

Asian Needle Ant | AN INVASIVE STINGING ANT

Ants are among the most successful and widespread invasive species worldwide. One stinging invasive ant, the Asian needle ant (*Brachyponera chinensis*; fig. 1), is beginning to cause problems in North America after being relatively unnoticed for many years.

The Asian needle ant's native range includes China, Japan, and the Koreas. By the time it was first discovered in the U.S. in 1932, it was already present in at least three Southeastern States (Smith 1934). Over the past few decades, it has been documented in several U.S. States and in the Mediterranean region (fig. 2) (Guénard and others 2017, Janicki and others 2016), and it is capable of invading much of North America's temperate forests (Bertelsmeier and others 2013). Unlike many invasive species that tend to colonize areas in the wake of natural or human disturbance, Asian needle ants are capable of invading undisturbed forest areas where they nest under and within logs and other debris, under stones, and in leaf litter (fig. 3). They can also occur near homes and businesses under mulch, pavers, landscape timbers, and other objects.



Figure 1—Asian needle ant (*Brachyponera chinensis*) worker. (Photo by Chris Hartley, Missouri Botanical Garden; inset courtesy of Joe MacGown, Mississippi Entomological museum; bar is 1 mm for scale)

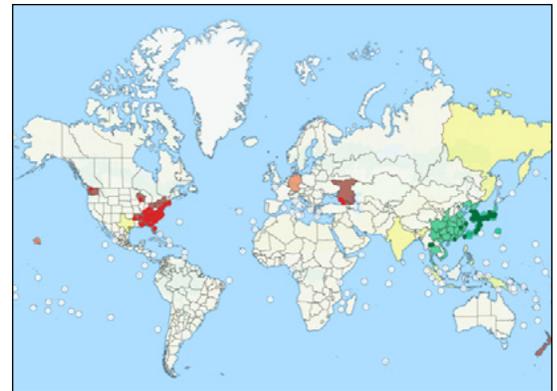


Figure 2—Current distribution of Asian needle ant (*Brachyponera chinensis*). Red indicates nonnative populations, green indicates native populations, pink indicates indoor introductions. Sources: Guenard and others (2017) and Janicki and others (2016); mapping application available at <https://antmaps.org/>.



Figure 3—Asian needle ant workers and brood (immature stages) under a rotting log. (Photo by J.T. Vogt, USDA Forest Service)

The Federal Register defines **invasive species** as those that are nonnative (or alien) to the ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health (EO 1999).

Identification

Asian needle ant workers are small, shiny, dark brown to black, with the end of the antennae and the legs being a lighter orange-brown. Workers are about 0.2 inches in length. There are other ant species in the Eastern United States that superficially resemble Asian needle ants, so it takes an experienced eye to positively identify them.

Environmental Impacts

Only within the last 20 years have researchers begun to understand the potential long-term impacts of Asian needle ant invasion. Native ant abundance and diversity are reduced in areas where Asian needle ant is established (Guénard and Dunn 2010; Suehiro and others 2017; Vogt, unpublished data). Of great concern is the apparent ability of Asian needle ants to displace ant species that are critical seed dispersers. Many herbaceous plants' seeds have a nutritious structure attached called an eliasome, which attracts certain ants (fig. 4). These ant species, many in the genus *Aphaenogaster* in the U.S. East, carry the seeds away from the mother plant, ensuring proper dispersal of the plant species. Researchers have demonstrated substantial decreases in seed dispersal where Asian needle ants have invaded forest areas (Rodriguez-Cabal and others 2012, Warren and others 2015). Thus, this invasive species could have dramatic, long-term negative effects on forest understory.

FAST FACTS

1

Asian needle ants are native to Asia but widely established in the Eastern United States

2

These ants decrease populations of native ants that are important for seed dispersal

3

Their stings may result in a life-threatening allergic reaction called anaphylaxis



Lateral view of an alate queen (Photo by Joe A. MacGown)

of anaphylaxis

- Skin reactions, including hives, itching, and flushed or pale skin
- Low blood pressure (hypotension)
- Constriction of the airway, wheezing, difficulty breathing
- Swollen tongue or throat
- Weak and rapid pulse
- Nausea, vomiting, or diarrhea
- Dizziness or fainting
- Psychological symptoms, such as a feeling of impending doom

If you suspect you are having a systemic allergic reaction (anaphylaxis) from an Asian needle ant sting, seek immediate medical attention as it could be life-threatening.

Human Impacts

Perhaps the most troubling characteristic of Asian needle ants is their sting. While they are not terribly aggressive, like the more familiar red imported fire ants, their stings are painful, often affecting different people in different ways. In fact, the sting can result in life-threatening anaphylaxis, an acute allergic response (**see list of symptoms above**) (Cho and others 2002, Fukuzawa and others 2002, Leath and others 2006, Nelder and others 2006). Stings are often reported to result in intense pain at the site of the sting that comes and goes over the course of several hours. Some people experience pain away from the sting site. Redness of the skin and mild to severe urticaria (hives) are reported as symptoms. In a study in the native range of the Asian needle ant, 2.1 percent of people stung exhibited anaphylaxis (Cho and others 2002). While anaphylaxis has been reported in the United States (Nelder and others 2006), the percentage of people who have developed hypersensitivity (increased allergic response that can lead to anaphylaxis) to Asian needle ant stings is unknown. People who are hypersensitive to other stinging insects may be at increased risk of anaphylaxis from Asian needle ant stings (Cho and others 2002, Kim and others 2001).



Figure 4—*Aphaenogaster* worker ants (shown here) are important seed dispersers. Asian needle ants decrease populations of *Aphaenogaster*, thus interfering in this natural and essential seed dispersal process. (Photo used with permission under commercial license ©Alexander Wild, all rights reserved)

Implications

While some control measures have shown to be effective against Asian needle ants, treating remote or forested areas seems unlikely due to the costs involved and the chance of negatively affecting other, desirable species. Individuals should be aware of this emerging pest and try to avoid it. Everyone should be familiar with anaphylaxis and seek help immediately if they or someone close by experiences the commonly reported symptoms (**see list above**). Some people, especially those who are aware of hypersensitivity to stings or other allergens, choose to carry an epinephrine auto-injection device. Take special care in areas with debris on the ground (e.g., logs, rotting wood, leaf litter) or rocks under which ants can nest. Researchers are continuing to assess the impacts of this invasive ant on people and the environment, as well as effective means of controlling it where there is a high likelihood of human encounters. Unfortunately, as with many invasive species, it appears Asian needle ants are here to stay.

USDA is an equal opportunity provider, employer, and lender.

Literature Cited

- Bertelsmeier, C.; Guénard, B.; Courchamp, F. 2013. Climate change may boost the invasion of the Asian needle ant. *PLoS ONE*. 8: e75438. <https://doi.org/10.1371/journal.pone.0075438>.
- Cho, Y.S.; Lee, Y.M.; Lee, C.K. [and others]. 2002. Prevalence of *Pachycondyla chinensis* venom allergy in an ant-infested area in Korea. *Journal of Allergy and Clinical Immunology*. 110: 54-57. <https://doi.org/10.1067/mai.2002.124890>.
- Executive Office of the President (EO). 1999. E.O. 13112 of Feb 3, 1999. Federal Register. 64 FR 6183: 6183-6186. <https://www.federalregister.gov/d/99-3184>.
- Fukuzawa, M.; Arakura, F.; Yamazaki, Y. [and others]. 2002. Urticaria and anaphylaxis due to sting by an ant (*Brachyponera chinensis*). *Acta Dermatovenereologica*. 82: 59. <https://doi.org/10.1080/000155502753600939>.
- Guénard, B.; Dunn, R.R. 2010. A new (old), invasive ant in the hardwood forests of eastern North America and its potentially widespread impacts. *PLoS ONE*. 5: e11614. <https://doi.org/10.1371/journal.pone.0011614>.
- Guénard, B.; Weiser, M.; Gomez, K. [and others]. 2017. The Global Ant Biodiversity Informatics (GABI) database: a synthesis of ant species geographic distributions. *Myrmecological News*. 24: 83-89.
- Janicki, J.; Narula, N.; Ziegler, M. [and others]. 2016. Visualizing and interacting with large-volume biodiversity data using client-server web-mapping applications: The design and implementation of antmaps.org. *Ecological Informatics*. 32: 185-193. <https://doi.org/10.1016/j.ecoinf.2016.02.006>.
- Kim, S.S.; Park, H.S.; Kim, H.Y. [and others]. 2001. Anaphylaxis caused by the new ant, *Pachycondyla chinensis*: demonstration of specific IgE and IgE-binding components. *Journal of Allergy and Clinical Immunology*. 107: 1095-1099. <https://doi.org/10.1067/mai.2001.114341>.
- Leath, T.M.; Grier, T.J.; Jacobson, R.S.; Fontana-Penn, M.E. 2006. Anaphylaxis to *Pachycondyla chinensis*. *Journal of Allergy and Clinical Immunology*. 117: S129. <https://doi.org/10.1016/j.jaci.2005.12.517>.
- Nelder, M.P.; Paysen, E.S.; Zungoli, P.A.; Benson, E.P. 2006. Emergence of the introduced ant *Pachycondyla chinensis* as a public-health threat in the Southeastern United States. *Journal of Medical Entomology*. 43: 1094-1098. [https://doi.org/10.1603/0022-2585\(2006\)43\[1094:EOTIAP\]2.0.CO;2](https://doi.org/10.1603/0022-2585(2006)43[1094:EOTIAP]2.0.CO;2).
- Rodríguez-Cabal, M.A.; Stuble, K.L.; Guenard, B. [and others]. 2012. Disruption of ant-seed dispersal mutualisms by the invasive Asian needle ant (*Pachycondyla chinensis*). *Biological Invasions*. 14: 557-565. <https://doi.org/10.1007/s10530-011-0097-5>.
- Smith, M.R. 1934. Ponerine ants of the genus *Euponera* in the United States. *Annals of the Entomological Society of America*. 27: 557-564. <https://doi.org/10.1093/aesa/27.4.557>.
- Suehiro, W.; Hyodo, F.; Tanaka, H.O. [and others]. 2017. Radiocarbon analysis reveals expanded diet breadth associates with the invasion of a predatory ant. *Scientific Reports*. 7: 15016. <https://doi.org/10.1038/s41598-017-15105-1>.
- Warren, R.J.; McMillan, A.; King, J.R. [and others]. 2015. Forest invader replaces predation but not dispersal services by a keystone species. *Biological Invasions*. 17: 3153-3162. <https://doi.org/10.1007/s10530-015-0942-z>.

Author Information

James T. Vogt, Project Leader, USDA Forest Service, Southern Research Station, james.t.vogt@usda.gov; <https://www.srs.fs.usda.gov/staff/146>.

Acknowledgments

The author thanks Jerome Goddard and **Eric P. Benson** for many helpful comments on an earlier version of this manuscript.

Citation: Vogt, J.T. 2021. Asian needle ant. Science Update SRS-SU-143. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 2 p. <https://doi.org/10.2737/SRS-SU-143>.