voorkeur heeft voor vochtige, min of meer beschaduwde situaties.

8 soorten zijn min of meer xerofiel. De meeste daarvan zijn eurytoop tot zeer eurytoop en kultuurtolerant. Ze werden in lage aantallen aangetroffen en zijn weinig typisch voor het studiegebied.

Als stenotope bossoorten kunnen we slechts een 3-tal soorten vermelden. Daarvan is de sterk bedreigde *Carabus coriaceus* de belangrijkste. Ook *Calathus piceus* en *Leistus rufomarginatus* zijn evenwel niet algemeen. Verdere bemonstering van het parkbos zou ongetwijfeld nog wel bijkomende soorten voor het reservaat kunnen opleveren. Tot slot vermelden we nog de 3 arboricole loopkevers *Dromius quadrimaculatus*, *D.quadrinotatus* en *Bembidion harpaloides* die achter schors in het jonge wilgenbroekbos, dat reeds veel dood hout bevat, zijn aangetroffen. *D.quadrinotatus* nam in de periode na 1950 signifikant af in onze streken.

Uit Figuur 2 blijkt duidelijk een korrelatie tussen de ekologische amplitude van de soort (gebaseerd op DESENDER & TURIN 1989) en het aantal records (lokaliteiten per jaar) voor elke soort (gebaseerd op DESENDER 1986a-d). Met andere woorden : zeer stenotope soorten zijn signifikant zeldzamer in ons land dan eurytope en stenotope. Stenotope, daarentegen, zijn enkel signifikant zeldzamer dan zeer eurytope. Het lager aantal records van de stenotope en zeer stenotope soorten kan eenvoudig worden verklaard door het feit dat moerasgebieden, waar het merendeel van deze soorten aan gebonden zijn, niet zo talrijk voorkomen in onze streken. Hetzelfde komt ook tot uiting in de spreiding van de soorten volgens ekologische amplitude over 10 Arcsin-frequentieklassen die de zeldzaamheid (aantal records) weerspiegelen (Figuur 3). Hieruit blijkt tevens dat het aandeel zeer zeldzame soorten eerder aan de lage kant ligt. Dit mag niet worden geïnterpreteerd als zou de Blankaart niet zo belangrijk zijn voor loopkevers. DESENDER & TURIN (1989) wezen er reeds op dat het aantal zeer zeldzame hygrofiele soorten relatief klein is, ten opzichte van de vele xerofiele soorten, waarvan vele in ons land bovendien de noordgrens van hun areaal bereiken.

Dankwoord

Met dank aan de beheerscommissie van de Blankaart en konservator Paul HOUWEN voor het verlenen van toestemming voor het uitvoeren van onderzoek ten behoeve van natuurbeheer.

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2. Op verzoek van Dhr. M. ALDERWEIRELDT leest de secretaris de volgende mededeling.

Faunistics and ecology of the carabid beetle fauna (Coleoptera, Carabidae) of a woodland relict in 'de Vlaamse Ardennen' (Eastern Flanders, Belgium)

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Summary

The ground beetle fauna of a woodland area with adjacent pasture, situated in 'de Vlaamse Ardennen' was studied during a complete year cycle by means of pitfall trapping. Some faunistic comments on the species list are given. One of the rarest species which was collected is Notiophilus quadripunctatus, *a species only known from 9 U.T.M.-squares since 1950.*

The recorded habitat preferences and the observed seasonal activity patterns of the most abundant species are discussed with some comments on their life cycle.

Samenvatting

De loopkeverfauna van een bosgebied met aangrenzend weiland, gesitueerd in de Vlaamse Ardennen, werd onderzocht gedurende een volledige jaarcyclus, met behulp van bodemvallen. Enkele faunistische commentaren op de soortenlijst worden geformuleerd. Zo is de vangst van Notiophilus quadripunctatus *slechts de tiende na 1950.*

Van de meest talrijke soorten worden de waargenomen habitatpreferenties en de seizoenale activiteitspatronen besproken. Op de levenscyclus van enkele soorten wordt kort ingegaan.

Introduction

In general, the entomofauna of the southern parts of Eastern and Western Flanders (called 'de Vlaamse Ardennen') is not very well investigated. This contribution tries to improve our knowledge of the carabid beetle fauna of that re-

gion.

The studied site is situated at Melden, in one of the many, small woodland areas in between Oudenaarde en Ronse, called the 'Rotelenberg' and 'Koppenberg'. The surface of this woodland relict is now approximately 35 ha. It was considerably larger a few ages ago, as is indicated on old maps (FERRARIS, 1771-1778). On these maps, the area is mentioned as Meldenbosch. It is situated at about 80 m of elevation above sea-level in the U.T.M. 10x10 km square ES42 (cf. Fig. 2).

Material and methods

The site was sampled with 6 plastic pitfall traps, with an aperture of 115 cm^2, in a gradient going from the woodland to a grazed pasture. The localization of the pitfall traps, together with the most important vegetation characteristics is illustrated in fig. 1. Two pitfalls (R1, R2) were thus installed in the *Fagetum nudum* woodland itself, two in the woodland edge (R3, R4) while the remaining two were situated in the pasture (R5, R6).

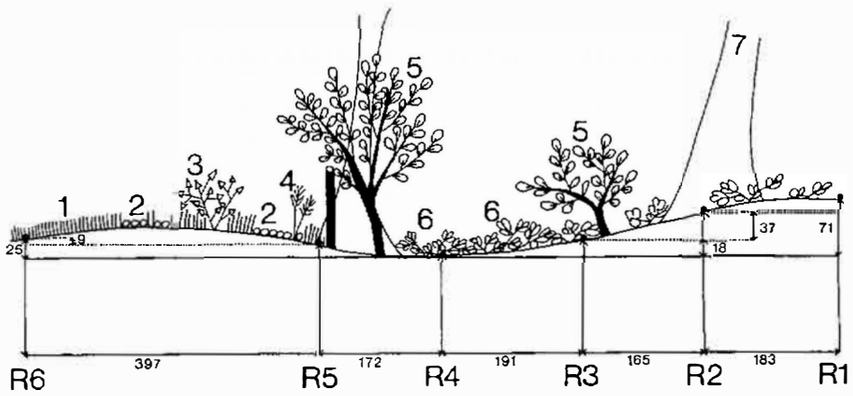

Fig. 1. Localization of the 6 pitfall traps in a gradient from the *Fagetum nudum* woodland to the grazed pasture, with indication of the main plant species : 1 = *Poaceae*, 2 = *Stellaria media*, 3 = *Urtica dioica*, 4 = *Holcus lanatus*, 5 = *Corylus avellana*, 6 = *Rubus* spec., 7 = *Fagus sylvatica*. Distances indicated are in cm.

A 4% formaline solution (with some detergent) was used for fixation. The traps were emptied at approximately fortnightly intervals from 11.III.1985 till 10.III.1986.

Carabid beetles were identified with FREUDE et al. (1976) and LINDROTH (1974). The nomenclature used is according to DESENDER (1985).

Results and discussion

1. Faunistics

Only 29 species belonging to 14 genera were collected, which is a relatively low number. 6 species are very common in Belgium (known from more than 200 U.T.M.-squares), 19 species can be considered as common (recorded from more than 100 but less than 200 U.T.M.-squares), and 3 species are less common (known from more than 50 but less than 100 U.T.M.-squares, cf. DESENDER, 1986a,b,c,d). One rare species was captured, *Notiophilus quadripunctatus*, which is known from 9 U.T.M.-squares only since 1950 (DESENDER, 1986a) (Fig. 2). This is a western palearctic species, reaching its distribution limit in Belgium and occurring mainly in woodland areas and wet grasslands (DESENDER, 1986a).

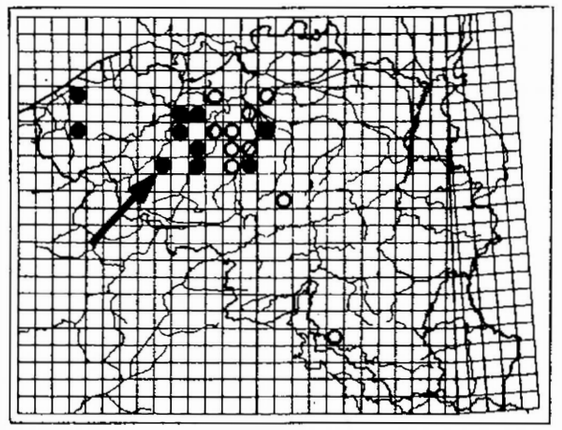

Fig. 2. Distribution of *Notiophilus quadripunctatus* in Belgium. Open circles = data before 1950, filled circles = date since 1950, filled squares = data from both time periods. (From DESENDER, 1986a). The arrow situates the studied area.

The presence of *Pterostichus cristatus* is also worth mentioning. Although this typical woodland species is known from more than 100 U.T.M.-squares (DESENDER, 1986c) (Fig. 3), it is very rare in the northern part of Belgium (Flanders). Its occurrence there is almost completely restricted to the Zoniën-forest and to some of these woodland areas in the south of Eastern Flanders.

It is interesting to note that several of these species show a more or less atlantic European distribution pattern (e.g. *Leistus fulvibarbis*, Fig. 4). Woodland species with a more Central European distribution pattern (e.g. *Pterostichus cristatus*), as occurring in the Ardennes, are scarce. This further stresses the importance of the few remaining woodlands in Flanders.

Table 1, summarizing the total catches of the 29 carabid beetle species, shows

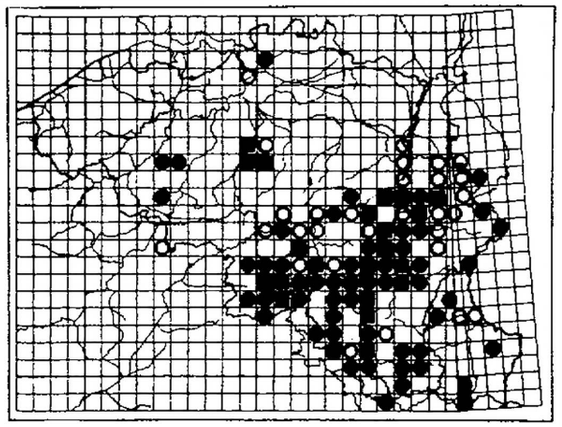

Fig. 3. Distribution of *Pterostichus cristatus* in Belgium. Open circles = data before 1950, filled circles = date since 1950, filled squares = data from both time periods. (From DESENDER, 1986c).

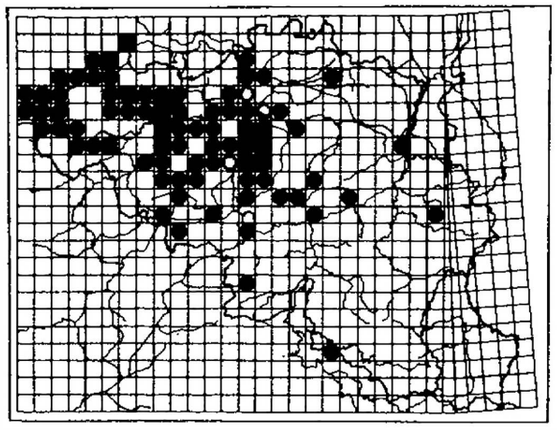

Fig. 4. Distribution of *Leistus fulvibarbis* in Belgium. Open circles = data before 1950, filled circles = date since 1950, filled squares = data from both time periods. (From DESENDER, 1986a).

that only 5 species can be considered as abundant (more than 20 individuals captured), namely *Nebria brevicollis*, *Leistus fulvibarbis*, *Bembidion lampros*, *Notiophilus biguttatus* and *Leistus rufomarginatus*.

2. Habitat preference of the most abundant species

Fig. 5 shows the registrated habitat preference of the 5 most abundant species. The lowest numbers are always registrated in the dry, *Fagetum nudum* woodland. *Nebria brevicollis*, *Leistus fulvibarbis*, *Bembidion lampros* and *Notiophilus biguttatus* all show a significant preference for the pasture. This pasture however is almost completely enclosed by the woodland area and has a well developed litter layer partly caused by falling leafs. The sampled part is still very shadowy. In this way the woodland influences the faunal composition of the pasture far more than vice versa (Table 1). The preference of the above-mentioned species for the pasture is probably mainly caused by differences in humidity. Only *Leistus rufomarginatus* seems to be rather indifferent although the numbers trapped are rather low. It is known that this species is more bound to woodland areas than the other ones discussed above.

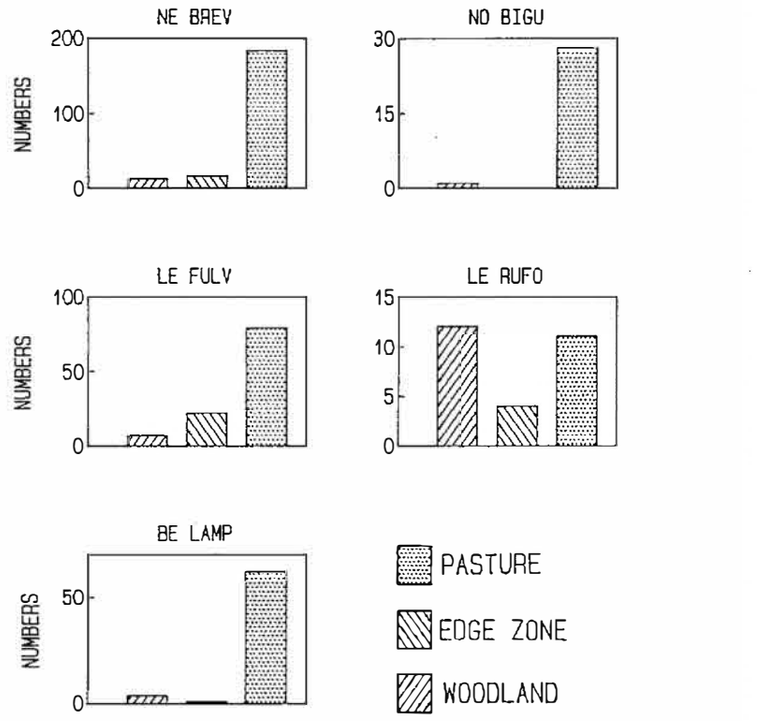

Fig. 5. Habitatpreference of the five most abundant species. NE BREV = *Nebria brevicollis*, LE FULV = *Leistus fulvibarbis*, BE LAMP = *Bembidion lampros*, NO BIGU = *Notiophilus biguttatus*, LE RUFO = *Leistus rufomarginatus*.

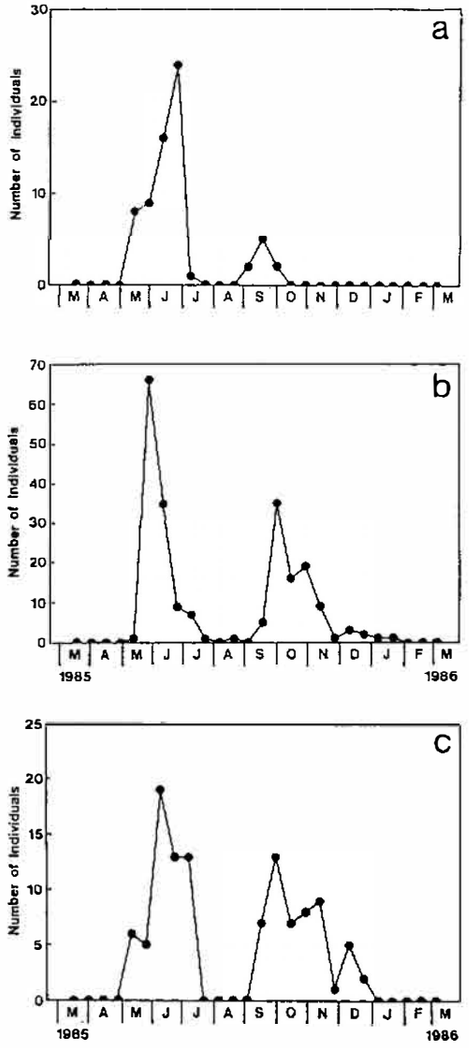

Fig. 6. Seasonal activity distribution of the three most abundant species (males + females) for (6a) *Bembidion lampros*, (6b) *Nebria brevicollis* and (6c) *Leistus fulvibarbis*.

3. Seasonal activity of the most abundant species

Besides investigating the faunal composition and the habitat preferences of the occurring species, pitfall traps are also very useful for registrating seasonal activity

patterns (ADIS, 1979; DESENDER, 1984: TRETZEL, 1955; a.o.). Activity is especially correlated with reproductive behaviour (MAELFAIT & BAERT, 1975). Different authors have divided the phenology patterns of carabid beetles into different groups based on the timing of reproduction and diapauze events (e.g. LARSSON, 1939; THIELE, 1977).

Bembidion lampros (Fig. 6a) is an example of an adult hibernator, breeding in spring and summer and with an almost inactive new generation appearing during autumn. This is in agreement with literature data (e.g. DESENDER & POLLET, 1987).

Nebria brevicollis (Fig. 6b) and *Leistus fulvibarbis* (Fig. 6c) are both examples of autumn breeding species, hibernating as larvae. These species show two distinct peaks of activity during the year, namely one during late spring and early summer and one during autumn. They however reproduce during autumn, normally from September onwards (ALDERWEIRELDT, 1987). Females were found to carry mature eggs during autumn only (DESENDER & POLLET, 1987). Larvae were found to occur from late autumn untill the next spring (DESENDER & POLLET, 1987). The high activity during spring and early summer is due to an intensive search for food of the newly emerged beetles. During summer both species enter an aestivation diapauze.

males/females	R1	R2	R3	R4	R5	R6	TOT
Agonum assimile	1/0						1/0
Agonum fuliginosum						1/0	1/0
Agonum viduum						1/0	1/0
Amara familiaris						1/0	1/0
Amara lunicollis	1/1		0/1				1/2
Asaphidion flavipes		0/1		0/1			0/2
Badister bipustulatus		0/1					0/1
Badister lacertosus		0/1					0/1
Bembidion biguttatum						1/0	1/0
Bembidion guttula					0/2		0/2
Bembidion lampros	1/0	0/3	0/1		14/9	20/19	35/32
Bembidion quadrimaculatum						0/1	0/1
Bradycellus harpalinus					0/2		0/2
Leistus ferrugineus			0/1		1/0	10/1	11/2
Leistus fulvibarbis	1/3	1/2	3/4	6/9	20/17	32/10	63/45
Leistus rufomarginatus	1/0	10/1	1/2	1/0	6/0	4/1	23/4
Loricera pilicornis	0/1		1/0		1/1	2/2	4/4
Nebria brevicollis	1/6	0/5	1/1	6/8	65/63	27/29	100/112
Notiophilus biguttatus		0/1			10/11	5/2	15/14
Notiophilus palustris		0/1					0/1
Notiophilus quadripunctatus	1/0				0/1		1/1
Patrobus atrorufus		1/0				1/0	2/0
Pterostichus cristatus			2/0	0/1	1/0		3/1
Pterostichus cupreus						1/0	1/0
Pterostichus madidus		2/0	1/0		5/1		8/1
Pterostichus nigrita				0/1			0/1
Pterostichus strenuus	1/0				6/0	5/7	12/7
Stenolophus teutonus		0/1					0/1
Trechus obtusus					6/2	1/1	7/3
TOTAL	8/11	14/17	9/10	13/20	135/109	112/73	291/240

Table 1. Total numbers per pitfall trap (males/females) of all carabid species captured during the complete year cycle, in alfabetical order.

Acknowledgements

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3. Op verzoek van J.-P. MAELFAIT leest de secretaris de volgende mededeling.

Lycosid spiders of the Belgian coast

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Summary

In this contribution, the knowledge concerning the wolfspider fauna (Araneae, Lycosidae) of the Belgian coast is summarized. Of the 43 Lycosidae known from Belgium, 21 have been recorded from the dune and saltmarsh areas that occur along the Belgian coast. Several rare species were encountered. Of each species some information on its habitat preference and distribution along the Belgian coast is provided.

Introduction

The Belgian coast is a narrow strip 1 to 2 km in width and some 60 km long of lime rich sand between the North Sea and the polder region. After World War II mass tourism led to the transformation of the beach front to an almost continuous wall of concrete and apartment buildings (DAELS & VERHOEVE, 1988). The landward side of dunes was turned into camping and caravanning sites. Only few natural dune areas survived this process of touristic expansion. The more important dune relicts are situated near the French and Dutch border. Smaller relicts in between have often been planted by trees or are used for the pumping of drinking water.

There is however good hope, because governmental authorities recognized the urgent need for the preservation of the remaining areas. Mere conservation will however not suffice. Active management, including for instance preventing sea buckthorn invading open short vegetation, will be needed.

A better understanding of the threats of these unique ecosystems is needed. We try to contribute to this by studying the arthropods occurring in these habitats. We summarize here what is known about the lycosid spiders (Araneae : Lycosidae).

Material and methods

The hereafter given characterization of the habitat and the occurrence along the Belgian coast of lycosid spiders is based on a large number of records. These were only very fragmentary published, e.g. DESENDER et al., 1982, HUBLE (1975, 1976), HUBLE & MAELFAIT (1982), MAELFAIT et al. (in press). The complete list of records will be published in ALDERWEIRELDT & MAELFAIT (in prep.).