

HOUSE ANTS OF KARACHI, PAKISTAN

by

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ABSTRACT

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Ants are ubiquitous and ecologically important, yet little is known of ants within Pakistan. I studied ants collected from houses and apartments in Karachi, Pakistan to determine which ants are common indoor ants. Ants were attracted by spilling syrups and sodas on the floor which were left overnight. The following morning the ants were collected using an aspirator. A total of eleven species were found. Of these eight were well-known pest ants with worldwide distributions: *Paratrechina longicornis*, *Tetramorium simillimum*, *Monomorium pharaonis*, *Monomorium subopacum*, *Monomorium destructor*, *Tapinoma melanocephalum*, *Pheidole megacephala*, and *Tetramorium bicarinatum*. Three others, *Camponotus sp.*, *Pheidole sp.*, and *Solenopsis sp.*, not identified to species were probably native species. *Paratrechina longicornis* and *M. subopacum* were the two most dominant species that were found in the highest abundance.

To my parents and siblings,
for their endless support and assistance in bringing me where I stand today.

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Introduction

Ants are found worldwide in every country and in most houses. While ants are a commonplace insect, they are ecologically important to organisms and the surrounding environment. Ants play a significant role in nutrient cycling, seed dispersion, and pollination (Basu 1997). In addition, ants act as food for many organisms. Since ants are found in great abundance, they are usually very difficult to control. Many times ants enter homes solely for the purpose of finding food. In addition to homes, ants can be found in apartments, bakeries, and even hospitals. Many negative effects are often attributed to ants found in the human environment. Their presence is regarded as detrimental to human health, food conservation and quality, wood conservation, electrical installations, and electronic equipment (Smith 1965; Delabie et al. 1995). These characteristics lead to the extermination of many ants as common pests and explain why ants are unwanted guests in homes.

The objective of my research is to determine which ant species occur in houses of Karachi, Pakistan.

Materials and Methods

In June 2007, Shaheen and Zeeshan Valliani collected ants from 25 houses and apartments located in Karachi, Pakistan (Fig. 1). Strawberry syrup, honey, ruh afza, (a popular fruit syrup in India and Pakistan,) and sodas, such as cola and cream soda, were spilled and left over night. The following morning the ants were collected using an aspirator. The ants were identified by Dr. James K. Wetterer.



Figure 1. Map of Pakistan (from Google)

Results

We found a total of eleven species (Table 1). Each site had at least one ant species. Of these, eight were well-known pest ants with worldwide distributions: *Paratrechina longicornis*, *Tetramorium simillimum*, *Monomorium pharaonis*, *Monomorium subopacum*, *Monomorium destructor*, *Tapinoma melanocephalum*, *Pheidole megacephala*, and *Tetramorium bicarinatum*. Three others, *Camponotus sp.*, *Pheidole sp.*, and *Solenopsis sp.*, not identified to species were probably native species. I found that *P. longicornis* and *M. subopacum* were the two most abundant ant species followed by *M. pharaonis* and *Pheidole sp.*

Table 1. House-Infesting Ants of Karachi, Pakistan

Ant Species	Number of Records	% of Records	Status
<i>Camponotus sp.</i>	4	16%	N?
<i>Monomorium destructor</i>	4	16%	W/N
<i>Monomorium pharaonis</i>	9	36%	W/N
<i>Monomorium subopacum</i>	14	56%	W/N
<i>Paratrechina longicornis</i>	14	56%	W/E
<i>Pheidole megacephala</i>	1	4%	W/E
<i>Pheidole sp.</i>	8	32%	N?
<i>Solenopsis (Diplo.) sp.</i>	2	8%	N?
<i>Tapinoma melanocephalum</i>	2	8%	W/E
<i>Tetramorium bicarinatum</i>	1	4%	W/E?
<i>Tetramorium simillimum</i>	1	4%	W/E?

Status: W = worldwide; E = exotic; N = native, ? = status is uncertain

Discussion

In developed countries, such as the United States, there is abundant information regarding the ant species that infiltrate human-built and residential structures. However, in developing countries, such as Pakistan, few studies have attempted to identify the ants residing in people's homes and apartments. In this study, we identified the species of ants living indoors in Karachi, Pakistan. We found that the ant species residing in Pakistani house locations were similar to those in Floridian house. Eight of the eleven species that we observed in Pakistan are established worldwide. In addition, we found that seven of these species were found in Florida, all except *Monomorium subopacum*.

Previous studies have investigated the ants in areas surrounding Pakistan. In Bangladesh, 124 different species of ants have been identified (Hannan 2007). Hannan (2007) collected 19 species of ants from Savar, Dhaka, Bangladesh, 14 of which were new records for that country. Of the 19 species observed by Hannan (2007), we found three of them, *Monomorium pharaonis*, *Tapinoma melanocephalum*, and *Paratrechina*

longicornis, also inhabiting Pakistan. These species are believed to be native to East Asia (Wetterer, pers. comm.), suggesting that their populations in Bangladesh and Pakistan are exotic. In order to monitor the spread of these species, further studies should be conducted to determine their current distribution.

A study that was done on the house-infesting ants in Bahia, Brazil discovered ant species also similar to those that we observed in Pakistan. These species include *Pheidole megacephala*, *Tapinoma melanocephalum*, *Paratrechina longicornis*, and *Tetramorium simillimum* (Delabie et al. 1995). Our discovery of these ants in Pakistan, as well as previous studies, confirm that this species of ants has a global distribution.

In this study we found that *Monomorium subopacum* is abundant in the households of Karachi, Pakistan, but not in Florida. *Monomorium subopacum* appears to prefer drier climates, such as parts of Africa north of the Sahara, the drier regions of the states bordering the Mediterranean (Bolton 1987), and Cape Verde (Wetterer, pers. comm.). This species' preference for drier locations explains the lack of its presence in Florida's more humid climate. Although previous studies have proposed that *M. subopacum* is native to Madeira, the Canary Islands, and Cape Verde, our study suggests the possibility of *M. subopacum* being native to Pakistan due to its great abundance in this part of the world.

The following sections provide descriptions of the ant species that we identified in Karachi, Pakistan.

1. *Camponotus sp.*

Camponotus sp. is commonly known as the carpenter ant. Carpenter ants are native to many parts of the world. They are one of the most common pest ants, especially in the Pacific Northwest and in the Northeastern part of the United States (Klotz et al. 1995). Black carpenter ants are more likely to be common house-infesting ants. Carpenter ants are responsible for a great amount of damage. They often prefer dead, moist wood to build their nest on. This species consists of workers of various sizes, which are distinguished by major (large), intermediate (medium), and minor (small) (Smith 1965).

2. *Monomorium destructor*

Monomorium destructor is commonly known as the destroyer ant. This species of ant is possibly of North African and Asian origin (Wetterer, pers. comm.). The destroyer ant is established in many parts of the world including, but not limited to, Tennessee, Florida, and the Cape Verde Islands (Bolton 1987; Deyrup et al. 1989; Deyrup 2003). Due to their distributions, it appears as if these species are commonly found in extremely dry areas (Smith 1965; Wetterer, pers. comm.). This species is a common house-infesting pest and feeds on almost everything it finds around the house, including meats, sweets, and cookies. The species will even feed on fabrics, furniture, and electrical wires earning its name as the destroyer ant. The destroyer ant is also known to bite humans, even while in bed (Smith 1965; Wetterer, pers. comm.).

3. *Monomorium pharaonis*

These species of ants are commonly known as pharaoh ants. Pharaoh ants are thought to be native to Asia (Wetterer, pers. comm.). These ants are distributed around the world by commerce. Pharaoh ants are one of the most popular house-infesting ants and are found almost everywhere (Oi et al. 1994; Smith 1965; Wetterer, pers. comm.). These species of ants can be found in hospitals, ships, apartments, houses, and even grocery stores (Oi et al. 1994). These house-infesting ants are one of the most difficult species of ants to control (Smith 1965).

4. *Monomorium subopacum*

Monomorium subopacum has been found to be distributed in regions of Africa north of the Sahara where conditions are arid. It is also found to be widespread in the dry regions of the Mediterranean (Bolton 1987, Wetterer et al. 2007). This species is thought to be native to Madeira, the Canary Islands, and Cape Verde (Wetterer et al. 2007).

5. *Paratrechina longicornis*

A common name for this species is crazy ants. The crazy ants are thought to be of Asian origin (Wetterer, pers. comm.). Trading has played a significant role in transporting these ants to various parts of the world through exporting. Today, this species is labeled as one of the most common species in Florida. However, farther inland this species is mostly distributed randomly and are found in various indoor facilities including houses, apartments, and even hospitals. This species consists of a group of workers who lack any sense of direction and are usually running around everywhere,

hence the name crazy ants. The crazy ants are a highly adaptive species and can be found in both wet and dry habitats (Smith 1965).

6. *Pheidole megacephala*

Pheidole megacephala is commonly known as the big-headed ant. This species is thought to be a native of Africa and is distributed throughout the tropics and the subtropics due to human commerce (Wetterer & O'Hara 2002; Wetterer et al. 2007). *Pheidole megacephala* is known for its tendency to kill off most native invertebrates that occur in its range, especially native ants (Wetterer & O'Hara 2002; Wetterer & Wetterer 2004). This species have also been found in Ascension and appears to be more common in St. Helena, indicating a possibility that this species might be common to these areas. This species is known to attack everything that comes in its path and often finds its way into beds and clothing (Wetterer et al. 2007).

7. *Pheidole* sp.

Pheidole is an extremely broad genus consisting of up to a thousand species. Because of the huge number of species that exist within this genus, it is often very difficult to identify them. It is one of the most ecologically important ant genera in the world. "In tropical forests, arid scrub, grassland and warm deserts, it appears often to dominate the insect parts of communities" (Brown 1981). Species of this genus are known as seed harvesters (Smith 1965).

8. *Solenopsis (Diplo.) sp.*

Solenopsis sp. is commonly called the thief ant due to its behavior of nesting in the nests of other ants and stealing their food and offspring (Smith 1965). This species is often overlooked due to its small size (Wetterer et al 2007). Thief ants are thought to be native through the eastern and central United States from southern Canada to the Gulf Coast (Smith 1965).

9. *Tapinoma melanocephalum*

Tapinoma melanocephalum is commonly called the ghost ant. This species is found in both indoor and outdoor environments in the tropics and the subtropics (Wetterer, pers. comm.). The ghost ant is probably of the East Asian origin (Wetterer, pers. comm.). However, this species is so widespread all over the world that it is difficult to determine its original habitat (Smith 1965). Although this species is found in both indoor and outdoor environments, it usually is found nesting inside homes. This species appears to have a preference for sweet foods as they have been found feeding on sugarcanes and cakes (Smith 1965).

10. *Tetramorium bicarinatum*

This species has been found to be established in Samoa for at least 50 years. Several specimens of *Tetramorium bicarinatum* found in Samoa were listed by Bolton (1987). Although this species is thought to be exotic in the Pacific region, today it is widespread (Wetterer & Vargo 2003). This species is probably native to Southeast Asia (Bolton 1979).

11. *Tetramorium simillimum*

Tetramorium simillimum is found to have a long history in Bermuda, yet this species remains rare (Wetterer & Wetterer 2004). This study found that *T. simillimum* was the least abundant ant species in Pakistan. Similarly, Wetterer & Wetterer (2004) also found *T. simillimum* to be a rare species with the smallest presence. This species is considered to be an Old World tramp species (Wetterer & Wetterer 2004). This species is probably of African origin (Wetterer & Vargo 2003).

It is possible that, in addition to these eleven species, other species of ants are also present in the households of Karachi, Pakistan, but, because they might not be attracted to sweet substances like the syrups and sodas used in this study, they were not found. In the future, it may be interesting for studies to consider the possible presence of these other ants that are not necessarily attracted to sugar.

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