The hoverflies (Diptera, Syrphidae) in an alluvial system of the Rhine in the Urdenbacher Kämpe near Düsseldorf

Axel Ssymank, BfN Bonn &
Tobias Krause, Düsseldorf

The BfN advises
The BfN supports
The BfN enforces
The BfN informs

Criorhina berberina, w.

Federal Agency for Nature Conservation

3rd Int. Symposium on Syrphidae, Leiden 2005

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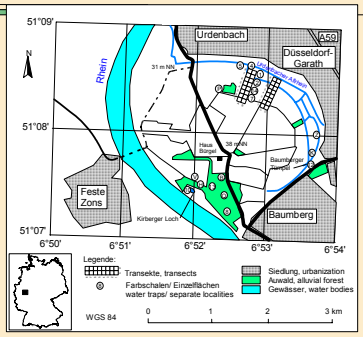
- Sampling area & methods
- Results from water traps
- Results from grid mapping and observations
- Flower visiting
- Aspects of nature conservation

Sampling area

Urdenbacher Kämpe, NW:

- 30 – 40 m NN
- 650 -700 mm/a,
- subatlantic climate
- mostly alluvial soils
- gradient from mesic to wet alluvial meadows
- alluvial forests

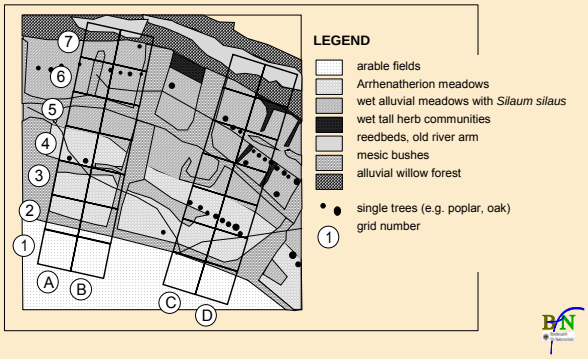


Along the lower Rhine the study area represents the largest natural remnants of alluvial forests and zonations of extensive mesic to wet alluvial hay meadows.

Methods used

- **10 water traps (yellow colour, outside dark grey, emptied every 10-14 days): a transect of 5 traps in the grassland catena, additional traps in other habitats**
- **two transects with each 2 rows of 100 x 100 m² grids (16 grids), 15 minutes observation time, mainly during May to August (transect I, in total 6 periods).**
- **individual observations by Tobias Krause and Axel Ssymank, with special attention to habitats underrepresented in transect and water traps studies (especially alluvial oak-elm wood, forest margins and wet habitats…..)**

Transects – grid mapping



Results, water traps

- **Years 2002 and 2003:**
- **541 individuals of 37 species, low catch**
- **most abundant species:** *Cheilosia albitarsis* **(38 %),** *Episyrphus balteatus* **(27 %),** *Eristalinus sepulchralis* **(8 %)**
- **only 4 species with at > 1,5 %:** *Chalcosyrphus nemorum* **(5,5 %),** *Neoascia tenur* **(5,4 %),** *Anasimyia lineata* **(2,6 %) and** *Melanostoma scalare*
- **clear differences in dominance and species composition between alluvial forests and grassland**
- **almost no differences between mesic and wet alluvial grassland**
- **especially species-rich grids where traps on the ecotones of alluvial forest to wet grassland (e.g. xylobiont species like** *Chalcosyrphus nemorum, Temnostoma* **etc. present.)**

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Transect 1, mapping results

Rasterfeld	A1	B1	A2	B2	A3	B3	A4	B4	A5	B5	A6	B6	A7	B7	Sum T I
Ausstattung	A	A	MA	MA	M	M	M	M	F	F	F	F	F	F	
Episyrphus balteatus	1		8	1	4	2	3	11	13	18	11	54	36	32	192
Sphaerophoria scripta	3	1	1	1	3	3		2	2	4	3		47	31	101
Eristalis tenax	1		1	4	2	5	9	2	2	5		1	5	9	46
Syrphus ribesii	2	1		1		2	2	2	7	1	2		1	3	24
Syritta pipiens	2	3					1		2	1	3	4		3	19
Cheilosia albitarsis			38	11	15	12	53	59	220	70	116	130	126	192	1042
Sphaerophoria taeniata				1		3					6		37	11	58
Merodon equestris			2	1			1	3	4	4		1	3	7	26
Syrphus vitripennis					2	1	1	5	7	2			2	2	22
Volucella bombylans			2			2	1	1	5	3	2	1			17
Melanostoma mellinum							1			2	1		6	4	14
Eupeodes latifasciatus							1			2			7	4	14
Myathropa florea			1	1	1	1	1		3			1	3	2	14
Eristalis pertinax			1	3	2	2	1	1	1	1				1	13
Eristalinus sepulchralis										3	4	3	2	5	17
Helophilus pendulus							1			2	1	8	2		14
Sphaerophoria interrupta agg. (w)										2	1		6	5	14
Cheilosia pagana									2	3	4			1	10
Anasimyia interpuncta						1						1	7		9
Melanogaster hirtella													1	1	3
Platycheirus fulviventris													23		23
Neoascia tenur													4		4
Melanostoma scalare													2	1	3
Helophilus hybridus														2	2
Platycheirus peltatus										1				1	2
Pyrophaena rosarum													2		2
Melanogaster nuda														1	1
Tropidia scita														1	1
Lejogaster metallina													1		1
Platycheirus manicatus													1		1
Individuenzahl	10	5	54	25	35	35	84	91	275	127	156	213	333	327	1770
Artenzahl	6	3	11	10	13	12	20	13	19	21	14	13	30	30	

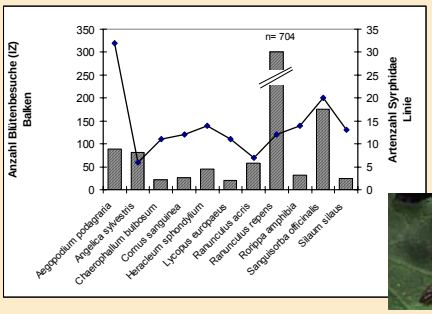
A arable fields,
M mesic grassland,
F wet alluvial meadows,
F/W …dito, forest & river margins

Direct additional observations

No.:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Habitat:	Alluvial forests (AF)									wet grasslands / tall herb communities															AF	
	light canopy											Forest margins (M)								M					M	
Xylota segnis	4			2	1	4			8	2	2	2														25
Temnostoma vespiforme	10	1		10	1	3																				25
Temnostoma bombylans	8	1	2	1			2	8		1																23
Baccha elongata	1					1	1	4																		7
Brachyopa scutellaris	1	4		2																						7
Brachymyia berberina	1	2	1	1																						5
Brachypalpoides lentus	1	1				2																				4
Volucella pellucens	7	4	8			1					1															21
Chalcosyrphus nemorum	3					3		4						2												12
Volucella inflata		6	1			2				1		1														11
Volucella bombylans	4	1	4	4		3		1	1		4		1	1	1											25
Caliprobola speciosa	3					1										1										5
Eristalis pertinax	10	4	7				2					1	76							1						101
Myathropa florea	12	4	7	1	1							4	5													34
Syrphus ribesii	2	1	2		1									1	2											9
Melanostoma scalare	1	2	3												1		1									8
Cheilosia albitarsis											3		1	1	2	4		9	2	2				1		26
Sphaerophoria scripta	1																16				1		2			20
Helophilus trivittatus													9		2		5									16
Eristalis tenax	1		2									4			2		5									14
Syritta pipiens	1								1			3		2		1		2								10
Eristalis arbustorum			1								3	1		1		1			1		1					9
Cheilosia vulpina													3							1	1		2	1		8
Anasimyia interpuncta																			2	1			3			6
Individuenzahl	94	38	59	24	7	26	20	12	16	17	12	17	97	27	7	22	5	32	23	12	6	14	9	14	4	611
Artenzahl	34	18	16	11	4	17	5	7	6	10	10	9	8	12	7	17	2	7	10	11	5	13	5	12	3	

Flower visiting

Aegopodium podagraria: **32 species, with a number of typical species for wet alluvial forests (Querco-Ulmetum)**



Flower visits on *Aegopodium podagraria*

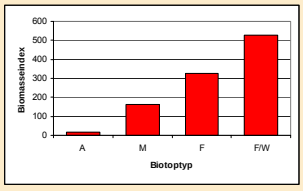
32 species observed, 30% of individuals xylobiont

richest flower-visiting guild, species living in sap runs well represented

Eristalis pertinax	16	Brachypalpoides lentus	1
Volucella pellucens	13	Cheilosia variabilis	1
Myathropa florea	10	Eristalis abusiva	1
Volucella bombylans	8	Eristalis interrupta	1
Volucella inflata	5	Eristalis tenax	1
Brachyopa scutellaris	4	Episyrphus balteatus	1
Syrphus ribesii	4	Leucozona lucorum	1
Brachymyia berberina	3	Melanostoma scalare	1
Cheilosia impressa	2	Platycheirus scutatus	1
Cheilosia pagana	2	Sphegina sibirica	1
Eristalis arbustorum	2	Syrphus torvus	1
Merodon equestris	2	Syrphus vitripennis	1
Neoascia podagrica	2	Temnostoma bombylans	1
Baccha obscuripennis	1	Temnostoma vespiforme	1
Brachyopa pilosa	1		

Biomass and species richness

Habitat	arable fields	mesic grassland	wet alluvial grassland	in contact to alluvial forest
	A	M	F	F/W
Relative biomass	**1**	**10**	**20**	**32**
Species number	8	35	35	42



Relative biomass index:

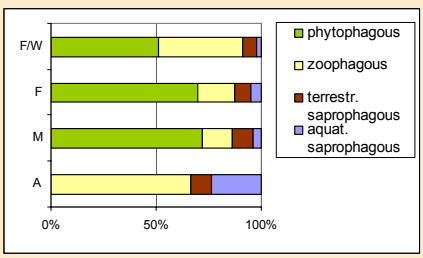
$\Sigma_{1\text{-}i}$ (K_KLA$_i$*IZ$_i$ / Anz R)

with
K_KLA$_i$ = size class of species i,
IZ$_i$ = number of individuals of species i
Anz R = number of grids whith data

Larval feeding types

Comparison of habitat types (based on transect data):

A arable fields, M mesic grassland, F wet alluvial meadows, F/W …dito, forest & river margins



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Total Results

Syrphidae collected/ observed in 2002 and 2003

- **Water Traps: 541 individuals out of 37 species**
- **Observations T. Krause: 119 individuals out of 65 species**
- **Observations A. Ssymank: 492 individuals out of 67 species**
- **Transect mapping: 2083 individuals out of 57 species**

∑ **Total Results: 3235 individuals out of 103 species**

Aspects of Nature Conservation I

The Urdenbacher Kämpe is an old nature conservation area, meanwhile part of a pSCI for the european network of protected sites NATURA 2000

of high floristic interest: a number of rare plants typical for large river valleys like *Euphorbia palustris*, *Thalictrum flavum* or *Veronica longifolia*, in total > 420 plant species present

high interest for vegetation science: largest remnants of alluvial forest on the lower rhine (Querco-Ulmetum), species rich lowland haymeadows (Dauco-Arrhenatheretum) and highly endangered alluvial meadows (Silaum silaus-meadows)

Red Data Book 1998, Ssymank & Doczkal

Criorhina pachymera (Egger, 1858)	2
Caliprobola speciosa (Rossi, 1790)	3
Chrysogaster basalis Loew, 1857	3
Criorhina ranunculi (Panzer, 1804)	3
Meligramma guttatum (Fallén, 1817)	3
Myolepta dubia (Fabricius, 1805)	3
Neoascia interrupta (Meigen, 1822)	3
Volucella inflata (Fabricius, 1794)	3
Anasimyia interpuncta (Harris, [1776])	V
Cheilosia vulpina (Meigen, 1822)	V
Lejogaster metallina (Fabricius, 1781)	V
Orthonevra brevicornis (Loew, 1843)	V
Parhelophilus frutetorum (Fabricius, 1775)	V
Parhelophilus versicolor (Fabricius, 1794)	V
Platycheirus fulviventris (Macquart (w), 1829)	V
Temnostoma vespiforme (Linnaeus, 1758)	V
Volucella zonaria (Poda, 1761)	V
Heringia brevidens (Egger, 1865)	G
Heringia heringi (Zetterstedt, 1843)	G
Melanogaster parumplicata (Loew, 1840)	G
Trichopsomyia lucida (Meigen, 1822)	G

Legend:

2 heavily endangered
3 endangered (vulnerable)

V prewarning list, endangered if trends continue
G endangered, but degree of threat unknown

Aspects of Nature Conservation II

- **Species richness was highest in ecotones from mesic to wet hay meadows and along the border of the alluvial forests**
- **Alluvial forests had a rich fauna of old and dead wood as for example Temnostoma vespiforme, T. bombylans, Brachyopa scutellaris, Criorhina pachymera, C. ranunculi and Volucella inflata.**
- **Large populations of Temnostoma-species and Volucella inflata.**
- **A number of rare species were present as well as 12 species of the federal red data book and 9 potentially endangered species**

➡ **not only of conservation interest for plants but also from a dipterological point of view**

Thank you very much for your attention !

- Thank you also to the Biological Station „Urdenbacher Kämpe“ for support
- to the local nature conservation authorities
- to D. Doczkal & C. Claussen for help with critical species
- the paper will be published in Volucella

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