

FRAGMENTA FAUNISTICA

Fragm. faun.	Warszawa, 30.12.2003	46	195–202
--------------	----------------------	----	---------

Wiesława CZECHOWSKA and Wojciech CZECHOWSKI

**Further record of *Lasius neglectus* VAN LOON, BOOMSMA *et* ANDRASFALVY
(Hymenoptera: Formicidae) for Warsaw, with a key to the Polish species
of the subgenus *Lasius s.str.***

Abstract: Three new sites of *Lasius neglectus*, an expansive invasive polygynous and polydomous ant species, are reported from Warsaw, its northernmost known locality. A key to the Polish representatives of the subgenus *Lasius s.str.* is given.

Key words: ants, *Lasius neglectus*, pest species, urban fauna, key, fauna of Poland

Authors' address: Laboratory of Social and Myrmecophilous Insects, Museum and Institute of Zoology PAS, Wilcza 64, 00-679 Warszawa, POLAND; e-mail: wczechowska@miiz.waw.pl; wcz@miiz.waw.pl;

INTRODUCTION

Lasius neglectus VAN LOON, BOOMSMA *et* ANDRASFALVY, a polygynous representative of the subgenus *Lasius s.str.*, is a very expansive invasive tramp ant species for which Asia Minor is the most probable centre of dispersion. It has spread to part of southern Asia and to the entire Mediterranean region, and even reached Central Europe (e.g. SEIFERT 2000). In Europe, *L. neglectus* has been first time reported – and described as a new species – from Budapest, where it was introduced at the beginning of the 1970s (BOOMSMA *et al.* 1990, VAN LOON *et al.* 1990). Then SEIFERT (1992) synonymized *L. neglectus* with *L. turcicus* SANTSCHEI, considering it to be a polygynous form of the latter. Later, however, he restored *L. neglectus* to species status, presuming – on the basis of morphological, genetic and zoogeographical data – that it had recently been separated from *L. turcicus*, its sister species (SEIFERT 2000).

At present, the species is in a phase of singularly effective expansion, although, in the absence of nuptial flights which have been substituted by intranidal mating, it mainly expands its range passively. The type of its supposed carrier (ornamental plants) is, at least for the time being, a restricting factor and therefore the species occurs mainly in urban greenery (mostly in and near botanical gardens) (SEIFERT 2000; see also SCHLICK-STEINER *et al.* 2003). In newly invaded areas, *L. neglectus* is highly competitive with the local ant species because it occupies all available nesting places and monopolizes trees with aphids. The species is also reported to infest houses in masses and to pose, by protecting homopterans, problems in greenhouses, parks and gardens (VAN LOON *et al.* 1990, ESPADALER & COLLINGWOOD 2000, SEIFERT 2000, TARTALLY 2000, ESPADALER & REY 2001).

According to the present data, the range of *L. neglectus* extends in Eurasia between 1°E and 75°E and from 36°N to 52°N and includes about 40 known localities. As many as 14 of them are situated in Turkey (SEIFERT 2000) (Fig. 1). The Czech population that so far had been referred to as the only known *L. neglectus* site in a natural habitat in Europe (SEIFERT 2000) has recently appeared to be a population of the new species, *L. austriacus* SCHLICK-STEINER, STEINER, SCHÖDL *et al.* SEIFERT (SCHLICK-STEINER *et al.* 2003). Warsaw (52°12'N, 21°02'E), where *L. neglectus* was reported four years ago (CZECHOWSKA & CZECHOWSKI 1999), is the northernmost known locality. Very recently, another northern site of *L. neglectus* was discovered: the city of Ghent in Belgium (51°N) (DEKONINCK *et al.* 2002).

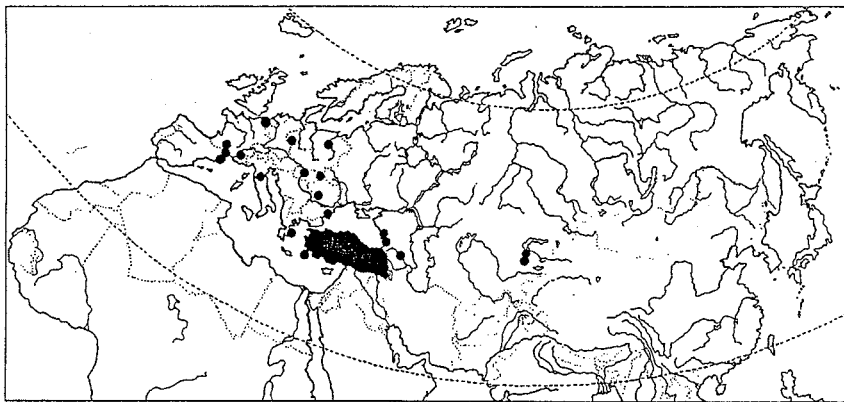


Fig. 1. Distribution of *L. neglectus* in Palaearctic (from CZECHOWSKI *et al.* 2002, updated).

LASIUS NEGLECTUS IN WARSAW

The first record of *L. neglectus* in Warsaw (CZECHOWSKA & CZECHOWSKI 1999) was of two 1.6-km-apart polydomous systems of the species in the centre of the city: (1) in Solec St (this site was at first imprecisely described as Tamka St) and (2) at the crossing of Furmańska St and Bednarska St (Fig. 2).

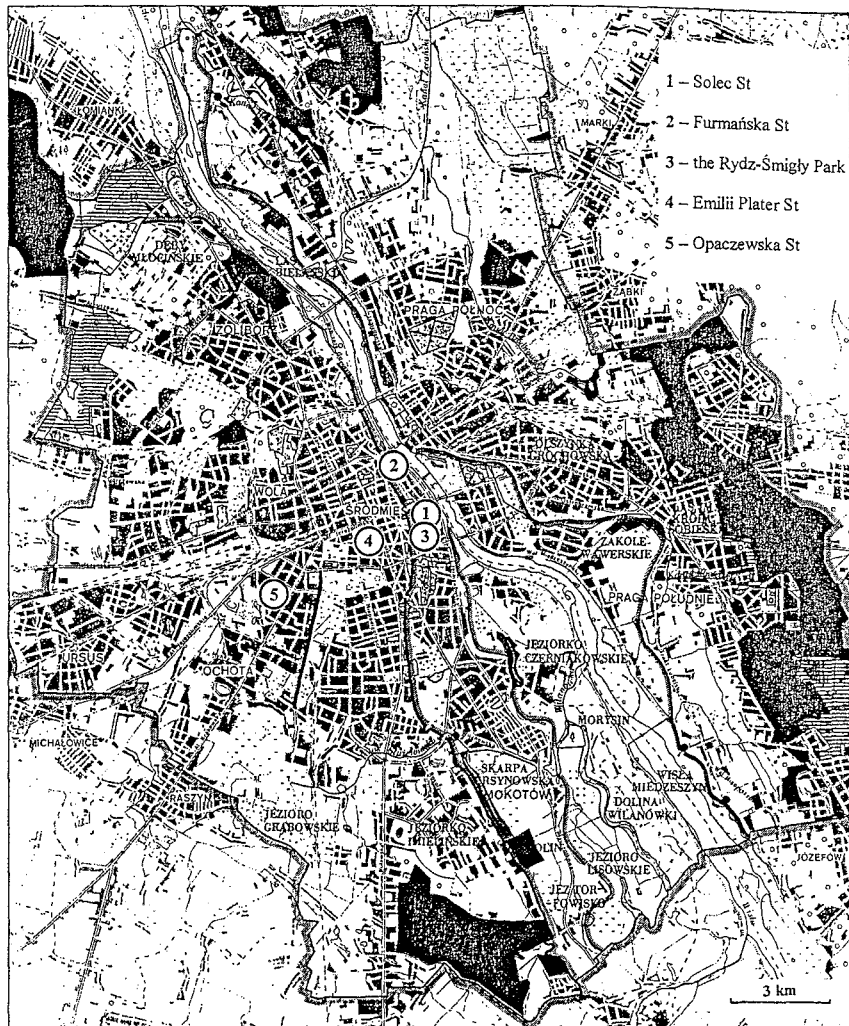


Fig. 2. Stands of *L. neglectus* in Warsaw.

The Solec St polydomous colony filled a courtyard (with tenement houses round it) and stretched for about 100 m along the pavement of a street lined mainly with poplars. It was discovered in 1999 because worried tenants had sent information about ants appearing in their flats during the dry spring. The tenants connected this phenomenon with the fact that the shrubs in the yard had recently been cut down, and an

inspection revealed that aphids on a (severely trimmed) bullace (*Prunus insititia*) were the main source of food for *L. neglectus*. The ants had never entered any flats before, although, judging by the size of the colony, they must have been living in the yard for some time. The drastic cutting down of the greenery probably limited the available honeydew resources and thus increased the water deficit. Inside the flats, the ants were not particularly interested in food, but mostly gathered near taps in the kitchens and bathrooms. Another of the already known polydomous colonies (i.e. that at Furmańska St), vaster and more abundant than the former, inhabited a square richly covered with greenery. All the trees (lindens and poplars) were invaded by *L. neglectus* in masses. On the basis of the late Prof. B. PISARSKI's personal communication it may be assumed that at least there *L. neglectus* appeared at the beginning of the 1990s at the latest.

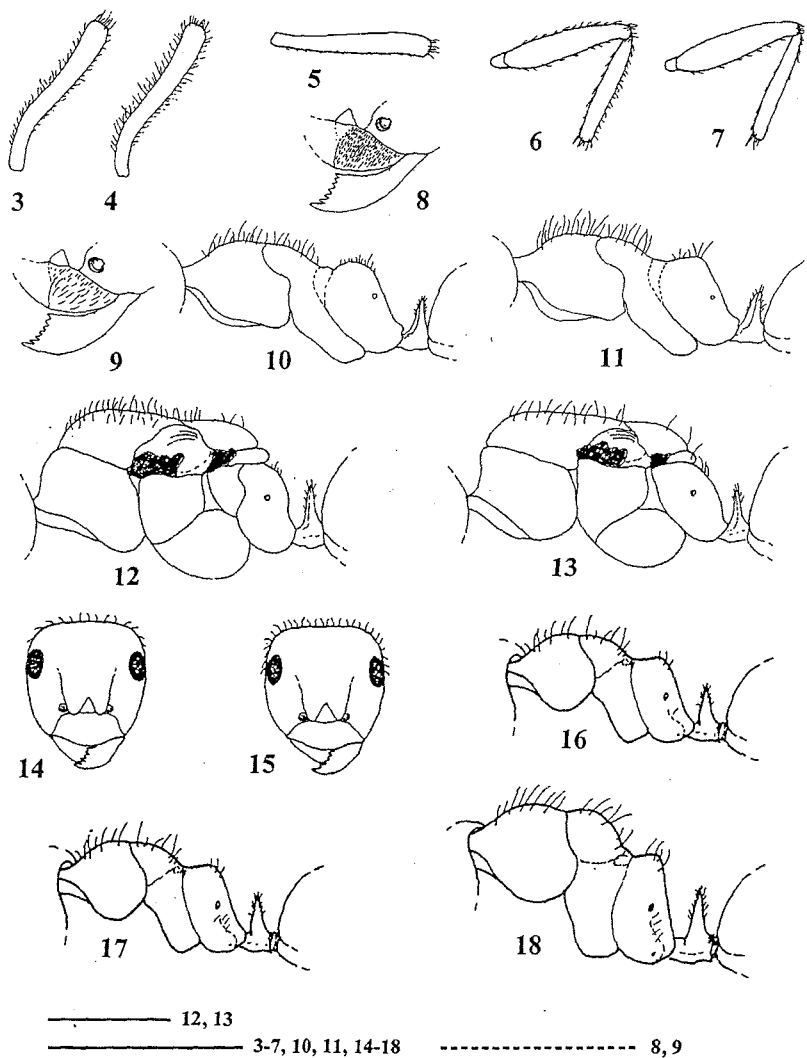
In the summer of 2002, three other polydomous systems of *L. neglectus* were found in Warsaw, all of them in the centre, too: (3) Marshal Edward Śmigły-Rydz Park (the former Centralny Park Kultury, (4) in Emilia Plater St and (5) in Opaczewska St (Fig. 2).

In 2002, in E. Śmigły-Rydz Park, an abundant presence of *L. neglectus* was recorded, but the extent of the species' nest system was not determined. This place was investigated more clear-sightedly in the next season, 2003. It appeared that the local polydomous colony system was spread over an area of at least 4 hectares and the ants monopolized all the trees there – lindens, oaks, maples, poplars, larches. The centre of the system seemed to be a square paved with granite cubes. There were a lot of nest entrances in crevices between cubes. In tree canopies, the ants as well as being aphid attendants, they were fairly effective predators. They carried down to their nests a lot of small soft-bodied insects, including aphids.

The E. Plater St colony stretched for about 300 m along the street where the ants visited canopies of several trees – lindens, ashes, horse-chestnuts, maples, and robinsias. The main colony there seemed to be that at the foot of the old maple. This tree, invaded by ants in masses, was situated at the crossing of E. Plater St and Nowogrodzka St at a very small patch of dense ornamental shrubby and herb vegetation, completely encircled by concrete or asphalt surface.

The discovery of the Opaczewska St colony was also followed to complaints about ants entering flats. The linear polydomous system of *L. neglectus* stretched for about 1 km in the green belt along the street. There swarms of ants were in all the trees: lindens, maples, poplars, oaks, willows, elders, and birches.

All the polydomous colonies of *L. neglectus* recorded so far from Warsaw are situated within a radius of 3 km. They have been found more by coincidence than by purposeful investigation, and therefore one may assume that this species, labelled as a pest, is very widespread in the city. How widespread and what its impact is on the native myrmecofauna of urban greenery of Warsaw will be shown by future studies the situation calls for. In view of the expansion rate of the species, reports of its presence in other cities in Poland and in Central Europe in general are a matter of (short) time. Since at first glance *L. neglectus* is very similar to other species of the subgenus *Lasius* s.str., a key to their identification is given below.



Figs 3-18. Morphology of *Lasius* s.str. species (3-11 and 14-18 – workers, 12 and 13 – gynes): 3, 6, 8, 10 and 12 – *L. niger* (L.); 4, 9, 11 and 13 – *L. platythorax* SEIFERT; 5, 7, 15 and 18 – *L. psammophilus* SEIFERT; 14 and 16 – *L. alienus* (FÖRST.); 17 – *L. neglectus*. 3-5 – antennal scape; 6 and 7 – hind femur and tibia; 8 and 9 – clypeus; 10-13 and 16-18 – alitrunk and petiole, lateral view; 14 and 15 – head, tal view. Scale: solid lines – 1 mm, broken line – 0.5 mm (from CZECHOWSKI *et al.* 2002).

In the key, the following measurements and indices are used:

HL – length of head in full-face view, measured in a straight line from anterior point of median clypeal margin to mid-point of occipital margin;

HW – maximum width of head in full-face view directly behind eyes;

AL – diagonal length of alitrunk in profile, measured from antero-dorsal point of alitrunk to posterior margin of propodeal lobes (in workers), or from antero-upper margin of pronotum to posterior margin of propodeal lobes (in gynes);

AH – height of alitrunk, measured from upper level of mesonotum perpendicularly to level of lower margin of mesopleurae;

SL – maximum straight-line length of antennal scape in profile;

AI (alitrunk index) = AL/AH ;

SI (scape index) = SL/HL .

For general ant morphology, as well as some details see Czechowski *et al.* (2002).

- 1 Dorsal surface of scape and external margin of hind tibiae with numerous standing hairs (Figs 3, 4 & 6) 2
 – Dorsal surface of scape and external margin of hind tibiae without or, at most, with a few standing hairs (Figs 5 & 7) 4
- 2 (1) Body of workers distinctly bicoloured, with head and especially alitrunk yellowish red to brownish red, contrasting with much darker gaster; clypeus with relatively sparse pubescence (similar to that in *L. platythorax*, see below). Body of gynes reddish brown, at least sides of alitrunk light reddish brown; alitrunk relatively long and low, $AI > 1$ *L. emarginatus* (OL.)
 – Body of workers yellowish brown to greyish black, never distinctly bicoloured. Body of gynes brown to brownish black; alitrunk relatively shorter and higher, $AI < 1.70$ (with exception of *L. platythorax*, see below) 3
- 3 (2) Clypeus with very dense pubescence (Fig. 8); standing hairs on antennal scape relatively sparse and short, longest hairs not longer (usually shorter) than half of maximum width of scape at apex (Fig. 3); metanotal groove usually relatively deep and abrupt, propodeal dorsum usually convex and rounded; standing hairs on body relatively short (Fig. 10). Gynes: alitrunk convex, relatively high and short, $AI < 1.70$ (Fig. 12) *L. niger* (L.)
 – Clypeus with relatively sparse pubescence (Fig. 9); standing hairs on antennal scape relatively abundant and long, longest hairs longer than half of maximum width of scape at apex (Fig. 4); metanotal groove usually shallow, propodeal dorsum somewhat flattened, more conical than rounded; standing hairs on body relatively long (Fig. 11). Gynes: alitrunk weakly convex or somewhat flattened, relatively low and long, $AI > 1.75$ (Fig. 13) *L. platythorax* SEIFERT
- 4 (1) Body with very fine, strictly appressed pubescence, so the surface appears perfectly smooth; body of workers distinctly bicoloured, with alitrunk yellowish red,

- contrasting with darker gaster; head bronze, relatively wide. Antennal scape short, *SI* of gynes <0.80 *L. brunneus* (LATR.)
- Body with coarser pubescence, hairs slightly projecting from cuticle, so the surface does not appear perfectly smooth; body usually almost unicolour, occasionally alitrunk slightly lighter than gaster. Antennal scape longer, *SI* of gynes >0.80 5
- 5 (4) Head margin behind eyes with less than 15 (usually with 10–12) standing hairs (Fig. 14); area between propodeal spiracles and metapleural glands without or, at most, with 1, very rarely with 2 (in workers) or 5–6 (in gynes) standing hairs (Fig. 16); clypeus with relatively sparse pubescence (similar to that in *L. platythorax*) *L. alienus* (FÖRST.)
- Head margin behind eyes with more than 15 (usually with 17–20) standing hairs (Fig. 15); area between propodeal spiracles and metapleural glands with 2–5 (in workers) or 6–20 (in gynes) standing hairs (Figs 17, 18) 6
- 6 (5) Clypeus with denser pubescence (similar to that in *L. niger*); whole body brownish black *L. paralienus* SEIFERT
- Clypeus with relatively sparser pubescence (more sparse than in *L. alienus*); head, and especially alitrunk of workers from brown to reddish brown, lighter than brownish black gaster 7
- 7 (6) Workers: standing hairs on alitrunk dorsum longer; metanotal groove deeper and more abrupt (Fig. 18); legs frequently lighter than body, often yellowish brown; mandibles with 8, more rarely with 9 teeth. Gynes: larger, *HW*>1.44 mm. Monogynous species, inhabits predominately xerothermally sandy areas *L. psammophilus* SEIFERT
- Workers: standing hairs on alitrunk dorsum shorter; metanotal groove shallow, propodeal dorsum more flattened (Fig. 17); mandibles most often with 7 teeth. Gynes: smaller, *HW*<1.40 mm. Polygynous and polydomous species, dwelling in anthropogenic habitats, especially in urban greenery *L. neglectus* VAN LOON, BOOMSMA et ANDRASFALVY

ACKNOWLEDGEMENTS

We thank Birgit Schlick-Steiner, Florian Steiner and Michał Woyciechowski for reviewing the ms, as well as their corrections suggestions and right comments that enabled us to improve the paper.

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 soc.*, 37: 363–375.
- CZECHOWSKA W. & CZECHOWSKI W. 1999. *Lasius neglectus* VAN LOON, BOOMSMA et ANDRASFALVY, 1990 (Hymenoptera, Formicidae), nowy dla Polski gatunek mrówki, w Warszawie. *Przeł. zool.*, 43: 189–191.
- CZECHOWSKI W., RADCHENKO A. & CZECHOWSKA W. 2002. The ants (Hymenoptera, Formicidae) of Poland. MIZ PAN, Warszawa, 200 + 1 pp.

- DEKONINCK W., DE BAERE C., MERTENS J. & MAELFAIT J.-P. 2002. On the arrival of the Asian invader ant *Lasius neglectus* in Belgium (*Hymenoptera Formicidae*). Bull. S.R.B.E./K.B.V.E., 138: 45–48.
- ESPADALER X. & COLLINGWOOD C. A. 2000. Transferred ants in the Iberian Peninsula (*Hymenoptera, Formicidae*). Nouv. Rev. Entomol. (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 Soc., 48: 159–164.
- SCHLICK-STEINER B. C., STEINER F. M., SCHÖDL S. & SEIFERT B. 2003. *Lasius austriacus* sp.n., a Central European ant related to the invasive species *Lasius neglectus*. Sociobiology, 41: 725–736.
- SEIFERT B. 1992. A taxonomic revision of the Palaearctic members of the ant subgenus *Lasius* s.str. (*Hymenoptera: Formicidae*). Abh. Ber. Naturkundemus. Görlitz, 66: 1–67.
- SEIFERT B. 2000. Rapid range expansion in *Lasius neglectus* (*Hymenoptera, Formicidae*) – an Asian invader swamps Europe. Mitt. Mus. Nat.kd. Berl., Dtschl. entomol. Z., 47: 173–179.
- TARTALLY A. 2000. Notes on the coexistence of the supercolonial *Lasius neglectus* VAN LOON, BOOMSMA et ANDRÁSFALVY 1990 (*Hymenoptera: Formicidae*) with other ant species. Tiscia, 32: 43–46.
- VAN LOON A. J., BOOMSMA J. J. & ANDRÁSFALVY A. 1990. A new polygynous *Lasius* species (*Hymenoptera: Formicidae*) from Central Europe. I. Description and general biology. Insectes soc., 37: 348–362.

STRESZCZENIE

[Tytuł: Kolejne doniesienie o występowaniu *Lasius neglectus* VAN LOON, BOOMSMA et ANDRÁSFALVY (*Hymenoptera: Formicidae*) w Warszawie z kluczem do oznaczania polskich gatunków z podrodzaju *Lasius* s.str.]

Praca zawiera informację o znalezieniu w Warszawie trzech kolejnych stanowisk *Lasius neglectus* – wywodzącego się z Azji Mniejszej, niezwykle ekspansywnego poliginicznego i polikalicznego gatunku mrówek, dla którego Warszawa jest obecnie najdalej na północ wysuniętym znanym stanowiskiem. Podane są okoliczności występowania tych i uprzednio (CZECHOWSKA & CZECHOWSKI 1999) wykazanych z Warszawy kolonii oraz klucz do oznaczania krajowych gatunków z podrodzaju *Lasius* s. str.