

## The Cecidomyiidae (Diptera) of common reed, *Phragmites australis* (Poaceae) with three species new for Belgium

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### Abstract

The gall-midges *Giraudiella inclusa*, *Lasioptera arundinis* and *L. hungarica*, living inside stems of common reed (*Phragmites australis*) are recorded for the first time in Belgium.

**Keywords :** Cecidomyiidae, Belgian fauna, Common reed.

### Introduction

The family Cecidomyiidae is probably one of the least known dipteran groups in Belgium. Until now, approximately 2 200 species are known from the Palaearctic Region (SKUHRÁVÁ & SKUHRÁVÝ, 1994). Only 140 species are recorded for Belgium (GOSSERIES, 1991) where about 270 were found in the Netherlands (OOSTERBROEK, 1981).

Many phytophagous species of Cecidomyiidae are well known from their typical galls formed during the larval stage and are mostly determined on these galls. Although commonly called gall midges, only two-thirds of the known species are phytophagous gall-formers. Other species are phytophagous in flowerheads or stems without making galls, are mycophagous, predacious or parasitoid (GAGNÉ, 1981; GOSSERIES, 1991).

In the winter of 1998–99 we performed a survey on the cecidomyiid fauna of the common reed *Phragmites australis* (CAV.) TRIN. EX STEUD (Poaceae). During this study we came across three representatives of Cecidomyiidae that were not reported for Belgium yet. We briefly discuss the distribution and ecology of the respective species.

### Material and methods

In the winter of 1998–99, about 4.500 reed

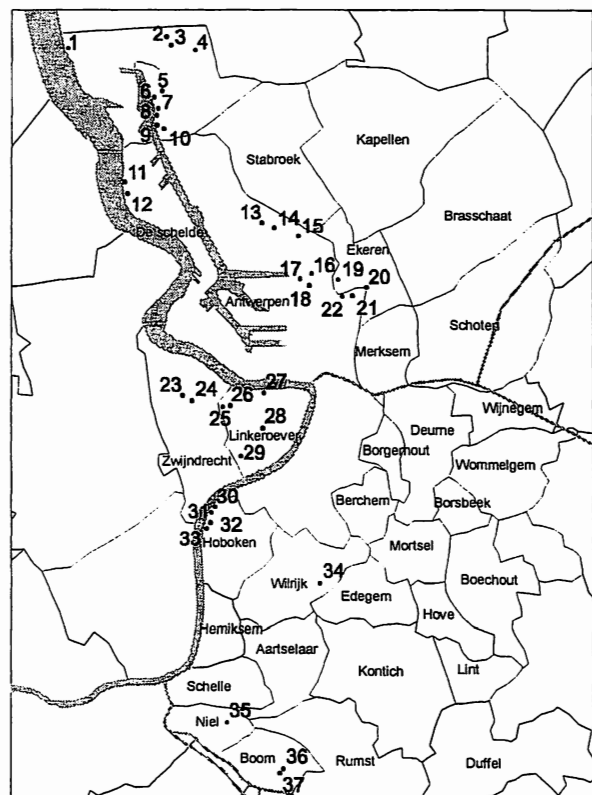


Fig. 1. Map of Antwerp, showing the 37 sample sites.

The numbers on the map agree with those in Table 1.

stems were collected in 37 reed stands (18 different sites, Fig. 1) in the province of Antwerp, Belgium. Choosing the reed stands, we tried to include as many different types as possible.

Table 1. Presence (1) – absence (0) of the different gall midge species in the sampled reed stands.

	reedstand name	UTM-hok	<i>G. inclusa</i>	<i>L. arundinis</i>	<i>L. hungarica</i>	number of species
1	Zandvliet, Groot Buitenschoor	ES 8691	1	0	0	1
2	Zandvliet, Noordlandbrug (A4)	ES 9091	1	0	1	2
3	Zandvliet, Noordlandbrug (A4)	ES 9091	1	0	1	2
4	Zandvliet, Conterscherp	ES 9191	1	0	0	1
5	Berendrecht, de Zouten	ES 9089	1	1	1	3
6	Berendrecht, de Zouten	ES 9089	0	0	1	1
7	Berendrecht, Reigersbos	ES 9188	1	0	0	1
8	Berendrecht, Reigersbos	ES 9188	1	1	1	3
9	Berendrecht, Reigersbos	ES 9188	1	0	0	1
10	Berendrecht, Reigersbos	ES 9188	1	0	0	1
11	Lillo, Galgenschoor	ES 8984	1	0	0	1
12	Lillo, Galgenschoor	ES 8984	1	0	0	1
13	Hoevenen, Rode Weel	ES 9584	1	0	1	2
14	Hoevenen, Rode Weel	ES 9584	1	0	1	2
15	Hoevenen, Rode Weel	ES 9584	1	0	0	1
16	Ekeren, Ekers Moeras	ES 9781	1	0	1	2
17	Ekeren, Ekers Moeras	ES 9681	1	1	1	3
18	Ekeren, Ekers Moeras	ES 9781	1	0	1	2
19	Ekeren, Groot Hagelkruis	ES 9881	1	0	1	2
20	Ekeren, Oude landen	ES 9981	1	1	1	3
21	Ekeren, Oude landen	ES 9981	1	0	0	1
22	Ekeren, Oude landen	ES 9981	1	1	1	3
23	Linkeroever, autostrade (N49)	ES 9376	1	0	0	1
24	Linkeroever, autostrade (N49)	ES 9376	1	0	1	2
25	Linkeroever, Blokkesdijk	ES 9376	1	0	0	1
26	Linkeroever, Blokkesdijk	ES 9376	1	0	0	1
27	Linkeroever, Blokkesdijk	ES 9477	1	0	0	1
28	Linkeroever, Blancefloerlaan	ES 9575	1	0	0	1
29	Linkeroever, Burchtse Weel	ES 9474	1	0	0	1
30	Hoboken, Hobokense Polder	ES 9371	1	0	0	1
31	Hoboken, Hobokense Polder	ES 9371	1	1	0	2
32	Hoboken, Hobokense Polder	ES 9371	1	0	1	2
33	Hoboken, Hobokense Polder	ES 9371	1	1	1	3
34	Wilrijk, UIA	ES 9868	1	1	0	2
35	Niel, de Kleiputten	ES 9362	1	1	1	3
36	Boom, de Schorre	ES 9660	1	0	1	2
37	Boom, de Schorre	ES 9660	1	0	1	2
	number of reedstands		36	9	19	

Therefore, the study included large and small, dense and rare, high and low, moist and dry reed stands, on the edges of farmlands, woods, roads and rivers, or in the middle of vast nature reserves. The larger sites (e.g. : 'Ekers moeras' in Tab. 1) were sampled more intensively to get a clear image of the presence of the dif-

ferent species.

The reed stands were sampled by means of four randomly selected square plots of 0,5 m × 0,5 m (0,25 m<sup>2</sup>). In sparse reed stands more squares were sampled so that at least 100 stems were collected in each stand. In the lab, the



Fig. 2. Longitudinal section through a reed stem showing grain-like galls formed by *Giraudiella inclusa*.



Fig. 3. Pupated larva of *Giraudiella inclusa* showing the hard sclerotised structure on the top.

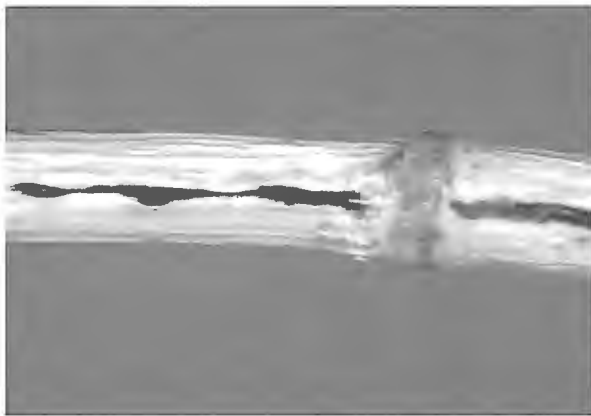


Fig. 4. Side shoot of a reed stem attacked by *Lasioptera arundinis*.

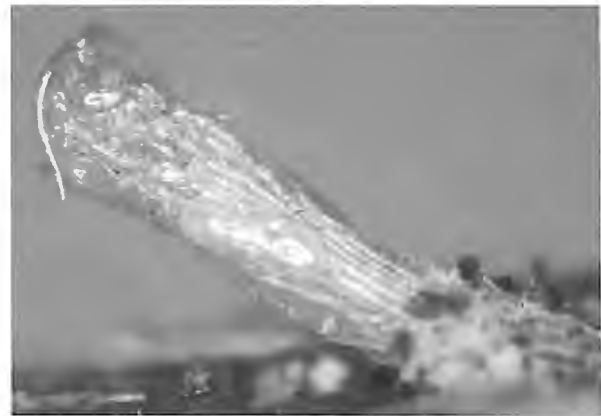


Fig. 5. Exuvium of *Lasioptera arundinis*

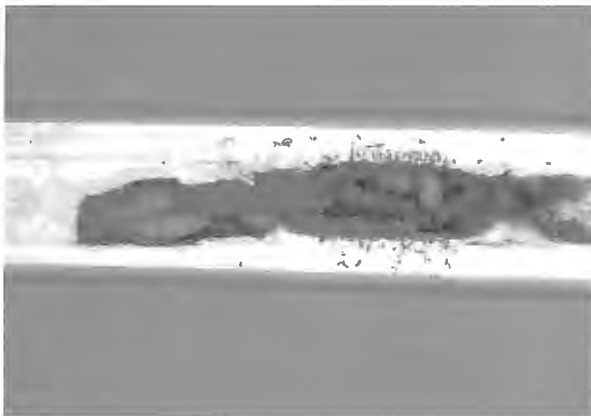


Fig. 6. Longitudinal section in a reed stem showing larvae of *Lasioptera hungarica* accompanied by the black fungus *Macrophoma* sp.



Fig. 7. Pupa of *Lasioptera hungarica*

collected shoots were dissected and checked on the presence of the different invertebrates.

### Results

*Giraudiella inclusa* (FRAUENFELD, 1862)

The larvae of this gall midge live inside self-

induced, grain-like galls on the inside of the reed stem (Fig. 2) where they feed on the nutritious gall-tissues (SKUHRAVÁ & SKUHRAVÝ, 1981, 1992). According to TSCHARNTKE (1987), *G. inclusa* can develop up to four generations a year. The 1<sup>st</sup> generation develops in the 1<sup>st</sup> to 9<sup>th</sup> internode of the reed stems, while the 2<sup>nd</sup> to 4<sup>th</sup>

generation can be found in the upper internodes and side shoots (TSCHARNTKE 1987, 1989). Each of these generations consists of fast developing individuals and individuals that remain in the third instar until hibernation (TSCHARNTKE, 1987). Pupation occurs in April-May, after which they bore through the stem wall, making use of a hard sclerotised structure on the top of the pupae (Fig. 3).

*G. inclusa* appears to be a common species since it was found in 36 of the 37 reed stands.

#### *Lasioptera arundinis* SCHINER, 1854

The larvae of this species live inside the side-shoots of reed stems (SKUHRÁVÁ & SKUHRÁVÝ, 1981). These side-shoots develop when the main shoot loses its apical dominance due to the destruction of the growing tip (SKUHRÁVÁ & SKUHRÁVÝ, 1981). When this happens, the growing tissues at the nodes, which were dormant, become active. *L. arundinis* seems to be restricted to reed stands, where side shoot inducing species, like *Archanara geminipuncta* (HAWORTH) (Lepidoptera) can be found (SKUHRÁVÁ & SKUHRÁVÝ, 1981, 1992; TSCHARNTKE, 1999).

Side-shoots infested by *L. arundinis*-larvae (also called 'ambrosia' galls) are easily recognisable because they are heavily swollen and have shortened internodes with a longitudinal gap, stuffed with a black fungus of the genus *Macrophoma* (Deuteromycetes) (Fig. 4) (ROHFRIJSCH, 1997). The larvae develop inside the internodes, feeding on a mixture of host tissue and fungus. In the 3<sup>rd</sup> larval stage, their spatula sternalis starts to sclerotise and they bore a whole through the gap. This takes about 15 days, after which they spin a protecting operculum and crawl back into the internode to pupate (SKUHRÁVÁ & SKUHRÁVÝ, 1981, 1992). The pupae don't possess a hard sclerotised structure on the top (Fig. 5).

During June-July the adults emerge (SKUHRÁVÁ & SKUHRÁVÝ, 1981). Before they oviposit on fresh side shoots, the females of *L. arundinis* collect conidia of the fungus, making use of specialized structures on the top of the ovipositor (ROHFRIJSCH, 1997). This behaviour guarantees food for their offspring.

In this study this species was found in 9 of the 37 investigated reed stands (24%).

#### *Lasioptera hungarica* MÖHN, 1968

The larvae of this species live tightly packed (30-300 larvae / internode) in the 1<sup>st</sup> - 13<sup>th</sup> inter-

node of the reed stems (Fig. 6) (SKUHRÁVÁ & SKUHRÁVÝ, 1981). Like *L. arundinis*, they live in close harmony with a black fungus of the genus *Macrophoma* (ROHFRIJSCH, 1997). The infested shoots are difficult to distinguish from healthy ones. Only blackish longitudinal slits in the stem can indicate the presence of this species in a stand. These slits are caused by pecking birds, mainly *Parus* sp., which feed on the larvae during the winter (SKUHRÁVÁ & SKUHRÁVÝ, 1981, 1992).

In contrast to *G. inclusa* and *L. arundinis*, neither the larvae nor the pupae of *L. hungarica* can perforate the wall of the stem to make a hole for the hatching imago (Fig. 7). Therefore the possibility of reproduction (mating and ovipositing) is dependent on external factors, such as birds and storms (SKUHRÁVÁ & SKUHRÁVÝ, 1981).

This species was found in 51% (19 out of 37) of the investigated reed stands.

#### Acknowledgements

We 'd like to thank Famke VALCK & Mark MATTHIJSEN for their support and help. Figures 2, 4 and 6 were printed by permission of "De Antwerpse Koepel voor Natuurstudie" (ANKONA).

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*Bulletin S.R.B.E./K.B.V.E.*, 137 (2001) : 29-31

## ***Trichoniscoides sarsi* (PATIENCE, 1908) : a new species for the fauna of Belgium (Isopoda Trichoniscidae)**

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### **Abstract**

*Trichoniscoides sarsi* was observed for the first time in Belgium on the 16<sup>th</sup> of April 2000. The species was found in loose clay on the side of a ditch in the creek area of Assenede. A second observation was made on the 20<sup>th</sup> of July 2000 in Nieuwpoort, where the animal was found under a drifted woodblock in the supralittoral of the river Ijzer in the nature reserve 'De Ijzermonding'. In the present paper the species is briefly described and some notes on the distribution and the habitat are given. With this species the number of terrestrial isopods in Belgium has risen to 33.

**Keywords :** *Trichoniscoides sarsi*, Isopoda, Belgium.

### **Samenvatting**

*Trichoniscoides sarsi* werd voor het eerst waargenomen in België op 16 april 2000. De soort werd aangetroffen in de rulle klei van een grachtkant in het Asseneedse krekengebied. Een tweede waarneming werd verricht op 20 juli 2000 in Nieuwpoort waar de soort werd aangetroffen onder aangespoeld hout in het vloedmerk van de Ijzer in het natuureservaat 'De Ijzermonding'. In deze bijdrage wordt de soort kort beschreven en de verspreiding en het habitat worden besproken. Met deze soort stijgt het aantal soorten landpissebedden in België tot 33.

### **Résumé**

*Trichoniscoides sarsi* est rapporté pour la première fois de Belgique le 16 avril 2000. L'espèce a été trouvée dans l'argile meuble à côté d'un ruisseau dans la région des criques d'Assenede. Une seconde observation a eu lieu le 20 juillet 2000 à Nieuwpoort où l'espèce a été trouvée sous une pièce de bois, échouée sur la zone supralittorale de l'Ijzer, dans la réserve naturelle 'De Ijzermonding'. Une brève description et quelques notes sur la distribution et l'habitat sont données. Avec cette espèce, le nombre d'isopodes terrestres pour la Belgique s'élève à 33.