

# Establishment and range expansion of some new Heteroptera (Hemiptera) in Norway

Frode Ødegaard & Anders Endrestøl

Ødegaard, F. & Endrestøl, A. 2007. Establishment and range expansion of some new Heteroptera (Hemiptera) in Norway. *Norw. J. Entomol.* 54, 117-124.

In this paper we present new records of three species of Heteroptera previously not recorded in Norway: *Deraeocoris lutescens*, *Chilacis typhae* and *Heterogaster urticae*. We assume that the populations of these species are established in Norway quite recently. We also present data indicating further range expansions of two other newly arrived species, *Labops sahlbergii* and *Heterotoma planicornis*. Many species of Heteroptera are associated with anthropogenic habitats such as ruderal fields that are common in urban areas. This makes Heteroptera as a group particularly exposed for unintended introductions to new areas. We assume that *D. lutescens*, *H. planicornis*, *C. typhae* and *H. urticae* have been introduced with ornamental plants or semi-natural vegetation. However, it is often difficult to assess whether a new species is found as a result of natural range expansion or as a result of human assisted introduction, processes that are not mutually exclusive. Further monitoring of these species should be carried out, in order to document their range dispersal as well as their potential ecological impacts.

Keywords: *Chilacis typhae*, *Deraeocoris lutescens*, *Heterogaster urticae*, Heteroptera, introduced species, range expansion

Frode Ødegaard, Norwegian Institute for Nature Research, Tungasletta 2, 7485 Trondheim, Norway  
E-mail: frode.odegaard@nina.no

Anders Endrestøl, Natural History Museum, University of Oslo, Pb 1172 Blindern, 0318 Oslo, Norway  
E-mail: anders.endrestol@nhm.uio.no

## INTRODUCTION

Since the publication of the catalogue of the Hemiptera-Heteroptera of Norway (Coulianos 1998), several papers on species new to Norway as well as new regional records of Heteroptera have been published. These contributions have increased our knowledge on faunistics of Norwegian Heteroptera, and most of the new records probably represent earlier undiscovered native populations as the Heteroptera are a rather poorly collected group in Norway. On the other hand, a large proportion of new insect records in

Norway represent range expansions of recently established populations (Semb-Johansson 1988, Ødegaard & Ligaard 2000). Earlier publications on Norwegian Heteroptera have not paid very much attention to changes in species composition over time.

Alien species represent one of the five major threats to the biodiversity on Earth (Wilcove et al. 2000). This is also a relevant situation in our country since as many as 2483 species are defined as introduced to Norway according to the recently published Norwegian Black List (Gederaas et

al. 2007). Nine of these species belong to the suborder Heteroptera, though their impacts on the ecosystem are poorly known.

Imported plants and plant parts are regarded as a major vector for introduced invertebrates, including Heteroptera. The introduced species are in most cases transported as stowaways with plant material. Many of these species are broad generalists in terms of host use and environmental preferences. In addition, they may have good dispersal abilities, which is a prerequisite for establishment and further natural dispersal in the new environment. (Lockwood et al. 2007). Some species, therefore, could expand their range from alien population in our neighbouring countries, and, eventually establish populations in Norway.

It is often difficult to assess whether a new species is found as a result of natural range expansion or as a result of human assisted introduction, particularly in the case of widely distributed generalist species. In some cases both processes could be involved. Investigations on distribution and historical records could be useful for this assessment. The direction of the range expansion, host plant specificity, frequency of occurrence and sample sizes would also be important parameters for assessments of causes and impact of range expansions.

In this paper we present new records of three species previously not recorded in Norway: *Deraeocoris lutescens*, *Chilacis typhae* and *Heterogaster urticae*. We assume that the populations of these species are established in Norway quite recently. We also present data indicating further range expansions of two other species which may have arrived recently: *Labops sahlbergii* and *Heterotoma planicornis*.

## MATERIAL

The material collected by Anne Sverdrup-Thygeson (AST), Vera Sandlund (VS) and Frode Ødegaard (FØ) is kept in FØ's collection, and the material collected by Lars Ove Hansen (LOH)

and Anders Endrestøl (AE) is kept at the Natural History Museum, University of Oslo (NHMO). The nomenclature follows Aukema & Rieger (1999, 2001).

\* = new regional records; \*\* = new to Norway

## Miridae

\*\**Deraeocoris lutescens* (Schilling, 1837)

Ø, EIS 20, Halden: Knardal (UTM<sub>WGS84</sub> 32PL36855544), 15.V-9.VIII 2007 (leg. AST). Ca. 100 ex. from flight interception traps situated in old oak trees.

AK, EIS 28, Oslo: Majorstua (UTM<sub>WGS84</sub> 32VNM96224483), 8.V.1999, 2 ex. (leg. FØ); Bygdøy (UTM<sub>WGS84</sub> 32VNM94104310), 13.V - 1.VII.2004, ca. 100 ex. from flight interception traps (leg. AST); 28.VI.2006, hundreds of ex. on *Tilia* sp. and *Corylus* (leg. FØ); 27.IX.2007, 6 ex. swept from *Tilia* sp., 2 ex. from *Urtica* sp., and 1 ex. from *Populus nigra* var. *italica* (leg. AE); Grefsen, 12.IV.2007, 1 ex. found under bark (leg. AE); Tøyen, 15.IV.2007 several ex. swept from *Acer* (leg. AE); 18.VIII.2007 2 ex. swept from *Populus* (leg. AE); St. Hanshaugen, 14.VIII.2007, several ex. swept from *Acer*, *Quercus*, *Corylus* and *Fagus* (leg. AE); Bærum: Høvik, Hestenga (UTM<sub>WGS84</sub> 32VNM88074102), 28.IX.2007, 5 ex. swept from *Tilia* sp. (leg. AE); Asker: Drengsrud (UTM<sub>WGS84</sub> 32VNM78953318), 28.IX.2007, 4 ex. swept from *Tilia* sp. (leg. AE).

BØ, EIS 28, Lier: Nøste (UTM<sub>WGS84</sub> 32VNM69232385), 28.IX.2007, 2 ex. swept from *Tilia* sp. (leg. AE); Drammen: Gulsbogen gård (UTM<sub>WGS84</sub> 32VNM655236), 28.IX.2007, 25 ex. swept from *Tilia* sp. (leg. AE); Sentrum (UTM<sub>WGS84</sub> 32VNM67232396), 28.IX.2007, 12 ex. swept from *Tilia* sp. (leg. AE); Nedre Eiker: Nordenga (UTM<sub>WGS84</sub> 32VNM60452415), 28.IX.2007, 1 ex. swept from *Fraxinus excelsior* (leg. AE).

VE, EIS 19, Horten: Borre, Karljohansvern (UTM<sub>WGS84</sub> 32VNL84598807), 13.V-15-VII.2005. 10 ex. from flight interception traps. (leg. AST). A replication at the same locality in 2007 gave ca. 100 ex. of *D. lutescens* in 2007 (leg. AST).

*D. lutescens* lives on foliage of different deciduous trees, particularly *Tilia* spp. In addition, *Quercus*,

*Corylus* and *Ulmus* are frequently used host plants (Wachmann et al. 2004). It could also be found on different herbs (Gaun 1974), e.g. *Urtica* sp. as we have documented. The species is distributed from southern Scandinavia, all over Europe, to northern Africa in the south, and to Caucasus in the east (Wachmann et al. 2004). Since the first record in Norway in 1999 this species seems to attain an outbreak-like population increase and range expansion in the Oslofjord area. Recent records confirm that this apparent dramatic population increase also has spread to the nearby regions in BØ, Ø and VE. We assume that *D. lutescens* has been introduced to Norway with imported ornamental trees, for instance *Tilia x europaea*, which is commonly planted in gardens. It would be interesting to monitor the population growth and range distribution of this species in the future.

**\**Labops sahlbergii*** (Fallén, 1829)

**HES**, EIS 38, Eidskog: Leirsjøen, 27.VI.1993, 4 ex. (leg. LOH).

**HES**, EIS 47, Åsnes (UTM<sub>WGS84</sub>33VUH656173), 3.VII.2000, 3 ex. (leg. VS); Flisa, 13.VII.2003, 3 ex. (leg. FØ); Grue: Smihola, 5.VII.2000, 1 ex. (leg. VS).

**HES**, EIS 56, Våler: Smalberget (UTM<sub>WGS84</sub>33VUH48815782), 24.VI.2006, 6 ex. (leg. AE); Berget (UTM<sub>WGS84</sub>33VUH49945330), 24.VI.2006, 5 ex. (leg. AE).

**OS**, EIS 63, Ringebu: Storevja, 17.VIII.2003, 2 ex. (leg. FØ).

**OS**, EIS 44, Nord-Aurdal: Sanderstølen (UTM<sub>WGS84</sub>32VNN07814393), 18.VII.2007, 14 ex. (leg. AE).

**BV**, EIS 44, Gol: Fjøsremmen (UTM<sub>WGS84</sub>32VNN07814393), 18.VII.2007, 1 ex. (leg. AE).

All specimens have been found by sweep netting in grass or *Carex*-dominated meadows and wetlands.

These new records confirm an expansion towards the west further than earlier reported by Coulianos (1998) and Ødegaard (1998). We can even report that the species was common on broad-leaved grasses at STI, Oppdal, Kongsvoll, 890 m asl in 2003 and 2007. In Europe, *L. sahlbergii* has

a north-eastern distribution with records from Norway, Sweden, Finland, Latvia and Russia (Coulianos 1998, Aukema & Rieger 1999).

**\**Heterotoma planicornis*** (Pallas, 1772)

**AK**, EIS 28, Oslo: Bleikøya (UTM<sub>WGS84</sub>32VNM973403), 19.VIII.2005, 1 ex. swept from vegetation among the cabins at the middle of Bleikøya (leg. AE).

**AAV**, EIS 6, Arendal: Tromøya, Revesand (UTM<sub>WGS84</sub>32VMK883775), 23.VII.2007, 1 ex. swept from *Betula pendula* var. *dalecarlica* (leg. AE).

This species was recorded new to Norway from a specimen swept on *Quercus* (VAY, Søgne, 10.VIII.1981, leg. G. Taksdal) (Coulianos 1998). To our knowledge, only two more records exist, both from VAY, Kristiansand: Kuholmen, 2.VII.1999 and Nedre Timenes, 6.VIII.2006, leg. K. Berggren). This species is very characteristic with its flattened, enlarged second antenna segment. *H. planicornis* is widespread in Europe, but not frequently found in the northern countries (Norway and Sweden). The species feeds on aphids and other small arthropods on different species of plants (e.g. *Urtica*, *Rubus*, *Prunus*) (Gaun 1974, Kment & Bryja 2006). The species is not previously found associated with *Betula* sp. (Kment & Bryja 2006). *H. planicornis* is very common in urban areas in northern Europe and it might be that the Norwegian populations originate from specimens introduced with for instance ornamental plants or waste material. As this is a broad generalist species we expect a further expansion of this species in Norway if it is not limited for climatic reasons. The species was evaluated as near threatened (NT) in the Norwegian Red list (Kålås et al. 2006) due to a small population size. This evaluation should probably be reassessed in light of these new records, which may indicate a range expansion.

**Lygaeidae**

**\*\**Chilacis typhae*** (Perris, 1857) (Figure 1-2).

**AK**, EIS 28, Oslo: Bygdøy, Halsentjernet (UTM<sub>WGS84</sub>32VNM93254269), 09.X.2006, 1 ex. swept from vegetation surrounding the pond



**Figure 1.** *Chilacis typhae* (Perris, 1857). Specimen collected at Halsentjernet (Bygdøy, Oslo) 09.X.2006. Photo: Karsten Sund, Natural History Museum, Oslo.

Halsentjernet (leg. AE); 22.IV.2007, 2 ex. swept from flower spikes of *Typha latifolia* (leg. AE); 27.IX.2007, 1 ex. found on flower spikes of *Typha latifolia*.

This species is new to Norway. The species is found in Europe up to southern parts of northern Europe (Wagner 1966) and extending to Kirgizia and Uzbekistan (Coulianos 2003). It is found in several localities in Finland and Åland, and it is relatively rare in Denmark. *C. typhae* is associated with flower spikes of *Typha latifolia* where it spends the winter as imagines (Wagner 1966).

In the late 1800's the locality "Halsentjernet" was a small lake. Later on this small lake evolved into a swamp dominated with vegetation of *Phragmites australis* and *Phalaris arundinacea*. In 2001 this swamp was excavated and partly turned into a parking-lot and a small pond. Today, this pond has semi-natural vegetation, with some species planted. Both *Typha latifolia* and *Typha angustifolia* is found around the pond and both are probably planted (Høiland 2004). It is not known whether *C. typhae* has been introduced with the planted *Typha latifolia* or if the species has colonized the pond due to natural dispersal. Several other localities (in Ø, AK, and BØ) with *T. latifolia* have been investigated without any findings.

**\*\**Heterogaster urticae*** (Fabricius, 1775)

Ø, EIS 19, Moss: Jeløy, Alby (UTM<sub>WGS84</sub> 32VNL91838867), 15.VI.2007, 4 ex. sweep-netted on *Urtica dioica* (leg. FØ).

This species is widely distributed and common in northern parts of western Palaearctic. As the species name indicates the species is associated with *Urtica* spp. (Wachmann et al. 2007). This species was first reported from Norway by Staverløkk (2006) from samples taken from waste material in containers with ornamental plants imported from the Netherlands. We now report for the first time that established populations of *H. urticae* have been found on free land in Norway. The locality is a typical disturbed landfill site where masses of soil and organic waste have

been dumped. The vegetation in the soil heaps consists of typical ruderal weeds in clusters. It is not known whether any waste material at the site originate from far away.

## DISCUSSION

Several of the species mentioned in this paper are assumed to be introduced to Norway with ornamental plants or semi-natural vegetation. The species *D. lutescens*, *H. planicornis*, *C. typhae* as well as *H. urticae* could potentially be historically introduced. As described above, *D. lutescens* has probably shown a massive outbreak in the Oslo area the last few years, and could be expected to spread further to other neighbouring regions, and along the south coast of Norway. Our recent investigations indicate that this is true for BØ and Ø. The species was found in high frequencies in BØ, especially on *Tilia* sp. within Drammen. Since it is also documented from VE, we see no obstacles for its further spread southward along the Norwegian coast. The species was reported new to Sweden in 2000 (Lindskog & Viklund 2000) and seems to be spreading also there (Gillerfors & Coulianos 2005). As we have observed from Norway, also in Sweden the species has mainly been found in urban areas, parks and gardens (Gillerfors and Coulianos 2005). This makes the hypothesis of introduction through exotic tree species particularly relevant. The relatively few findings in Denmark combined with the recent findings in Sweden also support a theory of introduction in Sweden (Lindskog & Viklund 2000). *D. lutescens* is regarded as an alien species in Norway (Gederaas et al. 2007).

*Labops sahlbergii* was recorded new to Norway in 1987 (Coulianos 1998). Since then, its dispersal westwards has probably proceeded rapidly and populations are very dense in the colonized sites. We have no indication of human assisted dispersal in this species, but probability of such is high for species occurring with large populations in cultural landscapes.

*Heterotoma planicornis* probably have a coastal



**Figure 2.** *Chilacis typhae* (Perris, 1857) on flower spike of *Typha latifolia* at Halsentjernet (Oslo, Bygdøy) 22.IV.2007. Photo: Anders Endrestøl.

southeastern distribution in Norway. It is mainly reported from ruderal habitats in Europe (Kment & Bryja 2006), which is supported by our findings, but it is also known to occupy various habitats in other parts of its range (*see review* Kment & Bryja 2006). Currently, the species seems to be quite rare in the north though distributed relatively widely. Although the Norwegian records are few, we assume the species to be in expansion due to its broad use of habitats and preferences for urban areas. Such ecological traits may indicate that *H. planicornis* has been introduced to Norway with waste plant material during the last decades, as it is hard to believe that this very characteristic species have been overlooked for years.

*Chilacis typhae* has currently been found with

established populations in only one locality in Norway. We have investigated several other sites with *Typha latifolia* in southeast Norway without any findings. This supports the theory that the species could be introduced to Norway with semi-natural plant material used on the particular locality, although it was expected to appear in Norway (C-C. Coulianos pers. com). Coulianos (1976, 2003) assumed that *C. typhae* has been overlooked both in Sweden and Estonia. This may be the fact also in Norway as *Typha* spp. are difficult to examine in their habitats. On the other hand, where the plants are available for examination the species could easily be spotted on the flower spikes during spring or autumn (Figure 2). A third theory would be that *C. typhae* has dispersed naturally, because its habitat has become more frequently occurring during recent years. Ødegaard & Ligaard (2000) found that several insects associated with eutrophic freshwater habitats, and particularly species associated with *Typha* and *Phragmites*, have expanded their range the last decades. Also, the host-plant *Typha latifolia* is expanding its range in a north-western direction in Norway (Lid & Lid 2005). Further investigations should be made to investigate its distribution. Findings in Ø and VE where the host plant is abundant would support expansion.

*Heterogaster urticae* is reported from waste material in containers with ornamental plants imported from the Netherlands (Staverløkk 2006), and so the established population reported in this paper could very well originate from introduced specimens. Records done in a highly, disturbed site with dumped soil masses support this theory. On the other hand, the species is widely distributed in our neighbouring countries (Sweden, Finland, and Denmark) and the rest of the Palearctic region (Aukema & Rieger 2001). Alternatively, natural range expansion could, therefore, explain its occurrence in Norway. The locality in Østfold county is quite near to neighbouring populations in Sweden. These theories are not mutually exclusive, and may be the species disperses naturally from introduction sites either in Norway or Sweden, and eventually colonizes available habitats in between (Ødegaard & Tømmerås

2000). *Heterogaster urticae* is regarded as an alien species in Norway (Gederaas et al. 2007).

Several species of Heteroptera are associated with anthropogenic habitats such as ruderal fields that are common in urban areas. This makes Heteroptera as a group particularly exposed for unintended introductions to new areas. It may very well be that other species reported new to Norway quite recently also belong such category of species, for instance, *Megalocera recticornis* (Geoffroy, 1785) (Miridae), *Coriomeris denticulatus* (Scopoli, 1763) (Coreidae) and *Brachycareus tigrinus* (Schilling, 1829) (Rhopalidae), all published new to Norway by Ødegaard (1998).

It will be very interesting to monitor these species in the forthcoming years as there are several possible scenarios for their fate. Probably, we will see further range expansions to the north and westwards until the species are restricted by unsuitable habitats or too harsh climate. It may also happen that species will be knocked out from climate bottlenecks due to their poor tolerance to harsh climate. On the other hand, a warmer climate as seen during the last years may be an additional explanation for the spread of the species. A typical trait of many alien species is the outbreak like population growth when they establish in new areas (Lockwood et al. 2007), as the pattern seen in *D. lutescens*. An outbreak may also appear after a time lag of several decades, as shown in introduced plants (Kowarik 1995). Such mass occurrences may have major impact on several components of the ecosystems. Both host-plants and local fauna could be severely affected, even though we have no indication yet that this could happen to any of the above mentioned species. The species mentioned should be monitored carefully to reveal any such effects in the future.

**Acknowledgements.** We wish to thank the collectors that have contributed to these findings: Lars Ove Hansen, Vera Sandlund and Anne Sverdrup-Thygeson. Many thanks also to Sigmund Hågvar for comments on the manuscript.

## REFERENCES

- Aukema, B. & Rieger, C. (eds.) 1999. Catalogue of Heteroptera of the Palaearctic Region Vol 3: Cimicomorpha II- Miriridae. 557 pp. Netherlands Entomological Society, Amsterdam.
- Aukema, B. & Rieger, C. (eds.) 2001. Catalogue of Heteroptera of the Palaearctic Region Vol 4: Pentatomorpha I. 346 pp. Netherlands Entomological Society, Amsterdam.
- Coulianos, C-C. 2003. Records of true bugs new to Estonia, with some biological notes (Hemiptera-Heteroptera). *Sahlbergia* 8, 55-63.
- Coulianos, C-C. 1998. Annotated Catalogue of the Hemiptera-Heteroptera of Norway. *Fauna norv. Ser. B* 45, 11-40.
- Coulianos, C-C. 1976. Några för Sverige nya Hemiptera-Heteroptera samt anmärkningar och tillägg till Ölands och Gotlands heteropterfauna. *Ent. Tidskr.* 97, 103-114.
- Gederaas, L., Salvesen, I. og Viken, Å. (red.) 2007. Norsk svarteliste 2007 – Økologiske risikovurderinger av fremmede arter. 2007 Norwegian Black List – Ecological Risk Analysis of Alien Species. 151 pp. Artsdatabanken, Norway.
- Gaun, S. 1974. Blomstertæger. *Danmarks Fauna* 81. 279 pp. Dansk Naturhistorisk Forening. København.
- Gillerfors, G. & Coulianos, C-C. 2005. Fynd av för Sverige nya och sällsynta skinnbaggar (Hemiptera, Heteroptera). -Records of true bugs (Hemiptera Heteroptera) new or rare to Sweden. *Ent. Tidskr.* 126, 215-224.
- Høiland, K. 2004. En nyanlagt fangdam. Pp. 151-152 in: Hartvig, K. H. (red.) 2004. Bygdøy-Registrering av natur- og kulturverdier på deler av Bygdøy. Skisse til verneplan for deler av Bygdøy. Naturvernforbundet i Oslo og Akershus og Norsk botanisk forening, Østlandsavdelingen, Oslo.
- Kowarik, I. 1995. Time lags in biological invasions with regard to the success and failure of alien species. Pp. 15-38 in Pysek, P., Prach, K., Rejmanek, M. & Wade (eds.). *Plant invasions: General aspects and special problems*. SPB Academic Publishing, Amsterdam.
- Kment, P. & Bryja, J. 2006. Revised occurrence of *Heterotoma* species (Heteroptera: Miridae) in the Czech Republic and Slovakia with remarks on nomenclature, diagnostic characters and ecology. *Acta Musei Moraviae, Scientiae biologicae* 91, 7-52.
- Kålås, J.A., Viken, Å. og Bakken, T. (red.) 2006. Norsk

- Rødliste 2006. 416 pp. Artsdatabanken, Norway.
- Lid, J. & Lid, D.T. 2005. Norsk Flora. 7. utgåve ved Reidar Elven. 1230 pp. Det Norske Samlaget, Oslo.
- Lindskog, P. & Viklund, B. 2000. On *Deraeocoris lutescens* (Schilling) and *Pinalitus atomarius* (Meyer-Dlir) in Sweden (Heteroptera: Miridae). Entomol. Fennica 11, 231-238.
- Lockwood, J.L., Hopes, M.F., Marchetti, M.P. 2007. Invasion Ecology 304 pp. Blackwell Publishing, Malden, USA.
- Ødegaard, F. 1998. Faunistic notes on Heteroptera (Hemiptera) in Norway. Fauna norv. Ser. B 45, 93-99.
- Ødegaard, F. & Ligaard, S. 2000. Contribution to the knowledge of Norwegian Coleoptera. Norw. J. Entomol. 47, 7-19.
- Ødegaard, F. & Tømmerås, B.Å. 2000. Compost heaps refuges and stepping-stones for alien arthropod species in Northern Europe. Divers. Distrib. 6, 45-59.
- Semb-Johansson, A. 1988. Endringer i dyrelivet i vår tid. Fauna (Oslo) 41, 73-90,-109-132.
- Staverløkk, A. 2006. Fremmede arter og andre uønskede blindpassasjerer i import av grøntanleggsplanter. M.Sc. thesis, 111 pp. Universitetet for miljø og biovitenskap (UMB), Ås.
- Wachmann, E., Melber, A. & Deckert, J. 2004. Wanzen 2 – Tierwelt Deutschlands, 75: 294 pp. Verlag Goecke & Evers, Keltern.
- Wachmann, E., Melber, A. & Deckert, J. 2007. Wanzen 3 – Tierwelt Deutschlands, 78: 272 pp. Verlag Goecke & Evers, Keltern.
- Wagner, E. 1966. Wanzen oder Heteropteren I. Pentatomorpha. Tierwelt Deutschlands, 54: 235 pp. Verlag von Gustav Fischer, Jena.
- Wilcove, D.S., Rothstein, D., Dubow, J., Phillips, A., & Losos, E. 2000 Leading Threats to Biodiversity: What's Imperiling U.S. Species. Pp. 239-254 in: Stein, B.A., Kutner, L.S., and Adams, J.S. (eds.). Precious Heritage: The Status of Biodiversity in the United States. U.K. Oxford University Press, Oxford.

*Received 2 October 2007,  
accepted 24 October 2007*