The first record of the plant bug *Orthotylus* (*Orthotylus*) *flavinervis* (Kirschbaum, 1856) (Hemiptera, Miridae) from Norway

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The plant bug *Orthotylus* (*Orthotylus*) *flavinervis* (Kirschbaum, 1856) is reported from Norway for the first time. A reproducing pair (in copula) was found in Hvaler municipality in Viken county in June 2018. Comments on biology, habitat, identification characters, distribution and red list status of the genus *Orthotylus* Fieber, 1858 in the Nordic countries, are given.

Key words: *Orthotylus* (*Orthotylus*) *flavinervis*, Miridae, Heteroptera, Hemiptera, Viken, Norway.

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Introduction

The plant bugs (Miridae) represent the largest family of true bugs (Hempitera, Heteroptera). Within this family, the genus *Orthotylus* Fieber, 1858 is represented with 17 species in six subgenera in the Nordic countries. *Orthotylus* are mainly green-coloured species, which closely resemble each other. The host plant is of great help in the identification process. Most species are found on different trees or saltworts (Gaun, 1974). All species overwinter as eggs (Gaun, 1974) and all but one, *Orthotylus (Melanotrichus) flavosparsus* (C.R. Sahlberg, 1841), has one generation per year (Skipper 2013). The first Norwegian record of *Orthotylus (Orthotylus) flavinervis* (Kirschbaum, 1856) is presented here, along with a status of the genus in the Nordic countries (except Iceland).

Material and methods

Viken (EIS 12), Hvaler: Asmaløy, Huserstøet, (59.0517°N 10.9273°E), pair in copula, 26 June 2018, leg./det. Jørn R. Gustad. The pair was observed and photographed, not collected (Figure 1). The locality is situated on the coastline far SE in Norway. The general habitat is a shoreline with rocks and scattered vegetation. The site had relatively dense vegetation, with low trees, bushes and grass, about 10 metres above sea level. Further onshore there was a natural pasture.

Diagnostic characters

The general description of *O. (O.) flavinervis* is as follows: dorsally bright green body with a strikingly yellow head, contrasting to blackish eyes. Usually the shoulders and tips of cuneus have a restricted bright yellow spot, and the anterior edge of scutellum has a diffuse orange-yellow border. The membrane is dusky and the two closed cells have yellow borders/nerves/venation. The legs are mainly green, lower tibia yellowish and tarsi brownish. The antennae are pale yellow and (especially) the wings (namely clavus, corium and cuneus) have dense and short

FIGURE 1. *Orthotylus* (*Orthotylus*) *flavinervis* (Kirschbaum, 1856). Male (left) and female in copula at Huserstøet, Asmaløy, Hvaler, Viken. Photo: Jørn R. Gustad.

pale pubescence. Sexual dimorphism in Miridae where both sexes are macropterous has males with a more elongated body shape and females with a more oval body shape. In addition, the abdomen is more swollen in the females. In *O. (O.) flavinervis* (Kirschbaum, 1856) the sexes differ morphologically with the males having darkened first antennal segments (as dark as the eye), giving them a more contrasting appearance (Figure 1). These main characteristics (along with other) were included in Kirschbaum's original description of *Capsus flavinervis* Kirschbaum, 1856, and the epithet refers to the yellow veins in the membrane.

Even though the genus comprises 17 species in the Nordic countries (see table 1), the males of *O. (O.) flavinervis* cannot be confused with any other species in the genus, but abraded females can be confused with *Orthotylus (Orthotylus) marginalis* Reuter, 1883 or females of *Orthotylus (Orthotylus) virescens* (Douglas & Scott, 1865).

Gaun (1974) provides a key for identification which covers all species in table 1, along with *Blepharidopterus diaphanus* (Kirschbaum, 1856),

TABLE 1. The genus *Orthotylus* Fieber, 1858 distribution and red list status in Nordic countries. There are 17 species of the genus recorded in the Nordic countries (Denmark (Skipper, 2013), Finland (Finnish Biodiversity Info Facility), Norway (Norwegian Biodiversity Information Centre) and Sweden (The Swedish Species Information Centre). The species are listed alphabetically. * represents the record given in this paper.

Species	Denmark	Finland	Norway	Sweden
Orthotylus (*Pachylops*) *adenocarpi* (Perris, 1857)	NE	-	-	NT
Orthotylus (*Pseudorthotylus*) *bilineatus* (Fallén, 1807)	NE	LC	LC	LC
Orthotylus (*Orthotylus*) *boreellus* (Zetterstedt, 1828)	-	LC	LC	LC
Orthotylus (*Pachylops*) *concolor* (Kirschbaum, 1856)	NE	-	-	LC
Orthotylus (*Litocoris*) *ericetorum* (Fallén, 1807)	NE	LC	LC	LC
Orthotylus (*Orthotylus*) *flavinervis* (Kirschbaum, 1856)	NE	LC	*	LC
Orthotylus (*Melanotrichus*) *flavosparsus* (C.R. Sahlberg, 1841)	NE	LC	LC	LC
Orthotylus (*Pinocapsus*) *fuscescens* (Kirschbaum, 1856)	NE	LC	LC	LC
Orthotylus (*Orthotylus*) *marginalis* Reuter, 1883	NE	LC	LC	LC
Orthotylus (*Melanotrichus*) *moncreaffi* (Douglas & Scott, 1874)	NE	-	-	-
Orthotylus (*Orthotylus*) *nassatus* (Fabricius, 1787)	NE	LC	LC	LC
Orthotylus (*Orthotylus*) *prasinus* (Fallén, 1826)	NE	EN	LC	LC
Orthotylus (*Melanotrichus*) *rubidus* (Puton, 1874)	NE	-	-	LC
Orthotylus (*Orthotylus*) *tenellus* (Fallén, 1807)	NE	LC	LC	LC
Orthotylus (*Orthotylus*) *virens* (Fallén, 1807)	NE	LC	LC	LC
Orthotylus (*Pachylops*) *virescens* (Douglas & Scott, 1865)	NE	-	LC	LC
Orthotylus (*Orthotylus*) *viridinervis* (Kirschbaum, 1856)	NE	LC	LC	LC

which at the time being was treated as *Orthotylus (Orthotylus) diaphanus* (Kirschbaum, 1856). Gaun (1974) also provides genital drawings and valuable information on biology. Rintala & Rinne (2011) also provides a key with genital drawings, but includes only the Finnish species (12 out of 17 species).

Of these 17 species, Rabitsch (2010) suspects that; *Orthotylus adenocarpi* (Perris, 1857), *Orthotylus concolor* (Kirschbaum, 1856) and *Orthotylus virescens* (Douglas & Scott, 1865), have been introduced into Europe with ornamental plants in the 19th century.

Distribution and biology

According to the Global Biodiversity Information Facility (GBIF), *Orthotylus (Orthotylus) flavinervis* (Kirschbaum, 1856) has its stronghold in continental Europe and Great Britain. In the Nordic countries it is found scarcely and scattered, primarily in coastal forest in southern Finland (Finnish Biodiversity Info Facility) and Sweden (The Swedish Species Information Centre), and Nyköping Falster and Bornholm in Denmark (Gaun 1974, Skipper 2013). Skipper (2013) regards it as common on Bornholm. It is secondarily found in parks, courtyards and gardens (Finnish Biodiversity Info Facility, Skipper 2013), also a short way inland. The Norwegian record (of a reproducing pair) seen in context with recent Swedish records (eg. north and south of Göteborg in 2019), suggests that the species is expanding its range northwards.

Kirschbaum (1856) gives the flight period from June to August, and Skipper (2013) gives it as from ultimo June to medio August. Skipper

(2013) further notes that it has one generation a year, and the species overwinters as egg only.

The species is probably polyphagous. Kirschbaum (1856) gives its host as *Alnus* Mill., and Gaun (1974) and Skipper (2013) primarily *Alnus glutinosa* (L.) Gaertn. Gaun (1974) also mentions records on *Acer pseudoplatanus* L. from England, and Skipper (2013) on *Betula* L. *A. glutinosa* was present at the locality given here, and on which the pair of *O. (O.) flavinervis* was found.

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