

New and interesting Dutch Delphacidae (Homoptera, Auchenorrhyncha)

by

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ABSTRACT. — Twelve delphacid species are recorded as new for the Dutch fauna: *Kelisia guttula*, *K. ribauti*, *Anakelisia fasciata*, *Chloriona dorsata*, *C. vasconica*, *Paraliburnia clypealis*, *Megamelodes lequesnei*, *Muellerianella extrusa*, *Acanthodelphax denticauda*, *Florodelphax paryphasma*, *Xanthodelphax flaveolus* and *Criomorphus borealis*. Distributional data and information about the ecology of these species are provided. Previous Dutch records of *Stiroma affinis* and *Ribautodelphax imitans* are incorrect.

Introduction

Gravestein (1976) listed 57 species of Delphacidae, which had been found in the Netherlands up to 1976. Before that time, however, planthoppers were studied only by a few Dutch entomologists. In the last few years the knowledge about the ecology and distribution of Dutch Delphacidae has strongly increased due to extensive studies of the biosystematic research group in Wageningen. For the purpose of a European Invertebrate Survey project, field studies and examination of the material in Dutch musea and private collections were undertaken. These studies resulted in the discovery of several new species for the Dutch fauna, which are discussed in this paper. Ecological information for these species and some other species is provided.

For each species localities are given with the UTM coordinates for 1×1 km squares. Records are listed by province. The material is preserved in the collections of the following institutions and in the collections of the authors: Laboratory of Entomology, Wageningen (LHW); Rijksmuseum van Natuurlijke Historie, Leiden (RMNH); Instituut voor Taxonomische Zoölogie (Zoölogisch Museum), Amsterdam (ZMA); Collection C. F. M. den Bieman (CdB), Collection C. J. H. Booy (CB).

Abbreviations used: B-brachypterous; M-macropterous; L1-L5-larval instars.

Results of the survey

Kelisia guttula (Germar, 1818), f. n. sp.

Limburg: Sibbe, Gerendal, GS 0035, 12.IX.1977, 1 ♂ M, 1 ♀ M pitfall traps RIN, calcareous grassland. Gronsveld, Savelsbos, Zure Dries, FS 9332, 1/21.X.1981, 1 ♀ M pitfall traps RIN, small calcareous grassland. Stokhem, Berghofweide, GS 0235, 1/21.X.1981, 1 ♀ M pitfall traps RIN, calcareous grassland (All LHW). See also Cobben et al. (1983). Wijlre, Wraquelberg, GS 0437, 2.IX.1982, 17 ♂♂ M, 20 ♀♀ M, many L4 and L5, on *Carex flacca* Schreb. in a calcareous grassland, leg. CdB (CdB, LHW).

Kelisia guttula is clearly restricted to the calcareous region of the Netherlands; it is univoltine and hibernates in the egg-stage. Müller (1978) suggested that *K. guttula* possibly lives on *Carex flacca*. Our collectings and successful rearings on *Carex flacca* confirm this suggestion.

Kelisia ribauti Wagner, 1938, f. n. sp.

Gelderland: Wychen, Hatertse en Overasseltse Vennen, FT 9241, 13.VIII.1979, 1 ♂ M, *Molinia caerulea* (L.) Moench moor, leg. CdB (CdB).

The taxonomy of the *Kelisia ribauti* group is rather complicated and needs a thorough biosystematic study. A reliable distinction between *K. ribauti* and *K. sabulicola* Wagner by

morphological characters is hardly possible, but these species are ecologically clearly distinct. *K. sabulicola* is found at sand dunes and lives monophagous on *Carex arenaria* L. *K. ribauti* (western European form) is a species of damp meadows, moors etc., *K. ribauti* lives on *Carex* species a.o. *Carex elongata* L. (Wagner & Franz 1961). Both species are univoltine and hibernate in the egg-stage (Müller 1957).

Anakelisia fasciata (Kirschbaum, 1868) f. n. sp.

Utrecht: Overlangbroek, FT 6362, 28.VIII.1974, 40 ♂♂ B, 99 ♀♀ B with a "D-vac" suction apparatus, leg. R. H. Cobben & P. Mols (LHW); 20.VIII.1977, 11 ♂♂ B, 22 ♀♀ B, 2 ♀♀ M; 29.VIII.1981, 5 ♂♂ B, 15 ♀♀ B on *Carex acuta* L. in a *Fraxinus excelsior* coppice (LHW). Gelderland: Waardenburg, Komgronden reservaat Tielerwaard, FT 5346, 13.VIII.1981, 8 ♂♂ B, 20 ♀♀ B on *Carex riparia* Curt. in a wet alluvial *Populus* forest, leg. R. H. Cobben, T. Heyerman, CB (LHW, CB).

Anakelisia fasciata inhabits damp sedge vegetations like moors, bogs, lake shores etc., it is univoltine, hibernates mainly in the egg-stage, but also some females hibernate (Müller 1957). *A. fasciata* seems to be a very local species.

Chloriona dorsata Edwards, 1898, f. n. sp.

Zuid-Holland: Den Haag, 10.VII.1977, 3 ♂♂ M, 5 ♀♀ B, leg. K. de Jong (RMNH, and coll. W. Gravesteyn). Noord-Holland: Amsterdam, 16.VI.1976, 3 ♂♂ M, 11 ♀♀ B, leg. W. Gravesteyn (ZMA). Gelderland: Boven Leeuwen, FT 7348, 4 ♂♂ M, 1 ♀ B, together with *C. smaragdula* (Stål) on *Phragmites* along a small ditch, leg. CdB (CdB).

Chloriona dorsata lives on *Phragmites*, is univoltine and hibernates in the larval stage. This species has a limited distribution in NW Europe: England, Denmark, S. Sweden, Poland and France (Nast 1972, Ossiannilsson 1978).

Chloriona vasconica Ribaut, 1934, f. n. sp.

Utrecht: Leersum, Broekhuizen, FT 6464, 3.VI.1982, 1 ♂ M, 5 ♀♀ B, leg. CdB (CdB) together with *Chloriona smaragdula* on *Phragmites* along a small ditch. Gelderland: Uddel, Uddeler Meer, FT 8892, 12.VI.1982, 2 ♂♂ M, 1 ♀ M, 7 ♀♀ B, leg. CdB (CdB) on *Phragmites* along a small lake.

Chloriona vasconica lives on *Phragmites*, is univoltine and hibernates in the larval stage. A widespread species in the Palaearctis.

Paraliburnia clypealis (J. Sahlberg, 1871), f. n. sp.

Limburg: Plasmolen, St. Jansberg, GT 0335, 7.VI.1958, 4 ♂♂ B, 9 ♀♀ B, leg. R. H. Cobben (LHW). Haelen, GS 0781, 31.V.1982, 5 ♂♂ B, 1 ♀ B, on *Calamagrostis canescens* (Web.) Roth in a brookland under willows and 2 ♂♂ B, 6 L4-L5 on *Eriophorum vaginatum* L. at a swampy, shaded place; the collected larvae developed to adults when reared on this plant, leg. CdB (CdB). Beegden, GS 0376, 30.VIII.1982, 1 ♂ B on *Molinia caerulea* at the border of a small eutrophic pool; same place 2.IX.1982 1 ♀ B on *M. caerulea*, leg. CdB (CdB). Gelderland: Veenendaal, Blauwe Hel, FT 7665/FT 7666, 29.V.1981, 1 ♂ B, 1 ♀ B, 1 ♀ M, leg. CB (CB) together with *Paraliburnia adela* (Flor) on *C. canescens* in a wet fen; same place 12.VI.1981 5 ♂♂ B, 4 ♀♀ B, leg. CB (CdB) only *P. clypealis* on *C. canescens*. Appeltern, FT 7945, 23.V.1982, 1 ♂ B, 2 ♀♀ B, in a shady alluvial forest on *Calamagrostis canescens* same place 28.VIII.1982, 10 ♂♂ B, 12 ♀♀ B, many L4-L5 on a *Carex* sp. at a very wet, exposed place, leg. CdB (CdB). Hoge Veluwe, Deelense Was, FT 9573, 8.VI.1982, 1 ♂ M on *Eriophorum angustifolium* Honckeny in a dried-up moor, leg. CdB (CdB). Friesland: Drachten, 3.VI.1967, 1 ♀ B (leg. and coll. W. Gravesteyn). Terschelling 29.VIII.1981, 2 ♂♂ B on *C. canescens* on the shore of a dune pool, leg. CB (CB).

Paraliburnia clypealis is a rarely collected species and reported only from Sweden, England, Finland, USSR (n. Russia), Czechoslovakia (Moravia), DDR (Nast 1972) and BRD (Remane 1962). Ossiannilsson (1978), Schiemenz (1976), Dlabola (1969), Remane (1962) and LeQuesne (1960) reported catches on *Calamagrostis canescens* on wet places: fens, peatmoors, wet meadows etc. Remane (1962) mentioned that *P. clypealis* has hidden life habits and lives near to the base of *C. canescens*. This species is alleged to have a relict distribution in Central Europe. Schiemenz (1976) collected this species in four East German peat moors and stated that it is univoltine with adults occurring from the beginning of June till the middle of August and has a larval hibernation. In Scandinavia *P. clypealis* is also univoltine with adults appearing in June-July (Ossiannilsson 1978). In the Netherlands this species is clearly bivoltine with adults from end May-June and August-September, it is usually found on *C. canescens*, but is also collected from *Eriophorum vaginatum*, *E. angustifolium*, *Molinia caerulea* and on *Carex*, all in wet biotopes. Probably *P. clypealis* has a wider distribution in W. Europe, but has been rarely collected due to its hidden life habits.

Megamelodes lequesnei Wagner, 1963, f. n. sp.

Zeeland: Nieuw en St. Joosland, 28.VIII.1953, 1 ♀ B, leg. P. Brakman (det. W. Wagner 1963, coll. W. Gravesteyn).

Megamelodes lequesnei is often confused with *M. quadrimaculatus* (Signoret, 1865). LeQuesne (1960) figured both *Megamelodes* species but misinterpreted the names. *M. quadrimaculatus* sensu LeQuesne (1960) is *M. lequesnei*. *M. fieberi* (Scott, 1870) was synonymized with *M. quadrimaculatus* (Signoret, 1865) by Wagner (1963). This species was treated by LeQuesne (1960) under the name of *M. fieberi*.

The distribution of *M. lequesnei* is not well known due to this confusion (Nast 1972). This species lives locally at marshy places, but nothing is known about its hostplants.

Megamelodes quadrimaculatus (Signoret, 1865)

Lauterer (1980) mentions *M. quadrimaculatus* as a very rare, paludicolous species. It is known to occur in Ireland, England and Wales, the Netherlands, Belgium, France, DDR, BRD, Hungary, Italy, Czechoslovakia and the Madeira Archipelago. In these countries, it occurs in a few localities. It lives mainly on the soil surface in swampy areas on *Carex* spp and is probably very hygrophilous.

In the Netherlands, *M. quadrimaculatus* is known from 9 localities and adults were collected from May until January mostly on rather humid places, but one locality is rather exceptional. In 1981 a population was discovered along a shaded wood-path in Gelderland; Slijk-Ewijk, Landgoed Loenen, FT 8952, 20.VII, one larva on *Poa annua*, one larve on *Agrostis tenuis*; 29.VII, three larvae on *Poa pratensis* (all larvae developed on these respective plants); 4.VIII, 2 ♀♀ B, 5 ♂♂ B on *A. tenuis*; 13.VIII, 1 ♀ B on *P. annua*; 27.VIII, 1 ♂ B, 1 ♀ B on *A. tenuis* (all leg. G. van Amelsvoort) and 23.VIII, 1 ♂ B on *A. tenuis*, leg. CdB (CdB). This species was also collected numerously in this alluvial forest in pit-falls.

Morris (1974) mentioned a comparable collecting site "4.IX.1971, The Burren, Ireland 1 ♀ along a woodland pathway". Drosopoulos (1982) reported collecting and rearing of this species on dicotylous plants: *Mentha aquatica* and other hygrophilous plants.

Muellerianella extrusa (Scott, 1871), f. n. sp.

The biosystematics of the genus *Muellerianella* in Western Europe have been extensively studied by Drosopoulos (1977) and Booij (1982).

M. extrusa was recently separated from *M. fairmairei* (Perris, 1857) by Booij (1982). It is a monovoltine species living monophagous on *Molinia caerulea* mostly in bogs, moors, margins

of oligotrophic pools etc. *M. extrusa* was subsequently recorded from more than 40 localities in the Netherlands and adults were found from June up to early November.

Booij (1982) mentioned samples taken by Morris of *extrusa*-like individuals from Castor Hanglands (England) in a vegetation dominated by *Arrhenatherum elatius* (L.) and *Brachypodium pinnatum* (L.) P.B. 1 ♂ B and 2 ♀♀ B of this form were collected in the province of Limburg: 2.VIII.1982. Kunrade, Kunderberg, GS 0839, on *A. elatius* from a dry calcareous hill-slope; *B. pinnatum* was the dominant grass species on this spot. The taxonomic status of this form is under study.

Acanthodelphax denticauda (Boheman, 1847), f. n. sp.

Utrecht: Overlangbroek, FT 6362, 10.VII.1974, 9 ♂♂ B, 7 ♀♀ B; 30.VII.1974, 51 ♂♂ B, 12 ♀♀ B; 20.VIII.1974, 11 ♂♂ B, 1 ♀ B; 19.IX.1974, 1 ♂ B, all leg. Drosopoulos (LHW); 8.VIII.1973, 1 ♂ B, 1 ♀ B; 31.VII.1973, 7 ♂♂ B, 3 ♀♀ B, leg. P. Mols (LHW); 29.VII.1977, 4 ♂♂ B, 2 ♀♀ B, leg. CB (CB); 20.V.1982, 10 ♂♂ B, 8 ♀♀ B, leg. P. de Vrijer (LHW), 17.VI.1983, 2 ♂♂ B, leg. CdB (CdB), all on *Deschampsia caespitosa* (L.) P.B. in a *Fraxinus excelsior* coppice.

This univoltine species was collected exclusively on *D. caespitosa* and was also reared on this plant (Drosopoulos 1977). Despite extensive collecting on *D. caespitosa* in all parts of the Netherlands, *A. denticauda* was only found in Overlangbroek, so it is probably a very rare species in the Netherlands. In most of its range *A. denticauda* is very rare, only in Sweden, it is locally abundant (Ossiannilsson 1978). *D. caespitosa* did not occur at moravian localities (Czechoslovakia) and *Calamagrostis canescens* is suggested as a hostplant (Lauterer 1980).

Florodelphax paryphasma (Flor, 1861), f. n. sp.

Overijssel: Kalenberg, Weerribben, FU 9853/FU 9754, 7.VI.1981, 1 ♂ M, leg. Th. Heyerman (LHW). Swept along a road side in an extensive marshy area. Gelderland: Buren, FT 5954, 5.VI.1983. 1 ♂ M swept in an unfertilized meadow, leg. CdB (CdB).

Florodelphax paryphasma is known from Sweden, England, USSR (Estonia, Kazakhstan, Latvia, M. Russia), DDR and BRD (Nast 1972). In the BRD this species is known from three localities only. *F. paryphasma* is collected in wet meadows, peatmoors etc.; the hostplants are unknown (Droste et al. 1980, Marchand 1953, Emmrich 1966).

Xanthodelphax flaveolus (Flor, 1861), f. n. sp.

Limburg: Herkenbosch, Meijnweg, LB 0072, 9.VI.1982, 1 ♂ B together with *X. stramineus* (Stål) on a grassy *Calluna* heath dominated by *Agrostis tenuis* Sibth. and *Festuca ovina* L., leg. CdB (CdB).

X. flaveolus is known from most countries in W. Europe from xerophilous and mesophilous habitats (Schiemenz 1969). The ecology of this species is poorly known; its hostplants are unknown and even its mode of hibernation is unclear. Schiemenz (1969) suggested that it hibernates in the egg-stage in the DDR. In Finland *X. flaveolus* and *X. stramineus*, which are often found together, have the same phenology (Kontkanen 1952); *X. stramineus* is a bivoltine species in our country and has a larval diapause (Müller 1957, Remane 1958).

Criomorphus borealis (J. Sahlberg, 1871), f. n. sp.

Limburg: Plasmolen, St. Jansberg, GT 0335, 7.V.1958, 1 ♂ B at a flush, leg. R. H. Cobben (LHW). Haalen, GS 0781, 31.V.1982. 1 ♂ B, 2 ♀♀ B together with *Paraliburnia clypealis* on *Calamagrostis canescens* in a brookland under willows, same place, 29.V.1983, 2 ♂♂ B, 4 ♀♀ B. Beegden, GS 0376, 30.V.1982, 1 ♂ M on *Agrostis tenuis* in a *Calluna* heath, leg. CdB (CdB). Gelderland: Appeltern, FT 7945, 23.V.1982, 2 ♂♂ B, 1 ♀ B together with *P. clypealis*

on *C. canescens* in an alluvial forest, leg. CdB (CdB). Groesbeek: GT 0438/GT 0538, 13.VI.1983, 1 ♂ B, 2 ♀ ♀ B; 21.VI.1983, 3 ♂ ♂ B, 4 ♀ ♀ B, one male parasitised by a Pipunculid, leg. CB (CB), on shaded *C. canescens* in a brookland.

Criomorphus borealis is known from Czechoslovakia, Sweden, Norway, Finland, DDR, Poland, USSR, (Estonia, Latvia, M. Russia, Nw. Siberia) and Mongolia (Nast 1972). The discovery of *C. borealis* in the Netherlands is striking, because this species was not known from W. Europe thus far and the nearest localities are in the DDR (Schiemenz 1976) and W. Berlin (Strübing 1960). The Dutch habitats correspond very well with the habitats of this species in the DDR and Scandinavia: brooklands, forested moors, birch forests etc. In these countries *C. borealis* is univoltine and collected on *C. canescens* (Schiemenz 1976, Ossiannilsson 1978). Strübing (1960) reared *C. borealis* successful on *C. canescens*. Also in our country *C. borealis* is univoltine; visits to the collecting sites in July and August were unsuccessful. The populations seem to be small, since only a few animals were collected on each location despite of much effort. Ossiannilsson (1978) stated the rareness of macropterous individuals; the macropterous male, collected in Beegden outside the normal habitat, probably was a migrant.

Criomorphus albomarginatus Curtis, 1833

C. albomarginatus is a monovoltine species in the Netherlands from road sides, open forests, shaded sand dunes etc. It hibernates in the larval stage (Müller 1957). Adults were collected from 7 May till 19 July, with a maximum in the last week of May and the first week of June. A sample of 18 ♂ ♂ and ♀ ♀ and many L2-L3 in Gelderland: Boven Leeuwen, FT 7348, 28.VIII.1982, on *Festuca rubra* in an alluvial poplar-forest was quite surprising and could indicate a partial second generation. A closer examination showed that all adults were parasitized by Strepsiptera. It may be that the life span of the parasitized adults of the first generation is prolonged till the time that the larvae of the next generation are big enough to become parasitized by the triangulae. The prolongation of the life span due to stylopisation was also observed for *Xanthodelphax stramineus*, *Dicranotropis hamata* (Boheman), *Chloriona glaucescens* Fieber and *C. smaragdula* (Lindberg 1939, 1949). This phenomenon could explain the catches of adults beyond the normal generation time.

Conclusions

The species listed in the foregoing section seem to be well established in the Netherlands, though some of them are restricted to a few localities, usually nature reserves. Their occurrence implies an extension of the Dutch list with twelve species. Records of two other species listed by Gravesteyn (1976) viz. *Ribautodelphax imitans* (Ribaut) and *Stiroma affinis* Fieber are due to misidentifications. The former species was confused with *Ribautodelphax pungens* (Den Bieman, in prep.). *R. imitans* is a southern species which does not occur in the Netherlands. Reexamination of the *Stiroma affinis* Fieber material, revealed that in all cases *S. bicarinata* (Herrich-Schäffer) was involved. Thus *S. affinis* should be deleted from the Dutch delphacid list.

Though the Dutch delphacid fauna has been studied rather extensively some new species may still be discovered in the future. Collectors are recommended to look for species like *Anakelisia perspicillata* (Boheman), *Stenocranus longipennis* (Curtis) and *Criomorphus moestus* (Boheman) which occur in neighbouring countries and for which suitable habitats are present in the Netherlands. Also *Scottianella dalei* (Scott), so far only reported from England and France (Nast 1972), can be expected in our country, while this species was recently collected new for the BRD: Köln, Wahner Heide 1 ♂ B, 8.VIII.1982, leg. CdB (CdB).

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De titel is misleidend, omdat er geen Empidoidea I bestaat. Dit twaalfde deel van deze langzamerhand welbekende en goed aangeschreven serie begint met een algemene inleiding op de Empidoidea, die hier in vijf families worden onderverdeeld: Empididae, Hybotidae, Microphoridae, Dolichopodidae en Atelestidae. Na het algemeen gedeelte worden in dit volume drie der vijf families behandeld: Hybotidae, Atelestidae en Microphoridae. Tot de Hybotidae wordt onder meer gerekend de subfamilie Tachydromiinae, die reeds in 1975 in volume 3 van deze serie, getiteld: *The Tachydromiinae (Dipt. Empididae) of Fennoscandia and Denmark*, werd behandeld. Dit derde volume moeten wij volgens de korte Introduction zien als Empidoidea I. Het is duidelijk, dat door deze opzet in de toekomst misverstanden kunnen ontstaan.

Het algemene gedeelte (72 pagina's) geeft behalve de morfologie van de imagines ook iets over fylogenie, biologie en zoögeografie. Het is jammer, dat bij de zoögeografie alleen verspreidingspatronen in de Scandinavische landen besproken worden. Dit hangt wel samen met het feit dat deze serie speciaal voor deze landen geschreven is.

Verder niets dan goeds over dit nieuwe deel in deze serie. Kenners van de redactie en van de schrijver zullen ook niets anders verwacht hebben. — Theowald van Leeuwen.

NEUROETHOLOGY AND BEHAVIORAL PHYSIOLOGY; roots and growing points, 1983. Frans Huber & Hubert Markl, eds. pp. XVIII, 412, 183 figs. Springer Verlag, Berlin etc.; ISBN 3-540-12644-9. Prijs (gebonden) DM 80,—.

In dit boek, opgedragen aan de kort geleden gestorven neuroetholoog K. D. Roeder, worden onderzoeken omtrent de rol van het zenuwstelsel bij de totstandkoming van gedragpatronen verslagen. In het grootste deel van de onderzoeken zijn insecten het proef„konijn". Een belangrijk element daarin is de relatief aanzienlijke grootte van het cellichaam van een insektezenuw en het geringe aantal daarvan, zodat het in kaart brengen van banen en betrekkingen wat minder problematisch is dan bij gewervelde dieren.

Het boek bevat 26 artikelen, gegroepeerd in vijf blokken die een oplopend integratieniveau behandelen: de neurale basis van bewegingen (lopen, stridulatie), zintuigen (chemoreceptie, geluidsherkenning en -localisatie, gezicht), ontwikkeling en leren (vervellingen, leerprocessen bij honingbijen), predator-prooi relaties (insect versus vleermuis, akoestische lokatie van prooi en kerkuilen), en de neuro-ethologie van het volle leven (in complexe omgevingen, sociale structuren en bij de navigatie). — W. N. Ellis.