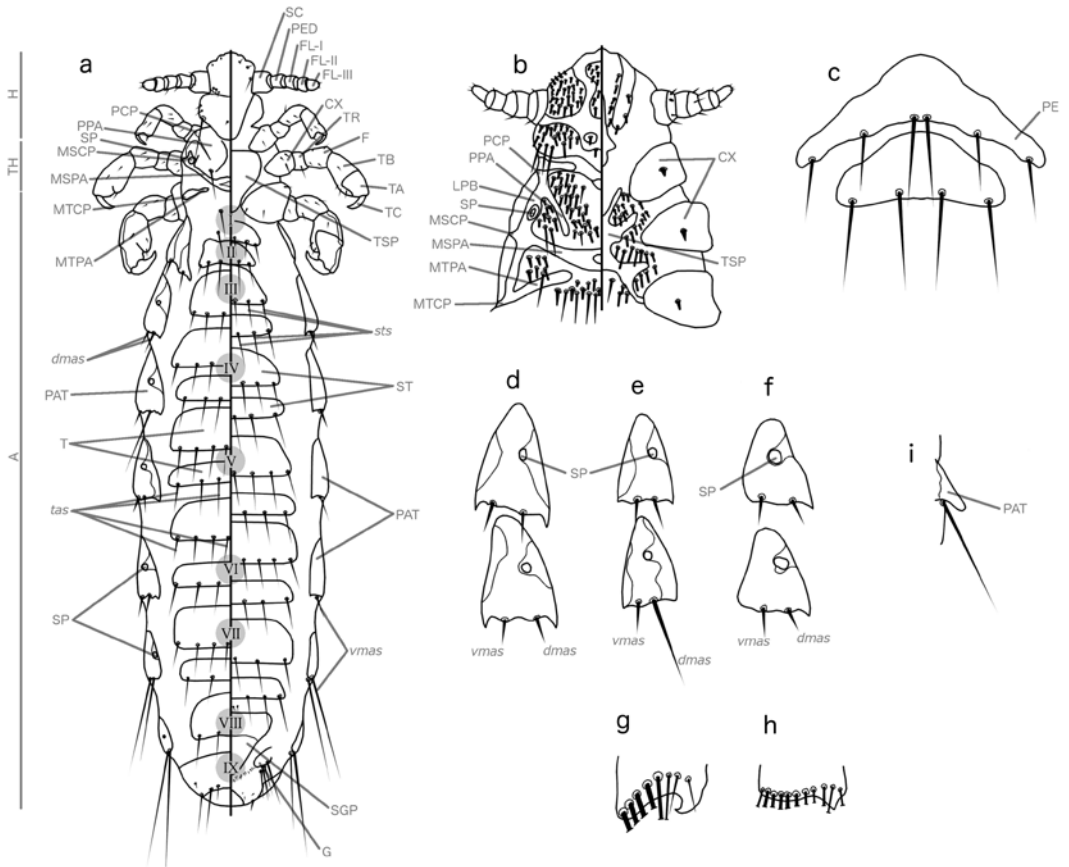


Figure 61. Morphology of Anoplura. Lines on left-hand side delimit body parts. – a) female *Polyplax serrata*. – b) head and thorax of female *Echinophthirius horridus*. – c) sternal plates of female abdominal segment II of *Polyplax borealis*. – d) paratergal plates III–IV of *Polyplax borealis*, lateral view, with ventral half to the left and dorsal half to the right. – e) paratergal plates III–IV of *Polyplax serrata*, lateral view, with ventral half to the left and dorsal half to the right. – f) paratergal plates III–IV of *Polyplax spinulosa*, lateral view, with ventral half to the left and dorsal half to the right. – g) left gonopod of female *Linognathus vituli*. – h) left gonopod of female *Linognathus stenopsis*. – i) paratergal plate of *Haemodipsus ventricosus*. All figures redrawn from Kim et al. (1986); no scale given in originals.

Morfologi hos Anoplura. De grå linjerna till vänster betecknar de olika kroppsdelarna. – a) hona av *Polyplax serrata*. – b) huvud och thorax hos hona av *Echinophthirius horridus*. – c) sternalplattor på abdominalsegment II hos hona av *Polyplax borealis*. – d) sidoaspekt av paratergalplattor III–IV hos *Polyplax borealis*, med ventral delen till vänster och dorsala delen till höger. – e) sidoaspekt av paratergalplattor III–IV hos *Polyplax serrata*, med ventral delen till vänster och dorsala delen till höger. – f) sidoaspekt av paratergalplattor III–IV hos *Polyplax spinulosa*, med ventral delen till vänster och dorsala delen till höger. – g) vänster gonopod hos hona av *Linognathus vituli*. – h) vänster gonopod hos hona av *Linognathus stenopsis*. – i) paratergalplatta hos *Haemodipsus ventricosus*. Alla illustrationer omritade efter Kim et al. (1986); ingen skala i original.

# Entomologisk Tidskrift

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- 50 *Öhrn, P.*: Nikiforuk, A. 2011. **Empire of the Beetle.** – Greystone Books, Canada.

## Instruktioner för författare (reviderade i november 2012)

**Allmänt.** Läs igenom denna sida innan Du skriver den slutliga versionen av Ditt manus. Använd artiklarna i detta häfte som exempel på hur manuskriptet ska utformas.

Artiklarna bör vara skrivna på svenska, men även danska, norska accepteras. Artiklar av uppenbart internationellt intresse kan också vara på engelska liksom artiklar skrivna av utländska författare. Vid tveksamhet, kontakta huvudredaktören. Till artiklar på engelska ska det finnas en svensk sammanfattning på slutet.

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Använd gärna illustrationer, gärna i färg.

### Artikels utformning

*Artikeln* inleds med titel, författarnamn, en engelskspråkig titel, *Abstract* och författarens adress. Titeln bör vara kort och koncis men ändå beskriva vad artikeln innehåller så väl som möjligt. *Abstract* är på engelska och innehåller en sammanfattning av artikelns innehåll på *maximalt 200 ord*. Precis före *abstract* placeras ett stycke med författarnamn, titel (svensk och engelsk), "Entomologisk Tidskrift" etc. på det sätt som artiklarna i detta häfte är utformade.

*Texten.* De enda formatteringar som bör finnas är radbrytningar i slutet av stycken, *kursiv* samt **fet** text. All övrig formattering görs av redaktionen.

Skriv vetenskapliga namn på släkten och arter med *kursiv stil*. Landskapsförkortningar (eller faunaprovinns) skrivs med versal plus gemen bokstav, t.ex. Sk, Vr och Sö.

Förteckningar över fynd av insekter bör vara konsekvent strukturerade efter mallen: "**Land: Faunaprovinns För-samling** Fyndplats ev. fyndomständigheter datum (ev. insamlare), Fyndplats för nästa fynd..." osv. Faunaprovinser förkortas enligt ovan. Sortera församlingarna i bokstavs- eller geografisk ordning. Församlingar kan ersättas med kommuner (men var konsekvent i hela artikeln). Koordinater kan gärna infogas.

*Litteratur* förtecknar den litteratur som refereras i artikeln, alfabetiskt ordnad efter författarnamn. Alla referenser ska finnas nämnda i texten. Nedanstående exempel visar hur referenserna anges (tidskriftsartikel, bok, resp. bokkapitel).

Nilsson, L.A. & Cederberg, B. 2001. *Nomada fucata*, ett för Sverige nytt gökbi (Hymenoptera: Anthophoridae). – Ent. Tidskr. 123: 19-22.

Trägårdh, I. 1939. Sveriges skogsinsekter. 2:a uppl. – Hugo Geber, Stockholm.

Stephens, J.M. 1963. Immunity in insects. – In: Steinhaus, E.A. (ed.). *Insect pathology. An advanced treatise*. Vol. 1: 273-297. Academic Press, New York.

I texten hänvisas till litteraturförteckningen enligt: Trägårdh (1939), (Trägårdh 1939) eller om man vill hänvisa till vissa sidor: Trägårdh (1939: 285-287). Verk av två författare refereras enligt (Nilsson & Cederberg 2001) och verk av fler än två enligt (Franzén m.fl. 2002).

*Tabeller* placeras på separata sidor i slutet av manuskriptet. Tabelltexten och texten i tabellhuvudet ska ges i både en svensk och en engelsk version. Den engelska versionen ska göra tabellen begriplig för den som inte kan skandinaviska språk. Tabellerna numreras med arabiska siffror och det ska finnas hänvisningar till alla tabeller i texten enligt: "Tabell 1".

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