Invasive Insects: Risks and Pathways Project

ASIAN NEEDLE ANT

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Invasive insects are a huge biosecurity challenge. We profile some of the most harmful insect invaders overseas to show why we must keep them out of Australia.

Species

Asian needle ant / *Pachycondyla chinensis*. Also *Brachyponera chinensis*.

Main impacts

Displaces native ants from forests, leading to declines in plants that require ant dispersal of their seeds, as well as declines of ants. Has a painful sting and causes severe allergic reactions in some people.

Native range

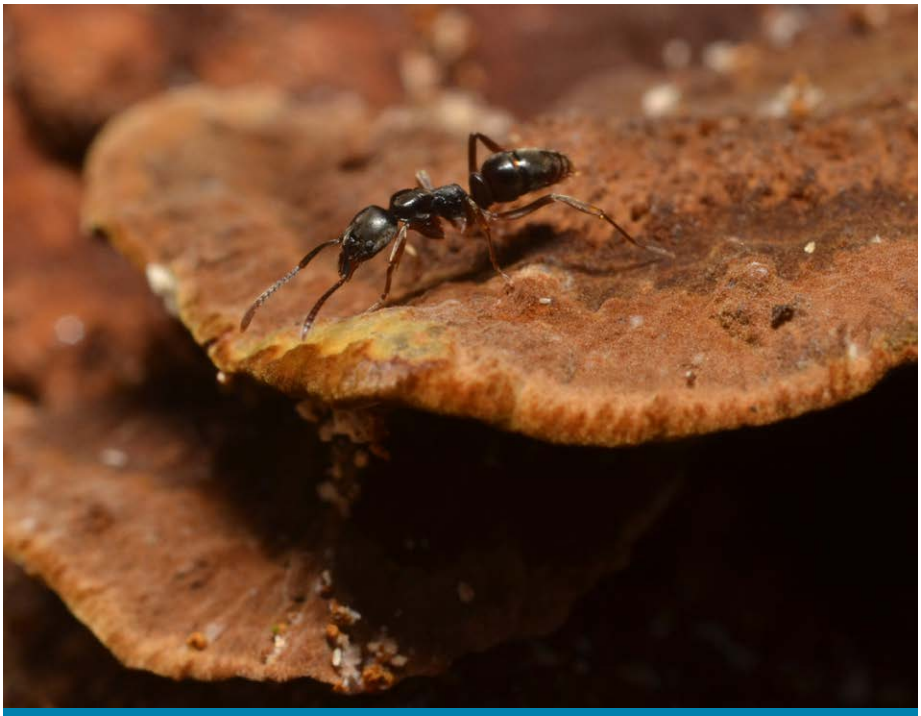
China, Taiwan, North Korea, South Korea, Japan.[1]

Invasive range

United States, Russia, Georgia.[1]

Main pathways of global spread

Unknown, but there are records of interceptions on plant materials.[1]



WHAT TO LOOK OUT FOR

Asian needle ants are dark brown to black with orange-brown mandibles, legs, antennae and stingers. The workers are 3.5 to 5.0 mm long. They are flexible about where they nest – in forests, they typically live in logs or under rocks and leaves; in urban areas they can nest in potted plants, piles of mulch and underneath door mats.

Photo: Chris Hartley

ENVIRONMENTAL IMPACTS OVERSEAS

In the United States the Asian needle ant has penetrated undisturbed native forests, including in national parks and state parks, where it displaces a range of native ants[2]. Surveys in North Carolina found it was twice as abundant as all native ant species combined and the richness of native ant species was lower (by about a third) than in uninvaded areas[2]. The needle ant may achieve high abundance in part because of its efficiency at hunting termites[2,12]. In a laboratory study, the Asian needle ant completely destroyed termite nests[12]. This may reduce termite abundance in invaded areas, with consequences for rates of decomposition.

About a third of the understorey plant species in eastern North American forests rely on ants for seed dispersal, a service not provided by the Asian needle ant[2]. In some sites in North Carolina, the needle ant completely displaces the most important seed dispersing ant, the 'dominant keystone' winnow ant (*Aphaenogaster rudis*), probably both by killing its workers and reducing the availability of termite prey[2,3,12]. The dispersal abilities of the affected plants are limited, their germination rates are low, and they are known to be sensitive to disturbance[2]. Without the winnow ant, their seeds are vulnerable to being eaten by rodents or failing to grow because of shading by their parent plants[4]. The understorey of forests is changing as a consequence[3].

HUMAN AND ECONOMIC IMPACTS OVERSEAS

Asian needle ants have been identified as a public health threat in the United States because of their stings, incurred in gardens and wooded areas[1,5]. Victims have described the sting as an intense pain that fades and returns frequently over several hours, often in areas beyond the original sting site[5]. Some suffer anaphylactic shock, as reported in medical papers from China, Japan, South Korea and the United States[1], with symptoms including generalised

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Asian needle ant. Photo: © Matt Bertone

urticaria, respiratory distress, wheezing and hypotension with or without loss of consciousness[6]. Some health problems attributed to fire ants in the United States may be due to Asian needle ants, which have received far less publicity[1].

AUSTRALIAN CONCERNS

Australia has more ant-dispersed plants than any other region of the world[7,8]. Invasion by Asian needle ants could cause substantial disruptions to habitats and plant declines and extinctions if seed-dispersing ants are displaced, as has occurred in those parts of the United States that have been studied. The Australian plants dependent on ant dispersal occur in 78 genera[9] and include many ecologically important, iconic and rare species, including wattles, pea bushes, boronias, guinea flowers and fringed lilies, all of which could be expected to become less common if they lose ant dispersal services[10]. At special risk are all the threatened plant species in genera that rely on ant dispersal. Examples in NSW include *Bertya* (4 species), *Boronia* (7 species), *Hibbertia* (10 species) and *Pomaderris* (16 species)[11]. The arrival of these ants could also put some native ant species at risk. The Asian needle ant is unusual among invasive ants in that it can dominate relatively undisturbed forests[12], so it can be expected to invade national parks and nature reserves.

In the United States this ant has been recorded from Florida, Alabama, Arkansas, New York State, Wisconsin and Washington State, indicating wide climatic tolerances, which would translate into a wide distribution in eastern and southern Australia.

SOURCES

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ABOUT THIS PROJECT

The Invasive Insects: Risks and Pathways Project is a partnership between Monash University and the Invasive Species Council. To find out more visit invasives.org.au/risks-and-pathways.