

*Anoplolepis gracilipes*  [简体中文](#) [正體中文](#)

**System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae

**Common name** gramang ant (Indonesian Bahasa), Maldive ant (English, Seychelles), yellow crazy ant (English), Gelbe Spinnerameise (German), crazy ant (English), ashinaga-ki-ari (Japanese), long-legged ant (English)

**Synonym** *Anoplolepis longipes* , Emery 1925  
*Plagiolepis longipes* , Emery 1887  
*Formica longipes* , Jerdon 1851

## Similar species

**Summary** *Anoplolepis gracilipes* (so called because of their frenetic movements) have invaded native ecosystems and caused environmental damage from Hawaii to the Seychelles and Zanzibar. On Christmas Island in the Indian Ocean, they have formed multi-queen supercolonies. They are also decimating the red land crab (*Gecarcoidea natalis*) populations. Crazy ants also prey on, or interfere in, the reproduction of a variety of arthropods, reptiles, birds and mammals on the forest floor and canopy. Their ability to farm and protect sap-sucking scale insects, which damage the forest canopy on Christmas Island, is one of their more surprising attributes. Although less than 5% of the rainforest on Christmas Island has been invaded so far, scientists are concerned that endangered birds such as the Abbott's booby (*Sula abbotti*), which nests nowhere else in the world, could eventually be driven to extinction through habitat alteration and direct attack by the ants.



[view this species on IUCN Red List](#)

## Species Description

*Anoplolepis gracilipes* is one of the largest invasive ants and are typically small to medium-sized and range from 1-2mm, like *Wasmannia auropunctata*, to more than 5mm (Holway *et al.* 2002). The ant, also known as the long-legged ant, is notable for its remarkably long legs and antennae. *A. gracilipes* workers are monomorphic, displaying no physical differentiation (Holway *et al.* 2002). It has a yellow-brownish body colour, and is weakly sclerotized. Workers have a long slender gracile body, with the gaster usually darker than the head and thorax. It may subdue or kill invertebrate prey or small vertebrates by spraying formic acid.

Please click on [AntWeb: \*Anoplolepis gracilipes\*](#) 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: Yellow crazy 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 *Anoplolepis gracilipes* contains an overview, diagnostic features, comparison charts, images, nomenclature and links. (Sarnat, 2008)

## Notes

**Foraging Behaviour:** Although the yellow crazy ant (*Anoplolepis gracilipes*) typically nests under leaf litter or in holes in the ground, it forages extremely competitively over every surface within its territory, including forests trees (Room 1975, in O'Dowd *et al.* 1999). Its ability to forage throughout the day and night, and over a wide range of temperatures allows it to rapidly alter invaded ecosystems. High temperatures (such as those that occur around midday) and surface ground temperatures of 44°C may prevent workers from foraging. Ant activity begins to decline from around 25°C and foraging may be limited by rain. Researchers have reported an increase in both foraging activity and nest size in the dry season. It exhibits frenetic behaviour when its foraging is disturbed, which presumably explains its common name.

Note that it should not to be confused with the similarly named crazy ant ([Paratrechina longicornis](#)) and that most literature on *A. gracilipes* is under its synonym (*A. longipes*).

## Lifecycle Stages

The life cycle of *Anoplolepis gracilipes* has been estimated to take 76-84 days. Eggs hatch in 18-20 days, and worker larvae develop in 16-20 days. Pupae of workers require around 20 days to develop while those of queens develop in 30-34 days.

## Habitat Description

*Anoplolepis gracilipes* are known to be ready invaders of disturbed habitats such as urban areas, forest edges or agricultural fields (Ness and Bronstein, 2004). The ability of *A. gracilipes* to live in human dwellings or human-frequented areas has meant it has become a serious pest in many households and buildings (O'Dowd *et al.* 1999).

The yellow crazy ant has been known to successfully colonise a variety of agricultural systems, including cinnamon, citrus and coffee crops and coconut plantations (Haines and Haines 1978, Van Der Goot 1916, in Holway *et al.* 2002; O'Dowd *et al.* 1999) and on banana, rambutan, mango, durian, sugarcane and langsat (Jochen Drescher pers.comm May 2010). In agricultural regions it is typically found nesting at the base, or even in the crown, of crop plants. For example, on New Guinea it nests in the crowns of coconut trees, feeding off honeydew-producing scale insects and palm flower nectar (Young 1996, in O'Dowd *et al.* 1999).

*A. gracilipes* is also capable of invading undisturbed habitats as in the case of the drier monsoon forests on Christmas Island (Indian Ocean), where the yellow crazy ant experienced a population explosion and thrives in (previously) undisturbed native forest habitats (CBD, 2003); it is however not known to enter lowland rainforest or submontane rainforest (Jochen Drescher pers.comm May 2010). The nesting requirements of the ant are general and it often nests under leaf litter or in cracks and crevices (Lewis *et al.* 1976, Rao and Veeresh 1991, in O'Dowd *et al.* 1999). On Christmas Island, the yellow crazy ant takes advantage of crab burrows, the woody debris of the forest floor, tree hollows and epiphytes and the hollows created at the base of palm leaves (O'Dowd *et al.* 1999).

## Reproduction

*Anoplolepis gracilipes* colonies are polygynous. Worker production fluctuates but is continuous throughout the year. Sexual offspring may occur year-round, but are generally produced seasonally (prior to the rainy season) (Baker 1976, in O'Dowd *et al.* 1999). Colony budding is an important form of dispersal for the ant, although winged queens and males (known as alates) have been reported on Christmas Island. It is unclear if winged forms of the ant are able to start new colonies.

## Nutrition

*Anoplolepis gracilipes* have a broad diet characteristic of many invasive ants. A generalised feeding regime increases the invasiveness of an ant due to the increased ability to gain nutrition from available resources including grains, seeds, arthropods, decaying matter and vegetation (Holway *et al.* 2002; Ness and Bronstein 2004). The yellow crazy ant is a scavenger and preys on a variety of litter and canopy invertebrates, such as small isopods, myriapods, molluscs, arachnids, land crabs and insects (O'Dowd *et al.* 1999). In the Seychelles, they feed on invertebrates and will attack, kill, and dismember large arthropods (Haines *et al.* 1994, in O'Dowd *et al.* 1999). Like all ants, they require proteinaceous foods for brood production (O'Dowd *et al.* 1999). In addition to protein-rich foods *A. gracilipes* may rely heavily on carbohydrate-rich nutrient sources, such as plant nectar or honeydew-producing scale insects (especially insects in the *Homoptera* genus). In the Seychelles, the quantity of honeydew in a 2.5mg worker is estimated to be up to 50% (Haines *et al.* 1994 in O'Dowd *et al.* 1999). The presence of *Homoptera* insects may be so important that it may limit population growth. For example, in cocoa plantations in Papua New Guinea *Homoptera* insect populations are thought to be necessary to support and sustain *A. gracilipes* colonies (Holway *et al.* 2002).

## General Impacts

High densities of the yellow crazy ant (*Anoplolepis gracilipes*) have the potential to devastate native 'keystone' species, resulting in a rapid alteration of ecosystem processes and negative effects on endemic species. The most notable example concerns the native forests of Christmas Island, in which populations of the yellow crazy ant have exploded in recent decades (at least 60 years after its initial introduction) (CBD 2003).

Please follow this link for more details on the [impacts of yellow crazy ants](#) on biodiversity.

For a summary of the general impacts of invasive ants, such as their affect on mutualistic relations, the competitive pressure they impose on native ants and the effect they may have on vulnerable ecosystems please read this document: [invasive ants impacts](#) compiled by the ISSG.

## Management Info

Preventative measures: [The Pacific Ant Prevention Programme](#) 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 from establishing within or spreading between countries in the Pacific.

A detailed pest risk assessment for the eight species ranked as having the highest potential risk to New Zealand was prepared as part of 'The Invasive Ant Risk Assessment Project', [Harris \*et al.\* 2005](#), for Biosecurity New Zealand by Landcare Research. *Anoplolepis gracilipes* scored as a high-risk threat to New Zealand. The Invasive ant risk assessment for *A. gracilipes* can be viewed at [Anoplolepis gracilipes risk assessment](#). Please see *Anoplolepis gracilipes information sheet* for more information on biology, distribution, pest status and control technologies.

**Chemical:** The toxic principles in ant baits include the so-called "stomach" poisons, hydramethylnon (Maxforce, Amdro), sulfuramid and sodium tetraborate decahydrate (Borax). Insect Growth Regulators (IGRs) disrupt development and include compounds such as methoprene and fenoxycarb. Stomach poisons work relatively fast compared to IGRs, but may sometimes work too quickly, eliminating workers before the insecticide can be distributed throughout the entire colony. One promising approach is to use pheromones (compounds produced by a species that regulate their own behaviour) as "biopesticides" to disrupt the reproduction by the queen (O'Dowd *et al.* 1999). Baits should be designed with the foraging strategies of the specific ant species in mind. Determining the preferred size, type and dispersal pattern of the bait is an important step. Nesting, foraging and behavioural traits of the ant should all be taken into consideration. The use of appropriately designed baits is needed to reduce the cost of toxin use to native ant populations and non-target fauna (McGlynn, 1999). Please follow this link for more detailed information on the [management of the yellow crazy ant](#) compiled by the ISSG.

## Pathway

Transported in road vehicles, machinery, boats, and aircraft. Transported in packaging material, timber. Translocated in soil, produce and timber. Transported in soil and produce. Transported in soil, packaging materials, pallets. Deliberate introductions for biological control of plant pests on coconut, coffee and cacao plantations. Transported in goods, packaging, pallets in container. *Anoplolepis gracilipes* has entered Australian ports in sea cargo containers in Cairns and Brisbane, Queensland, Australia and been intercepted in Fremantle, Western Australia. Translocated in soil, produce and timber. Transported in soil, packaging materials, pallets.

## Principal source:

**Compiler:** Dr. Dennis O'Dowd, Centre for Analysis and Management of Biological Invasions, Australia & IUCN/SSC Invasive Species Specialist Group (ISSG)

## Review:

**Publication date:** 2009-09-28

## ALIEN RANGE

<b>[3]</b> AMERICAN SAMOA	<b>[14]</b> AUSTRALIA
<b>[1]</b> BRUNEI DARUSSALAM	<b>[1]</b> CAROLINE ISLANDS
<b>[1]</b> CHILE	<b>[3]</b> CHINA
<b>[1]</b> CHRISTMAS ISLAND	<b>[2]</b> COOK ISLANDS
<b>[1]</b> FIJI	<b>[5]</b> FRENCH POLYNESIA
<b>[1]</b> GUAM	<b>[1]</b> HONG KONG
<b>[4]</b> INDIA	<b>[8]</b> INDONESIA
<b>[4]</b> JAPAN	<b>[2]</b> KIRIBATI
<b>[2]</b> MALAYSIA	<b>[2]</b> MARSHALL ISLANDS
<b>[3]</b> MAURITIUS	<b>[18]</b> MEXICO
<b>[1]</b> MICRONESIA, FEDERATED STATES OF	<b>[1]</b> NEW CALEDONIA
<b>[1]</b> NEW ZEALAND	<b>[1]</b> NIUE
<b>[5]</b> NORTHERN MARIANA ISLANDS	<b>[1]</b> PALAU
<b>[1]</b> PAPUA NEW GUINEA	<b>[1]</b> REUNION
<b>[4]</b> SAMOA	<b>[13]</b> SEYCHELLES
<b>[2]</b> SOLOMON ISLANDS	<b>[1]</b> SOUTH AFRICA
<b>[1]</b> SOUTH EAST ASIA	<b>[2]</b> TAIWAN
<b>[1]</b> TANZANIA, UNITED REPUBLIC OF	<b>[1]</b> TOKELAU
<b>[1]</b> TONGA	<b>[1]</b> TUVALU
<b>[4]</b> UNITED STATES	<b>[1]</b> UNITED STATES MINOR OUTLYING ISLANDS
<b>[1]</b> VANUATU	<b>[1]</b> WALLIS AND FUTUNA

**Red List assessed species 14: CR = 3; EN = 1; VU = 5; NT = 1; LC = 4;**

[Crocidura trichura](#) **CR**

[Ducula whartoni](#) **VU**

[Fregata andrewsi](#) **CR**

[Lioscincus tillieri](#) **NT**

[Ninox natalis](#) **VU**

[Simiscincus aurantiacus](#) **VU**

[Tropidoscincus variabilis](#) **LC**

[Cryptoblepharus novocaledonicus](#) **LC**

[Emoia nativitatis](#) **CR**

[Lacertoides pardalis](#) **VU**

[Litoria fallax](#) **LC**

[Papasula abbotti](#) **EN**

[Sterna fuscata](#) **LC**

[Zosterops natalis](#) **VU**

## BIBLIOGRAPHY

**93** references found for *Anoplolepis gracilipes*

### Management information

Global Invasive Species Database (GISD) 2026. Species profile *Anoplolepis gracilipes*. Available from: <https://iucngisd.org/gisd/species.php?sc=110> [Accessed 17 February 2026]

[ABC Online, 2005. Christmas Island, Yellow Crazy Ants.](http://www.abc.net.au/nature/island/ep2/locals/3.htm)

**Summary:** Available from: <http://www.abc.net.au/nature/island/ep2/locals/3.htm> [Accessed 18 Jan 2005]

[AntWeb, 2006. \*Anoplolepis gracilipes\*](http://antweb.org)

**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 20 April 2006]

The species page is available from:

<http://antweb.org/getComparison.do?rank=species&genus=anoplolepis&name=gracilipes&project=&project=> [Accessed 2 May 2006]

[Commonwealth of Australia, 2006a. Threat abatement plan to reduce the impacts of tramp ants on biodiversity in Australia and its territories, Department of the Environment and Heritage, Canberra.](http://www.environment.gov.au/biodiversity/threatened/publications/tap/pubs/tramp-ants.pdf)

**Summary:** This plan establishes a national framework to guide and coordinate Australia's response to tramp ants, identifying the research, management, and other actions necessary to ensure the long term survival of native species and ecological communities affected by tramp ants. It identifies six national priority species as an initial, but flexible, list on which to focus attention. They are the red imported fire ant (*Solenopsis invicta*), tropical fire ant (*S. geminata*), little fire ant (*Wasmannia auropunctata*), African big-headed ant (*Pheidole megacephala*), yellow crazy ant (*Anoplolepis gracilipes*), and Argentine ant (*Linepithema humile*).

Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/tap/pubs/tramp-ants.pdf> [Accessed 17 November 2009]

[Commonwealth of Australia, 2006b. Background document for the threat abatement plan to reduce the impacts of tramp ants on biodiversity in Australia and its territories, Department of the Environment and Heritage, Canberra.](http://www.environment.gov.au/biodiversity/threatened/publications/tap/pubs/tramp-ants-background.pdf)

**Summary:** This background document to the Threat abatement plan to reduce the impacts of tramp ants on biodiversity in Australia and its territories provides supporting information on a range of issues such as tramp ant biology, population dynamics, spread, biodiversity impacts and management measures.

Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/tap/pubs/tramp-ants-background.pdf> [Accessed 17 November 2009]

[Commonwealth Scientific and Industrial Research Organisation \(CSIRO\) Media Release - Ref PR04\\_123 - Jul 16, 2004. Yellow crazy ant eradication begins in Arnhem Land](http://www.csiro.au/files/mediaRelease/mr2004/CrazyAnts.htm)

**Summary:** Available from: <http://www.csiro.au/files/mediaRelease/mr2004/CrazyAnts.htm> [Accessed 18 May 2007]

[Department of Environment and Climate Change \(DECC\), NSW., 2005. Invasion of the yellow crazy ant - key threatening process declaration](http://www.nationalparks.nsw.gov.au/npws.nsf/content/yellow_crazy_ant_ktp)

**Summary:** Available from: [http://www.nationalparks.nsw.gov.au/npws.nsf/content/yellow\\_crazy\\_ant\\_ktp](http://www.nationalparks.nsw.gov.au/npws.nsf/content/yellow_crazy_ant_ktp) [Accessed 18 May 2007]

[Department of Primary Industries and Fisheries \(DPIF\), 2005. Weeds & pest animal management. Crazy ant \*Anoplolepis gracilipes\*](http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xml/4790_4538_ENA_HTML.htm)

**Summary:** Available from: [http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xml/4790\\_4538\\_ENA\\_HTML.htm](http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xml/4790_4538_ENA_HTML.htm) [Accessed 30 April 2008]

Haines, I. H. and Haines, J. B. 1978. Pest status of the crazy ant, *Anoplolepis longipes* (Jerdon) (Hymenoptera: Formicidae), in the Seychelles. *Bull. Entomol. Res.* 68: 627-638.

Haines, I. H. and Haines, J. B. 1979. Residual sprays for the control of the crazy ant *Anoplolepis longipes* (Jerd.) in the Seychelles. *Pesticide Science* 10: 201-206.

Haines, I. H. and Haines, J. B. 1979. Toxic bait for the control of *Anoplolepis longipes* (Jerdon) (Hymenoptera: Formicidae) in the Seychelles. II. Effectiveness, specificity and cost of baiting in field applications. *Bulletin of Entomological Research* 69:

Haines, I. H. and Haines, J. B. 1979. Toxic bait for the control of *Anoplolepis longipes* (Jerdon) (Hymenoptera: Formicidae) in the Seychelles. III. Selection of toxicants. *Bulletin of Entomological Research* 69: 203-211.

Haines, I. H. and Haines, J. B. 1979. Toxic bait for the control of *Anoplolepis longipes* (Jerdon) (Hymenoptera: Formicidae) in the Seychelles. I. The basic attractant carrier, its production and weathering properties. *Bulletin of Entomological Research* 69:

Haines, I. H., Haines, J. B. and Cherrett, J. M. 1994. The impact and control of the Crazy ant, *Anoplolepis longipes* (Jerd.), in the Seychelles. pp. 206-218 in Williams, D. F. (ed.), *Exotic ants. Biology, impact, and control of introduced species*. Westview, Boulder, CO.

[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.](http://www.bah.govt.nz/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](http://www.landcareresearch.co.nz/research/biocons/invertebrates/Ants/ant_pest_risk.asp) [Accessed 20 May 2007]



Harris, R.J. & Barker, G. (2007). Relative risk of invasive ants (Hymenoptera: Formicidae) establishing in New Zealand. *New Zealand Journal of Zoology* 34: 161-178.

[Hoffmann, B., pers.comm 2007a. North east Arnhem Land YCA Eradication Protocols](#)

**Summary:** The eradication project in NE Arnhem Land is a collaboration between Dhimurru Land Management Aboriginal Corporation, CSIRO, Alcan Gove, Department of Environment and Heritage, Northern Territory Government, Indigenous Land Corporation and the Northern Land Council. The project which began in 2004, is expected to last for 4 years.

The yellow crazy ant eradication project in northeast Arnhem Land is the largest eradication project for this ant on mainland Australia. In the interest of sharing knowledge of invasive ant management, Dr. Ben Hoffmann has provided a brief project description as well as the project protocols here for public use. The project protocols are dynamic, and as such are updated from time to time as new knowledge is obtained or as requirements change.

Any queries relating to these documents can be directed to Ben.Hoffmann@csiro.au

[Hoffmann, B., pers.comm., 2007b. North east Arnhem Land Yellow crazy ant eradication project](#)

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Any queries relating to these documents can be directed to Ben.Hoffmann@csiro.au

Holway, D.A., Lach, L., Suarez, A.V., Tsutsui, N.D. and Case, T.J. 2002. The Causes and Consequences of Ant Invasions, *Annu. Rev. Ecol. Syst.* 33: 181-233.

[IUCN 2010. IUCN Red List of Threatened Species. Version 2010.4.](#)

**Summary:** The IUCN Red List of Threatened Species provides taxonomic, conservation status and distribution information on taxa that have been globally evaluated using the IUCN Red List Categories and Criteria. This system is designed to determine the relative risk of extinction, and the main purpose of the IUCN Red List is to catalogue and highlight those taxa that are facing a higher risk of global extinction (i.e. those listed as Critically Endangered, Endangered and Vulnerable). The IUCN Red List also includes information on taxa that are categorized as Extinct or Extinct in the Wild; on taxa that cannot be evaluated because of insufficient information (i.e. are Data Deficient); and on taxa that are either close to meeting the threatened thresholds or that would be threatened were it not for an ongoing taxon-specific conservation programme (i.e. are Near Threatened).

Available from: <http://www.iucnredlist.org/> [Accessed 25 May 2011]

[Krushelnicky, P.D., Loope, L.L. and Reimer, N.J. 2005. The Ecology, Policy, and Management of Ants in Hawaii, Proc. Hawaiian Entomol. Soc. 37.](#)

**Summary:** Available from: [http://www.ctahr.hawaii.edu/peps/museum/ant\\_website/Krushelnicky\\_et\\_al\\_Ant\\_review2005.pdf](http://www.ctahr.hawaii.edu/peps/museum/ant_website/Krushelnicky_et_al_Ant_review2005.pdf) [Accessed March 10 2007]

Lewis, T., Cherrett, J. M., Haines, I., Haines, J. B. and Mathias, P. L. 1976. The crazy ant (*Anoplolepis longipes* (Jerd.) (Hymenoptera, Formicidae)) in Seychelles, and its chemical control. *Bull. Entomol. Res.* 66: 97-111.

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

McGregor, A. J. and Moxon, J. E. 1985. Potential for biological control of tent building species of ants associated with *Phytophthora palmivora* pod rot of cocoa in Papua New-Guinea. *Annals of Applied Biology* 107(2): 271-278.

Ness, J. H and Bronstein, J. L. 2004. The Effects of Invasive Ants on Prospective ant Mutualists, *Biological Invasions* 6: 445-461.

[Nishida, G. M. and Evenhuis, N. L. 2000. Arthropod pests of conservation significance in the Pacific: A preliminary assessment of selected groups. In Invasive Species in the Pacific: A Technical Review and Draft Regional Strategy. South Pacific Regional Environment Programme, Samoa: 115-142.](#)

**Summary:** Discusses over a dozen of the worst arthropod pests in the South Pacific, with particular emphasis on ants and their control and management.

O Dowd, D. J. 1999. Crazy ant attack. *Wingspan* 9(2): 7.

O Dowd, D. J., Green, P. T. and Lake, P. S. 1999. Status, impact, and recommendations for research and management of exotic invasive ants in Christmas Island National Park. Darwin, Northern Territory, Environment Australia: 50 pp, 8 figures, 2 plates.

Oi, D.H., Vail, K.M. and Williams, D.F. 2000. Bait distribution among multiple colonies of Pharaoh ants (Hymenoptera: Formicidae), *Journal of Economic Entomology* 93(4): 1247-1255.

O Dowd, D.J., Green, P.T. and Lake, P.S. 1999. Status, Impact, and Recommendations for Research and Management of Exotic Invasive Ants in Christmas Island National Park. Centre for the Analysis and Management of Biological Invasions: Clayton (Victoria, Australia).

O Dowd, D. J., Green, P. T. and Lake, P. S. 1999. Status, Impact, and Recommendations for Research and Management of Exotic Invasive Ants in Christmas Island National Park. Report to Environment Australia.

[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.

Rao, N. S. and Veeresh, G. K. 1990. Management of crazy ant, *Anoplolepis longipes* (Jerdon). *Indian J. Plant Prot.* 18: 105-8.

Reimer, N. J. 1994. Distribution and impact of alien ants in vulnerable Hawaiian ecosystems. In *Exotic ants: biology, impact, and control of introduced species*. Williams, D. F. (ed) Boulder, Colorado, Westview Press: 11-22.

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]

Slip, D. J., 2002. [Control of the invasive exotic yellow crazy ant \(\*Anoplolepis gracilipes\*\) on Christmas Island, Indian Ocean. In \*Turning the tide: the eradication of invasive species\*: 406 - 414 IUCN SSC Invasive Species Specialist Group. IUCN. Gland, Switzerland and Cambridge, UK.](#)

**Summary:** Eradication case study In Turning the tide: the eradication of invasive species.

Stanaway, M. A., Zalucki, M. P., Gillespie, P. S. and Rodriguez, C. M. 2001. Pest risk assessment of insects in sea cargo containers. Australian Journal of Entomology 40: 180-192.

Stanley, M. C. 2004. [Review of the efficacy of baits used for ant control and eradication. Landcare Research Contract Report: LC0405/044. Prepared for: Ministry of Agriculture and Forestry.](#)

**Summary:** Available from: <http://www.landcareresearch.co.nz/research/biocons/invertebrates/ants/BaitEfficacyReport.pdf> [Accessed 10 December 2005]

Veeresh, G. K. 1987. Pest status of crazy ant *Anoplolepis longipes* (Jerdon) in Karnataka, India, and causes for its outbreak. In Chemistry and biology of social insects. J. Eder and H. Rembold. Munich, Peperny: 667-668.

Veeresh, G. K. and Gubbaiah 1984. A report on the Crazy ant (*Anoplolepis longipes* Jerdon) menace in Karnataka. J Soil Biol Ecol 4: 65-73.

Walker, K. 2006. [Yellow crazy ant \(\*Anoplolepis gracilipes\*\) 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=84> [Accessed 6 October 2006]

Way, M. J. 1953. The relationship between certain ant species with particular reference to biological control of the coreid, *Theraptus* spp. Bull. Entomol. Res. 44: 669-691.

Way, M. J. and Khoo, K. C. 1992. Role of ants in pest management. Annu. Rev. Entomol. 37: 479-503.

Williams, D. F. 1994. Exotic ants: biology, impact, and control of introduced species. Westview Press, Boulder, Colorado.

## General information

Baker, G. L. 1976. The seasonal life cycle of *Anoplolepis longipes* (Jerdon) (Hymenoptera: Formicidae) in a cacao plantation and under brushed rain forest in the northern district of Papua New Guinea. Insectes Soc. 23: 253-261.

Blard, F. 2006. Les fourmis envahissantes de l'île de la Réunion: Interaction compétitives et facteurs d'invasion. Thèse de doctorat. Université de la Réunion. 97 pp

**Summary:** Cette étude porte sur les relations compétitives entre trois espèces ainsi que sur les facteurs liés à leur succès dans l'invasion des milieux.

Bos, M.M., Tylmanakis, J.M., Steffan-Dewenter, I.S. & Tscharntke, T. (2008). The invasive Yellow Crazy Ant and the decline of forest ant diversity in Indonesian cacao agroforests. *Biological Invasions* 10:1399-1409.

Brown, E. S. 1959. Immature nutfall of coconuts in the Solomon Islands, I. Distribution of nutfall in relation to that of *Amblyopelta* and of certain species of ants. Bull. Entomol. Res. 50: 97-133, plates 2 & 3.

Brown, E. S. 1959. Immature nutfall of coconuts in the Solomon Islands, II: Changes in ant populations and their relation to vegetation. Bull. Entomol. Res. 50: 523-558.

Bruhl, C.A. & Eltz, T. (2009). Fuelling the biodiversity crisis: species loss of ground-dwelling forest ants in oil palm plantations in Sabah, Malaysia (Borneo). *Biodiversity and Conservation*, in press.

[Convention on Biological Diversity. 2003. Pilot Assessments: The Ecological and Socio-Economic Impact of Invasive Alien Species on Island Ecosystems. Subsidiary Body on Scientific, Technical and Technological Advice \(Ninth meeting: Item 7.1 of the provisional agenda, Montreal, 10-14 November 2003\).](#)

**Summary:** Available from: <http://www.biodiv.org/doc/meetings/sbstta/sbstta-09/information/sbstta-09-inf-33-en.pdf> [Accessed 18 April 2005]

Drescher, Jochen; Heike Feldhaar and Nico Bluthgen, 2010. Interspecific Aggression and Resource Monopolization of the Invasive Ant *Anoplolepis gracilipes* in Malaysian Borneo. *Biotropica* Article In Press *gracilipes* in Malaysian Borneo

Drescher, Jochen; Nico Bluthgen and Heike Feldhaar, 2007. Population structure and intraspecific aggression in the invasive ant species *Anoplolepis gracilipes* in Malaysian Borneo. *Molecular Ecology* (2007) 16, 1453-1465

Feare, C. 1999. Ants take over from rats on Bird Island, Seychelles. *Bird Conservation International* 9: 95-96.

- Fellowes, J. R. 1994. Community structure of Hong Kong ants. Les Insectes Sociaux. 12th Congress of the International Union for the Study of Social Insects, Paris, Sorbonne, 21-27 August 1994. A. Lenoir, G. Arnold and M. Lepage. Paris, Université Paris Nord: 421.
- Fluker, S. S. 1969. Sympatric associations among selected ant species and some effects of ants on sugarcane mealybugs in Hawaii. Ph.D. thesis, University of Hawaii, 96 pp.
- Fluker, S. S. and Beardsley, J. W. 1970. Sympatric associations of three ants: *Iridomyrmex humilis*, *Pheidole megacephala*, and *Anoplolepis longipes* in Hawaii. Ann. Entomol. Soc. Am. 63: 1290-96.
- Gerlach, J. (2004). Impact of the invasive crazy ant *Anoplolepis gracilipes* on Bird Island, Seychelles. *Journal of Insect Conservation* 8: 15-25.
- Gillespie, R. and Reimer, N. 1993. The effect of alien predatory ants on Hawaiian endemic spiders. *Pacific Science* 47(1): 21-33.
- Gillespie, R.G. and Reimer, N. 1993. The Effect of Alien Predatory Ants (Hymenoptera: Formicidae) on Hawaiian Endemic Spiders (Araneae: Tetragnathidae). *Pacific Science* 47(1) 21-33.
- Green, P. T., O Dowd, D. J. and Lake, P. S. 1999. Alien ant invasion and ecosystem collapse on Christmas Island, Indian Ocean. *Aliens* 9: 2-4.
- Greenslade, P. J. M. 1971. Phenology of three ant species in the Solomon Islands. *J. Aust. Entomol. Soc.* 10: 241-252.
- Greenslade, P. J. M. 1972. Comparative ecology of four tropical ant species. *Insect. Soc.* 19: 195-212.
- Greenslade, P. J. M. and Greenslade, P. 1977. Some effects of vegetation cover and disturbance on a tropical ant fauna. *Insectes Soc.* 24: 163-182.
- Haines, I. H. and Haines, J. B. 1978. Colony structure, seasonality and food requirements of the crazy ant, *Anoplolepis longipes* (Jerd.), in the Seychelles. *Ecol. Entomol.* 3: 109-118.
- Hardy, D. E. 1979. An ecological survey of Puaaluu Stream. Part III. Report on a preliminary entomological survey of Puaaluu Stream, Maui, Coop. Nat. Park Resources Study Unit. Univ. of Hawaii, Manoa. Tech. Rept. 27: 34-39.
- Hill, M., Holm, K. Vel, T., Shah, N.J. and Matyot, P. 2003. Impact of the introduced yellow crazy ant *Anoplolepis gracilipes* on Bird Island, Seychelles *Biodiversity and Conservation* 12(9): 1969-1984.
- [ITIS \(Integrated Taxonomic Information System\), 2004. Online Database \*Anoplolepis gracilipes\*](http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=575523)
- 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=575523](http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=575523) [Accessed 22 February 2008]
- Jourdan, H., Mille, C. 2006. Les invertébrés introduits dans l'archipel océanien : espèces envahissantes et potentiellement envahissantes. Première évaluation et recommandations pour leur gestion. In M.-L. Beauvais et al. (2006) : Les espèces envahissantes dans l'archipel océanien, Paris, IRD éditions, 260 p. + cd-rom.
- Summary:** Cette synthèse sur les invertébrés envahissants et potentiellement envahissants dans l'archipel océanien a été réalisée dans le cadre d'une expertise collective menée par l'IRD.
- [Lester, Philip J. and Tavite, Alapati., 2004. Long-Legged Ants, \*Anoplolepis gracilipes\* \(Hymenoptera: Formicidae\), Have Invaded Tokelau, Changing Composition and Dynamics of Ant and Invertebrate Communities \*Pacific Science - Volume 58, Number 3, July 2004, pp. 391-401 - Article\*](#)
- Summary:** Available from: [http://muse.jhu.edu/journals/pacific\\_science/v058/58.3lester.pdf](http://muse.jhu.edu/journals/pacific_science/v058/58.3lester.pdf) [Accessed Jan 20 2006]
- Lumsden, L., Silins J., and Schulz, M. 1999. Population dynamics and ecology of the Christmas Island Pipistrelle, *Pipistrellus murrayi*, on Christmas Island. Heidelberg, Victoria, Australia, Arthur Rylah Institute for Environmental Research, Department of Natural Resources and Environment: 99.
- Majer, J. D. 1993. Comparison of the arboreal ant mosaic in Ghana, Brazil, Papua New Guinea and Australia - its structure and influence on arthropod diversity. In Hymenoptera and Biodiversity. J. LaSalle and I. D. Gauld. Wallingford, UK, CAB International: 115-141.
- Maschwitz, U., Fiala, B. and Dolling, W. R. 1987. New trophobiotic symbioses of ants with South East Asian bugs. *Journal of Natural History* 21(5): 1097-1108.
- Rajagopal, D. 1984. Observations on the natural enemies of *Odontotermes wallonensis* (Wasmann) (Isoptera: Termitidae) in South India. *J. Soil Biol. Ecol.* 4: 102-107.
- Rajagopal, D. and Musthak, Ali T. M. 1984. Predatory ants of the mound building termite, *Odontotermes wallonensis* (Wasmann) with special reference to the predatory behaviour of *Leptogenys processionalis* (Jerdon). *J. Bombay Nat. Hist. Soc.* 81: 721-725.
- Rao, N. S. and Veeresh, G. K. 1991. Nesting and foraging habits of crazy ant *Anoplolepis longipes* (Jerdon) (Hymenoptera: Formicidae). *Environmental Ecology* 9(3): 670-677.
- Rao, N. S. and Veeresh, G. K. 1991. Some observations on the biology and behaviour of crazy ant, *Anoplolepis longipes* (Jerdon) (Hymenoptera: Formicidae). *Entomon.* 16(4): 261-267.
- Rao, N. S., Veeresh, G. K. and Viraktamath, C. A. 1989. Association of crazy ant, *Anoplolepis longipes* (Jerdon) with different fauna and flora. *Indian Journal of Ecology* 16(2): 205-208.
- Rao, N. S., Veeresh, G. K. and Viraktamath, C. A. 1991. Dispersal and spread of crazy ant *Anoplolepis longipes* (Jerdon) (Hymenoptera: Formicidae). *Environmental Ecology* 9(3): 682-686.
- Reimer, N. J., Beardsley, J. W. and Jahn, G. 1990. Pest ants in the Hawaiian Islands. Applied myrmecology, a world perspective. In Vander Meer, R. K., Jaffe, K. and Cedeno, A., Boulder, CO, Westview Press: 40-50.
- Room, P. M. 1975. Diversity and organization of the ground foraging ant faunas of forest, grassland and tree crops in Papua New Guinea. *Australian Journal of Zoology* 23: 71-89.
- Room, P. M. 1980. Insect fauna of oil palm in the Northern Province of Papua New Guinea. *Papua New Guinea Agric. J.* 31: 1-4.
- Sakimura and Higa 1967. The long-legged ant, new to pineapple. *Pineapple Research Institute News* 15: 48-53.
- [Sarnat E.M. and E. P. Economo, 2011. Fiji Ants. The online home of Fiji's Myrmecofauna.](#)
- Summary:** Available from: <http://www.fijiants.org/> [Accessed 7 February 2011]
- Soans, A. B. and Soans, J. S. 1971. A case of intergeneric competition and replacement in the ants *Oecophylla smaragdina* (Fab.) and *Anoplolepis longipes* (Jerdon) (Hymenoptera: Formicidae). *Journal of the Bombay Natural History Society* 68: 289-290.
- Van der Groot, P. 1916. Verdere onderzoekingen omtrent de oeconomische beteekenis der gramang-mier. Mededeelingen van het Proefstation Midden-Java, Salatiga 22: 1-222.
- Vander Meer, R. K., Jaffe, K. and Cedeno, A. 1990. Applied Myrmecology: A World Perspective. Boulder, CO, Westview Press.



- Veeresh, G. K. 1990. Pest ants of India. Applied Myrmecology, A World Perspective. In Vander Meer, R. K., Jaffe, K. and Cedeno, A.. Boulder, CO. 741 pp., Westview Press: 15-24.
- Way, M. J. and Khoo, K. C. 1989. Relationships between *Helopeltis theobromae* damage and ants with special reference to Malaysian cocoa smallholdings. J. Plant Prot Trop 6: 1-11.
- Wetterer, J. K. 1997. Ants On Cecropia in Hawaii. Biotropica 29(1): 128-132.
- Wetterer, J. K. 1998. Nonindigenous ants associated with geothermal and human disturbances in Hawaii i Volcanoes National Park. Pacific Science 52(1): 40-50.
- Wetterer, J. K. (2005). Worldwide distribution and potential spread of the long-legged ant, *Anoplolepis gracilipes* (Hymenoptera: Formicidae). *Sociobiology* 45(1): 77-97.
- Wilson, E. O. and Taylor, R. W. 1967. The ants of Polynesia (Hymenoptera: Formicidae). Pacific Insects Monog. 14: 1-109.
- Young, G. R. 1996. The Crazy Ant, *Anoplolepis longipes* (Jerdon) (Hymenoptera: Formicidae) on coconut palms in New Guinea. Papua New Guinea Journal of Agriculture, Forestry and Fisheries. 39(2): 10-13.