

A Review and Checklist of Swedish Lonchaeidae (Diptera)

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The status of Lonchaeidae in Sweden is reviewed and a Swedish checklist is provided with species recorded on a Province basis. 60 species are recorded making the Swedish fauna the largest and one of the best studied in Europe at the present time. Data is also provided on the ecology and relative abundance of Swedish species based on data gathered by the Swedish Malaise Trap Project and saproxylic rearing studies.

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The Lonchaeidae are a small family of acalyptrate Diptera and form part of the superfamily Tephritoidea. Globally approximately 550 species are known in eight genera, they are present in all zoogeographical regions where they occur in a wide range of habitat types. In Europe there are just over 100 described species in seven genera.

Lonchaeidae (Fig. 1, 2) are moderately small in size, 3-6 mm, stout-bodied and hairy flies with black halteres and, in most genera, with an entirely matt to entirely shiny black body colour. Many species exhibit a varying number of yellow tarsomeres, and a few species have silvered faces or a partly orange antennal 1st flagellomere. The wings are usually clear, though occasionally with a yellowish or brownish tinge. The females of all species have a very characteristic long, stiffened aculeus (ovipositor) which, when extended, can be as long as the pre-abdomen. The aculeus is usually rather slim and pencil-like in appearance, but in some species it is greatly flattened and broadened to form a blade-like structure. The common name of the Lonchaeidae, lance-flies, is derived from this characteristic.

The biology of the Lonchaeidae is diverse, although primarily associated with living or decay-

ing plant tissue, including herbs and trees (Kovalev & Morge 1984, McAlpine 1987). In Europe, many species, especially of *Lonchaea*, live under the bark of dead or dying trees, in decomposed wood, sometimes being more or less host tree specific. Several *Earomyia* species are associated with conifers where they feed on the developing seeds, while others may develop in plant tissues.

Previous work on Swedish Lonchaeidae

Studies on Swedish Lonchaeidae go back to the early days of entomology and the type material of several species described in the 18th, 19th, and early 20th centuries is from Swedish localities. These include *Lonchaea tarsata* Fallén, 1820, *L. deutschii* Zetterstedt, 1837), *Earomyia lonchaeoides* Zetterstedt, 1848, *Chaetolonchaea pallipennis* (Zetterstedt, 1855) and *Dasiops laticeps* (Czerny 1934). McAlpine (1958) re-examined material in the Zetterstedt Collection, Zoological Institute in Lund, he re-described and illustrated the types of species described by Zetterstedt including *L. deutschii*, *E. lonchaeoides* and *C. pallipennis*.

The first attempt to specifically review the Swedish fauna was by Hackman (1956) in his work on the Lonchaeidae of Eastern Fennoscandia.



Figure 1. Female *Lonchaea palposa* Zetterstedt. Photo: Jeremy Richardson.

Hona av stjärtflugan *Lonchaea palposa* Zetterstedt.

dia. He provided a key and checklist to the 35 species then known in Finland, Sweden and Norway. Although there have been nomenclature changes since that time he recorded 20 species from Sweden based mainly on material collected by Oscar Ringdahl in the early decades of the 20th century.

Nuorteva (1967) dealt mainly with the Finnish fauna but does record two specimens of *Lonchaea laticornis* Meigen, 1826 from Öland. I have not examined these specimens and as *L. laticornis* is now regarded as a complex of species identifiable only from the males their identity remains unclear. The next major review was in the Catalogue of Palaearctic Diptera where Kovalev & Morge (1984) list 29 species as occurring in Sweden. Hellqvist (2013) added *Dasiops appendiculus* Morge, 1959 and the same year Nilsson-Örtman (2013) added *Earomyia netherlandica* MacGowan, 2004 to the Swedish list. MacGowan (2014a) lists Swedish records of *Protearomyia rameli* MacGowan, 2014 and *P. withersi* MacGowan, 2014. MacGowan (2014b) described *Lonchaea angelina* MacGowan, 2014 also from Swedish material.

Identification

Unfortunately there are no modern published keys covering the entire Swedish or European Lonchaeidae. There are however two sources which are the most useful in determining the Swedish species. In the chapter on Lonchaeidae in Keys to the insects of the European USSR (Shtakel'berg 1989), a key is provided which includes 43 of the Swedish species. The Handbook to the Lonchaeidae of the British Isles (MacGowan and Rotheray 2008) includes keys to 41 species which occur in Sweden including 9 not listed by Shtakel'berg (1989). The identification of the remaining 8 species requires reference to literature sources specifically Kovalev (1974 & 1978) and MacGowan (2014a & 2014b). On-line information about Lonchaeidae including photographs, distribution and species descriptions is available at <http://lonchaeidae.myspecies.info>.

Data sources

The data presented in this paper is a combination of previous published records, loaned material from the Diptera collection, Museum of Zoology, University of Lund and data from a SYNTHESIS sponsored visit to the Swedish Museum of Natural History, Stockholm. It also utilises data derived from the Swedish Malaise trap project (SMTP) and academic studies of the saproxylic fauna of clear-fell sites. I also acknowledge the help of many Swedish Dipterists who have sent me specimens or records over the years. This breadth of data has led to a unique understanding of the Lonchaeidae present in Sweden and their distribution within the country.

The European context

In recent years there have been several Diptera checklists published for western European countries which can help put the Swedish fauna into context. Kahanpää & Winqvist (2014) list 41 species definitely known from Finland whilst a further 3 are doubtful records. 46 species are recorded from the British Isles (MacGowan & Rotheray 2008), 27 from Denmark (MacGowan 2001), 47 from Germany (Maca 1999), 3 from Lithuania (Pakalniškis et al. 2000), 43 from Hungary (MacGowan 2007) and 51 from France

(Withers & MacGowan 2014). The Swedish fauna currently consists of 60 species, just over half the European fauna and the highest number so far recorded in any European country.

Ecological information

Genus *Dasiops* Rondani, 1856.

9 species recorded from Sweden. Several *Dasiops* species including *D. perpropinquus* and *D. spatiosus* have been bred from dead wood habitats whilst others, especially those with a broad blade-like female aculeus, such as *D. hennigi* and *D. mucronatus* are considered more likely to develop in plant stems. One of the commonest Swedish species *D. spatiosus* has been bred from decaying birch logs in Scotland (MacGowan & Rotheray 2008), and this probably accounts for its relatively common occurrence in Sweden.

Genus *Protearomyia* McAlpine, 1962.

3 species recorded from Sweden. The larval habitats of *Protearomyia* are poorly known, Peris (1848) describes *Protearomyia nigra* larvae as occurring in a range of herbaceous plants including *Verbascum* spp., *Angelica sylvestris* and *Cirsium vulgare* and it is probable that this is where all *Protearomyia* species develop. Adults are usually found in open grassland or meadow habitats. Previously only one species, *P. nigra* was considered to occur in Sweden and northern Europe but recent work (MacGowan 2014a) has shown that another two species *P. withersi* and *P. ramelli* are present and these apparently reach the northern limit of their range in the south of Sweden.

Genus *Chaetolonchaea* Czerny, 1934.

3 species recorded from Sweden. The larval habitats of *Chaetolonchaea* are also poorly understood although Morge (1959) does record one eastern Palearctic species as being bred from flower bulbs. There is a strong adult association with open grassland and meadow habitats and the larvae probably develop in the stems or bulbs of meadow plants. *C. dasyops* and *C. pallipennis* are recorded for several provinces, mainly in southern Sweden; *C. brevopilosa* seems to be more uncommon.



Figure 2. Male *Silba fumosa* (Egger). Photograph by Eugene Vandebeulque.

Hane av *Silba fumosa* (Egger).

Genus *Earomyia* Zetterstedt, 1842.

5 species recorded from Sweden. The available evidence suggests that the larvae of species such as *E. schistopyga* and *E. virilis* are associated with the cones of coniferous trees, whilst the larvae of species such as *E. netherlandica* and *E. viridana* are most probably associated with plant stems. The larval habitat of *E. lonchaeoides*, a common spring species in Sweden, is not known.

Genus *Lonchaea* Fallén, 1820

38 species recorded from Sweden. The larvae are almost exclusively associated with decaying wood, either under the bark or in the decaying sapwood. The only known exception in the Swedish fauna is *L. chorea* which is associated with a wide range of decaying organic material such as manure and decaying vegetables and is often found near human habitation.

There is in general a distinction between those species which will use coniferous trees for larval development and those which use broad-leaved trees. Even within this division there are species which will utilise only one type of conifer such as *Pinus sylvestris* L. or one type of broadleaved tree, in particular the large number of species which inhabit decaying aspen *Populus tremula* L.

Only a few species are less demanding in their larval requirements and will inhabit any type of dead wood, the commonest and best known example is *L. sylvatica*. Further detail on

the larval associations of several *Lonchaea* species is provided in Table 2 below.

Genus *Silba* Macquart, 1851.

One species in Sweden. Formerly placed in the genus *Setisquamalonchaea* Morge, *Silba fumosa* is a species whose larvae are associated with a range of decaying vegetable matter. It reaches the northern limit of its European range in southern Sweden where it seems to be relatively common.

Data from the Swedish Malaise trap project

The Swedish Malaise trap project (SMTP) operated 75 traps at 50 sites distributed across a wide range of Swedish habitats between 2003 and 2006 (Karlsson et al. 2005). This standardised trapping programme provided a unique overview of the abundance and distribution of Lonchaeidae within Sweden. 386 specimens belonging to 6 genera and 32 species were captured and identified (Table 1).

Nine species are represented by more than 10 individuals. The saproxylic *L. affinis* which is common and widespread throughout most of Scandinavia is also the commonest species

Table 1. Species ordered by number caught in SMTP traps
* = males only identified.

Stjärtlflugor fångade i svenska Malaisefällprojekttet ordnade efter antalet fångade individer.

| Species | Number |
|-----------------------------------|------------|
| <i>Lonchaea affinis</i> | 102 |
| <i>Earomyia lonchaeoides</i> | 68 |
| <i>Silba fumosa</i> | 44 |
| <i>Chaetolonchaea dasyops</i> | 20 |
| <i>Lonchaea chorea</i> | 19 |
| <i>Lonchaea deutschi</i> | 17 |
| <i>Lonchaea sylvatica</i> | 15 |
| <i>Protearomyia nigra</i> * | 13 |
| <i>Chaetolonchaea pallipennis</i> | 11 |
| <i>Dasiops spatiosus</i> | 9 |
| <i>Lonchaea fugax</i> | 9 |
| <i>Protearomyia withersi</i> * | 9 |
| <i>Lonchaea bukowski</i> | 8 |
| <i>Lonchaea corusca</i> | 5 |
| <i>Dasiops laticeps</i> | 4 |
| <i>Lonchaea hackmani</i> | 4 |
| <i>Lonchaea nitens</i> | 4 |
| <i>Lonchaea obscuritarsis</i> | 4 |
| <i>Lonchaea fraxina</i> | 3 |
| <i>Lonchaea ragnari</i> | 3 |
| <i>Earomyia viridana</i> | 2 |
| <i>Lonchaea patens</i> | 2 |
| <i>Lonchaea tarsata</i> | 2 |
| <i>Dasiops appendiculus</i> | 1 |
| <i>Dasiops solivagus</i> | 1 |
| <i>Earomyia virilis</i> | 1 |
| <i>Lonchaea angelina</i> | 1 |
| <i>Lonchaea nitidissima</i> | 1 |
| <i>Lonchaea spicata</i> | 1 |
| <i>Lonchaea ultima</i> | 1 |
| <i>Lonchaea zetterstedti</i> | 1 |
| <i>Protearomyia rameli</i> * | 1 |
| Total | 386 |

Table 2. Number of individuals reared by tree species from wood samples systematically collected on clear cuts. * = not recorded by SMTP.

Antal individer per trädslag av flugor som kläckts fram ur vedprover som samlats in systematiskt på hyggen. * = ej funnen i Malaisefällprojekttet.

| Species | Aspen | Birch | Oak | Pine | Spruce | Total |
|--------------------------------|-------------|------------|-----------|----------|------------|-------------|
| <i>Lonchaea caledonica</i> * | | | | 3 | | 3 |
| <i>Lonchaea collini</i> * | | | | | 20 | 20 |
| <i>Lonchaea contigua</i> * | | 33 | | | | 33 |
| <i>Lonchaea fraxina</i> | 90 | | | | | 90 |
| <i>Lonchaea fugax</i> | 510 | 1 | | | | 511 |
| <i>Lonchaea gordokovi</i> * | 9 | | | | | 9 |
| <i>Lonchaea hackmani</i> | 55 | | | | | 55 |
| <i>Lonchaea nitens</i> | 6 | | 1 | | | 7 |
| <i>Lonchaea patens</i> | 45 | 2 | 1 | | | 48 |
| <i>Lonchaea peregrina</i> * | 46 | | | | | 46 |
| <i>Lonchaea ragnari</i> | 52 | | | | | 52 |
| <i>Lonchaea stackelbergi</i> * | 9 | | | | | 9 |
| <i>Lonchaea subneatosi</i> * | 32 | | | | | 32 |
| <i>Lonchaea sylvatica</i> | 148 | 161 | 5 | 3 | 71 | 388 |
| <i>Lonchaea tenuicornis</i> * | | | 3 | | | 3 |
| <i>Lonchaea zetterstedti</i> | | | | | 49 | 49 |
| Total | 1002 | 197 | 10 | 6 | 140 | 1355 |

in the traps. Three grassland associated species, *C. dasyops*, *P. nigra* and *C. pallipennis* were also in this group, indicating that where suitable conditions exist these species can occur in considerable numbers. In contrast to many other Lonchaeids both *S. fumosa* and *L. chorea* can utilise a variety of substrates for larval development, a feature which most probably accounts for their abundance. *L. sylvatica* which, unusually for a *Lonchaea* species, develops in both coniferous and deciduous trees, is also common. There are however two species included in this group which have not previously been regarded as common. *E. lonchaeoides* although distributed through much of northern Europe typically emerges early in spring before many Dipterists start collecting. The Malaise traps, which were operating all year round, have indicated its true abundance. *L. deutschi*, which has also previously been regarded as rare, seems to show a preference for sub-montane woodland and scrub, a habitat which is common in Sweden but perhaps not often visited by collectors.

Data from rearing studies.

Studies carried out by Jonsell, Hansson & Wedmo (2007) and Jonsell & Hansson (2011) on the biodiversity value of logs and stumps for Coleoptera also produced 1355 specimens of saproxylic Lonchaeidae. These studies took place in clear fell areas of timber production woodlands in Uppland province. The sampling protocol involved collecting samples of branches, logs and stumps of 5 known tree species from which larvae and puparia were reared out. As a result valuable data on species larval associations and the relative importance of individual tree species for saproxylic Lonchaeidae was collected. The samples were derived from two age classes of stumps and logs, one summer old and 4-5 years old.

The results show that the at Uppland study site the most important tree species for saproxylic Lonchaeidae was aspen *Populus tremula*, followed by birch *Betula* spp. and spruce *Picea abies*. By far the most common species was *L. fugax*, a relatively small species whose larvae can occur in large numbers under the bark of decaying aspen.

Of the 16 species collected in samples all but

four were restricted to one tree species. The exceptions being *L. sylvatica*, a well-known generalist species, with *L. fugax*, *L. nitens* and *L. patens* being mainly concentrated in one tree but with a few examples reared from other tree species. This corresponds with the findings of Rotheray et al. (2001) who noted that where saproxylic Diptera rearing records were specific to particular tree species most associated were with *P. tremula* and *P. sylvestris*.

Discussion

This collation of Lonchaeidae data shows that Sweden has a rich and diverse fauna which can be partly explained by geographical factors. In southern Sweden thermophilic species such as *Silba fumosa* are present, in the north a more boreal element characterised by species such as *L. deutschi* is found whilst there is also an eastern element characterised by species such as *L. gordokovi*, *L. nitidissima* and *L. xylophila*. The extensive tree cover in Sweden is also probably an important factor in determining the richness of the fauna, particularly so for species in the genus *Lonchaea* almost all of whose members develop in decaying wood.

The data also emphasises the importance of aspen as a key tree species for maintaining the diversity of saproxylic Lonchaeidae and, as has been noted by Rotheray et al. (2001), for a range of other rare and threatened Diptera. In the first four to five years after it has fallen the decaying cambial layer of trunks and branches provides a rich development site for many species.

Each of the differing methods of capture and sampling employed has contributed to the compilation of a comprehensive checklist. Specimens from museum collections and individual collectors are usually obtained by hand netting or to a much lesser extent from rearing. Both the SMTP and the Uppland rearing study have added species to the list. Comparison of these two methods of collecting, Malaise traps and rearing studies provide an interesting comparison and illustrate the importance of using a variety of survey techniques in order to determine the full extent of the fauna. The Malaise traps were particularly effective in collecting a range of non-saproxylic species and in total captured 32 species out of 60 on the Swedish list. Of the

16 *Lonchaea* species recorded from the rearing study 8 were not found in the Malaise trap samples. These 8 species are uncommon or rare and together only represented 11.1% of the total number of specimens obtained in the study.

One unusual feature is that the most common saproxylic *Lonchaea* species in Malaise traps and one of the most widespread in Sweden, *L. affinis*, was not represented in the rearing study samples. This species has been bred from spruce (*Picea abies*) and Scots pine (*Pinus sylvestris*) in Finland and Russia (MacGowan & Rotheray 2008) and Hackman (1956) also states that the larvae (listed as *L. laxa*) had been found under bark of spruce and perhaps also other coniferous trees. Further knowledge of the autecology of this species is required to explain this finding, it may be that the larvae of this species require dead wood in a later stage of decay or that the log size of dead wood sampled was not suitable. It seems unlikely that the physical characteristics of the clear cut area have prevented *L. affinis* from colonising the site as a considerable number of other *Lonchaea* species were recorded during the study.

The data presented provides the most up to date and extensive review of Swedish Lonchaeidae, it is hoped that it will act as a baseline for further study and research into this interesting group of Diptera.

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References

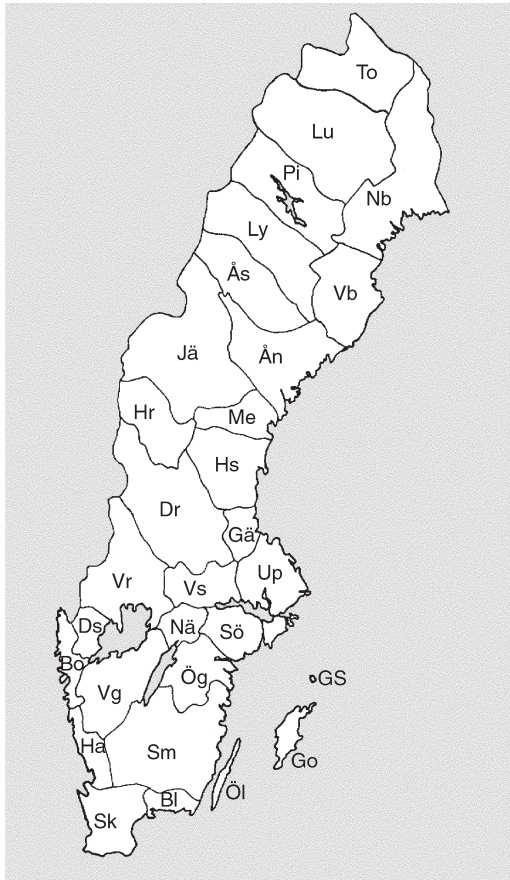
Hackman, W. 1956. The Lonchaeidae (Dipt.) of Eastern Fennoscandia. – *Notulae Entomologicae* 36: 89-115.
 Hellqvist, S. 2013. Nytt i den Svenska fluglistan från norra Sverige. – *Entomologisk Tidskrift* 134: 111-119.
 Jonsell, M., Hansson, J. & Wedmo, L. 2007. Diversity of saproxylic beetle species in logging residues in Sweden – Comparisons between tree species and diameters. – *Biological Conservation* 138: 89-99.

Jonsell, M. & Hansson, J. 2011. Logs and stumps in clearcuts support similar saproxylic beetle diversity: implications for bioenergy harvest. – *Silva Fennica* 45: 1053-1064.
 Karlsson, D., Pape, T., Johanson, K.A., Liljeblad, J. & Ronquist, F.: Svenska Malaisefällprojekter, eller hur många arter steklar, flugor och myggor finns i Sverige? [The Swedish Malaise Trap Project, or how many species of Hymenoptera and Diptera are there in Sweden?] – *Entomologisk Tidskrift* 126: 43-53.
 Kahanpää, J., & Winqvist, K. 2014. Checklist of the Diptera superfamilies Tephritoidea and Sciomyzoidea of Finland (Insecta). – *Zookeys* 441: 259-275.
 Kovalev, V.G. 1974. Species of the genus *Lonchaea* Fl. close to *limatula* Collin (Diptera, Lonchaeidae) – *Entomologicheskoe Obozrenie* 53: 447-453.
 Kovalev, V.G. 1978. New and little-known species of Lonchaeidae (Diptera) from the Moscow region – *Entomologicheskoe Obozrenie* 57: 188-199.
 Kovalev, V.G. & Morge, G. 1984. Family Lonchaeidae. – In Soós, Á. and Papp, (Eds.). *Catalogue of Palaearctic Diptera* 9, Micropezidae - Agromyzidae: 247-259. Elsevier.
 Maca, J. 1999. Lonchaeidae; in Schumann, H., Bährmann, R., & Stark, A. (Eds.), *Entomofauna Germanica* 2. Checkliste der Dipteren Deutschlands – *Studia Dipterologica Supplement* 2, 368pp.
 McAlpine, J.F. 1958. Identities of Lonchaeid Flies described by Zetterstedt, with notes on related species (Diptera) – *The Canadian Entomologist* 90: 402-418.
 McAlpine J.F. 1987. Chapter 62. Lonchaeidae. – In: McAlpine J.F., Peterson B.V., Shewell G.E., Teskey H.J., Vokeroth J.R. and Wood D.M. (Eds) *Manual of Nearctic Diptera*, Monograph 28, Vol. 2: 791–797, Research Branch Agriculture Canada, Ottawa.
 MacGowan, I. 2001. Lonchaeidae. – In Petersen, F.T. and Meier, R. (Eds.) *A Preliminary list of the Diptera of Denmark*. *Steenstrupia* 26(2): 276pp.
 MacGowan, I. 2007. Corrections and additions to the list of Hungarian Lonchaeidae (Diptera). – *Folia Entomologica Hungarica Rovartani Kozlemenyek* 68: 105-110.
 MacGowan, I. 2014a. Three new species of *Proteomyia* McAlpine, 1962 (Diptera; Lonchaeidae) with a key to males of the Palearctic species – *Zootaxa* 3796: 337–348.
 MacGowan, I. 2014b. A review of the *Lonchaea fraxina* group of species (Diptera: Lonchaeidae) with the description of a new species - *Entomologisk Tidskrift* 135: 179-186.
 MacGowan, I. & Rotheray, G. E. 2008. British Lonchaeidae. Diptera, Cyclorrhapha, Acalyptratae - Handbooks for the Identification of British Insects, Vol. 10 (15). – Royal Entomological Society, London.
 Morge, G. 1959. Monographie der palaarktischen Lonchaeidae (Diptera). – *Beiträge zur Entomologie* 9: 909-945.

- Nilsson-Örtman, V. 2013. Stjärftflugor (Diptera: Lonchaeidae) i Europa och första fyndet för Norden av den ovanliga arten *Earomyia netherlandica* – Entomologisk Tidskrift 134: 197-201.
- Nuorteva, M. 1967. On the habitats of some *Lonchaea* species in Fennoscandia (Dipt., Lonchaeidae) – Annales Entomologici Fennici 33: 118-121.
- Pakalniškis, S., Rimšaitė, J., Sprangauskaitė-Bernotienė, R., Butautaitė, R. & Podėnas, S. 2000. Checklist of Lithuanian Diptera – Acta Zoologica Lituonica 10(1): 3-58.
- Perris, M.E. 1848. Notes pour servir à l'histoire des métamorphoses de diverses espèces de Diptères (Pre-

mière Partie). II. Notes pour servir à l'histoire de la *Lonchaea nigra*, Meig. – Annales de la Société entomologique de France (2) 7: 62-65.

- Rotheray, G.E., Hancock, G., Hewitt, S., Horsfield, D., MacGowan, I., Robertson, D., & Watt, K. 2001. The biodiversity and conservation of saproxylic Diptera in Scotland – Journal of Insect Conservation 5: 77-85.
- Shtakel'berg, A.A. 1989. Chapter 75 Family Lonchaeidae. – In: Keys to the insects of the European USSR, G. Ya. Bei-Bienko (ed.) 5(1-2): 358-373. Diptera and Siphonaptera. (English Version) Smithsonian Institution Libraries and the National Science Foundation, Washington, D.C.
- Withers, P. & MacGowan, I. 2014. A preliminary account of the fauna of Lonchaeidae (Diptera) of continental France including a species new to science – Studia Dipterologica 21 (1): 3-10.



Swedish faunal provinces: Skåne (Sk), Blekinge (Bl), Halland (Ha), Småland (Sm), Öland (ÖI), Gotland (Go), Gotska Sandön (GS), Östergötland (Ög), Västergötland (Vg), Bohuslän (Bo), Dalsland (Ds), Närke (Nä), Södermanland (Sö), Uppland (Up), Västmanland (Vs), Värmland (Vr), Dalarna (Dr), Gästrikland (Gå), Hälsingland (Hs), Medelpad (Me), Härjedalen (Hr), Jämtland (Jä), Ångermanland (Ån), Västerbotten (Vb), Norrbotten (Nb), Åsele lappmark (Ås), Lycksele lappmark (Ly), Pite lappmark (Pi), Lule lappmark (Lu) and Torne lappmark (To).

Appendix. Province checklist of Swedish Lonchaeidae.

Lanskapskatalog för svenska stjärftflugor.

| Species | Provinces (and notes) |
|---------------------------------------|--|
| DASIOPINAE | |
| Dasiopini | |
| DASIOPS Rondani, 1856 | |
| <i>appendiculus</i> Morge, 1959 | Sö, Vr, Ån, Ly. |
| <i>hennigi</i> Morge, 1959 | Ha. |
| <i>facialis</i> Collin, 1953 | Sm, Go*, Jä, Vb, Pi*, To. |
| = <i>albiceps</i> (Frey, 1930) | |
| <i>laticeps</i> (Czerny, 1934) | Sm, Sö, Up, Jä (The type locality is Åre, Jämtland). |
| <i>mucronatus</i> Morge, 1959 | Sk, Sm, ÖI. |
| <i>occultus</i> Collin, 1953 | Ög, To. |
| = <i>ingricus</i> (Stackelberg, 1955) | |
| <i>perpropinquus</i> Morge, 1959 | Sk, Sö. |
| <i>solivagus</i> Morge, 1959 | Ly. |
| <i>spatiosus</i> (Becker, 1895) | Sk, Bo, Up, Vr, Me, Hr, Lu. |
| = <i>sericans</i> (Becker, 1895) | |

LONCHAEINAE

Earomyiini

| | |
|------------------------------------|--|
| PROTEAROMYIA McAlpine, 1962 | |
| <i>nigra</i> (Meigen, 1826) | Sk, Sm, ÖI, Go*, Ög, Bo, Sö, Up, Vs, Dr, Jä, To. |
| <i>rameli</i> MacGowan, 2014 | Sk. |
| <i>withersi</i> MacGowan, 2014 | Sk. |

CHAETOLONCHAEA Czerny, 1934

| | |
|--|---|
| <i>brevipilosa</i> Czerny, 1934 | Sk, ÖI. |
| <i>dasyops</i> (Meigen, 1826) | Sk*, Sm, ÖI, Go, Up. |
| <i>pallipennis</i> (Zetterstedt, 1855) | Sk, Bl, Ha, Sm, ÖI, Ög, Up, Vb (The type locality is Ottenby, Öland). |

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(Continued/ Forts. fr. föreg sida)

| Species | Provinces (and notes) | |
|---|---|--|
| EAROMYIA Zetterstedt, 1842 | | |
| <i>lonchaeoides</i> Zetterstedt, 1848 | Sk, Sm, Ög, Up, Vr, Hs, Hr, Ån, Vb, Lu (The type locality is Vadstena, Östergötland). | <i>gorodkovi</i> Kovalev, 1974 Sm. <i>hackmani</i> Kovalev, 1981 Ha, Sm, Sö, Up, Vb. = <i>peregrina</i> auct. nec Becker, 1895 |
| <i>netherlandica</i> MacGowan 2004 | Öl. | <i>hirticeps</i> Zetterstedt, 1837 To. |
| <i>schistopyga</i> Collin, 1953 | Sk, Up. | <i>iona</i> MacGowan, 2001 Ha. |
| <i>viridana</i> (Meigen, 1826) | Sk, Sm. | <i>limatula</i> Collin, 1953 Ån, "Lapland". |
| <i>virilis</i> Collin, 1953 | Sk, Ög. | <i>mallochi</i> MacGowan & Rotheray, 2000 Sk. |
| Lonchaeini | | <i>nitens</i> (Bigot, 1885) Sm, Ög, Sö, Up, To*. = <i>krogerusi</i> Czerny, 1934 |
| LONCHAEA Fallén, 1820 | | <i>nitidissima</i> Kovalev, 1978 To. |
| <i>affinis</i> Malloch, 1920 | Sk, Ha, Sm, Sö, Up, Vr, Dr, Hs, Hr, Jä, Ån, Vb. | <i>obscuritarsis</i> Collin, 1953 Sk, Sm, Go, Sö, Dr, Ås. |
| = <i>laxa</i> auct. nec Collin, 1953 | Nb, Ås, Ly, Pi, Lu, To. | <i>palposa</i> Zetterstedt, 1847 Sk, Sm*, Vb. |
| <i>albigena</i> Collin, 1953 | Sk, Ög, Up. | <i>patens</i> Collin, 1953 Sk, Ha, Sm, Ds, Sö, Up, Vr, Dr, Vb. |
| <i>albitarsis</i> Zetterstedt, 1837 | Jä*, Vb. | <i>peregrina</i> Becker, 1895 Sk, Sm. |
| <i>angelina</i> MacGowan, 2014 | Vr. (The type locality is Ransäter, Värmland) | <i>postica</i> Collin, 1953 Sk. |
| <i>bukowski</i> Czerny, 1934 | Ög, Hr, Up, Vb, To. | <i>ragnari</i> Hackman, 1956 Sm, Sö, Up, Hs, Vb, Ly, To. |
| <i>caledonica</i> MacGowan & Rotheray, 2000 | Sk, Up. | <i>scutellaris</i> Rondani, 1874 Sk, Sm, Ög. |
| <i>carpathica</i> , Kovalev, 1974 | Me, Vb. | <i>spicata</i> MacGowan, 2008 Vb. |
| <i>caucasica</i> Kovalev, 1974 | Ha. | <i>stackelbergi</i> Czerny, 1934 Sm, Ög, Up, Dr. |
| <i>chorea</i> (Fabricius, 1781) | Sk, Bl, Ha, Sm, Öl, Ög, Sö, Up, Vr, Me, Jä, Vb, Ås, Ly, Lu. | <i>subneatosia</i> Kovalev, 1974 Sk, Sm, Up, Dr. |
| <i>collini</i> Hackman, 1956 | Sk, Sö, Up. | <i>sylvatica</i> Beling, 1873 Sk, Ha, Sm, Ög, Sö, Up, Vs, Ån, Vb. |
| <i>contigua</i> Collin, 1953 | Sk*, Ha, Sm*, Up, Me, Ån, Vb. | = <i>lucidiventris</i> Becker, 1895 |
| <i>corusca</i> Czerny, 1934 | Sk, Ha, Go, Sö, Up, Vs, To. | <i>tarsata</i> Fallén, 1820 Sk, Sm, Öl, Go, Sö (The type locality is "Sweden" – without locality). |
| = <i>alni</i> Ringdahl, 1947 | | <i>tenuicornis</i> Kovalev, 1978 Sm. |
| = <i>lauta</i> Collin, 1953 | | <i>ultima</i> Collin, 1953 Sk, Sm Öl, Up. |
| = <i>britteni</i> Collin, 1953 | | <i>xylophila</i> Kovalev, 1978 Vb. |
| <i>deutschii</i> Zetterstedt, 1837 | Sm, Vs, Hs, Hr, Jä, Vb, Ly, Lu, To. (The type = <i>sarekensis</i> Frey, 1916 locality is Jukkasjärvi, Torne Lappmark) | <i>zetterstedti</i> Becker, 1902 Sm, Sö, Up, Dr, Nb, Ån, To. |
| <i>fraxina</i> MacGowan & Rotheray, 2000 | Sm, Sö, Up, Vs, Vr. | SILBA Macquart, 1851 |
| <i>fugax</i> Becker, 1895 | Sk, Sm, Ög, Na, Sö, Up, Vs, Vr, Dr, Hs, Ån, Vb. | = <i>Setisquamalonchaea</i> Morge, 1963 |
| = <i>cariicola</i> Czerny, 1934 | | <i>fumosa</i> (Egger, 1862) Sk, Ha, Sm, Öl, Go. = <i>flavidipennis</i> Zetterstedt, 1847 |

*) denotes where the only province record is from Hackman (1956).