

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 denticles. 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 denticles. 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.

Please see PaDIL (Pests and Diseases Image Library) Species Content Page [Ants: white-footed ant](#) for high quality diagnostic and overview images.

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, comparison 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 develop 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 performed 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 eradicate 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 (*Dysmicoccus 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 49°C 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:

Pubblication date: 2009-07-09

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

BIBLIOGRAPHY

35 references found for *Technomyrmex albipes*

Management 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)

Available from: http://www.landcareresearch.co.nz/research/biocons/invertebrates/Ants/ant_pest_risk.asp [Accessed 20 May 2007]

McGlynn, T.P. 1999. The Worldwide Transfer of Ants: Geographical Distribution and Ecological Invasions, *Journal of Biogeography* 26(3): 535-548.

[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/PPO 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.

Available from: <http://www.extento.hawaii.edu/kbase/crop/Type/technomy.htm> [Accessed 22 December 2006]

[Warner, J. 2003. Bait Preferences and Toxicity of Insecticides to white-footed ants *Technomyrmex albipes* \(Hymenoptera: Formidae\). University of Florida.](#)

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

Available from: http://nersp.nerdc.ufl.edu/~ortgedb/etdNew/jwarner1/Warner_J.pdf [Accessed 27 December 2006]

[Warner, J., R. H. Scheffrahn and B. Cabrera. 2002. Entomology and Nematology Department, Ft. Lauderdale Research and Education Center, Institute of Food and Agricultural Sciences, University of Florida, Ft. Lauderdale, FL.](#)

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

Available from: <http://edis.ifas.ufl.edu/IN551> [Accessed 28 December 2006]

[Warner, J. & R. Scheffrahn. 2004. Feeding preferences of white-footed ants *Technomyrmex albipes* \(Hymenoptera: Formicidae\), to selected liquids. University of Florida, Institute of Food and Agricultural Sciences.](#)

Summary: Gives management information about which chemicals are most effective for white-footed ant control and why. Available from: http://shalompest.homestead.com/warner_scheffrahn_2004_feeding_pref_wfa.pdf [Accessed 21 December 2006]

[Warner, J. & R. Scheffrahn. 2005. Laboratory Evaluation of Baits, Residual Insecticides, and an Ultrasonic Device For Control of White-Footed Ants, *Technomyrmex albipes* \(Hymenoptera: Formicidae\). Fort Lauderdale Research and Education Center University.](#)

Summary: Very good information about the efficacy of chemicals on the white-footed ant. Available from: http://shalompest.homestead.com/Sociobiology_Vol_45_No_2_2005.pdf [Accessed 23 December 2006]

General information

[AntWeb, 2006. *Technomyrmex albipes*](#)

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 comparison tool PDF field guides maps on AntWeb and Google Earth and Ant genera of the world slide show.

AntWeb is available from: <http://antweb.org/about.jsp> [Accessed 22 December 2006]

The species page is available from: <http://www.antweb.org/description.do?rank=species&genus=technomyrmex&name=albipes&project=> [Accessed 22 December 2006]

[Biosecurity New Zealand. 2006. Importation of Nursery Stock. Ministry of Agriculture and Forestry.](#)

Summary: A paper that details what plants can/can't be imported into New Zealand and the regulations they must pass through.

Available from: <http://www.biosecurity.govt.nz/imports/plants/standards/155-02-06.pdf> [Accessed 22 December 2006]

[Bringsoe, H. \(2007\). An observation of *Calumma tigris* \(Squamata: Chamaeleonidae\) feeding on white-footed ants, *Technomyrmex albipes* complex, in the Seychelles. *Herpetological Bulletin* 102: 15-17.](#)

[California Academy of Sciences. \(2009\). Species: *Technomyrmex albipes*. \[Accessed 23 June, 2009\]](#)

[Collingwood, C. A. & van Harten, A. \(2005\). Further additions to the ant fauna \(Hymenoptera: Formicidae\) of Yemen. *Zoology in the Middle East* 35: 73-78.](#)

[Deyrup, M. 2003. An updated list of Florida ants \(Hymenoptera: Formicidae\). *Florida Entomologist*. Article: pp. 43-48.](#)

Summary: A published list of ants that occur in Florida.

[Hansen, D. M. & Muller, C. B. \(2009\). Invasive ants disrupt gecko pollination and seed dispersal of the endangered plant *Roussea simplex* in Mauritius. *Biotropica* 41\(2\): 202-208.](#)

[ITIS \(Integrated Taxonomic Information System\). 2006. Online Database *Technomyrmex albipes*.](#)

Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.

Available from: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=575154 [Accessed 21 December 2006]

[Kirschenbaum, R. & Grace, J. K. \(2007\). Dominant ant species in four habitats in Hawaii \(Hymenoptera: Formicidae\). *Sociobiology* 50\(3\).](#)

[Lindquist, R. Undated. Temperature in the Management of Insect and Mite Pests in Greenhouses.](#)

Summary: Describes indoor conditions that affect ant populations. [Accessed 21 December 2006]

[Little, E. 1984. Ants in Light Switches: Note. *New Zealand Entomologist*, 1984, Vol. 8](#)

Summary: Provides information about electrical light switches and how white-footed ants can break them.

Available from: http://www.ento.org.nz/nzentomologist/free_issues/Volume%208-47.pdf [Accessed 22 December 2006]

[Neville, P. J., O Dowd, D. J. & Yen, A. L. \(2008\). Issues and implications for research on disturbed oceanic islands illustrated through an ant survey of the Cocos \(Keeling\) Islands. *Journal of Insect Conservation* 12: 313-323.](#)

[Pfeiffer, M., Tuck, H. C. & Lay, T. C. \(2008\). Exploring arboreal ant community composition and co-occurrence patterns in plantations of oil palm *Elaeis guineensis* in Borneo and Peninsular Malaysia. *Ecography* 31: 21-32.](#)

Summary:

[Robertson, H. 2004. *Technomyrmex albipes*. *Iziko Museums of Cape Town*](#)

Summary: Gives a brief physical description of *T. albipes*.

Available from: http://www.museums.org.za/bio/ants/dolichoderinae/technomyrmex/technomyrmex_albipes.htm [Accessed 21 December 2006]

[Room, P. 1971. The Relative Distributions of Ant Species on Ghana's Cocoa farms. *The Journal of Animal Ecology*.](#)

Summary: Tells about habits of ants in cocoa farms and how they impact them in Ghana.

[Room, P. 1975. Relative Distributions of Ant Species in Cocoa Plantations in Papua New Guinea. *The Journal of Applied Ecology*.](#)

Summary: Gives information about *T. albipes* New Guinea.

[Suarez, A., Holway, D., & P. Ward. 2005. The role of opportunity in the unintentional introduction of non-native ants. *PNAS*. Vol. 102, No. 47.](#)

Summary: Provides information about invasiveness of white-footed ant in the US.

Available from: <http://www.pnas.org/cgi/content/full/102/47/17032> [Accessed 23 December 2006]

[Sugiura, S. \(2008\). Hot water tolerance of soil animals: utility of hot water immersion in preventing invasions of alien soil animals. *Applied Entomology and Zoology* 43\(2\): 207-212.](#)

[Teryama, M. & M. Kubota. 2003. *Technomyrmex albipes*. Japanese Ant Database Group.](#)

Summary: Provides information about white-footed ant nesting sites.

Available from: <http://ant.edb.miyakyo-u.ac.jp/E/Taxo/F70401.html> [Accessed 23 December 2006]

[Vargo, D. 2000. Soil Invertebrates of American Samoa. *Micronesica* 33\(1/2\):1-10, 2000](#)

Summary: This document gives a good description of what ants are in Micronesia. [Accessed 23 December 2006]



GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Technomyrmex albipes*

[Walker, K. 2006. white-footed ant \(*Technomyrmex albipes*\) Pest and Diseases Image Library. Updated on 29/08/2006 12:02:55 PM.](#)

Summary: PaDIL (Pests and Diseases Image Library) is a Commonwealth Government initiative, developed and built by Museum Victoria's Online Publishing Team, with support provided by DAFF (Department of Agriculture, Fisheries and Forestry) and PHA (Plant Health Australia), a non-profit public company. Project partners also include Museum Victoria, the Western Australian Department of Agriculture and the Queensland University of Technology. The aim of the project is: 1) Production of high quality images showing primarily exotic targeted organisms of plant health concern to Australia. 2) Assist with plant health diagnostics in all areas, from initial to high level. 3) Capacity building for diagnostics in plant health, including linkage developments between training and research organisations. 4) Create and use educational tools for training undergraduates/postgraduates. 5) Engender public awareness about plant health concerns in Australia. PaDIL is available from : <http://www.padil.gov.au/aboutOverview.aspx>, this page is available from: <http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=620> [Accessed 4 January 2007]

Way, M. & B. Bolton. 1997. Competition between ants for coconut palm nesting sites. *Journal of Natural History*, 1997, 31,439-455

Summary: This paper describes how several species of ants prefer plant nesting sites.

Wetterer, J. 1997. Ants on *Cecropia* in Hawaii. *Biotropica* 29(1): 128-132

Summary: Distribution information and information about ants on Hawaiian trees.

[Wetterer, J. 2002. Ants of Tonga. *Pacific Science* \(2002\), vol. 56, no. 2:125-135](#)

Summary: Gives information about ants in Tonga and their nativity in the Pacific.

Available from: http://muse.jhu.edu/journals/pacific_science/v056/56.2wetterer.pdf [Accessed 23 December 2006]

Wetterer, J. & A. Wetterer. 2003. Ants (Hymenoptera: Formicidae) on non-native Neotropical Ant-Acacias (Fabales: Fabaceae) in Florida. *Florida Entomologist* 86(4).

Summary: This paper describes ants that have been seen on ant-acacia trees in Florida.

Wetterer, J. K. (2008). *Technomyrmex difficilis* (Hymenoptera: Formicidae) in the West Indies. *Florida Entomologist* 91(3): 428-430.