

Taxonomy, distribution, biology  
and conservation status of  
Finnish Auchenorrhyncha  
(Hemiptera: Fulgoromorpha et Cicadomorpha)

Guy Söderman

NATURE





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## PREFACE

The latest assessment of the Finnish species in year 2000 revealed a strong deficiency in the knowledge of planthoppers and leafhoppers. About one third of all species could not be properly assessed and were classified as data deficient. A year later a national Expert Group on Hemiptera was formed to increase the basic knowledge of this insect order. The author started the research on Auchenorrhyncha in the fall 2002. In 2003 the research was included in the project "Threatened and poorly known insects" carried out by the Finnish Environment Institute as a part of the national research programme on "Deficiently Known and Endangered Forest Species" (acronym PUTTE) financed by the Ministry of Environment in Finland. The part dealing with Auchenorrhyncha was conducted in a four year period 2002-2005. The information in this report thus stands for the knowledge gained by the end of year 2005. The report itself is an integral part of the research results. Other parts are the check-list and the distribution maps of the species that have been set up on the home page of the Expert Group.

<http://users.utu.fi/veirinne/tyoryhma/tyoryhma.htm>

Identification schemes to the species have not been produced as there are many up-to-date works from recent years covering most of the Finnish fauna.



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# 1 Introduction

Auchenorrhyncha is a polyphyletic group of insects within the order Hemiptera. The order is nowadays divided into five homophyletic groups (suborders) (Campbell et al. 1995, Sorensen et al. 1995, Borgoin & Campbell 2002). Two of these, Fulgoromorpha (planthoppers) and Cicadomorpha (leafhoppers) belong to Auchenorrhyncha. The three others are Heteroptera (true bugs), Sternorrhyncha (jumping lice, plant lice, scale bugs and mealy bugs) and Coelorrhyncha, only occurring in the tropics. The Auchenorrhyncha has developed during the Lower Permian and at least 40,000 recent species are known to science, with many thousands yet to describe (Holzinger et al. 2003). Species diversity is highest in the tropics and subtropics and decreases northwards. A value of 11 species/100 km has been presented for Northern Finland (Raatikainen & Ylönen 1988).

Planthoppers and leafhoppers are hemimetabolic insects that suck plant juices. Of the Finnish species only two, the members of the family Achiliidae, feed on subcortical fungal mycelia. However, English researchers regard it possible, that the nymphs of the family Cixiidae, living subterraneously, might feed on fungal mycorrhiza (Nickel 2003). Recently, the nymph of a Nearctic planthopper has also been found to feed on moss (Wheeler 2003).

Nymphs of several species are confined to specific plants, plant groups or genera. With more information collected on their biology, the higher has the portion of monophages become. Oligophages are often monophagous at their distributional range (Nickel 2003).

## 2 History of Finnish research

The history of Finnish research of Auchenorrhyncha begins with Carl Reinhold Sahlberg (1779-1860), who in 1842 described three new species to science (one is still valid). The true pioneer was John Reinhold Sahlberg (1846-1920), better known in Finland as a coleopterologist, who at the end of 1860's made research of the Fennoscandian fauna (Sahlberg 1867, 1868, 1871, 1876) and published the results in a remarkable monograph (1871) of that time. He described several new species and genera to science. Five genera and sixteen species occurring in Finland are still valid. In his monograph he mentions 171 species from within the present borders of Finland. The prominent Finnish heteropterologist of that time, O. M. Reuter (1850-1913), conducted the first regional Auchenorrhyncha survey in southwestern Finland and published the results in 1880, when he also described new species to science (one is still valid).

The research gained an enormous effort by Håkan Lindberg (1898-1966), who together with his family members collected a vast amount of insects in the beginning of the 20th century. Håkan Lindberg focused his taxonomic efforts to Auchenorrhyncha and traveled extensively in Finland collecting new material (Lindberg 1924, 1932, 1937, 1952, Lindberg & Saris 1952). Lindberg did the first synopsis of the Finnish fauna in 1924 and the first checklist in 1935 (Lindberg 1935). The internationally acknowledged Swedish hemipterologist Frej Ossiannilsson (1908-1995) assisted Håkan Lindberg in preparing a comprehensive publication on the Auchenorrhyncha of Eastern Fennoscandia in 1947 (cf. also Ossiannilsson 1947), in which 261 species from present day Finland are identified. Lindberg continued his research still in the 1950's, but he did not emphasize much research into genital morphology of males. Lindberg devoted his last years of research to the Macaronesian and Mediterranean fauna. In his lifetime he described one new genus and four species new to science from Finland. Paavo Kontkanen (1905-1976) also collected a vast material of planthoppers and leafhoppers, predominantly from northern Karelia in the 1930's and 1940's. He published several contributions to the knowledge of the Finnish fauna (Kontkanen 1937, 1938, 1947a, 1947b, 1948, 1949a, 1949b, 1950, 1952, 1953a, 1953b, 1954). Kontkanen focused much of his research to ecological and phenological questions in the 1950's, and his period of active research faded at the same time as Lindberg's. One reason for this was the intensive research of the young Rauno Linnavuori (\*1927) in the years 1947-53 (Linnavuori 1948, 1949a, 1949b, 1950, 1951, 1952a, 1952b, 1953a, 1953b). Linnavuori dissertated in 1959 on the Neotropical Deltocephalidae and he soon became an internationally known expert on Hemiptera. His interest in exotic Auchenorrhyncha has prevailed until present. Although his own national research was periodically short, he described 5 species new to science from Finland. His greatest gift to Finnish hemipterology was, however, the taxonomic guides in the series *Animalia Fennica* in the years 1966-67 (Heteroptera) and 1969 (Auchenorrhyncha). These textbooks gave the opportunity for many young Finnish entomologists to get an insight into the world of true bugs, plant hoppers and leafhoppers. In his books on the Finnish Auchenorrhyncha (1969a, 1969b) Linnavuori includes information on 298 Finnish species and several occurring in adjacent countries. In the 1950's and 1960's Pekka Nuorteva (\* 1926) started etiological research of the nymphs and, in addition, described one species new to science (Nuorteva 1948, 1952, 1955). Nuorteva focused his research to planthoppers harmful to cultivated plants. Mikko Raatikainen (-1995) continued this line of research. He was particularly interested in the fauna of croplands and the original habitats of species migrating to croplands (Raatikainen & Vasarainen 1973, 1976). He was the first in starting to rear nymphs in Finland. Olli Halkka carried out genetic research on the spittle bug *Philaenus spumarius* during many years in the period 1960-1980 (see eg. Halkka 1967).

Inspired by Linnavuori's books three young entomologists, Larry Huldén (\*1948), Guy Söderman (\*1949) and Anders Albrecht (\*1953) started to collect Hemiptera in the early 1970's. The last mentioned two persons were distracted to other insect groups for years to come, but Huldén continued to collect and work with Hemiptera in the Zoological Museum of Helsinki (Brander & Huldén 1971, Huldén 1974, 1975, 1977, 1978, Huldén & Albrecht 1981). He assisted Frej Ossiannilsson with gathering information and revising museum material from Finland for the monographic taxonomic series written by Ossiannilsson on North-European Auchenorrhyncha (1978-83). When Ossiannilsson's books were completed, Huldén published together with Osmo Heikinheimo in 1984 the 2<sup>nd</sup> Finnish checklist on Hemiptera including 307 species of Auchenorrhyncha. Huldén's interest in Hemiptera faded after this. Hemipterological research was however continued by Martti Koponen (1938\*), who collected a material of more than 3,000 Auchenorrhyncha specimens, now placed in the Museum of Applied Biology in Helsinki, and Veikko Rinne (\*1956). Rinne made a thorough survey of the Heteroptera and Auchenorrhyncha in the National Park of the Finnish Southwestern Archipelago in 1994-1998 (Clayhills et al. 2000).

In the year 2001 a voluntary Expert Group on Finnish Hemiptera was established. As a result the author reinforced research into Finnish Auchenorrhyncha. Also Albrecht and Rinne have continued to collect planthoppers and leafhoppers again, as well as other members of the Expert Group and some new amateurs.

Regional research varies a lot. As the main aim for research during different periods has been to discover new species, the focus has always been on the southern- and easternmost areas, and to some extent also on the northernmost. Large areas in central and western Finland have often been neglected. As of present, a little less than 1,500 grid units of 10 × 10 km have been surveyed, which is only slightly exceeding 40% of the landarea of Finland. The number of recorded species/grid unit is for the most low (< 50 species). In the best studied grid unit less than 50% of all known species have been recorded.

## 3 Conservation status work

### 3.1

#### Earlier Finnish conservation status works

In the first evaluation of Finnish threatened species (Rassi et al. 1985) seven species of Auchenorrhyncha are mentioned: *Cicadetta montana* (extinct), *Cixidia confinis* (vulnerable), *Kelisia sabulicola*, *Gravesteiniella boldi*, *Cixidia lapponica*, *Hephathus nanus*, *Typhlocyba bifasciata* (near threatened). Only these species with specific biology were evaluated.

In the second evaluation (Rassi et al. 1990) only the same 7 species were re-evaluated: *Cicadetta montana* (endangered), *Cixidia confinis*, *C. lapponica*, *Kelisia sabulicola*, *Typhlocyba bifasciata*, *Gravesteiniella boldi*, *Hephathus nanus* (near threatened).

In the latest evaluation (Rassi et al. 2001) twelve species are listed: *Cicadetta montana* (critically endangered), *Agallia estonica* (endangered), *Gravesteiniella boldi*, *Hephathus nanus*, *Kelisia sabulicola*, *Muirodelphax aubei*, *Zonocyba bifasciata* (vulnerable), *Cicadula albingensis*, *Cixius cambricus*, *Endria nebulosa*, *Lebradea flavovirens*, *Megophthalmus scanicus* (near threatened). The rest of the Finnish species were grossly divided into not threatened (least concerned) and poorly known (data deficient) mainly based on old literature (Linnavuori 1969a, 1969b) information (Mannerkoski pers.comm.). Thus, a third of all Finnish species was classified as data deficient on different grounds. I have analyzed these grounds and grouped them accordingly:

#### **DD1 = taxonomic problems in identification, evaluation of the Finnish population impossible without revision**

Although most males of Auchenorrhyncha can be easily identified from their genital structures, there are still problems related with this technique. When the method came more common in use, it was found that the shape of the male aedagus could vary for several reasons. The German researcher Müller (1954) discovered that apical appendices of the species of *Euscelis* varied with the amount of light, they were shorter in areas with shorter periods of daylight. Recently Tisheckin (2003) has shown quite large variation in the aedagus structures of the genus *Scleroracus*.

Changes in the aedagus structure are also caused by parasitization (Pipunculidae and Dryinidae), in particular in the genera *Edwardsiana*, *Chloriona* and *Chlorita*. Some very rare taxa of the first mentioned genus (i.a. *Edwardsiana kemneri*, *E. staminata*) have for this reason been removed from the checklists of many countries. More "pseudotaxa" of this type might still be found.

Lately it has also been observed, that diminutive changes in the male genitalia might be caused by change of host plant. I have noted this in the species *Edwardsiana rosae*, *E. sociabilis*, *E. bergmani*, *Ribautiana ulmi* and *Eurhadina pulchella*.

Identification problems also occur in genera, where the male genitalia are weakly sclerotized or very similar in shape. In these genera other discriminating characters have been used for the identification, such as appendices of the male pygophore (*Empoasca* and *Oncopsis*) or the apodemes (*Kybos*, *Zygina* and *Macrosteles*). The intraspecific variation of these characters is poorly known, but some studies have shown quite large variations (see e.g. LeQuesne 1961a). The apodemes are quite sensitive structures,

which easily crumble when the specimens dry out. Thus old museum material is difficult to revise on the basis of such a character.

In support of taxonomic research, the nymphs and their host plants have gained much field lately. This is the method I have used in order to solve some taxonomic problems in the Finnish fauna. The sensory pitting of Fulgoromorpha nymphs and the chaetotaxy of Cicadomorpha nymphs often reveals greater differences between closely related species than the adults do. Moreover, nymphs show a higher plant relation degree than adults in feeding. The study and rearing of nymphs, and their host plant relationship, may be regarded as the 3rd stage of taxonomic research and has become a very important taxonomic method today (see Nickel 2003). It does, actually, take the taxonomy of Auchenorrhyncha quite close to that of aphids.

On the other hand, modern molecular techniques have not been used extensively in the taxonomical research on the species level of Auchenorrhyncha, yet, but bioacoustic methods have become more common (see De Vrijer 1981, Tischechin 1999, 2003, Gogala & Trilar 1999, 2004). These new techniques require much laboratory work and are still too expensive to become routines.

### **DD2 = fresh material is missing, the species have not efficiently been collected in its niche**

Taxonomic and faunistic research of Finnish Auchenorrhyncha went into near dormancy in the mid 1980's. The boom of ecological research was the cause. Taxonomic and faunistic research was not regarded very important in Finnish science. As a consequence, there is very little material collected in the late 20<sup>th</sup> century. Although collecting was effectuated in the beginning of the 21st century, there are not that many collectors, which can update the status of the Finnish species. In order to do so, this study has had to include a large collecting scheme based on passive sampling. Different trap designs, viz. light-traps, Malaise traps, yellow pans and pit fall traps, have been used to collect as many species as possible.

### **DD3 = the distributional picture is incomplete due to difficult identification techniques**

The distribution of many species has remained unclear, because identification to the species level requires analysis of the male genitalia. Unfortunately, the method described by Linnavuori (1969a), including maceration and preparation of the male abdomen, alienates people from using it. However, the genital apparatus can easily be taken out with an insect pin from fresh material, and even if it is slightly hardened the specimens can be damped in water vapour for 24 hours before the procedure. With a little training one can manage to study the genital structures of several males per minute. If the material is very old and dry, conventional maceration techniques must be applied.

### **DD4 = the biology of the species is incompletely known, the host plant of the nymph is not known**

There are several records on plants from which adults have been swept. Previously it was often assumed that the species live on these plants. However, adult Auchenorrhyncha move and fly quite much in their habitat and even stray to strange ones. Many species also regularly migrate, either vertically or horizontally, during their life cycle. Others, living in small and disperse microhabitats, migrate in order to find new suitable habitat patches for the new generation. The host plant of the nymph might be quite another one than on which the adult is met upon. The insight in the species biology has radically changed the opinion of species commonness. Some species regarded as rare in earlier times have shown to be quite common, when they have been searched for on their right host plants, whereas other, presumed to be common, have revealed very host specific ways of living and to be rare.

### **DD5 = the occurrence of the species in Finland is dubious, the recorded specimen (-s) may be a long-range migrant**

The occurrence of some species in Finland has been questioned as they have been found only in single specimens and a long time ago. Mostly insufficient collecting intensity is the cause for this. Rare species

tend to turn up only if the samples are large enough. This is proven in this study also. Despite of this, there are species that have not been found for over half a century even if large and fresh material collected with the right technique has been applied. In most cases, the biology of the nymphs is still not known, probably being the cause for not finding them, but in other this cannot be the case. The discovery of new species to Finland in the last 5 years has shown that most of them are found repetitively from year to year. Such species have found their niche of living and are able to hibernate and reproduce in Finland. There are also species that are not repeatedly found and remain as single specimen finds from Finland. Such species much be critically assessed, keeping in mind the possibility of long-range migration. Some might even be temporary visitors that have prevailed for a year or two in favourable microclimatic sites. Nickel (2003) critically assessed the German fauna, but in view of the total number of species, only a handful was considered potential long-range migrants. My study supports his findings. There are not many Finnish species that may be considered occasional migrants from further south.

3.2

### **Conservation status work in other European countries**

Of the 620 known species in Germany (Nickel & Remane 2002) 3 have been classified as regionally extinct, 56 as threatened and 72 as near threatened (Remane et al. 1998). The largest portion of the threatened species still has sustainable populations in the wetlands of northern Europe.

Of the near 400 known species in Sweden (Ossiannilsson 1978, 1981, 1983, Gillerfors 2002, 2003, 2005) only three have been listed in the latest red data book (Gärdenfors 2005). In Sweden, most species were regarded as data deficient due to the lack of expertise and well-documented data.

Of the 387 known species from UK (Wilson, pers.comm.2006) one has been classified as endangered (*Cicadetta montana*), 76 as notable and 22 as data deficient (Peter Kirby 1992).

Of the other European countries only Italy has evaluated its fauna of Auchenorrhyncha (Pavan 1992).

## 4 Methods and material

4.1

### Taxonomy

I have critically assessed the latest taxonomic research done abroad, in which new methods, bioacoustic signals and host plants of the nymphs, have been used to separate species. I have got invaluable help from my colleagues Dr. Mike Wilson (Cardiff), Dr. Herbert Nickel (Göttingen), Dr. Dimitri Tishechkin (Moscow), Prof. Alexandr Emelyanov (St.Petersburg), and Gösta Gillerfors (Lund), who have discussed taxonomic problem with me and provided me with articles on difficult genera. Based on this I have, when considered necessary, revised adults of the Finnish material of some species. I have paid special attention to difficult genera such as *Javesella*, *Oncopsis*, *Kybos*, *Empoasca*, *Edwardsiana*, *Eupteryx*, *Linnavuoriana*, *Zygina*, *Balclutha*, *Cicadula*, *Scleroracus* and *Psammotettix*.

4.2

### Biology

In the biological research I have tried to clarify the developmental stage of hibernation and, in particular, the host plants of the nymphs of which there has been very scanty reliable information. I use the term food plant for the plant on which the adult feeds, and the term host plant for the plant on which the nymph feeds.

I have collected and stored nymph material from many plants in the field. The nymphs have been treated with the freeze-dry technique (Albrecht 1994) and in the identification of the mounted nymphs I have used the schemes of Wagner (1950), Vilbaste (1968, 1982), Walter (1975, 1978), Wilson (1978) and Stewart (1986) for guidance.

4.3

### Distribution

The following collecting methods have been used in the faunistic research:

The most extensive sampling technique is the use of **light traps**. Standard traps belonging to the National Moth Monitoring Scheme (Söderman 1994, Leinonen et al. 1998) and different trap designs used by private collectors have been used. The material consists of altogether 76 sites and 745 effective trap-months. The results from the year 2002-2003 have been presented earlier (Söderman 2004).

In open terrain such as shores, pastures and mires **Malaise traps** have been used. Although the Malaise trap is an old design that the Finnish dipterologist Richard Frey used already in the 1930's, the general conception has long been that it is useful only in the tropics (possibly due to the use of its inventor). In Finland Malaise traps came into re-use in the 1980's but have been in extensive use only in the 21<sup>st</sup> century. Two types of traps have been used: the BioQuip model and the Terra Polar model. The material consists

of altogether 40 sites and 235 effective trap months. In addition, in southwestern Finland material has been collected from riparian buffer zones with large **interception traps**. This material consists of 40 sites and 200 effective trap months.

In traditional farmlands and on xerothermic sites **yellow color traps** of different design have been used (cf. Söderman & Leinonen 2003). The yellow-traps are a more easily used version of yellow pans. The material has been collected from the national pollinator network and from research projects. Two types of traps have been used: the Russells Chemical model and the Calabuig model. The material consists of altogether 190 sites and 4,485 effective trap months.

In sandy areas and ombrotrophic bogs **pitfall traps** have been used. The material has been collected from various research projects. The material consists of altogether 23 sites and 3,640 effective trap months.

The author, his colleagues and field assistants have made inventories in the field using **sweep-nets**. The collected material has been aspirated alive, killed in a freeze and analyzed fresh. The sweep-net is easy to use, but it has limitations. Species living hideously in tufts or close to the ground surface (e.g. *Aphrodes*, *Agallia*, *Euscelis*, *Streptanus*, members of Delphacidae) and species living in canopies (e.g. *Edwardsiana*) are seldom encountered in such samples. Moreover, collectors refrain from sweeping thorny plant species such as roses and hawthorns, and species living on these plants are also rare in sweep-net samples. In addition, a suction sampler (model Vortex) has been used for collecting statistically appropriate quantitative samples from a few grassland areas in the years 2005. The material has been treated as the sweep-net samples.

The field inventories have had three purposes: 1) re-visits to sites of rare species found in earlier periods, 2) to make inventories of conservation areas to assess the conservation status of rare species, and 3) to look for nymphs to define the host plants of the species.



## 5 Review of Finnish species

A review of the Finnish species, their distribution and biology is given in this chapter. On the basis of this information I have suggested a revision (see appendix 1) of the threat classification using the principles and criteria proposed by IUCN (see Rassi et al. 2001).

The systematics and nomenclature of Auchenorrhyncha follows that adopted in Central Europe (see e.g. Nickel 2003). Vernacular names in Finnish are found on the website of the Expert Group on Hemiptera (<http://users.utu.fi/veirinne/tyoryhma/tyoryhma.htm>). Synonyms are included only if they have been in use in Finland before.

The names of plants follow Mossberg & Stenberg (2003) and for ornamental trees and brushwood Hämet-Ahti et al. 1992.

For each species I have briefly reported the general distribution.

Moreover, I have given the threat class (U) of the year 2000 evaluation complementing the class DD with subclasses given in chapter 3.1, the stage of hibernation (H): o = egg, n = nymphal stage, a = adult, the known number of generations per year (G) in Finland known to me and methods (M) by which the species has been captured: s = sweeping or suction sampler, l = light trap, m = Malaise or interception trap, y = yellow trap and p = pitfall.

The distribution of species in Finland is roughly given according to biogeographical regions in the text and on provincial level in appendix 1. More detailed distribution data has been stored in a database at the Zoological Museum of Turku University from which distribution maps on a 10 × 10 km grid have been produced and are available on the website of the Expert Group on Hemiptera (<http://users.utu.fi/veirinne/tyoryhma.tyoryhma.htm>). If species records are scarce, I have treated the history of finds more in detail or mentioned single records in the text.

In the biological section the preferred habitats of the species and the host plant (-s) of the nymphs are mentioned.

### Suborder Fulgoromorpha

#### Family Cixiidae

##### Subfamily Cixiinae

##### *Cixius* Latreille, 1804

###### Taxonomic comments:

- Species of the subgenus *Ceratocixius* are sometimes difficult to identify and some of the morphospecies may turn out to be sibling species. Thus, the taxon *cambricus* divides into two ecological types in Europe of which one

lives on xerothermic heaths and meadows, the other one on more humid mountain down slopes. They may possibly be distinct species that cannot be morphologically separated, yet. The type specimen recorded from

England belongs to the eastern European type that also occurs in Finland (Holzinger et al. 2003).

- All species of the genus have nymphs with an endogeic development. At the moment only nymphs of *C.similis* can be separated from other species.

*C.(Cixius) nervosus* (Linnaeus, 1758)

Eurosiberian; U: DD4; H: n; G: 1; M: s

Very rare in the southwestern part of Finland from which it appears to have retarded. There are recent findings from Häme and northern Karelia. Adults have been found mostly on wooded pastures, which have become rare in the southwest. The nymphs live subterraneously and are apparently polyphagous, adults ascend trees and brushwood (*Alnus*, *Fraxinus*, *Betula*, *Quercus*, *Salix*) for feeding and mating. Females descend in autumn to bases of herbs for oviposition.

*C.(Ceratocixius) cunicularius* (Linnaeus, 1767)

Eurosiberian; U: LC; H: n; G: 1; M: s,l,y,m,p

Common and widespread north to the orohemiarctic region and the Barents Sea. Lives preferably in boreal deciduous forests, but has also been recorded on mires in the northern half of Finland. The nymphs live preferably subterraneously, but there are records of nymphs also from decayed trees, which probably belong to this species. Adults ascend leaf trees (*Betula*, *Alnus*) and brushwood (*Salix*, *Corylus*, *Lonicera*) for feeding and mating. Females return to the ground layer for oviposition.

*C.(Paracixius) distinguendus* Kirschbaum, 1868

Eurosiberian; U: LC; H: n; G: 1; M: s,l,y,m

Previously known from scattered localities in the hemiboreal region, but has evidently expanded its range to the southern boreal region in the last decade. It lives in wet boreal deciduous forests and thickets fringing shores and mires. The nymphs live subterraneously, possibly on rhizomes of ferns, and adults ascend tall herbs and grasses (*Filipendula*, *Lysimachia*, *Epilobium angustifolium* and *Phragmites*) for feeding and mating. Females return to the ground layer for oviposition.

*C.(Paracixius) cambricus* China, 1935

European; U: NT; H: n; G: 1; M: s

Very rare in Finland. Confirmed from alvar-like meadows on islands in the National Park of Southwestern Finnish Archipelago. There are two inland records of this species. One single specimen taken in year 1942 from Northern Karelia, strangely apart from all other localities, that Lindberg considered belonging to *C.stigmaticus* (Germar, 1818). Ossianilsson determined it with hesitation to *C.cambricus* in 1943 and Huldén (1975) also considers it to be

long to this species. Another inland occurrence was recorded in 2002 from an air field in Satakunta. In Russia the species is confined to forest steppes and in England to sand terraces. The nymph is said to feed on roots of sedge underneath stones in England (LeQuesne 1960).

Data: Al: Kökar 1947 (leg. A.Nordman, W.Hellén & H.Lindberg); Ab: Nauvo 1961 (leg. G.Roos), 1969 (leg. P.T.Lehtinen), 1993 (leg. V.Rinne), Korppoo 1995 (leg. V.Rinne); N: Tammisaari Gullö 1961 (leg. Anonymous); St: Hämeenkyrö 2002 (leg. K.Mattila); Kb: Kontiolahti 1942 (leg. H.Lindberg).

*C.(Paracixius) similis* Kirschbaum, 1868

*Cixius distinguendus* in J.Sahlberg 1871 nec Kirschbaum, 1868

Siberian; U: LC; H: n; G: 1; M: s,y,m,p

Widespread and common throughout Finland and further north to the Barents Sea. It is most abundant in the central and northern parts of the country where peatbogs are more numerous. It lives in mires, on paludified shore meadows, in moist cool coniferous forests and in cool scrubby island habitats off the Baltic shore. The polyphagous nymph has been found in peat and moss. Adults ascend scrubs (*Vaccinium*, *Myrica*, *Ledum*, *Betula nana*, *Salix*) for feeding and mating. The female returns to the ground surface for oviposition.

***Pentastiridius*** Kirschbaum, 1868

*Oliarius* Stål

*P.leporinus* (Linnaeus, 1761)

West-Palaeartic; U: LC; H: n; G: 1; M: s, l, y

Rare and scattered in the coastal reed beds of the Finnish Gulf and on reedy shores of lakes in western Finland. It has also been found from lake and mire fringes inland. The nymphs are polyphagous and live subterraneously feeding on roots of different plants. I have recorded them on *Tripleurospermum maritimum* and *T.inodorum*. Adults ascend monocots on the shore (*Phragmites*, *Bolboschoenus*, *Scirpus*, *Carex*, *Eriophorum*) for mating. Fertilized females make nocturnal flights to new habitat patches. It belongs to the guild of species with highly fluctuating annual local populations due to water level changes in its breeding niche. It may be rare in some years and very numerous and expanding in others. A rare incident of this is described by Reuter (1880), who recorded an influx of more than 1,000 specimens to one single wheat field in southwestern Finland in 1878.

## Family Delphacidae

### Subfamily Kelisiinae

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#### **Kelisia** Fieber, 1866

Taxonomic comment:

- The *guttula*- and *pallidula*-groups comprise several species in Europe, some of which are difficult to identify with small distinguishing characters in the male aedagus but with different host plants (see Holzinger et al. 2003). Insofar, the Finnish species appear to be taxonomically clear, but further investigations are hampered by the lack of new material as most species have recently become very rare.

#### *K.guttula* (Germar, 1818)

Eurosiberian; U: DD2; H: o; G: 1; M: s

Rather rare and localized in the hemiboreal region and with a few scattered occurrences in the southern boreal region of Finland. Lives on tall-grass shore meadows and sedge mires. The nymph lives on *Carex lasiocarpa* and *C. vesicaria*.

#### *K.confusa* Linnavuori, 1957

Southeast European ? ; U: -; H: o; G: 1; M: s

The first specimen was encountered with a suction sampler in the Nature Reserve Ramsholmen in southern Alandia (Albrecht et al. 2006). The species is previously known from southeastern Europe (Nickel 2003), but Holzinger et al. (2003) synonymized the taxon *K.nervosa* described by Vilbaste from Lithuania in 1970 with this species. The nymph is mentioned to live on *Carex elata* (Nickel 2003).

Data: Al: Jomala Ramsholmen 2005 (leg. Söderman & Ahlroth).

#### *K.vittipennis* (J.Sahlberg, 1868)

*Stenocarenum guttuliferus* in J.Sahlberg, 1871 nec Kirschbaum, 1868

Eurosiberian; U: LC; H: o; G: 1; M: s

Rather common on mires in the hemiboreal, southern and middle boreal regions of Finland with strongholds on ombrotrophic bogs in the south. The nymph is strictly monophagous on *Eriophorum vaginatum*. A small cotton-grass patch is usually enough to sustain a rather big local population.

#### *K.pallidula* (Boheman, 1847)

Eurosiberian; U: LC; H: o; G: 1; M: s

Very rare, probably extinct from the mainland Finland, but still with small remnant populations in Alandia. It has occurred in minerotrophic spring seepages, alkaline fens and basic woody meadows in the southwesternmost parts. The nymph is

strictly monophagous on *Carex panicea* (Nickel 2003).

#### *K.praecox* Haupt, 1935

Eurosiberian; U: -; H: a; G: 1; M: s

Rare in southern Finland and there are only some recent findings in 2002-2003 (Albrecht et al. 2003). Despite collecting efforts, it has not been found in suitable sites elsewhere. Lives along wet ditches and rivulets, where the host plant *Scirpus sylvaticus* grows. The host plant in Central Europe is *Carex brizoides* (Holzinger et al. 2003), which is missing from Finland.

Data: Ab: Espoo 2003 (leg. V.Rinne); N: Espoo 2003 (leg. Rinne, Albrecht, Söderman), Helsinki 2002 (leg. Albrecht & Rinne), Sipoo 2003 (leg. A.Albrecht), Tuusula 2003 (leg. I.Mannerkoski).

#### *K.ribauti* W.Wagner, 1938

*Kelisia pannonica* Matsumura 1911 ssp.*ribauti* W.Wagner, 1938 in Linnavuori 1969b.

Eurosiberian; U: LC; H: o; G: 1; M: s

Widespread but with scattered localities in the boreal parts of the country. It has been found in wetlands and on wet patches close to the sea shore where its host plant grows. The nymph lives in Finland monophagously on small-grown *Carex nigra*.

#### *K.monoceros* Ribaut, 1934

European; U: DD4; H: o; G: 1; M: s

Very rare in Finland where it is only found on xerothermic slopes. The host plant of the nymph in Central Europe is *Carex otrubae* growing in wet sites (Nickel 2003), but finds in Finland are related to occurrences of *Carex ericetorum* and *C.muricata*.

Data: Ab: Paimio, Turku 1949 (leg. R.Linnavuori); Sa: Joutseno 1951 (leg. R.Linnavuori), 2004 (leg. Söderman & Albrecht), Luumäki, 2004 (leg. Söderman & Albrecht); Al: Föglö 1975 (leg. A.Albrecht), Sund 2005 (leg. Söderman & Ahlroth); Ab: Pohja 1976 (leg. A.Albrecht).

#### *K.sabulicola* W.Wagner, 1952

West-European; U: VU; H: a; G: 1; M: s

Lives in Finland only on a few southwestern dune fields (Albrecht et al. 2003), where the host plant of the nymph *Carex arenaria* grows. None of the known sites represent conservation areas, but the known populations are quite big. On some of the sites the host plant is however declining.

Data: N: Hanko Tvärminne 1976 (leg. A.Albrecht), 1993, Hanko Tulliniemi 1993 (leg. V.Rinne); Ab: Dragsfjärd Örö 1996 (leg. V.Rinne), 2001 (leg. A.Albrecht); Al: Eckerö Degersand 2002 (leg. Albrecht, Söderman & Mattila), 2005 (leg. Söderman & Ahlroth); N: Hanko Tvärminne and Lappohja 1993 (leg. T.Lammes), 2004 (leg. Albrecht, Söderman, Ahlroth & Mannerkoski).

**Anakelisia** W.Wagner, 1963

*A.perspicillata* (Boheman, 1845)

European; U: -; H: a; G: 1; M: s

One macropterous male of this species has quite recently been found from a dry meadow in north-eastern Alandia (Albrecht et al. 2006). The stronghold of the species is probably in western Estonia. The host plant of the nymph is said to be *Carex flacca* or *C.pilulifera* abroad (Nickel, 2003).

Data: Al: Sund Mångstäkta 2002 (leg. G.Söderman)

## Subfamily Stenocraninae

**Stenocranus** Fieber, 1866

Taxonomic comment:

- Analysis of male genitalia in series of the taxon *S.minutus* show a large variation in the curvature of the appendix of the aedagus, some of which fit the drawings of *S.major* by Ossiannilsson (1978:figs 126-127). The variation is believed to be caused by slight deformation during copulation. The form of the male aedagus is therefore an unreliable character for differentiation of the two species.

*S.major* (Kirschbaum, 1868)

West-Palaeartic; U: DD3; H: a; G: 1; M: s,l,y,m

Still quite rare and localized in southern Finland where it was first recorded as late as in 1994. During the next ten years it spread quite rapidly and is nowadays not uncommon south of the Suomenselkä water divide in Finland. It lives on wet seaside meadows, humid inland patches and in riparian buffer zones. The nymph is a strict monophage of *Phalaris arundinacea*.

*S.minutus* (Fabricius, 1878)

West-Palaeartic; U: LC; H: a; G: 1; M: s,l,y,m

Rather common in southern Finland, in particular within the hemiboreal region, but it has expanded also to the eastern parts of Central Finland north to Northern Karelia. As the species first was met with on the islands of Alandia in year 1943, it seems to have had two expansion routes; one from southwest, the other from southeast. It lives on road verges and mesic meadows. The nymph lives strictly monophagous on *Dactylis glomerata*.

*S.fuscovittatus* (Stål, 1858)

Eurosiberian; U: -; H: a; G: 1; M: s

The species has insofar only been recorded twice from Finland (Albrecht et al. 2003). It was swept from a paludified lakeshore on *Carex vesicaria*, which probably is the host plant of the nymph in Finland, and from *Ledum* in a pine bog.

Data: N: Pernaja 2002 (leg. Albrecht & Söderman), Hyvinkää 2002 (leg. A.Albrecht).

## Subfamily Delphacinae

**Delphacinus** Fieber, 1866

*D.mesomelas* (Boheman, 1849)

Pontomediterranean; U: DD2; H: n; G: 1; M: s,m

Rare and occurring only in the southern parts of Finland. It lives on dry meadows, but also accepts s.c. substitutional habitats, viz. road verges. The nymph is a monophage of *Festuca ovina*.

**Eurysula** Vilbaste, 1968

*E.lurida* (Fieber, 1866)

*Metropis laevifrons* J.Sahlberg, 1871

Siberian; U: DD2; H: n; G: 1; M: s,p

Rare in the hemiboreal parts of Finland. There are only a few recent records within its distributional range in southern and central parts of Finland. Lives in sandy places where the host plant *Calamagrostis epigejos* grows (Linnavuori 1952b). Both adults and the nymphs live hideously in the grass tufts. It appears to be most common in the early succession stages of disturbed areas.

**Eurybregma** Scott, 1875

Taxonomic comment:

- There are two species of this genus in Europe, which have an eastern distribution. The best known is *E.nigrolineata* Scott, 1875, which has proved to be expansive. It was known already in the 1940's in eastern Germany from where it expanded to the western parts in the 1960's and during the last decade further west and south to France, Belgium and northern Italy, but not notably to the north (see, however, Gillerfors 2002). The second, less well-known species is *E.porcus* that originally was described as a species of *Criomorpus*. *E.porcus* is known from the Balkans and European Russia. It was found in the Leningrad Region in the 1960's and the Finnish occurrence is a part of this population.

*E.porcus* (Emelyanov, 1964)

Siberian; U: -; H: a; G: 1; M: s

The species has been found only once in Finland and one adult and two nymphs were swept from a lush meadow (Albrecht et al. 2006). The host plant is either *Elymus repens* or *Dactylis glomerata*.

Data: Kb: Tohmajärvi 2003 (leg. M.Pajari).

**Stiroma** Fieber, 1866

*S.affinis* Fieber, 1866

Eurosiberian; U: LC; H: n; G: 1; M: s,l,y,p

Rather common throughout the country in cool and humid, often coniferous, forests, on cropland margins and in mires. The nymph lives on several species of grasses, but seems to prefer species of *Calamagrostis*.

*S.bicarinata* (Herrich-Schäffer, 1835)

Eurosiberian; U: LC; H: n; G: 1; S: s,l,y,m

Common throughout the country in clearings of boreal deciduous forests and cropland margins. The nymph lives on grasses (Poaceae). I have found it most abundantly on *Deschampsia flexuosa*.

**Stiromoides** Vilbaste, 1971

*Eurysa* pro parte

*S.maculiceps* (Horvath, 1903)

Siberian; U: DD4; H: n; G: 1; M: s

This rare eastern species has only been found once in a xerothermic site in southeastern Finland (Linnavuori 1952a). The nymph is said to live on *Koeleria* in Central Europe (Holzinger et al. 2003), but the host plant in Finland is probably *Festuca ovina*.

Data: Sa: Joutseno 1951 (leg. R.Linnavuori).

**Achorotile** Fieber, 1866

*A.albosignata* (Dahlbom, 1845)

Siberian; U: LC; H: n; G: 1; M: s,m, p

Rather rare and localized, but widely distributed in Finland. It lives only on sandy and rocky surfaces with sparse tufts of its host plants *Agrostis canina* and *A.vineale*.

*A.longicornis* (J.Sahlberg, 1871)

Siberian and boreoalpine in Europe; U: DD5; H: n; G: 1; M: s

There are two very old records from the 19<sup>th</sup> century of the species from Finland, one from a sandy field, the other from a stony heath. The third, and most recent record, is some 20 years old. The host plant of the nymph is probably *Agrostis vineale* growing on the most recent recording site. In the Alps it has been swept from *Juncus trifidus* (Nickel 2003).

Data: Kl: Parikkala 1966 (leg. J.Sahlberg); N: Vantaa 1889 (leg. A.Palmén); Ta Janakkala 1984 (leg. M.A.Koponen).

**Euconomelus** Haupt, 1929

*E.lepidus* (Boheman, 1847)

Eurosiberian; U: LC; H: o; G: 1; M: s

Rather scarce along the seashore north to Oulu in northern Ostrobothnia. It has furthermore been recorded locally from shores of large lakes in Finland. Lives on muddy shores, where either of the host plants of the nymph, *Eleocharis palustris* or *E.uniglumis*, grows abundantly.

**Conomelus** Fieber, 1866

*C.anceps* (Germar, 1821)

West-European; U: LC; H: o; G: 1; M: s

Rather common in the hemi- and southern boreal regions of Finland on various muddy shores and swampy forest patches. The nymph lives in Finland on *Juncus effusus* and *J.conglomeratus*. In the Alps it is also known from *J.inflexus* (Holzinger et al. 2003).

**Delphax** Fabricius, 1798

*D.crassicornis* (Panzer, 1796)

Transpalaeartic; U: DD2; H: o; G: 1; M: s,l,m

Rather rare and predominantly occurring along the seashore and locally inland in reed-beds. It is also recorded from northern Karelia. The nymph is a strict monophage of *Phragmites australis*. Both adults and nymphs spend much time close to the basal tufts based on my recent recordings from Alandia.

*D.pulchellus* (Curtis, 1838)

*Delphax minki* in J.Sahlberg, 1871 nec Fieber, 1866

European; U: LC; H: o; G: 1; M: s,l,m

More rare than the preceding species and found only in coastal reed-beds of southern Finland. The nymph is a strict monophage of *Phragmites australis*.

**Euides** Fieber, 1866

*E.basilinea* (Germar, 1821)

*Delphax speciosa* Boheman, 1845

West-Palaeractic; U: DD2; H: o; G: 1; M: s,l,m

The presumed halobiontic species was in early times recorded from alkaline mire reed-beds in southwestern Finland (Linnavuori 1969b). The few recent records do neither imply alkaline nor saline habitats, but rather muddy sites. The adult female oviposits in the stems of *Phragmites australis* and

the nymph lives on the basal parts of the plant (Strübing 1960, Vogel 1981).

Data: Al: Finström <1871 (leg. Reuter & J.Sahlberg), Eckerö 1943 (leg. H.Lindberg); Ab: Raisio 1947 (leg. R.Linnavuori); St: Pori 2000 (leg. K.Mattila); Ab: Ruissalo 2004 (leg. V.Rinne); Tb: Jyväskylä 2004 (leg. J.Kahanpää); Ab: Lieto, Tarvasjoki 2005 (leg. T.Kanerva).

### **Chloriona** Fieber, 1866

*C.chinai* Ossiannilsson, 1946

*Chloriona prasinula* H.Lindberg, 1935 nec Fieber, 1872

Siberian; U: LC; H: n; G: 1; M: s

Rare along the seashore north to the middle boreal region in Finland. In addition, it has been recorded at the shore of Lake Oulujärvi. It lives in the outer waterlogged parts of reedbeds. The small nymph lives on the basal parts and ascends with age to the upper parts of *Phragmites australis*.

*C.glaucescens* Fieber, 1866

*Chloriona unicolor* in J.Sahlberg 1871 nec Herrich-Schäffer, 1835

West-Palaeartic; U: LC; H: n; G: 1; M: s,l,m

Rather common in coastal reed-beds north to Central Ostrobothnia, but also inland along shores of larger lakes. The nymph lives monophagously in the upper parts, close to the inflorescens, of *Phragmites australis*.

*C.smaragdula* (Stål, 1853)

*Chloriona smaragdula* J.Sahlberg, 1871

West-Palaeartic; U: DD3; H: n; G: 1; M: s

Rare in Finland north to the northern boreal region. It lives preferably on eutrophic lakeshores. The nymph lives in the upper parts of *Phragmites australis* (Vogel 1981).

### **Megamelus** Fieber, 1866

*M.notula* (Germar, 1830)

*Megamelus brevisfrons* Reuter, 1880

Eurosiberian; U: LC; H: o; G: 1; M: s

Common north to the northern boreal region in Finland. It lives on paludified shores and sedge mires. The nymph lives on *Carex* and *Juncus* and the adult has been swept from *Equisetum palustre* in numbers.

### **Unkanodes** Fennah, 1956

*U.excisa* (Melichar, 1898)

Siberian; U: DD2; H: n; G: 2; M: s,l

Rather rare and lives on sandy beaches of the Baltic Sea, north to the island of Hailuoto. The nymph is a strict monophage of *Leymus arenarius*.

### **Megadelphax** W.Wagner, 1963

*M.sordidula* (Stål, 1863)

Eurosiberian; U: LC; H: n; G: 2; M: s,l,y,m

Common north to the central boreal region in Finland. It lives on tall-grass meadows, lays, crop-fields, road verges and in riparian buffer zones. The nymph feeds on *Phleum pratense* and *Alopecurus pratensis* in Finland.

### **Laodelphax** Fennah, 1963

*L.striatella* (Fallén, 1826)

Transpalaeartic; U: DD4; H: n; G: 1; M: s,l,m

Widespread and nowadays rather common in southernmost Finland and with scattered records further north. This is a species which adapts well to disturbed habitats and is one of the pioneer species inhabiting open and poorly vegetated sites. Adult brachypterous specimens preferably live on dry and mesic meadows, but macropterous individuals often stray very far from their local population. The records north of the southern boreal region in Finland are all macropterous individuals, possibly on dispersal flight. The species has apparently expanded its range northwards in this century. The nymph lives on various grasses (Poaceae), most abundantly on *Agrostis capillaris*.

### **Paraliburnia** Jensen-Haarup, 1917

*P.adela* (Flor, 1861)

Eurosiberian; U: DD4; H: n; G: 1; M: s

Very rare and local in Finland on wet shore meadows and riverbanks. I have found the nymph on *Phalaris arundinacea*, but *Glyceria* is also mentioned by other hemipterologists (LeQuesne 1960, Linnavuori 1969b, Vilbaste 1974). Both nymphs and adults live hideously in the tufts.

*P.clypealis* (J.Sahlberg, 1871)

North-European; U: DD4; H: n; G: 1; M: s,m

Very rare in Finland. It lives in quaking mires and on wet paludified shore meadows. The nymph feeds on *Calamagrostis canescens*. Adults and nymphs live a hideous life like the preceding species.

Data: Kb: Hammaslahti 1943 (leg. P.Kontkanen); Ab: Raisio 1947 (leg. R.Linnavuori); Tb: Jyväskylä 2004 (leg. J.Kahanpää); St: Säkyli 2005 (leg. E.Kallio).

### **Hyledelphax** Vilbaste, 1968

*H.elegantula* (Boheman, 1847)

Eurosiberian; U: LC; H: n; G: 1; M: s,l,m,p

Rather common throughout the country and found in various dry habitats from meadows to strings of raised bogs. The nymph feeds on *Deschampsia flexuosa* and *Calamagrostis arundinacea*.

### **Calligypona** J.Sahlberg, 1871

*C.reyi* (Fieber, 1866)

*Calligypona albicollis* J.Sahlberg, 1871

Transpalaeartic; U: DD4; H: n; G: 1; M: s

Rare in the southwestern parts north to southern Ostrobothnia. Lives on shore meadows. The nymph feeds on *Schoenoplectus lacustris* and *S.tabernaemontani*.

### **Delphacodes** Fieber, 1866

*D.capnodes* (Scott, 1870)

European; U: -; H: a; G: 1; M: s

Only two populations of this tyrphobiontic species is known from mire conservation areas in southern Finland (Albrecht et al. 2006). The nymph and adults live in the peat and feed on basal parts of sedges (*Carex*) and cottongrass (*Eriophorum*).

Data: St: Yläne Vaskijärvi 2005 (leg. J.Kirjavainen); Ta: Kuru Seitsemäinen 2005 (leg. J.Kirjavainen)

*D.venosus* (Germar, 1830)

*Liburnia curtula* J.Sahlberg, 1871

European; U: LC; H: a; G: 1; M: s,m

Localized in the interior of the country north to central Ostrobothnia where it lives in mires and on humid, slightly paludified meadows. The nymph lives in the peat and feeds on basal parts of sedges (*Carex*), rushes (*Juncus*) and cottongrass (*Eriophorum*). Macropterous specimens may stray to drier biotopes in autumn.

### **Gravesteiniella** W.Wagner, 1963

*G.boldi* (Scott, 1870)

Eurosiberian; U: VU; H: n; G: 1; M: s,y,p

Previously known from a few dune fields on where the nymphs lived on *Festuca polesica* (Al-

brecht 1977). Along the southern Baltic shores it lives on *Ammophila arenaria* (Ossiannilsson 1978). It was, however, recently found inland from an esker in Häme where none of these grasses grow, so it may also be living on other fescue species. In Central Europe it has been found inland only from eastern Austria and Hungary (Holzinger et al. 2003).

Data: N: Hanko Tvärminne 1976-79 (leg. A.Albrecht), 2004 (leg. J.Ikävälko); Ab: Dragsfjärd Örö 1996 (leg. V.Rinne); Ta: Loppi Komio 2005 (leg. Karjalainen & Salminen).

### **Muellerianella** W.Wagner, 1963

*M.brevipennis* (Boheman, 1847)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m,p

Common in the hemi- and southern boreal regions in Finland living on all kinds of mesic and dry grasslands and in forest clearings. Occasionally it can also be found in mires. The nymph is monophagous on *Deschampsia flexuosa*.

*M.extrusa* (Scott, 1871)

*Calligypona fairmairei* (Perris, 1857) p.p. in Linnavuori 1969b

Eurosiberian; U: DD1; H: o; G: 1; M: s

Rare in mires and wooded pastures in the southern boreal region of Finland. The nymph feeds on *Molinia caerulea*.

*M.fairmairei* (Perris, 1857)

Holomediterranean; U: DD1; H: o; G: 1; M: s

There is only a few records of this species from southwestern Finland. The nymph feeds on softgrass (*Holcus lanatus* and *H.mollis*) in central Europe (Nickel 2003). Drosopoulos (1977) states that oviposition takes place on *Juncus effusus* and that young nymphs move to *Holcus* for further development. Some of the Finnish specimens may be migrants from further south.

Data: N: Hanko Tvärminne 1972 (leg.?) op.cit.Ossiannilsson 1983 addendum; Ab: Nauvo Seili 2005 (leg. T.Ranta).

### **Muirodelphax** W.Wagner, 1963

*M.aubei* (Perris, 1857)

*Liburnia obsoleta* J.Sahlberg, 1871

West-Palaeartic; U: VU; H: o; G: 1; M: s

Only recorded twice from Finland. Lives on alvar-like calcareous thyme-growing meadows, where the nymph feeds on *Poa pratensis*.

Data: Al: Lemland 1953 (leg. W.Hellén); Ab: Jurmo 1995 (leg. V.Rinne).

**Acanthodelphax** LeQuesne, 1964

*A.denticauda* (Boheman, 1847)

European; U: LC; H: n; G: 1; M: s,m

Occurs throughout the country with the exception of Alandia. It is much more common in the northern parts of the country and becomes rare in the southern parts. Lives on humid meadows and mires (Raatikainen & Ylönen 1988). The nymph feeds on *Calamagrostis canescens* (Linnavuori 1952b) and *Deschampsia caespitosa* (Drosopoulos 1977).

*A.spinosa* (Fieber, 1866)

European; U: -; H: n; G: 1; M: s,y,m

The first records of this species from Finland are from the 21st century, when it was found in dry meadows, city gardens, on airport fields and road verges (Albrecht et al. 2006). Abroad the species lives on sheep grazed meadows on *Festuca ovina* (Gillerfors 2003) or *F.rubra* (Nickel 2003).

Data: N: Hanko Tvärminne 2002 (leg. K.Mattila), Espoo Nuukio 2003 (leg. V.Rinne), Espoo Mäkkylä 2004 (leg. K-E.Lundsten), Inkoo Västankvarn 2004 (leg. J.Pöyry); Ab: Lohja Varola 2004 (leg. Pöyry & Paukkunen), Karjalohja Niku 2004 (leg. J.Pöyry), Salo 2004 (leg. J.Paukkunen); Ta: Loppi 2005 (leg. Karjalainen & Salminen); Sa: Joutseno 2005 (leg. A.Valtonen).

**Nothodelphax** Fennah, 1963

*Tyrphodelphax* Vilbaste

*N.albocarinata* (Stål, 1858)

*Liburnia albocarinata f.intermedia* J.Sahlberg, 1871

Siberian; U: LC; H: n; G: 1; M: s

Disperse north to northern Ostrobothnia in Finland. It lives on sedge-dominated mires and in wet bog depressions. I have found the nymph on *Carex limosa*. Ossiannilsson (1978) mentions *Eriophorum* as well.

*N.distincta* (Flor, 1861)

*Liburnia albocarinata f.brachyptera* in J.Sahlberg 1871

North-European; U: LC; H: n; G: 1; M: s,p

Rather common, but localized, throughout the interior of Finland in large mire complexes. The nymph lives monophagously in the tufts of *Eriophorum vaginatum*.

**Dicranotropis** Fieber, 1866

*D.hamata* (Boheman, 1847)

Transpalaeartic; U: LC; H: n; G: 2; M: s,y,m,p

Very common north to the northern boreal region in Finland on various grasslands. The nymph lives on several grass species, i.a. *Dactylis*, *Alopecurus*, *Elymus repens* and *Festuca* in Finland.

**Florodelphax** Vilbaste, 1971

*Paraliburnia* pro parte

*F.paryphasma* (Flor, 1861)

*Delphax lucticolor* J.Sahlberg, 1871

Eurosiberian; U: DD4; H: n; G: 1; M: s

A very rare species that has been found only in a few sites. It lives on wet shore meadows and in fringes of eutrophic mires. The nymph is a strict monophage of *Carex disticha*. Nymphs and adults live hideously in tufts.

Recent data: St: Yläne Vaskijärvi 2004 (leg. V.Rinne).

**Kosswigianella** W.Wagner, 1963

*K.exigua* (Boheman, 1847)

European; U: DD4; H: n; G: 1; M: s

Rare and found only twice in Finland. It lives on dry sandy meadows. The nymph only feeds on *Festuca ovina*. There are old records (leg. J.Sahlberg) from Russian Karelia, so the species may also live in the southeastern part of Finland.

Data: Ab: Parainen <1880 (leg. O.M.Reuter), Dragsfjärd Öro 1996 (leg. V.Rinne).

**Struebingianella** W.Wagner, 1963

*Paraliburnia* pro parte

*S.lugubrina* (Boheman, 1847)

European; U: LC; H: n; G: 1; M: s

Rare in the hemi- and southern boreal regions of Finland. It lives in lush groves, swamps and on eutrophic lakeshores. The nymph has been found only on *Glyceria lithuanica* and *G.fluitans* in Finland. It is also mentioned from sedges (*Carex*) and common reed (*Phragmites*) (Linnavuori 1969b).

**Xanthodelphax** W.Wagner, 1963

*X.flaveola* (Flor, 1861)

Siberian; U: LC; H: n; G: 1; M: s,l,y,m

Rather common on the mainland north to northern Ostrobothnia on dry and mesic short-grown meadows and lays (Raatikainen & Vasarainen 1976). The nymph lives monophagously on *Poa pratensis*.

*X.straminea* (Stål, 1858)

Siberian; U: LC; H: n; G: 1; M: s,y,m

Rather common in the hemi-, southern and middle boreal regions in Finland. Lives on rather dry meadows (records from ombrotrophic bogs refer



to stray specimens). The nymph feeds on *Agrostis canina* and *A.stolonifera*.

*X.xantha* Vilbaste, 1965

Eurosiberian ?; U: -; H: n; G: 1; M: s,m

This rare species was described from the Altai and is previously only known from southern Russia, Belorussia, southern Germany, eastern Poland and Latvia (Holzinger et al. 2003). It is reported from humid tall-grass forests and mires and the nymph is supposed to live on *Calamagrostis canescens* and *Molinia caerulea* (Remane & Fröhlich 1994). Macropterous specimens belonging to this species was recently swept from a flower-rich dry slope meadow in southeastern Finland. They may be migrants as prevailing butterfly migrations from the east occurred during the capture day. Brachypterous specimens were later found from a dry road verge further south, indicating that the species has produced native populations (Albrecht et al. 2006).

Data: Kl: Parikkala Koitsanlahti 2004 (leg. G.Söderman), Sa: Joutseno Korvenkylä 2005 (leg.A.Valtonen).

**Paradelphacodes** W.Wagner, 1963

*Paraliburnia* pro parte

*Struebingianella* pro parte

*P.litoralis* (Reuter, 1880)

North-European; U: DD2; H: n; G: 1; M: s

Very rare on shore meadows of the southwestern and Ostrobothnian coast (Linnavuori 1969b). Moreover, it has been found in quaking mires in Finnish Lapland (Albrecht et al.2003). The nymph feeds on *Eleocharis uniglumis* along the coast and in Lapland on *E.acicularis*.

Data: Ab: Parainen <1880 (leg. O.M.Reuter); Oa: Kvevlax and Korsholm 1940 (leg. H.Lindberg); Ab: Raisio 1948 (leg. R.Linnavuori); Lk: Kolari 2000 (leg. K.Mattila); Li: Inari 2000 (leg. K.Mattila).

*P.paludosa* (Flor, 1861)

Siberian; U: LC; H: n; G: 1; M: s

Rare and localized in the interior parts of the country with strongholds in the southwest. It lives in small forest mires and on wet lakeshore meadows. The nymph feeds monophagously on *Carex rostrata* close to the peat surface (Linnavuori 1952b)

**Oncodelphax** W.Wagner, 1963

*O.pullula* (Boheman, 1852)

North-European; U: LC; H: n; G: 1; M: s

Rare in southern Finland north to the middle boreal region in mires and on paludified lakeshores. The nymphs and adults live hideously in the peat where they feed on basal parts of tufts of *Carex vesicaria*.

**Criomorphus** Curtis, 1833

*C.albomarginatus* Curtis, 1833

European; U: LC; H: n; G: 1; M: s,y,m,p

Common in Finland north to the northern boreal region. It lives on mesic and wet meadows, but also in mires. The nymph feeds on *Festuca*, *Poa*, *Deschampsia* and *Calamagrostis* (Raatikainen & Vasarainen 1976).

*C.borealis* (J.Sahlberg, 1871)

Siberian; U: LC; H: n; G: 1; M: s,y,p

Rather common throughout the mainland, but clearly more abundant in the eastern parts. It lives on wet and mesic meadows and in lush groves. The nymph feeds on *Calamagrostis arundinacea* and in the north on *C.purpurea*. It has not been found on *C.canescens*, which is mentioned by Schiemenz (1987) as the host plant.

*C.moestus* (Boheman, 1847)

North-European; U: DD4; H: n; G: 1; M: s,p

Very rare in the boreal mainland of Finland and clearly more common in the west and north. It is mentioned to live on paludified meadows (Kontkanen 1948). The suggested host plants of the nymph are *Calamagrostis canescens* (Ossiannilsson 1978) and *C.stricta* (Nickel, l.c.). I have recorded brachypterous and macropterous specimens abundantly in a field of *Poa alpigena* in western Lapland and some specimens in an ombrotrophic bog. In England it is associated with *Poa trivialis* (LeQuesne 1960).

**Javesella** Fennah, 1963

Taxonomic comments:

- Species in the *discolor*-group are difficult to identify, because the male genitalia structures differ but little. Holzinger et al. (2003) consider it possible that *J.bottnica* is conspecific with *J.simillima*, but Huldén (1974) also showed differences in the ratio of the wings of the brachypterous morph. My own research of fresh material supports the opinion of Huldén, in regarding *J.bottnica* as a distinct species.
- The macropterous form of *J.pellucida* is dimorphic in Finland. In one morph, the outer margin of the wing is wholly black (*f.marginata* Fabricius, 1794) and such specimens are more common on wet sites, the other (nominal form) predominates on dry meadows, cropfields and ruderal areas. I have not found any differences in the

male genitalia of the two morphs. The dimorphism is apparently the result of seasonally different generations, the darker ones representing the 2<sup>nd</sup> generation. The species has been stated to be monovoltine in Finland (Raatikainen & Vasarainen 1976) but this is incorrect, at least for the 21<sup>st</sup> century populations.

*J.(Javesella) discolor* (Boheman, 1847)

Eurosiberian; U: LC; H: n; G: 1; M: s,l,p

Common throughout the country in wet meadows, swampy clearings in forests and on mires. The nymph lives polyphagously on monocots, i.a. on *Deschampsia*, *Scirpus*, *Eriophorum*, *Carex* and *Juncus*.

*J.(Javesella) simillima* (Linnavuori, 1948)

*Liburnia nitidipennis* in J.Sahlberg 1871 pro parte, nec Kirschbaum, 1868

Siberian; U: DD1; H: n; G: 1; M: s,p

Localized and rare in Finland. It lives in small swampy forest depressions. The suggested host plants of the nymph are *Eriophorum angustifolium* and *Carex rostrata* (Linnavuori 1952a).

Data: Ab: Karjalohja <1871 (leg. J.Sahlberg), Raisio 1947 (leg. R.Linnavuori); Sb: Kiuruvesi 1951 (leg. R.Linnavuori); Ta: Ruovesi Siikaneva 2004-2005 (leg. Mattila & Kirjavainen); St: Yläne Vaskijärvi 2004-2005 (leg. Rinne & Kirjavainen).

*J. (Javesella) bottnica* Huldén, 1974

North-European; U: DD1; H: n; G: 1; M: s

Most Finnish records are old and disperse. The newest finds are from both the Finnish and Russian sides of Kuusamo, where it was swept from sedge bordering an oligotrophic lake, and from lakeshore in the National Park of Seitsemien in Central Finland. The host plant of the nymph is unknown, but most specimens have been swept from *Carex acuta*.

*J.(Javesella) pellucida* (Fabricius, 1794)

Transpalaeartic; U: LC; H: n; G: 1-2; M: s,l,y,m

Very common throughout the country on all kinds of grassland. The nymphs appear to feed on grasses (Poaceae) in drier sites and on sedges (Cyperaceae) in wetter.

*J.(Javesella) dubia* (Kirschbaum, 1868)

*Liburnia pargasensis* Reuter, 1880

Transpalaeartic; U: LC; H: n; G: 1; M: s,l,y,m

Rather common throughout the country. It lives in humid forests (Linnavuori 1952b), on humid meadows, in mires and on dewy crop-fields. The nymph feeds at least on *Agrostis stolonifera*, *Avena* and *Phleum*.

*J.(Javesella) obscurella* (Boheman, 1847)

Transpalaeartic; U: LC; H: n; G: 1; M: s,l,m

Common north to the northern boreal region. It lives on mesic and unimproved grasslands. The nymph feeds on *Alopecurus geniculatus*, *Avena*, *Lolium* and *Phleum* (Ikäheimo & Raatikainen 1961).

*J.(Javesella) forcipata* (Boheman, 1847)

Siberian; U: LC; H: n; G: 1; M: s

Common throughout the country in mires, swampy forests, wet groves and shore meadows. The nymph feeds on *Deschampsia caespitosa* in Finland.

*J.(Javesella) alpina* (J.Sahlberg, 1871)

*Javesella forcipata* (Boheman, 1847) *f.alpina* J.Sahlberg, 1871 in Linnavuori 1969a

North-Siberian; U: LC; H: n; G: 1; M: s

Occurs only in the north on lake- and rivershores and near springs in the mountain birch forest. The host plant of the nymph is not known, but adults have been swept from *Vachlodea atropurpurea* and *Nardus stricta*.

*J.(Haffneriella) stali* (Metcalf, 1943)

Siberian; U: LC; H: n; G: 1; M: s

Rare and localized in Finland. It has been collected from riverbeds and wet sandy areas. The nymph feeds on *Equisetum arvense* and *E.palustre*.

### ***Ribautodelphax* W.Wagner, 1963**

Taxonomic comment:

- The Dutch researcher Bieman showed that the *angulosa*-complex comprises two species (1981, 1987), which are very difficult to discern from one another (see Holzinger et al. 2003). The host plants of the two species differ, but they commonly grow together in the same sandy areas. The Finnish museum material has been revised and most specimens reported by Huldén (1977) belong to the taxon *vinealis*.

*R.albostrata* (Fieber, 1866)

West-Palaeartic; U: LC; H: n; G: 1; M: s,y,m,p

Rather common throughout the mainland on sandy fields and mesic meadows. The nymph feeds on *Poa*.

*R.angulosa* (Ribaut, 1953)

European; U: DD4; H: n; G: 2; M: s, y

The species was thought to be extinct from Finland until the year 2004 when it was found from a few calcareous crevasses in rock meadows in southwestern Finland. Even at the best sites the

populations are fairly small, although producing two generations per year. On these sites the nymph lived monophagously on *Anthoxanthum odoratum*. Due to the isolated and small-sized occurrences, none of which have been protected, the Finnish populations are not regarded as sustainable. The main threat to the sites is overgrowth induced by eutrophication. The species seems to be very scarce in Germany (Nickel 2003).

Data: Ab: Lohja 1927, 1936 (leg. H.Lindberg), Lohja Varola 2004 (leg. J.Pöyry), Karjaa Enbacken 2004 (leg. Ikävalko & Paukkunen); N: Inkoo Backaviken and Gölesudden 2004 (leg. Malinen & Paukkunen).

*R.vinealis* Bieman, 1987

European?; U: DD4; H: n; G: 1; M: s,m,p

The species has previously only been recorded from the Netherlands and northern Germany (Holzinger et al. 2003) but has probably been confused with the pervious species in older recordings. In main Finland it has been found on dry and sandy slopes throughout the country as far north as Finnish Lapland (Albrecht et al. 2006). It has been found where the host plant of the nymph *Agrostis vineale* grows abundantly. The species has insofar not been recorded from other Nordic countries, but some older records from Sweden may refer to this species.

*R.collina* (Boheman, 1847)

*Liburnia biarmica* J.Sahlberg, 1871

European; U: DD4; H: n; G: 1; M: s

Very rare and localized in the interior of Finland on sandy patches. The nymph feeds monophagously on *Agrostis capillaris*.

*R.pallens* (Stål, 1854)

European, boreoalpine; U: LC; H: n; G: 1; M: s,m

Rather rare but widely distributed in the southern and central parts of Finland. Lives on dry sandy slopes where the host plant of the nymph *Festuca ovina* grows in abundance, but also in cultivated fields (Linnavuori 1952b).

Note! The delphacid taxon *Liburnia axillaris* J.Sahlberg, 1871 is included as endemic of Finland in the database Fauna Europaea. I have not been able to locate the type specimen, but it is obvious that the taxon has been described under another name, because Sahlberg's description is very vague and does not allow for exclusive identification.

## Family Achilidae

*Cixidia* Fieber, 1866

*C.confinis* (Zetterstedt, 1838)

North-European; U: LC; H: n; G: <1; M: s

Rather rare in the southern boreal region of Finland. Lives in humid conifer forests, both commercial and natural, underneath the cortex of decomposing trunks. The nymphs feed on fungal mycelia of *Amyloporia* (Linnavuori 1951).

*C.laponica* (Zetterstedt, 1838)

*Epiptera laponica* (Zetterstedt, 1838)

Siberian; U: LC; H: n; G: <1; M: l,y

Rather rare from the southern to the northern boreal region in Finland. The life cycle is much the same as in the preceding species (cf. Päivinen et al. 1999)

## Family Caliscelidae

*Ommatidiotus* Spinola, 1839

Taxonomic comment:

- Morphologically different female specimens of *Ommatidiotus* were in 2004 swept from *Carex* in xeric habitats along the southwestern coast of Finland. They differ from *O.dissimilis* in having the forewing veins darker than the interspaces, a broader and dark stripe on their head and having more indentations on their ovipositor than females of *dissimilis* from wetlands. The females swept in 2004 bear striking similarities with the taxon *inconspicuus*, to which I believe they belong.

*O.dissimilis* (Fallén, 1806)

Siberian; U: LC; H: o; G: 1; M: s,y,p

Rather rare in the southern and central parts of Finland – most records are from the southern part. It lives on tufty mires and wet shores. The nymph lives on *Eriophorum vaginatum* and *E.angustifolium*.

*O.inconspicuus* Stål, 1863

East-European ?; U: -; H: o; G: 1; M: s

Very rare and only recorded from sandy xeric sites in southwestern Finland. Adults were swept from *Carex arenaria* (Albrecht et al. 2006).

Data: N: Hanko Tvärminne 2004 (leg. Albrecht & Söderman), Hanko Lappohja 2004 (leg. Albrecht & Söderman).

## Suborder Cicadomorpha

### Family Cicadidae

#### *Cicadetta* Kolenati, 1857

##### Taxonomic comment:

- Gogala & Trilar (1999, 2004) have with bioacoustic techniques shown that there are at least four different species in Europe belonging to the *montana*-complex. The song of *C. montana* s.str. is continuous and long-lasting with only short, irregular interruptions. The schemes of the cicada song in the best site in Finland is reminiscent of this (Albrecht, pers.comm.).

#### *C. montana* (Scopoli, 1772)

Transpalaeartic; U: EN; H: n; G: 1/6 (?); M: s

Endangered over large areas in Europe, from where it has vanished in several places in Western Europe (Wilson, Gillerfors, Nickel l.c.). In nearby Russia, along the river Luga, there are records from the years 1858, 1895, 1923, 1971 and 1986. There is one good known site in the parish Pohja in Finland (Albrecht et al. 2003), but the species probably occurs in two other sites also. There is a song hearing from Inkoo in the 1990's and a quite recent adult sample from Lohja. It lives on dry exposed woody slopes. The nymph lives subterraneously and feed on roots of leaf-trees and herbs. In England the female oviposits the bases of bracken (LeQuesne 1965). The development lasts 6 years in the vicinity of Moscow in Russia (Kudryásheva 1975). In Finland the newest adult and *exuviae* records are from the years 1990, 1996, 2002, 2004 and 2005 in Pohja (Jaakko Lahti, in litt.), which indicate multiple cycles. In the cicada survey of this 113 *exuviae* and 10 adults were counted in 2004 and 47 *exuviae* and 13 adults in 2005. There are earlier records from the same site in the years 1986 and 1989 (leg. Albrecht) and the song from Inkoo was heard in year 1995 (Lauri Kaila, pers.comm.).

### Family Aphrophoridae

#### *Lepyronia* Amyot & Serville, 1843

#### *L. coleoptrata* (Linnaeus, 1758)

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y  
Common in the southern interior parts of Finland. It lives on both dry and mesic meadows and also

in mires. On meadows adults are abundant on bed-straw (*Galium*) and in mires on cinquefoil (*Potentilla palustris*). The nymph is polyphagous and feeds on various herbs.

#### *Peuceptyelus* J.Sahlberg, 1871

#### *P. coriaceus* (Fallén, 1826)

Siberian; U: LC; H: a; G: 1; M: s,l,y,p

Localized in humid spruce stands of southern and central Finland. Adults have been found on Norway spruce (*Picea abies*), but I have no records of spit on this tree. The nymph might hide in the undervegetation and feed on dicots and adult only ascend spruce for feeding, mating and hibernation.

#### *Neophilaenus* Haupt, 1935

##### Taxonomic comments:

- Linnavuori (1969b) considers the taxon *dilutus* (J.Sb.) a subspecies of *N. exclamationis*, which he has found only in Raisio in southwestern Finland. Ossiannilsson (1981) regards it only as a form. Holzinger et al. 2003 adopt the opinion of Wagner (1955) including five different subspecies in Europe. I have found the taxon *dilutus* to be sympatric with the nominal form in several populations and consider it only a morph of the species.
- At present it is not clear if the taxon *lineatus* consists of more than one species (cf. Holzinger et al. 2003). Ossiannilsson (1981) distinguishes between four different morphs, *f. typica*, *f. aterrima*, *f. pulchella* and *f. pallida* Haupt, 1917. The three firstmentioned all live on mires and humid meadows, whereas *f. pallida* is restricted to xeric dune landscapes. There are some differences in the male aedagus and genital style between the latter form and the others (Ossiannilsson 1981:237) and it may be a distinct species (cf. Vilbaste 1974). Neither crossing experiments nor molecular analyses have yet been made to solve the taxonomic status of *pallida*.

#### *N. exclamationis* (Thunberg, 1784)

*Philaenus dilutus* J.Sahlberg, 1871

*Philaenus exclamationis nigerrimus* H.Lindberg, 1923

European; U: LC; H: o; G: 1; M: s,l,y,m,p

Common throughout the country, preferably in dry sites, but also recorded from lush shady groves. The nymph feeds on grasses (Poaceae), preferably on *Festuca*.

*N.lineatus* (Linnaeus, 1758)  
*Philaenus aterrimus* J.Sahlberg, 1871  
*Philaenus pulchellus* J.Sahlberg, 1871

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y,m,p

Very common in Finland north to the northern boreal region. It lives on humid and wet meadows and in mires. The nymph feeds on both grasses (Poaceae) and sedges (Cyperaceae). The form *pallida* is only known from a rocky dry meadow on the Alandian mainland.

*N.minor* (Kirschbaum, 1868)  
West-Palaeartic; U: DD2; H: o; G: 1; M: s

The only known Finnish record is from a xerothermic site in southeastern Finland (Linnavuori 1952a). The nymph probably feeds on *Festuca ovina* in Finland. Abroad it is stated to be monophagous on *Koeleria* (Schiemenz 1988).

Data: Sa: Joutseno 1950 (leg. R.Linnavuori).

### ***Aphrophora*** Germar, 1821

*A.alni* (Fallén, 1826)  
Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y,m,p

Common in boreal deciduous forests and alder groves in southern and central Finland. The nymph is polyphagous on herbaceous plants. The adults ascend trees, brushwood and tall herbs for feeding and mating. In the Lake Oulujärvi surrounding the dark-black, microclimatically induced, morph *umbrina* is common.

*A.pectoralis* Matsumura, 1903  
*Aphrophora forneri* Haupt, 1919  
*Aphrophora salicina* in Lindberg 1947 nec Goeze, 1778  
*Aphrophora costalis* Matsumura, 1903

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m,p

Rather common in the southern and central parts of Finland. It lives on both dry and wet meadows and in small-leaved deciduous forest. The nymph lives in spits on basal branching of new shoots of willows, most abundantly on *Salix phylicifolia*, more seldom on *S.caprea*, *S.cinerea* and *S.aurita*.

### ***Philaenus*** Stål, 1864

*P.spumarius* (Linnaeus, 1758)  
Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y,m,p

Very common throughout the country becoming more rare in Lapland. It lives on all kind of grasslands and on road verges. The nymph is polyphagous on herbaceous plants.

## Family Membracidae

### ***Centrotus*** Fabricius, 1803

*C.cornutus* (Linnaeus, 1758)  
Eurosiberian; U: LC; H: n; G: 1; M: s,y

The species has become rarer in Finland, but still occurs locally along boreal deciduous forest margins in the southern and eastern parts. The nymph lives polyphagously in the herbaceous layer (recorded in Finland from *Cirsium* and *Geranium sylvaticum*). Adults ascend trees (oak, aspen, alder) for feeding and mating. The female descends later for oviposition.

## Family Cicadellidae

### Subfamily Ulopinae

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#### ***Ulopa*** Fallén, 1814

*U.reticulata* (Fabricius, 1794)  
European; U: LC; H: a; G: 1; M: s,m,p

Rather common in the southern and central parts of Finland, where it lives on dry heaths and on strings of ombrotrophic bogs. Both nymphs and adults feed monophagously on heather (*Calluna vulgaris*), the fruits of which they remind.

### Subfamily Megophthalminae

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#### ***Megophthalmus*** Curtis, 1833

*M.scanicus* (Fallén, 1806)  
Mediterranean; U: LC; H: o; G: 1; M: s,m

Rare in Finland within the hemi- and southern boreal regions on dry meadows and road verges. The nymph feeds on *Lotus corniculatus*.

### Subfamily Macropsinae

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#### ***Oncopsis*** Burmeister, 1838

Taxonomic comment:

- The *flavicollis*-complex is one of the most difficult in Europe. Already Wagner (1949) proved that the coloring of the adults of the taxon *flavicollis* varies much. Later, LeQuesne (1961a) showed a great variation in the shape of the appendices of the pygophore. Claridge

& Reynolds (1972) looked for biological differences and distinguished between two groups: *O. flavicollis* and *O. subangulata* oviposited inside dormant leafbuds and *O. carpini* (J.Sahlberg, 1871) and *O. avellanae* oviposited in young apical shoots of branches. Differences are also found in the ovipositor shields of the females (upwards curving in the former group and straight in the latter). The reliable distinguishing character within the groups was found in their courtship song (Claridge & Reynolds 1973), and a hitherto unidentified species, not morphologically identified (Claridge & Nixon 1981) was found in the *flavicollis-subangulata* complex. The host plants have been regarded as discriminating in the *carpini-avellanae* complex (LeQuesne 1961a). *O. carpini* feeds on *Carpinus* and *O. avellanae* on *Corylus*, but finds of the latter on *Alnus glutinosa* in England and Finland show characters in between these taxa. The whole complex will probably be solved only with molecular techniques in future.

### *O. flavicollis* (Linnaeus, 1761)

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y,m,p

Very common throughout Finland. It lives in boreal deciduous forests. The nymph feeds on birches (*Betula*).

### *O. avellanae* Edwards, 1920

West-European; U: -; H: o; G: 1; M: s,l

Recorded new to Finland in the survey of the National Park of the Southwestern Archipelago in 1986. Later it has been recorded, not uncommon, along the shores of the Gulf of Finland and further north to Pori (Albrecht et al. 2006). It lives in coastal alder-groves. The nymph and the adult feed monophagously on *Alnus glutinosa*. The facial pattern of the Finnish specimens are in comparison to the British I have seen more strongly depicted, but clearly of the same type (see Biedermann & Niedringhaus 2004).

### *O. subangulata* (J.Sahlberg, 1871)

*Oncopsis fortior* W.Wagner, 1944

North-European; U: LC; H: o; G: 1; M: s,l,y,m

Rather common throughout Finland. It lives in boreal deciduous woods on *Betula*.

### *O. tristis* (Zetterstedt, 1838)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m

Common throughout Finland in boreal deciduous woods. The nymph feeds on birches (*Betula*), preferably *B. pendula*.

### *O. appendiculata* W.Wagner, 1944

European; U: DD2; H: o; G: 1; M: s,l

Very rare in Finland with only three records from the southeastern part. It lives on small-grown, twining, silver birches (*Betula pendula*) growing on xerothermic slopes.

Data: Sa: Joutseno 1946 (leg. E.Thuneberg), 1950 (leg. R.Linnavuori); Ka: Kotka 2003 (leg. Sundell & Söderman).

### *O. planiscuta* (Thomson, 1870)

North-Siberian; U: LC; H: o; G: 1; M: s,l,y

Most common in the eastern parts of Forest Lapland and very rare and localized in other parts of the boreal region. It lives in boreal deciduous woods in the north and close to large mire complexes in the south. The host plant of the nymph is grey alder (*Alnus incana*).

### *O. alni* (Schrank, 1801)

European; U: LC; H: o; G: 1; M: s,l,m

Rather common in Finland north to the southern parts of the northern boreal region. It lives in boreal deciduous forests, humid groves and coastal alder thickets on *Alnus incana* and *A. glutinosa*.

### *Pediopsis* Burmeister, 1838

#### *P. tiliae* (Germar, 1831)

European; U: DD2; H: o; G: 1; M: s,l

Very rare in the southwestern parts of Finland where it lives in broad-leaved deciduous woods and in parks. Only one of known sites is protected. The nymph and adult feed on small-leaved lime (*Tilia cordata*).

Data: Ab: Turku and Parainen < 1880 (leg. O.M.Reuter), Ruissalo 1919 (leg. H.Lindberg), 1947 (leg. R.Linnavuori), Lohja 1943 (leg. H.Lindberg), Turku 1983 (leg. V-M.Mukkala), 1994 (leg. V.Rinne), Lemu Nyynäinen 1994 (leg. Mukkala & Rinne); N: Hanko Tvärminne 2003 (leg. G.Söderman), Inkoo 2003 (leg. G.Söderman); Ab: Turku Ruissalo 2004 (leg. Rinne & Söderman)..

### *Macropsis* Lewis, 1834

Taxonomic comment:

- In Central Europe the *cerea*-group forms a species complex (Nickel 2003). The Finnish *cerea*-specimens vary very little so they might belong to one species only - to which, can only be defined after more research in Central Europe.

### *M. infuscata* (J.Sahlberg, 1871)

*Macropsis cerea* in Lindberg 1947 nec Germar, 1837

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m,p

Common in Finland north to the northern boreal region. Lives in boreal deciduous forests. The nymph is monophagous on *Salix caprea*.

### *M. cerea* (Germar, 1837)

*Macropsis haupti* in Lindberg 1947 nec W.Wagner, 1941

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m

Common in Finland north to the northern boreal region. It lives in boreal deciduous woodlands and in inner parts of shores on broad-leaved willows (*Salix aurita*, *S. caprea*, *S. cinerea*, *S. pentandra*).

*M. fuscineris* (Boheman, 1847)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y

Rather rare in the hemi- and southern boreal regions of Finland. It lives in boreal deciduous forests. The nymph feeds on aspen (*Populus tremula*), preferably on young basal sprouts.

*M. impura* (Boheman, 1847)

Eurosiberian; U: LC; H: o; G: 1; M: s,y

Rather rare in the southern parts of Finland, where it lives on sandy fields and shores and in gravel pits. The nymph is a monophage of *Salix repens*.

*M. fuscata* (Zetterstedt, 1828)

West-Palaeartic; U: LC; H: o; G: 1; M: s,l,y,m

Rather common in the southern and central parts of Finland. It is often found along road verges, where the host plant of the nymph *Rubus idaeus* grows.

*M. scutellata* (Boheman, 1845)

West-Palaeartic; U: -; H: o; G: 1; M: m,l

Two recent records from the eastern part of the Salpausselkä ridges are known (Albrecht et al. 2006). Both sites represent dry ruderal areas. Lives abroad in hot nettle-communities (*Urtica dioica*) and is difficult to observe (Nickel 2003).

Data: Sa: Lappeenranta airfield 2003 (leg. Sundell & Söderman), Luumäki Päivärinne 2005 (leg. Saarinen & Söderman).

### **Macropsidius** Ribaut, 1952

*M. sahlbergi* (Flor, 1861)

Pontomediterranean; U: -; H: o; G: 1; M: l

Only recorded from light-traps in southeastern Finland (Albrecht et al. 2003), where the nymph feeds on *Artemisia campestris*. The Finnish site is the northernmost in Europe. It is earlier known from a few sites in the Baltic countries (Vilbaste 1971, 1974).

Data: Sa: Lappeenranta airfield 2002, 2003 (leg. Sundell & Söderman).

### **Hephathus** Ribaut, 1952

Taxonomic comment:

- The Russian researcher Mityaev (1967) has shown that the species *H. nanus* comprises two species. *H. nanus* is described from mountainous Central Europe and lives monophagously on *Carlina acaulis*, a hostplant missing from Northern Europe. The Asian species that has spread to eastern Finland is a distinct species *H. achilleae*. The species depicted in Ossiannilsson (1981:297) belongs to the latter (the model is a Karelian specimen).

*H. achilleae* Mityaev, 1967

*H. nanus* auct. nec (Herrich-Schäffer, 1835)

North-Siberian; U: VU; H: o; G: 1; M: s

Very rare and only recorded from two sites in eastern Finland. It lives on dry meadows. The nymph feeds according to Mityaev on *Achillea millefolium*.

Data: Kb: Pyhäselkä Hammaslahti 1927 (leg. P.Kontkanen), Kontiolahti 1942 (leg. H.Lindberg).

## Subfamily Agalliinae

### **Agallia** Curtis, 1833

*A. brachyptera* (Boheman, 1847)

West-Palaeartic; U: LC; H: o + a (fem.); G: 1; M: s,l,y,p

Common and widespread in the southern and central parts of Finland. Lives in the southern parts on rather dry and mesic grassland where nymphs live on herbaceous plants, like clover (*Trifolium*), sorrel (*Rumex*), dandelion (*Taraxacum*) and yarrow (*Achillea*). In Central Finland and Ostrobothnia the species, both adults and nymphs are very common on eskers and ombrotrophic bogs. It is not clear which host plant(s) these nymphs live on, but species of *Vaccinium* are the most likely hosts.

### **Anaceratagallia** Zachvatkin, 1946

Taxonomic comment:

- The two taxa *A. ribauti* and *A. lithuanica* are very close and with few distinguishing features in the male. In the studied Finnish series the distinguishing characters are however unambiguous, and the different host plants suggest of two separate species. Females can not yet be separated.

*A. venosa* (Fourcroy, 1785)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,p

Rather common but localized in the southern and central parts of Finland. It lives on rather dry meadows. The nymph is monophagous on *Lotus corniculatus*.

*A. ribauti* Ossiannilsson, 1938

West-Palaeartic; U: LC; H: a; G: 1; M: s,l,m,p

It is common north to the middle boreal region in Finland with strongholds in the eastern parts. It lives on dry meadows and sandy sites. The nymph feeds on plantains (*Plantago*) in Finland.

*A.lithuanica* Vilbaste, 1974

East-European ?; U: -; H: a; G: 1; M: s,l

Found insofar only in a few sites in southern Finland where it lives on dry sandy meadows (Albrecht et al. 2006). The nymph and adult feed on thyme (*Thymus serpyllum*).

Data: N: Hanko Neljäntuulentupa 1993 (leg. T. Lammes); Sa: Lappeenranta 2003 (leg. G.Söderman), Joutseno 2004 (leg. Söderman & Albrecht), Luumäki 2004 (leg. Söderman & Albrecht).

*A.estonica* Vilbaste, 1961

East-European ?; U: EN; H: a; G: 1; M: s,p

The species has been recorded from alvar-like heaths in the outer archipelago in southwestern Finland. Most specimens have been captured in pitfalls. The nymph feeds on *Thymus serpyllum* (Vilbaste 1974).

Data: Ab: Nauvo Lökholm 1969 (leg. P.T.Lehtinen), Nauvo Bergham 1992 (leg. V.Rinne), Korppoo Jurmo 1995 (leg. V.Rinne).

## Subfamily Idiocerinae

***Idiocerus*** Lewis, 1834

*I.stigmatalis* Lewis, 1834

European; U: LC; H: o; G: 1; M: s,l,y

Localized in the hemiboreal region, becoming more rare further north in the southern boreal region of Finland. It lives in boreal deciduous forests and parks. The nymph feeds on tree-sized willows (*Salix caprea*, *S.pentandra*, *S.viminalis*, *S.fragilis*).

*I.lituratus* (Fallén, 1806)

West-Palaeartic; U: LC; H: o; G: 1; M: s,l,y

Rather common but localized north to the boundary of the middle and northern boreal region in Finland. It lives preferently on sandy shores, road verges and along fringes of mires. The nymph feeds on willows (*Salix aurita*, *S.caprea*, *S.cinerea*, *S.repens*, *S.fragilis*).

*I.herrichii* Kirschbaum, 1868

West-Palaeartic; U: DD4; H: o + a (fem.); G: 1; M: s,l

Rare in alluvial forests and in parks in southern Finland. The nymph feeds on tree-sized narrow-leaved willows, like *Salix pentandra* and *S.fragilis*.

***Metidiocerus*** Ossiannilsson, 1981

*Idiocerus* pro parte

*M.elegans* (Flor, 1861)

Siberian; U: LC; H: o + a (fem.); G: 1; M: s,l,y,m

Common throughout Finland in fringes of forests and mires and in coastal thickets. The nymph feeds on brush-sized willows, most abundantly on *Salix myrsinifolia*, but has also been found on *S.rosmarinifolia*, *S.caprea*, *S.cinerea* and *S.aurita*.

***Populicerus*** Dlabola, 1974

*Idiocerus* pro parte

*P.populi* (Linnaeus, 1761)

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y,m

Very common in Finland north to the southern parts of the northern boreal region. It lives in boreal deciduous woods. The nymph and adult feed on aspen (*Populus tremula*) only.

*P.laminatus* (Flor, 1861)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m

Widespread in Finland like the preceding species, but more localized in the northern part of its range. The nymph and adult live monophagously on aspen (*Populus tremula*).

*P.nitidissimus* (Herrich-Schäffer, 1835)

*Idiocerus fulgidus* auct. nec Fabricius, 1775

West-Palaeartic; U: DD4; H: o; G: 1; M: s

Only found in town parks in southern Finland. The nymph and adult feed on poplars (*Populus nigra*, *P.balsamifera*).

Data: N: Helsinki Botanical Garden 1946 (leg. H.Lindberg); Ab: Turku 1948 (leg. R.Linnavuori); N: Järvenpää 2002-2003 (leg. I.Mannerkoski).

*P.confusus* (Flor, 1861)

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y,m

Widespread and rather common north to the southern parts of the northern boreal region in Finland. It lives on various shore meadows and in boreal deciduous forests on broad-leaved willows (*Salix aurita*, *S.caprea*, *S.cinerea*).

*P.albicans* (Kirschbaum, 1868)

West-Palaeartic; U: DD5; H: o; G: 1; M: s,l

Only found from a few parkland sites in southern Finland (Albrecht et al. 2003). The nymph is monophagous on *Populus alba*.

Data: Ka: Virolahti 1998 (leg. Huldén & Albrecht), 2003 (leg. A.Albrecht); N: Hanko 2003 (leg. K-E.Lundsten), Vantaa 2003 (leg. A.Albrecht).



### **Acericerus** Dlabola, 1974

*A.heydenii* (Kirschbaum, 1868)

European; U: -; H: a; G: 1; M: s,l,m

Recently recorded from southwestern Finland where it has been met with in light-traps, Malaise traps and swept from maples (Albrecht et al. 2006). The nymph lives on *Acer platanoides* in Finland. This is apparently a recent immigrant to Finland that can not have been overlooked by earlier hemipterologist. The populations in southwestern Finland are marginal in Europe as the closest finds are from Denmark and Poland. Insofar, it is missing from the Baltic countries. In Finland the species has established itself in natural and protected broad-leaved forests.

Data: Ab: Nauvo Seili 2002 (leg. K.Ruohomäki), 2005 (leg. T.Ranta), Turku Ruissalo 2004 (leg. Söderman & Kirjavainen).

### **Tremulicerus** Dlabola, 1974

*Idiocerus* pro parte

*T.distinguendus* (Kirschbaum, 1868)

European; U: -; H: o; G:1; M:window trap

A female of this species was been captured in a trunk window trap in early summer in the southwestern archipelago. The specimen is likely to be a vagrant, because the host plant of the nymph, *Populus alba*, does not grow on the small island it was captured from.

Data: Ab:Nauvo Stora Styholm 2005 (leg. Clayhills & Rinne).

*T.tremulae* (Estlund, 1796)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y

Widespread and rather common in the hemi- and southern boreal regions of Finland although more scarce in the northern part of its range. It lives in aspen forests and in parks. The nymph and adult feed on aspen (*Populus tremula*).

### **Stenidiocerus** Ossiannilsson, 1981

*Idiocerus* pro parte

*S.poecilus* (Herrich-Schäffer, 1835)

West-Palaeartic; U: DD4; H: o + a (fem.); G: 1; M: l

Very rare and only found in city parks in southern Finland with strongholds in the southwestern part. Most female records are from the winter period, but the Lappeenranta records are from late summer. The nymph is a monophage of black poplar (*Populus nigra*).

Data: Ab: Sauvo, Turku, Taivassalo, Lohja (latest records in 1994 and 1999); N: Helsinki 1946 (leg. H.Lindberg & P.Nuorteva); Sa: Lappeenranta airfield 2002 (leg. Sundell & Söderman).

### **Sahlbergotettix** Zachvatkin, 1953

*Idiocerus* pro parte

*S.salicicola* (Flor, 1861)

North-Siberian; U: DD2; H: o; G: 1; M: s

Only recorded once, more than a century ago, from Finland. According to Vilbaste (1974) it lives on fens and paludified meadows in Estonia, in places where the host plant *Salix rosmarinifolia* grows.

Data: St: Yläne 1869 (leg. J.Sahlberg).

## Subfamily lassinae

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### **Iassus** Fabricius, 1803

*I.lanio* (Linnaeus, 1761)

European; U: DD3; H: o; G: 1; M: s,l,y

Rather rare in southwestern Finland, but is expanding eastwards and northwards. It lives in broad-leaved deciduous forests and parks. Nymphs and adults feed on common oak (*Quercus robur*).

### **Batracomorphus** Lewis, 1834

*B.allionii* (Turton, 1802)

*Cicada prasina* Fabricius, 1794 nec Pallas, 1773

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m

Rare on xerothermic sites in Finland, where it occurs mainly along the Salpausselkä ridges and their adjacent esker chains. Lives on hot and dry meadows, but can locally be very abundant (Söderman 2004). The host plant of the nymph might be *Lotus corniculatus*. Abroad it is mentioned only from *Genista* and *Cytisus* (Nickel 2003).

## Subfamily Dorycephalinae

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### **Eupelix** Germar, 1821

*E.cuspidata* (Fabricius, 1775)

Transpalaeartic; U: LC; H: a; G: 1; M: s,y,m,p

Rather rare in the hemi- and southern boreal regions of Finland. It lives on sandy ground and dry fields. The nymph feeds on *Festuca ovina* in Finland, abroad also *F.rubra* is mentioned (Nickel 2003).

## Subfamily Aphrodinae

### **Aphrodes** Curtis, 1829

Taxonomic comment:

- Tishechkin (1998) showed in his research that the old taxon *A. bicincta* is a species complex of four taxa with different bioacoustics, morphology and ecology. The nomenclature problem is, however, not exclusively solved yet. According to Tishechkin the species previously named *A. bicincta* in Finland should be *A. makarovi* Zachvatkin, 1948. Moreover, two other species occur in Finland, *A. bicincta* (Schrank, 1776) and *A. diminuta* Ribaut, 1952. The fourth taxon of the complex, *A. aestuarina* (Edwards, 1908), has an Atlantic distribution and is confined to halophilic coastal meadows. Its taxonomical status is still unsolved. In my opinion the taxon *centrorossica* Zachvatkin, 1953 is not necessarily conspecific with *diminuta* as they appear to live in different habitats and have different host-plants.

*Aphrodes makarovi* Zachvatkin, 1948 *sensu* Tishechkin 1998

*Aphrodes bicincta* auct. partim nec (Schrank, 1776)

European; U: LC; H: o; G: 1-2; M: s,l,y,m

Fairly common north to the middle boreal region of Finland. Lives on mesic and wet meadows and is very abundant in riparian buffer zones. The nymph feeds on nettles (*Urtica*) and dandelions (*Taraxacum*).

*A. bicincta* (Schrank, 1776) *sensu* Tishechkin 1998

*Aphrodes makarovi* Zachvatkin, 1948 *sensu* Ossianniilsson 1981 p.p.

Eurosiberian; U: -; H: o; G: 1; M: s,l,y

Assumed to be rather common in the southern and central parts of Finland. It prefers sandy fields and dry meadows (Albrecht et al. 2003). The nymph lives on species of Fabaceae, on *Lotus corniculatus* and *Astragalus alpinus*, in particular.

*A. diminuta* Ribaut, 1952

? *Aphrodes centrorossica* Zachvatkin, 1953

*Aphrodes bicincta* (Schrank, 1776) *sensu* Ossianniilsson 1981 p.p.

*Aphrodes bicincta* auct. partim nec (Schrank, 1776)

European; U: -; H: o; G: 1; M: s,p

The species has been found in several mire complexes in Finland. The first known records are from Finnish Lapland and were reported as *A. bicincta* (Raatikainen & Ylönen 1988). Most other European records are also from oligotrophic mires (Ossianniilsson 1981: Öland, Norway, Nickel 2003). Tishechkin (1998), however, names species of Fabaceae, in particular *Oxytropis*, as host plants. Although some species of *Oxytropis* grow in the vicinity of some Nordic sites, they do not grow in mires, from where also nymphs of the species

have been sampled. If the host plant is a dicot, *Potentilla palustris* or *Menyanthes trifoliata* are possible candidates based on the plant compositions of the Finnish recording sites.

### **Planaphrodes** Hamilton, 1975

*Aphrodes* pro parte

Taxonomic comment:

- The type specimen of *P. trifasciata* has been shown to belong to *P. bifasciata*. The second oldest name is *P. laeva*, but the description is weak and uncertain, so the species might have to be re-described under a new name.

*P. bifasciata* (Linnaeus, 1758)

European; U: LC; H: o; G: 1; M: s,l,m,p

Common throughout Finland. It lives preferably on dry meadows. The nymph feeds on various grasses (Poaceae).

*P. nigrita* (Kirschbaum, 1868)

European; U: DD1; H: o; G: 1; M: s,y,p

Rare in Finland, and only recorded from a few sites in the southern part. Dry sandy fields of eskers are its main habitat and the nymph feeds on grasses (Poaceae).

Data: Ta: Hattula 1945 (leg. P. Nuorteva); Sa: Taipalsaari 1947 (leg. W. Hellén); Tb: Jyväskylä 1947 (leg. W. Hackman); N: Helsinki 1960 (leg. Paulomo), 1964 (leg. A. Nordman); Ta: Lammi 1973 (leg. G. Söderman); Kb: Tohmajärvi 1973 (leg. G. Söderman); Ta: Loppi 2004-2005 (leg. Karjalainen & Salminen).

*P. laeva* (Rey, 1891)

*P. trifasciata* auct. nec Fourcroy, 1785

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,p

Rather common but localized north to the boundary of the middle and northern boreal regions in Finland. It lives on sandy ground, dry meadows and ombrotrophic bogs. The nymph and the adult feed on *Calluna vulgaris*, *Thymus serpyllum* and *Arctostaphylos uva-ursi*.

### **Anoscopus** Kirschbaum, 1858

*Aphrodes* pro parte

*A. albifrons* (Linnaeus, 1758)

European; U: LC; H: o; G: 1; M: s,l,y,m,p

Rather common in the hemi- and southern boreal regions of Finland. It lives on dry meadows. The nymph feeds on bent-grasses (*Agrostis*) and small-reeds (*Calamagrostis*).

*A. histrionicus* (Fabricius, 1794)

West-Palaeartic; U: LC; H: o; G: 1; M: s

Very rare and possibly extinct from Finland. It has lived on sandy sites and dry meadows in the

southern parts. The latest Finnish record of the species is more than 60 years old. The nymph feeds on grasses (Poaceae).

*A.flavostriatus* (Donovan, 1799)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,p

Rather common in the southern and central parts north to the island of Hailuoto in northern Ostrobothnia. Lives in open dry woods and on mesic meadows, where the nymph feeds on grasses (Poaceae).

### **Stroggylocephalus** Flor, 1861

*S.agrestis* (Fallén, 1806)

Eurosiberian; U: LC; H: o; G: 1; M: s,y

Rather rare in Finland north to the middle boreal region. Lives on tall-grass shore meadows, which are often paludified. The nymph feeds on *Carex vesicaria* and *Bolboschoenus maritimus* in Finland.

*S.livens* (Zetterstedt, 1838)

Siberian; U: DD4; H: a; G: 1; M: s,p

Rare and localized in the western parts of Finland, but recorded north to Lapland. It has probably been overseen because of its life-style and -cycle. It lives a very hideous life on oligotrophic mires. The adult hibernates in the peat. The nymph feeds in the tufts of *Rhynchospora alba* and *Eriophorum angustifolium*.

## Subfamily Cicadellinae

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### **Evacanthus** Lepeltier & Serville, 1825

*E.interruptus* (Linnaeus, 1758)

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y,m

Common north to the northern boreal region in Finland. Lives on mesic, tall-herb meadows, where adults often are swept from *Epilobium angustifolium*. The nymph feeds on plants of Asteraceae, and I have found it most abundantly on *Achillea ptarmica*.

*E.acuminatus* (Fabricius, 1794)

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y,m,p

More scarce than the preceding species in Finland and extends north only to the middle boreal region. It lives on tall herbs in groves, lush forest stands and on riverbanks. The nymph feeds on plants of Lamiaceae (*Galeopsis*, *Lamium* and *Stachys*).

### **Batysmatophorus** J.Sahlberg, 1871

*B.reuteri* J.Sahlberg, 1871

North-Siberian; U: LC; H: o; G: 1; M: s,l,y,m

Rather rare, but may be locally abundant, on wet alluvial meadows in Forest Lapland. Linnavuori (1969a) mentions it to live on willows. The nymph has however only been collected from *Geranium sylvaticum* in Finland, although adults willingly ascend brushwood for feeding and mating.

### **Cicadella** Latreille, 1817

*C.viridis* (Linnaeus, 1758)

*Tettigella viridis* in Lindberg 1947

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y,m,p

Very common north to the northern boreal region in Finland. It lives on humid and mesic meadows, along forest ditches and in mires. The nymph feeds on rushes (*Juncus*), sedges (*Carex*), wood-rush (*Scirpus*) and common reed (*Phragmites*).

*C.lasiocarpae* Ossiannilsson, 1981

*Cicadella concolor* Haupt, 1912 in Huldén 1978

Siberian; U: DD3; H: o; G: 1; M: s,l

It has insofar only been found in four places in Finland. Lives syntopically with the preceding species in mires and on paludified lakeshores. The nymph feeds at least on *Carex lasiocarpa* and *C.vesicaria*.

Data: Ta: Janakkala 1916 (leg. P.H.Lindberg); Sa: Mikkeli Anttola 1986 (leg. G.Söderman); N: Valkmusa National Park 2003 (leg. G.Söderman); Ab: Karjalohja Kalkkikallio mire 2005 (leg. Salokannel & Mattila).

## Subfamily Typhlocybinae

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### **Alebra** Fieber, 1872

*A.albostriella* (Fallén, 1826)

European; U: -; H: o; G: 1; M: y

The only known record is from a yellow-trap in southeastern Finland (Albrecht et al. 2003). In Central Europe, where it is common, it lives in groves and deciduous forests, where the nymph is polyphagous on various leaf-trees (oak, alder, maple, elm and hazel). The Finnish specimen belongs to *f.diluta* Ribaut, 1936.

Data: Sa: Joutseno Anola 2002 (leg. G.Söderman).

*A.neglecta* W.Wagner, 1940

Eurosiberian; U: -; H: o; G: 1; M: s,l

In Finland only recorded from the southeast, in but it is quite abundant in adjacent Russia on the

Karelian Isthmus in small-leaved deciduous forests (Albrecht et al. 2003). The nymph feeds here on *Prunus padus*, further south in Europe also abundantly on other leaf-trees (*Carpinus*, *Quercus*).

Data: Sa: Joutseno 2002 (leg. G.Söderman).

*A.wahlbergi* (Boheman, 1845)

European; U: -; H: o; G: 1; M: s,l

Discovered from the Helsinki metropolitan area in the 21th century, where it lives in parks on small-leaved lime (*Tilia cordata*) (see Albrecht et al. 2003) and maple (*Acer platanoides*). Also found in (Ab) Turku Ruissalo (leg. V.Rinne & G.Söderman, 2004). Further south in Europe it lives on a number of other leaf-trees, such as oak, birch, ash and hazel. Demichelis & Bosco (1995) however state that the nymph prefers lime also in southern Europe. The Finnish specimens are pale and belong to *f.pallescens* Ribaut, 1936.

***Erythria*** Fieber, 1866

*E.aureola* (Fallén, 1826)

European; U: LC; H: o; G: 1; M: s,m,p

Rather common in the hemi- and southern boreal regions of Finland, where it lives on heaths and ombrotrophic bogs. The nymph and adult feed on *Calluna vulgaris*; from Central Europe also thyme is mentioned (Nickel 2003), which has not been verified from Finland.

***Emelyanoviana*** Anufriev, 1970

*Erythria* pro parte

*E.mollicula* (Boheman, 1845)

West-Palaeartic; U: DD5; H: o; G: 1; M: s

There are only two old records from eastern Finland, but the species was found to be not too rare along the northern coast of Estonia in the 1990's, so a re-colonisation along the Finnish southcoast is not impossible. It lives on dry meadows further south in Europe where the nymph feeds on *Ajuga*, *Salvia*, *Verbascum* and *Stachys* (Nickel 2003).

Data: Kb: Pielisjärvi Pielensuu 1942 (leg. H.Lindberg), Pyhäselkä Hammaslahti 1943 (leg. P.Kontkanen).

***Dikraneura*** Hardy, 1850

*D.aridella* (J.Sahlberg, 1871)

Siberian; U: LC; H: a; G: 1; M: s,l,m

Rather rare throughout Finland. It lives preferably in moss-covered coniferous forests. The nymph feeds on *Deschampsia flexuosa*.

*D.variata* Hardy, 1850

Holarctic; U: LC; H: a; G: 1; M: s

Rare in the southern parts of Finland in dry and open forests and on ruderal fields. The nymph lives on *Calamagrostis epigejos* and *Festuca*.

***Micantulina*** Anufriev, 1970

*Erythria* pro parte

*M.micantula* (Zetterstedt, 1838)

Eurosiberian; U: DD1; H: a; G: 1; M: s,l

Very rare in the southwestern parts of Finland. It lives on lush meadows and in broad-leaved forests. The nymph feeds on *Thalictrum*. In Sweden the species has a much wider distribution reaching much further north and utilizing drier habitats (Gillerfors 2005). The species may have been overlooked in Finland due to its localized occurrence.

Data: Al: "Alandia" <1880 (leg. O.M.Reuter); Ab: Lohja (leg. Linnaniemi); Al: Finström 1943 (leg. H.Lindberg), 1978 (leg. A.Albrecht), 2002 (leg. Östman & Söderman), Lemland 1978 (leg. A.Albrecht).

*M.pseudomicantula* (Knight, 1966)

*Dicraneura micantula* in Lindberg 1947 nec Zetterstedt, 1838  
Siberian; U: DD1; H: a; G: 1; M: s,l,m

Very rare and localized, and confined to lush forest groves in the interior of Finland. Linnavuori (1949a) recorded it in (Ta) Lammi from *Filipendula ulmaria*. Later, it has only been found from an *Aconitum*-grove, rich with *Filipendula*, in (Kb) Tohmajärvi. The nymph probably feeds monophagously on *Filipendula*.

***Wagneriala*** Anufriev, 1970

*Erythria* pro parte

*W.minima* (J.Sahlberg, 1871)

Siberian; U: DD2; H: o; G: 1; M: s,m

Only a few specimens have been found from thyme fields in southeastern Finland and from lichen-floored forests further to northeast. It lives on sandy fields and dry meadows in Central Europe. Here the nymph lives on *Carex humilis*, which does not grow in Finland. Vilbaste (1982) mentions *C.montana*, as the host plant, but this plant has gone extinct from Finland. In Finland *C.ericetorum* is the host plant in all recorded sites.

Data: Sa: Joutseno 1950 (leg. R.Linnavuori), Luumäki Pajari 2004 (leg. G.Söderman), Ok: Sotkamo Räätäkangas 2004-2005 (leg. R.Leinonen).

**Igutettix** Matsumura, 1932*Vilbasteana* Anufriev, 1970 in Albrecht et al. 2003*Dikraneura* pro parte*Alebroides* auct. nec Matsumura, 1931*Loculatus* (H.Lindberg, 1929)*Igutettix pulverosus* Matsumura, 1932*Dikraneura maculosa* Vilbaste, 1968

East-Palaeartic; U: -; H: o; G: 2-3; M: s,l,m

Recently, only in the 21th century recorded from gardens and parks, in the west from the metropolitan area of Helsinki east to the Karelian Isthmus in Russia (Albrecht et al. 2003). In Siberia the species lives on *Syringa reticulata* (= *amurensis*) (Anufriev & Emelyanov 1988). Found for the first time in Europe from Moscow in the late 20<sup>th</sup> century, where it lives in parks on ornamental lilac bushes (*Syringa persica* and *S. vulgaris*) (Tishechkin, l.c.). In Finland both adults and nymphs have been sampled from *Syringa josikaea*, *S. x henryi*, and once from *S. reflexa*. The leaves of the lilac become yellow-spotted, in particular along the margins (Söderman 2005).

**Forcipata** De Long & Caldwell, 1936*F.citrinella* (Zetterstedt, 1838)

Siberian; U: LC; H: o; G: 2; M: s,l,m

Common throughout Finland. Lives on mires and paludified lakeshores, but is often also encountered in boreal deciduous forests. The host plant of the nymph is at least *Carex rostrata*, but other sedges, or even rushes, are potential host plants in the wooded sites.

*F.forcipata* (Flor, 1861)

Siberian; U: LC; H: o; G: 1; M: s,m

Rather rare in the whole country, but more common in the north. Lives on lakeshores and alluvial river meadows. The nymph feeds on sedges (*Carex*) and woodrushes (*Luzula*).

**Notus** Fieber, 1866*N.flavipennis* (Zetterstedt, 1828)*Notus marginatus* J.Sahlberg, 1871

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y

Common throughout the country on lakeshore fringes, wet meadows and in mires. The nymph feeds i.a. on *Carex vesicaria*, horsetails (*Equisetum*) and *Scirpus sylvaticus*.

**Empoasca** Walsh, 1862

Taxonomic comment:

- The pygophore appendices, characteristic for the species, have been speculated to vary much (Nickel 2003), and hence some taxa described from the Russian Far-East, such as *E.viburni* Vilbaste, 1968, *E.betuleti* Vilbaste, 1965 and *E.silvatica* Vilbaste, 1968 (see Anufriev & Emeljanov 1988) could fall within the variation of the species *E.ossianniilssoni*. A large variation could also include the Central European taxon *E.dealbata* Cerutti, 1939, which would thus be the eldest valid name of the species. I have seen thousands of male pygophores of *E.ossianniilssoni* from Forest Lapland to the Pskov oblast in Russia and only noted an insignificant variation in this character. On the basis of this, I see no reason for synonymizing the Asian species, neither the species from the European Alps with this species described from Finland.
- Ossianniilsson (1981) used the name *E.solani* for the species *E.pteridis* although the description of Curtis was vague but the hostplant defined as potatoe. The specimens in the Curtis collection (in Australia) labeled *solani* have turned out to belong to four different species, none of which can be identified as *solani* (M.Wilson, pers.comm.). I therefore use Dahlboms name *pteridis* with a reliable description and type material for this species.

*E.vitis* (Göthe, 1875)*Typhlocyba flavescens* Flor, 1861 nec Fabricius, 1794

Transpalaeartic; U: LC; H: a; G: 1; M: s,l,y,m

Very common north to the middle and northern boreal boundary in all kind of boreal deciduous forests. The nymph lives on various brushwood and leaf-trees and the adults migrate to spruce for hibernation.

*E.pteridis* (Dahlbom, 1850)*E.solani* (Curtis, 1846) sensu Ossianniilsson, 1981

West-Palaeartic; U: DD3; H: o and a; G: 1-2; M: s,l,y,m

Rare and only met with in the southern parts of Finland. It lives on crop fields and pastures. The nymph is polyphagous, but prefers plants of the family Solanaceae. No adult migration is known in this species, but the phenology in the 21<sup>st</sup> century indicates that some females might hibernate as adults in favourable places.

*E.kontkaneni* Ossianniilsson, 1949

Siberian; U: DD3; H: a; G: 1; M: s,l,y,m

Very common inland north to the middle boreal region in Finland. It lives in boreal deciduous forests, preferably in the marginal parts. The nymph feeds on *Rubus idaeus*. The adults ascend leaf-trees (often bird cherry) and migrate to spruce for hibernation.

*E.ossiannilssoni* P.Nuorteva, 1948  
? *E.dealbata* Cerutti, 1939 (see above)

Siberian; U: DD3; H: a; G: 1; M: s,l,y,m

Rather rare in the southern parts of the country, but becomes very abundant in the northeastern parts of the middle boreal region in Finland (Albrecht et al.2003). It lives preferably in boreal deciduous forests. The nymph feeds on *Prunus padus* and *Filipendula ulmaria*. Adults migrate to spruce in late autumn for hibernation.

*E.apicalis* (Flor, 1861)

Siberian; U: DD3; H: a; G: 1; M: s,l

Rather common in deciduous woods in the interior parts of southern Finland and most common in the region of Häme. The nymph is a monophage of *Lonicera xylosteum*. Adults feed on a number of leaf-trees and they migrate to spruce for hibernation.

**Kybos** Fieber, 1866

*Empoasca* pro parte

Taxonomic comments:

- It has been a riddle that the taxon *betulicola* has not been recorded from Finland, because it is widespread in northern Sweden and Norway (Ossiannilsson 1981). The distinguishing characters from *lindbergi* have been the space between marginal appendices of the aedagus. Dworakowska (1976) has shown that the taxa *lindbergi* and *betulicola* can cross in Central Europe and intermediate forms have been identified in large male series (Lauterer & Holzinger 1996). According to present opinions the two taxa are considered conspecific. Linnavuori's name then takes priority. The status of the North-American species *K.ludus* (Davidson & DeLong, 1938) is still unclear (see Nickel 2003). Should it turn out to be synonymous with *betulicola*, the name *ludus* then takes priority over *lindbergi*.
- The distinction between the taxa *virgator* and *volgensis* have been questioned (Nickel 2003) as the descriptions (Vilbaste 1961, Ossiannilsson 1981) differ to some extent. In the material I have seen from Finland and Russia the taxa are easy to distinguish from one another and they apparently have different host plants, *virgator* living on *Salix viminalis* and *S.alba*, and *K.volgensis* on *S.pentandra*.

*K.smaragdula* (Fallén, 1806)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m,p

Very common throughout Finland. Adults live in the canopies of many leaf-trees, but the nymph feeds on alders (*Alnus*) only.

*K.lindbergi* (Linnavuori, 1951)

*K.betulicola* W.Wagner, 1955

Siberian; U: LC; H: o; G: 1; M: s,l,m

Common throughout Finland. It lives in boreal deciduous birch-dominated forests. The nymph lives on birches (*Betula*).

*K.strigilifer* (Ossiannilsson, 1941)

North-European; U: LC; H: o; G: 1; M: s,l

Rather common, but localized in the southern and central parts of Finland, where it inhabits forest margins. The nymph feeds in Finland at least on *Salix caprea*. From abroad also *S.cinerea*, *S.fragilis* and *Alnus* are mentioned, but it is not clear whether they are host plants of the nymph.

*K.virgator* (Ribaut, 1933)

Eurosiberian; U: LC; H: o; G: 1; M: s,l

Rather rare in southwestern Finland, but is also found in the surroundings of Lake Oulujärvi. It lives in river valleys, parks and on shores. The nymph feeds on *Salix viminalis* and *S.alba*.

*K.volgensis* (Vilbaste, 1961)

Southeast European ?; U: -; H: o ?; G: 2; M: s

The general distribution of this species is confusing. It was originally described from Astrachan in southwestern Russia (Vilbaste 1961). The only other known record is from central Sweden, where Ossiannilsson found it in two years, 1970 and 1979 from cultivated *Salix pentandra* (Ossiannilsson 1981). I have since recorded it in number from the Belgorod oblast close to the Ukrainian border and found two males from an old manor park in southern Finland (Albrecht et al. 2006). Ossiannilsson recorded both adults and nymphs in late autumn and adults in July. My own adult records both from Russia and Finland are mainly from June, indicating that the species in contrast to other members of the genus produces two generations per year in northern Europe. None of the occurrences in Sweden and Finland are associated with migratory weather conditions and the record of nymphs in Sweden indicates at least small permanent native populations. The species may have been overlooked by previous Finnish cicadologists as the distinguishing characters from *E.virgator* were published later than their main activity period. As there are no recent cicadologic inventories from the Baltic countries or from areas east of them, the possibility of a northward expansion in the late 20<sup>th</sup> century cannot be ruled out.

Data: N: Inkoo Fagervik 2005 (leg. G.Söderman)

*K.butleri* (Edwards, 1908)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,m

Common throughout Finland in all kinds of brushwood. The nymph feeds on willows of the *Salix aurita* group.

*K.populi* (Edwards, 1908)

Eurosiberian; U: LC; H: o; G: 1; M: s,l

Common in the boreal deciduous woodlands of southern and central Finland. The nymph feeds on aspen (*Populus tremula*).

*K.sordidulus* (Ossiannilsson, 1941)

Siberian; U: LC; H: o; G: 1; M: s,l,y

Rather common but localized throughout the country. It lives on shores and mire margins. The host plants of the nymph are *Salix myrsinifolia* and *S.myrsinites*.

*K.abstrusus* (Linnavuori, 1949)

European; U: DD5; H: o; G: 1; M: s

The species is widely spread in Central Europe, mostly occurring in alluvial forest, but also in urban areas and often in two generations. In the Nordic countries it has only been recorded in one generation in urban parks from Sweden (Ossiannilsson 1981) and in Finland from parks and gardens in the city of Turku in southwestern Finland. The nymph feeds on black poplar (*Populus nigra*) from which adults have been recorded in Finland and the local populations appears to be quite small, sometimes confined to a single tree.

Data: Ab: Turku 1948 (leg. R.Linnavuori), Turku Ruissalo Botanical Garden 2004 (leg. G.Söderman).

***Kyboasca*** Zachvatkin, 1953

*Empoasca* pro parte

*K.bipunctata* (Oshanin, 1871)

Eurosiberian; U: DD5; H: o; G: 1; M: s

Only recorded once in the city of Turku in southwestern Finland where it was collected from small *Ulmus x hollandica* saplings (Linnavuori 1969b). Quite common in Central Europe where it lives in groves and parks and one of the few species that has not declined due to the widespread elm-disease in Central Europe (Nickel 2003). The nymph feeds on elm (*Ulmus*) and seems to prefer young trees (Nickel 2003). The species was only recently recorded (in the wild) from the island of Gotland in Sweden (Gillerfors 2005). It is uncertain whether the species is resident in Finland anymore as elms are generating quite slowly nowadays and saplings are scarce even in protected elm groves. The species may still live in the city of Turku even if it has not been recorded for more than 50 years and despite recent efforts to relocate its population.

Data: Ab: Turku 1949 (leg. R.Linnavuori).

***Chlorita*** Fieber, 1872

*Xerochlorita* Zachvatkin, 1953 nomen nudum

*C.viridula* (Fallén, 1806)

Siberian; U: DD1; H: o; G: 1-2; M: s,l

The species has only been found in some coastal places in Finland. It is said to live on dry meadows and ruderal fields and on the same plants as the following species (Ossiannilsson 1978) and it seems to be widespread in Sweden (Gillerfors 2005). The sites in Finland represent wet shore meadows, so the nymph probably feeds on other plants than *Achillea* and *Chrysanthemum* mentioned by Ossiannilsson. In England it is known from coastal meadows and *Artemisia maritima* (LeQuésne & Paine 1981) and in Sweden it has recently been taken in number from *A.absinthum* (Gillerfors 2002). The host plant in Finland may be *Artemisia vulgaris* growing on coastal meadows.

Data: Oa: Laihia, Mustasaari, Ylistaro 1959 (leg. M.Raatikainen); St: Kokemäki 1994 (leg. V.Rinne); Ka: Virolahti 2002 (leg. G.Söderman).

*C.paolii* Ossiannilsson, 1939

Pontomediterranean; U: LC; H: o; G: 2; M: s,l,y,m,p

Common in the hemi- and southern boreal regions of Finland, but missing from Sweden (!). It lives on dry meadows and ruderal fields. The nymph feeds on *Achillea millefolium* and *Artemisia campestris*.

*C.dumosa* (Ribaut, 1933)

Pontomediterranean; U: DD2; H: o; G: 2; M: s,y,m,p

In Finland the species has exclusively been recorded from xerothermic sites with extensive thyme-cushions. It is said to live on sandy fields and the host plant of the nymph is *Thymus serpyllum* (Linnavuori 1969b). Some of the Finnish sites represent substitutional habitats with strong human influence, but the strongest populations have been found in esker areas with preserved xerothermic slope vegetation.

Data: Sa: Joutseno 1950 (leg. R.Linnavuori), Luumäki Pajari 2004 (leg. Söderman & Albrecht); N: Hanko Tvärminne 1979 (leg. A.Albrecht); St: Säköjärvi 2004-2005 (leg. Karjalainen & Salminen); Ta: Loppi Komio 2005 (leg. Karjalainen & Salminen); Ab: Vihti Nummela 2005 (leg. P.Ahlroth).

***Fagocyba*** Dlabola, 1958

*Typhlocyba* pro parte

*Dryocyba* Vilbaste, 1982 p.p. nomen nudum

Taxonomic comment:

- The species *cruenta* has earlier gone under the name *F.douglasi*, but already Linnavuori (1969a) doubted its

validity. The general opinion is nowadays, that the more colourful *F.cruenta* is only a summer form of the latter (Nickel & Remane 2002). Reddish color forms are common also in the genera *Eurhadina* and *Alebra* (see Ossianilsson 1981). The theory is, that these forms develop in warmer and sunnier places than the paler individuals. No differences in the genital structures of the males have been found between the taxa *F.douglasi* and *F.cruenta*, and they may occur syntopically and in the same population. As the name *cruenta* is older than *douglasi*, the species name should be *F.cruenta*.

*F.cruenta* (Herrich-Schäffer, 1838)

*Typhlocyba douglasi* Edwards, 1878

European; U: LC; H: o; G: 1; M: s,l,y

Common in the southern and central parts of Finland. Lives in groves, wet forests, alder stands along shores and in parks. The nymph feeds in Finland mostly on alder (*Alnus*), rarely on *Prunus padus* or *Malus*.

*F.carri* (Edwards, 1914)

European; U: -; H: o; G: 1; M: s,l

The species has been recorded in deciduous forest stands in (Ab) Ruissalo near Turku (Albrecht et al. 2003), where it was found to be quite common in 2004. The nymph feeds on common oak (*Quercus robur*).

**Edwardsiana** Zachvatkin, 1929

*Typhlocyba pro parte*

Taxonomic comments:

- Some hemipterologists (i.a. Ossianilsson, Linnavuori) have regarded the taxon *staminata* as a distinct species. It differs from *avellanae* only in the extra small appendices close to the apex of the aedagus. Most males, which have been identified to *staminata*, have in later investigations shown to be parasitized by pipunculid larvae (Nickel 2003). In parasitized specimens the genital structures often become deformed and *staminata*-like structures have been found in normal *avellanae* populations in Germany (Nickel, l.c.). Parasitization normally manifests as reduction in male genital organs, but in *staminata* extra small appendices appear, which makes the interpretation of deformation by parasitization problematic. Specimens reminding *staminata* has not been found in Finland, but I have seen a few in a large population of *avellanae* in Russia.
- Some authors regard the taxon *ampliata* as a synonym to *frustrator*. The male aedagus of *E.ampliata* is, however, quite different from that of *E.frustrator* in shape, and this character is stable in the southeastern European populations I have seen.
- Linnavuori reported the species *lanternae* new to Finland in 1949 and that he collected it from elm (Linnavuori 1949a). Ossianilsson (1981) however claimed that the specimens living on elm belong to another species, *E.ishidai*. He recalled, that the Finnish specimens collected by Linnavuori, which he identified from Raisio and Perniö belong to *E.ishidai*. As a consequence *E.lanternae*

was removed from the Finnish checklist (Huldén & Heikinheimo 1984). The taxon described as *E.lanternae* from Central Europe is however a distinct species, that occurs rare in northern Germany (Nickel 2003), England and Wales (Claridge & Wilson 1976) and lives on i.a. alder. Linnavuori later (1950) informed that he found specimens of *E.lanternae* also from Häme and Pirkanmaa, in places where no elm-trees grew. He collected these specimens preferably from birdcherry. I have myself found the species in light-traps located in lush forest stands of birdcherry and alder, but not with elm. The males of these specimens clearly have the aedagus shape similar to the species described by Wagner (1937). Thus, *E.lanternae* should be re-installed in the Finnish checklist.

- The taxon *kemneri* has been described only on the basis of one male from Swedish Jämtland. German researchers have later found parasitized males of the species *tersa* with aedagus structures reminiscent of *kemneri*. On the basis of this, *kemneri* is nowadays in many countries synonymized with *tersa* (Nickel 2003). Gillerfors (2005), however, argues that the synonymization is premature as new specimens matching the description of *kemneri* have been found in Sweden. Specimens belonging to *kemneri* have not been found in Finland. The specimens of *tersa* collected and reported by Raatikainen & Ylönen (1988) have in my revision shown to be parasitized specimens of *E.bergmani*.
- The type specimen of *E.hippocastani* has in the revision by Wilson & Claridge (1999) proved to belong to the species *E.lethierryi* (Edwards, 1881). All specimens of *E.hippocastani* taken from elm in Finland belong to the newly described species *E.ulmiphagus*. On the other hand, most specimens taken from hazel, that I have seen, belong to the species *E.plurispinosa*.

*E.rosae* (Linnaeus, 1758)

Transpalaeartic; U: DD3; H: o; G: 2; M: s,l,m

Common from the hemi- to the middle boreal region in Finland. In addition, it has been found isolated in Kuusamo. It lives in gardens, but also along shores invaded by roses. The nymph feeds on roses (*Rosa*), but they have also been found on *Sorbus aucuparia* and *Malus*, from which often the morph *f.manca* Ribaut, 1936 develops.

*E.avellanae* (Edwards, 1888)

? *Typhlocyba staminata* Ribaut, 1932

European; U: DD3; H: o; G: 1; M: s

The species has only been found once, for more than a century ago in Finland. It lives in hazel thickets (Gillerfors 2002). The nymph is a monophage of *Corylus avellana*.

Data: St: Yläne 1869 (leg. J.Sahlberg).

*E.stehliki* Lauterer, 1958

European; U: DD3; H: o; G: 1; M: s

It has been found once from a hazel thicket in southern Finland (Albrecht et al. 2003). An older record from the Helsinki-region (1927, leg.W.Siefke) is discarded, since the specimen is a female that cannot be determined to species. The nymph feeds



on *Corylus avellana*. Information of *Viburnum* as a host plant abroad (Nickel 2003), might refer to another species of the genus.

Data: Ab: Karjalohja Karkali 2003 (leg. G.Söderman).

*E. crataegi* (Douglas, 1876)

*Empoasca australis* Froggatt, 1918 nec Walsh, 1862

Eurosiberian; U: DD3; H: o; G: 1; M: s,l

Rare in the hemiboreal region of Finland, and locally further north. It lives in gardens, parks and groves. The nymph feeds on trees of Rosaceae (*Crataegus*, *Pyrus*, *Malus*).

*E. salicicola* (Edwards, 1885)

Siberian; U: DD3; H: o; G: 1; M: s,l,y

Rather rare in the southern and central inland parts of Finland. It lives in humid boreal deciduous forests and in willow thickets bordering lakes and mires. The nymph feeds on the underside of leaves of grey-leaved willows (*Salix aurita*, *S. cinerea*, *S. viminalis*, *S. caprea*).

*E. alnicola* (Edwards, 1924)

European; U: DD3; H: o; G: 1; M: s,l,y

Common in the southern and central parts of Finland, most abundant in alder-stands along the south coast and in wet forests inland. The nymph feeds on black alder (*Alnus glutinosa*).

*E. sociabilis* (Ossiannilsson, 1936)

North-European; U: LC; H: o; G: 2; M: s,l

Rather common north to central Finland, but clearly most abundant in the southwestern parts of the country. It lives on humid tall-grown meadows. The nymph feeds primarily on *Filipendula ulmaria*, but has adapted to live on roses (*Rosa*) in gardens and on seashores as well.

*E. frustrator* (Edwards, 1908)

European; U: DD3; H: o; G: 1; M: l,y

Rather rare in the hemiboreal region in Finland, but also further north in grove enclaves in the central parts. It lives in lush groves and in parks. The nymph feeds on *Acer platanoides*, rarely on small-leaved lime (*Tilia cordata*) in Finland.

Data: Ab: Parainen <1871 (leg. J. Sahlberg), Lohja 1944 (leg. H. Lindberg), Turku 1950 (leg. R. Linnavuori); N: Helsinki 1946 (leg. H. Lindberg); Ab: Turku 1994 (leg. V. Rinne); Al: Lemland Herrö 2002 (leg. G. Söderman); Ta: Lammi Pappilanniemi 2003 (leg. P. Malinen); Tb: Korpilahti Korospohja 2003 (leg. J. Murtosaari).

*E. ampliata* (W. Wagner, 1948)

East-European; U: -; H: o; G: 1; M: s

The single Finnish specimen was taken on a small-grown *Acer tataricum ssp. ginnala* in a garden in Helsinki (Albrecht et al. 2003). As it was swept

from an ornamental plant, it is possible that the species has been introduced in Finland. The species is quite common in forest steppe areas in western Russia, where it preferably lives on *Acer campestre* and produces two generations per year.

Data: N: Helsinki Pakila 2003 (leg. G. Söderman).

*E. ishidae* (Matsumura, 1932)

*Typhlocyba lanternae* auct. nec W. Wagner, 1937

Eurosiberian; U: DD3; H: o; G: 1; M: l

Very rare in Finland and only caught from the southwestern parts. It lives in broad-leaved deciduous groves and in parks. The nymph and adult feed on *Ulmus glabra*.

Data: Ab: Raisio, Perniö 1948 (leg. R. Linnavuori), Lohja 1969 (leg. H. Krogerus).

*E. lanternae* (W. Wagner, 1937)

European; U: -; H: o; G: 1; M: l

Rather rare and localized in southern Finland, living in boreal deciduous forests. The nymph lives on black alder (*Alnus glutinosa*) in England (Le-Questne & Payne 1981) and possibly on birdcherry (*Prunus padus*).

Data: Ta: Lammi Untulanmäki 1949 (leg. R. Linnavuori), Tuulos 1950 (leg. R. Linnavuori); Tb: Jyväskylä 1949 (leg. R. Linnavuori); N: Espoo Nuuksio 2003 (leg. K-E. Lundsten); Sa: Joutseno Kähärilä 2003 (leg. K-E. Lundsten); Ta: Asikkala Vesivehmaa 2003 (leg. O. Blomster); Kb: Tohmajärvi kirkonkylä 2003 (leg. Nieminen & Sundell).

*E. prunicola* (Edwards, 1924)

*Typhlocyba barbata* Ribaut, 1931

*Typhlocyba prunicola ssp. barbata* Ribaut, 1931 in Linnavuori 1969b

European; U: DD3; H: o; G: 2; M: s,l

Common in the interior boreal deciduous small-leaved forests in southern and central Finland. The nymph feeds on *Prunus padus* and willows of the *Salix aurita*-group. Most Finnish males belong to the form *barbata*. The nominal form has been collected only in a few specimens from southwestern Finland.

*E. menzbieri* Zachvatkin, 1948

Siberian; U: DD3; H: o; G: 2; M: s,l,y,m

Very common in Finland nowadays. It was recorded new to the country quite late, in the end of the 1960's, but it has possibly been overlooked before. It lives along forest margins and lakeshores and is quite abundant in alder stands. The nymph lives both on *Salix caprea* and grey alder (*Alnus incana*).

*E. plebeja* (Edwards, 1914)

West-Palaeartic; U: DD3; H: o; G: 1; M: s,l

Very rare in southern Finland, where it preferably lives in parks. It has been found in (Ab) Lohja (leg. H.Lindberg, 1923) and Turku (leg. R.Linnavuori, 1950). The nymph feeds on *Ulmus glabra*.

*E. candidula* (Kirschbaum, 1868)

European; U: DD3; H: o; G: 1; M: s

Only collected twice, from parks, in Finland. The nymph is a monophage of silver poplar (*Populus alba*).

Data: N: Helsinki Botanical Garden 1970 (leg. G.Söderman); Al: Jomala 1975 (leg. A.Albrecht).

*E. gratiosa* (Boheman, 1852)

European; U: -; H: o; G: 1; M: s

Insofar only recorded twice from black alders (*Alnus glutinosa*) in southeastern Finland (Albrecht et al. 2003).

Data: Ka: Vehkalahti 2002 (leg. A.Albrecht); N: Pyhtää Hirvivuolle 2003 (leg. G.Söderman).

*E. geometrica* (Schrank, 1801)

European; U: LC; H: o; G: 1; M: s,l,y,m

Very common in Finland north to the northern boreal region. It lives in humid boreal deciduous forests and along shores. The nymph feeds on alders (*Alnus glutinosa* and *A. incana*).

*E. soror* (Linnavuori, 1950)

Siberian; U: DD3; H: o; G: 2; M: s,l,y

Common inland in humid deciduous boreal forests north to the northern boreal region. The nymph feeds at least on grey alder (*Alnus incana*), possibly also on *Prunus padus*.

*E. tersa* (Edwards, 1914)

? *Typhlocyba kemneri* Ossiannilsson, 1942

Siberian; U: -; H: o; G: 1; M: m

The species is rather widely distributed in Europe, but has insofar only been recorded from the northern parts of Finland (Albrecht et al. 2003). It lives in alluvial brush. The nymph feeds in Finland on *Salix lapponum*. Further west and south in Europe it also lives on *S. viminalis*, *S. aurita* and *S. incana* (Ossiannilsson 1981, Nickel 2003).

Data: ObN: Ylitornio Aavasaksa 1995 (leg. T.Lammes); Ks: Kuusamo Oulanka 2002 (leg. Leinonen & Söderman).

*E. bergmani* (Tullgren, 1916)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m,p

Very common throughout Finland in all kinds of birch-stands north to the mountain birch forests. The nymph feeds on birches (*Betula*). Information

regarding alder and rowan as host plants cannot be confirmed from Finland.

*E. lethierryi* (Edwards, 1881)

*Typhlocyba hippocastani* Edwards, 1888

European; U: -; H: o; G: 1; M: s

Only recently swept from broad-leaved trees and hazel from the Alandian mainland (Albrecht et al. 2006). The nymph lives on various broad-leaved trees.

Data: Al:Lemland Apalholm 2005 (leg. Söderman & Ahlroth).

*E. ulmiphagus* Claridge & Wilson, 1999

*Typhlocyba hippocastani* auct. nec Edwards, 1888 p.p.

European; U: DD1; H: o; G: 1; M: s,l

Rare in parks and elm-groves in southern Finland. The nymph lives on *Ulmus glabra*.

*E. plurispinosa* (W.Wagner, 1935)

*Typhlocyba hippocastani* auct. nec Edwards, 1888 p.p.

European; U: DD1; H: o; G: 1; M: s

This species was found in the revision of the Finnish material of *E. hippocastani*. Insofar, there are only a few known sites of this monophagous species from hazel (*Corylus avellana*) thickets in Finland (Albrecht et al. 2006).

Data: N: Helsinki Botanical Garden 1975 (leg. A.Albrecht); Ab: Nauvo Bergham 1991 (leg. V.Rinne); Al: Lemland Apalholm 2002 (leg. A.Albrecht), 2005 (leg. Söderman & Ahlroth), Lemland Flaka 2002 (leg. A.Albrecht).

***Eupterycyba*** Dlabola, 1958

*Typhlocyba* pro parte

*E. jucunda* (Herrich-Schäffer, 1837)

European; U: -; H: o; G: 1; M: s,y

Only collected twice from alder thickets in southwestern Finland (see Albrecht et al. 2003). The nymph lives monophagously on black alder (*Alnus glutinosa*).

Data: Ab: Mietoinen Saari 2002 (leg. M.Salminen); St: Pori Yyteri 2005 (leg. G.Söderman).

***Linnavuoriana*** Dlabola, 1958

Taxonomic comment:

- Lauterer & Novotný (1991) regard the subspecies described by Linnavuori as a distinct species, because the shape of the male aedagus, differing from *L. decempunctata*, is constant. I have in my own research come to the same conclusion. Anyway, it cannot be a subspecies because it lives sympatrically with the preceding species in southern Finland. There are also differences in the coloring of the hind tibia between the species.

*L.sexmaculata* (Hardy, 1850)

*Cicada sexpunctata* Fallén, 1826 (primary homonym)

Eurosiberian; U: LC; H: a; G: 1; M: s,l,y,m,p

Very common throughout Finland. It lives in on various brushwoods along shores, lake and river meadows and forest margins. The nymph feeds on willows (*Salix*), mostly on *S.caprea*. Adults migrate to spruce for hibernation.

*L.decempunctata* (Fallén, 1806)

Siberian; U: LC; H: a; G: 1; M: s,l,y,m

Common, but more rare than the preceding species, throughout Finland in boreal deciduous woods and along lakeshores. The nymph feeds on birches (*Betula*). Adults migrate to spruce for hibernation.

*L.intercedens* (Linnavuori, 1949)

*Typhlocyba decemguttata* ssp.*intercedens* Linnavuori, 1949

North-European; U: -; H: a; G: 1; M: s,l,m

Rather common in the southern and central parts of Finland, where it occurs in alder stands, preferably along lakeshores and mire fringes. The nymph feeds preferably on black alder (*Alnus glutinosa*), but there are also observations from *A.incana* (Linnavuori 1949).

***Ribautiana*** Zachvatkin, 1947

*Typhlocyba* pro parte

*R.ulmi* (Linnaeus, 1758)

European; U: LC; H: o; G: 2; M: s,l

Rather common in broad-leaved deciduous woods and parks in the hemi- and southern boreal regions of Finland. The nymph commonly feeds on *Ulmus glabra*, but the species has also been recorded from sites where this host plant is missing. In these sites the alternative host plants may be grey alder (*Alnus incana*) and small-leaved lime (*Tilia cordata*).

***Typhlocyba*** Germar, 1833

*T.quercus* (Fabricius, 1777)

West-Palaeartic; U: -; H: o; G: 1; M: s,l,y

Recorded quite recently from Finland, and has been shown to be widely spread in southern and central Finland by the use of light-traps (Albrecht et al. 2003, Söderman 2004). It lives in lush groves and alder thickets. The nymph feeds in Finland on black and grey alder (*Alnus glutinosa*, *A.incana*), more seldom on common oak (*Quercus robur*). Other broad-leaved deciduous trees are mentioned from abroad (Nickel 2003).

***Zonocyba*** Vilbaste, 1982

*Typhlocyba* pro parte

*Z.bifasciata* (Boheman, 1851)

European; U: VU; H: o; G: 1; M: s,l

Was previously known only from parks in southern Finland (Albrecht 1977), but was recently also found to live in a natural elm-grove (Albrecht et al. 2003). The nymph feeds on *Ulmus glabra* and *Ulmus x hollandica* in Finland, abroad also on other broad-leaved deciduous trees (Nickel 2003). It has not been repeatedly recorded from all known sites, but as it lives in the canopy layer, monitoring of its populations is rather difficult.

***Eurhadina*** Haupt, 1929

*E.pulchella* (Fallén, 1806)

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y,m

Common north to the middle and northern boreal boundary in Finland. It lives in boreal deciduous forests and in alder-stands on shores. The nymph feeds mostly on grey alder (*Alnus incana*) in Finland, seldom on common oak (*Quercus robur*).

*E.concinna* (Germar, 1831)

European; U: DD3; H: o; G: 1; M: s,l

Rather common in groves of the hemi- and southern boreal regions of Finland. The nymph feeds on common oak (*Quercus robur*), abroad also on elm, maple, alder and birches (Ossiannilsson 1978, Nickel 2003).

*E.ribauti* W.Wagner, 1935

European; U: DD3; H: o; G: 1; M: s

Only recorded three times from common oak (*Quercus robur*) in southwestern Finland. Abroad it lives on *Tilia* and *Alnus* as well.

Data: N: Helsinki Botanical Garden 1946 (leg. H.Lindberg), Tammissaari Gullö 1976 (leg. G.Söderman); Al: Finström Bastö 2005 (leg. Söderman & Ahlroth).

*E.kirschbaumi* W.Wagner, 1937

European; U: DD3; H: o; G: 1; M: s,l

Rare and only found in a few young oak-stands in southern Finland. The nymph lives monophagously on *Quercus robur*.

Data: Ab: Raisio, Turku 1946 (leg. R.Linnavuori), Pohja 1976 (leg. A.Albrecht); N: Noux National Park 2002 (leg. Lundsten & Söderman), Pernaja Tervik 2002 (leg. A.Albrecht); Ta: Hämeenlinna Aulanko 2003 (leg. Malinen & Söderman).

**Eupteryx** Curtis, 1833

*E.atropunctata* (Goetze, 1778)

European; U: LC; H: o; G: 2; M: s,l,y,m

Rather rare in the hemi- and southern boreal regions of Finland. It lives in ornamental gardens, on wooded meadows and ruderal fields. The nymph feeds on *Satureja*, *Mentha*, *Melissa*, *Origanum* and other spicy herbs of Lamiaceae.

*E.origani* Zachvatkin, 1948

European; U: DD3; H: o; G: 1-2; M: l,m

Huldén (1977) reported the species new to Finland based on two old males identified by LeQuesne. Both are probably from ornamental gardens. In wild the species is also associated with dry grass fields and there are only a few recent findings. The nymph is said to be a monophage of *Origanum vulgare* (Nickel 2003), but in Finland it also lives on *Veronica* and *Satureja acinos*.

Data: N: Helsinki 1895 (leg. A.Luther); Oa: Petalax 1940 (leg. H.Lindberg); Ta: Jokioinen Nummela 1993 (leg. A.Vasarainen); Sa: Lappeenranta airfield 2003 (leg. Sundell & Söderman), Joutseno Anola 2004 (leg. Saarinen & Söderman), Joutseno Korvenkylä 2005 (leg. A.Valtonen); Kb: Tohmajärvi Jalajavaara 2005 (leg. G.Söderman).

*E.signatipennis* (Boheman, 1847)

North-European; U: LC; H: o; G: 1; M: s,l,y

Rather common in the southern and central parts of Finland. It lives on humid tall-grown meadows and in lush groves. The nymph feeds on *Filipendula ulmaria*.

*E.urticae* (Fabricius, 1803)

European; U: DD3; H: o; G: 2; M: s

Insofar, only recorded a few times in southern Finland from rich meadows. The nymph feeds on stinging nettle *Urtica dioica*.

Data: N: Ruotsinpyhtää 1970 (leg. G.Söderman); Sa: Ristiina 1972 (leg. M.A.Koponen); Ab: Raisio 1975 (leg. I.Dworakowska).

*E.cyclops* Matsumura, 1906

*Eupteryx urticae* auct. nec Fabricius, 1803

Eurosiberian; U: LC; H: o; G: 2; M: s,l,y,m

Very common north to the northern boreal region in Finland. It lives on nitriphilous meadows, in pastures and alder-stands of lakeshores with dense nettle growth. The nymph feeds on *Urtica dioica*.

*E.calcarata* Ossiannilsson, 1936

West-Palaeartic; U: DD3; H: o; G: 2; M: s,l,y,m

Rather common in southwestern Finland and rare elsewhere in the southern parts of the country. It lives preferably on alder-wooded meadows. The nymph feeds on *Urtica dioica*.

*E.collina* (Flor, 1861)

*Eupteryx alticola* Ribaut, 1936

*Eupteryx melissae* Curtis, 1836 in Lindberg 1935

European; U: DD3; H: o; G: 1-2; M: s

Only recorded twice from the southeastern part of Finland where it has been found from sun-exposed xerothermic slopes. In other parts of Europe it lives in lush groves and on mesic and dry meadows, but some records might be confused with the species *E.florida* Ribaut, 1952. The nymph is said to feed on *Mentha* and *Satureja* (Ossiannilsson 1981) and I have recorded it from *Satureja acinos*.

Data: Kl: Parikkala 1866 (leg. J.Sahlberg); Sa: Luumäki 2004-05 (leg. Söderman & Albrecht).

*E.stachydearum* (Hardy, 1850)

European; U: -; H: o; G: 2; M: s

Only recently found from herb-rich shores in conservation areas on mainland Alandia (Albrecht et al. 2006). The nymphs and adult live on a variety of plants belonging to Lamiaceae (Nickel 2003).

Data: Al: Finström Husö 2005 (leg. M.Östman); Lemland Nätö 2005 (leg. Söderman & Ahlroth).

*E.vittata* (Linnaeus, 1758)

European; U: LC; H: o; G: 1-2; M: y,m

The species has strongly declined within its distribution area in southern and central Finland. It preferably lives on pastures and in gardens. The nymph feeds on *Glechoma hederacea* and *Prunella vulgaris*.

*E.notata* Curtis, 1837

Pontomediterranean; U: LC; H: o; G: 2; M: s,l,y,m,p

Common in Finland at least to the northern boreal region on dry meadows, pastures, esker slopes and ruderal fields. The nymph feeds on *Pilosella officinarum*.

*E.tenella* (Fallén, 1806)

European; U: LC; H: o; G: 2; M: s,l,y,m,p

Rather common inland in Finland in the southern and central parts. It lives on pastures, dry meadows and in old gardens. The nymph feeds on *Achillea millefolium*.

**Wagneripteryx** Dlabola, 1958

*W.germari* (Zetterstedt, 1838)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m

Common north to the northern boreal region in dry pine forests, on pine-wooded hills and ombrotrophic bogs. The nymph feeds on *Pinus sylvestris* and is the only known species to feed through

the stomata of the needles (Günthart & Günthart 1981).

### **Aguriahana** Distant, 1918

*A. (Asymmetropterix) pictilis* (Stål, 1853)

*Asymmetropterix pictilis* (Stål, 1853) in Linnavuori 1969b

Siberian; U: LC; H: o; G: 1; M: s,l,y

Rather rare in Finland and more common in the middle and northern boreal regions. It lives in fresh moss-covered coniferous woods. Nickel (l.c.) suggests small-grown birches as host plants, because all other members of the tribe feed on trees. The nymph, however, feeds on *Vaccinium myrtillus*.

*A. (Eupteroidea) stellulata* (Burmeister, 1841)

*Eupteroidea stellulata* (Burmeister, 1841) in Linnavuori 1969b

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y

Rather common in the hemi- and southern boreal regions of Finland. It lives in groves and in parks. The nymph lives monophagously on small-leaved lime (*Tilia cordata*). Adults have been swept from a number of leaf-trees.

### **Alnetoidia** Dlabola, 1958

*Erythroneura* pro parte

Taxonomic comment:

- Pale specimens that form populations on hazel and apple trees have in earlier periods been considered different subspecies (Linnavuori 1969a). They, however, live syntopically with the nominal form in Finland, and no differences in the male genitalia between such populations have been found.

*A. alneti* (Dahlbom, 1850)

*Erythroneura alneti* ssp. *coryli* (Tollin, 1851)

*Erythroneura alneti* ssp. *mali* (Edwards, 1915)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y

Very common north to the northern boreal region in Finland. Lives in boreal deciduous forests, groves, alder stands on shores and in parks. The nymph feeds on alder, lime, hazel, elm and apple trees.

### **Zyginidia** Haupt, 1929

*Erythroneura* pro parte

*Z. pullula* (Boheman, 1845)

*Typhlocyba scutellaris* in J. Sahlberg 1871 nec Herrich-Schäffer, 1838

West-Palaearctic; U: DD2; H: o; G: 1; M: s

Only found on the Alandian mainland in Finland. Lives on wooded and dry meadows. The nymph feeds on grasses (Poaceae).

Data: Al: Eckerö, Finström 1943 (leg. H. Lindberg).

### **Zyginia** Fieber, 1866

*Erythroneura* pro parte

*Flammigeroidia* Dlabola 1858

Taxonomic comments:

- The taxon *ordinaria* is quite critical, because it belongs to a sister species complex. The taxon *Z. salicina* Mityaev, 1975, living on narrow-leaved willows (*Salix rosmarinifolia* and *S. repens*), has not yet been recorded from Finland, but may occur in some older museum collections, which are in need of revision. The two species are difficult to distinguish. *Z. salicina* is usually the smaller of the two.
- The status of the taxon *suavis* is also quite critical, because there are records from common oak and small-leaved lime from Central Europe (Remane 1994). These may, in fact, belong to previously described but synonymized taxa, so changes in the names *suavis*, *rhamnocola* and *inconstans* (Ribaut, 1936) may still take place. A problem is also the species *Z. schneideri* (Günther, 1974), that has been found and reared in Scandinavia from apple, rowan, birdcherry and elm (Ossiannilsson 1981). I have swept specimens from elm, but they all belong to *suavis*. There is a need to revise old museum material, but the discrimination of taxa is problematic, because many *Zyginia* species can be reliably separated only by studying the apodemes of males.

*Z. (Zyginia) flammigera* (Fourcroy, 1785)

Eurosiberian; U: LC; H: a; G: 1; M: s,l,y,m

Rather common in the hemi- and southern boreal regions of Finland. It lives in boreal deciduous forests, parks and gardens and on lakeshores. The nymph feeds on woody species of the family Rosaceae, particularly on *Prunus padus*.

*Z. (Zyginia) angusta* Lethierry, 1874

Eurosiberian; U: -; H: a; G: 1; M: s,m

Only recorded from southwestern Finland (Albrecht et al. 2003). The nymph is said to feed on *Ulmus glabra* and *Crataegus* abroad, but neither of these host plants grow on the Finnish collecting sites (Rinne l.c.). The species probably live on rose (*Rosa*) in Finland.

Data: Ab: Rymättylä 1997 (leg. V. Rinne), Nauvo Seili 2005 (leg. T. Rinta).

*Z. (Zyginia) rosea* (Flor, 1861)

North-European; U: DD1; H: a; G: 1; M: s,l,y

Rather rare in the southern and central parts of Finland. It lives in boreal small-leaved deciduous forests. The nymph feeds on birch (*Betula pubescens*).

*Z.(Zygina) tiliae* (Fallén, 1806)

European; U: LC; H: a; G: 1; M: s,l,m

Common in the southern and central parts of Finland. It lives on shore meadows and in boreal deciduous and wet forests. The nymph feeds on alders (*Alnus*). Information from abroad regarding other broad-leaved trees (*Ulmus*, *Corylus*, *Tilia*) may refer to other species.

*Z.(Zygina) ordinaria* (Ribaut, 1936)

Eurosiberian; U: LC; H: a; G: 1; M: s,l,y,m

Common north to the central parts of Finland, where it has been found on both shore meadows and on dry sandy sites. The nymph is polyphagous, but often encountered on *Fragaria*, *Rubus* or *Salix*.

*Z.(Zygina) nigratarsis* Remane, 1959

*Zygina tiliae f.peruncta* Ribaut auct.partim

European; U: -; H: a; G: 1; M: s,l,y,m

Common in Finland north at least to the central parts and living in boreal deciduous forests and gardens. The nymph feeds on *Ribes alpinum* in the south and on cultivated currants (*Ribes cult.*) more in the north (Albrecht et al. 2003).

*Z.(Zygina) rosincola* (Cerutti, 1939)

European; U: DD1; H: a; G: 1; M: s,l,y

Rare and mostly occurs in gardens in southern Finland. The nymph feeds on roses (*Rosa*) and hawthorn (*Crataegus*).

*Z.(Zygina) suavis* (Rey, 1891)

*Zygina rhamnocola* Horvath, 1903

Eurosiberian; U: DD1; H: a; G: 1; M: s,l

Rather rare in the southwestern parts and very rare in other parts of southern Finland. It lives in lush groves. The nymph feeds on *Frangula alnus*.

*Z.(Zygina) rubrovittata* (Lethierry, 1869)

*Typhlocyba ericetorum* J.Sahlberg, 1871

European; U: LC; H: o; G: 1; M: s,l,y,m,p

Common in southern Finland north to the middle boreal region. It lives on heathlands and strings of ombrotrophic bogs. The nymph feeds on heather (*Calluna vulgaris*).

*Z.(Hypericiella) hyperici* (Herrich-Schäffer, 1836)

West-Palaeartic; U: LC; H: o; G: 1; M: s,l

Rare in Finland and most common on the south exposed slopes of the Salpausselkä ridges and rock outcrops. The nymph lives monophagously on *Hypericum perforatum*.

**Arboridia** Zachvatkin, 1946

*Erythronera* pro parte

*A.parvula* (Boheman, 1845)

Transpalaeartic; U: DD3; H: a; G: 2; M: s,l,y,m,p

Rather common in the southern and central parts of mainland Finland. Both sexes hibernate as adults on the basal parts of *Filipendula ulmaria* growing on dry, sandy meadows. In spring, after mating, females migrate to nearby bogs where they oviposit on *Rubus chamaemorus*. Nymphs feed on cloudberry only and the new adult generation migrates back to their drier hibernation sites.

## Subfamily Deltocephalinae

**Grypotes** Fieber, 1866

*G.puncticollis* (Herrich-Schäffer, 1834)

European; U: LC; H: o; G: 1; M: s,l,y,m

Not uncommon in southern and central Finland in pine stands on rocky hills, eskers and in dry pine forests. The nymph and adult feed on *Pinus sylvestris*, preferably in the canopy layer.

**Circulifer** Zachvatkin, 1935

Taxonomic comment:

- This taxon has previously been placed in the genus *Neoliturus* Distant, but according to Young & Frasier (1954) *Circulifer* is clearly a separate genus. The taxon has also gone under the name *C.opacipennis* (Lethierry, 1876) in Europe, but this is a Nearctic species. Eme-lyanov (1964) placed the taxon in the genus *Neoliturus* under the subgenus *Circulifer* and with the valid species name.

*C.haematoceps* (Mulsant & Rey, 1855)

West-European; U: -; H: o; G: 1; M: s

The species is widely distributed in the Mediterranean region and occurs disperse further north, as far as in Poland, on xerothermic sites. I found this species in a routine genital check in a material collected from (Om) Lohtaja in year 2001, where I had swept a few specimens from *Hockenya peploides* on the coastal sand-shore (Albrecht et al. 2006). The nymph is a polyphage, and has been found mostly from succulent and sclerophyllic plants such as *Atriplex*, *Cistus*, *Rosmarinus*, *Marrubium*, *Salicornia*, *Portulaca*, *Thymus*, *Beta* and *Sedum* (Nickel & Remane 2002, Nickel 2003). Little is, however, known about the biology of the species, although it is a notorious citrus-fruit virus transmitter. Due to the extraordinary distance of the Finnish site from the

core area of the species, I consider the Finnish specimens to be long-range migrants.

### ***Coryphaeus*** Puton, 1866

*C.gyllenhalii* (Fallén, 1826)

Pontomediterranean; U: LC; H: o; G: 1; M: s

Rare along the south coast of Finland and very localized along river estuaries of the Bothnian coast. Moreover, it is locally found inland in the southern parts. It lives in shallow bays with rich vegetation. The nymph feeds, far out in the water, on *Bolboschoenus maritimus* and *Schoenoplectus lacustris*. Linnavuori (1969b) also mentions *Hippuris vulgaris*, which probably is a food plant.

### ***Balclutha*** Kirkaldy, 1900

Taxonomic comments:

- Webb & Vilbaste (1994) have synonymized the taxon *B.arhenana* with *B.punctata*, because one paratype at the Natural History Museum of England has proved to belong to this species. The holotype, being the basis for Dlabola's description has not been seen by most taxonomists. The Finnish specimens share many characteristics with the taxon *B.rhenana*, but clearly differ from it regarding coloration and phenology. The shape of the aedagus, with a clear constriction in the basal third section matches the description given by Dlabola, which confirms that the holotype belongs to another species than *B.punctata*.
- The taxon *boica* has in times (Ossiannilsson 1983) been called *B.lineolata* (Hv.), the type specimen of which has shown to belong to *B.punctata*. Thus the younger name of Wagner is valid.

*B.punctata* (Fabricius, 1775)

*Balclutha lineolata* (Horvath, 1904)

Holarctic; U: LC; H: a; G: 1; M: s,l,y,m,p

Very common and distributed north to the northern boreal region in Finland. It lives on all kinds of rather dry meadows and along road verges. The nymph has been found on *Calamagrostis arundinacea*, *C.epigejos*, *C.stricta* and *C.canescens* in Finland.

*B.rhenana* W.Wagner, 1939

Eurosiberian; U: DD3; H: a; G: 1; M: s,l,m

Rather common north to the middle boreal region in Finland. It lives on mesic and wet seaside, lakeshore and river meadows. The nymph is monophagous on *Phalaris arundinacea* in Finland.

*B.arhenana* Dlabola, 1967

Transpalearctic ?; U: -; H: n; G: 1; M: s,l

Dlabola described the species from Upper-Mongolia. In Finland the taxon is not uncommon in light-trap samples from moderately dry sites in the

southern and central parts (Albrecht et al. 2003). The taxon has also been found in number from light-traps in nearby Russian areas (Söderman & Goltsova 2005). The flight peak of the adults is around midsummer (much later than the other adult-hibernating species), which might indicate hibernation in the nymphal stage. The host plant of the nymphs has not yet been confirmed, but it might be *Elymus repens* based on the vegetation of the capturing sites. The species have been captured in large numbers from several sites, northernmost in (Ok) Kajaani, and is probably quite wide-spread.

*B.calamagrostis* Ossiannilsson, 1961

North-European; U: LC; H: a; G: 1; M: s,l,m

Rather rare on dry meadows and fields in southern Finland. The nymph feeds on *Calamagrostis epigejos*.

*Balclutha boica* W.Wagner, 1950

North-European; U: -; H: a; G: 1; M: s,l,m,y

Occurs localized on misty river- and coastal slopes, most abundantly in the Oulujoki and Ounasjoki river valleys (Albrecht et al. 2003). The nymph lives on *Calamagrostis stricta* in Finland.

### ***Macrosteles*** Fieber, 1866

Taxonomic comments:

- The taxon *fascifrons*, previously reported from Finland, has by some cicadologists been regarded dubious. Vilbaste (1980) concluded that it is a junior synonym to *M.alpinus*. This has recently been confirmed in taxonomic research by Kwon (M.Wilson l.c.).
- The taxon *nubilus* is by many cicadologist only regarded as a rare intraspecific form of *M.horvathi*. In my opinion, the taxa are however clearly distinct and occupy different habitats, *M.horvathi* seashores and lake shores, *M.nubilus* minerotrophic seepages.

*M.septemnotatus* (Fallén, 1806)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m

Common in Finland north to the northern boreal region. Lives abundantly on mesic and wet meadows, where the host plant of the nymph, *Filipendula ulmaria*, grows.

*M.oshanini* Razvyakina, 1957

Eastern European; U: -; H: o; G: 1; M: m

Only recorded quite recently in a Malaise trap from the southwestern archipelago (Albrecht et al. 2006). The species is said to live in rich fens (Vilbaste 1971) and in shady broad-leaved forests (Ossiannilsson 1983). The host plant is not known, but sedge (*Carex*) has been prosed (Nickel 2003).

Data: Nauvo Seili 2005 (leg. T.Ranta).

*M. variatus* (Fallén, 1806)

Holarctic; U: LC; H: o; G: 1; M: s,l,y

Distributed throughout Finland in boreal deciduous forests and wet alder stands. The nymph feeds on *Vaccinium myrtillus* and *Urtica dioica*.

*M. sexnotatus* (Fallén, 1806)

Transpalaeartic; U: LC; H: o; G: 2; M: s,l,y,m,p

Very common in Finland north to the northern boreal region. It lives on all kind of wet sites (sometimes straying into crop fields). The nymph feeds on sedges (*Carex*), woodrushes (*Luzula*) and grasses (Poaceae), but it prefers rushes (*Juncus articulatus*, *J. filiformis*).

*M. ossiannilssoni* H.Lindberg, 1953

North-European; U: DD3; H: o; G: 1; M: s

Rare and localized in southern and central Finland. It lives in wet depressions of oligotrophic mires and on fringes of oligotrophic lakes. The nymph feeds monophagously on *Rhynchospora alba*.

*M. alpinus* (Zetterstedt, 1828)

*Macrosteles fascifrons* (Stål, 1858)

*Macrosteles fascifrons ssp. lindbergi* Dlabola, 1963

Holarctic; U: LC; H: o; G: 1; M: s,l

Rather common in the northern parts, becoming rare towards south in Finland. It lives preferably on quaking mires. *Menyanthes trifoliata* has been suggested as the host plant (Linnavuori 1952a), but it is more likely that it lives on monocot species. I have found the species in the southern parts of Finland in paludified depressions of sand pits, where nymphs fed on *Juncus filiformis*.

*M. cristatus* (Ribaut, 1927)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,m

Common north to the northern boreal region in Finland. It lives on mesic and wet meadows and often in crop-fields. The nymph feeds on grasses (Poaceae).

*M. laevis* (Ribaut, 1927)

Holarctic; U: LC; H: o; G: 2; M: s,l,y,m

Very common throughout the country. Lives on dry meadows and fields, where it may locally be very abundant, and in crop-fields. The nymph feeds on grasses (Poaceae).

*M. fieberi* (Edwards, 1889)

Holarctic; U: LC; H: o; G: 1; M: s,l,p

Rather rare in the southern and central parts of Finland. It lives in mires and on paludified lakeshores. The nymph feeds on sedges (*Carex*), rushes (*Juncus*), woodrushes (*Scirpus*) and cottongrasses (*Eriophorum*).

*M. lividus* (Edwards, 1894)

Siberian; U: DD3; H: o; G: 1; M: s,l,y

Rare and lives on coastal meadows north to Central Ostrobothnia. The nymph feeds on *Eleocharis uniglumis* in Finland.

*M. viridigriseus* (Edwards, 1924)

European; U: LC; H: o; G: 1; M: s,l,y

Rather common and abundant, especially along the Baltic coastal meadows north to Central Ostrobothnia. It is rare on paludified lakeshores inland. The nymph feeds on sedges (*Carex*) and rushes (*Juncus*).

*M. quadripunctulatus* (Kirschbaum, 1868)

Transpalaeartic; U: DD3; H: o; G: 1; M: s,l,y

Rare throughout the boreal region of Finland. It seems to prefer nutrient-rich fringes of mires as habitats. The host plant of the nymph is still not known, but it is likely to be a monocot.

*M. sordidipennis* (Stål, 1858)

*Cicadula sexnotata ssp. salina* Reuter, 1886

Holarctic; U: DD3; H: o; G: 1; M: s

A rare southwestern halobiont in Finland that only lives on meadows along the Baltic coast. The nymph feeds on *Juncus gerardi* in Finland.

*M. empetri* (Ossiannilsson, 1935)

*Limotettix sexnotata* in J.Sahlberg 1871 nec Fallén, 1806

North-Siberian; U: LC; H: o; G: 1; M: s,p

Very rare in Finland, with strongholds in the northern parts. It lives on heaths, ombrotrophic mires and in dry coniferous forests. It has been taken mostly from *Empetrum nigrum*, which not necessarily is its host plant. The nymph may live on monocots.

*M. frontalis* (Scott, 1875)

Holarctic; U: LC; H: o; G: 1; M: s,m

Rare and localized from the hemiboreal to the northern boreal region in Finland. It lives on paludified lakeshore meadows. The nymph feeds on *Equisetum palustre*.

*M. horvathi* (W.Wagner, 1935)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y

Rare along the Finnish coast north to Central Ostrobothnia. It lives on coastal meadows. The nymph feeds on *Juncus gerardi*, in Central Europe also on *J. lamprocarpus* (Nickel 2003)

*M. nubilis* (Ossiannilsson, 1936)

*Macrosteles horvathi f. nubila* Ossiannilsson, 1936

*Cicadula mannerheimi* Kontkanen, 1937

Siberian; U: LC; H: o; G: 1; M: s,l,y



More common than the preceding species in Finland, but highly localized north to the northern boreal region. Lives preferably in minerotrophic mires and is rarely met on paludified lakeshores. The nymph feeds on *Carex vesicaria*.

**Erotettix** Haupt, 1929

*Macrosteles* pro parte

*E.cyane* (Boheman, 1845)

Siberian; U: DD2; H: o; G: 1; M: s,l

Rare in Finland, and was thought extinct before it was abundantly captured at light at many sites (Albrecht et al. 2003, Söderman 2004). Lives in small eutrophic lakes where the nymph feeds on heliophilous water plants like waterlilies (*Nymphaea* and *Nuphar*) and *Potamogeton natans*.

**Sonronius** Dorst, 1937

*S.dahlbomi* (Zetterstedt, 1838)

Siberian; U: LC; H: o; G: 1; M: s,l,y,m

Rather common in the southern parts, more rare in the northern ones, but distributed north to the forest line in Finland. Adults live on rather dry and mesic meadows and have often been swept from fireweed (*Epilobium angustifolium*). The nymph has only been found on *Filipendula ulmaria*.

*S.binotatus* (J.Sahlberg, 1871)

Holarctic; U: LC; H: o; G: 1; M: s,l,y,m

Common north to the northern boreal region in Finland. Adults live on dry meadows, often on small-reeds (*Calamagrostis*). The nymph has been found on *Epilobium angustifolium*.

*S.anderi* (Ossiannilsson, 1948)

North-European; U: DD2; H: o; G: 1; M: s

There is only one, rather old, specimen known from Finland, which is the second known specimen of this species. The *locus classicus* of the species is from Kinnekulle, Västergötaland in Sweden, but it has not been recorded since despite efforts to do so (G.Gillerfors, l.c.). The biology of the taxon is completely unknown.

Data: Ab: Rymättylä 1950 (leg. R.Linnavuori).

**Sagatus** Ribaut, 1948

*S.punctifrons* (Fallén, 1826)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,m

Common in Finland north to the northern boreal region. It is most abundant on shore-meadows and

in fringes of mires. The nymph feeds on narrow-leaved willows, abundantly on *Salix phylicifolia* and *S.myrsinifolia*, more rarely on *S.repens* or tree-sized willows (*S.fragilis*, *S.triandra*, *S.viminalis*).

**Deltocephalus** Burmeister, 1838

*D.pulicaris* (Fallén, 1806)

Holarctic; U: LC; H: o; G: 1; M: s,m,p

Common north to the northern boreal region in Finland. It lives on short-grown meadows and in lawns. The nymph feeds on grasses, especially on *Poa pratensis* and *P.annua*.

**Endria** Oman, 1949

*E.nebulosa* (Ball, 1900)

Holarctic; U: NT; H: o; G: 1; M: s,y,m,p

Insofar, only recorded from a few sites in southern Finland. Most authors state it to live on sandy fields (see eg. Albrecht 1977) where adults have been found to live hideously in tufts of *Calamagrostis epigejos*. I have recently identified a large number of adults and nymphs from interception traps placed in riparian buffer zones in southwestern Finland where *Calamagrostis canescens* grow.

Data: N: Tuusula, Vantaa 1974 (leg. A.Albrecht), Hanko Tvärminne and Täktom 1976 (leg. A.Albrecht); Ta: Loppi 2004-2005 (leg. Karjalainen & Salminen); Ab: Nauvo Seili 2005 (leg. T.Ranta), Aura, Lieto, Pöytyä, Tarvasjoki 2005 (leg. T.Kanerva); Kb: Tohmajärvi Jalajavaara 2005 (leg. G.Söderman).

**Doratura** J.Sahlberg, 1871

*D.(Doratura) stylata* (Boheman, 1847)

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y,m

Very common north to the southern limit of the northern boreal region of Finland. It lives on dry meadows and ruderal fields. The nymph feeds on grasses, like *Agrostis capillaris*, *Nardus stricta* and *Festuca rubra*.

*D.(Doraturina) homophyla* (Flor, 1861)

Transpalaeartic; U: DD3; H: o; G: 1; M: s,l

Rare and localized to sandy fields with strongholds along the Salpausselkä ridges in Finland. The nymph feeds on grasses, especially *Festuca ovina*.

**Platymetopius** Burmeister, 1838

Taxonomic comment:

- Many authors, i.a. Emelyanov (1964) regard the taxon *henribauti* as a distinct species, which differs from *undatus* only by the larger falcate process of the pygophore

appendix. The pygophore appendix depicted by Ossian-nilsson (1983) matches that of *henribauti*. I have with my colleague A. Albrecht revised all Finnish male specimens and we have confirmed that they all belong to *undatus* s.str.

*P.undatus* (DeGeer, 1773)

? *Platymetopius henribauti* Dlabola, 1961

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y

Rather rare nowadays in Finland, where it lives on dry meadows and pastures in the southern and central parts. In Central Europe and in Britain the species has declined close to extinction for reasons unknown (Nickel 2003, Wilson pers.comm.). The host plant of the nymph is not defined, but nymphs live in the field layers. From abroad only *Heliant-henum* is mentioned (Schiemenz et al.1996), which is not an option in Finland. Adults ascend brushwood and leaf-trees for feeding and mating, from where adults mostly are collected.

***Idiodonus*** Ball, 1936

*I.cruentatus* (Panzer, 1799)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m,p

Common in Finland north to the northern boreal region. It lives in boreal deciduous and wet forests. The nymph lives in the field layer, quite likely on grasses (Poaceae). Adults ascend scrubs, brushwood and leaf-trees for feeding and mating.

***Colladonus*** Ball, 1936

*C.torneellus* (Zetterstedt, 1828)

Holarctic; U: LC; H: n; G: 1; M: s,l,y,m,p

Rather common throughout the interior of Finland on wet scrubland and in fringes of mires. The nymph lives in the field layer on herbaceous plants. Adults ascend scrubs (*Myrica*, *Betula nana*, *Salix*) and brushwood.

***Allygus*** Fieber, 1872

*A.mixtus* (Fabricius, 1794)

European; U: LC; H: o + a (fem.); G: 1; M: s,l,y,m

Common in the hemi- and southern boreal regions of Finland. It lives in humid boreal deciduous forests. The nymph feeds on grasses (Poaceae), most abundantly on *Calamagrostis arundinacea*. Adults ascend brushwood and leaf-trees for feeding and mating. The female returns to the ground in autumn for oviposition. Late females may hibernate as adults in cracks of tree-stems.

***Allygidius*** Ribaut, 1948

*A.commutatus* (Fieber, 1872)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m,p

Rather common in boreal deciduous forests of southern and central Finland. The nymph feeds on grasses (Poaceae). Adults ascend leaf-trees and brushwood like the preceding species.

***Graphocraerus*** Thomson, 1869

*G.ventralis* (Fallén, 1806)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m

Rather common in the hemi- and southern boreal regions of Finland. Lives on dry meadows, where the nymph feeds on grasses, in Finland almost exclusively on *Anthoxanthum odoratum*.

***Hardya*** Edwards, 1922

*H.tenuis* (Germar, 1821)

*Thamnotettix fulvopicta* J.Sahlberg, 1871

European; U: LC; H: a; G: 1; M: s

Very rare in Finland, possibly due to its hideous life-style and -cycle. Lives in dry lichen-rich pine forests, where the nymph feeds on *Deschampsia flexuosa*. Adults are found very late in autumn and after hibernation.

***Rhopalopyx*** Ribaut, 1939

*Paluda* pro parte

*R.preyssleri* (Herrich-Schäffer, 1838)

Eurosiberian; U: LC; H: o; G: 1; M: s,y,m,p

Rather common north to the middle boreal region of Finland. It lives preferably on dry grasslands, but also in riparian buffer zones. The nymph feeds on *Elymus repens* and *Poa pratensis*.

*R.adumbrata* (C.Sahlberg, 1842)

Eurosiberian; U: LC; H: o; G: 1; M: s,l

Rather rare in southwestern Finland and on more mesic and humid meadows than the preceding species. The nymph feeds on *Festuca rubra* and *Deschampsia caespitosa*.

*R.vitripennis* (Flor, 1861)

Transpalaeartic; U: LC; H: o; G: 1; M: s,l

Rather rare in the hemi- and southern boreal regions of Finland. It lives on dry pastures and xerothermic fields. The nymph feeds on *Festuca ovina*, *F.rubra*, *Calamagrostis epigejos* and species of *Agrostis*.

**Paluda** De Long, 1937

*P.flaveola* (Boheman, 1845)

Siberian; U: LC; H: o; G: 1; M: s,l,y,m

Common north to the middle boreal region in Finland. It lives on mesic and wet meadows and pastures. The nymph feeds on *Calamagrostis*, *Phalaris*, *Deschampsia* and *Molinia*.

**Elymana** De Long, 1936

*E.sulphurella* (Zetterstedt, 1828)

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y,m,p

Very common north to the northern boreal region in Finland, living on pastures, mesic meadows and in riparian buffer zones. The nymph feeds on grasses (Poaceae).

*E.kozhevnikovi* (Zachvatkin, 1938)

*Elymana ikumae* auct. nec Matsumura, 1911

Siberian; U: LC; H: o; G: 1; M: s,l

Rather rare in the southern and central parts of the Finnish mainland. It lives in fringes of mires, wet and lush groves and on shore and river meadows. The nymph feeds on *Calamagrostis canescens* and *Festuca pratensis* in Finland.

**Cicadula** Zetterstedt, 1838

Taxonomic comments:

- Ossiannilsson (1983) used the name *longiventris* for the species *rubroflava*, but J.Sahlberg described this species based on a female. Until females can reliably be separated it is best to use Linnavuori's name for the species.
- Huldén & Albrecht (1984) reported a new *Cicadula* species from Inari Lapland, with a promise of a later description. To my knowledge the specimen is lost (!) and cannot be revised. According to Albrecht (pers. comm.) the species belongs to the subgenus *Cyperana*. The sketch of the male genitalia fits rather well the Holarctic species *ciliata*, which is known from northern Siberia in the Palaeartic region (Anufriev & Emeljanov 1988). The identification is not fully reliable. Verification can only be done if more specimens are found.

*C.(Cicadula) quadrinotata* (Fabricius, 1794)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,m

Very common throughout the country in mires and on shore meadows. The nymph feeds on *Carex lasiocarpa* and *C.vesicaria*.

*C.(Cicadula) persimilis* (Edwards, 1920)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,m

Common in the southern and central parts of Finland. It lives on dry meadows, pastures and

ruderal fields. The nymph feeds on *Dactylis glomerata*.

*C.(Cicadula) albingensis* W.Wagner, 1940

Siberian; U: NT; H: o; G: 1; M: s

Only recorded from a few sites in southern Finland (Albrecht 1977, Albrecht et al. 2003). It lives in wet forests and on shore meadows. The nymph is a monophage on *Scirpus sylvaticus* in Finland. Abroad it is mentioned from *Carex riparia* and *C.acutiformis* (Nickel 2003).

Data: N: Hyvinkää 1973 (leg. M.A.Koponen), Ruotsinpyhtää 1975 (leg. A.Albrecht), Helsinki 2002 (leg. A.Albrecht), Pernaja 2002-2003 (leg. Albrecht & Söderman), Hanko Tvärminne 2002 (leg. A.Albrecht), Inkoo 2004 (leg. A.Albrecht); Ta: Ruovesi 2005 (leg. J.Salmela).

*Cicadula rubroflava* Linnavuori, 1952

? *Limotettix longiventris* J.Sahlberg, 1871

Siberian; U: DD3; H: o; G: 1; M: s,m

The species has a very disperse distribution in Finland based on the few known records. It has been recorded from fringes of mires and wet lake- and river shores, but also from mire-bottomed ablation pits in esker chains. The nymph feeds on *Carex nigra*, *C.rostrata* and *C.globularis*.

Data: Sa: Joutseno 1951 (leg. Linnavuori & Thuneberg); N: Sipoo 1974 (leg. A.Albrecht), Ruotsinpyhtää 1975 (leg. A.Albrecht); Ok: Kuhmo 1990 (leg. J.Viramo); Ab: Laitila Kaivola 1993 (leg. V.Rinne); Ks: Kuusamo Oulanka 2001 (leg. J.Ilmonen); Ta: Ruovesi 2005 (leg. J.Salmela); ObS: Rokuanvaara 2005 (leg. R.Leinonen).

*C.(Cicadula) saturata* (Edwards, 1915)

Siberian; U: LC; H: o; G: 1; M: s

Rather common in the hemi- and middle boreal regions of Finland. It lives in mires and on paludified lakeshores. The nymph feeds on sedges (*Carex limosa*, *C.rostrata*, *C.lasiocarpa*, *C.nigra*).

*C.(Cicadula) quinquenotata* (Boheman, 1845)

*Thamnotettix ribauti* Kontkanen, 1937

Eurosiberian; U: LC; H: o; G: 1; M: s,l

Rather common in the hemi- and southern boreal regions of Finland. It lives in mires and on shore-meadows. The nymph feeds on sedges (*Carex*) and cottongrass (*Eriophorum vaginatum*).

*C.(Cicadula) nigricornis* (J.Sahlberg, 1871)

Siberian; U: -; H: o; G: 1; M: l

Very rare and insofar only found twice in the southwestern part of Finland (Albrecht et al. 2006). The Finnish records are from alluvial meadows. The nymph is said to feed on *Calamagrostis canescens* (Ossiannilsson 1983).

Data: N: Tammisaari Solböle 2002 (leg. Koski & Söderman), Hanko Tulliniemi 2003 (leg. Lundsten & Söderman).

*C.(Cicadula) flori* (J.Sahlberg, 1871)

Eurosiberian; U: LC; H: o; G: 1; M: s,l

Rather common in the hemi- and southern boreal regions of Finland. It lives on wet peaty shores. The nymph feeds on *Carex acuta* and *Calamagrostis canescens*.

*C.(Cyperana) intermedia* (Boheman, 1845)

*Limotettix lunulifrons* J.Sahlberg, 1871

Holarctic; U: LC; H: o; G: 1; M: l

Rather rare throughout the country, becoming more scarce to the south. It lives on paludified meadows. The nymph feeds on sedges (*Carex*) and rushes (*Juncus*).

*C.(Cyperana) ? ciliata* (Osborne, 1902)

Holarctic; U: NE; H: o; G: 1; M: s

Only one specimen from northernmost Finland is known (Huldén & Albrecht 1984). In Siberia and in the Rocky Mountains of North America the species lives on slope mires and lives on sedges (*Carex*).

Data: Li: Hammastunturi 1981 (leg. J.Tuiskunen).

*C.(Cyperana) ornata* (Melichar, 1900)

*Cicadula ossiannilssonii* Kontkanen, 1947

Holarctic; U: LC; H: o; G: 1; M: l

Very common, but mostly nocturnal in the boreal region of Finland. It lives in boreal deciduous and wet forests and on tall-grown shore-meadows. The nymph feeds on sedges, most abundantly on *Carex canescens* and *C.leporina*

*C.(Henriana) frontalis* (Herrich-Schäffer, 1835)

Siberian; U: DD2; H: o; G: 1; M: s,l

Only found once in Alandia. It lives in the adjacent areas (e.g. in the Pskov oblast) on wet eutrophic lakeshores. The nymph is said to feed on *Carex riparia*, *C.acutiformis*, *C.acuta* and *Scirpus sylvaticus* (Nickel 2003).

Data: Al: Finström Pältsböle 1943 (leg.H.Lindberg).

### ***Speudotettix* Ribaut, 1942**

*S.subfuscus* (Fallén, 1806)

Transpalaeartic; U: LC; H: n; G: 1; M: s,l,y,m,p

Very common north to the forest line in Finland. Occurs mostly in humid boreal coniferous forests. The nymph feeds on *Deschampsia flexuosa* growing intermixed with *Vaccinium* species. Adults ascend leaf-trees, brushwoods and scrubs for feeding and mating. The female returns to the ground for oviposition. The color of the adult varies much and specimens from the northeastern parts of the boreal region are often blackish.

### ***Hesium* Ribaut, 1942**

*H.domino* (Reuter, 1880)

*Cicada biguttata* Fallén, 1806 nec Fabricius, 1781

*Hesium falleni* Metcalf, 1955

European; U: DD3; H: o; G: 1; M: s,l,y,m

Rather common on mesic and dry meadows in the hemi- and southern boreal regions of Finland. The nymph feeds on grasses, often *Festuca*, intermixed with herbaceous plants. Adults ascend leaf-trees and herbaceous plants for feeding and mating.

### ***Thamnotettix* Zetterstedt, 1838**

Taxonomic comment:

- In the northern mountain zone there are smaller and more colorful morphs, the reddish, *f.tincta* Zetterstedt, 1838, and the darkcolored *f.stupidula* Zetterstedt, 1838. These morphs are not distinct and intermediate forms are quite common. According to Ossiannilsson (1983) the northern forms are slightly smaller than the nominal form, which is an understatement, as most of them are 1/3 smaller and much more slender in shape. Fresh material from northern Finland indicates that the nominal form lives sympatrically with the smaller ones, so they cannot be subspecies. The genital structures of the males show no differences to the nominal form, so the smaller forms would just be dwarfish caused by the subarctic conditions. Although there are but little difference in the choice of habitats and host plants, the possibility of sister species cannot completely be ruled out.

*T.confinitis* (Zetterstedt, 1828)

*Athysanus prominulus* Reuter, 1880

Holarctic; U: LC; H: n; G: 1; M: s,l,y,m

The nominal form of the species is rather common throughout Finland, where it occurs in humid boreal deciduous, lush and wet forests. The northern forms only live in the mountain birch forests. The nymph lives on grasses (Poaceae) intermixed with herbaceous plants. Adults ascend leaf-trees, brushwood and scrubs (in the north mountain birch and *Betula nana*-scrub) for feeding and mating.

### ***Pithyotettix* Ribaut, 1942**

*P.abietinus* (Fallén, 1806)

Eurosiberian; U: LC; H: n; G: 1; M: s,l,y,m

Rather rare north to Forest Lapland in spruce dominated forests. The arboricol species is missing from the Alandian islands. The nymph and adult feed on Norway spruce (*Picea abies*).

**Perotettix** Ribaut, 1942

*P.orientalis* (Anufriev, 1971)

Eurosiberian; U: -; H: o; G: 1; M: s

There are only two records of this rare European species from protected spruce mires in Finland (Albrecht et al. 2006). Otherwise the species is only known from two sites in Sweden from Europe (Ossiannilsson 1983). It lives in cool and moist spruce forests. The nymph and adult feed on Norway spruce (*Picea abies*), possibly high up in the canopy.

Data: Ta: Ruovesi Siikaneva 2004 (leg. J.Kirjavainen); Ruovesi Ryökkeenneva 2005 (leg. J.Salmela).

*P.pictus* (Lethierry, 1880)

European, boreomontane; U: -; H: n; G: 1; M: s

There is only one recent record of this rare European species from Finland (Albrecht et al. 2006). Otherwise the species is only known from the mountain ranges in Central Europe (Nickel 2003). Like the preceding species it lives in moist spruce forests. The adult has in Finland been swept from Norway spruce (*Picea abies*).

Data: Ta: Valkeakoski 2004 (leg. J.Kirjavainen).

**Colobotettix** Ribaut, 1948

*C.morbillosus* (Melichar, 1896)

European, boreomontane; U: DD2; H: o; G: 1; M: s

The species has been found only from four sites in Finland. Lives in old moist spruce forests and the adults have in Finland been swept from *Picea abies* and *Abies* (Linnavuori 1952a).

Data: Ab: Raisio 1947 (leg. R.Linnavuori); Tb: Jyväskylä 1949 (leg. R.Linnavuori); Sb: Kiuruvesi 1951 (leg. R.Linnavuori); Ta: Tammela Torronsuo 2004 (leg. J.Kirjavainen).

**Macustus** Ribaut, 1942

*M.grisescens* (Zetterstedt, 1838)

Eurosiberian; U: LC; H: n; G: 1; M: s,l,y,m,p

Very common throughout Finland on wet meadows and in mires. The nymph feeds on sedges (*Carex*), woodrush (*Scirpus*), cottongrass (*Eriophorum*) and *Molinia caerulea*.

**Doliotettix** Ribaut, 1942

*D.lunulatus* (Zetterstedt, 1838)

*Cicada pallens* Zetterstedt, 1828 nec Gmelin, 1790

Holarctic; U: LC; H: n; G: 1; M: s,l,y,m,p

Very common throughout the country on mesic meadows, humid pastures and in boreal deciduous forests. The nymph feeds on *Calamagrostis arundinacea*, *C.canescens* and *Agrostis stolonifera* in Finland.

**Athysanus** Burmeister, 1838

*A.argentarius* Metcalf, 1855

*Cicada argentata* Fabricius, 1794 nec Olivier, 1790

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m

Common in the southern and central parts of Finland. It lives on various wet meadows and on road verges. The nymph feeds on grasses (Poaceae).

*A.quadrum* Boheman, 1845

Siberian; U: LC; H: o; G: 1; M: s,l,y,m

This is a localized and rare species in the southern parts of Finland. It lives on paludified tall-grown meadows and in riparian buffer zones, but adult specimens often stray to drier habitats. Adults are often found on *Filipendula* and *Potentilla palustris*. The nymph lives probably on plants of Rosaceae.

**Stictocoris** Thomson, 1869

*S.picturatus* (C.Sahlberg, 1842)

*Cicada lineata* Fabricius, 1787 nec Linnaeus, 1758

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m

Rather widespread in the southern parts in earlier periods. Nowadays it is rare with strongholds on dry pastures and rocky meadows in southwestern Finland. The nymph lives on plants of Fabaceae and the host plant in Finland is probably *Trifolium repens*. From abroad *Cytisus* and *Genista* are mentioned (Nickel 2003), which are no options in Finland.

**Scleroracis** Van Duzee, 1894

*Limotettix* pro parte

*Ophiola* pro parte

Taxonomix comments:

- Some authors consider this and the next genus as subgenera of *Ophiola* Edwards, 1922 (cf. Ossiannilsson 1983). However, more recent revisions (McKamey 2001, Tishechkin 2003) treat *Scleroracis* as a distinct genus. I tend to follow this opinion. Consequently, the taxon *paludosa*, differing in many respects from the taxa of *Scleroracis*, should be set in a separate genus *Ophiolix* when disregarding the supergenus *Ophiola*.
- The taxon, which highly reminds of a smaller and darker *decumanus*, has for long caused problems since LeQuesne (1961b) reported the taxon *S.plutonius* from

England and the Central European mountains. It was also reported from the island of Öland in Sweden (Ossiannilsson 1947) and from Finland (Huldén 1977) before Ossiannilsson (1983) synonymized it with *russeolus* (sic!). The real *plutonius* is a slightly larger Nearctic species (McKamey 2001). The male genital structure reminds partly of *decumanus*, but the apices of the aedagal apical processes are more slender and longer, and the lateral bulges of both sides are more acute and slightly serrated. The mix-up with *decumanus* also caused problems with the host plant records. Recently Tishechkin (2003) has dealt with the Russian species of the genus and described a new species *identicus*, that matches the taxon of *S.plutonius* sensu LeQuesne, 1961 nec Uhler (1877).

- While studying the taxon *plutonius* I noted that a high number of specimens habitually reminded of *S.corniculus*, but were more slender and darker. The male genitalia are reminiscent of those of *corniculus*, but the appendices of the aedagus are more strongly curved and slender as in *S.identicus*. The mesal falcate processes, also present in *corniculus*, are more slender and parallel with the apical processes of the aedagus. The described taxon might be a variation of *corniculus*, but I have insofar not seen any intermediate forms. Haupt (1935) mentions reminiscent specimens under the name *orichalceus*, a taxon, which Ossiannilsson (1947) synonymized with *corniculus*. Moreover, the two taxa seem to occupy different ecological niches, which would support the presence of a sibling species. The Nearctic species *S.instablis* (Van Duzee, 1894) is slightly larger, but identical with respect to the genital apparatus with *S.orichalceus* (see McKamey 2001), and might be conspecific.

*S.decumanus* (Kontkanen, 1949)

*Cicada striatula* Fallén, 1806 nec Fabricius, 1794

Eurosiberian; U: DD4; H: o; G: 1; M: s,l,y,m,p

Common from the hemiboreal to the northern boreal region in Finland. It lives on rocky outcrops, dry pastures and ruderal fields. The nymph feeds on *Rumex acetosella* in Finland, abroad also on *Polygonum aviculare* (Nickel 2003).

*S.identicus* Tishechkin, 2003

?*Scleroracus plutonius* sensu LeQuesne 1961 nec (Uhler,1877)

Eurosiberian ?; U: -; H: o; G: 1; M: s,l

The species has insofar been recorded only on the (Sa) Lappeenranta airfield in southeastern Finland, where eight males were captured in the years 2002-2003 in light-trap catches (Albrecht et al. 2006). In the year 2004 nymphs were found on *Artemisia campestris*, which is the host plant according to Tishechkin (2003). It is unclear which taxon the specimens taken from *Artemisia vulgaris* and reported by Huldén (1977) as *plutonius* represent. If the species is able to feed on Mugwort as well, they might belong to this species.

*S.orichalceus* (Thomson, 1869)

Holarctic ?; U: -; H: o; G: 1; M: s,l,y,m,p

The distribution of this taxon extends north to the northern boreal region of Finland. It lives on heaths, eskers and sandy ruderal fields. The nymph feeds on *Calluna vulgaris*, *Thymus serpyllum* and *Vaccinium vitisidaea*.

*S.corniculus* (Marshall, 1866)

*Limotettix intractabilis* Kontkanen, 1949

Eurosiberian ?; U: LC; H: o; G: 1; M: s,l,m,p

Much more scarce than the preceding taxon and extends north to the middle boreal region of Finland. It lives on wet meadows and in scrubby fringes of mires (Linnavuori 1969a). The nymph feeds on *Calluna vulgaris*, *Ledum palustre* and *Vaccinium uliginosum*.

*S.russeolus* (Fallén, 1826)

Siberian (Holarctic ?); U: LC; H: o; G: 1; M: s,l,y,p

Rather common in Finland north to the northern boreal region. Lives in oligotrophic mires, where the nymph feeds on *Arctostaphylos uvaursi* and *Vaccinium oxycoccus*.

*S.transversus* (Fallén, 1826)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,p

Rather rare in southern Finland on dry pastures and sandy fields. The nymph feeds on *Achillea millefolium*.

***Ophiolix*** Ribaut, 1942

*O.paludosa* (Boheman, 1845)

Siberian; U: LC; H: o; G: 1; M: s,l

Rather common north to the boundary of the middle and northern boreal regions in Finland. It lives on muddy shores. The nymph feeds on sedges (*Carex*) and horsetails (*Equisetum*).

***Limotettix*** J.Sahlberg, 1871

*L.striola* (Fallén, 1806)

Transpalaeartic; U: LC; H: o; G: 1; M: s,l,y

Very common in Finland north to the northern boreal region. It lives in mires and on various coastal and lacustrine meadows. Migrating specimens are often recorded from abnormal habitats. The nymph lives on species of *Eleocharis*, *Trichophorum* and *Schoenoplectus*.

*L. atricapillus* (Boheman, 1845)

North-European; U: LC; H: o; G: 1; M: s

Very rare in Finland and has seriously declined in late decades. It lives in oligotrophic mires. The nymph feeds on *Carex lasiocarpa* and *C. limosa*.

*L. sphagneticus* Emeljanov, 1964

Siberian; U: DD3; H: o; G: 1; M: s,l

This is a very rare species with few records from Finland. The nymph probably lives on sedges (*Carex*) growing in paludified bottoms of ablation depressions of eskers. The species has also been recorded at light in Russia (Söderman 2004).

Data: N: Hanko Täktom 1940's (leg. H.Lindberg); Kb: Kontiolahti 1942 (leg. H.Lindberg); Ok: Vaala 1973 (leg. M.A.Koponen).

*L. ochrifrons* Vilbaste, 1973

Siberian; U: DD3; H: o; G: 1; M: s

Very rare in Finland and only recorded twice. I found it in peaty depressions in conifer woods, where nymphs and adults fed on *Carex rostrata*.

Data: Kb: Kontiolahti 1942 (leg. H.Lindberg); N: Kirkkonummi Porkkala 2003 (leg. G.Söderman).

**Laburrus** Ribaut, 1942

*L. impictifrons* (Boheman, 1852)

Pontomediterranean; U: -; H: o; G: 1; M: s,l

I have recorded the species only from southeastern Finland (Albrecht et al. 2003). The nymph feeds monophagously on *Artemisia campestris*.

Data: Sa: Lappeenranta airfield 2002-2003 (leg. Sundell & Söderman).

**Euscelidius** Ribaut, 1942

*E. schenkii* (Kirschbaum, 1868)

West-Palaeartic; U: LC; H: o; G: 1; M: s,y

Rare in the hemi- and southern boreal regions of Finland. It lives on dry meadows, pastures and ruderal fields. The nymph has in Finland been found on nettle (*Urtica dioica*), elsewhere also on *Atriplex* and *Cirsium*.

**Euscelis** Brullé, 1832

*E. distinguendus* (Kirschbaum, 1868)

Eurosiberian; U: LC; H: o; G: 1; M: s,l

Rare in southern Finland, and localized in parts of central Finland. It lives on mesic meadows and ruderal fields. The nymph has in Finland mostly

been found on *Picris*, seldom on dandelions (*Taraxacum*).

**Ederranus** Ribaut, 1942

*Euscelis* pro parte

*E. sachalinensis* (Matsumura, 1911)

*Cicada lutea* C.R.Sahlberg, 1842 nec Olivier, 1790

Siberian; U: DD2; H: o; G: 1; M: s

Only recorded once, a long time ago, from Finland. East of Finland it is said to live primarily in eutrophic wet forests on *Calamagrostis canescens* (Emeljanov 1964). In Finland both C.R.Sahlberg and J.Sahlberg mention it to live in slash and burn areas (cf. Linnavuori 1969b). The biological records of the species are contradictory. Should it be associated with marshes, there should be many potential areas and habitats for the species to live in, but if it is associated with post-fire succession stages, and hence the likable host-plant being *Calamagrostis epigejos*, the cause for its extinction in Finland is more understandable.

Data: St: Yläne <1871 (leg. C.R.Sahlberg & J.Sahlberg).

*E. discolor* (J.Sahlberg, 1871)

*Athysanus nauta* J.Sahlberg, 1871

North-European; U: DD2; H: o; G: 1; M: s,l

Only recorded twice from Finland. In Russia the unicolored form *nauta* lives on paludified lakeshores (recorded at light, see Söderman 2004, Söderman & Goltsova 2005) and the picturated nominal form on eutrophic mires. The nymph feeds on *Phragmites australis* and *Glyceria maxima*, often far out in the water (Linnavuori 1969b).

Data: Ta: Tampere Teisko <1871 (leg. J.Sahlberg); St: Pori Yyteri 1994 (leg. V.Rinne).

**Streptanus** Ribaut, 1942

*S. aemulans* (Kirschbaum, 1868)

*Athysanus sahlbergi* Reuter, 1880

Holarctic; U: LC; H: o; G: 1; M: s,l,p

Common in Finland north to the northern boreal region. Lives on dry meadows and road verges, stray specimens have been found in ombrotrophic bogs and on riparian buffer zones. The nymph feeds on *Elymus repens*.

*S. sordidus* (Zetterstedt, 1828)

*Athysanus fraterculus* Reuter, 1880

European; U: LC; H: o; G: 1; M: s,l,p

Widely distributed, but localized, in Finland north to the northern boreal region. It lives in mi-

res and wet forests. The nymph feeds on *Agrostis stolonifera*.

*S.okaensis* Zachvatkin, 1948

Holarctic; U: DD4; H: o; G: 1; M: s,m,p

Occurs probably throughout the country, but it is highly localized. May be abundant where it occurs. Lives on paludified meadows and shores, where the adults and nymphs hide in the tufts of the host plant, *Calamagrostis canescens*. Also found on drier sites, possibly with nymphs also on *C.epigejos*.

*S.confinitis* (Reuter, 1880)

Holarctic; U: LC; H: o; G: 1; M: s,l,m,p

Localized, but probably spread throughout Finland. May have been mixed-up with the succeeding species, but adults develop on wet meadows in the end of summer. The nymph feeds on *Deschampsia caespitosa*.

*S.marginatus* (Kirschbaum, 1858)

Siberian; U: LC; H: n; G: 1; s,l,y,m,p

A very common, early summer species throughout Finland. It lives on dry and mesic fields, pastures and in clearings of forests. The nymph feeds on *Deschampsia flexuosa* and *Festuca ovina*.

### **Paramesus** Fieber, 1866

Taxonomic comment:

- Lately (see Nickel 2003), the Central European inland records of this species have been stated to belong to another species, *P.major* Haupt, 1927, that is known from Siberia to Poland, Hungary, the Czech Republic, Germany and Israel. The distinguishing characters are rather weak, but insofar, no intermediate forms have been found. All populations close to the Baltic Sea belong to *P.obtusifrons* according to Nast (1976). The specimens I have seen from the Finnish seaside belong to the latter species.

*P.obtusifrons* (Stål, 1853)

*Cicada nervosa* Fallén, 1826 nec Linnaeus, 1758

West-European; U: LC; H: o; G: 1; M: s,l

Rare and only occurring along the southern seaside in Finland. It lives on coastal meadows and in shallow bays, occasionally on shallow lakeshores. The nymph feeds on *Bolboschoenus maritimus* and *Schoenoplectus lacustris*.

### **Parapotes** Emeljanov, 1964

*P.reticulatus* (Horvath, 1897)

East-European; U: -; H: o; G: 1; M: l

A halobiont, that is very rare in Europe. It is known from the halophilic wetlands in Hungary and

Austria and from eight sites in Germany, of which one represents a brackish spring. According to literature the host plant is *Schoenoplectus lacustris*, but in the brackish site it was *Schoenoplectus tabernaemontani* (Nickel 2003). In addition to these records, there is one single find, in the year 1958, from the Baltic coast from Blekinge in Sweden (Ossiannilsson 1983). One female of the species was recorded in 2003 from southwestern Finland (N) Hanko Uddskatan (see Albrecht et al. 2003). The species may be a local rarity, because the host plants grow on the site. The adult and the nymph is said to live a hideous life in the tufts of the host plants and they appear only when the tufts are tightly pressed towards the ground for several minutes (Nickel, l.c.).

### **Calamotettix** Emelyanov, 1964

*Paramesus* pro parte

*C.taeniatus* (Horvath, 1911)

East-European; U: -; H: o; G: 1; M: l

Previously known only from Hungary, and originally described from the shores of Lake Balaton, Bulgaria, Romania and Ukraine. It was discovered new to Germany as late as in 1986 (Heller 1987). The nymph lives in the terrestrial parts of large stands of common reed (*Phragmites australis*). Also adults feed on common reed and are very wary and easily fly away of the slightest tremble. The female oviposits in the base of the straw and the nymphs live inside the basal leaves only some centimeters above the ground (Heller 1987).

The species was in year 2002 surprisingly found in light-traps from several places in southern Finland, and more were discovered the following year (Albrecht et al. 2003, Söderman 2004). The many sites indicate that the species has expanded to Finland some years ago, but not been observed due to its nocturnal way of life. I also recorded the species in the years 2002-2003 from a light-trap in the Sebez National Park in the oblast of Pskov in Russia, from where it also was unknown before (Söderman & Goltsova 2005). The adult is so striking in its coloring that it can not have been overseen too long. As the preceding species, it belongs to the guild, in which local populations are wiped out by high waterlevels.

### **Paralimnus** Matsumura, 1902

Taxonomic comment:

- The Finnish material in the subgenus *Paralimnus* has in my research shown to consist of two different species, not



earlier distinguished in Finland. They are, however, also easily distinguishable morphospecies.

*P.(Paralimnus) phragmites* (Boheman, 1847)  
West-European; U: LC; H: o; G: 1; M: s,l,y,m

Rather common in the southern and central parts of Finland, especially in the reed beds of the coast and large inland lakes. The nymph feeds on common reed (*Phragmites australis*).

*P.(Paralimnus) zachvatkini* Emelyanov, 1964  
East-European; U: -; H: o; G: 1; M: s,l

This species is previously only known from the delta of the river Volga (Emelyanov 1964) and from Romania and Bulgaria (Emelyanov, l.c). Recently the species has been recorded from Germany, too (Nickel, l.c.). The adult and the nymph live monophagously on common reed (*Phragmites australis*). This species was surprisingly found in light-traps from (N) Tammisaari Harparskog Lillträsk and Storträsk in 2002. When revising the museum material of the Turku University I also found one female from (Kl) Parikkala Siikalahti (leg. J.Sahlberg, 1866). The known sites represent highly eutrophic, overgrown, shallow lakes or bays of larger lakes on the proximal side of the foremost Salpauselkä formation (Albrecht et al. 2006). All occurrences represent nature conservation areas.

*P.(Paragygrus) rotundiceps* (Lethierry, 1885)  
European; U: DD2; H: o; G: 1; M: s,y

From northern Europe only a few sites are known: some very old sites in southern Norway, a single find in southern Sweden (year 1942) and a few sites from northwestern Finland. Nymphs and adults live on common reed (*Phragmites australis*) on sand-spits and tombolos (Söderman 2002). The nymph lives in the outer waterlogged part of the reed-stand inside the basal leaves. When the water level suddenly rises in spring due to flooding or when the shore is ice-rafted, the local populations may easily die out.

Data: Oa: Pietarsaari 1940 (leg. H.Lindberg); ObS: Kuvaniemi 1980 (leg. M.A.Koponen); Oa: Maalahti 1994 (leg. T.Lammes); Ok: Vaala Manamansalo 2001-2002 (leg. Söderman & Leinonen).

### ***Metalimnus* Ribaut, 1948**

Taxonomic comment:

- A form of the species *formosus*, named *steini* (Fieber, 1869), has been described from northern Germany. It has later been regarded as a distinct species, synonymous with *M.tredecimpunctatus* (Lindberg, 1929) from Japan. *M.steini* has been reported from large areas in the Palaearctic, i.a. from Hungary, Ukraine, Austria and

Kazakhstan (Nast 1976) and from the Russian Far-East (Anufriev & Emelyanov 1988). The status of the taxon is still unclear, because the types are missing. Anufriev & Emelyanov have depicted the male genitalia of this species, which considerably differs from those of *M. formosus*.

- Males of the species *formosus* occurs in two color morphs in Finland. One is light-colored (yellowish-orange), the other one more strongly fuscous (see also Ossianilsson 1983). I have found dark and slightly larger females with the 7<sup>th</sup> sternite more pointing than of females belonging to *formosus*. These and one male was recently identified by me as a separate species *M.obtusus* Emelyanov, 1966.

*M.formosus* (Boheman, 1845)  
Siberian; U: LC; H: o; G: 1; M: s,p

Rather common and distributed north to the northern boreal region. It lives in eutrophic mires, on floodplains and shore meadows, rarely in peat depressions in woodland. The nymph feeds on tall-grown sedges, such as *Carex rostrata*, *C.acuta* and *C.elata*.

*M.obtusus* Emelyanov, 1966  
Siberian; U: -; H: o; G: 1; M: s,l

Insofar only recorded from three localities in eastern Finland. All sites represent leaf-tree dominated paludified forests. The host plant of the nymph is unknown, but a few adult specimens have been swept from *Scirpus sylvaticus*. Otherwise the species is in Europe only known from Central Russia (Emelyanov 1966), the Pskov region (leg. Ivanov) and from Austria (Holzinger 1996).

Data: Sa: Mikkeli Anttola 1990 (leg. G.Söderman); Kb: Tohmajärvi Piilovaara 2002 (leg. Nieminen & Söderman); N: Pernaja Vanhakylä 2003 (leg. G.Söderman)

*M.steini* (Fieber,1869)  
Siberian ?; U: -; H: o; G: 1; M: l

Only one specimen has been caught in a light-trap from Finland (Albrecht et al. 2006). There are also records from light-traps in Russia (Söderman & Goltsova 2005). Abroad the species are reported from the upper parts of flooded meadows. The nymph is said to live on *Carex hirta*.

Data: Ka: Hamina Meltti 2002 (leg. Sundell & Söderman).

*M.marmoratus* (Flor, 1861)  
*Deltocephalus stâli* J.Sahlberg, 1871

Siberian; U: LC; H: o; G: 1; M: s

Very rare in southern and central Finland. Lives in oligotrophic mires, but has also been taken from calcareous fens. The nymph feeds on *Carex limosa*.

## **Arocephalus** Ribaut, 1946

*A.(Ariellus) punctum* (Flor, 1861)

*Deltocephalus paucinervis* J.Sahlberg, 1871

European; U: LC; H: o; G: 1; M: s,l,y,p

Rather rare in the hemi-, southern and coastal parts of the middle boreal regions of Finland. It lives on dry meadows, pastures and ruderal fields. The nymph feeds on sheep's-fescue (*Festuca ovina*).

*A.(Arocephalus) languidus* (Flor, 1861)

*Deltocephalus haupti* H.Lindberg, 1924

Pontomediterranean; U: DD2; H: o; G: 1; M: s

Very rare and only recorded twice from Finland. It lives on humid lakeshore pastures. The nymph feeds on *Molinia caerulea* in Finland.

Data: Ab: Karjalohja < 1871 (leg. J.Sahlberg); Kb: Hammaslahti 1942 (leg. P.Kontkanen).

## **Psammotettix** Haupt, 1929

Taxonomic comments:

- Taxa of the *nodosus*-group are sometimes difficult to identify, in particular since the description of the species *dubius*. Ossiannilsson (1983:824-825) depicted some variation in the spoon of the aedagus of this species, which has led some collectors to misinterpret male specimens with a pointed spoon apex as belonging to *P.lapponicus* (Ossiannilsson, 1938), a species which seems to be confined to valleys of the Scandinavian mountain range.
- The species *excisus* was recorded new to Finland by Raatikainen & Ylönen (1988) based on specimens captured in open mires in northern Finland. In the revision of the collected specimens, I found they were named *P.exilis*. This name is the junior synonym of two species; *P.exilis* W.Wagner, 1941 is the synonym of *P.excisus* and *P.exilis* Ossiannilsson 1953 is the synonym of *P.dubius*. The specimens belong to the latter taxon and Raatikainen & Ylönen have misinterpreted *P.exilis* as a synonym to *P.excisus*.
- There are two taxa with quite a similar description, *P.slovacus* Dlabola, 1948 and *P.makarovi* Morawskaja, 1952. The former is described from sandy areas in the mountains of Central Europe. The latter is described from near Moscow and is reported from NE-Latvia and SE-Estonia by Vilbaste (1971, 1974). They both share the same host plant and habitat type, and there are little differences in the depiction of their male genital structures. Apparently, the taxa are conspecific whereby the older name of Dlabola is valid.

*P.alienus* (Dahlbom, 1851)

Holarctic; U: LC; H: o; G: 1; M: s,l,y,m

Common in southern and central Finland. It lives on dry and mesic pastures and on crop-fields. The nymph feeds on grasses (Poaceae), especially on wheat (*Triticum*).

*P.cephalotes* (Herrich-Schäffer, 1835)

Eurosiberian; U: LC; H: o; G: 1; M: s

Rare in the southwestern part of Finland. It lives on wooded meadows and the nymph feeds on *Briaza media* and *Molinia caerulea*.

*P.confinitis* (Dahlbom, 1851)

Holarctic; U: LC; H: o; G: 1; M: s,l,y,m,p

Very common north to the northern boreal region of Finland. It lives on dry pastures, ruderal fields and road verges. The nymph feeds on grasses (Poaceae), most often on *Calamagrostis epigejos*.

*P.sabulicola* (Curtis, 1837)

*Deltocephalus arenicola* J.Sahlberg, 1871

West-European; U: DD3; H: o; G: 1; M: s

Rare on the active dune fields of the coast of the Baltic Sea. The nymph feeds on *Carex arenaria*, *Ammophila arenaria* and *Leymus arenarius* (Ossiannilsson 1983), in Finland probably only on *Leymus*, because the other grass species are missing from the Finnish localities.

Data: Om: Kokkola 1918 (leg. Linnaniemi); St: Pori Yyteri 1927 (leg. R.Krogerus), 2005 (leg. P.Ahlroth); Obs: Hailuoto 1927 (leg. R.Krogerus).

*P.nodosus* (Ribaut, 1925)

European; U: LC; H: o; G: 1; M: s,l,y,m,p

Rather common in the southern and central parts of Finland. It lives on sandy fields and on strings of ombrotrophic bogs. The nymph feeds on *Festuca rubra* and bent-grasses (*Agrostis*).

*P.albomarginatus* W.Wagner, 1941

West-European; U: DD3; H: o; G: 1; M: s

Very rare on lichen-covered rocks, sandy riverbeds and grey dunes in Finland. It has insofar been recorded only known from three sites. The nymph feeds on *Agrostis vinealis* and *A.mertensii*.

Data: Ab: Raisio 1948 (leg. R.Linnavuori); Ks: Kuusamo 1949 (leg. R.Linnavuori); Oba: Hailuoto 2001 (leg. G.Söderman).

*P.excisus* (Matsumura, 1906)

West-European; U: DD3; H: o; G: 1; M: l

Very rare and only known from southeasternmost Finland where it lives on a xerothermic field (Albrecht et al. 2006). The nymph feeds on bent-grasses (*Agrostis*) within growth stands of *Artemisia campestris*.

Data: Sa: Lappeenranta airfield (leg. Sundell & Söderman, 2002).

*P.dubius* Ossiannilsson, 1974

European, boreomontane; U: DD3; H: o; G: 1; M: s,l,m,p

Rather common in the hemi-, southern and middle boreal regions in Finland. The species clearly

prefers cooler environs than most other species of the genus. Lives on sandy fields, dry pastures and sandy shores near the coast and in the outer archipelago, but it also found inland near large water bodies and on dry strings on mires. The nymph feeds on grasses (Poaceae), most often it is found on *Deschampsia flexuosa*. There are only a few findings from the central European mountains (Nickel 2003).

*P.lapponicus* (Ossiannilsson, 1938)

Holarctic; U: -; H: o; G: 1; M: s,m

Found only recently on south-exposed dolomitic slopes in the Kilpisjärvi region in northwesternmost Finland (Albrecht et al. 2006). Ossiannilsson (1983) lists both dry and moist heather moors, grass meadows and marshes as its habitat. I have seen specimens from Norway that lived on reindeer grazed meadows on *Nardus stricta*.

Data: Le: Kilpisjärvi Saana 2005 (leg. K.Mattila), Pikku-Malla 2005 (leg. R.Partanen).

*P.frigidus* (Boheman, 1845)

North-Siberian; U: DD2; H: o; G: 1; M: s

Found only once in the subarctic region of Finland. It lives on tundra heaths (Ossiannilsson 1983) and on palsa bogs. The nymph probably lives on grasses (Poaceae).

Data: Le: Kilpisjärvi 1924 (leg. H.Lindberg).

*P.pallidinervis* (Dahlbom, 1851)

Pontomediterranean; U: DD3; H: o; G: 1; M: s,l

Rare on open and sparsely vegetated sandy sites. Recorded insofar only from a few sites in Finland. The nymph feeds of sheep's-fescue (*Festuca ovina*).

Data: St: Yläne, Laitila <1871 (leg. J.Sahlberg), Säskylä 1948 (leg. R.Linnavuori); Om: Lohtaja Vattajanniemi 2001, 2005 (leg. G.Söderman); Sa: Lappeenranta airfield 2003 (leg. Sundell & Söderman).

*P.poecilus* (Flor, 1861)

Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m,p

Known from sandy sites and gravel pits from southern Finland, but also recorded far north, from Inari Lapland. The nymph feeds on *Calamagrostis epigejos* in Finland.

*P.slovacus* Dlabola, 1948

East-European; U: -; H: o; G: 1; M: s,l,m,p

The species has been mostly been swept or collected in pitfall-traps from post-fire succession areas (Albrecht et al. 2006), but has also been recorded from dry esker slopes. It is clearly a pioneer species of disturbed habitats, but it does not seem to pro-

duce very large populations. The host plant of the nymph is *Calamagrostis epigejos*.

Data: Oa: Teuva 1994 (leg. T.Lammes); Sa: Lappeenranta airfield 2002 (leg. Sundell & Söderman); Ta: Torrnsuo post-fire area 2004 (leg. J.Kirjavainen), Loppi 2004-2005 (leg. Karjalainen & Salminen); Kl: Parikkala 2004 (leg. G.Söderman); St: Yläne Säskylä 2005 (leg. J.Kirjavainen); Sa: Luumäki 2005 (leg. Saarinen & Söderman); Kb: Tohmajärvi Jalajavaara 2005 (leg. G.Söderman).

***Ebarrius*** Ribaut, 1947

*E.cognatus* (Fieber, 1869)

*Deltocephalus interstinctus* auct. nec Fieber, 1869

European; U: LC; H: o; G: 1; M: s,y,m

Rather rare and localized in the boreal region of Finland with strongholds in the northern parts. It lives preferably on dry pastures, sandy fields and on sparsely vegetated rock surfaces. The nymph feeds on *Festuca ovina* and *Agrostis capillaris*.

***Adarrus*** Ribaut, 1947

*A.multinotatus* (Boheman, 1847)

West-European; U: -; H: o; G: 1; M: s

Quite recently recorded from a lush grove in Finland (Albrecht et al. 2006). The nymph is said to feed on *Brachypodium pinnatum* (Nickel 2003) growing abundantly in the recording area.

Data: Ta: Valkeakoski 2004 (leg. J.Kirjavainen).

***Errastunus*** Ribaut, 1947

*Adarrus* pro parte

*E.ocellaris* (Fallén, 1806)

Transpalaeartic; U: LC; H: o; G: 1; M: s,y,m,p

Rather rare and localized, but widespread in Finland. Lives on dry pastures, but is most abundant on alluvial meadows in the northern parts of the country. The nymph feeds on *Calamagrostis epigejos* and *C.purpurea*.

***Turrutus*** Ribaut, 1947

*T.socialis* (Flor, 1861)

Eurosiberian; U: DD2; H: o; G: 1; M: s

Only found twice from dry pastures in Finland. The nymph feeds on *Nardus stricta* and *Poa annua* according to Ossiannilsson (1983).

Data: Al: Eckerö 1943 (leg. H.Lindberg); Ta: Jokioinen 1991 (leg. V.Rinne).

### **Mongolojassus** Zachvatkin, 1953

*M. bicuspidatus* (J.Sahlberg, 1871)  
Siberian; U: -; H: o; G: 1; M: l

Only recorded from (Sa) Lappeenranta airfield in Finland and previously only known from two Fennoscandian sites in Russian Karelia (see Albrecht et al. 2003). It lives on dry open sand fields, with abundant growth of *Thymus serpyllum*. It is possible, that the host plant of the nymph is *Festuca ovina*, growing intermixed with thyme, because most members of the tribe live on grasses.

### **Jassargus** Zachvatkin, 1933

*J. (Arrailus) flori* (Fieber, 1869)  
*Deltocephalus oculatus* J.Sahlberg, 1871  
*Deltocephalus pseudocellaris* in J.Sahlberg 1871 pro parte, nec Flor, 1861  
*Deltocephalus falleni* in J.Sahlberg 1871 pro parte, nec Fieber, 1869

European; U: LC; H: o; G: 2; M: s,l,y,m,p

Common north to the northern boreal region in Finland. It is most abundant in wet depressions in forests, but also on various meadows and pastures, and along road verges. The nymph feeds on *Carex leporina* and probably also on *Festuca*.

*J. (Arrailus) alpinus* (Then, 1896) *ssp. neglectus* (Then, 1869)

Eurosiberian, arctoalpine; U: DD2; H: o; G: 1; M: s

Only recorded from the north, where it lives on heaths (Huldén 1977, Raatikainen & Ylönen 1988). The biology of the species in Finland is poorly known, but nymphs probably corresponding to this species have been found on various grasses.

*J. (Sayetus) sursumflexus* (Then, 1902)  
European; U: DD2; H: o; G: 1; M: s,p

Very rare in Finland and only recorded from three localities. It lives in peaty forest depressions and in rich fens. The nymph feeds on *Molinia caerulea*.

Data: Kb: Pyhäselkä Pielisjärvi 1943 (leg. P.Kontkanen); Obb: Rovaniemi Pisavaara 1950 (leg. H.Lindberg); Om:Halsua 2004 (leg. Hollmen & Itämies).

*J. (Sayetus) allobrogicus* (Ribaut, 1936)  
*Deltocephalus pseudocellaris* in J.Sahlberg 1871 pro parte, nec Flor, 1861  
*Deltocephalus falleni* in J.Sahlberg 1871 pro parte, nec Fieber, 1869

European; U: LC; H: o; G: 1; M: s,y,m,p

Localized, but distributed from the southern to the northern boreal parts of Finland. It is most frequent in the southwest. It lives on dry pastures and heaths. The nymph feeds on *Deschampsia flexuosa*.

### **Pinumius** Ribaut, 1947

*P. areatus* (Stål, 1858)  
Holarctic; U: -; H: o; G: 1; M: s

There is only one record of this psammophilous species from southeastern Finland (Albrecht et al. 2006). It lives on dunes and sandy ground in Central Europe and the nymph is believed to feed on *Festuca ovina* (Nickel 2003) and possibly *Elymus repens* (Ossiannilsson 1983).

Data: Sa: Rautjärvi 1990 (leg. M.A.Koponen).

### **Diplocolenus** Ribaut, 1947

*D. bohemani* (Zetterstedt, 1838)  
Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m,p  
Rather common in the southern parts of Finland. It lives preferably on xeric sites of pastures, eskers and heaths and along road verges. The nymph and adult feed on *Calamagrostis epigejos*.

### **Verdanus** Oman, 1949

*Diplocolenus* pro parte

*V. abdominalis* (Fabricius, 1803)  
West-Palaeartic; U: LC; H: o; G: 1-2; M: s,l,y,m,p  
Very common throughout the country on all kind of meadows, but prefers mesic ones. The colorful morph, *f. rufa*, is more common in drier and hotter places. The nymph feeds on grasses (Poaceae).

*V. limbatellus* (Zetterstedt, 1828)  
Holarctic; U: LC; H: o; G: 1; M: s,y,m

Predominantly in the northern parts of Finland. There are some single finds further south, even as far as from the Hanko peninsula. It lives on wet meadows. The nymph feeds on various grasses (Poaceae).

### **Arthaldeus** Ribaut, 1947

Taxonomic comment:  
• In the generic revision by Remane (1960) the species *A. arenarius* Remane, 1960, was found to live on small-reed (*Calamagrostis epigejos*) in Central Europe. This species had earlier been confused with the species *A. striifrons*. I have made a revision of the Finnish material of this genus, but not found *A. arenarius*. It may, however, occur in Finland, because it probably has a large distribution in Europe.

*A. pascuellus* (Fallén, 1826)  
Eurosiberian; U: LC; H: o; G: 1; M: s,l,y,m,p

Common in Finland north to the boundary between the middle and northern boreal region. It lives on mesic and wet meadows and pastures and

also in sedge-mires. The nymph feeds on grasses, i.a. on *Festuca*, *Lolium*, *Poa*, and in more wet parts also on *Calamagrostis canescens*.

*A.striifrons* (Kirschbaum, 1868)

Holomediterranean; U: DD4; H: o; G: 1; M: s

There are but very few old records of this species from Finland. It lives on mesic and moderately dry shore meadows. The nymph feeds on *Festuca pratensis* and *F.rubra*, not on clover as mentioned by Sahlberg (1871) and Linnavuori (1969b).

Data: Ab: Korppoo, Parainen <1880 (leg. O.M.Reuter), Raisio 1950 (leg. R.Linnavuori); N: Porvoo <1880 (leg. O.M.Reuter); Ab: Raisio 1948 (leg. R.Linnavuori).

### **Rosenus** Oman, 1949

*R.laciniatus* (Then, 1896)

*Thamnotettix abiskoensis* (H.Lindberg, 1926)

Holarctic; U: DD3; H: o; G: 1; M: s

A few specimens have been taken from tundra heaths in northernmost Finland. The nymph should feed on *Dryas octopetala* (Ossiannilsson 1983).

Data: Li: Utsjoki Kevo 1972-1973 (see Koponen 1981); Le: Kilpisjärvi fjell Pikku-Malla and fjell Saana 2004 (leg. K.Mattila).

### **Sorhoanus** Ribaut, 1947

*S.xanthoneurus* (Fieber, 1869)

Holarctic; U: LC; H: o; G: 1; M: s,l,p

Rather common north to the northern boreal region in Finland. Lives preferably in mires, but has also been found on tall-grown shore meadows and in open parts of ombrotrophic bogs. The nymph feeds on *Eriophorum vaginatum*.

*S.assimilis* (Fallén, 1806)

Siberian; U: LC; H: o; G: 1; M: s,l,p

More scarce than the preceding species in Finland. It occurs north only to the middle boreal region. It lives in wet aapa-mires and on humid meadows. The nymph feeds on *Carex rostrata*, *C.panicea* and *C.nigra*.

### **Lebradea** Remane, 1959

Taxonomic comment:

- Herbert Nickel (2003) considers it possible, that the German endemic species *L.calamagrostis* Remane, 1959 would be a synonym of this species. They differ only by the length of the lateral appendices of the male aedeagus (see Ossiannilsson 1983:868), which possibly could geographically vary. I have studied a large material of

*L.flavovirens* from Finnish Lapland to the Pskov region in Russia and not noted any variation within this area.

*L.flavovirens* (Gillette & Baker, 1895)

*Thamnotettix karafutonis* Matsumura, 1911

*Lebradea icarus* Ossiannilsson, 1976

Holarctic; U: NT; H: n; G: 1; M: s,l,y,m

It lives along road verges, in river valleys, on dry and mesic pastures and unimproved meadows. The adult and the nymph hide in the tufts of *Calamagrostis epigeios* (more seldom of *C.canescens*) and are therefore, difficult to sweep. I found the species, in hundreds of specimens in 1970, for the first time in Europe from light-trap captures (see Ossiannilsson 1983:870). Later it was found by sweeping as well (Albrecht 1977, Clayhills et al. 2002). This study indicates that it is quite common in light-trap captures and that it lives as far north as in Ivalo in Lapland (Albrecht et al. 2003).

### **Cosmotettix** Ribaut, 1942

*Palus* pro parte

*C.(Cosmotettix) caudatus* (Flor, 1861)

*Deltocephalus scriptifrons* J.Sahlberg, 1871

Siberian; U: LC; H: o; G: 1; M: s,l,m

Rather common in the southern and central parts of Finland. It lives on various sedge-grown meadows and in mires. The nymph feeds on *Carex vesicaria* in Finland, but on *C.hirta* in Central Europe (Nickel 2003).

*C.(Cosmotettix) evanescens* Ossiannilsson, 1976

North-European; U: -; H: o; G: 1; M: s

Previously only known from Sweden (Ossiannilsson 1983) but has recently been found in Finland from minerotrophic parts of mires in the south (Albrecht et al. 2006). The host plant of the nymph is unknown, but adults have been swept from *Eriophorum vaginatum*.

Data: Ta: Torronsuo mire complex 2004 (leg. J.Kirjavainen); Ab: Karjalohja Kalkkikallio mire 2005 (leg. Salokannel & Mattila), Ta: Seitsemäinen Kivineva 2005 (leg. J.Kirjavainen); Sa: Mäntyharju Tervalammets 2005 (leg. G.Söderman).

*C.(Cosmotettix) edwardsi* (H.Lindberg, 1924)

Siberian; U: DD2; H: o; G: 1; s,l

Very localized in the interior parts of southern, central and northern Finland. Lives in mires, but has been found straying to drier habitats as well. The nymph feeds on *Carex lasiocarpa*.

*C.(Cosmotettix) panzeri* (Flor, 1861)

*Deltocephalus concaviceps* H.Lindberg, 1924

North-European; U: LC; H: o; G: 1; M: s

Nowadays very rare. It occurs on ombrotrophic bogs in southern and central Finland. The nymph feeds on *Eriophorum angustifolium* and *E.vaginatum*. Despite several new inventories of large bog areas in southern Finland the species has only been located in one mire conservation area.

*C.(Airosus) costalis* (Fallén, 1826)  
Siberian; U: LC; H: o; G: 1; M: s,l,m

Rather common north to the northern boreal region in Finland. It lives in mires and on flooded meadows. The nymph feeds on *Carex rostrata* and *C. acuta* in Finland.

**Boreotettix** H.Lindberg, 1952

*B.bidentatus* (De Long & Davidson, 1935)  
*Cosmotettix serricauda* Kontkanen, 1949

Holarctic; U: DD2; H: n; G: 1; M: s,y,m,p

Rare and localized in Finland (Kontkanen 1949, Albrecht 1977). Lives in wet sandy depressions, most often in deflation hollows near dunes, but it has also been collected from sand-bottomed ditches (Albrecht pers.comm.) and in seepages from esker areas. The adult and nymph feed on sedge (*Carex*), but the degree of specialization is not known.

**Mocuellus** Ribaut, 1947

*M. collinus* (Boheman, 1850)  
*Athysanus lateralis* J.Sahlberg, 1871

Eurosiberian; U: DD5; H: o; G: 1; s,l

Very rare in southeastern Finland (see Albrecht et al. 2003). It lives on sandy old pastures. The nymph feeds on *Elymus repens* and there are records from *Leymus arenarius* abroad (Nickel 2003).

Data: Kl: Parikkala 1866 (leg. J.Sahlberg), 2004 (leg. G.Söderman), Simpele 2004 (leg. G.Söderman); Sa: Lappeenranta 2002 (leg. G.Söderman), Joutseno 2003 (leg. G.Söderman).

**Erzaleus** Ribaut, 1947

*E. metrius* (Flor, 1861)  
Siberian; U: DD4; H: o; G: 1; M: s,l,y,m

First recorded from Finland as late as in 1959 from southern Ostrobothnia (leg. Raatikainen). Since then it has strongly expanded and is nowadays rather common in the hemiboreal region and in parts of the middle boreal region. It lives, in particular, on paludified meadows and riparian buffer zones. The nymph feeds on reed-grass (*Phalaris arundinacea*) in the seaside and, occasionally, on sedges (*Carex riparia*, *C.acuta*) further inland.

## 6 Summary of species research

### 6.1

#### New species – research efforts

This research shows, despite earlier beliefs that the Finnish Auchenorrhyncha fauna would be quite well known because of the country's earlier prominent researchers, that it has been quite poorly investigated. Today 389 species are known from Finland, i.e. 56 (17%) more than when the conservation status of the Finnish species last, in year 2000, was evaluated. Of the newly discovered species 13 (*Anaceratagallia lithuanica*, *Aphrodes bicincta*, *A. diminuta*, *Balclutha arhenana*, *Cicadula ciliata*, *Edwardsiana lanternae*, *E. plurispinosa*, *Linnavuoriana intercedens*, *Oncopsis avellanae*, *Paralimnus zachvatkini*, *Metalimnus obtusus*, *Ribautodelphax vinealis* and *Scleroracus orichalceus*) have been found as a result of more thorough taxonomic studies, 15 (*Adarrus multinotatus*, *Balclutha boica*, *Cosmotettix evanescens*, *Delphacodes capnodes*, *Edwardsiana tersa*, *Laburris impictifrons*, *Macropsidius sahlbergi*, *Macrosteles oshanini*, *Mongolojassus bicuspidatus*, *Perotettix orientalis*, *P. pictus*, *Pinumius areatus*, *Psammotettix lapponicus*, *P. slovacus* and *Scleroracus identicus*) are regarded as old species, which populations have been found with more focussed field inventories, 25 (*Acanthodelphax spinosa*, *Acericerus heydenii*, *Alebra albostriella*, *A. neglecta*, *A. wahlbergi*, *Anakelisia perspicillata*, *Calamotettix taeniatus*, *Cicadula nigricornis*, *Edwardsiana gratiosa*, *E. lethierryi*, *Eupterycyba jucunda*, *Eupteryx stachydearum*, *Eurybregma porcus*, *Fagocyba carri*, *Kelisia confusa*, *K. praecox*, *Kybos volgensis*, *Macropsis scutellata*, *Metalimnus steini*, *Parapotes reticulata*, *Stenocranus fuscovittatus*, *Typhlocyba quercus*, *Igutettix oculatus*, *Xanthodelphax xantha* and *Zygina angusta*) are regarded as expansive species that have established native populations in the 21st century and 4 species (*Circulifer haematoceps*, *Tremulicerus distinguendus*, *Edwardsiana ampliata* and *Ommatidiotus inconspicuus*) are considered possible long-range migrants.

The increase of species in the 21st century is thus partly explained by more intensified research and inventory, partly by suitable climate conditions enabling species to expand their range to Finland from nearby core areas.

Despite present research efforts, there are still many species to be expected to occur in Finland, because they are quite abundant in neighbouring regions. Thus, more than 20 species not found in Finland occur in Estonia south of the Finnish Gulf. The true number of Finnish species may be close to 400.

### 6.2

#### Faunistic results

Diversifying the methods of inventory has considerably improved the knowledge of the distribution of species. The methodological results show that more than 60% of our species may be captured with light-traps, 40% by yellow-traps, circa 60 % by Malaise-traps and 20-25% by pitfall traps. During the research more than 1,000 new provincial records were made, largely supported by the new collecting techniques.

The number of species of the provinces is shown in appendix 1.

## Biological results

The occurrence of species is only partly explained by the vegetation/plants of the sites. The edaphic conditions (substrate affinities) often play a major role in the choice of breeding sites.

The distribution of Finnish species with regards to priority habitats (= habitats for breeding) is shown in table 2. The arboricol portion of the fauna is ca 1/3 and the non-arboricol portion 2/3. This is due to the high number of monocot host-plants of the fauna. Notable high species numbers is recorded for esker forests, hemiboreal broad-leaved forests, dry grasslands, lacustrine shore meadows and ruderal areas, all which are sensitive to change (see subchapter 7.2). Species poor habitats are subarctic habitats, croplands and dry coniferous forests. Also the subtype "old boreal forest" has a low number of species. The future development of this habitat type, important for saproxylic species in Finland, is therefore not very decisive for the Finnish Auchenorrhyncha fauna.

Table 1.  
Substrate affinities of the Finnish species

Affinity	Definition	S	% of all
Arboricol	Requires trees and brushwood for development	106	27.3
Psammobiont	All sites on exposed sandy soil	4	1.0
Psammophilic	Prefers (> 80% of sites) exposed sandy soil	26	6.7
Xerophilic	Prefers dry mineral soil and dry ombrotrophic bogs	67	17.3
Mesophilic	Prefers humid fine-grained soil	73	18.8
Hydrophilic	Prefers wet organic sites	89	22.9
Tyrphobiont	All occurrences on peaty soil	20	5.2
Halobiont	All occurrences on saline soil	3	0.8

Table 2.  
Priority habitats of the Finnish species

Forests total (M)	106		
Boreal forests unspecified (Mk)		6	
Dry coniferous forests (Mkk)			4
Esker forests (Mkh)			19
Small-leaved boreal forests (Mkt)			41
Lush boreal forests and groves (Mkl)			10
Hemiboreal forests and groves (Ml)		26	
Anthropogenic habitats (I)	139		
Woody pastures (Ih)		7	
Ruderal areas (Ij)		31	
Dry grasslands (In)		53	
Fresh grasslands (It)		24	
Wet grasslands (Ik)		9	
Parks and gardens (Ip)		13	
Crop fields (Iv)		2	
Boreal rocky surfaces (K)	1		
Subarctic mountains total (T)	4		



Subarctic heaths (Tk)		3	
Subarctic meadows (Tn)		1	
Water bodies (V)	1		
Shores total (R)	80		
Sandy Baltic shores (Rih)			7
Rocky Baltic shores (Rit)			1
Baltic shore meadows (Rin)			20
Lacustrine shores unspecified (Rj)		4	
Gravelly lacustrine shores (Rjt)			2
Lacustrine shore meadows (Rjn)			47
Mires total	57		
Mires unspecified (S)		2	
Wet paludified forests (Sk)		10	
Ombrotrophic bogs (Sr)		11	
Oligotrophic fens (Sn)		30	
Minerotrophic fens (Sl)		3	

Table 3.  
Comparison (in percent) of host specialization of Auchenorrhyncha nymphs between Germany and Finland.

Degree	Germany	Finland	Definition of host specialization
1 <sup>st</sup> degree monophagous	38,6	41,1	Restricted to 1(-2) plant species
2 <sup>nd</sup> degree monophagous	20,6	17,8	Restricted to 1 plant genus
1 <sup>st</sup> degree oligophagous	17,7	27,4	Restricted to 1 plant family
2 <sup>nd</sup> degree oligophagous	6,4	11,1	Restricted to 2 related plant families
polyphagous	14,3	2,7	Feeds on > 2 plant families
unknown	2,3	0,0	

Host specialization of nymphs is high in Finnish Auchenorrhyncha. If using the classification developed by Nickel (2003) a comparison between Germany and Finland is possible (table 3).

The table indicates that Finland has relatively more 1<sup>st</sup> degree monophages and oligophages and much less polyphages, which may be explained by the restricted food supply, i.e. plant species, in the northern part of the range of many species.

The spectrum of plant genera that host monophages in Finland does not markedly differ from the spectrum in Central Europe (see Nickel 2003). Altogether 35 plant genera have monophages in Finland. The ten most important plant genera for plant- and leafhoppers are (number of monophages in brackets): *Carex* (37), *Salix* (17), *Calamagrostis* (13), *Festuca* (12), *Phragmites* (10), *Populus* (10), *Alnus* (9), *Betula* (8), *Agrostis* (8), *Eriophorum* (7). Fescue and alder have more prominent roles in Finland than in Central Europe, because they stand as alternative hosts in Finland for species that have specialized on other host plants (e.g. *Corynephorus* and *Quercus*) further south.

The high specialization degree and affinity of the species increase the rarity of many Finnish hoppers and also the threat to extinction of local populations. Thus, planthoppers and leafhoppers must be regarded as good indicators for ecological research and studies on effects of land use management.

The success in reproduction and distribution of species are furthermore determined by stages of hibernation and growth speed. Of the Finnish species 71.5 % hibernate in the egg stage, 18.1 % in the nymphal stage and 9.8 % as adults.

Kontkanen (1954) reported only two species as having more than one generation in Finland. It is now evident, based on records of nymphs and adults, that the number of species regularly producing two generations per year is more than tenfolds higher. In addition, some normally monovoltine species may in favourable years with long warm autumns produce a partial second generation in southern Finland. The data on mono- vs. bivoltine species is still incomplete and much more detailed phenological records of nymphs are required to clarify the true picture in different parts of the country. For example, some monovoltine species hibernating as nymphs may do this in different nymphal stages (e.g. *Macustus grisescens* and *Speudotettix subfuscus*) and thus adults may be encountered throughout the growing season. This has much confused the interpretation of number of generations based on adult records of such species.

## 7 Conservation status changes and threats

7.1

### Conservation status changes

I have re-assessed the conservation status of each of the Finnish species in Appendix I (column aCS). In this I have followed the guidelines of Rassi et al. (2001). I have lowered the category in two cases (marked by asterisk in the mentioned column):

- the species has a strong core population near the Finnish border, it has good dispersal abilities and a tendency for expanding its range
- the species has established itself on ornamental trees and plants which do not grow in the wild in Finland.

The new conservation status categories of the species are not to be regarded official, they represent the authors personal opinion.

The comparison between the last evaluation (Rassi et al. 2001) and this is made in table 4, where also the new categories of "redlisted" species have been broken down to primary habitats, viz. main habitats of reproduction. For example, of the 5 species regarded as vulnerable in year 2000 one is now regarded as regionally extinct, 2 as endangered and 2 as near threatened.

Table 4.

Comparison between the previous and recent conservation status evaluation of Finnish species.

22.2.2006	RE	CR	EN	VU	NT	DD	NA	LC	CS-old
Regionally extinct (RE)	0								0
Critically endangered (CR)			1						1
Endangered (EN)			1						1
Vulnerable (VU)	1		2		2				5
Near threatened (NT)				1				3	4
Data deficient (DD)	5	13	12	12	27	1	1	40	111
Least concerned (LC)	1	3	1	4	3			211	223
Not evaluated (new)		8	11	11	2	2	5	5	44
CS-new	7	24	28	28	34	3	6	259	389
[Primary habitats of redlisted]									[sum]
Old coniferous forest (Mkv)									0
Esker (xeric) forests (Mkh)		5	1	2	7	1			16
Small-leaved dec.forests (Mkt)				2					2
Broad-leaved dec.forests (MI)	1	1	7	4	5				18
Wet (paludified) forests (Sk)	1	3	1	1	2				7
Dry (xeric) meadows (In)	3	7	3	3	3		1		20
Wooded pastures (Ih)			2	1	2				5
Wet and mesic meadows (Ik)									0
Ruderal (xeric) sites (Ij)		1	1	1	1				4

22.2.2006	RE	CR	EN	VU	NT	DD	NA	LC	CS-old
Parks and gardens (Ip)		1		3	3		2		9
Sandy seashores (Rih)		1	1		1		1		4
Seashore meadows (Rin)		1	2	2	2		1		8
Paludified lake shores (Rjn)	1	3	3	5	3	1	1		17
Oligotrophic bogs (Sr)				1	1				2
Oligotrophic fens (Sn)		1	4	3	2	1			11
Minerotrophic fens (Sl)	1				2				3
Subarctic heaths (Tk)			2	1					3
Eutrophic lakes and ponds (Vsr)									0

The comparison shows that the degree of species with an unfavourable conservation status is much higher than has been anticipated. Only about 2/3 of the species with native populations fall in the category of least concerned.

## 7.2

### Threat factors

Different threat factors may be discerned within different primary habitats. The most severe threat is the overgrowth of abandoned dry meadows originated through traditional farmland practices. Some species that preferentially live in these meadows have been able to establish themselves in so called substitutional habitats (or brown areas), v.i.z. man-made dry fields managed for other purposes than biological diversity. Management procedures in these are focused on recreation (sports fields) or traffic safety (air fields and road verges), some of which may change due to changing economic priorities. They do, however, today present a possibility for preserving rare species of dry meadows. Without these substitutional habitats the situation of dry grassland species would be much worse.

In forests the broad-leaved deciduous types possess most of the endangered species. Broad-leaved groves are at present restricted to southern Finland and these woodlands are fragments of historical larger forests and today small in size. The highest percentage of threatened species in Finland is associated with elms as in many other European countries. Elm disease has been suggested as one factor to the decline of these species in Central Europe, but this disease has not been recorded from Finland. As in the case of dry grassland species, so called substitutional habitats play a major role in preserving rare species confined to broad-leaved trees. Parks and gardens present possibilities for these species to survive in man-made and managed sites. The degree of "conservation" is nevertheless diminishing with the loss of old park trees and the introduction of trees of foreign origin. Xeric esker forest slopes have deteriorated and become overgrown as a result of effective forest fire combating. Many xeric species, however, also find refuges in the substitutional habitats mentioned under grassland species. The number of suitable sites is low and dispersion is hampered by long interdistances.

The nationally most important species, from an international perspective, are related to old spruce mires. These belong to the genera *Colobotettix* and *Perotettix*. These boreal or boreomontane species are in decline all over Europe (cf. Nickel 2003) and have in historical times probably had a wider range in the southern taiga zone. Due to the almost total loss of their habitat in southern Finland (Kuuluvainen et al. 2004) they are nowadays confined to relic sites protected by the national mire conservation programme.

Species related to shores have much in common with dry grassland species. Loss of grazing of sea shores and invasion by reeds and alien plants, like the dog rose, have changed the living conditions at least for species of sandy sea-shores. Several sandy seashores are also in high recreational use today and the psammobionts are confined to sites preserved open in military training areas. Noteworthy is, however, the increasing number of threatened species living on paludified lake shores (Finnish "luhta").

Water level regulation and draining of wet shores for silvicultural and agricultural use all add to the decline of this habitat type.

The plant and leafhopper fauna of mires is in Finland much less endangered than in Central Europe (Nickel & Remane 2002). Still the number of threatened and near threatened species living in oligotrophic fens appears to be growing. Many species confined to these fens are preserved only in large protected mire complexes, whereas unprotected fens, many of which have been drained in the last 50 years, distinctly have a poorer fauna.

## 8 References

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## Appendix I. Catalogus Auchenorrhynchorum Fenniae

No	31.5.2006/GS	CS	aCS	First	Last		Al	Ab	N	Ka	St	Ta	Sa	Kl	Oa	Tb	Sb	Kb	Om	Ok	Obo	Obu	Ks	LkW	LkE	Le	Li	
SO	FULGOROMORPHA																											
FAM	CIXIIDAE																											
SF	CIXIINAE																											
GEN	CIXIUS Latreille,1804																											
SG	CIXIUS Latreille,1804																											
1	C.nervosus (Linnaeus,1758)	DD	NT	1880	2005	1	2	2	2		5						5											
SG	CERATOCIXIUS W.Wagner,1939																											
2	C.cunicularius (Linnaeus,1767)	LC	LC	<1871	2005	1	2	5	5	5	5	5	5	4	4	5	5	5	5	5	5	5	5	5	5	5	5	3
SG	PARACIXIUS W.Wagner,1939																											
3	C.distinguendus Kirschbaum, 1868	LC	LC	1878	2005	1	3	5	5	5	5	5	5	5			5											
4	C.cambricus China, 1935	NT	VU	1942	2002	1	2	4	2		5						2											
5	C.similis Kirschbaum, 1868	LC	LC	<1871	2005	1	2	5	5	3	5	5	4	1	5	4	5	5	5	5	5	3	4	5	4	5	5	
GEN	PENTASTIRIDIUS Kirschbaum,1868																											
6	P.leporinus (Linnaeus,1761)	LC	LC	<1871	2005	1	5	4	5	5	2	5					5	3										
FAM	DELPHACIDAE																											
SF	KELISIINAE																											
GEN	KELISIA Fieber, 1866																											
7	K.guttula (Germar,1818)	DD	LC	1878	2003	1	5	4	5	0	5						5											
8	K.vittipennis (J.Sahlberg,1868)	LC	LC	1867	2005	1	5	5	5	5	5	5	1	3		3	2	3	5	3			4					
9	K.pallidula (Boheman,1847)	LC	EN	1869	2002		5	1	2	1	2																	
10	K.confusa Linnavuori,1957		EN $\alpha$	2005	2005	1	5																					
11	K.praecox Haupt,1935		LC $\alpha$	2002	2003	1	5	5																				
12	K.ribauti W.Wagner,1938	LC	LC	1880	2005	1	5	4	5	3	2	2	2*			3	2	2	5	5	2							
13	K.monoceros Ribaut,1934	DD	NT	1918	2005	1	5	4					5															
14	K.sabulicola W.Wagner, 1952	VU	NT $\alpha$	1976	2005	1	5	4	5																			
GEN	ANAKELISIA W.Wagner, 1963																											
15	A.perspicillata (Boheman, 1845)		EN $\alpha$	2002	2002	1	5																					
SF	STENOCRANINAE																											
GEN	STENOCRANUS Fieber,1866																											

No	31.5.2006/GS	CS	aCS	First	Last		Al	Ab	N	Ka	St	Ta	Sa	Kl	Oa	Tb	Sb	Kb	Om	Ok	Obo	Obu	Ks	LkW	LkE	Le	Li
16	S.major (Kirschbaum,1868)	DD	LC	1994	2005	1	5	5	5	5	5	5	5														
17	S.minutus (Fabricius,1787)	LC	LC	1943	2005	1	5	5	5	5		5	5	5				5									
18	S.fuscovittatus (Stål,1858)		EN	2002	2002	1			5																		
SF	DELPHACINAE																										
GEN	DELPHACINUS Fieber,1866																										
19	D.mesomelas (Boheman,1849)	DD	LC	1875	2005	1	5	5	5				5														
GEN	EURYSULA Vilbaste,1968																										
20	E.lurida (Fieber,1866)	DD	NT	<1871	2005	1	2	5	5			5		2		1	3*	5									
GEN	EURYBREGMA Scott, 1875																										
21	E.porcus (Emeljanov,1964)		EN $\alpha$	2003	2003	1												5									
GEN	STIROMA Fieber,1866																										
22	S.affinis Fieber,1866	LC	LC	<1871	2005	1	5	5	5	5	4	5	5	4	4	3	4	4	5	5	5	3	4	4	5		4
23	S.bicarinata (Herrich-Schaeffer,1835)	LC	LC	<1871	2005	1	2	5	5	5	5	5	5	4	4	4	4	5	4	5	4	4	5	5	4		4
GEN	STIROMOIDES Vilbaste,1971																										
24	S.maculiceps (Horvath,1903)	DD	CR	1950	1950								3														
GEN	ACHOROTILE Fieber,1866																										
25	A.albosignata (Dahlbom,1845)	LC	LC	1869	2005	1	4	5	4		5	5	4			5	3*	5		3			5	5		4	4
26	A.longicornis (J.Sahlberg,1871)	DD	CR	1866	1984				0			4		0													
GEN	EUCONOMELUS Haupt,1929																										
27	E.lepidus (Boheman,1847)	LC	LC	<1871	1995		4	4	4	1	4	2	3							2	2						
GEN	CONOMELUS Fieber,1866																										
28	C.anceps (Germar,1821)	LC	LC	1869	2005	1	5	5	5	3	2	5	5					2*									
GEN	DELPHAX Fabricius,1798																										
29	D.crassicornis (Panzer,1796)	DD	LC	1937	2005	1	5	5	5	5		4	4	5				2									
30	D.pulchellus (Curtis,1833)	LC	LC	<1871	2004	1	5	4	5		2		5														
GEN	EUIDES Fieber,1866																										
31	E.basilinea (Germar,1821)	DD	NT $\alpha$	<1871	2005	1	2	5			5					5		2									
GEN	CHLORIONA Fieber,1866																										
32	C.chinai Ossiannilsson,1946	LC	LC	1922	2004	1	4	4	2		5	5	3		2			2*	5	5							
33	C.glaucescens Fieber,1866	LC	LC	1879	2005	1	5	4	5	5	5		5		2			2	5		3						

No	31.5.2006/GS	CS	aCS	First	Last		Al	Ab	N	Ka	St	Ta	Sa	Kl	Oa	Tb	Sb	Kb	Om	Ok	Obo	Obu	Ks	LkW	LkE	Le	Li
34	C.smaragdula (Stål,1853)	DD	LC	1943	2005	1	2	5	5		4	5	4		3			2	2*				3*				
GEN	MEGAMELUS Fieber,1866																										
35	M.notula (Germar,1830)	LC	LC	1869	2005	1	4	5	5	3	5	5	5	3*	3	3*	3	5	3	3	5	2	3*	3	5		
GEN	UNKANODES Fennah,1956																										
36	U.excisa (Melichar,1898)	DD	LC	1924	2005	1	2	5	5	5	5								5		3	1					
GEN	MEGADELPHAX W.Wagner,1963																										
37	M.sordidula (Stål,1853)	LC	LC	1866	2005	1	5	5	5	5	5	5	5	3*	3	2	3	5	2	3*	3	3					
GEN	LAODELPHAX Fennah,1963																										
38	L.striatella (Fallen,1826)	DD	LC	1875	2005	1	5	5	5	5	5	5	5	5	5			5		5		2			3*		
GEN	PARALIBURNIA Jensen-Haarup,1917																										
39	P.adela (Flor,1861)	DD	NT $\alpha$	1942	2005	1		5	4			4															
40	P.clypealis (J.Sahlberg,1871)	DD	EN	1942	2005	1		2			5					5						2*					
GEN	HYLEDELPHAX Vilbaste,1968																										
41	H.elegantula (Boheman,1847)	LC	LC	1869	2005	1	2*	5	5	4	5	5	5	4	2	2	3	5	5	4	4	3	5	5	4	5	4
GEN	CALLIGYPONA J.Sahlberg,1871																										
42	C.reyi (Fieber,1866)	DD	NT	1943	1993		2	4	4						2												
GEN	DELPHACODES Fieber,1866																										
43	D.venosus (Germar,1830)	LC	LC	<1871	2005	1	4	5	5		5	5	5	5				2	3								
44	D.capnodes (Scott, 1870)		EN		2005	1					5	5															
GEN	GRAVESTEINIELLA W.Wagner,1963																										
45	G.boldi (Scott,1870)	VU	EN	1976	2005	1		4	5			5															
GEN	MUELLERIANELLA W.Wagner,1963																										
46	M.brevipennis (Boheman,1847)	LC	LC	<1871	2005	1	5	5	5	5	1	4	5	5	2*	3*	3	2*	5	5							
47	M.extrusa (Scott,1871)	DD	LC	1927	2005	1				3	0*	5		1		2											
48	M.fairmairei (Perris,1857)	DD	VU $\alpha$	1972	2005	1	2	5	3																		
GEN	MUIRODELPHAX W.Wagner,1963																										
49	M.aubei (Perris,1857)	VU	EN	1953	1995		4	4		3*																	
GEN	ACANTHODELPHAX LeQuesne,1964																										
50	A.denticauda (Boheman,1847)	LC	LC	<1871	2003	1		2	1	2*	1*	2	4	1	3	2	3*	2*	4	5	3	3	5	3*	3*		4

No	31.5.2006/GS	CS	aCS	First	Last		Al	Ab	N	Ka	St	Ta	Sa	Kl	Oa	Tb	Sb	Kb	Om	Ok	Obo	Obu	Ks	LkW	LkE	Le	Li	
51	A.spinosa (Fb.,1866)		LC	2002	2005	1		5	5			5	5															
GEN	NOTHODELPHAX Fennah,1963																											
52	N.albocarinata (Stål,1858)	LC	LC	1869	2004	1	1	5	5				5					5		4		3						
53	N.distincta (Flor,1861)	LC	LC	<1871	2005	1		4	5		5	5			2	3	4	2*	5	1*		2*		3*	2*		3*	
GEN	DICRANOTROPIS Fieber,1866																											
54	D.hamata (Boheman,1847)	LC	LC	1869	2005	1	5	5	5	5	5	5	5	4	4	4	4	5	4	4	4	4						
GEN	FLORODELPHAX Vilbaste,1971																											
55	F.paryphasma (Flor,1861)	DD	VU	1869	2004	1	2		2		5	1																
GEN	KOSSWIGIANELLA W.Wagner,1963																											
56	K.exigua (Boheman,1847)	DD	VU $\alpha$	1871	1996		2	4																				
GEN	STRUEBINGIANELLA W.Wagner,1963																											
57	S.lugubrina (Boheman,1847)	LC	VU	<1871	2005	1	2	4	2		3	5	3			3												
GEN	XANTHODELPHAX W.Wagner,1963																											
58	X.flaveola (Flor,1861)	LC	LC	<1871	2005	1		5	5			5	5		3	3	3	5	3	5	3	3						
59	X.straminea (Stål,1858)	LC	LC	<1871	2005	1	2	5	5	3	5	5	5	4	3	3	3	5	5	1*								
60	X.xantha Vilbaste,1965		VU $\alpha$	2004	2005	1							5	5														
GEN	PARADELPHACODES W.Wagner,1963																											
61	P.litoralis (Reuter,1880)	DD	NT	1878	2000	1		2							3									5		3	5	
62	P.paludosa (Flor,1861)	LC	LC	1869	2005	1		2	4		5	5	5		2	3	3	2*										
GEN	ONCODELPHAX W.Wagner,1963																											
63	O.pullula (Boheman,1852)	LC	LC	<1871	2005	1	2	2	2		5	5			2			2	2*									
GEN	CRIMORPHUS Curtis,1833																											
64	C.albomarginatus Curtis1833	LC	LC	<1871	2005	1	1	5	5	3	4	5	3	3	3		5	5	4			3	5					
65	C.borealis (J.Sahlberg,1871)	LC	LC	<1871	2005	1		5	5		5	5	4	3	4	4	4	5	5	5		3	5	1		5	5	
66	C.moestus (Boheman,1847)	DD	LC	<1871	2004	1			1		5			2	2				5			3		4				
GEN	JAVESELLA Fennah,1963																											
SG	JAVESELLA Fennah,1963																											
67	J.discolor (Boheman,1847)	LC	LC	<1871	2005	1	2*	5	5	3*	5	5	4	4	4	5	4	5	5	5	5	3	5	3	3	5	4	
68	J.simillima (Linnavuori,1948)	DD	NT	1947	2005	1		2			5	5					3		5									

No	31.5.2006/GS	CS	aCS	First	Last		Al	Ab	N	Ka	St	Ta	Sa	Kl	Oa	Tb	Sb	Kb	Om	Ok	Obo	Obu	Ks	LkW	LkE	Le	Li	
69	J.bottnica Huldén,1974	DD	NT $\alpha$	1916	2005	1						5		2	2		1		5			3	5	2				
70	J.pellucida (Fabricius,1794)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	5	5	4	5	2	5	5	5	5	5	3	5	4	
71	J.dubia (Kirschbaum,1868)	LC	LC	1871	2005	1	5	5	5	3	5	5	5	1	5	5	4	5	3	3	3	3	3*	3			3	
72	J.obscurella (Boheman,1847)	LC	LC	<1871	2005	1	5	5	5	5	5	5	4		5	5	3	5	5	3	3	3	5	3*				
73	J.forcipata (Boheman,1847)	LC	LC	<1871	2005	1	2*	5	5	3	5	5	5	5	4	3	4	5	4	4	3	3	3*	5	3*	2*	5	
74	J.alpina (J.Sahlberg,1871)	LC	LC	1866	2004	1																				5	5	
SG	HAFFNERIANELLA W.Wagner,1963																											
75	J.stali (Metcalf,1943)	LC	LC	1869	2005	1		1	3	5		5			2*	2	4				5		5		1	5	3	
GEN	RIBAUODELPHAX W.Wagner,1963																											
76	R.albostrata (Fieber,1866)	LC	LC	1869	2005	1	4	1	5	5		5	5	4	2		4	5		5		3	5	3	4	3	4	
77	R.angulosa (Ribaut,1953)	DD	VU	1916	2004	1		5	5																			
78	R.collina (Boheman,1847)	DD	LC	1937	2005	1	5	5	4			5	3	4				2*					5					
79	R.vinealis Bieman, 1987		LC	1927	2005	1	2	5	5			5							4	2	5		4	4	3	5	5	
80	R.pallens (Stål,1854)	LC	LC	<1871	2005	1	2	5	4		1	5					4	4	5	3								
FAM	ACHILIDAE																											
GEN	CIXIDIA Fieber,1866																											
81	C.confinis (Zetterstedt,1838)	LC	LC	1920	2004	1		1	5			3	5			5												
82	C.laponica (Zetterstedt,1838)	LC	LC	1840	2005	1					5	5				4		3				3		5	5		4	
FAM	CALISCELIDAE																											
GEN	OMMATIDIOSUS Spinola,1839																											
83	O.dissimilis (Fallen,1806)	LC	LC	1869	2005	1		4	5	5	5	5	2		4			2	5									
84	O.inconspicuus Stål, 1853		NA	2004	2004	1			5																			
	C I C A D O M O R P H A																											
FAM	CICADIDAE																											
GEN	CICADETTA Kolenati,1857																											
85	C.montana (Scopoli,1772)	CR	EN	<1871	2005	1		5	4			1	0															
FAM	APHROPHORIDAE																											
GEN	APHROPHORA Germar,1821																											
86	A.alni (Fallen,1805)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5							
87	A.pectoralis Matsumura,1903	LC	LC	<1871	2005	1	2	5	5	5	5	5	5	5		2	3*	5	5	5								
GEN	LEPYRONIA Amyot & Serville,1843																											

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88	L.coleoprata (Linnaeus,1758)	LC	LC	<1871	2005	1		5	5	5	5	5	5														
GEN	NEOPHILAENUS Haupt,1935																										
89	N.exclamationis (Thunberg,1784)	LC	LC	<1871	2005	1	5	5	5	4	5	5	5	4	4	3*	4	5	5	5	5	5	5	5	3	5	4
90	N.lineatus (Linnaeus,1758)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	4	3	5	5	5	5	5	4	5	5	3		3
91	N.minor (Kirschbaum,1868)	DD	CR	1950	1950								3														
GEN	PEUCEPTYELUS J.Sahlberg,1871																										
92	P.coriaceus (Fallen,1826)	LC	LC	1869	2005	1		5	5	5	5	5	3			4	4	5	5								
GEN	PHILAENUS Stål,1864																										
93	P.spumarius (Linnaeus,1758)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	4	4	4	5	5	5	5	5	5	5	5		5
FAM	MEMBRACIDAE																										
GEN	CENTROTUS Fabricius,1803																										
94	C.cornutus (Linnaeus,1758)	LC	LC	<1871	2005	1	2*	5	5	4	5	5	4	1	3	1	5	5	4								
FAM	CICADELLIDAE																										
SF	ULOPINAE																										
GEN	ULOPA Fallén,1814																										
95	U.reticulata (Fabricius,1794)	LC	LC	1866	2005	1	5	5	5	5	5	5	5	3	2	2		5	5	5	5						
SF	MEGOPHTHALMINAE																										
GEN	MEGOPHTHALMUS Curtis,1833																										
96	M.scanicus (Fallen,1806)	NT	LC $\alpha$	1879	2005	1	5	4	3	3*	0*	2	5	2		3*	5										
SF	MACROPSINAE																										
GEN	ONCOPSIS Burmeister,1838																										
97	O.flavicollis (Linnaeus,1761)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	4	5	5
98	O.avellanae Edwards, 1920		LC	1878	2005	1	5	5	5	5	5																
99	O.subangulata (J.Sahlberg,1871)	LC	LC	1869	2005	1	5	5	5	5	5	5	5		4	5	3		2*	5		5	5			3	
100	O.tristis (Zetterstedt,1838)	LC	LC	<1871	2005	1	2	5	5	5	4	5	5	1*	4	3	3	2*	4	5	5	5	5	5	4		5
101	O.appendiculata W.Wagner,1944	DD	VU $\alpha$	1946	2003	1				5			3														
102	O.planiscuta (Thomson,1870)	LC	LC	1920	2004	1					2*	5			4		1					5	5	4		5	
103	O.alni (Schrank,1801)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	5	2		5		5	5	5					
GEN	PEDIOPSIS Burmeister,1838																										
104	P.tiliae (Germar,1831)	DD	NT	<1871	2004	1		5	5																		
GEN	MACROPSIS Lewis,1834																										



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105	M.infuscata (J.Sahlberg,1871)	LC	LC	<1871	2005	1	2	5	5	5	5	5	5	3	2*	5	5	5	5	5	5	3		2						
106	M.cerea (Germar,1837)	LC	LC	<1871	2005	1	2	5	5	5	5	5	3	2	2	3*	3*	3	5	5		2								
107	M.fuscinervis (Boheman,1845)	LC	LC	1868	2005	1	2	5	5	3	5	5	2					5												
108	M.impura (Boheman,1847)	LC	LC	1869	2005	1	2	5	5		4	5	5				5	3			5									
109	M.fuscula (Zetterstedt,1828)	LC	LC	<1871	2005	1	5	5	5		5	5	5	3*	2*	3*	5	5				5								
110	M.scutellata (Boheman,1845)		VU $\alpha$	2003	2005	1							5																	
GEN	MACROPSIDIUS Ribaut,1952																													
111	M.sahlbergi (Flor,1861)		CR	2002	2003	1							5																	
GEN	HEPHATHUS Ribaut,1952																													
112	H.achilleae Mityaev, 1967	VU	RE	1927	1942													2												
SF	AGALLIINAE																													
GEN	AGALLIA Curtis,1833																													
113	A.brachyptera (Boheman,1847)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5		3*	4	5	5	5	5									
GEN	ANACERATAGALLIA Zachvatkin, 1946																													
114	A.venosa (Fourcroy,1785)	LC	LC	<1871	2005	1	5	5	5	5	3*	5	5	3*	2*			2	5	5	3		3*	3*						
115	A.ribauti Ossiannilsson,1938	LC	LC	1942	2005	1	5	5	5	5		5	5	5		3	5	5	2	5	5									
116	A.estonica Vilbaste,1961	EN	EN	1969	1995			4																						
117	A.lithuanica Vilbaste, 1974		NT $\alpha$	1993	2004	1			4				5																	
SF	IDIOCERINAE																													
GEN	IDIOCERUS Lewis,1834																													
118	I.stigmatalis Lewis,1834	LC	LC	1867	2005	1	5	5	5	5		5	5			2*														
119	I.litiratus (Fallen,1806)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	1*	2*		3	2	5	4*		3*	3							
120	I.herrichii Kirschbaum,1868	DD	LC	1867	2004	1	2	1	5		1	2																		
GEN	ACERICERUS Dlabola,1974																													
121	A.heydenii (Kirschbaum,1868)		VU $\alpha$	2002	2005	1		5																						
GEN	METIDIOCERUS Ossiannilsson,1981																													
122	M.elegans (Flor,1861)	LC	LC	<1871	2005	1	5	5	5	5	4	5	5	1*	4	3*	3*	5	2	5	4	3	5	3*		5	5			
GEN	POPULICERUS Dlabola,1974																													
123	P.populi (Linnaeus,1761)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	4	4	5	5	5	5*	5	4	5	5	3*			3			
124	P.laminatus (Flor,1861)	LC	LC	1869	2005	1	5	5	5	5	0	5	5		4		3	5	5	5	5	5	5							

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125	P.nitidissimus (Herrich-Schaeffer,1835)	DD	VU $\alpha$	1946	2003	1		3	5																		
126	P.confusus (Flor,1861)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	3	4		3	5	2*	5		5					
127	P.albicans (Kirschbaum,1868)	DD	NT $\alpha$	1976	2003	1			5	5																	
GEN	TREMULICERUS Diabola,1974																										
128	T.distinguendus (Kirschbaum,1868)		NA	2005	2005			5																			
129	T.tremulae (Estlund,1796)	LC	LC	<1871	2005	1	4	5	5	5	5	5		5	5	5	5		5								
GEN	STENIDIOCERUS Ossianniilsson,1981																										
130	S.poecilus (Herrich-Schaeffer,1835)	DD	NT $\alpha$	<1871	2002	1		4	2				5														
GEN	SAHLBERGOTETTIX Zachvatkin,1953																										
131	S.salicicola (Flor,1861)	DD	RE	1869	1869						0																
SF	IASSINAE																										
GEN	IASSUS Fabricius, 1803																										
132	I.lanio (Linnaeus,1761)	DD	LC	1937	2003	1	5	5	5	5		5	5														
GEN	BATRACOMORPHUS Lewis,1834																										
133	B.allionii (Turton,1802)	LC	NT	1866	2005	1	1	4	5			5	5	2													
SF	DORYCEPHALINAE																										
GEN	EUPELIX Germar,1821																										
134	E.cuspidata (Fabricius,1775)	LC	LC	1840	2005	1	2	5	5	4	4	5	5	3			3*	3	2		5						
SF	APHRODINAE																										
GEN	APHRODES Curtis,1829																										
135	A.makarovi Zachvatkin,1948	LC	LC	<1871	2005	1	5	5	5	5	4	5	5	5	2*	3	3	5	5	5	5		5				
136	A.bicincta (Schrank,1776)		LC	1975	2005	1	5	5	5	5	5	5	5					5									
137	A.diminuta Ribaut,1952		LC	1973	2005	1			5		5	5						5	5			3					
GEN	PLANAPHRODES Hamilton,1975																										
138	P.bifasciata (Linnaeus,1758)	LC	LC	<1871	2005	1	2	5	5	5	5	5	5	4	2*	3	5	5	5	5	5	4	5		5		5
139	P.nigrita (Kirschbaum,1868)	DD	NT	1945	2005	1			3			5	2			2		3									
140	P.laeva (Rey, 1891)	LC	LC	1869	2005	1	1	5	4		5	5	5	4		5	5	5	5	5	5		2	5			
GEN	ANOSCOPIUS Kirschbaum,1858																										
141	A.albifrons (Linnaeus,1758)	LC	LC	1869	2005	1	2	5	5	3	2	5	5			2		2		5							

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142	A.histrionicus (Fabricius,1794)	LC	RE	<1871	1942		2	2	1		1	1						2									
143	A.flavostriatus (Donovan,1799)	LC	LC	<1871	2005	1	5	5	5	5	4	5	5	3	4	3*	4	5	2*	5	5						
GEN	STROGGYLOCEPHALUS Flor,1861																										
144	S.agrestis (Fallen,1806)	LC	LC	1869	2004	1	2	5	5		5	5	2		2							3					
145	S.livens (Zetterstedt,1838)	DD	NT	1947	2004	1		5	3*		5	5							5			1		1			
SF	CICADELLINAE																										
GEN	EVACANTHUS Lepeletier&Serville,1825																										
146	E.interruptus (Linnaeus,1758)	LC	LC	<1871	2005	1	5	5	5	5	4	5	5	5	4	3*	5	5	2*	5	5	5					
147	E.acuminatus (Fabricius,1794)	LC	LC	<1871	2005	1	5	5	5		3	5	5			3*	3	5	5	5							
GEN	BATYSMATOPHORUS J.Sahlberg,1871																										
148	B.reuteri J.Sahlberg,1871	LC	LC	1868	2005	1																5	5	4*	5		
GEN	CICADELLA Latreille,1817																										
149	C.viridis (Linnaeus,1758)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5					
150	C.lasiocarpae OssianniIsson,1981	DD	EN	1916	2005	1		5	5		1	4															
SF	TYPHLOCYBINAЕ																										
GEN	ALEBRA Fieber,1872																										
151	A.albostriella (Fallen,1826)		EN $\alpha$	2002	2002	1							5														
152	A.neglecta W.Wagner,1940		EN $\alpha$	2002	2002	1							5														
153	A.wahlbergi (Boheman,1845)		LC $\alpha$	2002	2005	1		5	5																		
GEN	ERYTHRIA Fieber,1866																										
154	E.aureola (Fallen,1826)	LC	LC	<1871	2005	1		5	5	5	5	5	3		4	2		5	4		5					3*	
GEN	EMELYANOVIANA Anufriev,1970																										
155	E.mollicula (Boheman,1845)	DD	CR $\alpha$	1942	1942													2									
GEN	DIKRANEURA Hardy,1850																										
156	D.aridella (J.Sahlberg,1871)	LC	LC	<1871	2005	1	4	5	5	5	5	5	5		2	5	3	5	5	5			0	3*	3*		3
157	D.variata Hardy,1850	LC	NT	<1871	2004	1	2*	5	5			5	4														
GEN	MICANTULINA Anufriev,1970																										
158	M.micantula (Zetterstedt,1838)	DD	VU $\alpha$	<1880	2002	1	5																				
159	M.pseudomicantula (Knight,1966)	DD	NT $\alpha$	<1871	2003	1		4	1			2						5									

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GEN	WAGNERIALA Anufriev,1970																										
160	W.minima (J.Sahlberg,1871)	DD	VU	1950	2005	1							5							5							
GEN	IGUTETTIX Matsumura,1932																										
161	I.oculatus (Lindberg, 1929)		LC	2002	2005	1			5	5		5	5														
GEN	FORCIPATA DeLong&Caldwell,1936																										
162	F.citrinella (Zetterstedt,1828)	LC	LC	<1871	2005	1	5	5	5		4	5	5				5	5	5	5		3	5	4	3	5	5
163	F.forcipata (Flor,1861)	LC	LC	1925	2005	1		4	4		3	4	5		4		3	2				3	5	3	3		1
GEN	NOTUS Fieber,1866																										
164	N.flavipennis (Zetterstedt,1828)	LC	LC	<1871	2005	1	5	4	5	5	4	5	5	5	4	5	3	5	2	5	5	4	4	3	3		3
GEN	EMPOASCA Walsh,1862																										
165	E.vitis (Göthe,1875)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	1*	5	5	5	5	5	5	5	5		5	3		
166	E.pteridis (Dahlbom,1850)	DD	LC	1950	2005	1		4	5			5															
167	E.kontkaneni Ossiannilsson,1949	DD	LC	1948	2005	1	5	5	5	5	5	5	5	5	5	5	5	5		5	5						
168	E.ossiannilssoni Nuorteva,1948	DD	LC	1942	2005	1				5		5	5				5	5		5	5	5					
169	E.apicalis (Flor,1861)	DD	LC	1948	2005	1	2	5	5			5				5		2									
GEN	KYBOS Fieber,1866																										
170	K.smaragdula (Fallen,1806)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5		5	5	5	5	5	5	5	5	5	5	5		5
171	K.lindbergi Linnavuori,1951	LC	LC	1948	2005	1		5	5	5		5	4			2*	5		5	5		5				5	5
172	K.strigilifer Ossiannilsson,1941	LC	LC	1899	2005	1	5	5	4			5	5				0	2		5							
173	K.virgator Ribaut,1933	LC	LC	1943	2005		5	5	4		4	5								3*		2					
174	K.volgensis (Vilbaste,1961)		EN $\alpha$		2005	1			5																		
175	K.butleri Edwards,1908	LC	LC	1919	2005	1	5	4	5	5	5	5	5			5	3*	5	5	5	3	5	5	5		5	5
176	K.populi Edwards,1908	LC	LC	1918	2004	1	2	5	5	5	3	5	5			5	3	5		5		3					
177	K.sordidulus Ossiannilsson,1941	LC	LC	1916	2005	1	2	3	5			5	3			3*	3	2		5	4		2*				5
178	K.abstrusus Linnavuori,1949	DD	VU $\alpha$	1948	2004	1		5																			
GEN	KYBOASCA Zachvatkin,1953																										
179	K.bipunctata (Oshanin,1871)	DD	CR $\alpha$	1949	1952			3																			
GEN	CHLORITA Fieber,1872																										
180	C.viridula (Fallen,1806)	DD	NT	1959	2005	1	5			5	4				3												
181	C.paolii Ossiannilsson,1939	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	2*	4	4	5	5	5	5						
182	C.dumosa (Ribaut,1933)	DD	NT	1950	2005	1		5	4		5	5	5														

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GEN	FAGOCYBA Dlabola,1958																										
SG	FAGOCYBA Dlabola,1958																										
183	F.cruenta (Herrich-Schäffer, 1838)	LC	LC	<1880	2004	1	5	5	5	5	2	5	5			5	5			5	5						
SG	DRYOCYBA Vilbaste,1968																										
184	F.carri (Edwards,1914)		VU $\alpha$	2002	2004	1		5																			
GEN	EDWARDSIANA Zachvatkin,1929																										
185	E.rosae (Linnaeus,1758)	DD	LC	1955	2005	1	5	5	5	5		5	5				5						5				
186	E.avellanae (Edwards,1888)	DD	RE	1869	1869						0																
187	E.stehliki Lauterer,1958	DD	EN $\alpha$	2003	2003	1		5																			
188	E.crataegi (Douglas,1876)	DD	LC	<1880	2005	1	5	5	5			5															
189	E.salicicola (Edwards,1885)	DD	LC	1950	2005	1		4	5			5				5	5			5							
190	E.alnicola (Edwards,1924)	DD	LC	1937	2004	1	5	5	5	5	5	5	5				3	5		5							
191	E.sociabilis (Ossiannilsson,1936)	LC	LC	1942	2003	1	5	5	5	5			3				3					5					
192	E.frustrator (Edwards,1908)	DD	LC	<1871	2003	1	5	5	3			5				5											
193	E.ampliata (W.Wagner, 1947)		NA	2003	2003	1			5																		
194	E.ishidai (Matsumura,1932)	DD	EN	1948	1969			3																			
195	E.lanternae (W.Wagner, 1937)		LC	1948	2003	1		2	5			5	5			2		5									
196	E.prunicola (Edwards,1914)	DD	LC	1948	2004	1		5	5	5		5	5				5		5								
197	E.menzbieri Zachvatkin,1948	DD	LC	1970	2005	1		5	5	5	5	5	5	5		5	5	5	5	5	5						
198	E.plebeja (Edwards,1914)	DD	CR $\alpha$	1923	1950			3																			
199	E.candidula (Kirchbaum,1868)	DD	VU $\alpha$	1970	1975		4		3																		
200	E.gratiosa (Boheman,1852)		VU $\alpha$	2002	2003	1			5	5																	
201	E.geometrica (Schränk,1801)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
202	E.tersa (Edwards,1914)		DD	1995	2003	1																4	5				
203	E.soror (Linnavuori,1950)	DD	LC	1949	2004	1	5	5	5	5		5	4		5	5		5	5	5			5				
204	E.bergmani (Tullgren,1916)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5		5	5	5	5	5	5	5	5	5	5	5	5	5
205	E.lethierryi (Edwards, 1881)		EN $\alpha$	2005	2005	1	5																				
206	E.ulmiphagus Wilson & Claridge, 1999	DD	LC	1948	2003	1		5	5																		
207	E.plurispinosa (W.Wagner, 1935)		NT $\alpha$	1976	1991		5	4	4																		
GEN	EUPTERYCYBA Dlabola,1958																										

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208	E.jucunda (Herrich-Schaeffer,1837)		VU $\alpha$	2002	2005	1		5			5																
GEN	LINNAVUORIANA Dlabola,1958																										
209	L.sexmaculata (Hardy,1850)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
210	L.decompunctata (Fallen,1806)	LC	LC	<1871	2005	1	4	5	5	5	5	5	5	4	5	5	5	5	3	5	5	5	5	5	5		5
211	L.intercedens (Linnavuori,1949)		LC	1920	2005	1	2*	2*	5			5	5				5	5		5	5						
GEN	RIBAUTIANA Zachvatkin,1947																										
212	R.ulmi (Linnaeus,1758)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5		4												
GEN	TYPHLOCYBA Germar,1833																										
213	T.quercus (Fabricius.,1777)		LC	2002	2003	1	5	5	5	5		5	5			5		5									
GEN	ZONOCYBA Dlabola,1958																										
214	Z.bifasciata Boheman,1851	VU	NT	1976	2004	1		5	5			5															
GEN	EURHADINA Haupt,1929																										
215	E.pulchella (Fallen,1806)	LC	LC	<1880	2005	1	5	5	5	5	5	5	5	3	5	5		5	5	5	5						
216	E.concinna (Germar,1831)	DD	LC	1916	2005	1	5	5	5	5	2	2	5														
217	E.ribauti W.Wagner,1935	DD	EN $\alpha$	1946	2005		5		4																		
218	E.kirschbaumi W.Wagner,1937	DD	NT $\alpha$	1948	2003	1		4	5			5															
GEN	EUPTERYX Curtis,1833																										
219	E.atropunctata (Goetze,1778)	LC	LC	<1871	2005	1	5	5	4	5		5	5	4		2	3	5									
220	E.origani Zachvatkin,1948	DD	NT	1924	2005	1		3*	4			4	5		2	1*	3*	5									
221	E.signatipennis (Boheman,1847)	LC	LC	1869	2005	1		5	5		0	5	4		2*		5	5	4	5							
222	E.urticae (Fabricius,1803)	DD	NT $\alpha$	1970	1987			4	3				4														
223	E.cyclops Matsumura,1906	LC	LC	1937	2005	1	5	5	5	5	5	5	5	5	4	2	5	5	2	5	5	5					
224	E.calcarata OssianniIsson,1936	DD	LC	1918	2005	1	5	5	5	5			5														
225	E.collina (Flor,1861)	DD	CR	1866	2004	1							5	0													
226	E.stachydearum (Hardy,1850)		EN $\alpha$		2005	1	5																				
227	E.vittata (Linnaeus,1758)	LC	LC	1869	2005	1	0	4	5	3*	5	5			4			5									
228	E.notata Curtis,1937	LC	LC	<1871	2005	1	4	5	5	5	4	5	5	5			4	5	4	5			5				1
229	E.tenella (Fallen,1806)	LC	LC	1936	2005	1		5	5	5	4	5	5	4			5	5		5							
GEN	WAGNERIPTERYX Dlabola, 1967																										
230	W.germari (Zetterstedt,1838)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	1	5	5	3	5	5	5	5		5		5		5
GEN	AGURIAHANA Distant,1918																										

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231	A.pictilis (Stål,1853)	LC	LC	<1871	2003	1		4	4		0	2	5	1				5	5	5	5			3*					
232	A.stellulata (Burmeister,1841)	LC	LC	<1871	2005	1		5	5	5	5	5	5	3		5													
GEN	ALNETOIDIA Dlabola,1958																												
233	A.alneti (Dahlbom,1850)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5							
GEN	ZYGINIDIA Haupt,1929																												
234	Z.pullula (Boheman,1845)	DD	CR $\alpha$	1943	1943		2																						
GEN	ZYGINA Fieber,1866																												
SG	ZYGINA Fieber,1866																												
235	Z.flammigera (Fourcroy,1785)	LC	LC	<1871	2005	1	5	5	5	5	5	5	3	3				2*											
236	Z.angusta Lethierry,1874		EN $\alpha$	1997	2005	1		5																					
237	Z.rosea (Flor,1861)	DD	LC	<1880	2003	1		5	5	5	3	5	5			5		5		5									
238	Z.tiliae (Fallen,1806)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5		4	5		5		5	5								
239	Z.ordinaria (Ribaut,1936)	LC	LC	1875	2005	1	5	5	5	5	5	5	5			5	5	5		5	5								
240	Z.nigratarsis Remane,1959		LC	1997	2005	1	5	5	5	5	5	5	5			5				5	5								
241	Z.rosincola (Cerutti,1939)	DD	NT	1970	2004	1		5	5	5		5																	
242	Z.suavis (Rey,1891)	DD	LC	1948	2004	1		5	5	5		5	5																
243	Z.rubrovittata (Lethierry,1869)	LC	LC	1869	2005	1	5	5	5	5	5	5	5	3		3*	1	5		5									
SG	HYPERICIELLA Dworakowska,1970																												
244	Z.hyperici (Herrich-Schaeffer,1836)	LC	LC	<1871	2004	1		5	5			3	5	5				5											
GEN	ARBORIDIA Zachvatkin,1946																												
245	A.parvula (Boheman,1845)	DD	LC	1948	2005	1		5	5		5	5	5		3*		5	5	5	5									
SF	DELTOCEPHALINAE																												
GEN	GRYPOTES Fieber,1866																												
246	G.puncticollis (Herrich-Schaeffer,1834)	LC	LC	1927	2005	1	4	5	5	5	5	5	5	3				5	2										
GEN	CIRCULIFER Zachvatkin,1935																												
247	C.haematoceps (Mulsant & Rey, 1855)		NA	2001	2001	1													5										
GEN	CORYPHAELUS Puton,1866																												
248	C.gyllenhalii (Fallen,1826)	LC	NT	1869	2005	1	2	2	4		4	2			2	2	3	2	5										
GEN	BALCLUTHA Kirkaldy,1900																												

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249	B.punctata (Fabricius,1775)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5				3
250	B.rhenana W.Wagner,1939	DD	LC	1948	2005	1	5	5	5	5	5	5	5	5	5	5	5	5	5								
251	B.calamagrostis Ossiannilsson,1961	LC	LC	1973	2005	1	5	5	5		5	5	5		5	5											
252	B.boica W.Wagner, 1940		LC	1991	2005	1			5						5	5			5	5	5	5	5	5			
253	B.arhenana Dlabola,1967		LC	1978	2004	1	5	5	5	5	4	5	5					5		5							
GEN	MACROSTELLES Fieber,1866																										
254	M.septemnotatus (Fallen,1806)	LC	LC	<1871	2005	1	5	5	5	5	3	5	3	1*	2*	3*	3	5	2*	5	3*	3*	3*		3		
255	M.oshanini Razvyakina,1957		CR		2005	1		5																			
256	M.variatus (Fallen,1806)	LC	LC	<1871	2005	1	2	4	5	5	0	5	5				5	5	5	5	5	5	5	3*			4
257	M.sexnotatus (Fallen,1806)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	5	5	3	5	5	5	5		4	5	3	5	3
258	M.ossiannilssoni Lindberg,1953	DD	LC	1948	2005	1		4	5	3	5	5	4				3	5									
259	M.alpinus (Zetterstedt,1828)	LC	LC	<1871	2005	1		4					5				3	2*		5		5	3	3	4	5	5
260	M.cristatus (Ribaut,1927)	LC	LC	1925	2005	1	5	5	5	5	3	5	5		2	3	3	5	2	5	3	5	3*	5	3		3
261	M.laevis (Ribaut,1927)	LC	LC	1890	2005	1	5	5	5	5	5	5	5	5	2	3	1	5	5	5	2	3	3	4	4		3
262	M.fieberi (Edwards,1889)	LC	LC	1920	2005	1	5	4		5	5	5			2*	3*	3	2	5			3		3	3		
263	M.lividus (Edwards,1894)	DD	LC	<1871	2005	1	5	5	5	5	5				2				5		3						
264	M.viridigriseus (Edwards,1924)	LC	LC	1916	2005	1	5	5	5	5	4	4			4				5		5						
265	M.quadripunctatulus (Kirschbaum,1868)	DD	LC	1950	2005	1	5		3			5	3					2	5	5		3*	5				
266	M.sordidipennis (Stål,1858)	DD	NT	1884	1994		1	4	2																		
267	M.empetri (Ossiannilsson,1935)	LC	NT	1926	2004					3									5	1		3		3	3	3*	
268	M.frontalis (Scott,1875)	LC	LC	1936	2005	1	5	4	4		5		3				3	2*	2*				5	3*	3		
269	M.horvathi (W.Wagner,1935)	LC	LC	<1871	2005	1	5	4	4	4	5	2	4		2*		3	2*	5	3*	3						
270	M.nubilus (Ossiannilsson,1936)	LC	LC	1935	2003	1	4	5	3	5	4	5	3				3	5	4	4							
GEN	EROTETTIX Haupt,1929																										
271	E.cyane (Boheman,1845)	DD	LC	<1871	2003	1		1	5	5			5					5									
GEN	SONRONIUS Dorst,1937																										
272	S.dahlbomi (Zettterswtedt,1838)	LC	LC	1920	2005	1	5	5	5	3	5	5	5	4	5			5	4			4	3*	5	4	5	5
273	S.binotatus (J.Sahlberg,1871)	LC	LC	1866	2005	1	2*	4	5	5	5	5	5	5	4	5	5	5		5	5	5		3*		5	5
274	S.anderi (Ossiannilsson,1948)	DD	CR	1949	1949			2																			
GEN	SAGATUS Ribaut,1948																										



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275	S.punctifrons (Fallen,1826)	LC	LC	1869	2005	1		5	5	5	5	5	5	3	4	5	3	5	5	5	5						
GEN	DELTOCEPHALUS Burmeister,1838																										
276	D.pulicaris (Fallen,1806)	LC	LC	<1871	2005	1	5	5	4	3	4	5	5	4	4	3	4	5	5	5	5	3	3*	4	4		4
GEN	ENDRIA Oman,1949																										
277	E.nebulosa (Ball,1900)	NT	NT	1974	2005	1		5	4			5						5									
GEN	DORATURA J.Sahlberg,1871																										
SG	DORATURA J.Sahlberg,1871																										
278	D.stylata (Boheman,1847)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	4	4	4	5	5		5						
SG	DORATURINA Emelyanov,1964																										
279	D.homophyla (Flor,1861)	DD	LC	1879	2004	1	0*					5	5	3				5									
GEN	PLATYMETOPIUS Burmeister,1838																										
280	P.undatus (Degeer,1773)	LC	LC	1869	2005	1	5	5	4	5	0	5	5	5				2									
GEN	IDIODONUS Ball,1936																										
281	I.cruentatus (Panzer,1799)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	4	3*	5	5	5	5	5	5	5	3	4		5
GEN	COLLADONUS Ball,1936																										
282	C.torneellus (Zetterstedt,1828)	LC	LC	1869	2005	1		5	5	5	4	5	3		2		5	5	5	5		3	5	4	5	5	5
GEN	ALLYGUS Fieber,1872																										
283	A.mixtus (Fabricius,1794)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	1*	2*	5	3	5									
GEN	ALLYGIDIUS Ribaut,1948																										
284	A.commutatus (Fieber,1872)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	3			3	5		3*							
GEN	GRAPHOCRAERUS Thomson,1869																										
285	G.ventralis (Fallen,1806)	LC	LC	<1871	2005	1		5	5	5	5	5	5	4	2*	3	4	5									
GEN	HARDYA Edwards,1922																										
286	H.tenuis (Germar,1821)	LC	CR $\alpha$	1840	1937		0	1	0		0	1	2					2*									
GEN	RHOPALOPYX Ribaut,1939																										
287	R.preyssleri (Herrich-Schaeffer,1838)	LC	LC	<1871	2005	1	4	5	5	3	3	5	5	4	2*	3*	3	5	2*		3						
288	R.adumbrata (C.Sahlberg,1842)	LC	LC	<1871	2005	1	5	4	5		3*	5		5													
289	R.vitripennis (Flor,1861)	LC	LC	<1880	2005	1	0	4	5			2	5		4		3*	5	5		5						
GEN	PALUDA DeLong,1936																										
290	P.flaveola (Boheman,1845)	LC	LC	<1871	2005	1	5	5	4	3	4	5	5	5	4	3*	5	5	5	5	4	5	3	3	3		3*

No	31.5.2006/GS	CS	aCS	First	Last		Al	Ab	N	Ka	St	Ta	Sa	Kl	Oa	Tb	Sb	Kb	Om	Ok	Obo	Obu	Ks	LkW	LkE	Le	Li
GEN	ELYMANA DeLong,1936																										
291	E.sulphurella (Zetterstedt,1828)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	4	5*	5	5	5	5	5	3	5	3	3	5	3*
292	E.kozhevnikovi (Zachvatkin,1938)	LC	LC	<1871	2005	1		5	5	5	5	5			4	5		5	5		5						
GEN	CICADULA Zetterstedt,1838																										
SG	CICADULA Zetterstedt,1838																										
293	C.quadrinotata (Fabricius,1794)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	3*	4	3*	3	5	3	5	5	3	5	3	3		3
294	C.persimilis (Edwards,1920)	LC	LC	1919	2005	1	5	5	4	5		3	5	5				5									
295	C.albingensis W.Wagner,1940	NT	LC $\alpha$	1973	2005	1			5			5															
296	C.rubroflava Linnavuori, 1952	DD	NT	1951	2005	1		4	4		3	5	4							4	5		5				
297	C.saturata (Edwards,1915)	LC	LC	1920	2004	1	4	4	5		4	5	5		3			3*	2								
298	C.quinquenotata (Boheman,1845)	LC	LC	<1871	2005	1	5	5	5	5	3	5	3*		4		3	2	3	3							3*
299	C.nigricornis (J.Sahlberg, 1871)		VU $\alpha$	2002	2003	1		5	5																		
300	C.flori (J.Sahlberg,1871)	LC	LC	1869	2004	1	5	4	5	5	3	5	5		1	5		5	3								
SG	CYPERANA DeLong,1936																										
301	C.intermedia (Boheman,1845)	LC	LC	1869	2005	1		4	3	3	3	5	1		2	3*	3	2	3	5	5	2	4	3	5	3	5
302	C.ornata (Melichar,1900)	LC	LC	1916	2004	1	5	5	5	5	4	5	5		5	5		5	5	5	5	5	5				
303	C.ciliata (Osborne,1898)	DD	DD	1981	1981																						3
SG	HENRIANA Emelyanov,1964																										
304	C.frontalis (Herrich-Schaeffer,1835)	DD	CR $\alpha$	1943	1943		2																				
GEN	SPEUDOTETTIX Ribaut,1942																										
305	S.subfuscus (Fallen,1806)	LC	LC	<1871	2005	1		5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5
GEN	HESIUM Ribaut,1942																										
306	H.domino (Reuter,1880)	DD	LC	<1871	2005	1		5	5	5		5	5	3		5	5	5									
GEN	THAMNOTETTIX Zetterstedt,1838																										
307	T.confins (Zetterstedt,1828)	LC	LC	<1871	2005	1	5	5	5	3	3	5	3	1*	2*		5	5	5	5	5	5	5	5	5	5	5
307b	T.confins f.stupidula (Zetterstedt,1838)	LC	LC	<1871	2005																					5	5
GEN	PITHYOTETTIX Ribaut,1942																										
308	P.abietinus (Fallen,1806)	LC	LC	<1871	2004	1		5	5	5	5	5	5	4	5	3*	2	5	2*	5	3*	5	5	3*			
GEN	PEROTETTIX Ribaut,1942																										
309	P.orientalis (Anufriev,1971)		EN	2004	2005	1						5															

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310	P.pictus (Lethierry,1880)		CR	2004	2004	1						5															
GEN	COLOBOTETTIX Ribaut,1948																										
311	C.morbillosus (Melichar,1896)	DD	CR	1947	2004	1		2				5				2	3										
GEN	MACUSTUS Ribaut,1942																										
312	M.grisescens (Zetterstedt,1828)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	4	5	5	5	5	5	5	3	5	5	3	4	5	5
GEN	DOLIOTETTIX Ribaut,1942																										
313	D.lunulatus (Zetterstedt,1838)	LC	LC	<1871	2005	1	2	5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	4	4	5	3	5
GEN	ATHYSANUS Burmeister,1838																										
314	A.argentarius Metcalf,1855	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	3	4	3*	3	5									
315	A.quadrum Boheman,1845	LC	LC	<1871	2005	1		5	5		0	4	5	5		2											
GEN	STICTOCORIS Thomson,1869																										
316	S.picturatus (C.Sahlberg,1842)	LC	NT	<1871	2005	1	0*	5	5	5	0	3		2			5										
SG	SCLERORACUS Van Duzee,1894																										
317	S.decumanus (Kontkanen,1949)	DD	LC	<1871	2005	1	5	4	5	5	5	5	5	4	4		3	2	4	5	5	3	5	5	3	5	3
318	S.identicus Tischechkin, 2003		DD	2002	2004	1							5														
319	S.corniculatus (Marshall,1866)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5		2*	5*	5	5	5	5	3	3					
320	S.orchalceus (Thomson, 1869)	LC	LC	1949	2005	1			5	5	5	5	5						5	5	5	3*	5	5			3*
321	S.russeolus (Fallen,1826)	LC	LC	<1871	2005	1		4	5		5	5	5				3*	5	5	5	5	5		3*	3*	3*	3
322	S.transversus (Fallen,1826)	LC	LC	1871	2005	1	1	1	4	4	4	5	5	4	2	4	3	5	2								3*
GEN	OPHIOLIX Ribaut,1942																										
323	O.paludosa (Boheman,1845)	LC	LC	<1871	2005	1	5	4	3	5	5	2	5		2*	2	3	2	5	5	5	2					
GEN	LIMOTETTIX J.Sahlberg,1871																										
324	L.striola (Fallen,1806)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	1*	5	5	3	5	5	5	5	5	3*			5	5
325	L.atricapillus (Boheman,1845)	LC	EN	1880	1948		0		2			2	2*					2									
326	L.sphagneticus Emeljanov,1964	DD	EN $\alpha$	1942	1973				2									2		3							
327	L.ochrifrons Vilbaste,1973	DD	EN	1942	2003	1			5									2									
GEN	LABURRUS Ribaut,1942																										
328	L.impictifrons (Boheman,1852)		CR	2002	2003	1							5														
GEN	EUSCELIDIUS Ribaut,1942																										
329	E.schenkii (Kirschbaum,1868)	LC	LC	1869	2005	1	2	4	2	5	4	5	5					5			3			3*			
GEN	EUSCELIS Brullé,1832																										

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330	E.distinguendus (Kirschbaum,1858)	LC	NT	1875	2005	1		5	5		4	3	5					3*									
GEN	EDERRANUS Ribaut,1942																										
331	E.sachalinensis (Matsumura,1911)	DD	RE	<1871	<1871						0																
332	E.discolor (J.Sahlberg,1871)	DD	CR	<1871	1994						4		0														
GEN	STREPTANUS Ribaut,1942																										
333	S.aemulans (Kirschbaum,1868)	LC	LC	1869	2005	1	4	5	5	5	5	4	5	5	3	3*	3*	2	2			3		3*	3		
334	S.sordidus (Zetterstedt,1828)	LC	LC	<1871	2005	1	2	4	5	5	4	5	5		4		3	1	2*	5		3		3	3	5	3
335	S.okaensis Zachvatkin,1948	DD	LC	1948	2005	1	5	3*	5		5					5						3*					3
336	S.confinitis (Reuter,1880)	LC	LC	1875	2005	1	2	5	5		5	5						5	5	5			5	3			3*
337	S.marginatus (Kirschbaum,1858)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	1*	2*	3*	4	4	5	5	4	3	5	3	4	5	5
GEN	PARAMESUS Fieber,1866																										
338	P.obtusifrons (Stål,1853)	LC	LC	<1871	2005	1	5	4	5	5	2																
GEN	CALAMOTETTIX Emeljanov,1964																										
339	C.taeniatus (Horvath,1911)		LC $\alpha$	2002	2003	1	5		5	5			5														
GEN	PARAPOTES																										
340	P.reticulatus (Horvath,1897)		CR	2003	2003	1			5																		
GEN	PARALIMNUS Matsumura,1902																										
SG	PARALIMNUS Matsumura,1902																										
341	P.phragmitis (Boheman,1847)	LC	LC	<1871	2005	1	5	5	5	5	5	3*		3	4	3*	3*	2	5		5						
342	P.zachvatkini Emeljanov,1964		EN $\alpha$	1866	2002	1			5					0													
SG	PARAGYGRUS Emeljanov, 1959																										
343	P.rotundiceps (Lethierry,1885)	DD	EN	1940	2002	1									4				2	5	4						
GEN	METALIMNUS Ribaut,1942																										
344	M.formosus (Boheman,1845)	LC	LC	<1871	2005	1	5	5	5	3	3*	5	4	0*	2*	3*	3	5	5	3*	3*	3*					
345	M.obtusus Emeljanov,1966		NT	1990	2003				5				4					5									
346	M.steini (Fieber,1869)		NA	2002	2002	1				5																	
347	M.marmoratus (Flor,1861)	LC	CR $\alpha$	<1871	1942		0	2	2		0	2	2		2*	3*	2*	2									
GEN	AROCEPHALUS Ribaut,1946																										
SG	ARIELLUS Ribaut,1952																										
348	A.punctum (Flor,1861)	LC	LC	<1871	2005	1	5	5	5	4	5	5	5	1*					5		5						
SG	AROCEPHALUS Ribaut,1946																										

No	31.5.2006/GS	CS	aCS	First	Last		Al	Ab	N	Ka	St	Ta	Sa	Kl	Oa	Tb	Sb	Kb	Om	Ok	Obo	Obu	Ks	LkW	LkE	Le	Li	
349	A.languidus (Flor,1861)	DD	RE	<1871	1942			1										2										
GEN	PSAMMOTETIX Haupt,1929																											
350	P.alienus (Dahlbom,1851)	LC	LC	1869	2005	1	5	5	5	5	5	5	5	5	2	3*	3	2	2									
351	P.cephalotes (Herrich-Schaeffer,1834)	LC	VU	<1871	2005	1	5	4																				
352	P.confinitis (Dahlbom,1851)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	4	3*	5	5	5	5	5	3	3	5			3	
353	P.sabulicola (Curtis,1837)	DD	CR	1912	2005	1					5								1		2							
354	P.nodosus (Ribaut,1925)	LC	LC	1940	2005	1		5	5		5	5	5		4				5	5		3	5	3	3	3	3	
355	P.albomarginatus W.Wagner,1941	DD	EN	1949	2001	1		2													5		2					
356	P.excisus (Matsumura,1906)	DD	EN $\alpha$	2002	2002	1							5															
357	P.dubius Ossiannilsson,1974	DD	LC	1973	2005	1	5	5	5	5	5	5	5	5	4				5			3		5	3	5	5	
358	P.frigidus (Boheman,1845)	DD	EN $\alpha$	1924	1924																						1	
359	P.lapponicus Ossiannilsson,1938		EN	2005	2005	1																					5	
360	P.pallidinervis (Dahlbom,1851)	DD	NT	<1871	2005	1		0			2	5	5						5		5							
361	P.poecilus (Flor,1861)	LC	LC	1869	2005	1	5	4	5	5	5	5	5	5			4	5	5								3	
362	P.slovacus Dlabola,1946		NT	1994	2005	1					5	5	5	5	4			5										
GEN	EBARRIUS Ribaut,1947																											
363	E.cognatus (Fieber,1869)	LC	LC	1869	2004	1		5	5		5	5	3					2*		5			3	5	3	5	3	
GEN	ADARRUS Ribaut,1947																											
364	A.multinotatus (Boheman,1847)		CR	2004	2004	1						5																
GEN	ERRASTUNUS Ribaut,1947																											
365	E.ocellaris (Fallen,1806)	LC	LC	1869	2005	1		2		4	0				5				5		4	4	5	5	3*	5	4	
GEN	TURRUTUS Ribaut,1947																											
366	T.socialis (Flor,1861)	DD	EN	1943	1991		2					4																
GEN	MONGOLOJASSUS Zachvatkin,1953																											
367	M.bicuspidatus (J.Sahlberg,1871)		CR	2002	2003	1							5															
GEN	JASSARGUS Zachvatkin,1933																											
SG	ARRAILUS Ribaut,1952																											
368	J.flori (Fieber,1869)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	4	3*	4	5	5	5	3*	3*	5					
369	J.alpinus ssp.neglectus (Then,1896)	DD	LC	1973	1989																	3			4		4	
SG	SAYETUS Ribaut,1952																											

No	31.5.2006/GS	CS	aCS	First	Last		Al	Ab	N	Ka	St	Ta	Sa	Kl	Oa	Tb	Sb	Kb	Om	Ok	Obo	Obu	Ks	LkW	LkE	Le	Li
370	J.sursumflexus (Then,1902)	DD	EN $\alpha$	1943	2004	1											2	5			3						
371	J.allobrogicus (Ribaut,1936)	LC	LC	1919	2005	1		5	5	4	5	5	5		4	4	3	4	5		5	4	2	3*	3		3
GEN	PINUMIUS Ribaut, 1947																										
372	P.areatus (Stål, 1858)		CR	1990	1990								4														
GEN	DIPLOCOLENUS Ribaut,1947																										
373	D.bohemani (Zetterstedt,1838)	LC	LC	<1871	2005	1		4	5	5	5	5	5	4	4	3*	4	5									
GEN	VERDANUS Oman,1949																										
374	V.abdominalis (Fabricius,1803)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	5	4	3	4
375	V.limbatellus (Zetterstedt,1828)	LC	LC	1924	2005	1			2						4	0							4	3	4	5	5
GEN	ARTHALDEUS Ribaut,1947																										
376	A.pascuellus (Fallen,1826)	LC	LC	<1871	2005	1	5	5	5	5	5	5	5	3	4	5	3	5	5	5	5	3	5	4	3		3*
377	A.striifrons (Kirschbaum,1868)	DD	RE	<1871	1950			3	0																		
GEN	ROSENIUS Oman,1949																										
378	R.laciniatus (Then,1896)	DD	VU $\alpha$	1972	2004	1																				5	3
GEN	SORHOANUS Ribaut,1947																										
379	S.xanthoneurus (Fieber,1869)	LC	LC	1880	2005	1		4	5	5	5	5	5		4		3	5	5	5		3	3	3	3	3	
380	S.assimilis (Fallen,1806)	LC	LC	1871	2004	1	2	4	5	5	2	5	3		4		3	2	5				3		3		
GEN	LEBRADEA Remane,1959																										
381	L.flavovirens (Gillette & Baker,1895)	NT	LC	1969	2005	1	5	5	5	5	4	5	5		5	5	5	5	5	5	5	5					5
GEN	COSMOTETTIX Ribaut,1942																										
SG	COSMOTETTIX Ribaut,1942																										
382	C.caudatus (Flor,1861)	LC	LC	<1871	2003	1	4	5	5	5		2	5		2*		2*	2	5					3			
383	C.edwardsi (Lindberg,1924)	DD	LC	1920	2005	1		3	5	3	2	5			3*		3	2		5		5		3			
384	C.evanescens Ossiannilsson,1976		EN	2004	2005	1		5				5	5														
385	C.panzeri (Flor,1861)	LC	EN	<1871	2004	1	1	2	5	?	0	2	3				3	2				3		3	3*		
SG	AIROSUS Ribaut,1952																										
386	C.costalis (Fallen,1826)	LC	LC	<1871	2005	1	5	5	5	5	5	2	5	3*	2	5	3	2	4	4	3		5	3			
GEN	BOREOTETTIX H.Lindberg,1952																										
387	B.bidentatus DeLong&Davidson,1935)	DD	NT	1942	2005	1		4	4			5			4			4	4		5	3		3	3		
GEN	MOCUELLUS Ribaut,1947																										

No	31.5.2006/GS	CS	aCS	First	Last		Al	Ab	N	Ka	St	Ta	Sa	Kl	Oa	Tb	Sb	Kb	Om	Ok	Obo	Obu	Ks	LkW	LkE	Le	Li
388	M.collinus (Boheman,1850)	DD	NT $\alpha$	1948	2004	1							5	5													
GEN	ERZALEUS Ribaut,1947																										
389	E.metrius (Flor,1861)	DD	LC	1959	2005	1		5	5	5	4	4	5		3	5	5	5		5							
	Last recording periods:																										
	0 = < 1900																										
	1 = 1900..1924																										
	2 = 1925..1949																										
	3 = 1950..1974																										
	4 = 1975..1999																										
	5 = 2000..	in 21st century			347		227	303	303	194	228	273	255	131	157	148	161	226	164	153	121	124	98	95	71	48	84
	? = may be outside present borders	% in 21st century			89,2031																						
	* = literature record, specimen not seen																										
	$\alpha$ = the class has been lowered																										
	bold =new provincial records of this research				1047		46	22	56	111	61	57	99	50	28	46	24	53	75	95	86	31	32	21	19	19	16
	% new						20,3	7,3	18,5	57,2	26,8	20,9	38,8	38,2	17,8	31,1	14,9	23,5	45,7	62,1	71,1	25,0	32,7	22,1	26,8	39,6	19,0
	Column abbreviation:																										
	CS = conservation status 2000																										
	aCS = assessed new conservation status																										
	First = first recording year from Finland																										
	Last = latest recording year from Finland																										
	Al - Li = provinces																										

## Appendix 2. Host plants of Auchenorrhyncha in Finland

Note. Species in brackets have not been confirmed by me or any of my colleague.

- Acer platanoides** – Alebra wahlbergi, Edwardsiana frustrator, Acericerus heydenii  
**Acer ginnala** – [Edwardsiana ampliata]  
**Achillea** – Agallia brachyptera  
**Achillea millefolium** – Chlorita paolii, Eupteryx tenella, Scleroracus transversus  
**Achillea ptarmica** – Evacanthus interruptus  
**Agrostis** – [Achorotile longicornis], Anoscopus albifrons, Rhopalopyx vitripennis, Psammotettix nodosus, [Psammotettix excisus]  
**Agrostis canina** – Achorotile albosignata, Xanthodelphax straminea  
**Agrostis capillaris** – Laodelphax striatella, Ribautodelphax collina, Doratura stylata, Ebarrius cognatus  
**Agrostis mertensii** – Psammotettix albomarginatus  
**Agrostis stolonifera** – Xanthodelphax straminea, Javesella dubia, Doliotettix lunulatus, Streptanus sordidus  
**Agrostis vineale** – Achorotile albosignata, Psammotettix albomarginatus, Ribautodelphax vinealis  
**Ajuga reptans** – [Emelyanoviana mollicula]  
**Alnus incana** – Oncopsis planiscuta, Oncopsis alni, Kybos smaragdula, Fagocyba cruenta, Edwardsiana menzbieri, Edwardsiana geometrica, Edwardsiana soror, Linnavuoriana intercedens, [Ribautiana ulmi], Typhlocyba quercus, Eurhadina pulchella, Alnetoidea alneti, Zygina tiliae  
**Alnus glutinosa** – Oncopsis avellanae, Oncopsis alni, Kybos smaragdula, Fagocyba cruenta, Edwardsiana alnicola, [Edwardsiana lanternae], Edwardsiana gratiosa, Edwardsiana geometrica, Eupterycyba jucunda, Linnavuoriana intercedens, Typhlocyba quercus, Alnetoidia alneti, Zygina tiliae  
**Alopecurus pratensis** – Megadelphax sordidula, Dicranotropis hamata, Javesella obscurella  
**Ammophila arenaria** – [Gravesteiniella boldi], Psammotettix sabulicola  
**Anthoxanthum odoratum** – Ribautodelphax angulosa, Graphocraerus ventralis  
**Arctium** – Eupteryx atropunctata  
**Arctostaphylos uvaursi** – Planaphrodes laeva, Scleroracus russeolus  
**Artemisia campestris** – Macropsidius sahlbergi, Chlorita paolii, Scleroracus identicus, Laburris impictifrons  
**Artemisia vulgaris var.coarctata** – Chlorita viridula  
**Astragalus alpinus** – Aphrodes bicincta  
**Avena sativa** – Javesella obscurella  
**Betula pendula** – Oncopsis flavicollis, Oncopsis subangulata, Oncopsis tristis, Oncopsis appendiculata, Kybos lindbergi, Edwardsiana bergmani, Linnavuoriana decempunctata  
**Betula pubescens** – Oncopsis flavicollis, Oncopsis subangulata, Oncopsis tristis, Kybos lindbergi, Edwardsiana bergmani, Linnavuoriana decempunctata, Zygina rosea  
**Bolboschoenus maritimus** – Stroggylocephalus agrestis, Coryphaelus gyllenhalii, Paramesus obtusifrons  
**Brachypodium pinnatum** – Adarrus multinotatus  
**Briza media** – Psammotettix cephalotes  
**Calamagrostis** – Criomorpus albomarginatus, Anoscopus albifrons, Paluda flaveola  
**Calamagrostis arundinacea** – Hyledelphax elegantula, Criomorpus borealis, Balclutha punctata, Allygus mixtus, Doliotettix lunulatus  
**Calamagrostis canescens** – Paraliburnia clypealis, Acanthodelphax denticauda, Xanthodelphax xantha, [Criomorpus moestus], Balclutha punctata, Endria nebulosa, Elymana kozhevnikovi, Cicadula flori, [Cicadula nigricornis], [Ederranus sachalinensis], Streptanus okaensis, Arthaldeus pascuellus  
**Calamagrostis epigejos** – Eurysula lurida, Stiroma affinis, Dikraneura variata, Balclutha punctata, Balclutha calamagrostis, Endria nebulosa, Rhopalopyx vitripennis, Psammotettix confinis, Psammotettix poecilus, Psammotettix slovacus, Errastunus ocellaris, Lebradea flavovirens  
**Calamagrostis purpurea** – Criomorpus borealis, Errastunus ocellaris, Diplocolenus bohemani  
**Calamagrostis stricta** – [Criomorpus moestus], Balclutha boica, Balclutha punctata  
**Calluna vulgaris** – Ulopa reticulata, Planaphrodes laeva, Erythria aureola, Zygina rubrovittata, Scleroracus orichalceus, Scleroracus corniculatus



- Carex** – *Megamelus notula*, *Delphacodes venosus*, *Javesella discolor*, *Javesella bottnica*, *Cicadella viridis*, *Forcipata forcipata*, *Macrosteles sexnotatus*, *Macrosteles fieberi*, *Macrosteles viridigriseus*, *Cicadula quinquenotata*, *Cicadula intermedia*, [*Cicadula ciliata*], *Macustus griseus*, *Ophiola paludosa*, *Limotettix sphagneticus*, *Boreotettix bidentatus*
- Carex acuta** – *Cicadula flori*, [*Cicadula frontalis*], *Metalimnus formosus*, *Cosmotettix costalis*
- Carex acutiformis** – [*Cicadula frontalis*], *Erzaleus metrius*
- Carex arenaria** – *Kelisia sabulicola*, [*Ommatidiotus inconspicuus*]
- Carex canescens** – *Cicadula ornata*
- Carex disticha** – *Florodelphax paryphasma*
- Carex elata** – *Metalimnus formosus*
- Carex ericetorum** – *Kelisia monoceros*, *Wagneriala minima*, [*Macrosteles empetri*]
- Carex globularis** – *Cicadula rubroflava*
- Carex hirta** – [*Metalimnus steini*]
- Carex lasiocarpa** – *Kelisia guttula*, *Cicadella lasiocarpae*, *Cicadula quadrinotata*, *Cicadula saturata*, *Limotettix atricapillus*, *Cosmotettix edwardsi*
- Carex leporina** – *Cicadula ornata*, *Jassargus flori*
- Carex limosa** – *Nothodelphax albocarinata*, *Cicadula saturata*, [*Metalimnus marmoratus*], [*Limotettix atricapillus*]
- Carex muricata** – *Kelisia monoceros*
- Carex nigra** – *Kelisia ribauti*, *Cicadula rubroflava*, *Cicadula saturata*, *Sorhoanus assimilis*
- Carex panicea** – *Kelisia pallidula*, *Sorhoanus assimilis*
- Carex riparia** – [*Cicadula frontalis*], *Erzaleus metrius*
- Carex rostrata** – *Paradelphacodes paludosus*, [*Javesella simillima*], *Forcipata citrinella*, *Cicadula rubroflava*, *Cicadula saturata*, *Limotettix ochrifrons*, *Metalimnus formosus*, *Sorhoanus assimilis*, *Cosmotettix costalis*
- Carex vesicaria** – *Kelisia guttula*, *Stenocranus fuscovittatus*, *Oncodelphax pullula*, *Stroggylocephalus agrestis*, *Cicadella lasiocarpae*, *Notus flavipennis*, *Macrosteles nubilus*, *Cicadula quadrinotata*, *Cosmotettix caudatus*
- Carlina biebersteinii** – [*Hephathus achilleae*]
- Cirsium** – *Centrotus cornutus*
- Corylus avellana** – *Edwardsiana avellanae*, *Edwardsiana stehliki*, *Edwardsiana plurispinosa*, *Alnetoidea alneti*
- Crataegus** – *Edwardsiana crataegi*, *Zygina flammigera*, [*Zygina angusta*], *Zygina rosincola*
- Cyperaceae** – [*Javesella pellucida*], *Neophilaenus lineatus*
- Dactylis glomerata** – *Stenocranus minutus*, [*Eurybregma porcus*], *Dicranotropis hamata*, *Cicadula persimilis*
- Deschampsia** – *Criomorpha albomarginatus*, *Javesella discolor*, *Paluda flaveola*
- Deschampsia caespitosa** – *Acanthodelphax denticauda*, *Javesella forcipata*, *Rhopalopyx adumbrata*, *Streptanus confinis*
- Deschampsia flexuosa** – *Stiroma bicarinata*, *Hyledelphax elegantula*, *Muellerianella brevipennis*, *Anoscopus albifrons*, *Dikraneura variata*, [*Hardya tenuis*], *Speudotettix subfuscus*, *Streptanus marginatus*, *Jassargus allobrogicus*
- Dryas octopetala** – *Rosenus laciniatus*
- Eleocharis** – *Limotettix striola*
- Eleocharis acicularis** – *Paradelphacodes litoralis*
- Eleocharis palustris** – *Euconomelus lepidus*
- Eleocharis uniglumis** – *Euconomelus lepidus*, *Paradelphacodes litoralis*, *Macrosteles lividus*
- Elymus repens** – *Eurybregma porcus*, *Dicranotropis hamata*, [*Balclutha arhenana*], *Rhopalopyx preysleri*, *Streptanus aemulans*, *Mocuellus collinus*, [*Pinumius areatus*]
- [**Endogaic**] – *Cixius nervosus*, *Cixius cunicularius*, *Cixius distinguendus*, *Cixius cambricus*, *Cixius similis*, *Pentastiridius leporinus*, *Cicadetta montana*
- Epilobium angustifolium** – *Sonronius binotatus*
- Equisetum** – *Notus flavipennis*, *Ophiola paludosa*
- Equisetum arvense** – *Javesella stali*
- Equisetum palustre** – *Javesella stali*, *Macrosteles frontalis*

- Eriophorum** – *Delphacodes venosus*, *Delphacodes capnodes*, *Nothodelphax albocarinata*, *Javesella discolor*, *Macrosteles fieberi*, *Macustus griseus*
- Eriophorum angustifolium** – [*Javesella simillima*], *Ommatidiotus dissimilis*, *Stroggylocephalus livens*, *Cosmotettix panzeri*
- Eriophorum vaginatum** – *Kelisia vittipennis*, *Nothodelphax distincta*, *Ommatidiotus dissimilis*, *Cicadula quinquenotata*, *Cosmotettix panzeri*, *Sorhoanus xanthoneurus*
- Festuca** – *Dicranotropis hamata*, *Criomorphus albomarginatus*, *Neophilaenus exclamationis*, *Dikraneura variata*, *Hesium domino*, *Jassargus flori*, *Arthaldeus pascuellus*
- Festuca ovina** – *Delphacinus mesomelas*, [*Stiromoides maculiceps*], *Acanthodelphax spinosa*, [*Kosswigianella exigua*], *Ribautodelphax pallens*, [*Neophilaenus minor*], *Eupelix cuspidata*, *Doratura homophyla*, *Rhopalopyx vitripennis*, *Streptanus marginatus*, *Arocephalus punctum*, *Psammotettix pallidinervis*, *Ebarrius cognatus*, [*Pinumius areatus*], [*Mongolojassus bicuspidatus*]
- Festuca polesica** – *Gravesteiniella boldi*
- Festuca pratensis** – *Elymana kozhevnikovi*, *Arthaldeus striifrons*
- Festuca rubra** – *Acanthodelphax spinosa*, *Doratura stylata*, *Rhopalopyx adumbrata*, *Rhopalopyx vitripennis*, *Psammotettix nodosus*, *Arthaldeus striifrons*
- Filipendula ulmaria** – *Micantulina pseudomicantula*, *Empoasca ossiannilssoni*, *Edwardsiana sociabilis*, *Eupteryx signatipennis*, *Macrosteles septemnotatus*, *Sonronius dahlbomi*, *Athysanus quadrum*
- Fragaria vesca** – *Zygina ordinaria*
- Frangula alnus** – *Zygina suavis*
- Galeopsis** – *Evacanthus acuminatus*
- Geranium sylvaticum** – *Centrotus cornutus*, *Batysmatophorus reuteri*
- Glechoma hederacea** – *Eupteryx vittata*
- Glyceria fluitans** – *Struebingianella lugubrina*
- Glyceria lithuanica** – *Struebingianella lugubrina*
- Glyceria maxima** – [*Ederranus discolor*]
- Holcus lanatus** – *Muellerianella fairmairei*
- Holcus mollis** – [*Muellerianella fairmairei*]
- Hypericum perforatum** – *Zygina hyperici*
- Juncus** – *Megamelus notula*, *Delphacodes venosus*, *Javesella discolor*, *Cicadella viridis*, *Macrosteles fieberi*, *Macrosteles viridigriseus*, *Cicadula intermedia*
- Juncus articulatus** – *Macrosteles sexnotatus*
- Juncus effusus** – *Conomelus anceps*
- Juncus conglomeratus** – *Conomelus anceps*
- Juncus filiformis** – *Macrosteles sexnotatus*, *Macrosteles alpinus*
- Juncus gerardi** – *Macrosteles sordidipennis*, *Macrosteles horvathi*
- Lamium** – *Evacanthus acuminatus*
- Ledum palustre** – *Scleroracus corniculus*
- Leymus arenarius** – *Unkanodes excisa*, *Psammotettix sabulicola*, *Psammotettix poecilus*
- Lolium perenne** – *Javesella obscurella*, *Arthaldeus pascuellus*
- Lonicera xylosteum** – *Empoasca apicalis*
- Lotus corniculatus** – *Megophthalmus scanicus*, *Anaceratagallia venosa*, [*Batracomorphus allionii*], *Aphrodes bicincta*
- Luzula** – *Forcipata forcipata*, *Macrosteles sexnotatus*
- Malus domestica** – *Fagocyba cruenta*, *Edwardsiana rosae*, *Edwardsiana crataegi*, *Alnetoidea alneti*
- Mentha arvensis** – *Eupteryx atropunctata*, [*Eupteryx collina*]
- Molinia caerulea** – *Muellerianella extrusa*, *Xanthodelphax xantha*, *Paluda flaveola*, *Macustus griseus*, *Arocephalus languidus*, *Psammotettix cephalotes*, *Jassargus sursumflexus*
- Nardus stricta** – *Javesella alpina*, *Doratura stylata*, *Turrutus socialis*
- Nuphar** – *Erotettix cyane*
- Nymphaea** – *Erotettix cyane*
- Origanum vulgare** – *Eupteryx atropunctata*
- Phalaris arundinacea** – *Stenocranus major*, *Paraliburnia adela*, *Balclutha rhenana*, *Paluda flaveola*, *Erzaleus metrius*
- Phleum pratense** – *Megadelphax sordidula*, *Javesella obscurella*

- Phragmites australis** – Delphax crassicornis, Delphax pulchellus, Euides basilinea, Chloriona chinai, Chloriona glaucescens, Chloriona smaragdula, Cicadella viridis, Ederranus discolor, Calamotettix taeniatum, Paralimnus phragmitis, Paralimnus zachvatkini, Paralimnus rotundiceps
- Picea abies** – Pithyotettix abietinus, Colobotettix morbillosus, [Perotettix orientalis], [Perotettix pictus]
- Picris** – Euscelis distinguendus
- Pilosella officinarum** – Eupteryx notata
- Pinus sylvestris** – Wagneripteryx germari, Grypotes puncticollis
- Plantago major** – Anaceratagallia ribauti
- Poaceae** – Laodelphax striatella, Javesella pellucida, Neophilaenus exclamationis, Neophilaenus lineatus, Planaphrodes bifasciata, Planaphrodes nigrita, [Anoscopus histrionicus], Anoscopus flavostriatus, [Zyginidia pullula], Macrosteles sexnotatus, Macrosteles cristatus, Macrosteles laevis, Deltocephalus pulicaris, Idiodonus cruentatus, Allygus mixtus, Allygidius commutatus, Elymana sulphurella, Thamnotettix confusus, Athysanus argentarius, Psammotettix alienus, Psammotettix confinis, Psammotettix dubius, [Psammotettix frigidus], Verdanus abdominalis, Verdanus limbatus
- Poa** – Criomorpha albomarginata, Arthaldeus pascuellus
- Poa alpigena** – [Criomorpha moestus]
- Poa annua** – Deltocephalus pulicaris, [Turrutus socialis]
- Poa pratensis** – [Muirodelphax aubei], Xanthodelphax flaveola, Ribautodelphax albocarinata, Deltocephalus pulicaris, Rhopalopyx preysleri
- Populus alba** – Populicerus albicans, Edwardsiana candidula, [Tremulicerus distinguendus]
- Populus balsamifera** – Populicerus nitidissimus
- Populus nigra** – Populicerus nitidissimus, Stenidiocerus poecilus, Kybos abstrusus
- Populus tremula** – Macropsis fuscinervis, Populicerus populi, Populicerus laminatus, Tremulicerus tremulae, Kybos populi
- Potamogeton natans** – Erotettix cyane
- Potentilla palustris** – Athysanus quadrum
- Prunella vulgaris** – Eupteryx vittata
- Prunus padus** – Alebra neglecta, Empoasca ossiannilssoni, Fagocyba cruenta, [Edwardsiana lanternae], Edwardsiana prunicola, [Edwardsiana soror], Zyginia flammigera
- Pyrus communis** – Edwardsiana crataegi
- Quercus robur** – Iassus lanius, Fagocyba carri, Typhlocyba quercus, Eurhadina pulchella, Eurhadina concinna, Eurhadina ribauti, Eurhadina kirschbaumi
- Rhyncospora alba** – Stroggylocephalus livens, Macrosteles ossiannilssoni, [Limotettix atricapillus]
- Ribes alpinum** – Zyginia nigritarsis
- Ribes x cultorum** – Zyginia nigritarsis
- Rosa** – Edwardsiana rosae, Edwardsiana sociabilis, Zyginia flammigera, Zyginia rosincola
- Rubus chamaemorus** – Arboridia parvula
- Rubus idaeus** – Macropsis fuscula, Empoasca kontkaneni, Zyginia ordinaria
- Rumex** – Agallia brachyptera
- Rumex acetosella** – Scleroracus decumanus
- Salix** – Linnavuoriana sexmaculata, Zyginia ordinaria
- Salix aurita** – Aphrophora pectoralis, Macropsis cerea, Idiocerus lituratus, Metidiocerus elegans, Populicerus confusus, Kybos butleri, Edwardsiana salicicola, Edwardsiana prunicola
- Salix caprea** – Aphrophora pectoralis, Macropsis infusata, Macropsis cerea, Idiocerus stigmatalis, Idiocerus lituratus, Metidiocerus elegans, Populicerus confusus, Kybos strigilifer, Edwardsiana salicicola, Edwardsiana menzbieri, Linnavuoriana sexmaculata
- Salix cinerea** – Aphrophora pectoralis, Macropsis cerea, Idiocerus lituratus, Metidiocerus elegans, Populicerus confusus, Edwardsiana salicicola
- Salix fragilis** – Idiocerus stigmatalis, Idiocerus lituratus, Idiocerus herrichii, Sagatus punctifrons
- Salix lapponum** – Edwardsiana tersa
- Salix myrsinifolia** – Metidiocerus elegans, Kybos sordidulus, Sagatus punctifrons
- Salix myrsinites** – Kybos sordidulus
- Salix pentandra** – Macropsis cerea, Idiocerus stigmatalis, Idiocerus herrichii, [Kybos volgensis]
- Salix phylicifolia** – Aphrophora pectoralis, Sagatus punctifrons
- Salix repens** – Macropsis impura, Idiocerus lituratus, Sagatus punctifrons

- Salix rosmarinifolia** – Metidiocerus elegans, [Sahlbergotettix salicicola]  
**Salix triandra** – Sagatus punctifrons  
**Salix viminalis** – Idiocerus stigmatalis, Edwardsiana salicicola, Sagatus punctifrons  
**Salvia** – [Emelyanoviana mollicula]  
**Satureja acinos** – Eupteryx origani, Eupteryx collina  
**Schoenoplectus lacustris** – Calligypona reyi, Coryphaelus gyllenhalii, Limotettix striola, Paramesus obtusifrons  
**Schoenoplectus tabernaemontani** – Calligypona reyi, Limotettix striola, [Parapotes reticulatus]  
**Scirpus sylvaticus** – Kelisia praecox, Javesella discolor, Cicadella viridis, Notus flavipennis, Macrosteles fieberi, Cicadula albingensis, [Cicadula frontalis], Macustus grisescens  
**Sorbus aucuparia** – Edwardsiana rosae  
**Stachys silvatica** – Evacanthus acuminatus, [Emelyanoviana mollicula]  
**[Subcortical]** – Cixidia confinis, Cixidia lapponica  
**Syringa josikaea** – Igutettix oculatus  
**Syringa reticulata** – Igutettix oculatus  
**Taraxacum** – Agallia brachyptera, Aphrodes makarovi, Euscelis distinguendus  
**Thalictrum** – Micantulina micantula  
**Thymus serpyllum** – Anaceratagallia estonica, Anaceratagallia lithuanica, Planaphrodes laeva, Chlorita dumosa, Scleroracus orichalcea  
**Tilia cordata** – Pediopsis tiliae, Alebra wahlbergi, Edwardsiana frustrator, [Ribautiana ulmi], Aguriahana stellulata, Alnetoidia alneti  
**Trichophorum** – Limotettix striola  
**Trifolium** – Agallia brachyptera  
**Tripleurospermum** – Pentastiridius leporinus  
**Triticum cereale** – Psammotettix alienus  
**Ulmus glabra** – [Edwardsiana ishidai], [Edwardsiana plebeja], Edwardsiana ulmiphagus, Ribautiana ulmi, Zonocyba bifasciata, Alnetoidia alneti, [Zygina angusta]  
**Ulmus x hollandica** – [Kyboasca bipunctata]  
**Urtica dioica** – Macropsis scutellata, Aphrodes makarovi, Eupteryx urticae, Eupteryx cyclops, Eupteryx calcarata, Macrosteles variatus, Euscelidius schenckii  
**Vaccinium** – Agallia brachyptera  
**Vaccinium myrtillus** – Aguriahana pictilis, Macrosteles variatus  
**Vaccinium oxycoccus** – Scleroracus russeolus  
**Vaccinium vitisidaea** – Scleroracus orichalceus  
**Vaccinium uliginosum** – Scleroracus corniculus  
**Vachlodea atropurpurea** – [Javesella alpina]  
**Verbascum** – [Emelyanoviana mollicula]  
**Veronica** – Eupteryx origani  
**Polyphagous** – Lepyrionia coleoprata, Aphrophora alni, Philaenus spumarius, Peuceptyelus coriaceus, Empoasca vitis, Empoasca pteridis

DOCUMENTATION PAGE

<i>Publisher</i>	Finnish Environment Institute (SYKE)			<i>Date</i> March 2007
<i>Author(s)</i>	Guy Söderman			
<i>Title of publication</i>	<b>Taxonomy, distribution, biology and conservation status of Finnish Auchenorrhyncha Hemiptera: Fulgoromorpha et Cicadomorpha</b>			
<i>Publication series and number</i>	The Finnish Environment 7/2007			
<i>Theme of publication</i>	Nature			
<i>Parts of publication/ other project publications</i>	The publication is only available in the internet: <a href="http://www.ymparisto.fi/julkaisut">www.ymparisto.fi/julkaisut</a>			
<i>Abstract</i>	<p>The Finnish Fauna of Auchenorrhyncha is richer than previously anticipated. At the end of this 4-year research 389 species are known from the country, which is 55 (17 %) more than was known during the latest 2000 assessment of species. Of the new species 13 has been found in more thorough taxonomic research. Thirteen species are believed to be old species with relic small occurrences in the country. Twenty-six species are considered expansive that have established permanent populations in Finland and 3 species are classified as long-distance migrants.</p> <p>Diversifying the collection techniques has brought much new faunistic knowledge. Of the known species ca 60 % have been collected with light-traps, ca 40 % with color traps, ca 50 % with interception traps and ca 20 % in pitfalls. More than 1,000 new regional records were made during the research period.</p> <p>The report highlights the plant dependence of the nymphs. Only 2.5 % of the native species are regarded as polyphagous. Monophages counts to 41.1 % and oligophages to 56.4 % of all species. The high degree of specialization and the tendency for selecting specific breeding habitats increase the rarity of the species and the potential loss of local populations due to changes in land use. Plant- and leafhoppers comprise a sensitive indicator group for ecological impact assessments.</p> <p>The information basis on the Finnish Auchenorrhyncha has grown considerably. Almost all species, ie. 380 (98 %) have now a good data basis for conservation assessment. Only 3 species are considered data deficient and 5 species are set in the category not applicable. Seven species are assessed to be regionally extinct, 17 to critically endangered, 37 to endangered and 26 to vulnerable. Near threatened species counts to 37 and 255 species have sustainable populations in Finland.</p>			
<i>Keywords</i>	Auchenorrhyncha, leafhoppers, faunistics, distribution, endangered animals, nature conservation			
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KUVAILOLEHTI

Julkaisija	Suomen ympäristökeskus			Julkaisu-aika Maaliskuu 2007
Tekijä(t)	Guy Söderman			
Julkaisun nimi	<b>Taxonomy, distribution, biology and conservation status of Finnish Auchenorrhyncha Hemiptera: Fulgoromorpha et Cicadomorpha</b> (Suomen kaskaiden (Hemiptera: Fulgoromorpha & Cicadomorpha) taksonomia, levinneisyys, biologia ja uhanalaisuus)			
Julkaisusarjan nimi ja numero	Suomen ympäristö 7/2007			
Julkaisun teema	Luonto			
Julkaisun osat/ muut saman projektin tuottamat julkaisut	Julkaisu on saatavana vain internetistä: <a href="http://www.ymparisto.fi/julkaisut">http://www.ymparisto.fi/julkaisut</a>			
Tiivistelmä	<p>Suomen kaskaslajisto on osoittautunut oletettua rikkaammaksi. Tutkimuksen loppuessa tunnetaan maastamme 389 lajia, mikä on 55 (17%) enemmän kuin edellisessä uhanalaisuusarviointityössä. Uusista lajeista 13 on löydetty tarkemmalla taksonomisella tutkimuksella, 13 arvioidaan olevan vanhoja lajeja, joiden reliktimäiset esiintymät löytyivät tarkemman kenttätutkimuksen avulla, 26 arvioidaan olevan tulokaslajeja, jotka ovat pystyneet muodostamaan pysyvän kannan maassamme ja 3 lajia pidetään tällä hetkellä todennäköisinä kaukokulkeutuneina lajeina. Keräilytekniikan monipuolistaminen erilaisilla pyydyksillä on huomattavasti lisännyt tietoa lajien levinneisyydestä. Tähän mennessä kaikista lajeista n. 60 % todettiin tulevan yöllä valolle, n. 40 % päivällä keltarysiin, n. 50 % lentoestepyödyksiin ja n. 20% on tavattu kuoppapyödyksistä. Tutkimuksen aikana tehtiin yli 1000 uutta maankuntahavaintoa.</p> <p>Ekologisista tutkimustuloksista tärkein on kaskastoukkien ravintokasvisidonnaisuus. Tutkimuksen mukaan vain n. 2,5 % lajien toukista ovat moniruokaiset, 41,1 % ovat yksiruokaisia ja 56,4 % eriasteisia harvaruokaisia lajeja. Lajien korkea erikoistuneisuusaste ja niiden taipumus valita vain tietynlaisia elinympäristöjä nostaa lajien harvinaisuutta ja esiintymien uhkaa hävitä maankäytön muuttuessa. Kaskaat on siten varsin herkkä indikaattoriryhmä ekologiisiin vaikutustutkimuksiin.</p> <p>Tietopohja Suomen kaskaista on kasvanut merkittävästi. Riittävät tiedot Suomen lajien uhanalaisuusarvioinnille katsotaan tällä hetkellä olevan n. 98 % (380) lajilla, kun se edellisellä arviointikerralla oli vain n. 65%. Nykyisin tunnetuista lajeista kolme pidetään puutteellisesti tunnettuina, joko taksonomisten epämääräisyyksien tai toukan ravintokasvitietojen puutteellisuuden takia. Viisi lajia kuuluisi luokkaan ei sovellettavissa (NA) eri syistä. Muista lajeista arvioidaan tällä hetkellä 7 olevan hävinneitä (RE), 17 äärimmäisen uhanalaisina (CR), 37 uhanalaisina (EN), 26 vaarantuneina (VU), 37 silmälläpidettävänä (NT) ja 255 lajin kannat ovat maassamme suotuisalla suojelutasolla.</p>			
Asiasanat	Auchenorrhyncha, kaskaat, faunistiikka, levinneisyys, uhanalaiset eläimet, luonnonsuojelu			
Rahoittaja/toimeksiantaja				
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Painopaikka ja -aika				

## PRESENTATIONSBLAD

Utgivare	Finlands miljöcentral (SYKE)			Datum Mars 2007
Författare	Guy Söderman			
Publikationens titel	<b>Taxonomy, distribution, biology and conservation status of Finnish Auchenorrhyncha Hemiptera: Fulgoromorpha et Cicadomorpha</b> (Stritarnas (Hemiptera: Fulgoromorpha & Cicadomorpha) taxonomi, utbredning, biologi och hotkategori i Finland.)			
Publikationsserie och nummer	Miljön i Finland 7/2007			
Publikationens tema	Natur			
Publikationens delar/ andra publikationer inom samma projekt	Publikationen finns tillgänglig endast på internet: <a href="http://www.ymparisto.fi/julkaisut">http://www.ymparisto.fi/julkaisut</a>			
Sammandrag	<p>Finlands stritfauna har visat sig vara rikare än förväntat. Vid avslutandet av detta forskningsprojekt känner vi 389 arter från landet, vilket är 56 (17%) mer än vid tidpunkten för föregående rödlisting. Av de nya arterna har 12 kunnat påvisats genom noggrannare taxonomiska studier, 13 bedöms vara gamla arter vilkas relikta förekomster har uppdagats genom noggrannare fältarbete, 26 anses vara nya expansiva arter som bildat populationer på 2000-talet och 3 bedöms för närvarande som långväga immigranter.</p> <p>Utvidgandet av insamlingstekniken till bruk av olika fällor har avsevärt ökat informationen om arternas utbredning i landet. Hittills har ca 60% påträffats i ljusfällor, ca 40% i gulskålar, ca 50% i fönsterfällor och ca 20% i gropfällor. Över 1000 nya landskapsfynd gjordes under perioden 2002-05.</p> <p>Rapporten poängterar vikten av stritnymfernas beroende av sina näringsväxter. Enligt rönen är endast 2,5% av alla arter polyfaga, 41,5% är monofaga och 55,9% oligofaga. Arternas höga specialiseringsgrad samt benägenhet att välja specifika biotoper ökar på arternas sällsynthet och populationernas risk att försvinna vid markanvändningsskiften. Stritarna är därvidlag en mycket lämplig indikatorgrupp för undersökning av ekologiska effekter. Kunskapsläget för stritarna har avsevärt förbättrats. Tillräcklig information för bedömning av hotkategori gäller för 98% (379 arter) av faunan medan motsvarande situation tidigare var 65%. Kunskapsbrist anses beröra enbart 3 arter för tillfället och 5 arter anses inte kunna bedömas av olika skäl. Sju arter bedöms vara försvunna, 17 som akut hotade, 37 som starkt hotade, 26 som sårbara, 37 som missgynnade och 255 har livsdugliga populationer i landet..</p>			
Nyckelord	Auchenorrhyncha, stritar, utbredning, utrotningshotade djur, naturskydd			
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Tryckeri/tryckningsort och -år				

The publication is a revision of the Finnish froghopper and leafhopper fauna (Hemiptera: Auchenorrhyncha) using modern systematics and nomenclature and combining a vast amount of recent findings with older ones. The biology of each species is shortly discussed and a link is given to the regularly updated species distribution atlas on the web showing detailed distribution and phenology of each species. An intermittent assessment of the conservation status of all species is made and the threat factors are shortly discussed.



PUTTE



Research  
programme  
of deficiently  
known and  
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