Myrmecological News	13	19-27	Vienna, April 2010

Worldwide spread of the flower ant, *Monomorium floricola* (Hymenoptera: Formicidae)

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Abstract

The flower ant, *Monomorium floricola* (JERDON, 1851), is one of the most widely distributed ants of the tropics and subtropics. Occasionally, it is also found in temperate areas in greenhouses and other heated buildings. To evaluate the worldwide spread of *M. floricola*, I compiled published and unpublished specimen records from > 1100 sites. I documented the earliest known *M. floricola* records for 119 geographic areas (countries, island groups, major Caribbean islands, US states, and Canadian provinces), including many locales for which I found no previously published records: Alaska, Anguilla, Antigua, Barbados, Barbuda, Bermuda, Cape Verde, Cayman Islands, Congo, Curaçao, Dominica, Nevis, New Zealand, Phoenix Islands, Quebec, St Kitts, St Martin, and Washington DC. Most records of *M. floricola* from latitudes above 30°, and all records above 35°, appear to come from inside greenhouses or other heated buildings.

Although widespread, *M. floricola* is rarely considered a serious pest. However, because this species is very small, slow moving, cryptically colored, and primarily arboreal, I believe that it is probably often overlooked and its abundance and ecological importance is underappreciated. *Monomorium floricola* may be particularly significant in flooded mangrove habitats, where competition with non-arboreal ants is much reduced.

Key words: Arboreal, biological invasion, exotic species, invasive species, mangrove.

Myrmecol. News 13: 19-27 (online 29 October 2009)
ISSN 1994-4136 (print), ISSN 1997-3500 (online)

Received 16 April 2009; revision received 14 September 2009; accepted 16 September 2009

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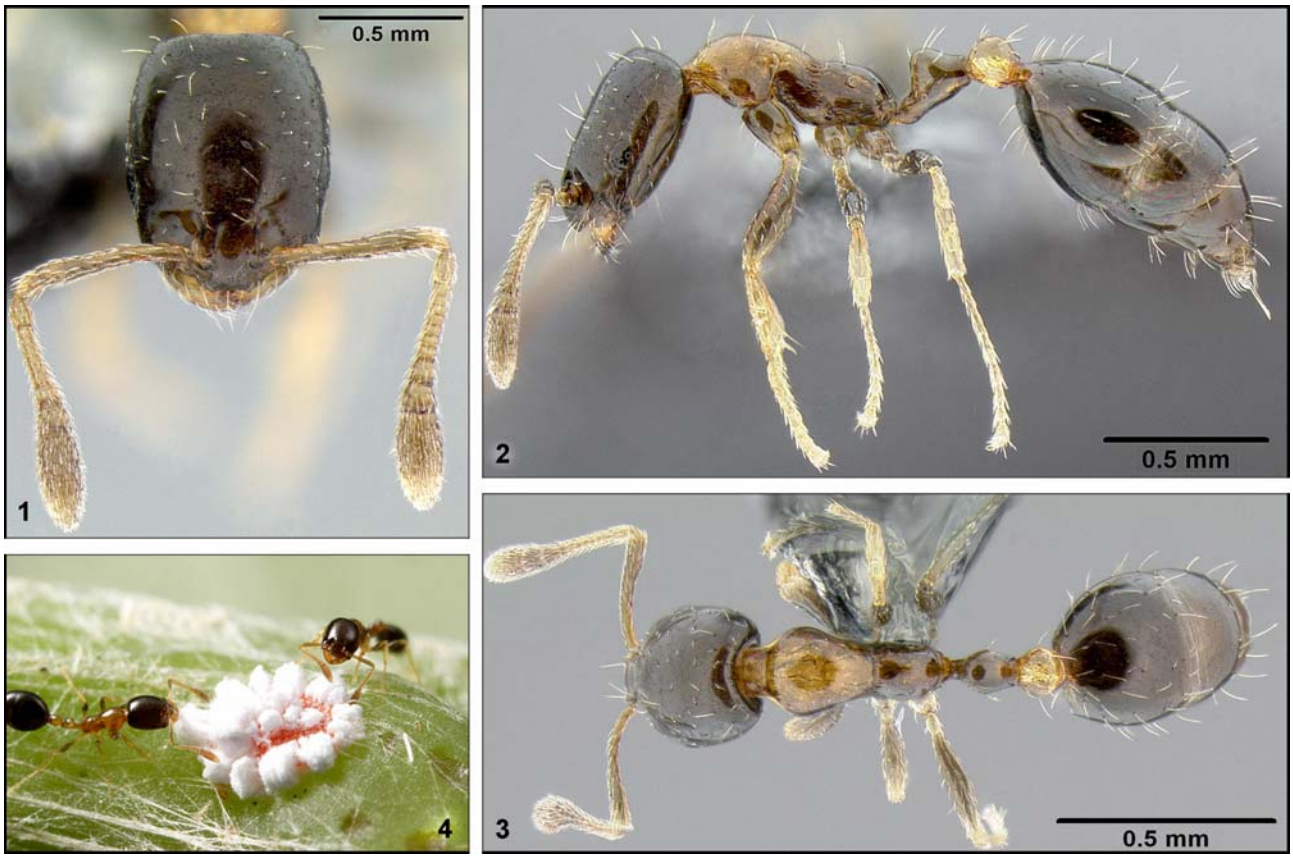
Introduction

FOREL (1911) listed 15 cosmopolitan ant species spread by human commerce that had attained, or were in the process of attaining, broad worldwide distributions. Many of these "tramp" ants have become major ecological, agricultural, and / or household pests, e.g., *Pheidole megacephala* (FABRICIUS, 1793) and *Linepithema humile* (MAYR, 1868). Others have not, as yet, developed into major problem species, e.g., *Tetramorium bicarinatum* (NYLANDER, 1846) and *Tetramorium lanuginosum* MAYR, 1870. One of FOREL's (1911) cosmopolitan ants that is rarely considered a major pest is the flower ant, *Monomorium floricola* (JERDON, 1851).

WILSON & TAYLOR (1967) wrote: "*M. floricola* is one of the most abundant and widespread of all pantropical ant species ... It is almost wholly arboreal, forming large colonies in trees and bushes in habitats of various degrees of disturbance. It is a prominent urban species in most tropical countries." On our campus here in Jupiter, Florida, *M. floricola* is inconspicuous and difficult to find in visual searches, yet this tiny species commonly recruits in large numbers to bait placed in trees. Even when found, *M. floricola* workers can be difficult to capture. When collecting *M. floricola* using an aspirator, I find workers often cling tenaciously to tree trunks and branches and must be scraped off the surface. On bark, *M. floricola* workers can disappear into the smallest crevice. Because this species is minute, slow moving, cryptically colored, and primarily arboreal, I believe that *M. floricola* is probably often overlooked, and its abundance and ecological importance is largely underappreciated. Here, I take a closer look at this tiny ant.

Identification and taxonomy. *Monomorium floricola* has small and slender monomorphic workers (1.7 - 2.0 mm total length) that are relatively simple to identify. They are distinguished by their minute size and distinctive bicolor appearance, with the pale mesosoma, petiole, and postpetiole contrasting with the uniformly dark brown head and gaster (Figs. 1 - 4). Workers of most similarly tiny *Monomorium* species are either entirely uniform in color (e.g., *Monomorium ebeninum* FOREL, 1891, *Monomorium monomorium* BOLTON, 1987) or have the head and mesosoma paler than the gaster (e.g., *Monomorium pharaonis* (LINNAEUS, 1758)). HETERICK (2006) noted that some particularly dark-headed specimens of the highly variable *Monomorium termitobium* FOREL, 1892, a species from Madagascar, closely resemble *M. floricola* in appearance. But *M. floricola* "can be distinguished by the combination of a uniformly dark brown or chocolate head and gaster. In *M. termitobium* the gaster is not uniformly dark brown or black, although it may be a dingy brownish-yellow or yellow with dark infuscation" (HETERICK 2006).

Junior synonyms of *M. floricola* include: *Monomorium angusticlava* DONISTHORPE, 1947 from New Guinea (synonymized by BOLTON 1987), *Monomorium cinnabari* ROGER, 1863 from Cuba (synonymized by WHEELER 1913), *Monomorium floreanum* STITZ, 1932 from the Galapagos Islands (synonymized by W. Brown in LINSLEY & USINGER 1966), *Monomorium impressum* SMITH, 1876 from Rodriguez Island (synonymized by BOLTON 1987), *Monomorium poecilum* ROGER, 1863 from Cuba (synonymized by EME-



Figs. 1 - 4: *Monomorium floricola*. (1) Head of worker from Lautoka, Fiji; (2) lateral view of the same worker; (3) dorsal view of the same worker; (4) two workers tending a mealybug on Isla Contadora, Panama (photos 1 - 3 by Eli Sarnat, 4 by Alex Wild).

RY 1894), and *Monomorium specularis* MAYR, 1866 from Samoa (synonymized by MAYR 1879). HETERICK (2001, 2006) synonymized the two remaining subspecies of *M. floricola*: *Monomorium floricola furinum* FOREL, 1911 from Sri Lanka and *Monomorium floricola philippinense* FOREL, 1910 from the Philippines, though HETERICK (2001, 2006) did not examine the types of either.

BOLTON (1987) placed *M. floricola* in the *Monomorium monomorium* species-group, a predominantly Afrotropical group with 69 known species from tropical Africa and "an unknown but quite large number" of species in other zoogeographical regions (BOLTON 1987). Within the *M. monomorium* group, BOLTON (1987) defined nine Afrotropical species-complexes, but *M. floricola* did not belong to any of these. Instead, BOLTON (1987) placed *M. floricola* in the *M. boerorum* FOREL, 1910 complex, "a large complex of 21 species comprising all those forms which do not fit any of the above complexes, and hence merely lumped here for convenience."

Common name. JERDON (1851) named this species *floricola* (Latin for flower or floral), having observed the ant "in small numbers on flowers and leaves." Few authors have used any common name for *M. floricola*. BARTH (1953) and SELLENSCHLO (1991a, b, 1994) used the German common name Braunrote Blütenameise (= brown-red flower ant) for *M. floricola*. Similarly, NAUMANN (1993) listed brownish-red flower ant as a common name for *M. floricola* in Australia. Recently, DEYRUP & al. (2000) proposed a new common name for *M. floricola*: the "bicolored trailing ant," with "trailing ant" the common name designated for the genus *Monomorium*. Although *M. floricola* is distinctly bicolored, so are many other *Monomorium* species (usually with the head and mesosoma paler than the gaster, e.g., *M. pharaonis*). In addition, the common name "bicolored trailing ant" would seem more appropriate for *Monomorium bicolor* EMERY, 1877.

I have used the common name "flower ant" for *M. floricola*, based on its Latin name. This simple common name is distinctive and should not be confused with that of any other ant. Also, this common name fits well with the inconspicuous and unappreciated "wall flower" nature of this species. In addition, *M. floricola* is known to feed on the nectar of flowers (e.g., GUERRANT & FIEDLER 1981, HABER & al. 1981, JUNKER & al. 2007).

Methods

I documented the worldwide range of *M. floricola* using both published and unpublished records. Unlike some other tramp ant species, *M. floricola* is relatively easy to identify correctly, and therefore identifications in the literature generally appear to be reliable. I obtained unpublished site records from museum specimens in the collections of the American Museum of Natural History (AMNH), the Archbold Biological Station (ABS), the British Natural History Museum (BMNH), the Museum of Comparative Zoology (MCZ), the Oxford University Natural History Museum (ONHM), and the Smithsonian Institution's National Museum of Natural History (SI). Stefan Cover confirmed iden-

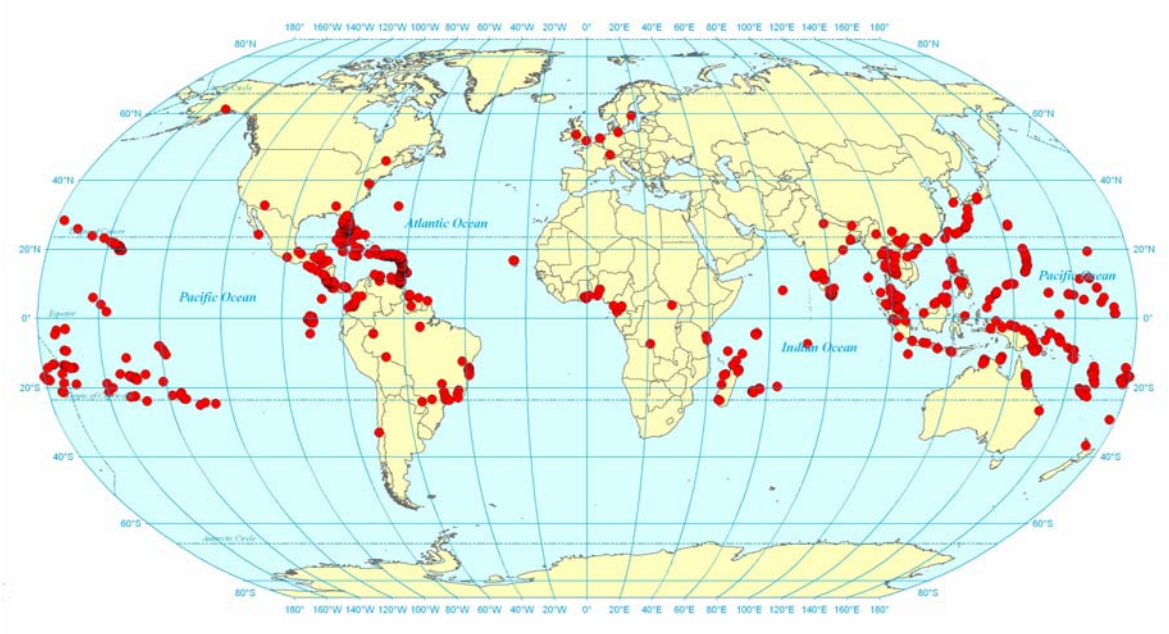


Fig. 5: Worldwide distribution of *Monomorium floricola*.

tifications of all MCZ specimens. In addition, I used on-line databases with specimen records from the Australian National Insect Collection (ANIC), California Academy of Science (CAS), and Essig Museum at UC Berkeley (UCB). I also received unpublished site records from J. Woinarski (Australia), B. Guénard (Quebec), J. Fellowes (Hong Kong, Hainan), D. Ward (Phoenix Islands), and G. Dlussky (Samoa). Finally, I collected *M. floricola* specimens on numerous Pacific, Atlantic, and Caribbean Islands, and in Florida (e.g., WETTERER 2002, WETTERER & VARGO 2003).

I obtained geographic coordinates for collection sites from published references, specimen labels, maps, or geography web sites (e.g., earth.google.com, www.tageo.com, and www.fallingrain.com). If a site record listed a geographic region rather than a "point locale," and I had no other record for this region, I used the coordinates of the largest town within the region or, in the case of small islands and natural areas, the center of the region. I did not map records of *M. floricola* on boats or intercepted in transit by quarantine inspectors. For some sites, it is not clear whether records come from established, transient, or indoor populations. Sometimes, I had to infer collection dates of specimens based on data from other sources, e.g., specimens collected by Charles T. Bingham in Burma must predate Bingham's retirement to London in 1894.

Results

I compiled published and unpublished specimen records from > 1100 sites worldwide (Fig. 5). I documented the earliest known *M. floricola* records for 119 geographic areas (countries, island groups, major Caribbean islands, US states, and Canadian provinces), including many locales for which I found no previously published records: Alaska, Anguilla, Antigua, Barbados, Barbuda, Bermuda, Cape Verde, Cayman Islands, Congo, Curaçao, Dominica, Nevis, New Zealand, Phoenix Islands, Quebec, St Kitts, St Martin, and Washington DC (Fig. 5; Tabs. 1 - 6).

In tropical Asia, *M. floricola* is now known from all countries except Bangladesh and Cambodia (Tab. 1). In tropical Oceania, *M. floricola* has been found in all island groups except Nauru and Tuvalu (Tab. 2). In my recent collections in the West Indies, I collected this species on virtually every island I visited (Tab. 4). The only major West Indian island group remaining without *M. floricola* records is the Turk and Caicos Islands, a group that I have not yet surveyed. A lack of records from these few tropical Asian, Oceania, and West Indian countries almost certainly reflects poor sampling rather than absence of *M. floricola*.

There are no records of *M. floricola* from West Asia, and very few from continental Africa (Fig. 5), though again, this may be due to poor sampling. It seems likely that thorough surveys of many port cities in tropical Africa would find *M. floricola*.

Most records of *M. floricola* from latitudes above 30°, and all records above 35°, appear to come from inside greenhouses (e.g., the Biodôme in Montréal and Biosphere 2 in Arizona) or other heated buildings (e.g., in Zurich and Washington DC). The highest latitude record came from Anchorage, Alaska (61.2° N; see Tab. 6). The label indicated that the specimen had been collected "on dried meat," so it is possible that it was collected in quarantine on imported meat.

Discussion

Monomorium floricola is one of the world's most broadly distributed tramp ants. It is widespread in tropical regions of both the Old and New World (Fig. 5). *Monomorium floricola* records are also common in subtropical parts of southern Japan and peninsular Florida (Fig. 5). In addition, *M. floricola* is occasionally found in greenhouses and other heated buildings in temperate areas, primarily Europe and North America. These temperate records, however, are very few compared with those of its congener *Monomorium pharaonis* (the pharaoh ant), a tropical ant with indoor records from almost every country in Europe and state in the US (J.K. Wetterer, unpubl.).

Tab. 1: Earliest known records for *Monomorium floricola* from Australia, Asia, and neighboring islands. Unpublished records include collector, museum source, and site. BMNH = Natural History Museum in London, SI = Smithsonian Institution.

	Earliest record
India	≤ 1851 (JERDON 1851, type locale)
Malaysia	1865 - 1867 (MAYR 1872 as *M. speculare*)
Burma / Myanmar	≤ 1894 (BOLTON 1987)
Sri Lanka	≤ 1894 (BINGHAM 1896)
Indonesia	≤ 1900 (EMERY 1900)
Papua New Guinea	≤ 1901 (FOREL 1901a as *M. speculare*)
Philippines	≤ 1910 (FOREL 1910 as *M. floricola philippinensis*)
Australia	1910 - 1913 (FOREL 1915)
Singapore	1913 (VIEHMEYER 1915)
Vietnam	1925 (WHEELER 1927)
Taiwan	≤ 1929 (WHEELER 1929)
Christmas Island	1933 (DONISTHORPE 1935)
Japan	1945 (A.B. Hardcastle, SI): Takabanare
BIOT	1971 (A.M. Hutson, BMNH): Diego Garcia
Korea	≤ 1983 (KIM & KIM 1983)
China	≤ 1995 (WU & WANG 1995)
Hainan Island	≤ 1995 (WU & WANG 1995)
Laos	1995 (RAPUSAS & al. 2006)
Hong Kong	1996 (J. Fellowes, pers. comm.): Mui Wo
Thailand	1998 (KRITSANEEPAIBOON & SAIBOON 2000)
Brunei	1999 - 2000 (EGUCHI & YAMANE 2003)

The worldwide spread of *M. floricola* is in some respects surprising given its biology. The queens of *M. floricola* are wingless and thus cannot disperse aerially. Instead, new colonies are formed through budding, where a fragment of a large colony separates to found a new colony (SNELLING 2005). The tiny *M. floricola* workers are very slow moving, severely limiting overland dispersal. Other life history characters, however, facilitate dispersal. Colonies of *M. floricola* are polygynous (with multiple fertile queens), polydomous (workers of one colony may be divided among multiple small nest sites), and can nest in the tiniest cavities. This allows colony fragments that include queens to be readily transported inside floating vegetation (e.g., branches, logs, and coconuts), and more recently inside human transported cargo.

Tab. 2: Earliest known records for *Monomorium floricola* from Oceania. + = no known published record. Abbreviations as in Tab. 1.

	Earliest record
Samoa	≤ 1866 (MAYR 1866 as *M. specularis*)
Tonga	≤ 1876 (MAYR 1876 as *M. speculare*)
Hawaii	≤ 1886 (BLACKBURN & CAMERON 1887 as *M. specularis*)
New Caledonia	1911 - 1912 (EMERY 1914)
Mariana Islands	≤ 1912 (WHEELER 1912)
Fiji	1915 - 1916 (MANN 1921)
Wake Island	1923 (TIMBERLAKE 1926)
Society Islands	~ 1924 (WILSON & TAYLOR 1967)
Line Islands	1924 (WILSON & TAYLOR 1967)
Tokelau	1924 (WILSON & TAYLOR 1967)
Cook Islands	1925 (WILSON & TAYLOR 1967)
Vanuatu	1929 (L.E. Cheesman, BMNH): Ounoua
Marquesas Islands	≤ 1933 (WHEELER 1933)
Austral Islands	1934 (WILSON & TAYLOR 1967)
Gambier Islands	1934 (WILSON & TAYLOR 1967)
Tuamotu Islands	1934 (WILSON & TAYLOR 1967)
Solomon Islands	1934 (Pagden, BMNH): Morovo Lagoon
Pitcairn Islands	1934 (WHEELER 1936)
FS Micronesia	1937 (CLOUSE 2007)
Palau	1938 (CLOUSE 2007)
Marshall Islands	1944 (CLOUSE 2007)
Gilbert Islands	1957 (CLOUSE 2007)
+ New Zealand	1960 (B. Molloway, SI): Auckland
Wallis & Futuna	1965 (WILSON & HUNT 1967)
Kermadec Islands	1966 (TAYLOR 1971)
Niue	≤ 1967 (TAYLOR 1967)
+ Phoenix Islands	2006 (D. Ward, pers. comm.): Enderbury, McKean & Mikumaroro

Native versus exotic range. By the 1880s, when the world's ant fauna was still very poorly known, *M. floricola* was already recorded from areas scattered all over the tropics (Tabs. 1 - 6), including India (1851), the West Indies (1863), Polynesia (1866), Southeast Asia (1867), South America (1868), Indian Ocean islands (1874), and Mexico (1888). In many cases, the earliest collection date for *M.*

Tab. 3: Earliest known records for *Monomorium floricola* from Africa and neighboring islands. Abbreviations as in Tabs. 1 and 2, and MCZ = Museum of Comparative Zoology.

	Earliest record
Mascarene Islands	1874 (SMITH 1876 as *M. impressum*)
Seychelles	≤ 1897 (FOREL 1897)
+ Congo	1913 (H.O Lang, MCZ): Niangara
Nigeria	≤ 1914 (SANTSCHI 1914)
Equatorial Guinea	1939 - 1940 (MENOZZI 1942)
Ghana	1970 (B. Bolton, BMNH): Tafo
+ Angola	1972 (D. Kistner, MCZ): Dundo
Cameroon	1980 (D. Jackson, BMNH): Nko'emvon
Tanzania	1983 (M.J. Way, BMNH): Chwaka
Togo	1985 (B. Dufour, BMNH): Tové
Madagascar	1989 (P.S. Ward, MCZ): 4 km ESE Andoany
+ Cape Verde	2003 (J.K. Wetterer): Praia Branca

floricola in a particular region appears to reflect the date of the first thorough ant surveys rather than the spread of the ant. Thus, determining its native range and reconstructing the chronology of its spread as an exotic is not possible using specimen records.

EMERY (1893) concluded that the close relationship of *M. floricola* "to other, less widespread species of the East Indies supports the assumption that their homeland lies in that region." Most subsequent researchers have concurred that *M. floricola* is a tropical Asian species (e.g., WILSON & TAYLOR 1967, DLUSSKY 1994, WETTERER 2002, SNELLING 2005, ABBOTT & al. 2006). Others have more broadly considered *M. floricola* an Old World species (e.g., CREIGHTON 1950, SMITH 1965, DUBOIS 1986, DEYRUP & al. 2000). SMITH (1965) wrote that its "original home appears to be the African or Oriental Region, probably the latter." The known distribution of *M. floricola* (Fig. 5) suggests an origin in Asia, where the species is widespread, rather than in Africa, where records are scarce.

In contrast to all earlier researchers, in a review paper on exotic ants in Brazil, FOWLER & al. (1994) listed the geographic origin of *M. floricola* as subtropical North America. Similarly, in a review paper on urban ants in the Neotropics, CHACÓN DE ULLOA (2003) wrote that *M. floricola* came from North America. Neither FOWLER & al. (1994) nor CHACÓN DE ULLOA (2003) offered any basis for proposing a revisionary view concerning the origin of *M. floricola*, and I know of no evidence to support it. The only area in North America with outdoor records of *M. floricola* is Florida, where *M. floricola* appears to be at the outer limits of its climatic tolerance and where it is universally considered an exotic (e.g., CREIGHTON 1950, SMITH 1965, DUBOIS 1986, DEYRUP & al. 2000).

Tab. 4: Earliest known records for *Monomorium floricola* from the West Indies. Abbreviations as in Tabs. 1 - 3.

	Earliest record
Cuba	≤ 1863 (ROGER 1863, as *M. cinnabari* & *M. poecilum*): site unknown
Grenada	1888 (H.H. Smith, BMNH): site unknown
St Vincent	≤ 1893 (FOREL 1893)
Bahamas	1904 (WHEELER 1905)
Barbados	≤ 1905 (WHEELER 1905)
Jamaica	≤ 1905 (WHEELER 1905)
Haiti	1912 - 1913 (WHEELER & MANN 1914)
Trinidad	1913 (WHEELER 1916)
Puerto Rico	1914 (W.M. Wheeler, MCZ): Culebra
+ Montserrat	1915 (H. Weber, MCZ): site unknown
+ Bermuda	date unknown (H. Weber, MCZ): site unknown
Martinique	≤ 1916 (T. Pergande, SI): site unknown
+ Antigua	≤ 1916 (T. Pergande, SI): site unknown
Dominican Republic	1920 (G.N. Wolcott, SI): site unknown
Virgin Islands	1935 (BEATTY 1944)
Bonaire	1937 (WEBER 1948)
+ Nevis	date unknown (N. Weber, MCZ): site unknown
St Lucia	1970 (C.I. Expedition, BMNH): site unknown
Guadeloupe	1986 - 1987 (JAFFE & al. 1990)
Aruba	≤ 1994 (JAFFE & LATTKE 1994)
+ Curaçao	2004 (J.K. Wetterer, MCZ): Piscadera
+ Dominica	2004 (J.K. Wetterer, MCZ): Larieu
+ Anguilla	2006 (J.K. Wetterer, MCZ): Windward Point Bay
+ St Martin	2006 (J.K. Wetterer, MCZ): Lotterie Farm
+ Barbuda	2007 (J.K. Wetterer, MCZ): Codrington
+ St Kitts	2007 (J.K. Wetterer, MCZ): Bayford's
+ Cayman Islands	2008 (J.K. Wetterer, MCZ): Websters

Impact. In tropical and subtropical areas, *M. floricola* is a common agricultural and indoor pest, but it is usually considered only a "minor annoyance" (e.g., DEYRUP & al. 2000). At times, however, *M. floricola* can have greater sig-

Tab. 5: Earliest known records for *Monomorium floricola* from South and Central America. Abbreviations as in Tabs. 1 and 3, and OMNH = Oxford University Museum of Natural History.

	Earliest record
French Guiana	1868 (RADOSZKOWSKY 1883 as *M. speculare*)
Brazil	≤ 1886 (BLACKBURN & CAMERON 1887 as *M. specularis*)
Mexico	1888 (H.H. Smith, BMNH): Vera Cruz
Bolivia	≤ 1894 (EMERY 1894)
Chile	≤ 1901 (FOREL 1901b)
Belize	1905 - 1906 (WHEELER 1907)
Guatemala	1912 (W.M Wheeler, MCZ): Patului
Guyana	1914 (G.E. Bokin, BMNH & OMNH): Georgetown
Panama	1923 (Zetek; MCZ): Las Sabanas
Colombia	1924 (L.E. Cheesman, BMNH): Isla Gorgona
Costa Rica	1925 (F. Nevermann, SI): Hamburg Farm
Galapagos	1925 (STITZ 1932)
Honduras	1935 (M. Bates, MCZ): Bonacca Island
Surinam	1936 (N.A. Weber, MCZ): Courantyne
Venezuela	1940 (collector unknown, MCZ): Moitaco
Cocos Island	≤ 1963 (HOGUE & MILLER 1981)
El Salvador	≤ 1972 (KEMPF 1972)
Nicaragua	≤ 1993 (MAES & MACKAY 1993)
Paraguay	≤ 2002 (WILD 2007)

nificance. In the Philippines, BANKS (1911) wrote that *M. floricola* was one of the most serious enemies of the silkworm. In Puerto Rico, PLANK & SMITH (1940) found *M. floricola* was the most common ant tending pineapple mealybugs. WAY & BOLTON (1997) found *M. floricola* nesting in coconut trees in all countries studied (Malaysia, Philippines, Sri Lanka, Tanzania, and Trinidad), where they fed on coconut pests. In the Society Islands, CHEESMAN & CRAWLEY (1928) wrote that, "*Monomorium floricola* swarmed on the coasts, firmly established as house-ants in all the villages visited." In São Paulo, Brazil, FOWLER & al. (1993) and ZARZUELA & al. (2002) found that *M. floricola* was the most common ant at local hospitals, where they may act as vectors of pathogenic bacteria (see MOREIRA & al. 2005).

There is little information on the importance of *M. floricola* in natural environments. WHEELER (1905) wrote of *M. floricola*: "In the Bahamas it is very common, nesting by preference in the Tillandsias, but also in twigs and under the bark of living trees." In Guam, NAFUS (1993) concluded that *M. floricola* reduces populations of native butterflies.

Tab. 6: Earliest known records for *Monomorium floricola* from North America and Europe. Abbreviations as in Tabs. 1 and 2.

North America	**Earliest record**
+ Washington DC	1885 (collector unknown, SI): house ant
Florida	1887 (T. Pergande, SI): Coconut Grove
Alabama	≤ 1979 (SMITH 1979)
+ Alaska	1989 (B.S. Blitz, SI): Anchorage
Arizona	1997 (WETTERER & al. 1999)
+ Quebec	≤ 2006 (B. Guénard, pers. comm.): Biodôme de Montréal
Europe	
Germany	≤ 1939 (JACOBSON 1939)
Netherlands	1975 (BOER & VIERBERGEN 2008)
Wales	1985 (A. Rundle, BMNH): Bangor
England	≤ 1987 (BOLTON 1987)
Sweden	≤ 1995 (DOUWES 1995)
Switzerland	2004 (LUESCHER & al. 2008)

The only time I have seen *M. floricola* dominate a natural habitat was on a small mangrove island in the Florida Keys where most of the ground was submerged at high tide (J.K. Wetterer & P. Hoy, unpubl.). In fact, *M. floricola* is commonly found in mangroves around the world, e.g., Australia (NIELSEN 2000), Indonesia (OZAKI & al. 2000), and Brazil (DELABIE & al. 2006). OZAKI & al. (2000) concluded that predation by high population levels of *M. floricola* in natural mangrove forest in Bali, Indonesia lowered populations of a scale insect that killed mangroves planted in monoculture. In Bahia, Brazil, DELABIE & al. (2006) found *M. floricola* at 11 of 13 mangrove sites, more than twice as many sites as any other exotic ant species. It may be that the very small size of *M. floricola* workers allows them to avoid confrontation with dominant arboreal ants and facilitate coexistence. In addition, *M. floricola* workers can produce poison gland substances that repel competitors at food sources (SNELLING 2005).

In conclusion, I believe that the impacts of *M. floricola* are probably greater than is generally appreciated, not only in disturbed environments, but in some natural habitats as well. *Monomorium floricola* may be particularly significant in flooded mangrove forests, where competition with non-arboreal ants is much reduced.

Acknowledgements

I thank S. Cover, P. Lester, A. Wetterer, and M. Wetterer for comments on this manuscript; S. Cover for help, encouragement, and ant identification; B. Bolton (BMNH), S. Cover (MCZ), M. Deyrup (ABS), J. Hogan (ONHM), and T. Schultz (SI) for help with their respective ant collections; W. O'Brien for GIS help; E. Sarnat and A. Wild

for use of their excellent photos; D.P. Wojcik and S.D. Porter for compiling their FORMIS bibliography; R. Pasos and W. Howerton of the FAU library for processing so many interlibrary loans; Florida Atlantic University, the National Science Foundation, and the National Geographic Society for financial support.

Zusammenfassung

Die Blütenameise, *Monomorium floricola* (JERDON, 1851), englisch "flower ant" genannt, ist eine der am weitesten verbreiteten Ameisenarten der Tropen und Subtropen. Hin und wieder wird sie auch in Gewächshäusern und anderen beheizten Gebäuden gemäßigter Zonen angetroffen. Um die weltweite Verbreitung von *M. floricola* zu evaluieren, habe ich veröffentlichte und unveröffentlichte Nachweise von > 1100 Fundorten zusammengetragen. Ich dokumentiere die frühesten bekannten Nachweise der Art für 119 geographische Gebiete (Länder, Inselgruppen, große karibische Inseln, US-Bundesstaaten und kanadische Provinzen), einschließlich vieler, für die ich keine bisher veröffentlichten Nachweise gefunden habe: Alaska, Anguilla, Antigua, Barbados, Barbuda, Bermuda, Curaçao, Dominica, Kaimaninseln, Kap Verde, Kongo, Neuseeland, Nevis, Phoenixinseln, Quebec, St. Kitts, St. Martin und Washington DC. Die meisten Funde von *M. floricola* aus geographischen Breiten von über 30° und alle Nachweise von über 35° scheinen aus dem Inneren von Gewächshäusern und anderen beheizten Gebäuden zu stammen.

Obwohl die Art weitverbreitet ist, wird *M. floricola* selten als schwerwiegender Lästling betrachtet. Meines Erachtens aber wird die Art, weil sie sehr klein und langsam, kryptisch gefärbt und primär arborikol ist, wahrscheinlich häufig übersehen und ihre Abundanz und ökologische Bedeutung daher unterschätzt. *Monomorium floricola* könnte insbesondere in überfluteten Mangroven von Bedeutung sein, wo die Konkurrenz mit nicht-arborikolen Ameisen stark verringert ist.

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