GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Monomorium pharaonis***

Monomorium pharaonis **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae

Common name fourmi pharaon (French), pharaoh ant (English)

Synonym
Atta minuta , Jerdon
Diplorhoptrum domesticum , (Shuckard)
Formica antiguensis , Fabricius
Formica pharaonis , Linnaeus
Monomorium domestica , (Shuckard)
Monomorium pharaonis , (Linnaeus)
Monomorium vastator , (Smith)
Myrmica (Monomorium) contigua , Smith
Myrmica (Monomorium) fragilis , Smith
Myrmica (Monomorium) vastator , Smith
Myrmica (Myrmecina) domestica , Shuckard
Myrmica contigua , Smith
Myrmica domestica , Shuckard
Myrmica fragilis , Smith
Myrmica pharaonis , (Linnaeus)
Myrmica unifasciata , Bostock
Myrmica vastator , Smith

Similar species

Summary

Monomorium pharaonis (the pharaoh ant) is native to Africa and has successfully invaded areas on every continent except Antarctica. It is concentrated in tropical regions but is also commonly found in temperate zones within suitable human infrastructure, especially buildings associated with the distribution or storage of food. Due to Monomorium pharaonis' ability to act as a vector for some bacterial human pathogens, its presence in hospitals is of great concern as it may increase infection rates.

view this species on IUCN Red List

Species Description
Workers of the pharaoh ants (*Monomorium pharaonis*) are approximately 2mm in length and have body colours ranging from light-brown to red. The males are the same size as the workers but are black in colour. The queens are 4mm in length and slightly darker than the workers (Nickerson and Harris 2003).
Please click on AntWeb: *Monomorium pharaonis* 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: Pharaoh ant for high quality diagnostic and overview images.
Please follow this link for the information sheet on *Monomorium pharaonis* prepared as part of 'The invasive ant risk assessment project', Harris *et al.* 2005., for Biosecurity New Zealand by Landcare Research.
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 *Monomorium pharaonis* contains an overview, diagnostic features, comparision charts, images, nomenclature and links. (Sarnat, 2008)

Notes
Apparently the name \"pharaoh ant\" originated from Linnaeus' mistaken impression that these ants were one of the biblical plagues during the time of Egyptian pharoahs (Riley 1889, in Ebeling 1996).

Lifecycle Stages
A study by Alvares and colleagues (1993) found that total egg to adult development period of the pharaoh ant (*Monomorium pharaonis*) ranged from 25 days to 54 days (greater than the respective minimum and maximum lengths reported in European populations). Eggs hatch within a week, and the larval period lasts up to 19 days. Queens live for about 12 months and non-sterile males die about 4 weeks after mating. A colony can have a population of several hundred thousand. When overcrowding becomes a problem a queen may take a few workers and immature ants and build a new nest, a mechanism known as budding or colony fission.

Habitat Description
Many introduced ants, including *Monomorium* spp., are restricted to a tropical or subtropical climates. The pharaoh ant (*Monomorium pharaonis*) is not known to invade regions with cold climates although it may be associated with human infrastructure, including climate-controlled buildings. Although its abundance in cold climates will be restricted, its continued presence represents a potential to spread to locations more suitable for ant colonisation (McGlynn 1999; Holway *et al*. 2002). \r\n
Nests are rarely found outdoors but can be found almost anywhere indoors (including light sockets, potted plants and wall cracks or crevices). They typically nest close to sources of warmth and water and many investigators have noted this tendency (Mallis 1969, in Ebeling 1996).\r\n
The effect of climatic and temperature variables on ant abundance have been suggested as important when planning eradication programmes in cold to temperate regions. In laboratory conditions the time needed to eradicate pharaoh ant populations depended on the temperature; at 26°C eradication took 3 weeks; at 8°C an eradication could take only 30 minutes (Berndt 1980). Temperatures near 0°C lead to the eradication of large colonies within 6 days, which lead the author to the suggestion that the cold temperatures of the European winter could be exploited for aiding eradications of the pharaoh ant.

Reproduction
A queen can lay up to 400 eggs in her lifetime and produces about 10 to 12 eggs per reproductive event. Larval instar development is cyclical at the colony level, suggesting reproductive bursts followed by lower reproductive activity of the queens (Alvares *et al*. 1993). The species is highly polygynous and workers are sterile. Unlike many ant species, *M. pharaonis* does not need to leave the nest to mate.

Nutrition
Pharaoh ants (*Monomorium pharaonis*) are primarily nocturnal, feeding on a variety of foods, including fats, proteins, carbohydrates and small insects. Pharaoh ants will recruit to a number of household foods, including sweets, honey, cakes, greasy foods (such as butter) and fatty foods (such as meats) (Antonelli and Akre 2003). \r\n
In laboratory trials Haack and colleagues (1995) investigated the comparative recruitment to and distribution (among workers and larvae) of protein, lipid and carbohydrate. The results were as follows:\r\n
A) Recruitment: Liquid carbohydrate was recruited too quickly, while solid carbohydrate (table sugar) was not actively recruited. Corn starch was ignored by foraging workers. Workers actively recruited to sucrose solution and solid protein (moist egg yolk powder) foods after two days of starvation, but a seven day period of starvation was necessary for active recruitment to lipids such as peanut oil (indicating that lipids may not be rapidly depleted in the metabolism of the pharaoh ant). \r\n
B) Distribution: Peanut oil and sucrose solution baits were rapidly distributed among adult workers. Peanut oil was distributed rapidly to all larval stages, while the sucrose solution and solid protein baits were distributed primarily to older larvae.

General Impacts
The pharaoh ant (*Monomorium pharaonis*) is classified as a “generalised Myrmicine” because it has generalised food and nesting requirements and defends resources if they are close to the nest (McGlynn 1999). In addition, *M. pharaonis* is known as a “tramp” species, which means it is particularly reliant on human-mediated dispersal and has a close association with humans. It frequently nests inside human structures but rarely displaces native species outside urban environments (McGlynn 1999; Holway *et al*. 2002).\r\n
M. pharaonis is a pest in many populated areas of the world. When it nests in homes, grocery stores or restaurants (which it often does) it often becomes a public nuisance. For example, in the Pacific Northwest it is a nuisance particularly in warehouses, grocery stores and other areas where food is kept (Antonelli and Akre 2003). Its presence in hospitals in of particular concern as it is a vector for the transmission of certain human bacterial pathogens (including *Streptococcus pyogenes*, *Pseudomonas aeruginosa* and *Staphylococcus epidermidis*), which commonly infect hospitalised patients (Nickerson and Harris 2003).
Please read Invasive ants impacts 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.

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 with economic, environmental or social impacts from establishing within or spreading between countries in the Pacific.
Chemical: In general, ant baits that contain a metabolic inhibitor as the active ingredient (for example hydramethylnon or sulfluramid) have a 2 to 3 day delay before significant mortality occurs, while baits that contain an insect growth regulator (for example methoprene, fenoxycarb or pyriproxyfen) have a delay of several weeks. The latter (IGRs) provide gradual long-term control, while metabolic inhibitors provide short-term, localised and rapid control. As the colonies of pharaoh ant are usually composed of several nest sites a bait containing a metabolic inhibitor (or another fast-acting toxin) may need to be placed at a greater number of sites over a wider area to compensate for the relatively low level of natural toxin spread between the workers (Oi Vail and Williams 2000).
Please follow this link for more detailed information on the management of the Argentine ant *Linepithema humile* compiled by the ISSG.

Pathway
Commercial trade (transport of potted plants) has been implicated in the spread of *M. pharaonis*.

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

Review:

Pubblication date: 2010-10-04

ALIEN RANGE

[1] AUSTRALIA
[1] BERMUDA
[1] CENTRAL AFRICAN REPUBLIC
[4] CZECH REPUBLIC
[1] FIJI
[2] GERMANY
[1] JAPAN
[1] NEW ZEALAND
[1] PORTUGAL
[1] SPAIN
[4] UNITED STATES
[1] AUSTRIA
[1] CAMEROON
[1] COSTA RICA
[1] ECUADOR
[1] GABON
[1] INDIA
[1] MADAGASCAR
[1] POLAND
[1] SAUDI ARABIA
[1] TONGA

Red List assessed species 1: NT = 1;

Oceanodroma tristrami **NT**

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AntWeb, 2006. *Monomorium pharaonis*
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]
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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]
Hooper-Bui, L.M., Appel, A.G. and Rust, M.K. 2002. Preference of food particle size among several urban ant species [Abstract], *J Econ Entomol. 95*(6): 1222-1228.
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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.
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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.
Rupes, V., Chmela, J. and Ledvinka, J. 1997. Comparison of the efficacy of baits with sulfluramid, hydramethylnon and methoprene against Pharaoh s ant [Abstract], *International Pest Control 39*(6): 189-191.
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.
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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=646 [Accessed 6 October 2006]

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