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Worldwide Spread of the Penny Ant, *Tetramorium bicarinatum* (Hymenoptera: Formicidae)

by

James K. Wetterer

ABSTRACT

Tetramorium bicarinatum (Nylander, 1846) (formerly misclassified as *Tetramorium guineense* (Fabricius)) has long been recognized as one of the world's most broadly distributed ant species. To evaluate the worldwide spread of *T. bicarinatum*, I compiled published and unpublished specimen records from >1000 sites. I documented the earliest known *T. bicarinatum* records for 148 geographic areas (countries, island groups, major Caribbean islands, US states, and Canadian provinces), including several areas for which I found no previously published records: Aruba, Barbuda, Belize, Comoro Islands, Grenada, Îles Eparses, Mascarene Islands, Missouri, Montserrat, Nepal, Sweden, and Tobago.

Tetramorium bicarinatum is widespread throughout much of the tropics and subtropics, except for continental Africa and West Asia, where it is largely absent. In addition, *T. bicarinatum* is found in temperate areas inside greenhouses and heated buildings. In the past, many authors have assumed *T. bicarinatum* to be African in origin. However, analysis of its known distribution and those of its closest relatives indicates that *T. bicarinatum* originated in the Indo-Pacific.

Currently, the most widely used common name for *T. bicarinatum* is "Guinea ant," a name based solely on the erroneous 19th century synonymy of *Tetramorium bicarinatum* with *Pheidole guineensis* (Fabricius) described from Guinea, West Africa. This ill-chosen common name perpetuates the misconception that *T. bicarinatum* is from Africa. This problem is further compounded by the coincidental existence a secondary homonym *Tetramorium guineense* (Bernard, 1953), the valid name of an unrelated species known only from Africa. Therefore, I propose a new common name for *T.*

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Note when correcting proof, change Fig. to CYMK if it is not gray scaled.)

bicarinatum: the penny ant, based primarily on the ant's copper-brown color, similar to that of a copper penny.

Key words: biogeography, biological invasion, exotic species, Formicidae, invasive species

INTRODUCTION

Tramp ants are species that are spread by human commerce and associate with human disturbance. Forel (1911) listed fifteen tramp ant species that he considered to have achieved or were in the process of achieving cosmopolitan worldwide distributions. In earlier review papers, I have examined the spread of five of these species, all of which have become major ecological, agricultural, and/or household pests. These are the long-legged ant, *Anoplolepis gracilipes* (Smith, 1857); the African big-headed ant, *Pheidole megacephala* (Fabricius, 1793); the long-horn crazy ant, *Paratrechina longicornis* (Latreille, 1802); the ghost ant, *Tapinoma melanocephalum* (Fabricius, 1793); the destroyer ant, *Monomorium destructor* (Jerdon, 1851); and the Argentine ant, *Linepithema humile* (Mayr, 1868) (Wetterer & Porter 2003, Wetterer 2005, 2007, 2008, 2009a, b, Wetterer *et al*. 2009). Here, I examine the spread of one of Forel's (1911) cosmopolitan ants that has not, as yet, developed into a major pest: *Tetramorium bicarinatum* (Nylander, 1846) (formerly misclassified as *Tetramorium guineense* (Fabricius, 1793)).

Taxonomy

Nylander (1846) first described *Myrmica bicarinata* (= *T. bicarinatum*) from California. *Bicarinata* means "with two ridges," and refers to the two well-defined frontal carinae (ridges) extending almost parallel on the ant's face from near the base of each antenna to the occiput (top of the head). Workers are medium size (~4 mm in total length), robust, and copper-brown in color from head to post-petiole, with a dark brown gaster.

Junior synonyms of *T. bicarinatum* include: *Myrmica cariniceps* Guérin-Méneville, 1852 described from the Dominican Republic, *Myrmica kollari* Mayr, 1853 described from Austria, *Myrmica modesta* Smith, 1860 described from Indonesia, *Myrmica reticulata* Smith, 1862 described from Panama and England.

Although there are several ant species in East Asia that resemble *T. bicarinatum*, only two of these also occur outside this region: *Tetramorium*

pacificum Mayr, 1870 and *Tetramorium insolens* Smith, 1861. Both differ from *T. bicarinatum* in having smooth, shiny mandibles. In addition, they differ in color: *T. pacificum* is a uniform dark brown or black and in *T. insolens* the gaster is the same color or lighter than the head and thorax (Bolton 1979).

METHODS

I documented the worldwide range of *T. bicarinatum* using both published and unpublished records (before 1977, essentially all records of this species used the name *T. guineense*). I obtained unpublished site records from museum specimens in the collections of the Smithsonian Institute (SI), Archbold Biological Station (ABS), the British Natural History Museum (BMNH), and the Museum of Comparative Zoology (MCZ). 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 C. Trauernicht (Micronesia), J. Trager (Missouri), E. Sarnat (Fiji), and B. Guénard (Quebec). Finally, I collected *T. bicarinatum* specimens on numerous Pacific, Atlantic, and Caribbean Islands, and in Florida (e.g., Wetterer 2002, Wetterer & Vargo 2003).

Except in the Indo-Pacific, *T. bicarinatum* is relatively simple to recognize, though some misidentification of *T. insolens* as *T. bicarinatum* has been reported. Published records usually included collection dates. In a number of cases, publications did not include the collection dates for specimens, but I was able to determine the date based on information on the collector's travel dates. For example, Mayr (1862) reported specimens that the Novara Expedition collected *T. bicarinatum* in Sydney and Manila (both visited in 1858) and Forel (1899) reported specimens that Sallé collected in Mexico (on an 1855 trip). Similarly, Bolton (1977) reported specimens that Fea collected in Cape Verde (on an 1898 trip). In other cases, the death of the collector limited the possible collection date, e.g., R. C. Wroughton, who collected *T. bicarinatum* in the Canary Islands, died in 1921.

RESULTS

I compiled published and unpublished specimen records from >1000 sites. I documented the earliest known *T. bicarinatum* records for 148 geographic areas

(countries, island groups, major islands, US states, and Canadian provinces), including several areas for which I found no previously published records: Aruba, Barbuda, Belize, Comoro Islands, Grenada, Îles Eparses, Mascarene Islands, Missouri, Montserrat, Nepal, Sweden, and Tobago.

Tetramorium bicarinatum records are particularly widespread in Oceania and the West Indies. In Oceania, *T. bicarinatum* is known from every tropical country except Niue and Nauru. In contrast, *T. bicarinatum* has very few records from continental Africa and West Asia. In fact, Bolton (1977, 1980) examined only one record of *T. bicarinatum* from sub-Saharan Africa: specimens from Durban, South Africa found "in hollow stems of orchid from Rangoon," Burma. The only other reports of *T. bicarinatum* from sub-Saharan Africa are a few old isolated records (Fig. 1; Table 2), and some of

Table 1. Earliest known records for *Tetramorium bicarinatum* from Asia and neighboring islands. Unpublished records include collector, museum source, and site. BMNH = Natural History Museum in London, MCZ = Museum of Comparative Zoology. + = no known published record.

	Earliest record
Philippines	1858 (Mayr 1862 as *T. guineense*)
Indonesia	≤1860 (Smith 1860 as *M. modesta*)
Malaysia	1865-67 (Mayr 1872 as *T. guineense*)
Asian Turkey	≤1877 (Mayr 1877 as *T. guineense*)
Syria	≤1877 (Mayr 1877 as *T. guineense*)
India	≤1891 (Wroughton 1892 as *T. guineense*)
Burma/Myanmar	≤1895 (Emery 1895 as *T. guineense*)
Christmas Island	1897 (C.W. Andrews, BMNH): site unknown
Papua New Guinea	≤1901 (Forel 1901 as *T. guineense*)
Taiwan	≤1912 (Forel 1912 as *T. guineense*)
Singapore	1913 (Viehmeyer 1915 as *T. guineense*)
China	≤1927 (Wheeler 1927a as *T. guineense*)
Japan	≤1927 (Teranishi 1927 in Onoyama 1980)
Hainan Island	1935 (Bolton 1977)
Bangladesh	1955 (Com. Inst. Ent. Ag. Dept., BMNH): East Bengal
Sri Lanka	1958 (KLA Perera, MCZ): Undugalla
BIOT	1971 (A.M. Hutson; BMNH): Diego Garcia I., Pointe Marianne
Bhutan	1972 (Bolton 1977)
+Nepal	1982 (M.G. Allen, BMNH): Kathmandu
Korea	≤1985 (Choi *et al.* 1985)
UAE	1995 (Collingwood *et al.* 1997)
Vietnam	2001 (Yamane *et al.* 2001)
Thailand	2001 (Ballmer 2003)
Yemen	2001 (Collingwood & van Harten 2005)
Cocos (Keeling) Is.	2005 (Neville *et al.* 2008)

these could be misidentifications. This virtual absence from sub-Saharan Africa is particularly striking given that *T. bicarinatum* is found on many islands surrounding Africa, including Madagascar, the Canary Islands, Cape Verde, Mayotte, Mauritius, Reunion, and the Seychelles (Fig. 1). In North Africa, Mayr (1862) first reported *T. bicarinatum* (as *T. guineense*) from the

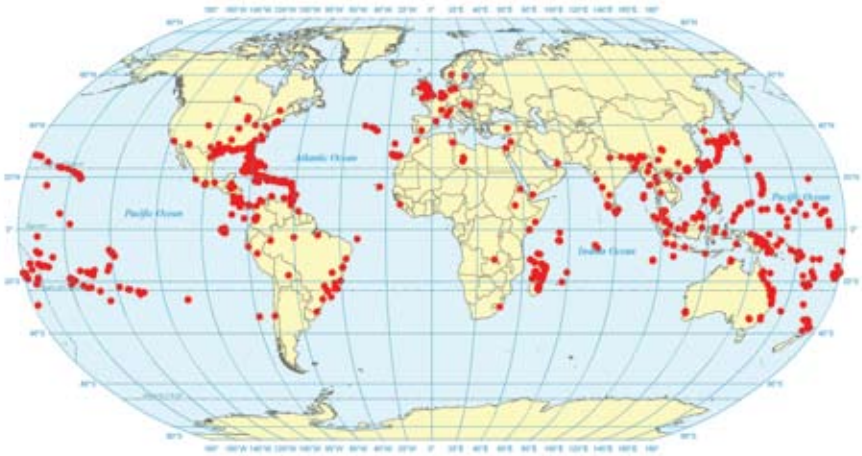

Fig. 1. Worldwide distribution of *Tetramorium bicarinatum.*

Table 2. Earliest known records for *Tetramorium bicarinatum* from Africa and neighboring islands. CAS = California Academy of Science. Abbreviation as in Table 1.

	Earliest record
Madeira	≤1858 (T.V. Wollaston, BMNH) site unknown
Egypt	≤1862 (Mayr 1862 as *T. guineense*)
Madagascar	≤1891 (Forel 1891 as *T. guineense*)
Guinea	≤1895 (Mayr 1895 as *T. guineense*)
Cape Verde	1898 (Bolton 1977)
+Mascarene Islands	1905 (J.S. Gardiner, BMNH): Cargados Carajos
Ethiopia	≤1910 (Forel 1910 as *T. guineense*)
Zaire	≤1913 (Forel 1913 as *T. guineense*)
Eritrea	1914 (Emery 1915 as *T. guineense*)
Canary Islands	≤1923 (R.C. Wroughton; BMNH): site unknown
Somalia	≤1930 (Menozzi 1930 as *T. guineense*)
Libya	1945 (Bernard 1960 as *T. guineense*)
Morocco	≤1962 (Cagniant 1962 as *T. guineense*)
Tunisia	≤1965 (Bernard 1965 as *T. guineense*)
Seychelles	1968 (B. Cogan & A.T. Hutson, BMNH): Menai Island
South Africa	≤1980 (Bolton 1980)
+Îles Eparses	1999 (R. Jocque & G. DeSmet, CAS): Mayotte, Dziani Karihani
+Comoro Islands	2008 (B. Fisher, CAS): Mouandzaza

Sinai Peninsula. Cagniant (1962) reported *T. bicarinatum* (as *T. guineense*) from greenhouses in Morocco. Bernard (1965) wrote that *T. bicarinatum* (as *T. guineense*) was introduced to North Africa in greenhouses, but spread outdoors in the Sahara, including Tunisia, Libya, and Egypt.

Record errors

Wilson & Taylor (1967) reported records of *T. guineense macra* Emery, 1914 (= *T. insolens*) from Samoa as *T. guineense* (= *T. bicarinatum*), but Bolton (1977) reidentified these specimens. Similarly, Radchenko *et al.* (1999) found that specimens Pisarski (1957) reported as *T. guineense* (= *T. bicarinatum*) from Poland were actually *T. insolens*. Collingwood & van Harten

Table 3. Earliest known records for *Tetramorium bicarinatum* from Australia and Oceania. Abbreviations as in Table 1.

	Earliest record
Australia	1858 (Mayr 1862 as *T. guineense*)
Hawaii	≤1879 (Smith 1879 as *T. guineense*)
Fiji	≤1893 (Haupt 1893 as *T. guineense*)
New Caledonia	1911-12 (Emery 1914 as *T. guineense*)
Wallis & Futuna	1913 (Emery 1914 as *T. guineense*)
Norfolk Island	1915 (Wheeler 1927b as *T. guineense*)
Samoa	1916 (H. Swale, BMNH): Apia
Solomon Islands	1916 (Mann 1919 as *T. guineense*)
Austral Islands	1921 (Wilson & Taylor 1967 as *T. guineense*)
Line Islands	1924 (Wilson & Taylor 1967 as *T. guineense*)
Phoenix Islands	1924 (Wilson & Taylor 1967 as *T. guineense*)
Tokelau	1924 (Wilson & Taylor 1967 as *T. guineense*)
Marquesas Islands	1925 (Cheesman & Crawley 1928 as *T. guineense*)
Society Islands	1925 (Cheesman & Crawley 1928 as *T. guineense*)
Vanuatu	1930 (L.E. Cheesman, BMNH & MCZ): SW Malekula
Tuamotu Islands	1932 (Wilson & Taylor 1967 as *T. guineense*)
Cook Islands	1933 (Wheeler 1934 as *T. guineense*)
Gambier Islands	1934 (Wilson & Taylor 1967 as *T. guineense*)
Pitcairn Island	1934 (Wilson & Taylor 1967 as *T. guineense*)
Mariana Islands	1936 (Clouse 2007)
FSM	1939 (Clouse 2007)
Wake Island	1940 (Clouse 2007)
Marshall Islands	1944 (Clouse 2007)
Palau	1946 (Clouse 2007)
Johnston Island	1947 (Wilson & Taylor 1967 as *T. guineense*)
Kermadec Islands	1956 (Taylor & Wilson 1961 as *T. guineense*)
Tuvalu	1956 (E.S. Brown, BMNH): Funafuti
Tonga	1956 (Wilson & Taylor 1967 as *T. guineense*)
Gilbert Islands	1957 (Clouse 2007)
New Zealand	1959 (Taylor 1961 as *T. guineense*)

(2001) erroneously listed *T. bicarinatum* from Niue based on incorrect site information (see Wetterer 2006). Bolton (1977) listed records from Pakistan and Honduras, but the labels indicate that the specimens were actually from East Pakistan (= Bangladesh) and British Honduras (= Belize), respectively. Bolton's (1977) record from Cargados, Seychelles, was actually from Cargados Carajos, a part of Mauritius. Although Wheeler (1906) speculated, without examining the specimens, that *Tetramorium caespitum* (L) specimens reported from Bermuda by Verrill (1902) were actually *T. bicarinatum*, I did not map this as a record.

DISCUSSION

Tetramorium bicarinatum is extremely widespread, throughout tropical and subtropical regions of both the Old and New World, except for continental Africa and West Asia, where it has been rarely recorded (Fig. 1). *Tetramorium bicarinatum* is particularly common in disturbed agricultural and urban habitats. For example, Mann (1921) reported that in Fiji *T. bicarinatum* (as *T. guineense*) occurred "throughout the islands, most commonly in cultivated districts." In temperate areas, particularly in Europe and North America, *T.*

Table 4. Earliest known records for *Tetramorium bicarinatum* from the West Indies. SI = Smithsonian Institute. Abbreviations as in Table 1.

	Earliest record
Dominican Republic	1850 (Guérin-Méneville 1852 as *cariniceps*)
Cuba	≤1862 (Mayr 1862 as *T. guineense*)
St. Vincent	1889-90 (Forel 1893 as *T. guineense*)
Bahamas	1893 (Nutting 1894 as *T. guineense*)
Jamaica	1909 (Wheeler 1911 as *T. guineense*)
Dominica	1911 (Wheeler 1913 as *T. guineense*)
Haiti	1912-13 (Wheeler & Mann 1914 as *T. guineense*)
Puerto Rico	1914 (collector unknown, MCZ): Arecibo
Virgin Islands	1917 (H. Morrison, SI): St Croix Experimental Station
+Grenada	1918 (H. Morrison, SI): Botanical Gardens
Trinidad	1918 (H. Morrison, SI): La Brea
Barbados	1936 (E.A. Chapin & R.E. Blackwelder, SI): site unknown
+Montserrat	1936 (E.A. Chapin & R.E. Blackwelder, SI): site unknown
Saint Kitts	1937 (Weber 1948 as *T. guineense*)
Antigua	≤1979 (Bolton 1979)
Guadeloupe	1986-87 (Jaffe & al. 1991)
+Tobago	2003 (J.K. Wetterer, MCZ): King's Bay Beach
+Aruba	2007 (J.K. Wetterer, MCZ): Oranjestad
+Barbuda	2007 (J.K. Wetterer, MCZ): Rock Bay

bicarinatum is found inside greenhouses and heated buildings. For example, Weiss (1916) reported that *T. bicarinatum* was common in greenhouses of New Jersey.

Tetramorium bicarinatum is occasionally reported as an agricultural pest, due to its habit of tending phloem-feeding Hemiptera. For example, Mann (1920) wrote that *T. bicarinatum* was found throughout Cuba where it was "one of the commonest ants attending Coccidae." I received *T. bicarinatum* specimens from J.P. Torregrossa, who reported them as a pest on yam in Guadeloupe. *Tetramorium bicarinatum* is also a well-known predator on other insects and has been used as a biological control agent against crop pests. In Cuba, *T. bicarinatum* is used for biocontrol of banana pests (Roche 1975, Roche & Abreu 1983, Bendicho & Lopez 1987). In north Queensland Australia, *T. bicarinatum* workers attacked caterpillar pests of banana and high populations of the ants appeared to significantly reduce the incidence of the caterpillars (Gold *et al*. 2001). In southern Fukien Province, China, *T. bicarinatum* is used for biocontrol of sugarcane pests (Huang 1986 in Simoons 1991).

Tetramorium bicarinatum can also have impacts in natural environments. For example, Greenslade (2008) reported that *T. bicarinatum* and a scale

Table 5. Earliest known records for *Tetramorium bicarinatum* from South and Central America. Abbreviations as in Tables 1 & 4.

	Earliest record
Mexico	1855 (Forel 1899 as *T. guineense*)
Panama	≤1862 (Smith 1862 as *M. reticulata*)
Venezuela	≤1862 (Roger 1862 as *T. guineensis*)
Colombia	≤1870 (Mayr 1870 as *T. guineense*)
Brazil	≤1879 (coll. F. Smith, BMNH): site unknown
Galapagos	1890-92 (Emery 1893 as *T. guineense*)
Costa Rica	≤1896 (Emery 1896 as *T. guineense*)
Cocos Island	≤1902 (Forel 1902 as *T. guineense*)
Guyana	1913 (Crawley 1916 as *T. guineense*)
Easter Island	1922 (Wilson & Taylor 1967 as *T. guineense*)
+Belize	1934 (J.J. White, BMNH): Punta Gorda
Nicaragua	≤1937 (W.M. Wheeler, MCZ): site unknown
Chile	1951 (Kempf 1970 as *T. guineense*)
Peru	1967 (Bolton 1977)
Honduras	1975 (N.L.H. Krauss, SI): San Pedro Sula
Bolivia	≤1979 (Bolton 1979)
Juan Fernandez	2000 (Ingram *et al.* 2006)

insect that it tends have undergone a population explosion on some small Australian islands, causing damage to *Pisonia* trees, which are important nesting sites for seabirds. Greenslade (2008) reported that on North East Herald Cay, the number of *T. bicarinatum* in pitfall traps increased almost 100 fold between 1997 and 2007, and that its numbers "in May 2007 were so high on the ground, in dead timber and on trees and shrubs, that abundance of other invertebrates was suppressed in places where the ant was active." Suzuki & Murai (1980) found that *T. bicarinatum* was a key predator on founding queens of the wasp *Ropalidia fasciata* (Fabricius, 1804) on Okinawa.

Native and exotic range

In the past, most authors concurred that *T. bicarinatum* originally came from Africa. Bolton (1977), however, concluded: "because a number of closely related species overlap the range of *bicarinatum* in the Oriental and Indo-Australian regions I am now of the opinion that *bicarinatum* is of SE Asian origin not African origin as I and others originally thought (most recently

Table 6. Earliest known records for *Tetramorium bicarinatum* from North America. Abbreviations as in Tables 1 & 4.

	Earliest record
California	1840 (Nylander 1846, type locale)
Louisiana	≤1886 (Mayr 1886 as *T. guineense*)
Washington DC	≤1886 (Mayr 1886 as *T. guineense*)
Florida	≤1886 (Mayr 1886 as *T. guineense*)
Colorado	≤1889 (Ashmead 1890 as *T. guineense*)
West Virginia	1906 (A.M.W., SI): Martinsburg
Wisconsin	1908 (Burrill & Smith 1918 as *T. guineense*)
Texas	1910 (J.D. Mitchell, SI): Victoria
New Jersey	1914 (Weiss 1915 as *T. guineense*)
Illinois	1915 (F. Oeschlin, SI): Chicago
New York	1921 (Bequaert 1921 as *T. guineense*)
Mississippi	1921 (Smith 1922 as *T. guineense*)
Georgia	1923 (W.L. McAtee, SI): Jekyll Island
Ohio	1931 (collector unknown, SI): Columbus
Arkansas	1932 (D.E. Read, SI): Pine Bluff
North Carolina	≤1937 (Powell 1937 as *T. guineense* in Wojcik & Porter 2008)
Alabama	≤1947 (Murphree 1947 in MacGown & Forster 2005)
Manitoba	1977 (Ayre 1977 as *T. guineense*)
South Carolina	≤1993 (Martinez 1993)
Arizona	1993-94 (Wetterer *et al.* 1999)
Quebec	≤1996 (Johnson 1996)
+Missouri	≤2006 (J. Trager, pers. comm.): Missouri Botanical Garden
Connecticut	2006 (Ridge 2007)

Creighton, 1950; Brown, 1957; Wilson & Taylor, 1967; Bolton & Collingwood, 1975)." Within *Tetramorium*, Bolton (1977) placed *T. bicarinatum* in the "*bicarinatum*-group," most closely allied with four Indo-Pacific species. Three of these are restricted to Asia: *Tetramorium indicum* Forel, 1913 (described from Sumatra and ranging from the eastern Indian Ocean to Java), *Tetramorium nipponense* Wheeler, 1928 (described from Japan and ranging in East Asia west to Bhutan), and *Tetramorium obtusidens* Viehmeyer, 1916 (described from Singapore and also found in Thailand, the Philippines, and perhaps New Guinea). The fourth species, *Tetramorium insolens* (described from Sulawesi) has a wide distribution in the Indo-Pacific region as well as a few scattered records from other parts of the world. Recently, Schlick-Steiner *et al*. (2006) analyzed DNA sequence and found that four additional Indo-Pacific species were as closely related to *T. insolens*: *Tetramorium pacificum* (described from Tonga with a broad Indo-Pacific range), *Tetramorium scabrum* Mayr, 1879 (described from Borneo and ranging through China, Indonesia, and Malaysia), *Tetramorium manobo* (Calilung, 2000) (known only from the Philippines), and *Tetramorium cynicum* Bolton, 1977 (known only from the Philippines). Thus, the known distribution of *T. bicarinatum* and those of its closest relatives strongly supports the conclusion that *T. bicarinatum* originated in the Indo-Pacific.

Table 7. Earliest known records for *Tetramorium bicarinatum* from Europe.

	Earliest record
Austria	≤1853 (Mayr 1853 as *M. kollari*)
England	≤1862 (Smith 1862 as *M. reticulata*)
France	≤1895 (Marchal 1895 as *T. guineense*)
Monaco	≤1895 (André 1896 as *T. guineense*)
Scotland	1904 (Godfrey 1907 as *T. guineense*)
Netherlands	1909 (Boer & Vierbergen 2008)
Ireland (Northern)	≤1915 (Donisthorpe 1915 as *T. guineense*)
Azores	≤1933 (Santschi 1933 as *T. guineense*)
Germany	1937 (Jacobson 1939 as *T. guineense*)
Hungary	≤1939 (Jacobson 1939, Stitz 1939 as *T. guineense*)
Scandinavia	≤1979 (Collingwood 1979)
Belgium	≤1986 (van Boven & Mabelis 1986 in Dekoninck *et al.* 2006)
Italy	2001 (Limonta & Colombo 2003)
Spain	2003 (Reyes & Espadaler 2005)
+Sweden	≤2004 (Radchenko 2004): site unknown
Norway	≤2006 (Artsdatabanken 2006)

Name errors

Unfortunately, some researchers continue to consider *T. bicarinatum* to be an African species. For example, Dlussky (1994) listed *T. guineense* (F.) (= *T. bicarinatum*) as an African species. Wetterer (2002) followed Dlussky's (1994) designation. This appears to be based, at least in part, on two unfortunate name issues that have plagued the taxonomy of *T. bicarinatum.* The root problem arose when Roger (1862) incorrectly designated *Myrmica bicarinata*, *Myrmica carniceps*, *Myrmica reticulata*, and *Myrmica kollari* (all = *T. bicarinatum*) as junior synonyms of *Myrmica guineensis* Fabricius, 1793 (= *Pheidole guineensis*), a species described from Guinea. Mayr (1862) accepted this synonymy, but moved the species to the genus *Tetramorium*. For more than 100 years, all researchers used *Tetramorium guineense* (Fabricius) as the name for *T. bicarinatum*. Bolton (1977), however, examined Fabricius' type specimens of *guineensis* and found that all were minors of a West African *Pheidole* species. Bolton (1977) concluded: "with the removal of *guineensis* to *Pheidole* the next available name for this well-known tramp species is *bicarinatum* which now becomes the valid name." Although virtually all researchers immediately switched to using the name *T. bicarinatum*, a few continued to use an incorrect name. For example, many studies of *T. bicarinatum* in Cuba (e.g., Roche 1975, Roche & Abreu 1982, 1983, 1984, Roche & Perez 1985, Bendicho & Gonzalez, 1986, Bendicho & Lopez 1987, Loddo Vega *et al*. 2002) referred instead to *Tetramorium guineense* (Mayr), using the author who moved the species to *Tetramorium*.

Shortly after Bolton (1977) replaced the invalid name *T. guineense* (Fabricius) with *T. bicarinatum*, Bolton (1980) made an unrelated name change which, due to an unfortunate coincidence, has resulted in some additional confusion. Bolton (1980) transferred an African ant species, *Xyphomyrmex weitzeckeri guineensis* Bernard, 1953 described from the mountains of Guinea, to the genus *Tetramorium*. The resulting name, *T. guineense* (Bernard), is a secondary homonym of the invalid name *T. guineense* (Fabricius) (= *T. bicarinatum*). *Tetramorium guineense* (Bernard) is apparently known only from Africa (reported from Central African Republic, Gabon, Ghana, Guinea, Ivory Coast, Liberia, Nigeria, Senegal, Somalia, and Zaire, Bolton 1980, Taylor 2007). However, the reappearance of the name *T. guineense* apparently led some authors to falsely assume that this name has been resurrected, either as

a valid senior synonym for *T. bicarinatum* or as a closely related *Tetramorium* species. Thus, a number of authors have confounded the names *T. guineense* (Fabricius) (= *T. bicarinatum*) and *T. guineense* (Bernard) (e.g., see Wetterer & Vargo 2003, Wetterer & Wetterer 2004). In most cases, the error is simple to detect. For example, Fernandez & Sendoya (2004) recently listed *T. guineense* (Bernard) from countries throughout the Neotropics, citing as a source Bolton (1979), which actually lists Neotropical records of *T. bicarinatum*. Similarly, Solomon & Mikheyev (2005) wrote that Forel (1902) and Wheeler (1919) had reported *T. guineense* (Bernard) on Cocos Island, Costa Rica when, in fact, they both reported *T. guineense* (Fabricius) (= *T. bicarinatum)*. Vieira *et al*. (2003) listed *T. guineense* (Bernard) on a checklist of arthropods of Corvo Island, but not *T. bicarinatum*, which Wellenius (1949) reported (as *T. guineense* (Fabricius)) from this island.

Common name

The most popular common name for *T. bicarinatum* continues to be "Guinea ant," a name based solely on the erroneous synonymy of *Tetramorium bicarinatum* with *Pheidole guineensis* (Roger 1862; see Introduction). This unfortunate common name not only perpetuates the misconception that *T. bicarinatum* is from Africa, but also sows confusion about the status of invalid name *Tetramorium guineense* (Fabricius) (= *T. bicarinatum*) versus the valid *Tetramorium guineense* (Bernard). Some authors still incorrectly believe *T. guineense* to be the valid name of a tramp species, either the senior synonym of *T. bicarinatum* or distinct species. For example, the Texas A & M Center for Urban and Structural Entomology web page concerning *T. bicarinatum* (TAMU 2008) incorrectly reports that *T. bicarinatum*: "is a close relative of the Guinea ant, *Tetramorium guineense* (Fabricius), another tramp species of African origin commonly found in the Gulf Coast region."

I believe that use of the name Guinea ant for *T. bicarinatum* should be discontinued, and that a replacement common name needs to be coined. Therefore, I propose the name "penny ant" for *T. bicarinatum*, based primarily on the ant's copper-brown color, which is similar to that of an old copper penny. In addition, guinea and penny are both monetary denominations, making this newly minted common name relatively simple to remember. Although many entomologists feel that insect common names are of little value and

should be avoided in the scientific literature, such names remain the most common currency among pest control specialists and in the popular press. I believe that once it is in wide circulation, this new name for *T. bicarinatum*, penny ant, will prove its worth.

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