Fast spread of a fungal parasite in an invasive supercolony

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Invasive ants often form dense networks of connected nests (Fig. 1) in contrast to the smaller and spatially dispersed colonies of most social insects. It was recently proposed that such supercolonies are more vulnerable to infection as they would serve as large targets with high rates of transmission from nest to nest (Ugelvig & Cremer, 2012, Funct. Ecol. 26: 1300-1312).

Here we studied the invasive garden ant *Lasius neglectus*, a pest species where several European populations are infected with the ectoparasitic fungus *Laboulbenia formicarum*. In one population (supercolony) in Gif-sur-Yvette, France, we followed the prevalence and intensity of infection over 10 years.

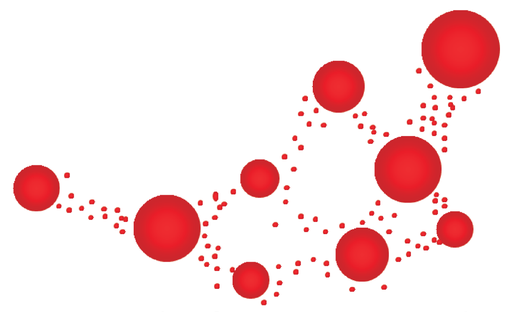
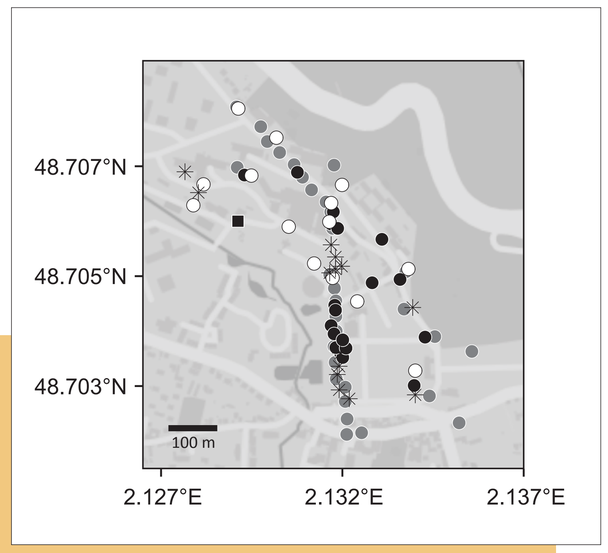
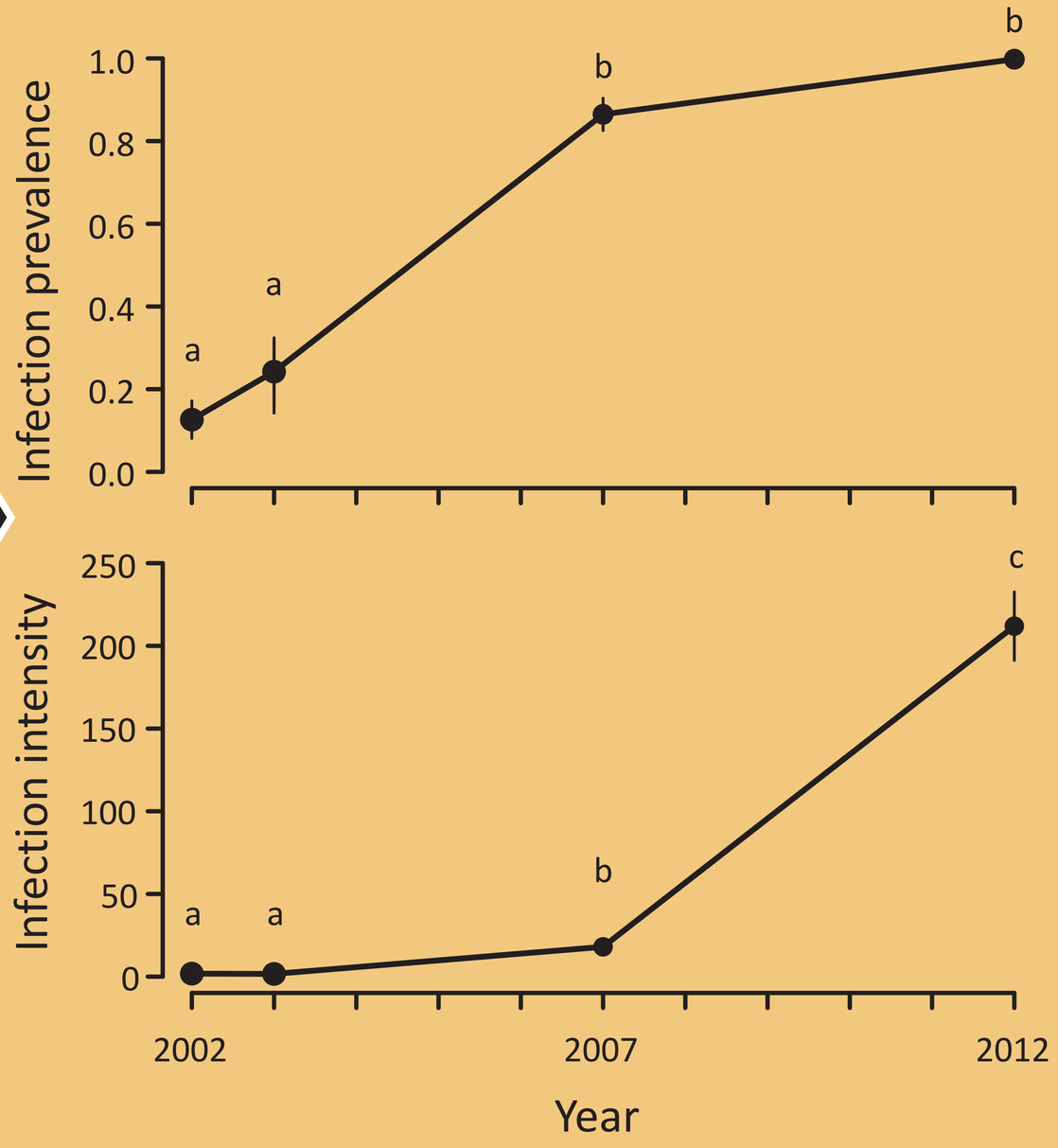


Fig. 1: Network of interconnected nests (supercolony) typical for invasive ants



Healthy *L. neglectus* worker ant



Infected *L. neglectus* worker ant

Fig. 2: The development of mean ± s.e.m infection prevalence (top) and infection intensity (bottom) (lower case letters indicate statistical significant differences) of the ectoparasitic fungus *L. formicarum* (infected ant, right) in a supercolony of the invasive garden ant *L. neglectus* (healthy ant, left). Insert (white box, top right) showes the supercolony area of approximately 0.2 km^2 and samples taken in the years 2002 (white circles, *N* = 14), 2003 (black squares, *N* = 3, GPS-data available only for one site), 2007 (grey circles, *N* = 31) and 2012 (black circles, *N* = 19). In 2012 four other *Lasius* species were sampled in the same area (asterisks, *N* = 14).

By April 2012 basically all (278/279) of the examined ants showed signs of infection (Fig. 2, top) and infection levels exceeded 800 thalli on individual ants (Fig. 2, bottom). In contrast, no other *Lasius* species in the area (Fig. 1, insert top right) was found to be infected.

To our knowledge this is the first direct support to the hypothesis that organisation in supercolonies makes ants more vulnerable to parasites and pathogens.

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