GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Technomyrmex albipes***

Technomyrmex albipes **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae

Common name white-footed house ant (English), ashijiro-hirafushi-ari (Japanese), white-footed ant (English)

Synonym
Formica (Tapinoma) albipes , Smith
Formica albipes
Tapinoma albipes , (Smith)
Tapinoma albitarse , Motschoulsky
Tapinoma nigrum , Mayr
Technomyrmex albipes , st. *rufescens* Santschi
Technomrmex albipes , var. *vitiensis* Mann.
Technomyrmex detorquens , Walker

Similar species *Linepithema humile, Paratrechina bourbonica, Technomyrmex difficilis*

Summary Native to the Indo-Pacific area, Technomyrmex albipes, commonly known as the white-footed ant, has spread to Australia, Africa, North America, Caribbean and Asia. Technomyrmex albipes are often found on cut flowers and other imported plants. It's penchant for invading houses and nesting in wall cavities distresses homeowners. The unusual colony structure of Technomyrmex albipes allows them to reproduce rapidly, especially in warm weather, reaching numbers in the millions in some locations. Management of Technomyrmex albipes is difficult when populations abound, as chemical poisons are not transferred between workers.

view this species on IUCN Red List

Species Description
Technomyrmex albipes is a small, black ant with whitish legs (Robertson, 2004) that is approximately 2-4mm in total length. (Tenbrink & Hara, 1992). Generally, the mandibles have 7-10 large teeth and between 2-15 dentricles. The front margin of the clypeus has broad, shallow concavity in the middle, or a distinct central notch. \"The petiolar scale is reduced or absent.\" Workers differ slightly from the above description, having 12 segmented antennae, mandibles with 10 teeth, and numerous dentricles. Their bodies are usually dark brown with pale legs and the petiolar node of the worker ant is flattened. (Harris *et al.* 2004). *T. albipes* can form large colonies with numbers ranging from 8,000 to 3,000,000 in one colony, making them very difficult to control. (PAPP, 2004). While in motion, workers raise their abdomen, distinguishing them from other ants in the colony. (Warner & Scheffrahn, 2004). Foragers lay trail pheromones so that nestmates may be recruited to help when resources are located. On structures, foragers follow lines and edges, usually going in straight lines. (Warner *et al*, 2002)
Please click on AntWeb: *Technomyrmex albipes* for more images and assistance with identification. The AntWeb image comparison tool lets you compare images of ants at the subfamily, genus, species or specimen level. You may also specify which types of images you would like to compare: head, profile, dorsal, or label.
\r\nPlease see PaDIL (Pests and Diseases Image Library) Species Content Page Ants: white-footed ant for high quality diagnostic and overview images.\r\n
Please follow this link for a fully illustrated Lucid key to common invasive ants [Hymenoptera: Formicidae] of the Pacific Island region [requires the most recent version of Java installed]. The factsheet on *Technomyrmex albipes* contains an overview, diagnostic features, comparision charts, images, nomenclature and links. (Sarnat, 2008)

Notes
T. albipes farm sap-sucking homopterans, protecting them in exchange for a high sugar secretion that many homopterans produce. (Warner & Scheffrahn, 2004). In New Zealand, *T. albipes foreli* is a regulated pest on plants in the *Citrus*, *Poncirus*, and *Fortunella* genus. Plants in these genus entering New Zealand are subject to visual inspection and approved insecticide treatments. (Biosecurity, 2006)

Lifecycle Stages
T. albipes has an unusual colony structure, evolved for large numbers of offspring. This species is one of only a few ant genera that exhibit a remarkable male polymorphism. (i.e. winged and wingless males). There are 3 different female types found in each colony. Queens are females that have wings. Intercastes are wingless females with a spermatheca, making them sexually viable. Workers are wingless females with out aspermatheca. There are also previously winged queens (Dealates), but they are rare or not present in most colonies. (Harris *et al.* 2004).
Eggs are laid by queen and protected by workers in the nest. The eggs may be fertilized or unfertilized and are whitish or yellowish .5mm ovals. Larvae appear as soft, legless, pale grups shaped like a crooked-necked squash. Transportation of young in perilous situations is by adults whose sticky saliva allows for young to be attached to their bodies. Immatures are fed and cared for throughout development in the nest by females, and develope faster at warmer temperatures. The juvenile state is a small proportion of *T. albipes's* lifespan, as workers can live for several years. Female adults tend all stages of juvenile ants, construct and maintain nests, and forage for food. Males exist mainly for reproduction. The queen of the colony is large and winged early in life and lays fertile and unfertile eggs throughout her existence. (Tenbrink & Hara, 2002)

Uses
In Sri Lanka, *T. albipes* helps control a pest of coconut, the coconut caterpillar (*Opisina arenosella*), by feeding on their eggs. (Warner *et al*, 2002).

Habitat Description
T. albipes is a scavenger that tramps/exploits forests and open habitats. Tent-like nests made from debris (Tenbrink & Hara, 2002) are found in dry places above the ground, mainly in trees, bushes, under palm fronds, in loose mulch, leaf litter, (Warner *et al*, 2002) rotting logs, under loose bark, and sometimes under stones (in soil). They can be found indoors searching for food and water, often forming long foraging lines. Indoor nests are often found in wall cavities (Warner & Scheffrahn, 2004) and attics. (Warner *et al*, 2002). *T. albipes* lives in areas with an elevation between 1000-5000 feet (305-1524 metres) and where annual rainfall exceeds 60 inches (1524mm). (Tenbrink & Hara, 1992)

Reproduction
Reproduction is preformed by intercastes who are inseminated by wingless males from the colony. Winged females (potential queens) and winged males copulate outside the nest after nuptial flight. \"New colonies are formed by dealate queens, but those queens are eventually replaced by intercastes. Thus, inbred wingless reproductions allow the enlargement and budding of colonies, often resulting in the formation of huge polydomous (single colonies that occupy more than one nest) containing millions of individuals\" (Harris *et al.* 2004).

Nutrition
T. albipes feeds on plant nectars and honeydews produced by homopterans (aphids, mealybugs, and scale insects). The homopterans are protected by *T. albipes* in exchange for their nectar secretions. (PAPP, 2004)

General Impacts
In households, *T. albipes* is considered a pest because it is found foraging in kitchens, bathrooms, and building exteriors. (PAPP, 2004) They are also attracted to contact points of light switches, which causes the switches to fail after repeated contact. The first indication of a light switch issue is a flickering light or sparks that can be seen through the switch cover in the dark. After a few days the switch ceases working. A dozen or more ants are usually found between the switch contacts forming an insulation. Other bodies are found below the contacts. Only 20% of the switches in a house are periodically affected; the cause of this fact is unknown. (Little, 1984). *T. albipes* can reach large numbers in buildings and is difficult to control. Impacts in their native habitat are unknown.
As an arboreal species, *T. albipes* should occupy a different niche than ground nesting ants, therefore having little impact on them. (Warner & Scheffrahn, 2004). The symbiotic relationship between homopterans (aphids, mealybugs, and scale insects) causes agricultural problems in some parts of the world where farmers have attempted to erradicate the sap-sucking homopterans, usually with biological controls. (PAPP, 2004). The homopterans, protected by *T. albipes*, sap plants of nutrients and help promote plant disease through honeydew residues left on leaves. (Wetterer, 1997). Sri Lanka has experienced problems with *T. albipes* spreading pineapple wilt disease because they protect the pink mealybug (*Dysmicocus brevis*). South African citrus orchards have seen localised outbreaks of red scale insects (*Aonidella aurantii*) because of the presence of *T. albipes*. (PAPP, 2004). *T. albipes* has also been implicated in the spread of fungal pod rot disease on cocoa plants. (Tenbrink & Hara, 1992).

Management Info
Preventative measures: The Pacific Ant Protection Plan is a proposal prepared for the Pacific Plant Protection Organisation and Regional Technical Meeting For Plant Protection. This plan aims to prevent the red imported fire ant and other invasive ant species with economic, environmental and/or social impacts, entering and establishing in or spreading between (or within) countries of the Pacific Region.
Chemical: *T. albipes* is difficult to control chemically because chemicals/poisons are not transferred between workers. Baits must be very appetizing to the ants so that large numbers will be individually affected. (Warner & Scheffrahn, 2004). Lindquist (undated) reports that water at a temperature of 49ºC or higher killed greater than 95% of *T. albipes*.
In a study of chemical bait efficacy on *T. albipes*, Imidacloprid, NecDew with DOT, 10ppm Thiamethoxam, and Terro yielded the highest mortality rates for bait traps. In laboratory colonies of *T. albipes*, NecDew containing 10 ppm of Thiamethoxam was the most effective treatment. Baits that were relatively effective in the laboratory experiment were Imidacloprid in 25%(w/v)sucrose water, NecDew with 10ppm DOT, 10ppm Thiamethoxam in 25%(w/v)sucrose water, and Terro Ant Killer 2. Other baits including residuals, other liquids, gels, one insecticidal dust, and an ultrasonic pest repeller were all unsatisfactory. (Warner & Scheffrahn, 2005). Another study reported that after one day, Talstar had the highest mortality rate, followed by Imidacloprid, and Thiamethoxam. A further study concluded that after 47 days, PJB+Thiamethoxam 10ppm treatment had a 100% mortality rate(MR), eclipsing Imadacloprid instant granules (84%MR) and Imadacloprid Pre-Empt (82%MR). Treatments that didn't vary from controls included Combat Bait Stations, Maxforce ant gel, Termidor, Indoxacarb surface, Demand CS, DeltaDust, XR007, and Whitmire ant bait. (Warner, 2003)
Biological: Tenbrink & Hara (1992) state that *Anoplolepis longipes* (long-legged ant) will displace *T. albipes* and is less likely to spread black pod disease of cocoa; however, *A. longipes* does tend homopterans. Another biological control option could be parasites, specifically the ones that live in the nests of *T. albipes* and stunt development of ants in juvenile stages. (Tenbrink & Hara, 1992).
Physical: Trim trees and shrubs that surround nests to prevent bridging to other vegetation. Do not allow vegetation to touch exterior walls of any edifice. (Warner *et al*, 2002).
Sugiura (2008) reports the use of hot water treatment to destroy *T. albipes* in soil and potted plants. Exposure to hot water at =47°C effectively killed the ant. Temperatures of up to 49°C are non-phytotoxic (Tsang *et al*., 1995 in Sugiura, 2008), and hot water has no negative environmental effects.

Pathway
T. albipes has been intercepted at ports, particularly in association with cut flowers. (Harris *et al.* 2004)

Principal source: Tenbrink, V. & A. Hara. 1992. *Technomyrmex albipes*. Beaumont Reaserach Center. Available from:www.extento.hawaii.edu/kbase/crop/Type/technomy.htm

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

Review:

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ALIEN RANGE

[1] AMERICAN SAMOA
[1] CAYMAN ISLANDS
[1] FIJI
[1] GUAM
[2] JAPAN
[3] MALAYSIA
[1] MICRONESIA
[6] AUSTRALIA
[1] CHINA
[1] GHANA
[1] INDIA
[1] MADAGASCAR
[8] MAURITIUS
[1] NEW CALEDONIA

[1] PAPUA NEW GUINEA
[1] PORTUGAL
[1] SAUDI ARABIA
[1] SOLOMON ISLANDS
[1] SRI LANKA
[1] VANUATU
[1] PHILIPPINES
[1] REUNION
[2] SEYCHELLES
[1] SOUTH AFRICA
[9] UNITED STATES
[1] YEMEN

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Managment information

Harris, R.; Abbott, K.; Barton, K.; Berry, J.; Don, W.; Gunawardana, D.; Lester, P.; Rees, J.; Stanley, M.; Sutherland, A.; Toft, R. 2005: Invasive ant pest risk assessment project for Biosecurity New Zealand. Series of unpublished Landcare Research contract reports to Biosecurity New Zealand. BAH/35/2004-1.

Summary: The invasive ant risk assessment project, prepared for Biosecurity New Zealand by Landcare Research, synthesises information on the ant species that occur in New Zealand (native and introduced species), and on invasive ants that pose a potential threat to New Zealand.

There is a great deal of information in this risk assessment on invasive ant species that is of global interest, including; biology, distribution, pest status, control technologies.

The assessment project has five sections.1) The Ants of New Zealand: information sheets on all native and introduced ants established in New Zealand 2) Preliminary invasive ant risk assessment: risk scorecard to quantify the threat to New Zealand of 75 ant species. 3) Information sheets on invasive ant threats: information sheets on all ant species scored as medium to high risk (n = 39). 4) Pest risk assessment: A detailed pest risk assessment for the eight species ranked as having the highest potential risk to New Zealand (*Anoplolepis gracilipes*, *Lasius neglectus*, *Monomorium destructor*, *Paratrechina longicornis*, *Solenopsis geminata*, *Solenopsis richteri*, *Tapinoma melanocephalum*, *Wasmannia auropunctata*) 5) Ranking of high risk species: ranking of the eight highest risk ant species in terms of the risks of entry, establishment, spread, and detrimental consequences.

NB. The red imported fire ant (*Solenopsis invicta*) is considered to be the worst ant pest in the world. However, *Solenopsis invicta* was specifically excluded from consideration in this risk assessment as this species has already been subject to detailed consideration by Biosecurity New Zealand

(This invasive ant pest risk assessment was funded by Biosecurity New Zealand and Foundation for Research, Science and Technology. Undertaken by Landcare Research in collaboration with Victoria University of Wellington and Otago Museum)

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Pacific Ant Prevention Programme, March 2004. Pacific Invasive Ant Group (PIAG) on behalf of the IUCN/SSC Invasive Species Specialist Group (ISSG).

Summary: A proposal prepared for the Pacific Plant Protection Organisation and Regional Technical Meeting For Plant Protection. This plan aims to prevent the red imported fire ant and other invasive ant species with economic, environmental and/or social impacts, entering and establishing in or spreading between (or within) countries of the Pacific Region.

Sarnat, E. M. (December 4, 2008) PIAkey: Identification guide to ants of the Pacific Islands, Edition 2.0, Lucid v. 3.4. USDA/APHIS/PPQ Center for Plant Health Science and Technology and University of California Davis.

Summary: PIAkey (Pacific Invasive Ant key) is an electronic guide designed to assist users identify invasive ant species commonly encountered in the Pacific Island region. The guide covers four subfamilies, 20 genera and 44 species.

The primary tool offered by PIAkey is an interactive key designed using Lucid3 software. In addition to being fully illustrated, the Lucid key allows users to enter at multiple character points, skip unknown characters, and find the most efficient path for identifying the available taxa. Each species is linked to its own web page. These species pages, or factsheets, are linked to an illustrated glossary of morphological terms, and include the following seven sections: 1) Overview of the species; 2) Diagnostic chart illustrating a unique combination of identification characters; 3) Comparison chart illustrating differences among species of similar appearance; 4) Video clip of the species behavior at food baits (where available); 5) Image gallery that includes original specimen images and live images (where available); 6) Nomenclature section detailing the taxonomic history of the species, and 7) Links and references section for additional literature and online resources.

Available from: http://www.lucidcentral.org/keys/v3/PIAkey/index.html [Accessed 17 December 2008]

Tenbrink, V. & A. Hara. 1992. *Technomyrmex albipes*. Beaumont Reaserach Center.

Summary: Very detailed information on multiple subjects concerning the white-footed ant. Includes management information also.

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Summary: Gives more information about bait preferences amongst white-footed ants.

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Summary: A great all around resource for general information concerning *T. albipes*.

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Summary: Gives manamgent information about which chemicals are most effective for white-footed ant control and why.
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General information

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Summary: AntWeb illustrates ant diversity by providing information and high quality color images of many of the approximately 10,000 known species of ants. AntWeb currently focusses on the species of the Nearctic and Malagasy biogeographic regions, and the ant genera of the world. Over time, the site is expected to grow to describe every species of ant known. AntWeb provides the following tools: Search tools, Regional Lists, In-depth information, Ant Image comparision tool PDF field guides maps on AntWeb and Google Earth and Ant genera of the world slide show.
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