

Ground beetles (Coleoptera, Carabidae and Cicindelidae) in the western part of Limburg (Flanders, Belgium)

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Abstract

During a carabid sampling campaign in 11 different UTM-square kilometres in the western part of Limburg, 79 species of ground beetles were identified. Eight species of this inventory are threatened to some degree in the region of Flanders. The discovery of *Amara brunnea* in a deciduous forest represents the second finding for Belgium. At mining waste heaps, 21 species of which 6 Red data species, were found. This data raises the number of known ground and tiger beetle species for UTM-square FS46 from 17 to 61, for FS56 from 128 to 133.

Keywords : Red list species, *Amara brunnea*, Carabidae, Cicindelidae, province of Limburg.

Introduction

The intention of this study was to obtain additional distribution data of ground beetles in the western part of the province of Limburg, by means of pitfall and hand collecting.

Material and methods

11 Different square kilometres situated in two UTM-10 km-squares (FS46, FS56) in the western part of Limburg were sampled by means of

21 pitfall traps (upper diameter 7,5 cm) and sporadic handcatches during the years 1995 and 1996. From January till December 1995 (330 days) 3 habitats at 'Kepkensberg' (Ham, FS4861) were sampled by means of 1 pitfall trap in each habitat. Between March and November 1996 (about 200 days) 19 pitfalls were in operation in 10 different UTM- square kilometres belonging to the UTM 10 km squares FS46 and FS56. Main habitats are summarised and situated in Table 1.

Table 1. Summary of the sampling stations mentioning the number of traps, the communality, UTM-coordinates and a brief habitat description (main habitats : C : heathland, D : dry grassland, F : forest or hedge, H : hay-field, M : marshland, P : pioneer vegetation, R : railroad embankment, W : mining waste heap)

Site	# traps	Communality	UTM (km ²)	Habitat	Main habitats
A	1	Ham	FS4760	Marshy deciduous forest edge	MF
B	1	Ham	FS4861	Pioneer vegetation along desiccated puddle	P
D	1	Tessenderlo	FS5260	Deciduous forest with bramble	F
E	1	Beringen	FS5260	Dry poor open grassland	D
F	1	Beringen	FS5360	Deciduous forest with oak	F
G	7	Beringen	FS5660	Mining waste heap	W
I	1	Ham	FS5062	Deciduous forest edge/railroad remnant	FR
Ja	1	Ham	FS4964	Wet moist hayfield	H
Jb	1	Ham	FS4964	Marshy deciduous forest	MF
K	1	Ham	FS4863	Beech-wood	F
L	1	Ham	FS4761	Holly-hedge	F
Ma	1	Ham	FS4661	Marshy deciduous forest	MF
Mb	1	Ham	FS4661	Marshy deciduous coppice forest	MF
Kep	3	Ham	FS4861	Heath/deciduous forest/pine-forest	C/F

Identifications of ground beetles were based on BOEKEN (1990) and checked by the co-author. Ecological and distribution data were taken from DESENDER (1986 a-d, 1989), DESENDER *et al.* (1995) and DESENDER & BOSMANS (1998).

Results

A total of 610 ground beetles, belonging to 67 species, were caught by means of pitfalls. Additional hand catches increased the total number of species with 12. In total, 79 species were thus found during this sampling campaign in the western part of Limburg. This represents 22 % of the Flemish native carabid fauna. Table 2 summarises the number of individuals (H in case of hand catch) for each species in each sampling station. Red list-species (DESENDER *et al.*, 1995) are printed in bold.

The largest number of Red list-species was caught on the mining waste heap. It concerns 21 species of which 6 Red list-species. The same site revealed also many rare spider species (JANSSEN, 1998). This specific habitat especially houses many very xerophylic and thermophylic species.

Discussion :

rare and threatened ground beetle species

From this species list in Flanders *Amara consularis*, *Amara tibialis*, *Harpalus puncticeps*, *Lionychus quadrillum* and *Microlestes minutulus* are 'Rare', *Olistophus rotundatus* is 'Vulnerable', *Harpalus autumnalis* 'Threatened' and *Amara brunnea* 'Indeterminate'. Figures 1 to 8 show the distribution of these Red list-species in Flanders (UTM-10 km squares). Hereafter, a brief description is given of the ecology of these species mentioning the number of captured males (m), females (f), the period in which the species was collected and the sampling station.

***Amara brunnea* (GYLLENHAL, 1810) : 1 m (15-31/VIII/1996) station F**

This stenotopic forest species is in the Red data book of ground beetles for Flanders categorised as 'Indeterminate' because it has only recently been observed in Flanders. This species was until now only known from the 'Bolderberg' in Heusden-Zolder. The deciduous forest along the canal 'Albertkanaal' concerns the second location only of *Amara brunnea* for Belgium! As

the species is brachypterous, this concerns most probably not a recent invasion but an old previously unnoticed record. This nocturnal beetle is less xerophilic than many other *Amara*-species and probably indicative for heathland forest.

***Amara consularis* (DUFTSCHMID, 1812) : 1 m handcatch station Kep; 1 f (6-15/VIII/1996) station G**

This constantly macropterous stenotopic species is rare in our region. It was caught flying during an investigation for moths with a mercury vapour lamp in grasslands at 'Kepkensberg'.

This beetle was also caught in a pitfall trap at the mining waste heap.

***Amara tibialis* (PAYKULL, 1798) : 1 f (21/V-10/VI/1996) station E**

A. tibialis is a constantly macropterous species of open sites (dunes, dry grasslands) on sand. This rare species has only been found in 23 UTM (10 km) squares in Flanders since 1950.

***Harpalus autumnalis* (DUFTSCHMID, 1812) : 1 m (15/IV-01/V/1996) station G**

This mostly brachypterous species of dry poor grasslands and dry heath is threatened in Flanders due to a strong recent decrease and its occurrence in only three UTM (10 km) squares since 1950.

***Harpalus puncticeps* (STEPHENS, 1828) : 10 m + 6 f (21/V-28/VII/1996) station G**

This constantly macropterous xerophilic species is known from chalk grasslands, stony slopes, other xerothermic habitats and sometimes even fields and rough vegetation. It concerns a rare species in Flanders because of the occurrence in only 22 UTM (10 km) squares.

***Lionychus quadrillum* (DUFTSCHMID, 1812) : 1 hand catch station G**

This rare stenotopic xerothermic species lives on gravel banks and between gravel on railroad verges. It only is known from 5 UTM (10 km) squares since 1950.

***Microlestes minutulus* (GOEZE, 1777) : 1 hand catch station E + 1 m (10-24/VI/1996) station G**

M. minutulus is a rare species (7 UTM squares since 1950) that lives in dry habitats.

***Olistophus rotundatus* (PAYKULL, 1798) : 3 f (1-15/IV; 28/VII-15/VIII; 15-29/IX/1996) station E, 1 f (01-15/IV/1996) station G.**

This species reproduces in autumn on dry

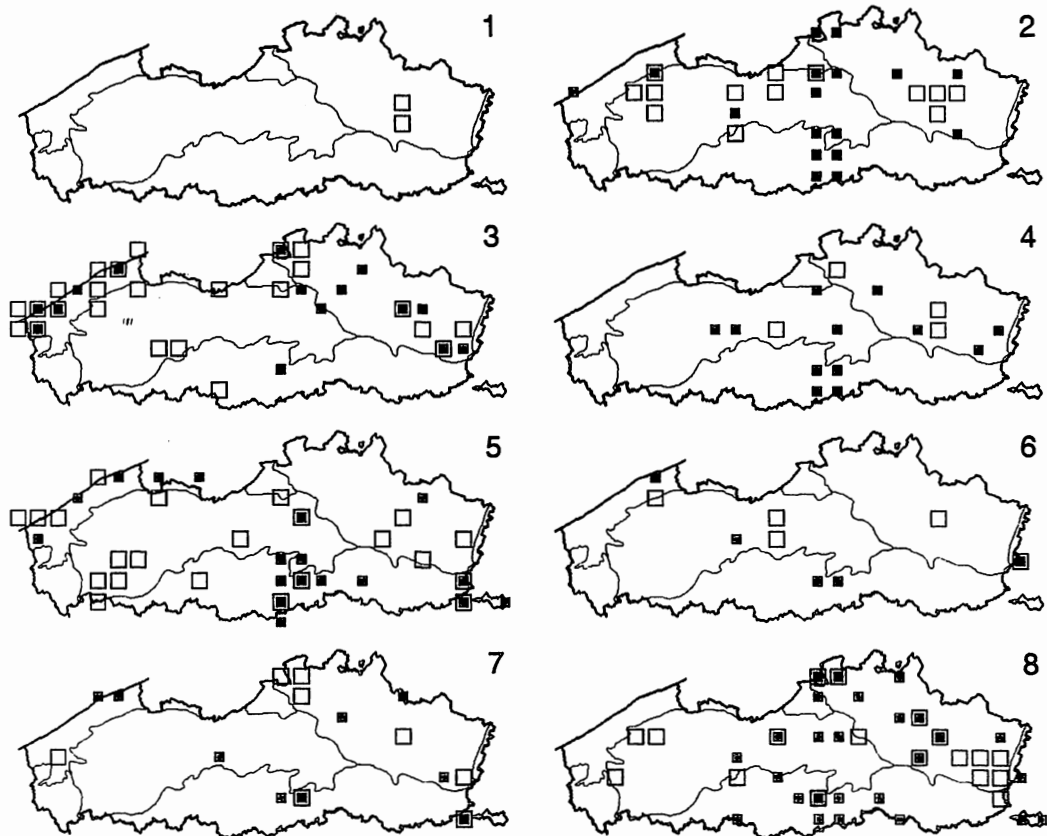
sunny gravel or sandy soils with sparse vegetation of preferably *Calluna* heather, grasses and lichens. *O. rotundatus* is vulnerable in Flanders

because of a fairly strong recent decrease and the occurrence in only 18 UTM (10 km) squares since 1950.

Table 2. Summary of the number of individuals (H in case of hand catch) for each species in each sampling station. Red list species (DESENDER *et al.*, 1995) are printed in bold.

species	SITE :	A	B	D	E	F	G	I	Ja	Jb	K	L	M	M	K
<i>Acupalpus dubius</i>										2					
<i>Agonum assimile</i>		1								4					
<i>Agonum fuliginosum</i>			1												
<i>Agonum muelleri</i>															1
<i>Agonum obscurum</i>			3							11			5		1
<i>Agonum sexpunctatum</i>															1
<i>Agonum viduum</i>			1												
<i>Amara aenea</i>					2		3								
Amara brunnea						1									
<i>Amara communis</i>						1	5								
<i>Amara consularis</i>								1							H
<i>Amara familiaris</i>						1									
<i>Amara lunicollis</i>															1
<i>Amara tibialis</i>					1										
<i>Anisodactylus binotatus</i>													2		
<i>Badister bullatus</i>				1								1			1
<i>Badister lacertosus</i>															1
<i>Bembidion doris</i>									H				1		
<i>Bembidion femoratum</i>								H							
<i>Bembidion lampros</i>			4				1		H						
<i>Bembidion mannerheimi</i>															
<i>Bembidion obliquum</i>									H						
<i>Bembidion properans</i>							1								
<i>Bembidion tetracolum</i>			3										1		
<i>Bradycellus harpalinus</i>			1									1	1		
<i>Bradycellus verbasci</i>															2
<i>Calathus erratus</i>						46									
<i>Calathus fuscipes</i>						17									
<i>Calathus melanocephalus</i>						6									2
<i>Calathus rotundicollis</i>		2										1	2		
<i>Carabus granulatus</i>									4	2					
<i>Carabus problematicus</i>						H									
<i>Cicindela campestris</i>									H						
<i>Cicindela hybrida</i>						H									
<i>Clivina fossor</i>										1					
<i>Dromius linearis</i>								H							
<i>Dyschirius globosus</i>			10		2	1	7	1	1	18				10	
<i>Elaphrus cupreus</i>										H				2	
<i>Elaphrus riparius</i>										H					
<i>Harpalus affinis</i>						1	3								
<i>Harpalus anxius</i>						9									
<i>Harpalus attenuatus</i>						2	3								
Harpalus autumnalis							1								
<i>Harpalus distinguendus</i>							2								
<i>Harpalus latus</i>							1								
Harpalus puncticeps										16					
<i>Harpalus rubripes</i>						5	14								
<i>Harpalus rufipes</i>															H
<i>Harpalus tardus</i>						1									
<i>Leistus ferrugineus</i>						1	3	15							1
<i>Leistus fulvibarbis</i>								1							
<i>Leistus rufomarginatus</i>		1													
<i>Leistus terminatus</i>														1	
Lionychus quadrillum								H							
<i>Loricera pilicornis</i>			10										16	1	1

<i>Metabletus foveatus</i>				9		25							
<i>Microlestes minutulus</i>				H		2							
<i>Nebria brevicollis</i>	1	18				1		5		4			2
<i>Nebria salina</i>		2		2								1	
<i>Notiophilus aquaticus</i>				2									
<i>Notiophilus biguttatus</i>				1	8			1		1	1		
<i>Notiophilus palustris</i>							1						2
<i>Notiophilus rufipes</i>			3		14		1			4			
<i>Olistophus rotundatus</i>				3		1							
<i>Panagaeus bipustulatus</i>													H
<i>Pterostichus oblongopunctatus</i>	4	1			1				2	1			1
<i>Pterostichus anthracinus</i>													H
<i>Pterostichus cupreus</i>		18											3
<i>Pterostichus diligens</i>								2	2				
<i>Pterostichus melanarius</i>	5												
<i>Pterostichus minor</i>		4						2			4		
<i>Pterostichus nigrata s.l.</i>		31			2			6	18		7		
<i>Pterostichus strenuus</i>					1			H			1		
<i>Pterostichus vernalis</i>									1				
<i>Pterostichus versicolor</i>		14				1		2		1	3		1 10
<i>Stenolophus mixtus</i>											2		1
<i>Stenolophus teutomus</i>								H					
<i>Synuchus nivalis</i>											1		
<i>Trechus obtusus</i>		1									1		
# individuals	4	12	4	11	34	10	3	17	81	6	20	36	3 30
# species (traps)	6	16	2	17	11	19	3	6	12	5	11	11	3 15
# species (hand catches)				3	3			8					4
total # species	6	16	2	20	11	22	3	14	12	5	11	11	3 19
# Red list species				3	1	6							1



Figs 1-8. Distribution in Flanders of Red data-book species mentioned in this note; filled squares : data before 1950; open squares data since 1950; 1. *Amara brunnea*, 2. *Amara consularis*, 3. *Amara tibialis*, 4. *Harpalus autumnalis*, 5. *Harpalus puncticeps*, 6. *Lionychus quadrillum*, 7. *Microlestes minutulus*, 8. *Olistophus rotundatus*. (main ecoregions added on the maps).

On the whole 51 species were found in UTM FS46 and 42 species in UTM FS56. This data raises the number of known ground and tiger beetle species for UTM-square FS46 from 17 to 61, for FS56 from 128 to 133. To conclude, it is obvious that this region not only houses a large biodiversity but moreover still shows a lot of interesting and rare ground beetles, especially from semi-natural and even anthropogenic habitats. Appropriate conservation and management measures are therefore necessary in order to preserve these habitats or microhabitats.

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References

- BOEKEN M., 1990. - De Loopkevers (Cicindelidae en Carabidae) van Nederland. Jeugdbondsuitgeverij, Utrecht, 155 pp.
- DESENDER K., 1986. - Distribution and ecology of carabid beetles in Belgium (Coleoptera, Carabidae) part 1. *Studiedocument* 26, Koninklijk Belgisch Instituut voor Natuurwetenschappen. 30 pp.
- DESENDER K., 1986. - Distribution and ecology of carabid beetles in Belgium (Coleoptera, Carabidae) part 2. *Studiedocument* 27, Koninklijk Belgisch Instituut voor Natuurwetenschappen. 24 pp.
- DESENDER K., 1986. - Distribution and ecology of carabid beetles in Belgium (Coleoptera, Carabidae) part 3. *Studiedocument* 30, Koninklijk Belgisch Instituut voor Natuurwetenschappen. 23 pp.
- DESENDER K., 1986. - Distribution and ecology of carabid beetles in Belgium (Coleoptera, Carabidae) part 4. *Studiedocument* 34, Koninklijk Belgisch Instituut voor Natuurwetenschappen. 48 pp.
- DESENDER K., 1989. - Dispersievermogen en ecologie van loopkevers (Coleoptera, Carabidae) in België : een evolutionaire benadering *Studiedocument* 54, Koninklijk Belgisch Instituut voor Natuurwetenschappen. 136 pp.
- DESENDER K., MAES D., MAELFAIT J-P. & VAN KERCKVOORDE M., 1995. - Een gedocumenteerde Rode lijst van de zandloopkevers en loopkevers in Vlaanderen. *Mededelingen van het Instituut voor Natuurbehoud* 1995 (1) : 1-208
- DESENDER K. & BOSMANS R., 1998 - Ground beetles (Coleoptera, Carabidae) on set-aside fields in the Campine region and their importance for nature conservation in Flanders (Belgium). *Biodiversity and Conservation* 7 : 1485-1493.
- JANSSEN M., 1998. - Faunistische bijdrage tot de kennis van de araneofauna van enkele weinig onderzochte regio's in België. Deel 5. West-Limburg. *Nieuwsbrief van de Belgische Arachnologische Vereniging* (1998), 13(2) : 30-36.
- WACHMANN E., PLATEN R. & BARNDT D., 1995. - *Laufkäfer* - Beobachtung, Lebensweise. 295 pp.