



# LEDRA

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## *LEafhopper Distribution Recording & Analysis*

Newsletter of the Auchenorrhyncha Recording Scheme for Britain & Ireland

### Editorial

Although this is the first newsletter for a while, there has been plenty of activity in the Recording Scheme. I am extremely grateful to everyone who has sent in their records on a regular basis. The website (<http://www.ledra.co.uk/>) continues to attract a healthy amount of traffic and is also the conduit for quite a number of enquiries. There has also been a steady flow of enquiries via email, mainly about identification matters, but some also on techniques, equipment or literature.

All the records of nationally notable and Red Data Book Auchenorrhyncha species that Peter Kirby accumulated when he was working on his species status review (Kirby, P. 1992. *A review of the scarce and threatened Hemiptera of Great Britain*) have now been digitized. These are important records covering some of the rarest species in Britain and have been incorporated into the scheme's database.

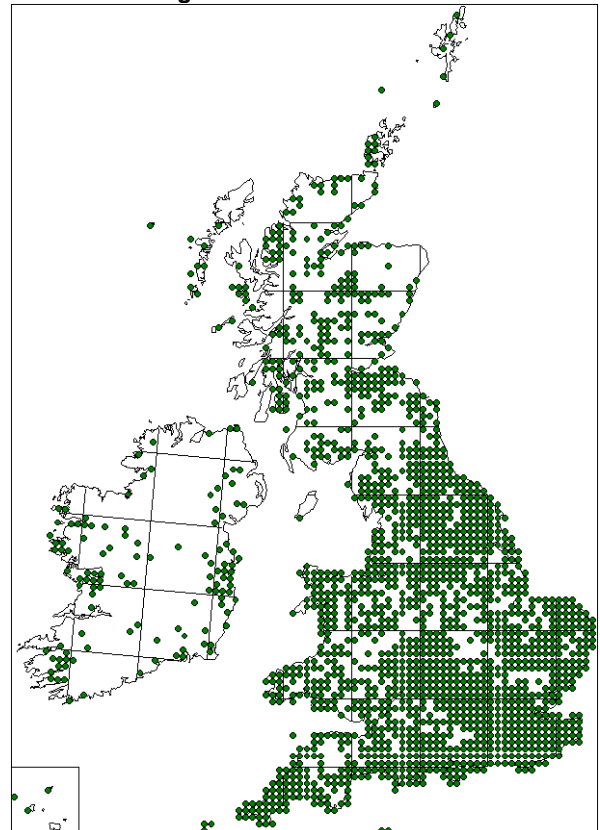
The database now stands at about 90,000 records across all species although there is still quite a backlog of data entry to be done from miscellaneous sources (old reports, published articles and correspondence). The map on the right shows the geographical coverage of all records mapped at the 10 km square level. Note, of course, that this map does not show the density of records or diversity of species in each 10 km square; each dot could represent one or several hundred records, of one or several species. Nevertheless, it does indicate good coverage for large parts of England, although there are some quite surprising gaps in odd places. This illustrates the importance of people submitting all their records to the recording scheme, even those for common species. It also shows the typical pattern for many recording schemes in the middle stages of development: poor coverage of Ireland (except parts of the west and east coasts) and much of the more remote parts of Scotland and mid-Wales. As always, I am very

grateful for any records submitted to the recording scheme, but especially for any of those 'white' areas that don't yet have any records.

At the individual species level, some distinct patterns are beginning to emerge. Quite a number suggest a strong climatic influence, with very few records, or none, for Scotland. It will be interesting to see if any of these species move north in future years, as has happened in some other insect groups.

**Alan Stewart, Co-ordinator, Auchenorrhyncha Recording Scheme**

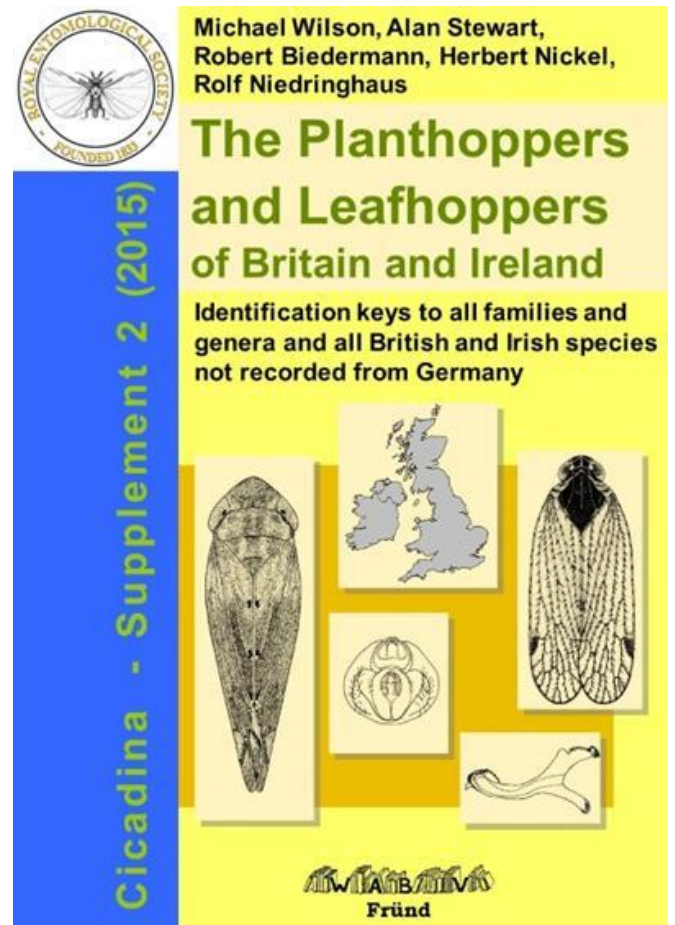
10-km square distribution map of all records currently held in the recording scheme database



## New reference book for Auchenorrhyncha in Britain and Ireland

Wilson, M.R., Stewart, A.J.A., Biedermann, R., Nickel, H. & Niedringhaus, R. (2015) *The Planthoppers and Leafhoppers of Britain and Ireland*. WABV-Fründ, Scheeßel.

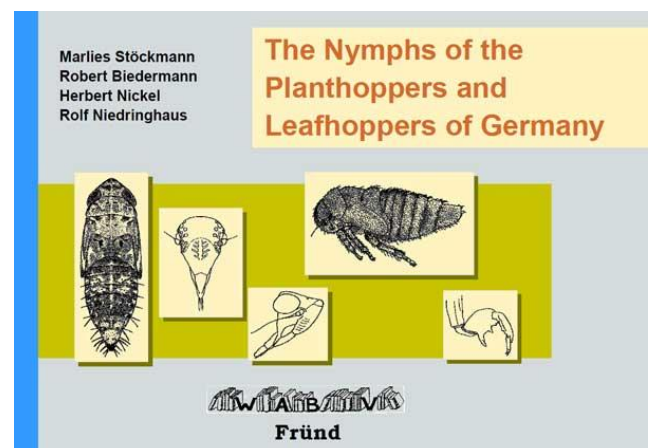
When it was published in 2009, *The Planthoppers and Leafhoppers of Germany* by Robert Biedermann and Rolf Niedringhaus quickly became one of the standard works for identifying Auchenorrhyncha in Britain. However, it contained many species that do not occur in this country, which caused some confusion when using the keys and descriptions. Likewise, it lacked a small number of species (mostly rather rare ones) that had been found in Britain but not in Germany. *The Planthoppers and Leafhoppers of Britain and Ireland* was put together specifically to fill these gaps. It contains an up-to-date checklist of all species occurring in Britain and Ireland (something that was badly needed given that the last one was published back in 1981 in the final RES handbook by Le Quesne & Payne), a revised key to families and genera dealing only with the species in Britain, descriptions of 18 extra species that were not included in Biedermann & Niedringhaus (2009), brief notes on species of particular interest and a full reference list. It is the second in a planned series of supplements to the original book tailored for individual countries or areas; the first dealt with the Benelux countries and a future one is planned for the Czech Republic. The book is available, price £35, exclusively from Pemberley Books: <http://www.pemberleybooks.com/>.



## New key to nymphs

Stöckmann, M., Biedermann, R., Nickel, H. & Niedringhaus, R. (2013) *The Nymphs of the Planthoppers and Leafhoppers of Germany*. WABV-Fründ, Scheeßel.

Recorders interested in Auchenorrhyncha have often been frustrated by the lack of a means of identifying nymphs, especially as they can greatly outnumber adults early in the season and some appear to be fairly distinctive. Various keys to species within genera or families have been published over the years, but a comprehensive treatment was lacking. This book brings together information from previously sources and adds many new species based on the authors' own collecting and rearing. Although there are still gaps in the



coverage, which the authors encourage other Auchenorrhyncha enthusiasts to help fill, and of course some will not be identifiable to species level in the nymphal stage anyway, this book will quickly

become the standard reference work for identifying nymphs of this group. It is available, price £72, from Pemberley Books: <http://www.pemberleybooks.com/>.

## The hunt for the New Forest Cicada using modern technology

The so-called New Forest Cicada, *Cicadetta montana*, has iconic status in Britain as our only species of cicada. It has only ever been reliably recorded in the New Forest, but no confirmed sightings have been reported since 1993 in spite of numerous attempts (and quite a bit of money spent) to find it. The fact that it may have a 7-8 year life cycle, most of it spent underground as an larva, means that a long time needs to elapse before it can justifiably be declared extinct in Britain. Optimists still hold out hope that it survives somewhere in the New Forest, and attempts are made each year to find it. It is very elusive, requires hot windless days at the right time of year (approximately six weeks around late May and early July) to be active and is best detected by its call. The problem is that the call is so soft and high-pitched that many people (and certainly those over the age of 40) cannot hear it. But perhaps that is where new technology can help.

An enterprising team of electronic engineers at Southampton University have developed a smartphone app that can be used to detect the cicada's call and record it as evidence along with a precise time and geo-location. The idea is that visitors to the forest leave the app running on their phone, perhaps while they are having a picnic, which will then detect if any cicadas are singing in the vicinity and relay any potential records back to

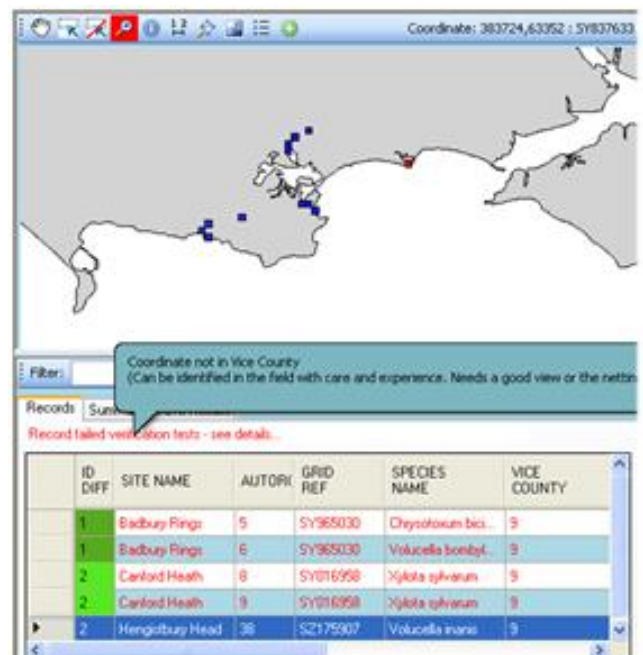


the project team. The app was launched in time for the 2013 season, but no confirmed records have materialised ... so far! You can read about the development of the app, how to download it and other material at:

<http://newforestcicada.info/>

## Record Cleaner software for data validation

This freely-available software has been written to help recorders improve the quality of their records before they pass them on to local record centres, recording schemes etc. It can be used to carry out two types of checking. First, it can check that all records are 'valid' in terms of conforming to a set of standard formats for attributes such as date, location and species name. Thus, records with ineligible dates (e.g. 31<sup>st</sup> April) and grid-references (e.g. SJ12345) are highlighted, as are incorrect spellings of the names of species and vice-counties. Secondly, it can be used to check for records that are doubtful in some way and should therefore be investigated further. Such instances might refer, for example, to grid-references that are in the sea or are outside the known range or season of the species concerned. *Record Cleaner* will accept data in a number of formats (including



Excel, text files and certain databases). Running the software produces a table of records that have failed the verification rules and therefore need checking, together with a distribution map (see above) to help spot records whose location looks suspicious.

The so-called 'verification rules' that define the limits beyond which records are flagged up have been set for many taxonomic groups

(including the Auchenorrhyncha) and can be downloaded with the software. Further information and a link to download the software can be found at:

<http://www.nbn.org.uk/Tools-Resources/Recording-Resources/NBN-Record-Cleaner.aspx>

## New species for Britain

Two new species have recently been added to the British list:

### *Japananus hyalinus*

This striking leafhopper represents both a new species and a new genus in Britain. It was discovered by Keith Edkins on Michaelmas daisies in his garden in Cambridge in August 2014 with further sightings in September and October of the same year. Keith has identified a number of



Auchenorrhyncha species in his garden, but this one looked unfamiliar so he posted a photo of it on the *UK Hoppers* Flickr website in case anyone could identify it. Herbert Nickel of Göttingen

University in Germany did so, suggesting that it was probably new for Britain. Keith has since constructed a whole web page about it: (<http://gwydir.demon.co.uk/insects/japananus.htm>).

It turns out that the species had been intercepted during inspections in 1999 of Japanese maple trees (*Acer palmatum*) imported from Korea, but it would have been destroyed. Its appearance in Cambridge therefore represents the first record in the wild in Britain. Japanese maples in other parts of the country would certainly be worth examining for this species.

### *Rhopalopyx elongata*

This is a much less striking leafhopper which can be separated from others in the genus only by dissection of a male. It was first found in suction samples at Lullington Heath NNR in East Sussex in 2013 taken by Alan Stewart who initially keyed it out using the RES Handbook to *R. vitripennis*, a species previously recorded only from Ireland. Reference to Biedermann & Niedringhaus (2009) however subsequently revealed it to be *R. elongata*. Tristan Bantock then found a second specimen at Wanstead Flats the following year and Nathalie Guérin found a further one at Ovingdean in East Sussex in 2015.

## All RES Handbooks on Auchenorrhyncha now available for free download

I reported in the last newsletter that three of the four Royal Entomological Society *Handbooks for the Identification of British Insects* pertaining to the Auchenorrhyncha by Walter Le Quesne could be downloaded for free as PDFs from the Society's website:

<http://www.royensoc.co.uk/content/out-print-handbooks>

I am pleased to report that the fourth and final handbook (Part 2c, covering the Typhlocybinæ) has now been added to the website. Although the last of these handbooks is now over thirty years old, and several species have been added to the British list since then, for me they still remain an essential source of information especially for their detailed written descriptions of species.

## News on Biodiversity Action Plan (BAP) / Section 41 species

### ***Erotettix cyane* (Pondweed leafhopper)**

It is very pleasing to report that new sites continue to be found for this species. It has now been recorded from Abingdon, Berkshire (Jonty Denton; *British Journal of Entomology and Natural History* 26, 94), Creech Heath, Dorset (Freshwater Habitats Trust), Ringwood, Hampshire (Chris Court) and Wartling, East Sussex (Graeme Lyons). Apart from presence of the host plant, the one feature that the ponds have in common seems to be very clean water.

### ***Doratura impudica* (Large dune leafhopper)**

Having characterised the distribution of this species around the south-east coast of Britain from Sandwich Bay, Kent to Holme, Norfolk, a survey

was conducted in 2013 of sand dunes in south-west England and South Wales. No further sites for the species were revealed. It was found, however, at two sites on the Lincolnshire coast in 2014 (Alan Stewart).

### ***Eurysanoides* (=Eurysa) *douglasi* (Chalk planthopper)**

Two sites for this species in Sussex were examined in some detail in 2014. Both populations were located in areas dominated by Tor grass (*Brachypodium pinnatum*) which is now assumed to be its host plant. Micro-habitat studies suggested that it was strongly associated with the presence of tussocks of this host plant species (Alan Stewart).

## A selection of notable records submitted to the recording scheme

### **CIXIIDAE**

#### ***Trigonocranus emmeae***

Joe Botting has made some remarkable observations of what appears to be a small colony of this species below ground in sparsely vegetated shingle around the edge of a pond in Llandrindod Wells. It is a rather enigmatic species that occurs very unpredictably in dry habitats that have a broken substrate, possibly because it spends much of its life underground.

### **DELPHACIDAE**

#### ***Asiraca clavicornis***

Having once been scattered but widespread across southern and eastern England, in recent years this species seemed mainly to have retreated to the Greater London area. It was therefore good to receive a record in 2013 from Sand Point in Somerset (Andy Foster).

#### ***Eurysella brunnea***

There has been a very slow accumulation of records for this species since it was first reported in Britain in 1992. The latest is from Shrewsbury (Keith Fowler).

#### ***Prokelisia marginata***

This species is native to North America but is now well established around the coasts of southern Britain wherever its host plant, *Spartina anglica*, grows in reasonably large stands. It has been reported from East Anglia, along the south coast of England, right round to the northern side of the Gower peninsula. The most recent records that extend its known range are Gibraltar Point in Lincolnshire in 2014 (Alan Stewart) and Paull Strays on the northern side of the Humber estuary in 2015 (Bill Dolling).

It would be interesting to know how far north the distribution of this species now extends in Britain. As one goes north, *Spartina* becomes rather scarce on the east coast due to a lack of suitable habitat, but it extends much further and more continuously on the western side of the

country. Any more northerly records from the east or west coast would be very gratefully received.

### ***Laodelphax striatella***

Mick Talbot sent this photograph to iSpot of a planthopper that he had found in Lincoln. The distinctive dark patch in the middle of the rear margin of the fore-wing strongly suggested it was *L. striatella*, a species which has been recorded only very occasionally in Britain. It is much better known



as a rather serious crop pest in tropical countries, especially on rice in south-east Asia. It is well known to be a long-distance migrant, so individuals found in Britain have probably been blown here by air currents and may never form permanent populations.

### ***Paraliburnia clypealis***

Predominantly found in fenland habitats, with a focus in East Anglia and The Fens, this species was recorded in 2014 in wet grassland at Whitchurch, Shropshire (Keith Fowler).

### ***Xanthodelphax flaveola***

With only a scattering of records across southern England, it was surprising to receive a report of this species from Llandrindod Wells (Joe Botting).

## **ISSIDAE**

### ***Issus coleoptratus***

First record for Cambridgeshire (VC29): a colony of nymphs and adults on ivy in a garden in Cambridge, May 2015 (Keith Edkins). Records for this species now cover large areas of England and Wales. Has anyone looked for it on ivy in Scotland?

## **CICADELLIDAE**

### ***Athysanus argentarius***

Historically confined to coastal sites in the south-east of England, this species has undergone a spectacular expansion of its range across Britain over the last thirty years or so. It has now reached Inkle Moor in South Yorkshire (Jim Flanagan).

### ***Orientus ishidae***

This species is apparently now widely established in the London area since its first discovery in Peckham by Penny Frith in 2011. In



2014 however, it also turned up in Cambridge (Keith Edkins) and on sticky traps set in nurseries in Hampshire and Bedfordshire to monitor for potentially invasive plant pests (FERA). Penny took this photograph of the highly distinctive nymph of this species.

### ***Fieberiella florii***

Apparently now quite widespread in the London area, this species was identified from material caught in a Malaise trap that had been operated in the wildlife garden of the Natural History Museum in London in October 2012 (Tristan Bantock).

### ***Placcotettix taeniatifrons***

Previously reported only from London (Kew and Blackheath) and Sandy in Bedfordshire, this *Rhododendron*-feeding species was reported from the Reading University campus in September 2013 (Chris Foster).

## ***Sagatus punctifrons***

Historically, records for this species were confined to West Sedge Moor on the Somerset Levels and Woking in Surrey. More recently, it has been reported from the Ouse Washes in Cambridgeshire (Martin Drake), Little Paxton Pits in Huntingdonshire (Peter Kirby) and most recently in 2014 at Mission Carr Nature Reserve in Nottinghamshire (Jim Flanagan).

## ***Arthaldeus arenarius***

This species was first recorded by Peter Kirby at Orton Pit SSSI in Huntingdonshire in 2010. He then discovered that specimens of this species had been overlooked in previous samples from Connington in Huntingdonshire and March in Cambridgeshire. More recently, Colin Lucas has found it at three sites in Suffolk in 2013, including on the RSPB reserve at Lakenheath Fen in Suffolk. In all cases, it was collected off *Calamagrostis epigeios*, its assumed host plant.

## ***Psammotettix frigidus***

Previously known only from Scotland, this upland species has now been reported from Llandrindod Wells, Powys (Joe Botting).

## ***Acericerus* species**

The two *Acericerus* species recently reported as new to Britain from south-east England seem to have spread quickly. Records for *A.*

*heydenii* come from Colchester in Essex (Sven Wair) and Easney Woods in Hertfordshire (Sam Jones), but it has also reached Shotesham in Norfolk (Andy Musgrove). *A. ribauti* has been reported from as far west as Bristol (Tony Smith) and as far north as Edenthorpe in South Yorkshire (Stuart Foster).

## ***Eupteryx decemnotata***

First reported in 2002 in Berkshire (Maczey & Wilson, 2004; *British Journal of Entomology & Natural History* 17: 111-114), this species has clearly been spreading fast, no doubt assisted by the transportation of its food plant, garden sage, *Salvia officinalis*. It has now been reported from Southsea in Hampshire (Ian Thirlwell) and as far north as Holme in Lancashire in July 2013 (Stuart Sharp) and Warrington in Cheshire in July 2014 (Phil Brighton).

## ***Liguropia juniperi***

This species is now regularly recorded in the London area. A record from South Hampshire in 2013 (Scotty Dodd) suggests that it may be spreading.

## ***Zyginella pulchra***

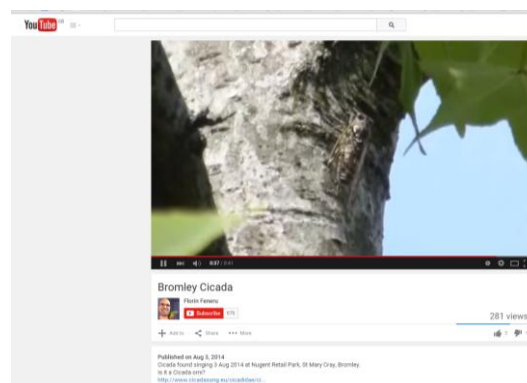
First reported in Kent in 2001 (Bleicher *et al.*, 2007; *British Journal of Entomology & Natural History* 20: 139-141), Further range expansion has taken this species to Warrington in Cheshire (Clive Washington).

## **The curious case of the Bromley cicada**

Florin Feneru of the Angela Marmont Centre for UK Biodiversity at the Natural History Museum in London posted an 8-minute video on YouTube of what was clearly a cicada “singing” on a tree trunk. The notes explained that the footage was not taken in the warmth of the Mediterranean region, but in a retail park in Bromley (SE London) on 3<sup>rd</sup> August 2014. Florin speculated that it might have been *Cicada orni*, a widespread species in southern Europe. The overall appearance and the nature of the call was certainly consistent with it belonging to this species, but the lack of any recognisable benchmark made it difficult to determine the size of the insect.

There have been previous records of non-native cicadas found as dead specimens in Britain before; I recall one in Kent a few years ago, which

was assumed to have hatched out from the roots of nursery trees imported from the continent. However, to my knowledge, this is the first confirmation of a live individual, and furthermore of one that was actually singing.



## ‘Ease of identification’ table

As with any group of organisms, not all species of Auchenorrhyncha are equally easy to identify. Some are sufficiently distinctive that they can be readily identified in the field, perhaps even by someone who is relatively inexperienced with this group of insects. The strikingly coloured black and red froghopper *Cercopis vulnerata* would be a good example. At the other extreme, there are species that even the experts struggle with. Of course, most species lie somewhere in between.

It was apparent that newcomers to the group would find it useful to have some guidance on this, particularly with respect to the species for which they should seek confirmation from someone with more experience. Accordingly, and in parallel with other recording schemes engaged in similar exercises, I have classified all Auchenorrhyncha species in terms of (i) their identification difficulty,

(ii) the level of expertise required in the recorder, and (iii) the type of evidence needed. The 5-point scale (1 = easy; 5 = most difficult) forms one of the ‘rule sets’ for the *Record Cleaner* software described above. For simplicity, the classification applies only to adult insects, the easier of the two sexes (usually males) and the easier or most common of different wing forms (usually brachypters) in species that are wing polymorphic.

The table of species and difficulty ratings will be posted on the Ledra website. The ratings are not set in stone; I would be pleased to hear from anyone who feels that the rating for a particular species should be adjusted up or down in the light of their own experience. Above all, I hope that the ratings will help novices gauge whether or not their identifications need to be checked.

ID Difficulty	Auchenorrhyncha (adults)	Total number of species
1	Can be identified in the field by anyone with a bit of experience. Species which beginners can rapidly learn to identify. Usually identifiable from a photo. Records acceptable from most sources.	63
2	Can be identified in the field with care and experience. Needs a good view or capture followed by examination with a good quality lens. Beginners should take voucher specimens until they gain familiarity and experience. May be identifiable from a good photo. Records acceptable from competent recorders.	105
3	Species that require examination of external characters (including externally visible genitalia structures) under a microscope with good lighting, but where identification is then relatively straightforward. May apply to females of species in which identification of males is easier. Identification accepted from experienced recorders (unless season, region or habitat is unusual), but less experienced ones would be expected to provide a specimen.	124
4	Species that are difficult to identify, often requiring dissection (although identification may not be conclusive in females). All except very experienced recorders could be expected to provide a specimen, particularly if the record is outside the known season or geographic range of the species.	86
5	Species that can only be identified following critical assessment, usually involving dissection and microscopic examination of genitalia. A specimen should always be retained for confirmation. May require consultation of specialist literature or comparison with verified reference material. Identification needs confirmation by a national expert. Even experienced recorders should seek a second opinion.	25

## Checklist of Auchenorrhyncha in Ireland

Anyone intending to record Auchenorrhyncha in Ireland will find it helpful to consult the most recent checklist of species published by Jim O’Connor and Brian Nelson, which brings up to date previous checklists published by Halbert in 1935 and de Courcy Willams in 1989:

O’Connor, J.P. & Nelson, B. (2012): *An annotated checklist of the Irish Hemiptera and small orders*. 151pp. The Irish Biogeographical Society, Dublin.

It shows that the total Auchenorrhyncha list for Ireland now stands at 209 species.



## Biographies of significant Auchenorrhyncha workers

This is the first in what is intended to become a series of occasional short biographies of people who have made significant contributions to the study of Auchenorrhyncha. **Jim Flanagan** writes about the life of the Russian entomologist Dr. Aleksei Zachvatkin who made many discoveries of new species of Auchenorrhyncha in his own country as well as further afield, most notably in southwest Asia (including Iran and Turkey).

### Dr. Aleksei Alekseevich Zachvatkin (1905-50)

A. A. Zachvatkin was born in 1905 in the town of Ekaterinburg, located in central Russia (east of the Ural mountain range). He spent most of his early years with his family in Switzerland. In 1913 the family returned to Russia to live in Moscow. After the October Revolution of 1917 the family situation became somewhat precarious due to their aristocratic origins. However, Zachvatkin was able to pursue informal studies at the Herbarium and Zoological Museum of Moscow University until 1926. Following this he was invited to work as a laboratory technician in the Central Asian Institute of Plant Protection, where he worked until 1931. During this time he became an



entomological specialist and published several papers on Auchenorrhyncha, Orthoptera, Coleoptera (Meloidea - oil beetles) and Diptera (Bombyliidae - bee flies).

Zachvatkin then moved to Leningrad to work at another plant protection institute and from 1933 he worked as a senior research officer at Moscow State University (MSU). In 1941 he became a Professor in the Department of Entomology and in 1950 the university's Director of the Research Institute of Soil and Biology. Among his many areas of expertise were arthropod embryology, acarology (mites) and the taxonomy of

Auchenorrhyncha: these were studied particularly in relation to crop health and protection (particularly of wheat) and his work was of great importance during WWII when high crop yields were essential to meet widespread food shortages. However, over many years he was able to undertake field work in several locations where he collected and described many new species of Auchenorrhyncha including the British species *Aphrodes makarovi* (which was previously recognised in Britain as a form of *A. bicinctus*), *Eupteryx origani* and *Streptanus okaensis*.

From the time he was attending informal further education at Moscow University and with the Central Asian Institute of Plant Protection, he developed into an effective field worker from his involvement in various scientific expeditions in Russia. Between 1940 and 1949 he undertook various trips to European Russia and Central Asia. During his time at the Zoological Institute of MSU, he also undertook the identification of many specimens of Auchenorrhyncha that other entomologists, such as B. P Uvarov and his friend N. N. Jenjouriste, collected in the field from Italy, SE Europe, Turkey, Iran, and for others from places as far as northern China. This work required a great deal of taxonomic research often involving long series of revisional studies of sub-genera, genera and sub-families as the Auchenorrhyncha faunas of these regions were very poorly known in comparison with that of Western Europe. This pioneering work on little studied faunas resulted in him describing many new genera and species to science.

Against his will, he was made to conform to the theories of Lysenkoism in which the study of genetics was suppressed (resulting in scientists and biologists being executed or imprisoned) and was made Deputy Dean of the Faculty of Biology and Pedology of MSU. After a prolonged and fractious working relationship with officialdom and battling with depression, Zachvatkin died aged only 45 in 1950. However, his achievements were many. He was twice awarded the Laureate of the State Prize of the USSR for his work on acarology and arthropod embryology (1941 and, posthumously, in 1951). He published his first scientific paper when he was 18 years old (as A. A.

Yazykov, using his father's surname). From the mid-1920s he began to include the surname of his stepfather in published papers, finally abandoning his father's surname after losing his identity papers during a field expedition in the late 1920s when a band of counter-revolutionaries held him and other expedition members captive for a time. During his career he produced around 46 papers (also some appearing in German, English and French) and co-authored several more, mostly on Acari and Auchenorrhyncha. Between 1953 and 1955 many papers that he had left behind were published posthumously with the help of former colleagues and pupils. Many new species and genera of animals were named in his honour including the genus of mites *Zachvatkinella* Lange, 1954 in the family Acaronychidae. His collections are deposited in the Zoological Museum of Moscow State University.

### Selected bibliography of the works of A. A. Zachvatkin and other sources of information

Lindberg H. & Zachvatkin A. A., 1936, Homoptera Cicadina in Schwedisch-chinesische wissenschaftliche Expedition nach den nordwestlichen Provinzen Chinas, unter Leitung von Dr. Sven Hedin und Prof. Su Ping-chang. Insekten gesammelt vom schwedischen Arzt der Expedition Dr. David Hummel 1927-1930, Arkiv for Zoologi. Utgifvet af K. Svenska Vetenskaps-akademien. Stockholm 29(4): 1-18.

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Zazykov (Zachvatkin), A. A., 1929, Description D'Un nouvelle espece du genre Edwardsiana Jaz. 1929 (Homoptera, Eupterygidae) des environs de Moscou, Revue Russe d'Entomologie 23: 262-265. New genus (*Edwardsiana*) and new species *E. ruthenica* described new to science.

Zachvatkin A. A., 1933, Sur quelques Homopteres interessants de la faune Italienne, Memorie della Societa Entomologica Italiana 12: 262-272. Description of new genus *Jassargus*.

Zachvatkin A. A., 1933, Cicadula-Arten der sexnotata-Gruppe dem Nord-Kaukasus, Konowia. 1933. № 12. S. 47-50. *Cicadula ramigera* described new to science.

Zachvatkin, A. A., 1937, Deux Zyginidae nouvelles de Turquie (Homoptera, Euptergidae), Bulletin Soc. Nat. Moscou, S. Biologue T., 46 (6): 317-322. *Zyginidia obesa* and *Z. rostrata* described new to science from collections made in Turkey by N. N. Jenjouriste during 1934. (In Russian and French).

Zachvatkin, A.A., 1945, On Some European Species of *Selenocephalus* (Homoptera, Jassidae), Proceedings of the Royal Entomological Society of London (B) 14. PTS 1-2, pp. 6-9. *Selenocephalus rossicus* described new to science.

Zachvatkin, A.A., 1946, Studies on the Homoptera of Turkey, I-VII. Transactions of the Royal Entomological Society of London 97:148-176. Descriptions of three new genera (*Chunroceras*, *Mesagallia* and *Anacateragallia*) and several sub-genera; descriptions of fifteen species new to science including seven species of *Hardya* and *Selenocephalus uvarovi*. This was the first in a series of notes that Zachvatkin was intending to produce from the study of samples collected in Turkey by Dr B.P. Uvarov in 1931 and by N. N. Jenjouriste in later years.

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Zachvatkin, A.A., 1953, Biological and systematic notes on Cicadina fauna of central Russia., Sbornik Nauchnykh trudov. [Collection of Scientific Works]. Moscow: Moscow St. Univ. P. 205-209. (In Russian).

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Zachvatkin, A.A., 1953, Cicadiny peskov astrakhankogo zapovednika, Sbornik Nauchnykh trudov. [Collection of Scientific Works]. Moscow: Moscow St. Univ. P. 211-223. Description of new genus *Sahlbergotettix*.

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Zachvatkin, Y A, 2008, Zachvatkin (Jasykov), Aleksei Alekseevich, Encyclopedia of Entomology, Springer Netherlands (ed. John L. Capinera).

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## Recent literature:

Full lists of publications on leafhoppers in Britain and Ireland since 2000 can be found on the Ledra website. The following is a list of papers directly related to species occurring in Britain and published since the last newsletter:

- Anderson, A., Carnus, T., Helden, A.J., Sheridan, H. & Purvis, G. (2013): The influence of conservation field margins in intensively managed grazing land on communities of five arthropod trophic groups. – *Insect Conservation and Diversity* 6, 201-211.
- Badmin, J.S. (2013): Cord-grass planthopper *Prokelisia marginata* (Van Duzee) (Hem: Delphacidae) in Devon. – *British Journal of Entomology and Natural History* 26, 49-50.
- Badmin, J.S. (2014): Adult *Ledra aurita* (L.) (Hemiptera: Cicadellidae) partially covered by the corticolous green alga *Desmococcus olivaceus*. – *British Journal of Entomology and Natural History* 27, 129-130.
- Bantock, T. & Harvey, P. (2013) *Dryodurgades antoniae* (Hemiptera-Auchenorrhyncha: Cicadellidae) new to Britain. *British Journal of Entomology and Natural History* 25: 75-77.
- Bluemel, J.K., Derlink, M., Pavlovčič, P., Russo, I.-R.M., King, R.A., Corbett, E., Sherrard-Smith, E., Blejec, A., Wilson, M.R., Stewart, A.J.A., Symondson, W.O.C. & Virant-Doberlet, M. (2014): Integrating vibrational signals, mitochondrial DNA and morphology for species determination in the genus *Aphrodes* (Hemiptera: Cicadellidae). – *Systematic Entomology* 39, 304-324.
- Burrows, M. & Sutton, G. (2013): Interacting gears synchronize propulsive leg movements in a jumping insect. – *Science* 341, 1254-1256.
- Denton, J. (2013) *Pithytettix abietinus* (Hemiptera: Cicadellidae) – new to Britain, from Surrey. *British Journal of Entomology and Natural History* 25: 199-200.
- Denton, J. (2013): *Erotettix* (= *Macrosteles*) *cyane* (Boheman) (Hemiptera: Cicadellidae) in Berkshire. – *British Journal of Entomology and Natural History* 26, 94.
- Denton, J. (2013): *Chloriona vasconica* Ribaut (Hemiptera: Delphacidae) in Middlesex (VC21). – *British Journal of Entomology and Natural History* 26, 170.
- Denton, J. (2014): *Colladonus torneellus* (Zetterstedt) (Hemiptera: Cicadellidae) in Surrey (VC17). – *British Journal of Entomology and Natural History* 27, 254.
- Flanagan, J. & Foster, S. (2014): *Streptanus okaensis* (Hemiptera: Cicadellidae) - a species of leafhopper new to Britain from south Yorkshire. – *British Journal of Entomology and Natural History* 27, 93-100.
- Guglielmino, A. & Bückle, C. (2015): Revision of Errhomeninae and Aphrodinae (Hemiptera, Cicadomorpha) in Italy with remarks on their variability and distribution in adjacent regions and description of three new taxa. – *Zootaxa* 3906, 1-+.
- Littlewood, N.A. (2012): Grazing impacts on Auchenorrhyncha diversity and abundance on a Scottish upland estate. – *Insect Conservation and Diversity* 5, 67-74.
- Lucas, C. (2013): Outcomes of the 2012 Suffolk Leafhopper Survey, including 13 new species for the county. – *White Admiral* 85, 16-18.
- Webb, M.D., Ramsay, A.J. & Lemaître, V.A. (2013): Revealing the identity of some early described European Cixiidae (Hemiptera: Auchenorrhyncha) - a case of forensic taxonomy; two new combinations and a name change for *Reptalus panzeri* in Britain. – *Acta Musei Moraviae, Scientiae Biologicae* 98, 57-95.

Further publications on Auchenorrhyncha studies done outside Britain but nevertheless very relevant to species occurring in this country include:

- Borchard, F. & Fartmann, T. (2014): Effects of montane heathland restoration on leafhopper assemblages (Insecta: Auchenorrhyncha). – *Restoration Ecology* 22, 749-757.
- Eschen, R., Brook, A.J., Maczey, N., Bradbury, A., Mayo, A., Watts, P., Buckingham, D., Wheeler, K. & Peach, W.J. (2012): Effects of reduced grazing intensity on pasture vegetation and invertebrates. – *Agriculture Ecosystems & Environment* 151, 53-60.
- Everwand, G., Rösch, V., Tschardtke, T. & Scherber, C. (2014): Disentangling direct and indirect effects of experimental grassland management and plant functional-group manipulation on plant and leafhopper diversity. – *Bmc Ecology* 14.
- Körösi, A., Batáry, P., Orosz, A., Rédei, D. & Báldi, A. (2012): Effects of grazing, vegetation structure and landscape complexity on grassland leafhoppers (Hemiptera: Auchenorrhyncha) and true bugs (Hemiptera: Heteroptera) in Hungary. – *Insect Conservation and Diversity* 5, 57-66.
- Rösch, V., Tschardtke, T., Scherber, C. & Batáry, P. (2013): Landscape composition, connectivity and fragment size drive effects of grassland fragmentation on insect communities. – *Journal of Applied Ecology* 50, 387-394.

- Rowe, H.I. & Holland, J.D. (2013): High plant richness in prairie reconstructions support diverse leafhopper communities. – *Restoration Ecology* 21, 174-180.
- Schuch, S., Bock, J., Krause, B., Wesche, K. & Schaefer, M. (2012a): Long-term population trends in three grassland insect groups: a comparative analysis of 1951 and 2009. – *Journal of Applied Entomology* 135, 321-331.
- Schuch, S., Wesche, K. & Schaefer, M. (2012b): Long-term decline in the abundance of leafhoppers and planthoppers (Auchenorrhyncha) in Central European protected dry grasslands. – *Biological Conservation* 149, 75-83.
- Wallner, A.M., Molano-Flores, B. & Dietrich, C.H. (2012): The influence of fire on Illinois hill prairie Auchenorrhyncha (Insecta: Hemiptera) diversity and integrity. – *Journal of Insect Conservation* 16, 433-445.
- Wallner, A.M., Molano-Flores, B. & Dietrich, C.H. (2013a): Evaluating hill prairie quality in the Midwestern United States using Auchenorrhyncha (Insecta: Hemiptera) and vascular plants: a case study in implementing grassland conservation planning and management. – *Biodiversity and Conservation* 22, 615-637.
- Wallner, A.M., Molano-Flores, B. & Dietrich, C.H. (2013b): Using Auchenorrhyncha (Insecta: Hemiptera) to develop a new insect index in measuring North American tallgrass prairie quality. – *Ecological Indicators* 25, 58-64.
- Zulka, K.P., Abensperg-Traun, M., Milasowszky, N., Bieringer, G., Gereben-Krenn, B.-A., Holzinger, W., Hölzler, G., Rabitsch, W., Reischuetz, A., Querner, P., Sauberer, N., Schmitzberger, I., Willner, W., Wrbka, T. & Zechmeister, H. (2014): Species richness in dry grassland patches of eastern Austria: A multi-taxon study on the role of local, landscape and habitat quality variables. – *Agriculture Ecosystems & Environment* 182, 25-36.

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