

On the arrival of the Asian invader ant *Lasius neglectus* in Belgium (Hymenoptera Formicidae)

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Abstract

Lasius neglectus Van Loon, Boomsma & Andrasfalvy 1990, a new ant species for Belgium was discovered in the city of Ghent. Grass lawn edges, stones, footpaths, gravel roads, bare sand and even concrete floors were used as nest places. This most recently known site (Citadelpark in Ghent) of occurrence in Europe (51,02° N; 03,44° E) shows that the species went up north-westwards and may perhaps be found more northwards in the near future. Assumptions on the arrival and expansion-history of the species in Ghent and Europe are made. In the microhabitats where this pest species can settle, *L. neglectus* impoverished the fauna to an almost single species ant fauna where only huge nests of this species are found. As *L. neglectus* can assume to be a potential threat for the native ant fauna, its expansion and the environmental factors determining this process should be investigated in Belgium.

Keywords: Formicidae, *Lasius neglectus*, ant-faunistics, new species, Belgium, pest species

Samenvatting

In de stad Gent werd *Lasius neglectus*, een nieuwe mierensoort voor België, ontdekt. Zowel grasperken, stenen, voetpaden, grindwegels, open zandplekken als betonbaantjes worden als nestplaatsen gebruikt. Deze meest recente vindplaats (Citadelpark in Gent) in Europa (51,02°N; 03,44°E) bevestigt dat deze soort zich verder noordwestwaarts heeft uitgebreid en inderdaad in de toekomst nog noordelijker gevonden zou kunnen worden. Hypotheses over de oorsprong en expansie-historiek van deze soort in Gent en Europa worden aangehaald. In de microhabitaten waar deze pestsoort zich kan vestigen, verarmt *L. neglectus* de fauna tot een één-soort mierenfauna en worden enorme nesten gevonden. Aangezien *L. neglectus* als een bedreiging voor de oorspronkelijke inlandse fauna kan worden aanzien, lijkt het ons onontbeerlijk de mate van uitbreiding van deze soort en de hierbij belangrijke stuurvariabelen in België, op te volgen.

Introduction

Recently, ant faunistics in Belgium has made important steps forward. Due to new taxonomical insights (SEIFERT, 1996; 1997) the last two years ten new species were added to our fauna and that especially because of intensive inventory work in the northern part of the country, Flanders (DEKONINCK & VANKERKHOVEN, 2001a; 2001b). In the summer of 2001 a huge inventory-project was started up and revealed interesting new localities of rare and even very rare Belgian ant species (Verspreidingsatlas voor de mieren van Vlaanderen, externe opdracht van het Instituut voor

Natuurbehoud). Not only the ant faunas of endangered habitats were investigated, but also agricultural areas, motorway verges and cities were inventoried intensively. Parks and road-edges in cities and their ant-fauna have never been a very popular study area. But it was in the centre of the city of Ghent that a new ant species for the Belgian fauna was discovered.

Lasius neglectus, a new polygynous ant species for Belgium

In the summer of 2001 the ant-fauna of parks in the city centre of Ghent was inventoried. In one park, the Citadelpark, the ant fauna only

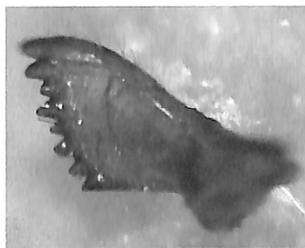


Fig. 1. Mandibula and mandibular dents of a worker of *L. neglectus* (at the top, total length : 470 μm , collected in Ghent) and *L. psammophilus* (under, total length : 505 μm , collected in Oostduinkerke).

existed of one very aggressive polygynous *Lasius* s. str. species. It constructed huge nests everywhere in the park. Grass lawn edges, stones, footpaths, gravel roads, bare sand and concrete floor are used as nest places. Even at the parking-places around the park the species was found. The Citadelpark is in the immediate vicinity of the buildings and the Botanical Garden of the University of Ghent. Also along the roads of the Botanical Garden (from and to the different greenhouses) and in the flowerpots, huge nests of this species were found. In some places the polygynous nest reaches more than 10 meters length and 1 meter width. During warm summer days in June-September, the activity of the species was enormous and it could be found on different shrubs and trees tending and harvesting aphids. Actually in November workers were still observed collecting all kinds of prey.

This typical ecology and organisation strategy, unknown for Belgian ants, made us suspect this species was not *Lasius psammophilus* SEIFERT,

1992, as thought at first. Determination unmasked the ant as *L. neglectus*, a new species for Belgium (number of mandibular dents: for *L. neglectus* < 8 and for *L. psammophilus* \geq 8: see Figure 1, specimens in personal collection). Some specimens of the *L. neglectus* population from the Citadelpark (Ghent) are deposited at the K.B.I.N. in Brussels.

First real pest ant for Belgium

From the 74 ant species so far known for Belgium *L. neglectus* is the second which is catalogued as an introduced "pest ant". In contrast with the other one, *Monomorium pharaonis* Linnaeus, 1758, *L. neglectus* is able to live outside buildings and greenhouses during the complete year and to intrude a wide range of different microhabitats. In the localities where we found it in the summer of 2001, the ant-fauna was indeed mostly impoverished to a one-ant-species fauna. No other species (except *L. niger*) were found in the habitats where *L. neglectus* had settled. Some other parks and small habitats in the city still contain a restricted city-ant-fauna, which in Ghent, can consist of several ant species (Table 1).

This possibility to out-compete all other ant species confirms its strong impact on the biotic environment if *L. neglectus* can settle down permanently (BOOMSMA *et al.*, 1990; VAN LOON *et al.*, 1990; ESPADALER & COLLINGWOOD, 2000; SEIFERT, 2000; ESPADALER & REY, 2001). *L. neglectus* was also found in the buildings of the University where its nests are located under and in ground and wall covering. In those places it organises itself to forage on left-overs and other waste in the buildings. Also VAN LOON *et al.* (1990), SEIFERT (2000) and ESPADALER & REY (2001) mentioned *L. neglectus* to occur as a plague inside houses, and to produce problems in greenhouses and gardens.

Table 1 Ant-fauna of Ghent and the microhabitat preference of the different species (pers. comm.).

Species	Preferred habitat in the city parks
<i>Lasius flavus</i> (FABRICIUS, 1781)	Grass lawns, lawn edges
<i>Lasius brunneus</i> (LATREILLE, 1798)	Old trees in parks and buildings
<i>Lasius niger</i> (LINNAEUS, 1758)	Everywhere
<i>Lasius fuliginosus</i> (LATREILLE, 1798)	Old trees in parks
<i>Lasius umbratus</i> (NYLANDER, 1846)	Grass lawns, lawn edges
<i>Myrmica rugulosa</i> (NYLANDER, 1846)	Grassland and road edges
<i>Myrmica rubra</i> (LINNAEUS, 1758)	Everywhere
<i>Myrmica ruginodis</i> (NYLANDER, 1846)	Shrubs and trees

Its biology and habitat preference in Belgium resemble those from sites elsewhere in Europe where the species was found. These are characterized by a high degree of urbanisation as can be found in city parks with trees and build-up areas with gardens (ESPADALER & REY, 2001). But as huge populations were already observed in open, anthropogenically disturbed grasslands outside human settlements and in open forests (SEIFERT, 2000), further expansion or invasion of the species in Belgium has to be expected.

Its origin and history: *L. neglectus* reached Ghent before 1978

The native radiation centre of *L. neglectus* is the natural steppe habitat in Asia Minor (SEIFERT, 2000). The range expansion during the last 25 years from its native region to the northwest of Europe, as this last record from Ghent confirms, is impressive. New colonization in Europe into natural or semi natural habitats continually proceeds, be it very slowly. At this moment the species is almost only found in cities where it probably was introduced by passive anthropogenic long-range transport by potted plants. As its current distribution in Europe suggests (SEIFERT, 2000) *L. neglectus* depends on this dispersion method to settle down at new localities.

The first place the species did settle in Europe perhaps more than 30 years ago will presumably never be discovered. As its name tells us it can be overseen for several years, although it constructs huge, striking nests. For this there are two reasons. Firstly *L. neglectus* was only recently discovered in and described from Budapest in 1990 (VAN LOON *et al.*, 1990). Secondly the species can only be correctly identified by specialists. Before and sometimes even after 1990, the species was identified as its sibling species *L. alienus*. It was in the summer of 2001 a specialist checked the *L. alienus* colonies in the Citadelpark and unmasked them as *L. neglectus*. The oldest material collected in the Citadelpark is stored in the collection of R. VAN NIEUWENHUYZE (leg. 1977-1980) which contains three workers of *L. neglectus* collected in the Citadelpark of Ghent on 11.V.1978 and formerly identified by the collector as *Lasius alienus*, making those three workers the second oldest record of the species in Europe after Budapest (VAN LOON *et al.*, 1990). This

confirms that *L. neglectus* was introduced in Belgium before 1978. Probably the first place this species could settle moreover than 23 years ago were the grass edges near the buildings 'Het Kuipke' in the centre of the Citadelpark where a four-yearly exposition of flowers and orchids took place in the 70s and 80s. As these expositions always took place during the months May-June a perfect swarming and invasion opportunities from plant-pots or ground storages of this exposition probably occurred several times before 1978.

Today *L. neglectus* can be considered as an important new fauna element for Europe (SEIFERT, 2000). The range of *L. neglectus* was delimited by 1° E and 75° E and by 36° N and 52° N, with 38 sites known (SEIFERT, 2000). The latest site, Ghent (51,02°N; 03,44°E) shows this neglected species (when not studied by specialists) has went up north-westwards already before 1978 and indeed may be found or discovered more northwards in the near future. Other old collections from current *L. neglectus* localities should be studied in order to unmask the origin and expansion-history of the species in Europe. Perhaps Ghent is one of the oldest original European populations from where *L. neglectus* invaded other localities in Europe.

Further investigation and control of the pest-species?

The possibility to out-compete other ant-species in urban and other anthropogenic habitats as also observed in Ghent, should attract our special attention in view of bioconservation. The extermination of resident ants could be less dramatic from the viewpoint of species conservation as long as already disturbed urban areas are colonised. Nevertheless it could be disastrous if valuable natural habitats are affected as was already observed in Moravia (Czech Republic) where *L. neglectus* was found in a semi-natural, xerothermous grassland with *Calluna* on silicate rock which was isolated and not directly touched by human transport or traffic activities (SEIFERT, 2000). In Bishkek (Czech Republic) also alate queens and males were found in a spider net, confirming the possibility of the species to disperse also without passive human transport (SEIFERT, 2000). Also ESPADALER & COLLINGWOOD (2000) suggest a dedicated follow-up of the expansion of the species, as *L. neglectus* is assumed to be a potential threat for the native entomofauna.

So investigation of the neighbourhood of other Botanical Gardens and locations where flower exposition takes place, could be interesting to find out how quick this species expands further northwestwards in Europe. This can be expected as the species can establish permanent colonies in regions with mean January temperatures of -5°C (SEIFERT, 2000). Also the extent and influence of its expansion and the important variables governing this process should be investigated in Belgium.

Therefore, we suggest a dedicated follow-up of the expansion rate of the species in and near Ghent. A detailed distribution of *L. neglectus* in Ghent is therefore needed. Also other locations where the species could already have settled will be screened. If the species indeed continues its expansion and even out-competes other ant-species, care should be taken when anthropogenic passive transport might occur.

References

- BOOMSMA J.J., BROUWER A.H. & VAN LOON A.J., 1990. - A new polygynous *Lasius* species (Hymenoptera : Formicidae) from central Europe. II Allozymatic confirmation of species status and social structure. *Insectes Sociaux, Paris*, 37 : 363-375.
- DEKONINCK W. & VANKERKHOVEN F., 2001a. - Eight new species for the Belgian ant fauna and other remarkable recent records (Hymenoptera, Formicidae). *Bulletin et Annales de la Société royale belge d'Entomologie*, 137 : 36-43.
- DEKONINCK W. & VANKERKHOVEN F., 2001b. - Checklist of the Belgian ant-fauna (Formicidae, Hymenoptera). *Bulletin van het Koninklijk Belgisch Instituut voor Natuurwetenschappen, Entomologie*, 71 : 263-266.
- ESPADALER X. & COLLINGWOOD C.A., 2000. - Transferred ants in the Iberian Peninsula (Hymenoptera, Formicidae). *Nouvelle Revue d'Entomologie (N.S.)*, 17 : 257-263.
- ESPADALER X. & REY S., 2001. - Biological constraints and colony founding in the polygynous invasive ant *Lasius neglectus* (Hymenoptera, Formicidae). *Insectes Sociaux*, 48 : 159-164.
- SEIFERT B., 1996. - Ameisen, bestimmen beobachten. Augsburg : Naturbuch Verlag, 352 pp.
- SEIFERT B., 1997. *Formica lusatica* n. sp. - a sympatric sibling species of *Formica cunicularia* and *Formica rufibarbis* (Hymenoptera, Formicidae). *Abhandlungen und Berichte des Naturkundemuseums Görlitz*, 69 : 3-16.
- SEIFERT B., 2000. - Rapid range expansion in *Lasius neglectus* (Hymenoptera, Formicidae) - an Asian invader swamps Europe. *Mitteilungen Museum Naturkunde Berlin, Deutsche Entomologische Zeitschrift*, 47 : 173-179.
- VAN LOON A.J., BOOMSMA J.J. & ANDRASFALVY A., 1990. - A new polygynous *Lasius* species (Hymenoptera; Formicidae) from Central Europe. I Description and general biology. *Insectes Sociaux, Paris*, 37 : 348-362.

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Tachinus flavolimbatus PAND., 1869 (Coleoptera Staphylinidae) a new beetle species for Belgium

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In De Panne (the most westerly situated corner of Belgium) an individual of *Tachinus flavolimbatus* (PAND.) has been discovered in the nature reserve De Westhoek on 26/9/2001 in the lime rich, thermophilic moss dunes. The species was not yet known to occur in Belgium (BRUGE *et al.*, 2001). It is a West-European species, found until now as far northwest as Paris (LOHSE, 1964), but it has also been reported from the Elzas (LUCHT, 1988).

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References

- BRUGE H., DRUGMAND D. & HAGHEBAERT G., 2001. - Coleoptera Staphylinidae de Belgique et du Grand-Duché de Luxembourg. Catalogue commenté et éléments de biogéographie. *Bulletin S.R.B.E./K.B.V.E.*, 137 : 139-172
- LOHSE G.A., 1964. - Staphylinidae I (Micropeplinae bis Tachyporinae). *Die Käfer Mitteleuropas*, 4 : 264 pp.
- LUCHT W.H., 1988. - Katalog. *Die Käfer Mitteleuropas*, 342 pp.