

# Abundance of *Micromus variegatus* (Fabricius, 1793) (Neuroptera, Hemerobiidae) in SE Norway as indicated by light-trap catches

LITA GREVE & SVERRE KOBRO

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The abundance of *Micromus variegatus* (Fabricius, 1793) as indicated by light-trap catches between 2000 and 2008 is presented and discussed, together with the status of the species in Norway as well.

Key words: *Micromus variegatus*, light-trapped material, distribution, abundance, global warming.

Lita Greve, Zoological Museum, University of Bergen, P.O.Box 7800, NO-5200 Bergen, Norway.  
E-mail: lita.greve.jensen@zmb.uib.no.

Sverre Kobre, The Norwegian Crop Research Institute, Fellesbygget, NO-1432, Ås, Norway.  
E-mail: sverre.kobre@bioforsk.no.

## Introduction

In 1984 a study was begun to describe variations in abundance over a long period of time for common, phototactic Lepidoptera and other insects at a single locality (Kobre 1991). Preliminary results on abundance of Neuroptera and Raphidioptera for the period 1988–1996 were discussed by Greve & Kobre (1998). 32 species of Neuroptera and 2 species of Raphidioptera were collected by the light trap. The light-trapping has continued all years up to present time. The presence of one species *Micromus variegatus* (Fabricius, 1793), not included by Greve & Kobre (1990) is discussed here.

## Material and methods

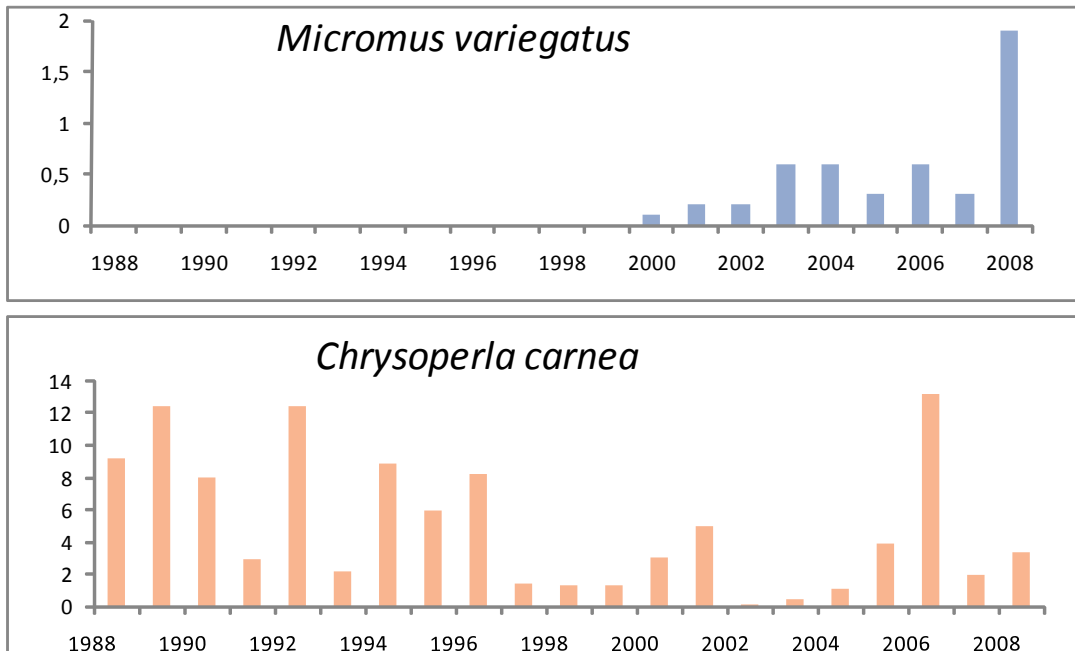
The light-trap used is a simple funnel type (Jalas-model (Söderman & Tahvanainen 1994)) with a mixed light bulb (Osram HWL 160W/235V). The trap was hung one meter above the ground at exactly the same place (EPSG 59.74758, 10.59246) every year from 1984 up to now. A new

bulb was installed in the beginning of each season. The trap was situated in an edge habitat at AK: Nesodden, Fagerstrand, between old coniferous forest, temperate deciduous forest, open grassland and a garden. The site is a shaded area and only to a small extent exposed to direct moonlight. The trap was usually operated the three first nights each week from late June to late October. Average number from nine nights (three nights in each of three consecutive weeks) is used as average of abundance each year.

## Distribution

*Micromus variegatus* was first recorded from Norway in 1989 (Greve 1989). A single male was netted near Grimstad (AAY) in 1984. In the following years 22 specimens were recorded from a total of 7 localities in Ø, AK, VE and AAY (Greve 2004). Of these 10 males and 7 females are from the light-trap at Nesodden where the first specimens were captured in 2000.

Additional material from later dates in Natural



**Figure 1.** Abundance of *Micromus variegatus* and *Chrysoperla carnea* as indicated by light trap catches at one single locality in SE Norway. Abundance is given as average number from nine nights.

History Museum, University of Oslo are listed here: Ø Moss: Jeløy, Alby, EIS 19, 2 August 2006, 1♂3♀♀, leg. O. Sørlibråten. AK Bærum: Oksenøya, Oksenøyveien 71, EIS 28, 32VNM899413, MT, 1 July–15 August 2003, calcarous meadow, 1♂, leg. L. O. Hansen, Oksenøya, Storøykilen, EIS 28, 32VNM894406, August 2002, at light, 2♂♂ leg. L. O. Hansen; Oslo: Hovedøya, Store Vestre Krutthus, EIS 28, 32VNM96664122, net, 27 July 2006, 1♂, leg. A. Endrestøl; Vestby: Kroken, EIS 20, 7 August 2006, 1♂, leg. O. Sørlibråten. AAY Grimstad: Søm, EIS 6, 32VMK831721, light-trap, June–July 2002, 1♀.

Thus, *Micromus variegatus* has now been recorded from a total of 13 localities, all from the same area as listed in Greve (2004), viz. the area around the Oslofjord from Hvaler in the southeast to Grimstad in the west. All localities are in coastal areas.

## Discussion

During 2000–2008 64 specimens, 38♂♂26♀♀ and 1 specimen of *M. variegatus* were collected in the light trap at Fagerstrand, see Figure 1.

Together with the 3♂♂ and 2♀♀ from additional localities noted in Greve (2004) and 10 additional specimens listed above, the total number of specimens recorded from Norway is 79. The total number of species of Neuroptera (Hemerobiidae) recorded from the light trap at Nesodden is 32.

Before the first specimen was netted in 1984 in the Grimstad area, *M. variegatus* was only recorded from Sweden north to the province Västgötland in Fennoscandia (Hedström 1987). The northern part of this Swedish province reaches approximately to the southern tip of Norway, but Västgötland is not bordering to Norway. *M. variegatus* is considered common in Southern England, scattered in Northern England and Southern Scotland (Plant 1994). *M. variegatus* has a wide distribution both in Europe (South of Fennoscandia) and in the Holarctic.

There is a possibility that *M. variegatus* has been overlooked in Norway up to now. It is a fairly small species in the family Hemerobiidae. However, many other small species in this family

have been collected in this area in the last 150 years. SE Norway is probably the best surveyed area in the country.

*M. variegatus* is definitely a characteristic species which can be easily determined by the wing-pattern, and is not difficult to determine compared to several other species in this family.

Furthermore, many species of Lepidoptera and Neuroptera have a more or less stable presence during the investigation periode (as *Chrysoperla carnea* in Figure 1) and we suggest that *M. variegatus* is new to this area, thus recently new to Norway and is increasing its area in southern Fennoscandia. This northward expansion may be a result of global warming.

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