Faune de Belgique / Fauna van België

Bulletin S.R.B.E./K.B.V.E., 135 (1999) : 152-158

Agromyzidae (Diptera) of the nature reserve "Étang de Virelles" : faunistics and life-history aspects

by J. SCHEIRS[1], L. DE BRUYN[1] & M. VON TSCHIRNHAUS[2]

[1] Department of Biology, Evolutionary Biology Group, University of Antwerp (RUCA), Groenenborgerlaan 171, 2020 Antwerp, Belgium (e-mail : scheirs@ruca.ua.ac.be; debruyn@ruca.ua.ac.be).
[2] Fakultät für Biologie, Universität Bielefeld, Postfach 100131, 33501 Bielefeld, Germany.

Abstract

During 1986, a Malaise trap survey was carried out in the naturereserve "Étang de Virelles (Virelles, Belgium). We identified at least 41 species of Agromyzidae captured with this trap. Twenty-one species are new to the Belgian fauna. Faunistic and ecologic aspects are discussed.

Samenvatting

Gedurende 1986 werd een Malaise val geplaatst in het natuurreservaat "Étang de Virelles". Wij identificeerden ten minste 41 soorten Agromyzidae verzameld met deze val. 21 soorten worden voor de eerste maal gemeld voor België. Faunistische en ecologische gegevens worden besproken.

Introduction

We are still far from knowing the Belgian agromyzid fauna. One of the reasons is that only few entomologists identified Agromyzidae captured on Belgian territory (e.g. MEUNIER, 1911; VAN DEN BUEL, 1933, 1936, 1938; COLLART, 1938, 1942, 1953). Another important reason is the difficult identification of Agromyzidae in general. This is mainly because of the great diversity of this family (about 1165 species occurring in the Palaearctic region), the unclarified status or brief description of many species, and the many undescribed species occurring in Europe (about 200 according to VON TSCHIRNHAUS).

Malaise traps are frequently used to investigate the insect fauna of a certain area. This type of trap has as main advantage that it captures in a passive way a considerable amount of the flying insect fauna occurring in the study area (TOWNES, 1972). A second advantage is that together with faunistic data, also life-history data (like phenology and sex specific activity) are gathered. However, such life-history data have to be interpreted with the necessary caution (SCHEIRS *et al.*, 1997b). The agromyzid fauna of two Belgian nature reserves was previously studied by means of Malaise traps (SCHEIRS *et al.*, 1995, 1997a).

In the scope of a larger study of the Belgian agromyzid fauna, we investigated the agromyzid community of the nature reserve "Étang de Virelles".

Material and methods

This Malaise trap survey was conducted in the nature reserve "Étang de Virelles", located in Virelles (UTM = ER.94), Belgium. This reserve consists of a large lake surrounded by reed beds and wet depressions. In 1986, a Malaise trap (type TOWNES, 1972) was placed at the border of the reserve in one of the wet depressions. A plant survey was made within a range of 100 m around the trap. In the direct vicinity of the trap, the vegetation type was characterized as *Caricetum*

acuto-vesicariae (W. KOCH) (*Magnocaricion* W. KOCH). Further away from the trap, this vegetation type changed either into *Calthion palustris* R. TX., *Phalaridetum arundinaceae* (*Magnocaricion* W. KOCH) or *Filipendulion* (DUVIGN.) (according to WESTHOFF & DEN HELD, 1975). All four vegetation types commonly occur at the same site and/or are a transition of each other. The complete list of plant species occurring at the trapping site is shown in Table 1. The trap was set out from 11.V.1986 till 27.X.1986 and was emptied at weekly intervals.

General identification keys for Agromyzidae were published by HENDEL (1931-1936), SPENCER (1972, 1976), and NOWAKOWSKI (1973). However, a reliable identification is only possibly by consulting numerous additional publications.

The identified Agromyzidae are stored in the collection of J. SCHEIRS at the University of Antwerp (RUCA). Later they will be deposited at the Royal Belgian Institute of Natural Sciences, Brussels.

Table 1. Vegetation occurring at trapping site (according to DE LANGHE *et al.* (1988)).

Equisetaceae:
Equisetum fluviatile L.
Equisetum palustre L.
Ranunculaceae:
Caltha palustris L.
Ranunculus flammula L.
Ranunculus repens L.
Ranunculus trichophyllos CHAIX
Urticaceae:
Urtica dioica L.
Caryophyllaceae:
Lynchnis flos-cuculi L.
Polygonaceae:
Rumex conglomeratus MURRAY
Polygonum amphybium L.
Polygonum hydropiper L.
Polygonum persicaria L.
Salicaceae:
Salix cinerea L.
Salix triandra L.
Brassicaceae:
Cardamine pratensis L.
Primulaceae:
Lysimachia vulgaris L.
Crassulaceae:
Sedum telephium L.
Rosaceae:
Filipendula ulmaria (L.) MAXIM.
Fabaceae:
Lotus uliginosus SCHKUHR
Onagraceae:
Epilobium hirsutum L.
Epilobium tetragonum L.
Apiaceae:
Angelica sylvestris L.
Solanaceae:
Solanum dulcamara L.
Boraginaceae:
Myosotis scorpioides L.
Lamiceae:
Galeopsis tetrahit L.
Lycopus europaeus L.
Mentha aquatica L.
Scutellaria galericulata L.
Stachys palustris L.
Scrophulariaceae:
Rhinanthus minor L.
Rubiaceae:
Cruciata laevipes OPIZ
Galium aparine L.
Galium palustre L.
Caprifoliaceae:
Viburnum opulus L.
Valerianaceae:
Valeriana repens HOST
Asteraceae:
Achillea ptarmica L.
Cirsium oleraceum (L.) SCOP.
Cirsium palustre (L.) SCOP.
Cirsium vulgare (SAVI) TEN.
Scorzonera humilis L.
Alismataceae:
Alisma plantago-aquatica L.
Juncaceae:
Juncus conglomeratus L.
Juncus effusus L.
Cyperaceae:
Carex disticha HUDS.
Carex cuprina (S. EX HEUFF.) N. EX K.
Carex elongata MURRAY
Carex riparia CURT.
Carex vesicaria L.
Eleocharis palustris (L.) R. ET SCHULT.
Poaceae:
Holcus lanatus L.
Phalaris arundinacea L.
Poa trivialis L.
Lemnaceae:
Lemna minor L.
Typhaceae:
Typha latifolia L.
Iridaceae:
Iris pseudacorus L.

Table 2. Phenological data and sex ratios of the species captured with the Malaise trap at "Étang de Virelles". The phenological records are mentioned for each species on a fortnightly basis. Species new to the Belgian fauna are printed in bold and preceded by an asterisk. In the last column the sex ratio is mentioned.

No.	Taxon	# Ind.	19. v	1. vi	14. vi	28. vi	16. vii	28. vii	12. viii	27. viii	11. ix	28. ix	13. x	27. x	♂:♀
1.	*Agromyza albipennis* MEIGEN, 1830	15	.	.	1	2	.	6	5	1	.	.	.	.	13: 2
* 2.	***Agromyza albitarsis* MEIGEN, 1830**	1	.	.	.	.	.	.	1	.	.	.	.	.	1: 0
3.	*Agromyza anthracina* MEIGEN, 1830	3	.	1	.	.	.	.	.	.	2	.	.	.	2: 1
* 4.	***Agromyza lithospermi* SPENCER, 1963**	1	.	.	.	.	1	.	.	.	.	.	.	.	1: 0
5.	*Agromyza mobilis* MEIGEN, 1830	8	.	.	1	2	.	.	.	.	3	1	1	.	3: 5
6.	*Agromyza nana* MEIGEN, 1830	4	.	1	.	.	1	1	1	.	.	.	.	.	2: 2
7.	*Agromyza nigripes* MEIGEN, 1830	54	1	4	.	9	7	15	15	3	.	.	.	.	34:20
8.	*Agromyza potentillae* (KALTENBACH, 1864)	10	1	2	1	1	.	.	.	.	3	1	1	.	3: 7
9.	*Agromyza reptans* FALLÉN, 1823	23	.	.	2	7	5	5	2	.	2	.	.	.	3:20
	Agromyza sp.	22	1	3	3	5	4	1	4	.	.	1	.	.	2:20
10.	*Aulagromyza discrepans*(V.D. WULP, 1871)	3	.	.	2	.	.	1	.	.	.	.	.	.	1: 2
* 11.	***Aulagromyza orphana* (HENDEL, 1920)**	13	.	3	8	2	.	.	.	.	.	.	.	.	9: 4
	Aulagromyza sp.	3	2	1	.	.	.	.	.	.	.	.	.	.	1: 2
12.	*Cerodontha angulata* (LOEW, 1869)	34	.	.	.	1	.	.	.	.	17	9	7	.	22:12
13.	*Cerodontha atra* (MEIGEN, 1830)	7	.	.	1	.	.	1	3	.	1	1	.	.	7: 0
* 14.	***Cerodontha biseta* (HENDEL, 1920)**	5	.	.	.	1	4	.	.	.	.	.	.	.	1: 4
* 15.	***Cerodontha eucaricis* NOWAKOWSKI, 1967**	4	.	.	.	.	.	.	.	.	4	.	.	.	3: 1
* 16.	***Cerodontha hirtae* NOWAKOWSKI, 1967**	1	.	.	.	.	.	.	.	.	1	.	.	.	1: 0
17.	*Cerodontha luctuosa* (MEIGEN, 1830)	25	.	.	.	2	.	.	2	.	11	1	4	5	22: 3
* 18.	***Cerodontha mellita* SPENCER, 1971**	5	.	1	.	1	1	2	.	.	.	.	.	.	3: 2
19.	*Cerodontha morosa* (MEIGEN, 1830)	4	.	.	.	1	3	.	.	.	.	.	.	.	1: 3
20.	*Cerodontha muscina* (MEIGEN, 1830)	21	.	1	.	2	2	.	3	.	10	1	2	.	1:20
* 21.	***Cerodontha scutellaris* (VON ROSER, 1840)**	1	.	.	.	1	.	.	.	.	.	.	.	.	1: 0
	Cerodontha sp.	8	.	2	.	.	.	2	3	1	.	.	.	.	0: 8
* 22.	***Gymnophytomyza heteroneura* (H., 1920)**	4	.	.	.	2	.	1	1	.	.	.	.	.	2: 2
23.	*Liriomyza flaveola* (FALLÉN, 1823)	7	.	.	.	.	.	.	.	.	5	2	.	.	4: 3
* 24.	***Liriomyza galiivora* (SPENCER, 1969)**	2	.	.	.	.	.	.	1	1	.	.	.	.	2: 0
25.	*Liriomyza phryne* HENDEL, 1931	6	.	.	.	3	.	.	.	.	2	1	.	.	0: 6
* 26.	***Liriomyza virgo* (ZETTERSTEDT, 1838)**	18	.	9	4	2	.	1	2	.	.	.	.	.	15: 3
	Liriomyza sp.	8	.	1	3	1	.	.	2	.	.	.	1	.	1: 7
* 27.	***Melanagromyza angeliciphaga* SP., 1969**	6	.	.	.	.	4	1	.	1	.	.	.	.	1: 5
28.	*Melanagromyza limata* SPENCER, 1971	2	.	.	.	.	1	1	.	.	.	.	.	.	1: 1
	Melanagromyza sp.	15	.	2	6	3	3	.	1	.	.	.	.	.	0:15
	Metopomyza sp.	2	.	1	.	1	.	.	.	.	.	.	.	.	0: 2
* 29.	***Napomyza bellidis* GRIFFITHS, 1967**	1	.	1	.	.	.	.	.	.	.	.	.	.	1: 0
30.	*Napomyza elegans* (MEIGEN, 1830)	2	.	.	.	1	1	.	.	.	.	.	.	.	2: 0
* 31.	***Napomyza nigriceps* V.D. WULP, 1871**	1	.	1	.	.	.	.	.	.	.	.	.	.	1: 0
	Napomyza sp.	3	1	1	.	.	.	.	.	.	1	.	.	.	1: 2
* 32.	***Ophiomyia definita* SPENCER, 1971**	2	.	2	.	.	.	.	.	.	.	.	.	.	2: 0
* 33.	***Ophiomyia labiatarum* HERING, 1937**	1	.	.	.	.	.	.	1	.	.	.	.	.	1: 0
	Ophiomyia sp.	55	1	7	11	4	4	8	12	2	6	.	.	.	3:52
* 34.	***Phytomyza angelicae* KALTENBACH, 1874**	2	.	.	.	1	.	1	.	.	.	.	.	.	2: 0
35.	*Phytomyza angelicastri* HERING, 1932	3	.	.	.	.	.	.	.	.	.	1	.	2	1: 2
* 36.	***Phytomyza evanescens* HENDEL, 1920**	1	.	.	.	1	.	.	.	.	.	.	.	.	1: 0
37.	*Phytomyza flavicornis* FALLÉN, 1823	3	2	1	.	.	.	.	.	.	.	.	.	.	2: 1
* 38.	***Phytomyza nigritula* ZETTERSTEDT, 1838**	1	.	.	1	.	.	.	.	.	.	.	.	.	1: 0
39.	*Phytomyza ranunculi* (SCHRANK, 1803)	4	.	.	.	.	.	.	.	.	1	1	1	1	0: 4
* 40.	***Phytomyza soenderupi* HERING, 1941**	1	1	.	.	.	.	.	.	.	.	.	.	.	1: 0
	Phytomyza sp.	19	.	.	4	1	2	3	.	.	5	.	3	1	0:19
* 41.	***Phytobia cambii* (HENDEL, 1931)**	1	.	1	.	.	.	.	.	.	.	.	.	.	1: 0

Results and Discussion

Faunistic and taxonomic remarks

During our trapping survey, we captured 442 specimens of Agromyzidae. We identified 41 species (Table 2). Several individuals (8♂♂ and 127♀♀) could not be identified because (1) their status was not clear and/or (2) only females were captured. Most species only represented by female individuals in the trap catches were not identified because the risk of incorrect identification.

Twenty-one species turned out to be new for

the Belgian fauna (printed in bold and preceded by an * in Table 2). This brings the actual number of Agromyzidae present in the Belgian fauna up to approximately 173 species. However, many old records listed in the checklist of the Belgian Diptera (DE BRUYN & VON TSCHIRNHAUS, 1991) must still be confirmed.

In the following survey, we consider species of faunistic and taxonomic interest.

Cerodontha mellita: This species is redescribed by SCHEIRS *et al.* (in press). This is the first record of the species after its description. The host plant of this species is still unconfirmed. Host records listed in NOWAKOWSKI (1973) and SPENCER (1990) are based on wrongly identified material. Probably a miner of *Carex* like most other representatives of this genus.

Gymnophytomyza heteroneura: The larvae of this species feed in the seeds of *Galium aparine* L. (SPENCER, 1990). The females of this species have a striking long and strong ovipositor with acute sclerotized cerci described by VON TSCHIRNHAUS (1991). This is probably a necessary adaptation for egg laying in seeds of these plants.

This brings us to a more general point about the identification of Agromyzidae. The first and the last author noticed independently from each other that the shape, length, and chaetotaxy of the ovipositor frequently are good diagnostic features. The ovipositor has a broad range of functions like mating, oviposition, and even feeding in Agromyzidae. Ovipositor shape is probably directed by one or more of these functions. Agromyzidae are all phytophagous and occupy a broad range of host plants. Adaptation of the ovipositor to the oviposition and/or feeding substrate is therefore likely to initiate variation in ovipositor shape in Agromyzidae. *Gymnophytomyza heteroneura* can be used as an example in this matter.

The morphology of the ovipositor of most agromyzid species has however not been taken into account for taxonomic and systematic purposes. Most descriptions lack a description of the female genitalia. We would like to stress the importance of this feature. The more because the identification of female Agromyzidae is very difficult at the moment and this easily visible character may therefore be of great diagnostic value.

Liriomyza galiivora: A species with a conspicuous wide distribution. It was described from North-America and has afterwards been found in Germany, Corsica, Lithuania, Hungary (VON TSCHIRNHAUS, 1992) and now in Belgium.

Melanagromyza angeliciphaga: Care must be taken with the identification of this species because several undescribed species occur in Europe. This species is a stem miner of few genera of Apiaceae (*Angelica*, *Heracleum*, *Pastinaca*) (SPENCER, 1990). The first author reared 4♂♂ and 2♀♀ of this species from stems of *Heracleum spondylium* L. collected on 6.VIII.1994 at Zoersel (FS.18).

Ophiomyia definita: This species was recently redescribed by SCHEIRS *et al.* (in press). Host plant is still unknown.

Phytobia cambii: VON TSCHIRNHAUS (1992) has synonimized this species with *Phytobia betulae* (KANGAS, 1935). Recently, mining behaviour and other life-history aspects were studied by YLIOJA *et al.* (1998).

Host plant and habitat preference

Dealing with phytophagous insects, one can assume that the species composition of a site must be related to some extent to the plant community of that site. Previous studies have already demonstrated a close relationship between the agromyzid fauna of a particular site and the vegetation occurring at that site (VON TSCHIRNHAUS, 1994; SCHEIRS *et al.*, 1997a). We investigated the relation between plant community and the agromyzid fauna present in this study. Therefore we conducted a plant survey (Table 1) and compared it with the host range of the Agromyzidae found in the Malaise trap (Table 3).

The host plants of 36 species (88%) of the Agromyzidae captured at Virelles are known. Of this group, nineteen species (53%) are monophagous (host plant range restricted to one plant genus), 16 species (44%) are oligophagous (host plants are found within different plant genera of the same family) and one (3%) was polyphagous (feeding on members of different plant families). Thus the largest proportion of species was monophagous, followed by the smaller group of oligophagous species, and on the last place the polyphagous species. This agrees with the pattern found in other studies; host range varies from a single plant taxon for a large proportion of insects to several plant taxa for a smaller proportion of insects (EASTOP, 1973; STRONG *et al.*, 1984).

Table 3. Host range of the Agromyzidae trapped at Virelles. The monophagous and oligophagous species developing in plants belonging to less than 4 host genera are mentioned with these genera. Oligophagous species recorded from more than three host genera and polyphagous species are mentioned without hosts. Host records are listed according to SPENCER (1990) and VON TSCHIRNHAUS (1992, 1994).

Plant family	Agromyzid species	Plant genera
Equisetaceae	*Liriomyza virgo*	*Equisetum*
Ranunculaceae	*Phytomyza evanescens*	*Ranunculus*
	Phytomyza nigritula	*Ranunculus*
	Phytomyza ranunculi	*Ranunculus, Ficaria, Myosurus*
	Phytomyza soenderupi	*Caltha*
Urticaceae	*Agromyza anthracina*	*Urtica, Parietaria*
	Agromyza reptans	*Urtica*
	Phytomyza flavicornis	*Urtica*
Salicaceae	*Agromyza albitarsis*	*Salix, Populus*
	Phytobia cambii	polyphagous, also Betulaceae
Rosaceae	*Agromyza potentillae*	oligophagous
Fabaceae	*Agromyza nana*	oligophagous
Apiaceae	*Melanagromyza angeliciphaga*	*Heracleum, Angelica*
	Melanagromyza limata	*Heracleum*
	Phytomyza angelicae	*Heracleum, Angelica, Laserpitium*
	Phytomyza angelicastri	*Angelica*
Boraginaceae	*Agromyza lithospermi*	*Lithospermum*
Lamiaceae	*Napomyza nigriceps*	*Glechoma*
	Ophiomyia labiatarum	*Galeopsis, Lamium, Stachys*
Rubiaceae	*Aulagromyza orphana*	*Galium*
	Gymnophytomyza heteroneura	*Galium* (seeds)
	Liriomyza galiivora	*Galium*
Asteraceae	*Napomyza bellidis*	*Bellis*
Juncaceae	*Cerodontha luctuosa*	*Juncus*
Cyperaceae	*Cerodontha angulata*	*Carex, Scirpus*
	Cerodontha eucaricis	*Carex*
	Cerodontha hirtae	*Carex*
	Cerodontha morosa	*Carex*
Poaceae	*Agromyza albipennis*	oligophagous
	Agromyza mobilis	*Triticum*
	Agromyza nigripes	oligophagous
	Cerodontha atra	oligophagous
	Cerodontha biseta	*Poa, Holcus*
	Cerodontha muscina	oligophagous
	Liriomyza flaveola	oligophagous
	Liriomyza phryne	oligophagous

Species without known host: *Aulagromyza discrepans, Cerodontha mellita, Cerodontha scutellaris, Napomyza elegans, Ophiomyia definita*

Plants differed greatly in the number of species belonging to their respective agromyzid communities. In case of 55% (N=30) of the plants occurring at the trapping site, no agromyzid species was recorded that included one of these plants in its host range (compare Table 1 with 3). If a plant was exploited by Agromyzidae (45%, N=25), the number of species feeding on the respective host plant varied. For instance, there were at least 4 species that live on *Carex* and groups of at least three species feeding respectively on *Angelica*, *Galium*, *Heracleum*, *Ranunculus*, and *Urtica*. Other host plants had fewer (1 or 2) agromyzids feeding on them. In case of the Poaceae we could not determine the exact amount of species exploiting the available grass species because of the oligophagous nature of most Agromyzidae developing in Poaceae. Several hypotheses explain the number of species (species richness and diversity) that exploit a given host plant. PRICE (1997) gives an overview of the factors that determine the

number of species in an insect community. He distinguishes historical factors (time available for colonization), external factors (number of potential colonizers and distance from the source), and internal factors (quality and quantity of the biotope and interaction with other species). It is beyond the purpose of this paper to concentrate on these hypotheses. We just want to state that remarkably few studies concentrated on community ecology of Agromyzidae despite the large number of agromyzid species, the many host plant species colonized, and the existence of a broad range of feeding guilds (miners in leaves, stems, roots, and the cambium of trees, species feeding in seeds or flower-heads, and gallers (SPENCER, 1990)).

Comparing the host range of Agromyzidae captured at Virelles and the plant survey at the trapping site (compare Table 3 with 1), we observed that only in case of 5 agromyzid species (12%) no host plant was recorded at the trapping site. A comparable result was found in two previous studies, namely 12% (SCHEIRS *et al.*, 1995) and 14% (SCHEIRS *et al.*, 1997a). A very low amount if one takes into account that the host spectrum of many Agromyzidae is still incomplete or plant species may have been overlooked during the plant survey. Therefore, Agromyzidae captured at a certain site are a partial reflection of the flora present at that site. Partial, because the host plants of a few were not recorded at the trapping site. But also because many potential host plants occurred at the trapping site whereof no Agromyzidae were recorded. The latter was probably mainly due to the fact that Malaise trapping does not give a complete reflection of the insect fauna occurring at the trapping site (see also SCHEIRS *et al.*, 1997b).

This study and preceding studies (VON TSCHIRNHAUS, 1994; SCHEIRS *et al.*, 1997a) clearly demonstrate that the agromyzid community of a certain trapping site stands in close relation to the plant community occurring at the trapping site. Therefore, Agromyzidae are very habitat specific. Different plant communities harbour also different agromyzid communities (see also VON TSCHIRNHAUS, 1992, 1994). These findings indicate that Agromyzidae may be useful as bio-indicators. However, the necessary ecologic and life-history information is still lacking for most species.

Acknowledgements

We thank Mr. MAGIS and Mr. ROUARD for placing and emptying the Malaise trap and for the identification and characterization of the vegetation.

References

COLLART A., 1938. - Contribution à l'étude des diptères de Belgique. *Bulletin et Annales de la Société entomologique de Belgique*, 78 : 363-373.

COLLART A., 1942. - Diptères mineurs de Belgique. I. *Bulletin du Museum royal d'Histoire naturelle belge*, 18 : 1-10.

COLLART A., 1953. - *Phytomyza scolopendri* ROBINEAU-DESVOIDY (Diptera, Agromyzidae) nouveau pour la faune de Belgique. *Bulletin et Annales de la Société royale belge d'Entomologie*, 89 : 237-238.

DE BRUYN L. & VON TSCHIRNHAUS M., 1991. - Agromyzidae. *In* : GROOTAERT P., DE BRUYN L. & DE MEYER M. (Eds), *Catalogue of the Diptera of Belgium*, Studiedokument van het KBIN 70 : 151-154.

DE LANGHE J.E., DELVOSALLE L., DUVIGNEAUD J., LAMBINON J. & VANDEN BERGHEN C., 1988. - Flora van België, het Groothertogdom Luxemburg, Noord-Frankrijk en de aangrenzende gebieden. Ceuterick N.V., Leuven. 972 pp.

EASTOP V.F., 1973. - Deductions from the present day host plants of aphids and related species. *Symposium of the Royal entomological Society of London*, 6 : 157-177.

HENDEL F., 1931-1936. - 59. Agromyzidae. *In* : LINDNER E. (Ed.), *Die Fliegen der Palaearktischen Region 6 (2)*, Schweizerbart'sche Verlagsbuchhandlung, Stuttgart. 570 pp.

MEUNIER F., 1911. - Contribution à la faune diptérologique des environs d'Anvers. *Annales de la Société scientifique de Bruxelles*, 35 : 104-113.

NOWAKOWSKI J.T., 1973. - Monographie der europäischen Arten der Gattung *Cerodontha* ROND. (Diptera, Agromyzidae). *Annales zoologici, Warszawa*, 31 : 327 pp.

PRICE P.W., 1997. - Insect ecology. John Wiley & Sons, New York, 874 pp.

SCHEIRS J., DE BRUYN L. & VON TSCHIRNHAUS M., 1995. - Agromyzidae (Diptera) of the nature reserve "Hobokense Polder" : faunistics and life-history aspects. *Bulletin et Annales de la Société royale belge d'Entomologie*, 131 : 191-205.

SCHEIRS J., DE BRUYN L. & VON TSCHIRNHAUS M. 1997a. - Agromyzidae (Diptera) of the nature reserve "De Kuifeend" : faunistics and life-history aspects. *Bulletin et Annales de la Société royale belge d'Entomologie*, 132 (1996) : 245-249.

SCHEIRS J., DE BRUYN L. & VON TSCHIRNHAUS M., 1997b. - Difficulties in assessing life-history as-

pects using different trappig methods in Agromyzidae (Diptera). *Journal of applied Entomology*, 121 : 429-433.

SCHEIRS J., DE BRUYN L. & VON TSCHIRNHAUS M., (submitted). - Redescription of *Cerodontha mellita* and *Ophiomyia definita* : two Agromyzidae (Diptera) new to the Belgian fauna. *Belgian Journal of Entomology*.

SPENCER K.A., 1972. - Diptera, Family Agromyzidae. *Handbooks for the Identification of British Insects*, 10 (5g), 136 pp.

SPENCER K.A., 1976. - The Agromyzidae (Diptera) of Fennoscandia and Denmark. *Fauna entomologica scandinavica*, 5a & b, 606 pp.

SPENCER K.A., 1990. - *Host specialization in the world Agromyzidae (Diptera)*. Kluwer Academic Publishers, Dordrecht, 444 pp.

STRONG D.R., LAWTON J.H. & SOUTHWOOD SIR R., 1984. - *Insects on plants : community patterns and mechanisms*. Blackwell Scientific Publications, Oxford, 313 pp.

TOWNES H., 1972. - A light-weight Malaise trap. *Entomological News* 83 : 239-247.

VAN DEN BRUEL W., 1933. - Contribution à l'étude des mouches de la chicorée-witloof, *Napomyza lateralis* FALL et *Ophiomyia pinguis* FALL. (Agromyzides). *Bulletin de l'Institut agronomique et des Stations de Recherches de Gembloux*, 2 : 17-44.

VAN DEN BRUEL W., 1936. - Notes complémentaires sur *Napomyza lateralis* FALL. *Bulletin & Annales de la Société entomologique de Belgique*, 76 : 441-455.

VAN DEN BRUEL W., 1938. - Communication (*Napomyza lateralis* FALL. et *Ophiomyia pinguis* FALL.). *Bulletin & Annales de la Société entomologique de Belgique*, 78 : 119.

VON TSCHIRNHAUS M., 1991. - New results on the ecology, morphology, and systematics of Agromyzidae (Diptera). *Proceedings of the second International Congress of Dipterology* : 285-312.

VON TSCHIRNHAUS M., 1992. - Minier- und Halmfliegen (Agromyzidae, Chloropidae) und 52 weitere Familien (Diptera) aus Malaise-Fallen in Kiesgruben und einem Vorstadtgarten in Köln. *Decheniana-Beihefte*, 31 : 445-497.

VON TSCHIRNHAUS M., 1994. - Minierfliegen (Diptera : Agromyzidae) aus Malaise-Fallen in spezifischen Pflanzengesellschaften : Ein Weinberg der Ahr-Eifel in Entwicklung zu einem Felsenbirnen-Gebüsch (*Cotoneastro-Amelanchieretum*). *Beiträge zur Landespflege Rheinland-Pfalz*, 16 (1993) : 481-534.

WESTHOFF V. & DEN HELD A.J., 1975. - Plantengemeenschappen in Nederland. B.V.W.J. Thieme & Cie, Zutphen, 324 pp.

YLIOJA T., SARANPÄÄ P., ROININEN H. & ROUSI M., 1998. - Larval tunnels of *Phytobia betulae* (Diptera : Agromyzidae) in birch wood. *Journal of economic Entomology*, 91 : 175-181.

Bulletin S.R.B.E./K.B.V.E., 135 (1999) : 158

Trouvailles récentes de Coléoptères Curculionidae en Belgique

par Guy LHOST

Captures effectuées à De panne (Westhoek, West-Vlaanderen), le 22.V.1999.

Ceuthorrhynchus trisignatus GYLL., 1837 **Belg. sp. n.** : 7♂♂ et 4♀♀ sur *Cynoglossum* officinale.

Jusqu'à présent, cette espèce, nouvelle pour la Belgique, n'est pas citée de France. Elle est connue d'Europe centrale (Autriche, Suisse, Moravie, ...) et curieusement pas signalée d'Allemagne !

A. HOFFMAN (1954, *Faune de France*, 59: Coléoptères Curculionides, 2ème partie) suggère que cette espèce pourrait être rencontrée en France et donne une description assez complète de ladite espèce.

Le site du Westhoek a été exploré par maints coléoptéristes et par moi-même de nombreuses fois. Seule le *Ceuthorrhynchus cruciger* (HERBST) est connu, selon moi, sur *Cynoglossum* à De Panne et dans les dunes du Zwin (Knokke). Le catalogue de G. TEMPERE (Curculionidae de France) paru en 1977 ne le signale pas.

Dorytomus minutus GYLL., 1835 a été capturé par fauchage, au pied de *Populus alba* : espèce rare, même en France, vivant, selon les auteurs, sur le peuplier précité.