

A remarkable extension of the Dutch true hopper fauna with nine species (Auchenorrhyncha: Cicadellidae, Cixiidae & Tettigometridae)

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The Dutch planthopper and leafhopper fauna is still insufficiently known. Since the most recent fauna list of 2011, 35 new species were added. In 2018-2019, eleven species were recorded new for the Netherlands, nine are presented in this publication: *Cixius beieri*, *Tettigometra laeta*, *T. virescens*, *Balcanocerus pruni*, *Edwardsiana platanicola*, *Hauptidia maroccana*, *Ribautiana alces*, *Balclutha saltuella* and *Calamotettix taeniatus*. For at least six of these species, their occurrence in the Netherlands implies a northern range expansion, which could be related to climate change. The ecology and distribution of each species are discussed.

Introduction

Since the publication of the Dutch plant- and leafhopper fauna list in 2011 (Den Bieman *et al.* 2011), 35 new species have been described and added. These include 31 species of leafhoppers (Cicadellidae) (Den Bieman 2017, Den Bieman & Belgers 2017, Den Bieman & De Haas 2017, 2018, 2019, Den Bieman & Van Klink 2015) and four species of planthoppers, of which two belong to the families Cixiidae (De Haas & Den Bieman 2018), one to Delphacidae (Den Bieman 2016) and one to Tettigometridae (Den Bieman & De Haas 2019). In 2018-2019 again eleven species were collected for the first time in the Netherlands. Nine of them are included in this publication.

Species were discovered in different ways. Four species were collected by the use of light traps: *Cixius beieri* Wagner, 1939, *Ribautiana alces* (Ribaut, 1931), *Balclutha saltuella* (Kirschbaum, 1868) and *Calamotettix taeniatus* (Horváth, 1911). Three additional species were detected after publication of photos by citizen scientists on the website Waarneming.nl: *Tettigometra laeta* Herrich-Schäfer, 1835, *T. virescens* (Panzer, 1799) and *Hauptidia maroccana* (Melichar, 1907). Some leafhopper species are to be expected in the Netherlands based on distribution data from neighbouring countries. Searching specific hostplants yielded two of these expected species: *Balcanocerus pruni* (Ribaut, 1952) and *Edwardsiana platanicola* (Vidano, 1961).

At least six of the new species occur in southern Europe: this concerns *T. laeta*, *T. virescens*, *E. platanicola*, *H. maroccana*, *B. saltuella* and *C. taeniatus*. The increasing annual temperatures and warm summers in northern European regions may have facilitated their range expansion to the north.

The nine novel species are described in more detail below. The Dutch geographical coordinates (Amersfoortcoördinaten = AC) are given for each collection site. Unless stated otherwise, the

material was collected by the authors and preserved in their collections. For species not included in Biedermann & Niedringhaus (2004), references to taxonomic literature are given.

Cixiidae

Cixius beieri (figure 1)

Material Province of Limburg: Brunssum-Treebeek (AC 194.6-327.6), light trap, 4.vi.2019, 1♂, leg. G. Lommen, coll. C.F.M. den Bieman; same locality and method, May-June 2019, 1♂, leg. G. Lommen, coll. M. de Haas.

There are two morphotypes of *C. beieri* which differ in the length of the ventral apical spine of the phallosome. However intermediate specimens are also known from Germany. Based on the description of Holzinger *et al.* (2003), our material belongs to *C. beieri f. haupti*.

Cixius beieri is known to occur in the mountain areas between 400 and 1200 m above sea level, for example the Alps and the central European highlands (Nickel 2003). This species is known from Austria, Czech Republic, Georgia, Germany, Italy, Poland, Slovakia, Ukraine, Switzerland and Bulgaria, although the latter need confirmation (Emeljanov 2015, Holzinger *et al.* 2003, Jach & Hoch 2013).

Cixius beieri is found in Germany and Austria in open, montane coniferous forests, among the edges of bogs, meadows and clearing, usually in moist and cool habitats. Most adults were collected on coniferous trees (mainly *Picea*, *Pinus*), but also on (dwarf) shrubs (Holzinger *et al.* 2003). There is one generation a year, adults are present from June to August and they hibernate subterranean in the nymphal instar (Holzinger *et al.* 2003, Nickel 2003).



1. *Cixius beieri* ♀, Oberharz, Niedersachsen, Germany, 26.vi.1976, leg. R. Remane.
Photo: Gernot Kunz
1. *Cixius beieri* ♀, Oberharz, Nedersaksen, Duitsland, 26.vi.1976, leg. R. Remane.



2. *Tettigometra laeta* ♂, Terneuzen, Buitenhoofd (province of Zeeland), 14.vii.2019. Photo: Theodoor Heijerman
2. *Tettigometra laeta* ♂, Terneuzen, Buitenhoofd (Zeeland), 14.vii.2019.

The Dutch data are puzzling as these novel observations are from a non-mountainous area 102 m a.s.l. with ecological conditions not in line with data from Germany and Austria. Perhaps these are incidental observations, however males were collected on two different dates. The light trap with which both males were attracted is already functioning for several years and this is the first observation of *C. beieri*. Future sampling will reveal whether this species will be observed again, and thus if this species is able to establish in the Netherlands this would then suggest not only a range expansion but also a habitat shift.

Tettigometridae

Tettigometra laeta (figure 2)

Material Province of Zeeland: Terneuzen, in a dry sun-exposed corner of a garden (AC 48.6-371.9), 5.vii.2019, photo on website Waarneming.nl, leg. N. De Somer; Terneuzen Buitenhoofd, on an abandoned bicycle path along the Gent-Terneuzen canal (figure 3) (AC 45.4-372.8), 14.vii.2019, 1 ♂. At both locations the ant *Lasius niger* (Linnaeus, 1758) was collected as the sole ant species, leg. and coll. C.F.M. den Bieman.

For over a century no Tettigometridae was collected in the Netherlands until 2018 when *Tettigometra impressopunctata* Dufour, 1846 was discovered in southeast of the Netherlands (Den Bieman & De Haas 2019). In 2019, two additional *Tettigometra* species (*T. laeta* en *T. virescens*) were discovered in the Netherlands. In Belgium however, both species are relative more frequently observed, and occur in many places including the dunes and along the Gent-Terneuzen canal and they are often found in road verges and in industrial areas (K. Lock personal communication). Hence based on these Belgian data, the discovery of both *Tettigometra* species in the south-west of the Netherlands near the Gent-Terneuzen canal (Zeeuws-Vlaanderen) seems predictable. The Auchenorrhyncha fauna of Zeeuws-Vlaanderen is poorly known and could reveal more surprising species.

Tettigometra laeta occurs throughout most of Europe, except in the north, Austria, Belgium, Bulgaria, Czech Republic, France, Germany, Greece, Hungary, Italy, Moldavia, Romania, Slovakia, Spain, Ukraine, former Yugoslavia and it also occurs in North Africa (Jach & Hoch 2013) and Turkey (Demir & Demirsoy 2009).



3. Collecting site of *T. laeta* Terneuzen, Buitenhoofd (province of Zeeland). Photo: Kees den Bieman
3. Vindplaats van *T. laeta* in Terneuzen, Buitenhoofd (Zeeland).



4. *Tettigometra virescens*, Veszprém, Kisapáti (Hungary), 6.ix.2009. Photo: Gernot Kunz
4. *Tettigometra virescens*, Veszprém, Kisapáti (Hongarije), 6.ix.2009.

The biology of *T. laeta* is rather well known thanks to the study of Lehouck *et al.* (2004) in the Belgian dunes. It is a species that inhabits dry and sun-exposed localities. Interestingly, they can form a special mutualistic relationship with ants, called trophobiosis, meaning that ants provides protection while obtaining food from the planthopper. In the Belgian dunes for example, relations have been found with three ant species *Tetramorium caespitum* (Linnaeus, 1758) (Myrmicinae), *Lasius psammophilus* Seifert, 1992 and *Formica cunicularia* Latreille, 1798 (Formicinae). Ants were observed attending and palpating the dorsal glandular area of *T. laeta*, taking honeydew directly from its anus, herding them and carrying the planthoppers into their nests when disturbed. The planthopper was rarely found in the absence of ants and probably develops within ant nests, which may provide protection against predation and adverse weather conditions.

Tettigometra laeta occurs on different hostplants (Lehouck *et al.* 2004), both above ground (on the leaves of rosettes) as well as below ground (on the roots). It was found under grass tussocks, rosettes of different plant species, but was most often found on *Crepis capillaris*. From July till September ant nests were investigated (Lehouck *et al.* 2004). The black larvae of *T. laeta* were found in ant nests up to July 21st, and adults from the end of July until the end of September larvae have not been found outside ant nests, however on four occasions, ants were observed

to hold them between their mandibles and carry the larvae into their nest. Adults were also observed being carried in this way by ants into a nest when disturbed, although adults were more frequently 'herded'.

In Belgium, adults were observed from late June till mid September (Waarnemingen.be). There is one generation in a year and they overwinter as adults (Holzinger *et al.* 2003).

Tettigometra virescens (figure 4)

Material Province of Zeeland: Hulst municipality, Verdrongen Land van Saeftinghe - Schor van Baalhoek (AC 64.5-375.7), 18.viii.2019, one adult on *Daucus carota*, in vegetation on salt-marsh bank, photo on website Waarneming.nl, leg. N. De Somer.

The distribution area of *T. virescens* covers the whole Mediterranean region up to Central Europe: Austria, Belgium, Czech Republic, France, Germany, Greece, Hungary, Italy, Luxembourg, Poland, Portugal, Romania, Slovakia, Spain, Switzerland, Ukraine, former Yugoslavia and Latvia. This species also occurs in North Africa, the Near East (Jach & Hoch 2013, Niedringhaus *et al.* 2010) and Iran (Mozaffarian *et al.* 2018).

The biology of *T. virescens* is not thoroughly studied. Regarding the mutualistic relationship with ants, there is only one old Italian record that describes the relationship between *T. virescens* and the ant *Camponotus vagus* (Scopoli, 1763) (= *Formica pubescens*)



5. *Balcanocerus pruni* ♂, genitalia removed, Eys, De Piepert (province of Limburg), 28.vi.2019. Photo: Theodoor Heijerman
5. *Balcanocerus pruni* ♂, genitaliën verwijderd, Eys, De Piepert (Limburg), 28.vi.2019.



6. *Edwardsiana platanicola* ♀, 1 km nw Wittem, Eyserlinde (province of Limburg), 15.ix.2019. Photo: Theodoor Heijerman
6. *Edwardsiana platanicola* ♀, 1 km nw Wittem, Eyserlinde (Limburg), 15.ix.2019.

(Delpino 1872). *Tettigometra virescens* is frequently found along woody margins on xerothermic sites, on basic to acid substrates and occasionally in relative moist habitats. Most adults are found on low vegetation. This species is probably polyphagous on grasses and herbs. It has one generation in a year, adults are found year-round, but mainly from August till June and hibernation takes place in the adult stage (Holzinger 2009, Holzinger et al. 2003, Nickel 2003).

Cicadellidae-Idiocerinae

Balcanocerus pruni (figure 5)

Material Province of Limburg: 1 km nw Eys, Nature reserve De Piepert (AC 192.2-315.5), on *Prunus spinosa* along a sun-exposed path, 28.vi.2019, 4♂♀, 2♀, leg. C.F.M. den Bieman & M. de Haas; same locality and hostplant, 4.viii.2019, 2♀, leg. C.F.M. den Bieman.

A survey on the Dutch Idiocerinae was given by Mol (2013). He found that in north-west Europe 24 Idiocerinae species are present and only *B. pruni* was lacking in the Netherlands. In this paper the closely related *Balcanocerus larvatus* (Herrich-Schäffer, 1835) living on the same hostplant as *B. pruni* was reported as new for the Netherlands. Mol (2013) predicted that *B. pruni* might also be discovered in the Netherlands in the near future.

The males of *B. pruni* and *B. larvatus* can be easily separated by differences in male genitalia (Biedermann & Niedringhaus 2004). The differences in wing and frons coloration are however less species specific due to the variability within each species (own material and Mol personal communication). *Balcanocerus pruni* is relative smaller, with a body length of 3.8-4.2 mm, compared to *B. larvatus* with 4.0-4.6 mm (both for males and females) (Biedermann & Niedringhaus 2004). However, the body length of our Dutch material of *B. pruni* is in between 4.15 and 4.50 mm and French specimens in the collection of the first author have a length in between 3.80-4.15 mm. Hence, these data suggest that body length is not reliable method for identification of *B. pruni*.

Balcanocerus pruni has a relative limited distribution: Bulgaria, Austria, France, Germany, Greece, Italy and South European Russia (Holzinger 2009, Jach & Hoch 2013). *Balcanocerus pruni* and *B. larvatus* live monophagously on *Prunus spinosa*. It has a preference for dry, sun-exposed sites. The phenology of both *Balcanocerus* species differ: *B. pruni* hibernates in the adult stage, while *B. larvatus* hibernates in the egg stage. Both species have one generation. In Germany adults of *B. pruni* were collected from August till June (Nickel 2003). Our material was mainly collected in June.



7. *Hauptidia maroccana*, Amsterdam (province of Noord-Holland), 29.vii.2019. Photo: Weia Reinboud
7. *Hauptidia maroccana*, Amsterdam (Noord-Holland), 29.vii.2019.

Cicadellidae-Typhlocybinae

Edwardsiana platanicola (figure 6)

Material Province of Limburg: 1 km nw Wittem, Eyslerlinde (AC 192.6-314.7), on *Platanus x hispanica*, 15.ix.2019, 2♂, 4♀, leg. C.F.M. den Bieman.

It seems that the distribution of *E. platanicola* expands rapidly in Western Europe. The species is now known from Croatia, France, Greece, Italy, Montenegro, Portugal, Slovenia and Switzerland (Arzone et al. 2008, Jach & Hoch 2013, Seljak 2016) and it was recently collected from Belgium and Luxembourg (Lock 2019). The Dutch locality is at this moment the most northern one. *Edwardsiana platanicola* lives monophagously on (non-native) *Platanus* species: *Platanus occidentalis* (origin Northern America), *P. orientalis* (origin Balkan peninsula and Minor Asia) and their hybrid *Platanus x hispanica* (Arzone et al. 2008). This raises the question whether *E. platanicola* might be of alien (non-European) origin as listed in Daisy (2009) or might originate from the Balkans. This arboricolous species has two generations in a year, adults are found from April till October and it overwinters in the egg stage (Mühlethaler et al. 2018).

This species can be identified using Della Giustina (1989).

Hauptidia maroccana (figure 7)

Material Province of Noord-Holland: Amsterdam, Haarlemmer Houttuinen, small town garden (AC 121.2-488.3), on *Digitalis ferruginea*, 5.iv.2019, 10 adults; same location, mid v.2019, 2♂, 7♀ (2 teneral), coll. C.F.M. den Bieman; same locality and hostplant, 3.vii.2019, about 20 adults and many larvae; same locality on *Aegopodium podagraria*, 21.vii.2019, one adult, all leg. C.M.A. Reinboud with photos on the website Waarneming.nl; same locality, 5.vi.2019, 5 adults; same locality, 4.vii.2019, 10 adults, all W. Reinboud on website Waarneming.nl; same locality on *Solanum*, 10.vii.2019, 3 adults, leg. T. Zijp on website Waarneming.nl; Amsterdam, Herengracht (AC 121.3-488.1), 7.vii.2019, one adult, leg. C.M.A. Reinboud on website Waarneming.nl; Amsterdam, Brouwersgracht (AC 120.7-488.5), on *Digitalis ferruginea*, 8.vii.2019, one adult, leg. C.M.A. Reinboud on website Waarneming.nl; Amsterdam, Vinkenstraat (AC 121.0-488.3), on *Silene x hampeana* (*S. latifolia x dioica*), 8.vii.2019, one adult, leg. C.M.A. Reinboud on website Waarneming.nl; Amsterdam, Buiten Brouwersgracht (AC 121.1-488.2), *Digitalis ferruginea*, 9.vii.2019, 6 adults, leg.

C.M.A. Reinboud on website Waarneming.nl; Amsterdam, Westergasfabriek (AC 119.4-488.8), on *Lamium*, 11.vii.2019, 1 adult, leg. C.M.A. Reinboud on website Waarneming.nl; Amsterdam, Vinkenstraat (AC 120.4-488.9), mid v.2019, 1♂, 2♀ leg. C.M.A. Reinboud, coll. C.F.M. den Bieman; Amsterdam Haarlemmer Houttuinen, small town garden (AC 121.2-488.3), on *Digitalis ferruginea* and *Solanum nigrum* subspecies *nigrum*, 2.vii.2019, 5♂, 13♀; same locality and hostplant, 10.vii.2019, 1♂, 6♀, all leg. and coll. C.F.M. den Bieman; Amsterdam, Buiten Brouwersgracht (AC 121.2-488.1), on *Digitalis*, 2.vii.2019, 2♂, 1♀, leg. and coll. C.F.M. den Bieman; Province of Zuid-Holland: Den Haag (AC 78.2-454.9), on tomato *Solanum lycopersicum*, 29.vii.2019, 1♂, 2♀, leg. K. Oomes on website Waarneming.nl, coll. M. de Haas.

Hauptidia maroccana originates from the Mediterranean, but has expanded its range to the north. It occurs in Great Britain, France, North Africa, Portugal and Spain. Reports on former Yugoslavia are doubtful (Jach & Hoch 2013). In Great Britain *H. maroccana* was first discovered in western England and south Wales, and recently it is spreading outwards from this area (Botting & Bantock 2018).

After the first discovery of *H. maroccana* in a small town garden in Amsterdam on two *Digitalis ferruginea* plants, it was found on many localities in the vicinity. Even the smallest places, often only a small pot on the street, with a suitable hostplant, were enough for a prosperous population of *H. maroccana* (figure 8). The polyphagous character of this species is illustrated by the six different host plant families on which adults were collected at the Dutch localities: Apiaceae (*Aegopodium podagraria*), Caryophyllaceae (*Silene x hampeana* (*S. latifolia x dioica*), *Silene dioica*), Lamiaceae (*Lamium*), Onagraceae (*Epilobium hirsutum*), Plantaginaceae (*Digitalis ferruginea* adults and larvae of *H. maroccana*) and Solanaceae (*Solanum lycopersicum*, *Solanum nigrum* subsp. *nigrum* adults and larvae of *H. maroccana*). *Digitalis purpurea* and *Silene dioica* are the native hostplants in Great Britain, but *H. maroccana* is also often found on cultivated garden and greenhouse plants (Botting & Bantock 2018). Moreover, Alford (2012) listed ten other greenhouse plants on which *H. maroccana* has been found and. Other hostplants are described by Aguin Pombo & Baena (2002). Polyphagy is however exceptional in Auchenorrhyncha, as monophagy and oligophagy are the usual feeding strategies (Nickel 2003).

Hauptidia maroccana is known as a pest on tomato, mainly when growing under protected cultivation. The pest population can increase with the reduced use of broad-spectrum insecticides within 'integrated pest management'. Adults and nymphs are feeding at the mesophyll at the underside of the leaves. At the upper side of the leaves, white or pale mottling become visible where the chlorophyll is removed. In case of severe infestation, the leaves may appear chlorotic and resemble mineral deficiency (EPP0 2004), resulting in reduced growth of the plant. When a plant becomes badly infested, the leaves are soiled by the fluid excreted by the nymphs, which serves as a very suitable medium for the growth of moulds (MacGill 1932).

Eggs are deposited singly in the secondary veins on the underside of the leaves. Under greenhouse conditions, eggs hatch after about a week and nymphal development takes one month. The duration of the immature stages is extended under cool conditions. In wintertime, eggs take at least one month to hatch and nymphal development lasts two to three months. Adults survive in summertime for more than three months and each female can deposit over 50 eggs during her life (Alford 2012, Choudbury 2002).

The basic protection strategy is weed control around greenhouses to prevent the growth of alternative hostplants that could function as source of infestations. In addition, the egg



8. Collecting locality of *H. maroccana*, Amsterdam, Buiten Brouwersstraat (province of Noord-Holland). Photo: Kees den Bieman
8. Vindplaats van *H. maroccana*, Amsterdam, Buiten Brouwersstraat (Noord-Holland).



9. *Ribautiana alces* ♂, genitalia removed, Wageningen (province of Gelderland), 29.vi.2018. Photo: Theodoor Heijerman
9. *Ribautiana alces* ♂, genitaliën verwijderd, Wageningen (Gelderland), 29.vi.2018.

parasitoid *Anagrus atomus* (Linnaeus, 1767) can provide effective biological control if it is released at start at the first sign of damage (EPPO 2004).

The number of generations of *M. maroccana* under outdoor conditions in the Netherlands is not known. In Great Britain, adults were found from August to March (Botting & Bantock 2018). In the Netherlands, adults were collected from April to July.

This species can be identified using Ribaut (1936) (*H. maroccana* = *Erythroneura pallidifrons* (Edwards, 1924)).

Ribautiana alces (figure 9)

Material Province of Gelderland: Wageningen (AC 174.67-442.03), light trap, 29.vi.2018, 1 ♂ leg D. Belgers, coll. C.F.M. den Bieman.

Nast (1987) listed *R. alces* for the Netherlands, but his source is unknown. It was never included in Dutch fauna lists and for this reason, *R. alces* was therefore also not included in the latest Dutch fauna list (Den Bieman et al. 2011).

Ribautiana alces is known from: Austria, Belgium, Czech Republic, France, Germany, Greece, Italy, Near East, Poland, Slovakia, South European Russia, Switzerland and former Yugoslavia (Lock, 2019, Jach & Hoch 2013, Swierczewski & Gebicki 2003) but is missing from Northern Europe, Great Britain and the Iberian peninsula. In Germany it is only known from the central parts (Kunz et al. 2011, Nickel 2003).

It lives monophagous on oaks (*Quercus robur* and perhaps also *Q. petraea*) along xerothermic, sunny forest edges. The number of generations is not known with certainty: one or two. In Germany adults are found from mid June till the end of September and the species hibernates in the egg stage (Nickel 2003).

Cicadellidae- Deltocephalinae

Balclutha saltuella (figure 10)

Material Province of Limburg: Sint Geertruid, Camping Bosrand (AC 180.3-310.5), light trap, 26.viii.2019, 1 ♂, leg. C.F.M. den Bieman.

Balclutha saltuella is represented in Central and Mediterranean Europe: Austria, Bulgaria, Czech Republic, France, Germany, Greece, Hungary, Italy, Luxembourg, Poland, Romania, Slovakia, Switzerland and former Yugoslavia (Holzinger 2009, Jach & Hoch 2013, Niederinghaus et al. 2010, Walczak et al. 2016). This species has an almost worldwide distribution and occurs even on oceanic islands, such as Saint Helena (Ashmole & Ashmole 2004).

Balclutha saltuella is an eurytopic pionier species. In several countries there are only single records, including Austria, Germany, Luxembourg, Poland (Holzinger 2009, Nickel 2003, Walczak et al. 2016) and probably also the Netherlands. Likely



10. *Balclutha saltuella* ♂, genitalia removed, Sint Geertruid, camping-site Bosrand (province of Limburg), 26.viii.2019. Photo: Theodoor Heijerman

10. *Balclutha saltuella* ♂, genitaliën verwijderd, Sint Geertruid, camping-site Bosrand (province of Limburg), 26.viii.2019.



11. *Calamotettix taeniatus* ♀, Helstorfer Moor, Niedersachsen (Germany), 6.vii.2009. Photo: Gernot Kunz

11. *Calamotettix taeniatus* ♀, Helstorfer Moor, Niedersachsen (Duitsland), 6.vii.2009.

they are immigrants from southern Europe but are not able to establish in these countries. In mid France it is a permanent settled species and this might be the source of the Dutch record.

Probably it is an oligophagous species living on grasses (Poaceae) at sunny often disturbed localities. This species has one generation in a year, adults hibernate and are collected year-round (Holzinger 2009, Nickel 2003).

Calamotettix taeniatus (figure 11)

Material Province of Limburg: Brunssum-Treebeek (AC 194.6-327.6), light trap, 17.vii.2019, photo on website Waarneming.nl, leg. G. Lommen, no material collected.

Calamotettix taeniatus does not occur in northwest Europe, it is known from: Austria, Czech Republic, Finland, France, Germany, Hungary, Italy, Moldavia, Poland, Romania, Slovenia, Russia and Ukraine (Guglielmino & Bückle 2015, Jach & Hoch 2013, Kunz & Holzinger 2018, Söderman 2007, Walczak & Jeziorowska 2015). Throughout its range, *C. taeniatus* appears to be a rare species (Della Giustina 1989, Walczak & Jeziorowska 2015). It is a species attracted by light as shown by results in the Czech Republic, Finland, Russia (Malenovsky & Lauterer 2010, Söderman 2007) and our own data. In Germany, this species is only known from nine locations and mid Germany seems to be the edge of its

area (Nickel 2003). The Dutch data imply an area expansion of *C. taeniatus* to the northwest. However, coming years will give insight in whether this single observation was an exception or whether more material will be collected indicating the establishment of a population and thus a species range expansion to the north.

Common reed *Phragmites australis* is the hostplant of the monophagous *C. taeniatus*. The nymphs live at the basal parts of the hostplant only some centimetres above the ground. The adults are very wary and easily fly away of the slightest tremble. The female oviposits in the base of the straw (Heller 1987, Nickel 2003, Söderman 2007). It probably occurs in temperately flooded freshwater sites as well as inland salt marches. This species has one generation in a year in Germany, adults were collected from the beginning of July till the beginning of September. *Calamotettix taeniatus* hibernates in the egg stage (Nickel 2003)

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Samenvatting

Een opmerkelijke uitbreiding van de Nederlandse cicadenfauna met zes dwergcicaden, een glasvleugelcicade en twee mierencicaden (Auchenorrhyncha: Cicadellidae, Cixiidae & Tettigometridae)

De dwergcicaden *Balcanocerus pruni*, *Edwardsiana platanicola*, *Hauptidia maroccana*, *Ribautiana alces*, *Balclutha saltuella* and *Calamotettix taeniatus*, de glasvleugelcicade *Cixius beieri* en de twee mierencicaden *Tettigometra laeta* en *T. virescens* zijn in 2018-2019 voor het eerst in Nederland waargenomen. Opvallend is dat tenminste zes van deze soorten een meer zuidelijke hoofdverspreiding hebben. Dit doet vermoeden dat de voortgaande klimaatverandering (o.a. hogere temperatuur, warmere zomers) aan deze uitbreiding bijdraagt. Vier soorten werden gevangen met lichtvallen: *Cixius beieri*, *Ribautiana alces*, *Balclutha saltuella* en *Calamotettix taeniatus*. Foto's van drie andere soorten werden geplaatst op de website Waarneming.nl: *Tettigometra laeta*, *T. virescens* en *Hauptidia maroccana*. Op basis van verspreidingsgegevens uit onze buurlanden zijn een aantal cicadensoorten in ons land te verwachten. Het gericht afzoeken van waardplanten resulteerde in de vondst van twee van deze te verwachten soorten: *Balcanocerus pruni* en *Edwardsiana platanicola*. Vooral de vondsten van de twee soorten mierencicaden is opmerkelijk. Na meer dan 100 jaar werd in 2018 weer een mierencicade in ons land waargenomen en nu in 2019 zelfs twee extra soorten. Of al deze soorten zich blijvend in ons land gaan vestigen is voor enkele soorten (*Cixius beieri*, *Balclutha saltuella* en *Calamotettix taeniatus*) onzeker. De ecologie en verspreiding van deze negen cicadensoorten wordt beschreven.



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