

# Key to the success of invasive ants discovered

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An international team of researchers, with the participation of Universitat Autònoma de Barcelona and CREAM, has achieved to resolve fundamental questions related to the behaviour of ants. Researchers discovered how some species that successfully invade large extensions of land have an unusual way of doing so: they cooperate with other colonies to form a supercolony. Researchers alert that a plague of this type of ant could turn into a global problem. The research, the first of its kind, has been published in the journal *PLoS ONE*.

Ants are excellent invaders: five of the one hundred most invasive species in the world are ants. While common ant colonies compete with neighbouring colonies for resources and territory, invasive ants abandon all aggressiveness between colonies and work together to form enormous supercolonies consisting in thousands of interconnected nests.

However, the origin of these species' characteristic traits which provide them with their extraordinary invasiveness is still a mystery for scientists, given that they only reveal their destructive potential following a long, inconspicuous lag phase. As a result, many fundamental questions about the origin of their invasive behavioural patterns are still unanswered: Are they originally present in the colonies, before they begin an invasion? When does this behaviour manifest itself? Are these traits the result of mutations in a small sector of the original population? Or do they develop when populations grow and adapt to a new habitat?

Researchers at la UAB and CREAM participated in the first large-scale interdisciplinary study on the behaviour, morphology, population

genetics, chemical recognition and parasite load of the invasive ant species *Lasius neglectus* and its non-invasive sister species *Lasius turcicus*. Both species, in all probability, originated in Asia Minor and their common genetic origin was confirmed in 2004.

*Lasius neglectus*, identified for the first time in 1990, is currently expanding throughout Europe - it can now be found in more than 100 locations - and occupies large extensions of parks and gardens. These invasive ants eradicate most native ants and other insect populations, damage trees, and in many cases cause economic and social problems by invading people's homes. They are similar in appearance to the common black garden ant, but are smaller and lighter in colour and can work up to nine times faster than their common garden counterparts. The species proliferates in mild climates of Europe and Asia, but it is also the first type of ant that can invade colder areas which until had not been affected by more exotic plagues. The northern areas affected until now are Jena in Germany, Ghent in Belgium and Warsaw in Poland.

This study has been able to answer some of the questions on the biology of this invasive behaviour. One of the key behavioural elements of these ants consists in forming interconnected nests, with many queens mating within existing colonies instead of starting a new one. Scientists have been able to demonstrate that the conditions needed to develop this invasiveness are already found in original populations. The study also reveals that the invasiveness is only fully expressed once the ants have escaped their natural enemies, such as parasites and pathogens. This happens when they travel to remote areas where local enemies have not had time to adapt and respond to these newcomers. In addition, researchers detected the same biological traits of invasiveness in the sister species *Lasius turcicus*, but which until now have not manifested themselves.

This data implies that many of the more than 12,500 ant species known

to man can become a serious problem if adequate measures are not taken. The study warns that invasive ant populations such as the *Lasius neglectus* can become a problem of global dimensions.

Source: Universitat Autònoma de Barcelona

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