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Rediscovery of a colony *Polyergus rufescens* (LATREILLE, 1798) in Belgium : Observations at the "Hageven" Nature reserve (Hymenoptera Formicidae)

W. DEKONINCK, V. VERSTEIRT & P. GROOTAERT

Royal Belgian Institute of Natural Sciences, Dept. Entomology, Vautierstraat 29, B-1000 Brussels (e-mail : wouter.dekoninck@naturalsciences.be; wouterdekoninck@hotmail.com).

Abstract

The first record of a colony of *Polyergus rufescens* (LATREILLE, 1798) in Belgium is from 1943 (RAIGNIER & VAN BOVEN, 1949). However BONDROIT (1911, 1918) mentions the record of a single worker in Yvoir but he was doubtful about this record. The last Belgian record of a colony *P. rufescens* was in Genk by VAN BOVEN in 1963 (VANKERKHOVEN, 1999). We rediscovered the species in August 2000 at the Nature reserve the Hageven in Neerpelt, Flanders (294 workers of *P. rufescens* were collected). The workers were collected with pitfalls traps. At the same time eggs and pupae of a Serviformica's species were found indicating a successful slave-making raid. The habitat where the species was found can be described as an ant-species rich, dry *Calluna-Corynephorus*-vegetation. The rediscovery of this vulnerable species in Belgium after over 37 years can be considered as hopeful but does not imply a sustainable presence in other comparable habitats in Belgium. Also the importance of ant community-compositions to determine the chances and key variables for nature development in areas with a former agricultural use in heathlands are discussed here.

Keywords : Formicidae, faunistics, Belgium, *Polyergus rufescens*, Nature development, ant community-composition.

Samenvatting

Een kolonie Amazonemieren (*Polyergus rufescens* LATREILLE 1798) terug gevonden in België en andere waarnemingen in het Natuurreservaat het Hageven (Hymenoptera : Formicidae).

De eerste melding van een kolonie van *Polyergus rufescens* in België dateert van 1943 (RAIGNIER & VAN BOVEN, 1949). Eerder meldde BONDROIT één werkster van deze soort in Yvoir maar hij catalogeerde deze vondst als twijfelachtig (BONDROIT, 1911, 1918). In 1963 werd door VAN BOVEN in Genk voor de laatste keer in België een kolonie van *P. rufescens* gevonden (VANKERKHOVEN, 1999). In augustus 2000 werd de Amazonemier opnieuw gevonden in België. In het natuurreservaat het Hageven te Neerpelt (Vlaanderen) werden 294 *P. rufescens*-werksters ingezameld. De werksters werden met pitfalls gevangen en er werden ook eieren en poppen van Serviformica's gevonden waardoor we met zekerheid kunnen stellen dat de slaven-rooftocht succesvol was. Het habitat waar de soort gevonden werd, was een mierensoorten-rijke, droge *Calluna-Corynephorus* vegetatie. De herontdekking van deze soort na 37 jaar is hoopvol maar garandeert geen andere vindplaatsen in gelijkaardige habitatten in België. Verder wordt het belang van de samenstelling van de mierenfauna in heidegebieden besproken ten einde de mogelijkheden van natuur-ontwikkeling in gebieden met een voormalig intensief landbouwgebruik na te gaan.

Introduction

The first record of a colony of the Amazon ant in Belgium dates from 1943 (RAIGNIER & VAN BOVEN, 1949). The last time the species was collected was 37 years ago. In 1963 VAN BOVEN found a colony of *P. rufescens* which was destroyed during the building of the Ford-factory in Genk (VANKERKHOVEN, 1999). Dispete several intensive searches by VANBRABANT and VANKERKHOVEN at other localities in the provinces Limburg and Antwerp the species was no longer found. From 1986 the species is considered as a doubtful Belgian ant species or at least as a very rare species in Belgium and the Netherlands (VAN BOVEN & MABELIS, 1986; DE BISEAU & COUVREUR, 1994). In the Netherlands a colony was recently rediscovered at the Achterhoek (MABELIS, 2000). The last record of the species in the Netherlands dated from 1975.

Study area, material and methods

The present observations were made during a study in order to determine the chances and key variables for nature development in areas with a former intensive agricultural use. Therefore a sampling campaign was performed in the Nature reserve "Het Hageven" from April to September 2000. The Hageven is a Nature reserve of 150 ha in Neerpelt, province Limburg. The reserve is an extensively grazed heathland surrounded with birch-pine woods. It contains swamps and many bogs. The aim of the study was to determine the chances and key variables for nature development in areas with a former intensive agricultural use. In the reserve four formerly intensive agricultural areas were sampled (nature developing sites 1, 2, 3 and 4) as well as a reference site in order to determine the colonisation potential of target invertebrate species. At each site three pitfalls and four white water traps containing a 3.5% formaldehyde solution, were installed from which all ants were identified.

Results

During the sampling campaign 9982 ants were collected and identified. We found 28 species. At some sites the presence of some species is doubtful as only a few workers (n<3) and/or only winged males or queens from neighbouring habitats were found (marked between brackets in table 1).

The first results of the sampling campaign at "Het Hageven" indicate the importance of ants as key variables for nature development in areas with a former intensive agricultural use. The reference site, a dry *Calluna-Corynephorus*-vegetation that has been left undisturbed for a long time, has a higher diversity than the other formerly agricultural areas of the heathland (table 1).

The *P. rufescens* workers were only sampled in the reference site during the first two weeks of August (293 individuals in pitfall 2 and one in pitfall 3). The workers were sampled during a slavemaking-raid of the species and they transported pupae and eggs of a Serviformica species (Fig. 1). The raid could be considered as successful.

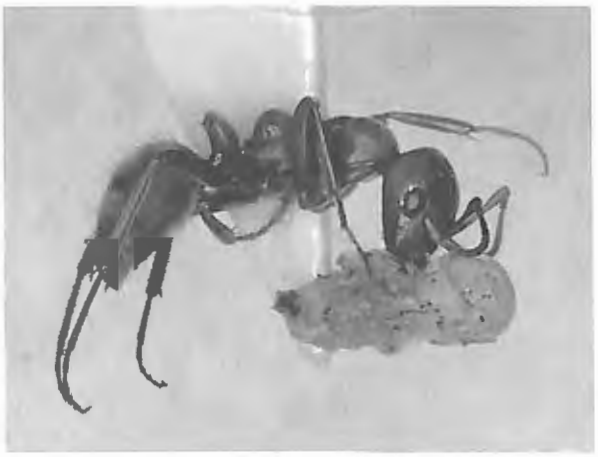

Fig. 1. *Polyergus rufescens*-worker with a Serviformica-pupa.

Also other rare species were only found in the reference site : *Anergates atratulus* (SCHENCK, 1852), *Formica lusatica* (SEIFERT, 1997), *Lasius psammophilus* (SEIFERT, 1992). Also some Serviformica-species : *Formica rufibarbis* (FABRICIUS, 1793), *F. cunicularia* (LATREILLE, 1798) were collected during the sampling campaign. At the other sites (four formerly intensive agricultural areas) less species were found and also less Serviformica-species and individuals were collected and the rare species were almost absent.

This recent discovery of *P. rufescens* in Belgium is remarkable (RAIGNIER & VAN BOVEN, 1949; VANKERKHOVEN, 1999). Because of its characteristic life-history this slave-making, ant species is seldomly observed. All records of the species were made so far, during warm August summer days, when a column of workers are attempting slave making-raids. Normally the

Table 1. Ant species composition at 4 nature developing sites and a reference in the Nature reserve "Het Hageven. w = worker, m = male, q = queen or gyne.

Species	**Nat.dev. site1** *Juncus effusus*-vegetation	**Nat.dev. site2** Poor *Agrostis*-grassland	**Nat.dev. site3** Upper part of the soil digged away	**Nat.dev. site4** *Juncus effusus*-vegetation	**Reference site** dry *Calluna-Corynephorus*-vegetation
Anergates atratulus					1q
Formica cunicularia	(1w)	6w			15w
Formica lusatica		(1w)			7w, 1m
Lasius psammophilus					126w, 1q
Polyergus rufescens					294w
Formica rufibarbis	(2w)	19w		(1w)	8w
Myrmica sabuleti	(1w)	5w, 3q	(1w)	(2w)	17w
Tetramorium caespitum	(1w)	6w	(3w)	(2w)	610w, 1m, 4q
Lasius niger	883w, 1m, 3q	2832w, 24m, 30q	398w, 5m, 4q	3604w, 14m, 32q	4w, 1m, 1q
Myrmica rubra	536w, 4m, 16q	109w, 1m, 12q	2w, 7q	5w, 5q	
Myrmica scabrinodis	20w, 3q	174w, 5m	2w, 7q	(1m, 2q)	
Myrmica ruginodis	10w, 1m	(1m)			(1m)
Myrmica rugulosa		13w		(2w, 2q)	
Lasius platythorax	7w				
Lasius flavus			(2q, 2w)	(3w)	
Myrmica schencki		4w		(3w)	(1w)
Myrmica specioides		(3w, 1q)			
Formica sanguinea			(1q)	(1w)	(1q, 1w)
Formica rufa					(1w, 1q)
Lasius sabularum			(2q)		
Lasius umbratus	(2m, 2q)	(1m, 2q)	(2m, 7q)	(6q)	(2q)
Lasius brunneus		(1w)			
Stenamma debile		(1q)		(1q)	
Strongylognathus testaceus		(1q)		(1q)	
Formica pratensis	(1w)	(1w)			
Lasius fuliginosus		(1q)			
Lasius meridionalis			(4q)	(1w)	
Lasius mixtus			(1q)		
number of species found	**11**	**18**	**11**	**14**	**14**
number of doubtful species	6	9	7	12	5
species indicative for the site	**5**	**9**	**4**	**2**	**9**

nests of *P. rufescens* (and foraging workers) can only be detected when workers leave for or come back from raids. In the meantime the Amazon-ants stay in the nest where their slaves serve them. Sometimes the nest of *P. rufescens* is wrongly considered as a nest of one of their slaves as the slaves and not the Amazone-workers protect the entrance. Normally *Formica fusca* is the commonly used slave-species. In the colony that was recently rediscovered in the Netherlands, also *Formica rufa* slaves were present (MABELIS, 2000). In the reference site at "Het Hageven" Amazone-workers have the opportunity to make different species as slaves as several nest from Serviformica-species and also *F. rufa*, *F. pratensis* were found in the neighbouring habitats.

The rediscovery of this vulnerable species in Belgium after 37 years can be considered as hopeful but does not imply sustainable existence in other comparable habitats in Belgium. Further intensively searches for this species in comparable habitats can be interesting. The use of pitfalls as a sampling method can help. The advantage of this sampling method to detect rarely observed ant-species is already suggested (DEKONINCK & VANKERKHOVEN, 2001).

Records of *P. rufescens* have declined in Europe during the last decennia. Suggested reasons of the decline of the species in the Netherlands are increased nitrogen-deposition that speeds up vegetation succession and stimu-

lates dominant grasses in heathlands. Also removing of the upper layer of the soil could have negative effects to the ant-fauna in general (MABELIS, 2000).

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Laboulbeniales (Fungi Ascomycetes) from Belgian Blattodea

by A. DE KESEL

National Botanic Garden of Belgium, Domein van Bouchout, B-1860 Meise, Belgium (e-mail : andre.dekesel@br.fgov.be).

Summary

Descriptions, illustrations and an identification key for three ectoparasitic *Herpomyces* species found on Belgian cockroaches (collection A. Collart) are given. *Herpomyces ectobiae* and *H. stylopygae* are new to the Belgian mycoflora.

Keywords : Blattodea, Laboulbeniales, *Herpomyces*, *Blatta*, *Blatella*, *Periplaneta*, ectoparasites, key.

Samenvatting

Beschrijvingen, illustraties en determinatiesleutel voor drie ectoparasitaire *Herpomyces* soorten van Belgische kakkerlakken (collectie A. Collart) worden gegeven. *Herpomyces ectobiae* en *Herpomyces stylopygae* zijn nieuw voor de Belgische mycoflora.

Introduction

Herpomyces THAXTER are highly specific and obligate ectoparasitic fungi (Laboulbeniales, Ascomycetes) found exclusively on adult cockroaches (Blattodea). The genus counts 25 species worldwide (TAVARES, 1985), an account on all known taxa is given by Thaxter (1931). Up to now only three species were found in Europe (SANTAMARIA *et al.*, 1991).