GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Pheidole megacephala***

Pheidole megacephala 简体中文 正體中文 **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae

Common name Grosskopfameise (German), big-headed ant (English), coastal brown-ant (English), brown house-ant (English), lion ant (English)

Synonym
Myrmica trinodis , Losana 1834
Formica megacephala , Fabricius 1793
Formica edax , Forskal 1775
Oecophthora perniciosa , Gerstacker 1859
Oecophthora pusilla , Heer 1852
Myrmica suspiciosa , Smith 1859
Atta testacea , Smith 1858
Pheidole janus , F. Smith
Pheidole laevigata , Mayr
Myrmica laevigata , F. Smith

Similar species

Summary Pheidole megacephala is one of the world's worst invasive ant species. Believed to be native to southern Africa, it is now found throughout the temperate and tropical zones of the world. It is a serious threat to biodiversity through the displacement of native invertebrate fauna and is a pest of agriculture as it harvests seeds and harbours phytophagous insects that reduce crop productivity. Pheidole megacephala are also known to chew on irrigation and telephone cabling as well as electrical wires.

view this species on IUCN Red List

Species Description
It is a small ant (minor workers approximately 2mm long and major workers 3-4mm long), ranging in colour from a pale yellow to a very dark brown. The first antennal segment (scape) of the minor workers far exceeds the top of the head, and is covered in many long hairs. There are no spines on the front of the body (pronotum), but two very small spines on the rear of the body (propodeum) facing almost directly up. There are many small punctations on the rear side of the body, and side of the head, but remaining body areas are smooth and shiny. The entire body is covered in many sparse, long hairs. The second waist segment (post petiole) is conspicuously swollen.
Please click on *AntWeb: Pheidole megacephala* 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 comare: head, profile, dorsal, or label.
Please see PaDIL (Pests and Diseases Image Library) Species Content Page *Ants: Coastal brown-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 *Pheidole megacephala* contains an overview, diagnostic features, comparision charts, images, nomenclature and links. (Sarnat, 2008)

Lifecycle Stages
This ant has a complete life-cycle, and developmental time and longevity of each stage is highly dependent on temperature. Incubation time of eggs ranges from13-32 days. Duration of the larval stage ranges from 23-29 days. Duration of the pupal stage ranges from 10-20+ days. Lifespans of minor workers have been shown to be 78 days at 21C, and 38 days at 27C.

Reproduction
Sexual reproduction by fertile queens. Insemination of virgin queens occurs once within the parent colony, then the male dies. Reproduction is year-round, but would vary according to climatic conditions of each locality. Queens have been documented to lay up to 292 eggs per month.

Nutrition
Omnivorous. Will capture and kill invertebrates and small vertebrates (e.g. bird hatchlings). Harvests seeds, and tends phytophagous insects. General scavenger.

General Impacts
This ant displaces most native invertebrate faunas directly through aggression, and as such is a serious threat to biodiversity. Evidence also exists of reductions in vertebrate populations where this ant is extremely abundant. Effects on plants and horticultural crops can be direct through the likes of seed harvesting, or indirect through the likes of harbouring phytophagous insects which reduce plant productivity. It is known to facilitate the invasion of introduced plant species. This ant is known to chew on irrigation, telephone cabling and electrical wires.

Management Info
Preventative measures: Preventative management is the best option stopping the spread of this species, with attention focused on the movement of soils, particularly in potted plants, and the movement of all other materials from infested areas. The Pacific Ant Prevention\r Programme is a proposal prepared for the Pacific Plant Protection Organisation and Regional \r\r\nTechnical Meeting For Plant Protection. This plan aims to prevent the red imported fire ant \r\r\nand other invasive ant species with economic, environmental and/or social impacts, entering \r\r\nand establishing in or spreading between (or within) countries of the Pacific Region.
\r\nPhysical: Fire may play an important role in controlling this ant in many areas by producing an environment less favourable to this ant, but providing a selective advantage to aggressive native ant species, or by direct destruction of colonies.
\r\nChemical: Good control is achieved using the bait 'Amdro' applied over the entire infested area. Complete eradication can be achieved within 24 hours. A major eradication event within Kakadu National Park, Australia, was completed by the end of 2002. Chemical control using general insecticides and chlorinated hydrocarbons such as DDT, heptachlor and Mirex® was the favoured option until relatively recently, with most of these chemicals now phased out due to environmental consequences. Latest options include the insect growth regulators (IGRs), methoprene, fenoxycarb and pyriproxyfen which regress ovarian tissues of fertile queens turning them sterile, and the stomach toxicant hydramethylnon, which kills all workers and reproductives that come into contact with it.

Pathway
Sailing ships in the 18th and 19th centuries.General freight and household movements from infested areas.

Principal source:

Compiler: IUCN SSC Invasive Species Specialist Group
Updates with support from the Overseas Territories Environmental Programme (OTEP) project XOT603, a joint project with the Cayman Islands Government - Department of Environment

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ALIEN RANGE

[1] AMERICAN SAMOA
[8] AUSTRALIA
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[3] JAPAN
[3] KIRIBATI
[1] MARSHALL ISLANDS
[1] MEXICO
[1] MOZAMBIQUE
[1] NEW CALEDONIA
[1] NIUE
[1] NORTHERN MARIANA ISLANDS
[1] PAPUA NEW GUINEA
[1] PITCAIRN
[1] PUERTO RICO
[2] SAINT HELENA
[1] SINGAPORE
[1] SOUTH AFRICA
[1] TAIWAN
[1] TOKELAU
[1] TUVALU
[6] UNITED STATES
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[1] WALLIS AND FUTUNA
[2] ANGOLA
[1] BERMUDA
[1] CAROLINE ISLANDS
[1] CHINA
[1] COTE D'IVOIRE
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[5] FRENCH POLYNESIA
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[1] MADAGASCAR
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[1] SAMOA
[1] SOLOMON ISLANDS
[1] SRI LANKA
[1] TANZANIA, UNITED REPUBLIC OF
[1] TONGA
[1] UNITED KINGDOM
[1] UNITED STATES MINOR OUTLYING ISLANDS
[1] VIET NAM

Red List assessed species 1: CR = 1;

Anas laysanensis **CR**

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51 references found for **Pheidole megacephala**

Managment information
AntWeb, 2006. *Pheidole megacephala*
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.
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=pheidole&name=megacephala&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.
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 fi re 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.
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]
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]
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IUCN/SSC Invasive Species Specialist Group (ISSG)., 2010. A Compilation of Information Sources for Conservation Managers.
Summary: This compilation of information sources can be sorted on keywords for example: Baits & Lures, Non Target Species, Eradication, Monitoring, Risk Assessment, Weeds, Herbicides etc. This compilation is at present in Excel format, this will be web-enabled as a searchable database shortly. This version of the database has been developed by the IUCN SSC ISSG as part of an Overseas Territories Environmental Programme funded project XOT603 in partnership with the Cayman Islands Government - Department of Environment. The compilation is a work under progress, the ISSG will manage, maintain and enhance the database with current and newly published information, reports, journal articles etc.
McEwen, F. L., Beardsley, J. W. Jr., Hapai, M. and Su, T. H. 1979. Laboratory tests with candidate insecticides for control of the big-headed ant, *Pheidole megacephala* (Fabricius). Proceedings of the Hawaiian Entomological Society 23: 119–123.
McGlynn, T.P. 1999. The Worldwide Transfer of Ants: Geographical Distribution and Ecological Invasions, *Journal of Biogeography 26*(3): 535-548.
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Summary: Discusses over a dozen of the worst arthropod pests in the South Pacific, with particular emphasis on ants and their control and management.
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.
Reimer, N. J. and Beardsley, J. W. 1990. Effectiveness of hydroxymethylnon and nenoxycarb for control of Big-headed ant (Hymenoptera: Formicidae), an ant associated with mealybug wilt of pineapple in Hawaii. Journal of Economic Entomology, 83: 74-80.
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Samways, M. J. 1985. Appraisal of the propeitary ant bait Amdro for control of ants in southern African citrus. Citrus and Subtropical Fruit Journal 621: 14-17.
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 &#65533; 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.
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Walker, K. 2006. Coastal brown-ant (*Pheidole megacephala*) Pest and Diseases Image Library. Updated on 28/08/2006 10:23:48 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=645 [Accessed 6 October 2006]
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