

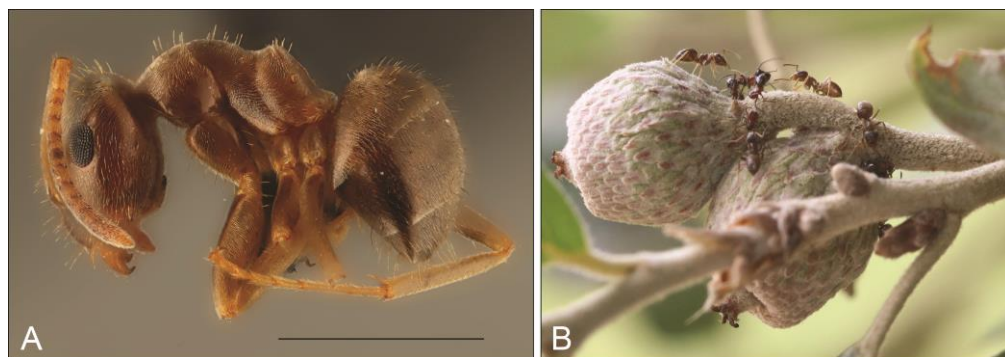
## Two invasive ant species, *Lasius neglectus* Van Loon et al., 1990 and *Tapinoma magnum* Mayr, 1861 (Hymenoptera: Formicidae), living in close proximity in coastal Slovenia

Dve invazivni vrsti mravelj, *Lasius  
neglectus* Van Loon et al., 1990 in  
*Tapinoma magnum* Mayr, 1861  
(Hymenoptera: Formicidae), živeči v  
neposredni bližini v obalni Sloveniji

Gregor BRAČKO,  
University of Ljubljana, Biotechnical Faculty,  
Department of Biology, Jamnikarjeva 101,  
SI-1000 Ljubljana, Slovenia;  
E-mail: gregor.bracko@bf.uni-lj.si

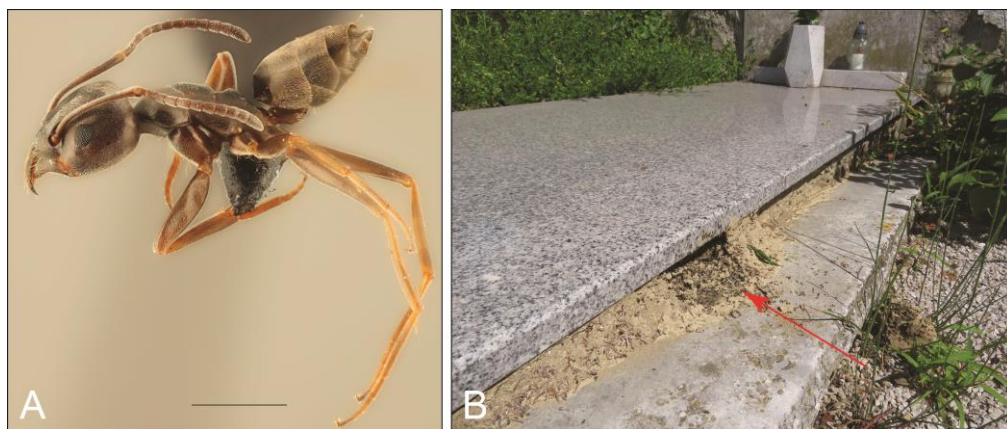
Invasive species have been given much attention in the last decades and ants are no exception (e.g., McGlynn 1999, Holway et al. 2002, Lach & Hooper-Bui 2009, Rabitsch 2011, Wittman 2014, Hoffmann et al. 2016). One of the most notorious

ant species invading the European territory is *Lasius neglectus* Van Loon et al., 1990 (Fig. 1A). This species, probably originating from Asia Minor (Seifert 2000), was described from Budapest, Hungary (Van Loon et al. 1990), and is now reported from 16 European countries (Espadaler & Bernal 2018). Here it is mostly found in human-modified habitats, ranging from purely urban habitats (e.g. in streets with heavy traffic) to city gardens, urban woods and semi-urban areas (Espadaler & Bernal 2018). It is reported on its negative effects on native arthropod fauna (Nagy et al. 2009). Less is known about *Tapinoma magnum* Mayr, 1861 (Fig. 2A). This species, previously also known under the name *T. nigerrimum*, is distributed in the Mediterranean area from NW Africa to Italy and is particularly abundant in open unstable or degraded areas with anthropogenic influence and a weakly developed tree layer (Seifert et al. 2017). Recently, it was reported to be artificially introduced to several cities in Germany, Belgium and the Netherlands, where it established permanent supercolonies and acts as a pest species with strong local impacts (Dekoninck et al. 2015, Noordijk 2016, Seifert et al. 2017). It shows the strongest invasive potential of all species of *T. nigerrimum* complex (Seifert et al. 2017).



**Figure 1.** *Lasius neglectus* from Izola, Slovenia. A – Worker, lateral view (scale bar = 1 mm), B – *L. neglectus* workers tending aphids on *Quercus ilex* in Izola park (photo: T. Delić – A, G. Bračko – B).

**Slika 1.** *Lasius neglectus* iz Isole, Slovenija. A – Delavka, stranski pogled (merilce = 1 mm), B – Delavke *L. neglectus* negujejo listne uši na *Quercus ilex* v parku v Izoli (foto: T. Delić – A, G. Bračko – B).



**Figure 2.** *Tapinoma magnum* from Izola, Slovenia. A – Worker, lateral view (scale bar = 1 mm), B – One of the many nests of *T. magnum* at Izola cemetery (with the open part of the nest pointed by the arrow) (photo: T. Delić – A, G. Bračko – B).

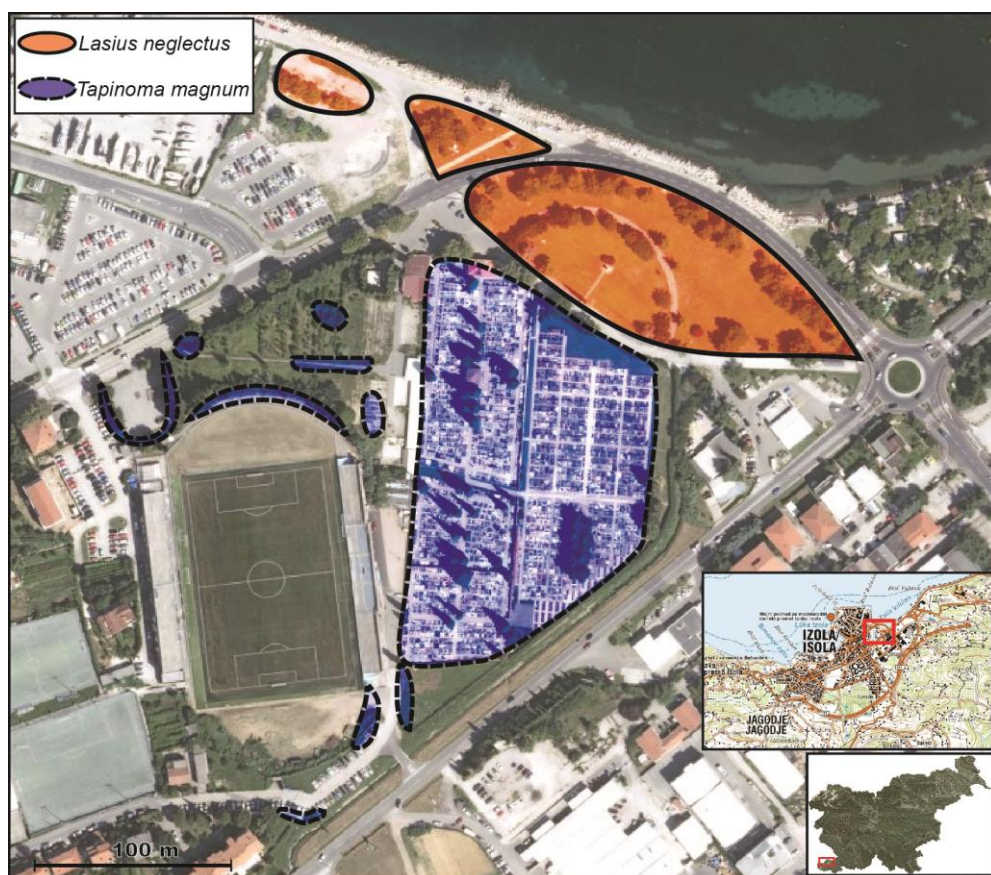
**Slika 2.** *Tapinoma magnum* iz Isole, Slovenija. A – Delavka, stranski pogled (merilce = 1 mm), B – Eno izmed številnih mravljišč *T. magnum* na izolskem pokopališču (odprti del mravljišča je označen s puščico) (foto: T. Delić – A, G. Bračko – B).

In 2008 and 2011, we found a colony of *Tapinoma* cf. *nigerrimum* next to the cemetery in the coastal town of Izola (SW Slovenia) (Bračko & Česnik 2016). Applying the latest taxonomic revision of *T. nigerrimum* complex (Seifert et al. 2017), the colony was subsequently identified as *T. magnum*. The more detailed inspection of this part of the town in spring 2018 and 2019 revealed that *T. magnum* was spread over a much larger area. A big supercolony of this species was discovered, occupying the entire Izola cemetery (ca. two hectares) in NE part of the town (45°32.3'N, 13°40.0'E, 3 m a.s.l.) and some smaller patches in its close vicinity (Fig. 3). During the inspection of the site, we discovered another invasive species, *Lasius neglectus*, which was spread over the urban park (ca. 1.5 hectare), situated just north of the cemetery (Fig. 3). The records of the two species from Izola are the only known for Slovenia.

It looks that *Tapinoma magnum* found favourable habitat at Izola cemetery (Fig. 2B). The combination of stony ground and graveyard stones, some vegetation (grass, plants on graves, individual trees), and frequent watering of the plants could represent optimal conditions for this species. *Tapinoma magnum* acts very aggressively when its nests are disturbed. The visitors of the cemetery report on nuisances when in contact with these ants. In the vicinity of the cemetery,

*T. magnum* nests can be found on lawns, along the paths and walls, but also on less disturbed sites, e.g. in the park west of the cemetery covered with some trees and shrubs. We assume that the species probably arrived to the cemetery area with the transport of plant and soil material for the needs of the cemetery. This way of transport is also responsible for the occurrence of *T. magnum* in the cities north of the Mediterranean area (Seifert et al. 2017).

The urban park in Izola, colonised by *L. neglectus*, is covered with regularly cut lawn and individual pine and oak trees. The nest openings are concentrated mostly around trees and on the edges of lawn along the paths. The species is known for extensively tending honeydew producing aphids on trees and below ground (Paris & Espadaler 2009, Espadaler & Bernal 2018). In Izola, large columns of *L. neglectus* foraging workers, leading to/from their aphid colonies (Fig. 1B), can be spotted on every tree in the park. The human-mediated transport is the main way of spreading this species between sites (Espadaler et al. 2007). As in the case of *T. magnum*, *L. neglectus* probably established itself in Izola after being brought here with various plant and soil material.



**Figure 3.** Izola map showing sites inhabited by the invasive ant species *Lasius neglectus* and *Tapinoma magnum* (base maps taken from [www.geopedia.si](http://www.geopedia.si) and Atlas okolja, <http://gis.arso.gov.si/atlasokolja>).

**Slika 3.** Karta Izole s prikazanimi mesti, poseljenimi z invazivnimi vrstama mravelj *Lasius neglectus* in *Tapinoma magnum* (osnovne karte vzete iz [www.geopedia.si](http://www.geopedia.si) in Atlasa okolja, <http://gis.arso.gov.si/atlasokolja>).

In Izola, we can observe two supercolonies of two invasive ant species living in close proximity to each other, which is something relatively rare in the field (see Fig. 3). So far, *L. neglectus* and *T. magnum* have never been reported to come into close contact. There are some cases of encountering *T. magnum* and the notorious Argentine ant *Linepithema humile* (Mayr, 1868), where *T. magnum* was reported to limit the spread of *L. humile* (Seifert et al. 2017). In general, invasive ants are often highly aggressive, dominant competitors, trying to exclude other dominant colonies from their territory (Cerdá et al. 2013, Bertelsmeier et al. 2015). Currently, both species from Izola seem to occupy their optimal habitat

(*T. magnum* the cemetery and *L. neglectus* the park) and prevent the other invasive species to spread into their territory. Along the path between the park and the cemetery, workers of both supercolonies can be observed, running away from each other when coming into contact.

It would be interesting to monitor the situation in the area of the two invasive species in Izola in the next years, especially if their territories expand, and what the situation is to be like in the contact zone of both supercolonies.

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## References

- Bertelsmeier C., Avril A., Blight O., Confais A., Diez L., Jourdan H., Orivel J., Saint Germès N., Courchamp F. (2015): Different behavioural strategies among seven highly invasive ant species. *Biol. Invasions* 17: 2491-2503.
- Braĉko G., Ćesnik L. (2016): First records of six ant species (Hymenoptera: Formicidae) for Slovenia. *Nat. Slov.* 18(2): 39-46.
- Cerdá X., Arnan X., Retana J. (2013): Is competition a significant hallmark of ant (Hymenoptera: Formicidae) ecology? *Myrmecol. News* 18: 131-147.
- Dekoninck W., Parmentier T., Seifert B. (2015): First records of a supercolonial species of the *Tapinoma nigerrimum* complex in Belgium. *Bull. Soc. R. Belg. Entomol.* 151: 206-209.
- Espadaler X., Bernal V. (2018): *Lasius neglectus*: a polygynous, sometimes invasive, ant. <http://www.creaf.uab.es/xeg/Lasius/index.htm> [accessed on August 2019].
- Espadaler X., Tartally A., Schultz R., Seifert B., Nagy C. 2007: Regional trends and preliminary results on the local expansion rate in the invasive garden ant, *Lasius neglectus* (Hymenoptera, Formicidae). *Insect. Soc.* 54: 293-301.
- Hoffmann B.D., Luque G.M., Bellard C., Holmes N.D., Donlan C.J. (2016): Improving invasive ant eradication as a conservation tool: A review. *Biol. Conservation* 198: 37-49.
- Holway D.A., Lach L., Suarez A.V., Tsutsui N.D., Case T.J. (2002): The causes and consequences of ant invasions. *Annu. Rev. Ecol. Syst.* 33: 181-233.
- Lach L., Hooper-Bùi L.M. (2009): Consequences of ant invasions. In: Lach L., Parr C.L., Abbott K.L. (Eds.), *Ant ecology*, Oxford University Press, New York, pp. 261-286.
- McGlynn T.P. (1999): The worldwide transfer of ants: geographical distribution and ecological invasions. *J. Biogeogr.* 26: 535-548.
- Nagy C., Tartally A., Vilisics F., Merkl O., Szita E., Szél G., Podlussány A., Rédei D., Csősz S., Pozsgai G., Orosz A., Szövényi G., Markó V. (2009): Effects of the invasive garden ant, *Lasius neglectus* Van Loon, Boomsma & Andrásfalvy, 1990 (Hymenoptera: Formicidae), on arthropod assemblages: pattern analyses in the type supercolony. *Myrmecol. News* 12: 171-181.
- Noordijk J. (2016): Leefwijze van *Tapinoma nigerrimum* (Hymenoptera: Formicidae), een nieuwe exotische mier in Nederland. *Entomol. Ber.* 76(3): 86-93.
- Paris C.I., Espadaler X. (2009): Honeydew collection by the invasive garden ant *Lasius neglectus* versus the native ant *L. grandis*. *Arthropod-Plant Inte.* 3: 75-85.
- Rabitsch W. (2011): The hitchhiker's guide to alien ant invasions. *BioControl* 56: 551-572.
- Seifert B. (2000): Rapid range expansion in *Lasius neglectus* (Hymenoptera, Formicidae) – an Asian invader swamps Europe. *Mitt. Zool. Mus. Berl.* 47(2): 173-179.
- Seifert B., D'Eustacchio D., Kaufmann B., Centorame M., Lorite P., Modica M.V. (2017): Four species within the supercolonial ants of the *Tapinoma nigerrimum* complex revealed by integrative taxonomy (Hymenoptera: Formicidae). *Myrmecol. News* 24: 123-144.
- Van Loon A.J., Boomsma J.J., Andrásfalvy A. (1990): A new polygynous *Lasius* species (Hymenoptera; Formicidae) from Central Europe. *Insect. Soc.* 37: 348-362.
- Wittman S.E. (2014): Impacts of invasive ants on native ant communities (Hymenoptera: Formicidae). *Myrmecol. News* 19: 111-123.