

Window gnats (Diptera : Anisopodidae) from beer traps in the vicinity of Mariánské Lázn with the first records of *Sylvicola zetterstedti* (Edwards, 1923) from the Czech Republic

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Objektyp: **Article**

Zeitschrift: **Mitteilungen der Schweizerischen Entomologischen Gesellschaft = Bulletin de la Société Entomologique Suisse = Journal of the Swiss Entomological Society**

Band (Jahr): **87 (2014)**

Heft 1-2

PDF erstellt am: **22.07.2024**

Persistenter Link: <https://doi.org/10.5169/seals-403078>

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Window gnats (Diptera: Anisopodidae) from beer traps in the vicinity of Mariánské Lázně with the first records of *Sylvicola zetterstedti* (Edwards, 1923) from the Czech Republic

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Results of catches of Anisopodidae trapped by beer traps in the vicinity of Mariánské Lázně in Western Bohemia in late summer 2012, and from spring to autumn 2013 are presented. During this survey, 3796 specimens belonging to four species were caught. Three species were present in similar numbers, *Sylvicola cinctus* (Fabricius, 1787), *S. fuscatus* (Fabricius, 1775), and *S. punctatus* (Fabricius, 1787), which was the commonest. Five males and one female of *Sylvicola zetterstedti* (Edwards, 1923) were collected in three localities, in the vicinity of Drmoul and Velká Hleďsebe. This is the first record of this species for the Czech Republic.

Key words: bait traps, new record, distribution, Central Europe.

INTRODUCTION

Anisopodidae is a small family of dipteran insects with nine species of the genus *Sylvicola* Harris, 1776, present in continental Europe (De Jong 2004). Only five species are known from the territory of the Czech Republic (Ševčík 2009b), where the family was rarely studied in the past, and no data were published from western Bohemia so far. All species of the family are regularly attracted by bait traps (Kurina 2006). Beer or syrup traps are routinely used by the author for faunistic surveys of various localities in the Mariánské Lázně surroundings (e.g. Dvořák & Dvořáková 2012). In this contribution, the results of trapping Anisopodidae using beer traps in 2012 and 2013 are presented.

MATERIAL AND METHODS

Bigger PET bottles filled with beer were hung 1,5–2 metres above the ground on a branch of a tree or shrub (Dvořák 2007, Dvořák & Dvořáková 2012). In August–September 2012, 14 traps were exposed during one month; in 2013, 10 traps were exposed from April to September and emptied each month.

Localities are described in this order: locality code, nearest village or town, mapping quadrat code, closer description of the locality including biotope, coordinates in WGS, and date of traps exposure.

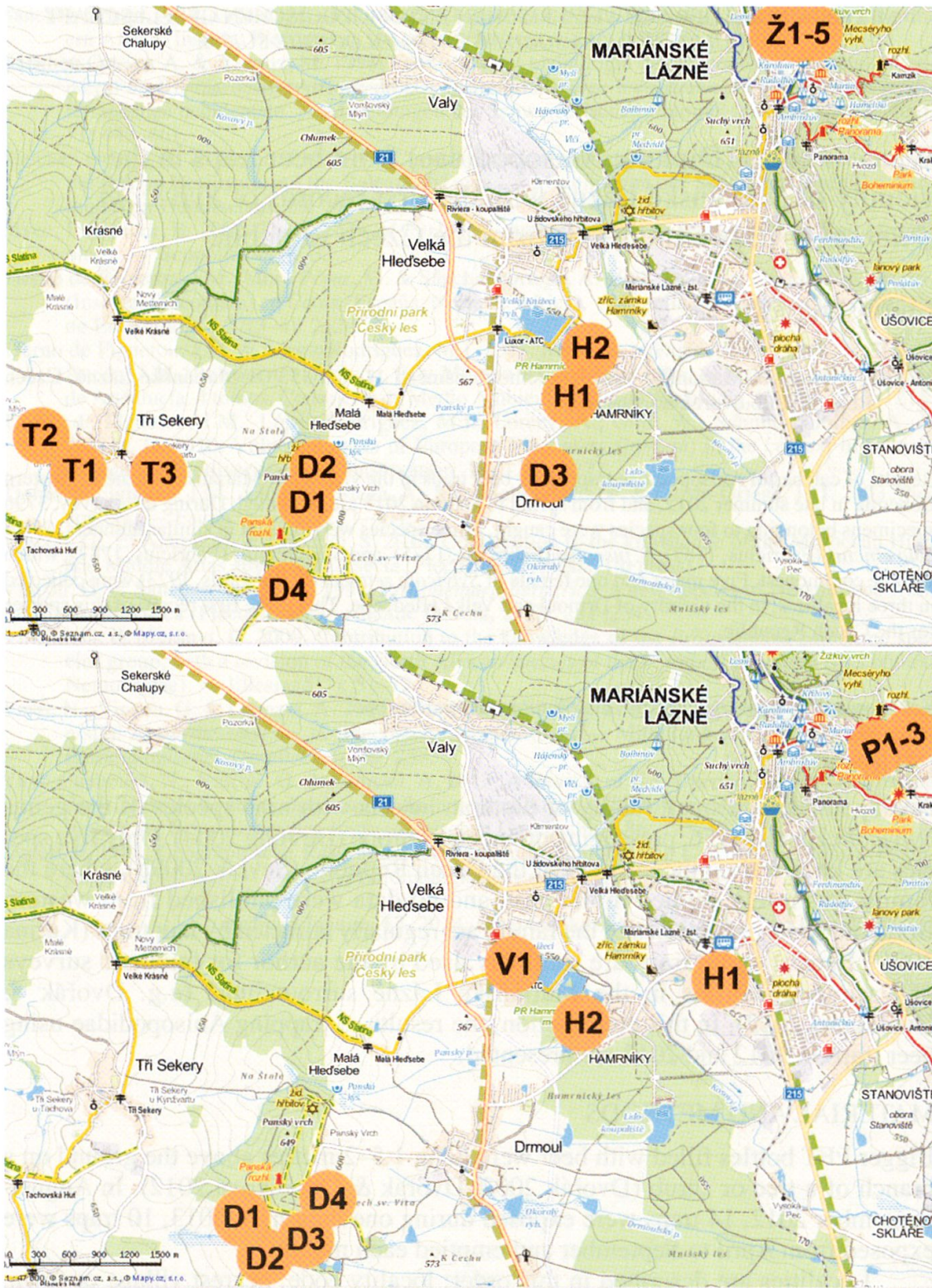


Fig. 1. Study area with localities of trapping. Top: year 2012, bottom: year 2013.

Localities studied in 2012 (Fig. 1, top)

- D1, Drmoul, 6041, Panský vrch Nature Monument, willow-alder wood, 49°56'32.5" N, 12°38'44.4" E, 19.VIII.–9.IX.2012
- D2, Drmoul, 6041, Panský vrch Nature Monument, ecoton of spruce forest and peaty meadow, 49°56'33.3" N, 12°38'47.2" E, 19.VIII.–9.IX.2012
- D3, Drmoul, 6042, forest margin under the playground, 49°56'33.2" N, 12°40'26.2" E, 27.VIII.–18.IX.2012
- D4, Drmoul, 6041, former military training area, xeric stand, 49°55'54.3" N, 12°38'07.6" E, 27.VIII.–18.IX.2012
- H1, Hamrníky, 6042, Hamrnický mokřad Nature Reserve, peaty meadow, 49°57'03.1" N, 12°40'48.5" E, 27.VIII.–18.IX.2012
- H2, Hamrníky, 6042, dam of the Malý Ostrovní pond, willow shrubs, 49°57'09.6" N, 12°40'47.5" E, 27.VIII.–18.IX.2012
- Ž1, Mariánské Lázně, 6042, Žižkův vrch Nature Reserve, leaf forest on rocky debris slope, 49°58'48.0" N, 12°42'24.9" E, 24.VIII.–17.IX.2012
- Ž2, Mariánské Lázně, 6042, Žižkův vrch Nature Reserve, leaf forest on rocky debris slope, 49°58'50.6" N, 12°42'13.4" E, 24.VIII.–17.IX.2012
- Ž3, Mariánské Lázně, 6042, Žižkův vrch Nature Reserve, leaf forest on rocky debris slope, 49°58'49.7" N, 12°42'22.6" E, 24.VIII.–17.IX.2012

 Tab. 1. Captures of *Sylvicola* species at individual localities.

Locality	Species			
	<i>S. cinctus</i>	<i>S. fuscatus</i>	<i>S. punctatus</i>	<i>S. zetterstedti</i>
H1	–	–	–	–
H2	2 ♀♀	–	–	–
D1	6 ♀♀	–	–	–
D2	4 ♂♂, 13 ♀♀	1 ♀	2 ♂♂, 1 ♀	–
D3	1 ♂, 9 ♀♀	19 ♂♂, 53 ♀♀	4 ♂♂, 11 ♀♀	–
D4	2 ♀♀	1 ♀	191 ♂♂, 489 ♀♀	–
T1	1 ♂, 5 ♀♀	1 ♂, 4 ♀♀	51 ♂♂, 138 ♀♀	–
T2	3 ♀♀	3 ♂♂, 6 ♀♀	128 ♂♂, 178 ♀♀	–
T3	1 ♀	–	4 ♀♀	–
Ž1	5 ♀♀	–	–	–
Ž2	3 ♀♀	–	–	–
Ž3	1 ♂, 7 ♀♀	–	–	–
Ž4	2 ♀♀	–	–	–
Ž5	10 ♀♀	–	1 ♀	–
Sum 2012	7 ♂♂, 68 ♀♀	23 ♂♂, 65 ♀♀	376 ♂♂, 822 ♀♀	–
H1	5 ♂♂, 42 ♀♀	59 ♂♂, 84 ♀♀	17 ♂♂, 48 ♀♀	–
H2	35 ♂♂, 55 ♀♀	91 ♂♂, 189 ♀♀	9 ♂♂, 8 ♀♀	–
V1	4 ♂♂, 28 ♀♀	24 ♂♂, 17 ♀♀	7 ♂♂, 15 ♀♀	1 ♂
D1	5 ♂♂, 15 ♀♀	2 ♂♂, 1 ♀	223 ♂♂, 406 ♀♀	–
D2	4 ♂♂, 37 ♀♀	2 ♂♂, 4 ♀♀	24 ♂♂, 16 ♀♀	1 ♂
D3	14 ♂♂, 42 ♀♀	8 ♂♂, 9 ♀♀	184 ♂♂, 140 ♀♀	3 ♂♂, 1 ♀
D4	8 ♂♂, 30 ♀♀	76 ♂♂, 30 ♀♀	45 ♂♂, 147 ♀♀	–
P1	27 ♀♀	3 ♀♀	1 ♂, 14 ♀♀	–
P2	1 ♂, 24 ♀♀	1 ♂, 3 ♀♀	12 ♀♀	–
P3	9 ♂♂, 104 ♀♀	4 ♂♂, 2 ♀♀	18 ♀♀	–
Sum 2013	82 ♂♂, 404 ♀♀	267 ♂♂, 342 ♀♀	510 ♂♂, 824 ♀♀	5 ♂♂, 1 ♀
Total	89 ♂♂, 472 ♀♀	290 ♂♂, 407 ♀♀	886 ♂♂, 1646 ♀♀	5 ♂♂, 1 ♀
Total	561 ex.	697 ex.	2532 ex.	6 ex.

- Ž4, Mariánské Lázně, 6042, Žižkův vrch Nature Reserve, leaf forest on rocky debris slope, 49°58'50.3" N, 12°42'31.0" E, 24.VIII.–17.IX.2012
 Ž5, Mariánské Lázně, 6042, Žižkův vrch Nature Reserve, leaf forest on rocky debris slope, 49°58'50.3" N, 12°42'25.4" E, 24.VIII.–17.IX.2012
 T1, Tři Sekery, 6041, Local biocentre Tři Sekery, aspen-willow wood, 49°56'35.3" N, 12°36'24.6" E, 23.VIII.–16.IX.2012
 T2, Tři Sekery, 6041, Local biocentre Tři Sekery, pond dam, 49°56'32.1" N, 12°36'20.4" E, 23.VIII.–16.IX.2012
 T3, Tři Sekery, 6041, garden of the house No. 21, 49°56'26.8" N, 12°37'10.0" E, 26.VIII.–16.IX.2012

Localities studied in 2013 (Fig. 1, bottom)

- H1, Hamrníky, 6042, alder wood by the pond, «U Mlékárny», 49°57'17.5" N, 12°41'49.6" E, 19.IV.–18.IX.2013
 H1, Hamrníky, 6042, damp willow shrubs, Hamrnický mokřad Nature Reserve, 49°56'58.8" N, 12°40'46.6" E, 19.IV.–18.IX.2013
 V1, Velká Hleďsebe, 6042, damp willow shrubs above the Knížecí pond, 49°57'15.4" N, 12°40'3.1" E, 19.IV.–18.IX.2013
 D1, Drmoul, 6041, xeric stand, former military training area, 49°55'56.3" N, 12°38'8.0" E, 21.IV.–30.IX.2013
 D2, Drmoul, 6041, damp alder wood under the pond, former military training area, 49°55'44.5" N, 12°38'11.6" E, 21.IV.–30.IX.2013
 D3, Drmoul, 6041, open forest margin, former military training area, 49°55'47.5" N, 12°38'25.3" E, 21.IV.–30.IX.2013
 D4, Drmoul, 6041, birch forest margin, former military training area, 49°55'56.9" N, 12°38'45.1" E, 21.IV.–30.IX.2013
 P1, Mariánské Lázně, 6042, maple-spruce forest in the Pstruží stream valley, 49°58'33.0" N, 12°43'25.3" E, 25.IV.–17.IX.2013
 P2, Mariánské Lázně, 6042, maple-spruce forest in the Pstruží stream valley, 49°58'33.8" N, 12°43'22.3" E, 25.IV.–17.IX.2013
 P3, Mariánské Lázně, 6042, maple-spruce forest in the Pstruží stream valley, 49°58'33.5" N, 12°43'19.90" E, 25.IV.–17.IX.2013

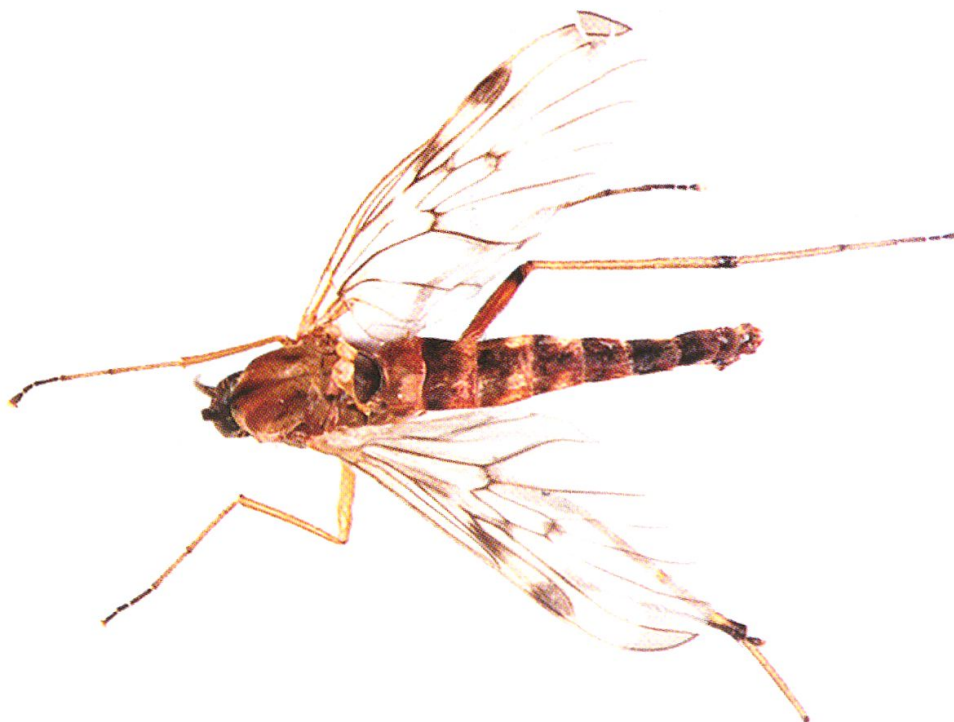


Fig. 2. *Sylvicola zetterstedti* (Edw.), male (Drmoul), dorsal view. Photo: J. Dvořák



Fig. 3. *Sylvicola zetterstedti* (Edw.), frons of male (Drmoul). Photo: Z. Kejval.

The material was identified using Haenni (1997), Krivosheina & Menzel (1998), and Michelsen (1999). The nomenclature follows De Jong (2004). The voucher material (pinned or preserved in small vials with ethanol) is deposited in the collection of the Municipal museum Mariánské Lázně.

RESULTS AND DISCUSSION

The cumulative results of trapping of Anisopodidae in 2012 and 2013 are summarized in Table 1. Altogether 3796 specimens belonging to four species of the genus *Sylvicola* were trapped and identified. During one month in 2012, using 14 beer traps, 1374 specimens of the three very common species (sensu Kovář & Barták 2001) *Sylvicola cinctus* (Fabricius, 1787), *S. fuscatus* (Fabricius, 1775), and *S. punctatus* (Fabricius, 1787) were caught. Noteworthy is the eudominance of *S. punctatus* (Tab. 1). During five months in 2013, by the use of 10 beer traps 2435 specimens were caught, belonging to four species: the same three common species as in 2012, but also *Sylvicola zetterstedti* (Edwards, 1923) (see below). The commonest species was *S. punctatus* again, but its dominance was not as absolute as in 2012 (Tab. 1).

Adults of all species of the genus *Sylvicola* are feeding on nectar and similar liquids (Kovář & Barták 2001) and are regularly attracted by traps (baited with beer, syrup, mead, etc.). This method is very effective for faunistic surveys of Anisopodidae, as exemplified in Estonia by Kurina (2006) who obtained most of the material of her study by using light and bait traps. Unfortunately, no similar results were published up to now from the territory of the Czech Republic.

Noteworthy is the capture of six specimens of *S. zetterstedti*, a rare species known from western, northern, and central Europe. It is reliably documented from

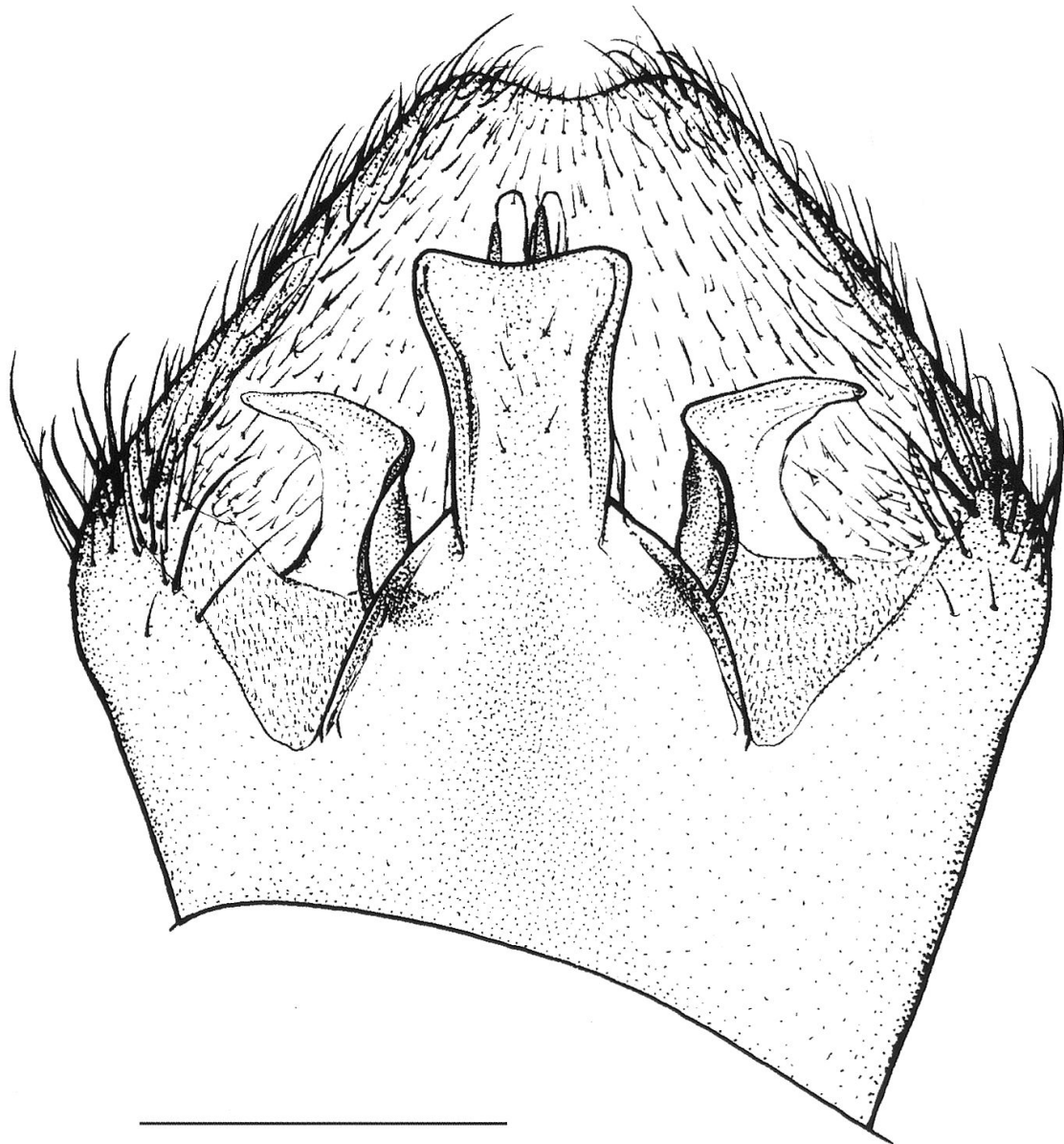


Fig. 4. *Sylvicola zetterstedti* (Edw.), male genitalia (Drmoul), ventral view. Scale 0.2 mm. Orig. Z. Kejval.

the following countries: Belgium, Finland, Great Britain, Ireland, Liechtenstein, the Netherlands, Norway, central Russia, Sweden, Switzerland (De Jong 2004), France (Haenni 1997), Lithuania (Podėnas & Pakalniškis 1997), Italy (Haenni 2005), Slovakia (Ševčík 2009a,b), and Spain (Carles-Tolrá *et al.* 2010).

Material of *Sylvicola zetterstedti*: Bohemia occ., D2, 17.VII.–22.VIII.2013, 1 ♂ (Figs 2–4); D3, 16.VI.–17.VII.2013, 1 ♂, 22.VIII.–30.IX.2013, 2 ♂♂, 1 ♀; V1, 16.VIII.–18.IX.2013, 1 ♂. For all specimens: L. Dvořák leg. et det., coll. Municipal museum Mariánské Lázně. Identification of the female was confirmed by genitalia dissection using Haenni (1997). **New species for the Czech Republic.**

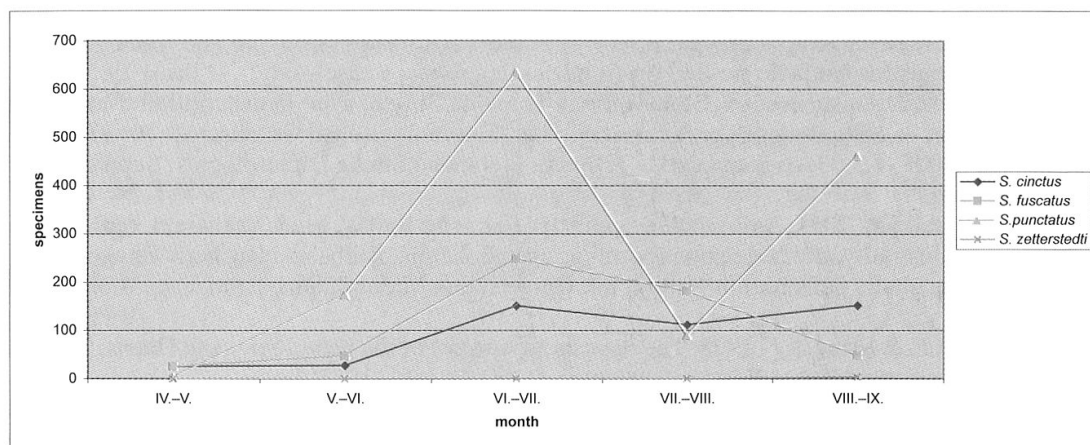


Fig. 5. Phenology of *Sylvicola* species based on the material presented in this paper.

The large number of trapped specimens could help to evaluate their ecological requirements. *Sylvicola cinctus* was trapped in 23 of 24 localities, so the species is practically eurytopic. *S. fuscatus* was trapped in 15 localities, *S. punctatus* in 17 localities, both in mass number in open and semi-open stands, while missing or rare in forests. *S. zetterstedti* was trapped in three localities only, all are in forests or their margins, on damp stands.

Phenology could not be evaluated with certainty, but the peak of occurrence for the three common species, except of *S. punctatus*, was in the traps hung in June and recovered in July (Fig. 5).

CONCLUSION

Beer (or similar bait) traps are a very effective method for obtaining abundant material of the family Anisopodidae. Hundreds of specimens of the three common species (*Sylvicola cinctus*, *S. fuscatus*, and *S. punctatus*) are regularly trapped, but rarer species may sometimes be found among such numerous material, as exemplified by *S. zetterstedti* in the present study.

ACKNOWLEDGEMENTS

The author wishes to thank Josef Dvořák (Prague-Hrnčův, Czech Republic) for preparing the Fig. 2 and Zbyněk Kejval (Museum of the Chodsko region, Domažlice, Czech Republic) for preparing the Figs 3–4. Jean-Paul Haenni (Natural History Museum collection, Muséum d'histoire naturelle, Neuchâtel, Switzerland) provided valuable comments on the manuscript.

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(received November 14, 2013; accepted March 27, 2014; published June 30, 2014)