

## Window gnats (Diptera: Anisopodidae) of the Czech part of the Bohemian Forest

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### Abstract

A three-week survey of window gnats was performed in the Šumava National Park in June 2016 and all records of Anisopodidae from the Czech part of the Bohemian Forest (Šumava) were summarised. Altogether the data to six species in 187 specimens of Anisopodidae were analysed. The record of *Sylvicola fenestralis* (Scopoli, 1763) was the first finding for the Bohemian Forest. The studied area has the highest diversity of Anisopodidae in the Czech Republic.

*Key words:* distribution, faunistics, new records, Šumava Mountains

### INTRODUCTION

Window gnats (Diptera: Anisopodidae) of the Šumava National Park and Protected Landscape Area (NP and PLA) in the Bohemian Forest (Šumava in Czech) have not been systematically studied yet. ŠEVČÍK (2004) published the record of the rarest Czech species, *Sylvicola limpidus* (Edwards, 1923). Later on, DVOŘÁK (2014b) reported the presence of *S. cinctus* (Fabricius, 1787), *S. punctatus* (Fabricius, 1787), and *S. zetterstedti* (Edwards, 1923).

In 2016, beer traps were placed on the territory of the Šumava NP and PLA for the purpose of faunistic study of window gnats. The results of this trapping survey are published in this study together with other published and unpublished data.

### MATERIAL AND METHODS

Twelve localities were studied in this survey using beer traps. They covered typical habitats (open, semiopen, forested) in the altitudes 785–1305 m a.s.l. in the Bohemian Forest, on the whole area of the Šumava NP, including its current buffer zone (Šumava PLA till 2016, Fig. 1). All the traps were managed by T. Lorenc and these sites are arranged as follows: locality – code of the mapping square, habitat, altitude, GPS coordinates, and dates of installation and recovery.

Vysoké Lávky – 6846, sedge meadow, 835 m, 49°7'48.698" N, 13°22'39.522" E, 9–28 Jun 2016.

Poledník – 6946, forest-free area on the top of Poledník Mt., 1305 m, 49°3'52.561" N, 13°23'42.597" E, 9–28 Jun 2016.

Staré Srní – 6946, wet meadow with willow shrubs, 840 m, 49°5'4.468" N, 13°28'38.687" E, 9–28 Jun 2016.

Filipova Huť – 6947, meadow with bushes, 1110 m, 49°1'51.039" N, 13°31'16.926" E,

7–28 Jun 2016.

Svinná Lada – 6947, Chalupská Slat' peat-bog, peat-bog margin, 925 m, 49°0'7.668" N, 13°39'1.655" E, 8–28 Jun 2016.

Březník – 7046, dead spruce forest, 1140 m, 48°58'6.580" N, 13°29'11.399" E, 7–28 Jun 2016.

Bučina – 7047, montane meadow, 1175 m, 48°58'14.218" N, 13°35'53.094" E, 8–28 Jun 2016.

Strážný – 7048, alderwood by a small pond W of the village, 830 m, 48°54'57.431" N, 13°43'12.978" E, 8–28 Jun 2016.

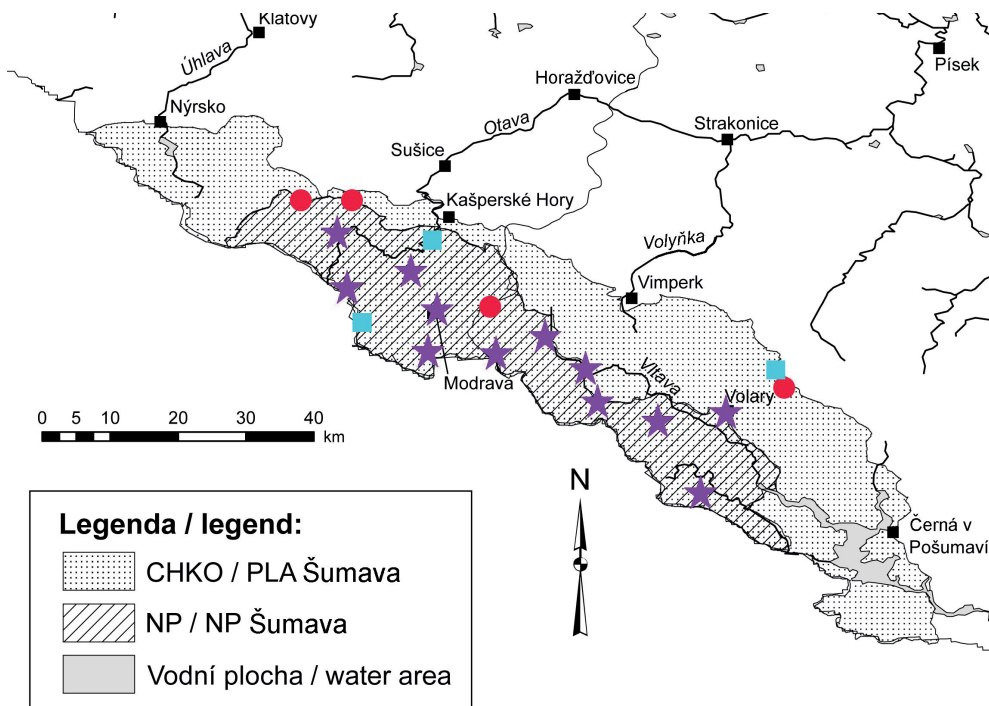
Polka – 7048, wet meadow by a stream, 835 m, 48°56'42.918" N, 13°42'35.940" E, 8–28 Jun 2016.

Volary – 7049, bushes behind a gas station, 785 m, 48°54'36.065" N, 13°52'20.120" E, 8–28 Jun 2016.

České Žleby – 7148, forest margin, 875 m, 48°53'29.563" N, 13°47'52.967" E, 8–28 Jun 2016.

Nová Pec – 7249, Plechý Mt., light gap in montane mixed forest, 1050 m, 48°47'11.936" N, 13°51'43.413" E, 8–28 Jun 2016.

The used beer traps were very simple: a PET bottle of 1.5–2 litres was filled with 0.5 litre of lager beer. The opened traps were hung on a branch of tree or shrub and exposed at the localities studied (Fig. 1). The traps were emptied after ca. three weeks. For more details see DVOŘÁK (2014a,b).



**Fig. 1.** All localities of Anisopodidae known from the territory of the Šumava NP and PLA in the Bohemian Forest. Violet stars: beer traps in 2016 (present survey); red circles: published records; blue squares: other unpublished records.

The material was identified using HAENNI (1997) and SÖLI & RINDAL (2014). The voucher specimens are deposited in the collections of the Municipal Museum Mariánské Lázně, Czech Republic, if not stated otherwise.

## RESULTS

Altogether five species and 66 specimens of window gnats were collected during the survey in June 2016 and records of other three specimens from previous studies are presented. Here we present these records along with all available data. All records are arranged as follows: (i) localities of systematic study using beer traps are named according to the list in Material and methods chapter and (ii) randomly received material locality – code of the mapping square, other collecting information provided by the collector, number of ♂♂ and/or ♀♀, collector.

### *Sylvicola cinctus* (Fabricius, 1787)

Published data

Nová Hůrka – 6845; Rovina – 6846 (DVOŘÁK 2014b).

New records

Poledník, 1 ♂, 12 ♀♀. Staré Srní, 1 ♂, 4 ♀. Filipova Huť, 3 ♀♀. Svinná Lada, 2 ♀♀. Březník, 1 ♂, 9 ♀♀. Strážný, 3 ♀♀. Polka, 1 ♀. Volary, 6 ♀♀. České Zleby, 2 ♀♀. Nová Pec, 2 ♀♀.

In the studied area, this species prefers semi-open to forested habitats and was caught in 785–1305 m a.s.l. DVOŘÁK (2014a) considered *S. cinctus* as a eurytopic species and DVOŘÁK (2014b) noted the species to be often found in forests, while it seems rather rare in open stands.

### *Sylvicola fenestralis* (Scopoli, 1763)

New records

Volary, 2 ♂♂, 1 ♀.

This species is such rarely collected in the Czech Republic that no habitat preferences could be stated.

### *Sylvicola fuscatus* (Fabricius, 1775)

New records

Poledník, 1 ♂. Volary, 1 ♀.

Two records from open and semi-open stands confirmed the preference of similar stands, as DVOŘÁK (2014a) has been published.

### *Sylvicola limpidus* (Edwards, 1923)

Published data

Jezerní Slat' peat-bog – 6947 (ŠEVČÍK 2004).

The only record is known from the very cold mountain peat-bog.

### *Sylvicola punctatus* (Fabricius, 1787)

Published data

Nová Hůrka – 6845; Rovina – 6846; Spálenec – 7049 (DVOŘÁK 2014b).

**Table 1.** Overview of Anisopodidae specimens from both the published and unpublished sources known from the Bohemian Forest (Šumava NP and PLA).

Species	Published	Unpublished	Total	%
<i>S. cinctus</i>	28 ♂♂, 58 ♀♀	3 ♂♂, 44 ♀♀	31 ♂♂, 102 ♀♀	71.1
<i>S. fenestralis</i>	–	2 ♂♂, 1 ♀	2 ♂♂, 1 ♀	1.6
<i>S. fuscatus</i>	–	1 ♂, 1 ♀	1 ♂, 1 ♀	1.1
<i>S. limpidus</i>	1 ♂	–	1 ♂	0.5
<i>S. punctatus</i>	9 ♂♂, 19 ♀♀	5 ♂♂, 11 ♀♀	14 ♂♂, 30 ♀♀	23.5
<i>S. zetterstedti</i>	3 ♂♂	1 ♂	4 ♂♂	2.1
<b>Total</b>	41 ♂♂, 77 ♀♀	12 ♂♂, 57 ♀♀	53 ♂♂, 134 ♀♀	100.0

#### New records

Vysoké Lávky, 1 ♀. Bučina, 1 ♂, 8 ♀♀. Strážný, 1 ♀. Volary, 2 ♂♂.

Svojše – 6846, Dračí Skály rocks, 14–15 May 2015, light trap, 1 ♂, P. Heřman, leg.

Modrava – 6946, Rokytecká Nádrž dam, 16 Jun 2014, 1 ♀, J. Máca, leg. et coll.

Spálenec – 7049, 800 m, 48°56' N, 13°57' E, 10 Jul 1988, light trap, 1 ♂, M. Barták leg. et coll.

This species was recorded in open to semi-open stands only (as in DVOŘÁK 2014a) in ca. 800–1305 m a.s.l. DVOŘÁK (2014b) noted the species to be predominant in forests and very commonly found (more than 90%) in open stands.

#### *Sylvicola zetterstedti* (Edwards, 1923)

##### Published data

Nová Hůrka – 6845; Rovina – 6846 (DVOŘÁK 2014b).

##### New records

Poledník, 1 ♂.

This species was first recorded in the Czech Republic by DVOŘÁK (2014a). In the Bohemian Forest, the species was caught on two semi-open wet stands at ca. 900 m a.s.l. and on a deforested top area at 1305 m a.s.l.

#### Overall results

The data of four species in 118 specimens were published from the Šumava NP and PLA and the data of five species in 69 specimens are newly published in this study. Altogether the data of six species in 187 specimens of Anisopodidae were analysed. Two species were eu-dominant: *S. cinctus* with 71.1% and *S. punctatus* with 23.5% of all specimens; the other four species were represented by 0.5–2.1% of specimens (Table 1).

From the new material, a single species was recorded on 12 localities and two species on one locality. In three cases, three species were caught on one locality; *S. cinctus* and *S. zetterstedti* were recorded in all three cases (Nová Hůrka, Poledník, Rovina). On the locality Volary, four species were caught: *S. cinctus*, *S. fenestralis*, *S. fuscatus*, and *S. punctatus*. One new locality of *S. zetterstedti* and the first records of *S. fenestralis* and *S. fuscatus* are the most interesting results of this survey.

## CONCLUSIONS

Six species of the family Anisopodidae have been recorded from the Czech Republic (ŠEVČÍK 2009, DVOŘÁK 2014a) and all of them are recently known from the Bohemian Forest, with the new records of *S. fenestralis* and *S. fuscatus* in the present study. Thus this area has the highest biodiversity of Anisopodidae in the Czech Republic. In comparison, five species are known from the high altitudes of the Giant Mts. (Krkonose Mts.) (ŠEVČÍK et al. 2009), from the Jizerské Hory Mts. and Ještědský Hřbet ridge (DVOŘÁK & VONIČKA 2015).

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