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ANTS (HYMENOPTERA: FORMICIDAE) FROM THE CAVES OF BELIZE, MEXICO, AND CALIFORNIA AND TEXAS (U.S.A.)

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ABSTRACT

A complete list is provided of all available records of ants from caves in Belize, Mexico, and California and Texas, U.S.A. The ecological status of species for which there is sufficient data is discussed, with special emphasis on the red imported fire ant, *Solenopsis invicta*, in Texas caves. The only species considered to be troglobites are three Mexican species: *Brachymyrmex cavernicola*, *Oligomyrmex urichi*, and *Paratrechina pearsei*.

INTRODUCTION

Few ants are closely associated with caves despite the subterranean habits of many species. The few species once considered troglobitic (restricted to life in caves) are now generally considered as troglophiles (reproduce in caves, but also occur on the surface) or trogloxenes (enter caves sometime during life but cannot reproduce there). Wilson (1962) in a review of species considered troglobitic argues convincingly that no ants are likely to be cave-restricted. The only species in the present areas of study ever considered to be troglobites were reported from caves in Yucatán, Mexico. Of these species, *Oligomyrmex urichi* (Wheeler) was described from a cave in Trinidad but has also been found in

surface localities (Wilson, 1962). *Paratrechina pearsei* Wheeler belongs to a poorly studied group and may have been recorded from the surface under another name. *Brachymyrmex cavernicola* Wheeler is a microphthalmic species that forms small nests in total darkness in caves. Wilson (1962) points out that this species belongs to a poorly studied group and may also have been recorded from the surface under another name. Its discovery in a cave in Oaxaca indicates that it is a widespread species in southern Mexico.

The only paper specifically devoted to ants from caves in this region is the study by Wheeler (1938) on ants from the caves of Yucatán, Mexico. This work listed 16 species from numerous caves. The remaining published records of ants from the caves of this region are scattered in reports on the fauna of different areas.

Most collections of ants were incidental to general biospeleological surveys in all of the areas included here. The California material was obtained as part of a study to determine the impact on potentially endangered harvestmen by construction of the New Melones Dam on the Stanislaus River. Much of the Texas ant material was obtained as part of studies on the distribution of

columns of ants carrying cut leaves into the caves, they are presumably only visitors to the cave environment. *Labidus coecus* and *Labidus praedator* have been taken in the dark areas of caves and these may be considered troglobiontes. Five species of the genus *Pachycondyla* have been found in caves of the Yucatán Peninsula, with *P. harpax* being the most abundant. Unfortunately, most records do not give habitat data, but many were found in cave entrances and these species may actually be accidentals. Wheeler in 1900 (cited by Creighton, 1950) stated that *P. harpax* construct small, irregular nests in soil under stones and logs. The workers avoid direct sunlight and forage in the morning and stay in the shade as much as possible. They eat other insects and myriapods. This would therefore suggest that the *Pachycondyla* were simply staying in the shade. Because these are very large ants, it is unlikely that they could find enough to feed upon except for crickets near cave entrances. *Solenopsis (Solenopsis) geminata* is the most abundant troglobionte ant in the caves of the Yucatán Peninsula. These have been found to be extremely abundant deep in caves, where they are doubtless a significant predator on other cavernicole.

Mexico: Other areas: Despite the vast area under consideration only 36 species have been positively identified from all parts of Mexico outside of the Yucatán Peninsula. Many collections remain unstudied, but despite this the ant fauna has been seriously neglected. The 36 known species must represent a small percentage of species that will eventually be found in the caves of Mexico.

As with Yucatán, most of the recorded species are accidentals. The only species likely to be a troglophil is *Brachymyrmex cavernicola*, recorded here for the first time from a cave outside the Yucatán Peninsula. It was found deep in a cave in Oaxaca. Three species also known as troglobiontes in Yucatán are also known from other parts of Mexico. *Labidus coecus* has been obtained in caves from Oaxaca and Tamaulipas. *Labidus praedator* has been identified from a cave in San Luis Potosí. The fire ant, *Solenopsis geminata*, is known from caves in Morelos, Oaxaca, Puebla, San Luis Potosí, Tabasco, and Veracruz. An enormous infestation occurred in Sótano de Guadalupe, San Luis Potosí, where numerous columns were present entering and leaving the 20 m entrance drop and moving deep into the cave. Prey being removed from the cave included troglobitic thysanurans and millipedes.

USA: California: The ant fauna of California caves is essentially unknown, with no records having been previously published. Six species from 15 caves and one mine tunnel are included below. With the exception of *Prenolepis imparis* all are known from a single cave and are presumably accidentals. The occurrence of *P.*

imparis in 11 caves and a mine indicates that this may be a troglobionte. Unfortunately, with the exception of a record of the species in all parts of Porcupine Cave, there are no data that provide sufficient information to allow further comments on the ecological status of this species. Normally, *P. imparis* feeds on liquids, especially the honey-dew of homopterans, nectar and exudates of plants, as well as juices of dead and dying earthworms (Wheeler, 1930). This ant is well known for its dislike of dry warm habitats and possibly its occurrence in caves is a means by which it can escape the undesired conditions sometimes found in surface habitats. Some of the caves from which this species have been collected contain roots descending through cave roofs; aphids have been collected from these roots and may further explain the presence of this species deep in some of the caves.

USA: Texas: At least 36 ant species have been found in Texas caves. Most are clearly accidental, but a few are troglobiontes. *Labidus coecus* has been found in numerous caves and has been taken from nests in at least three caves. These appear, however, to be temporary bivouacs, since subsequent trips a few months later found the sites empty. *Labidus coecus* is a generalist and feeds upon whatever source of food can be found with high protein content. Because most of their movements are in subterranean voids it is not entirely surprising to find them moving through caves (Fig. 1). Three species of fire ants, *Solenopsis geminata*, *S. invicta*, and *S. xyloni*, have all been found in Texas caves. *Solenopsis geminata* and *S. xyloni* have each been found in only three caves. A population of *S. geminata* in Featherman's Cave, Travis County, was observed to prey on cave invertebrates. This species, however, has been largely replaced in Central Texas by *S. invicta*.

The most important cave-associated ant in Texas is the red imported fire ant, *Solenopsis invicta*. This species was first introduced into the United States near Mobile, Alabama, in about 1930. It has since expanded its range to include large parts of the southern United States. The Texas distribution of this and other fire ants is plotted in Francke, et al. (1983). This species has had a devastating effect on cave fauna in all areas within its range. Studies by Nichols and Sites (1989) and Porter and Savignano (1990) have documented the impact of *S. invicta* on epigean arthropod communities.

Although there is little information available on early infestations of Texas caves, a few caves were found to have been invaded in the late 1980s. The U.S. Fish & Wildlife Service placed five Texas cave invertebrates on the federal endangered species list (Chambers and Jahrsdorfer, 1988). These species are the Tooth Cave pseudoscorpion *Tartarocreagris texana* (Muchmore), the Tooth Cave spider *Neoleptoneta myopica* (Gertsch),

endangered or potentially endangered cave invertebrates in Central Texas.

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ECOLOGY

Decu, et al. (1999) provided a general discussion of cavernicole ants and divide the species into three main categories: "trogloxènes," "trogloxènes réguliers," and

"trogloxènes phylétiques." The first category is used for species that only occasionally wander into caves or that inhabit entrance areas. This to a certain extent applies to the term "accidental" used by most North American workers. The second category is used to describe species that habitually enter caves, but that do not nest in caves. This essentially corresponds to the term "trogloxene" used by North American workers. The third category is used for species that nest in caves; this closely fits the concept of troglophiles as used by most American workers, that is species that can reproduce in caves but may also be found on the surface.

Many of the ants found in the caves of the areas under consideration are species that have washed or fallen into cave entrances or that inhabit leaf litter below entrances. A significant number of species recorded from caves in Mexico inhabit large entrance sinkholes that show few differences from sheltered surface habitats. All of these species can probably be considered accidentals ("trogloxènes of Decu, et al.). Insufficient habitat data exist for many of the species recorded from caves, but given the few available records for these species, they are likely not associated with the true cave habitat.

Belize: At least eight species of ants have been identified from two caves in Cayo District. With the exception of *Solenopsis geminata*, all were taken from the immediate entrance area under essentially surface conditions. *Solenopsis geminata* was found deeper in the cave and is apparently a true trogloxene.

Mexico: Yucatán Peninsula: The cavernicole ant fauna of the Yucatán Peninsula (Campeche, Quintana Roo, and Yucatán) is the most studied of any karst region in Mexico, but still is inadequately known. At least 47 species have been identified from this area, but most are accidentals. Most of the ants that have been collected were taken from within large surface sinks or in the twilight zone near cave entrances. Three species are considered herein to be troglophiles (trogloxènes phylétiques). *Brachymyrmex cavernicola* and *Paratrechina pearsei* have been found nesting in total darkness in caves in Yucatán. The third species, *Oligomyrmex urichi*, although not recorded from nests in México has been documented as nesting deep within the Guacharo Cave, Trinidad. Several genera probably contain trogloxenes (trogloxènes réguliers), but there are insufficient habitat data to properly document their ecological status.

Acromyrmex octospinosus has been taken from deep within caves in Yucatán, but there is insufficient information to indicate whether it nests in the caves or simply retreats into the caves for shelter. *Acromyrmex* are leaf-cutter ants which grow fungi on vegetable matter in their nest. Because the collectors did not note

the Bee Creek Cave harvestman *Texella reddelli* Goodnight and Goodnight, the Tooth Cave ground beetle *Rhadine persephone* Barr, and the Kretschmarr Cave mold beetle *Texamaurops reddelli* Barr and Steeves. Two additional species, the Bone Cave harvestman *Texella reyesi* Ubick and Briggs and the Coffin Cave mold beetle *Batriscodes (Excavodes) texana* Chandler, were added to the list (Chambers, 1993). All of these species are restricted to small areas of Travis and Williamson Counties. The concern for protecting these species in this rapidly urbanizing area led to numerous intensive studies on cavernicole fauna. With the greater attention to the cave fauna of this region came the realization that *S. invicta* was a serious threat to the survival of the endangered and other species in the caves of Central Texas. A study in 1991 by William R. Elliott and James R. Reddell found 24 of 64 known endangered species caves to have serious infestations of fire ants (Elliott, 1992, 1993). The infestation of caves in this and other areas of Central Texas has steadily increased since that time, and most caves have at least some degree of infestation throughout the area.



Fig. 8.—Rut made by *Labidus coecus* in Ant-Path Passage, Powell's Cave, Menard County, Texas; by David Meredith, 1960s.

A study by Cokendolpher and Francke (1985) revealed that the temperature and humidity in Texas caves is nearly optimal for *S. invicta*. The greatest infestation of Texas caves by fire ants is during periods of drought. Most of the caves containing endangered species are less than 50 m long and 10 m deep. Under hot, dry conditions in the summer, fire ants can be found in all parts of the caves that are humanly accessible. Only one nest has been found away from cave entrances and it did not appear to be viable. Other nests have been found in larger soil-floored sinkhole entrances or crawlways leading into caves.

During the most severe infestations the entire floor and much of the walls of the cave are carpeted with ants. Under these conditions essentially the only fauna that can be found are cave crickets (*Ceuthophilus* spp.) and harvestmen (*Leiobunum townsendii* Weed) that roost on the ceiling, and a few larger, fast-moving spiders. Less severe infestations usually consist of columns moving from the entrance deep into the dark zone. These columns usually lead directly to prey. The greatest impact on cave fauna has been to slower, sedentary species. Predation has been observed on earthworms, the troglobitic millipedes *Cambala speobia* (Chamberlin) and *Speodesmus* spp., the common troglophilic scorpion *Pseudouroctonus reddelli* (Gertsch and Soleglad), the pseudoscorpion *Tyrannochthonius texanus* Muchmore, cave crickets of the genus *Ceuthophilus*, dipteran larvae, and the white-throated slimy salamander *Plethodon albagula* Grobman. In Williams Cave No. 1, Williamson County, hundreds of exoskeletons of the troglobitic millipede *Cambala speobia* were found. A trail extended more than 20 m into the cave to end at a still-living but doomed millipede. Ants were observed crawling into the millipede, removing tissue and bringing it out to join a column exiting the cave.

Even though no direct observations have been made on predation by fire ants on the endangered species, the rarity of these small animals within the caves makes such observations unlikely. Probably the greatest ultimate impact on the ecology of caves by fire ant predation is the reduction of cave cricket populations. The cave cricket genus *Ceuthophilus* is a major source of nutrients for caves in this area. Of three species found in local caves, one species, *Ceuthophilus (Geotettix) cunicularis* Hubbell, is a troglophilic floor-dwelling species. This species has disappeared from some caves following fire ant invasion. In other caves, a few individuals have been found on cave walls where they have retreated, presumably in an attempt to escape the ants. The adults of other species roost on the ceiling and are less susceptible to direct predation by fire ants. Their eggs, however, are laid in cave soil and the

nymphs largely live on the floor. Very heavy predation on nymphs has been observed throughout the area.

A primary concern for recovery of the endangered invertebrates is to find a practical, ecologically sound method for control of *S. invicta* (Elliott, 1993b; O'Donnell, et al., 1994). Dr. William R. Elliott has conducted several studies on cave ecology, cave cricket foraging, and control of fire ants around several caves in Central Texas (1993, 1994). His studies indicate that most cave crickets forage within 30 m of cave entrances. Two control methods consisted of baiting with the low-impact pesticides Amdro® (hydramethylnon) and Logic® (fenoxycarb). These baits are formulated on corn grit with soybean oil. Amdro is a toxicant, whereas Logic impairs insect reproduction. The third method was the direct application of hot water to the mounds. The baiting methods were both found to be effective, but concerns exist over their impact on cave cricket populations since the crickets find the baits attractive. Hot water was the most effective method for immediate destruction of colonies and had the most lasting effects, but is extremely labor intensive. Recent attempts at control have included applications of hot water within 30 m of cave entrances and the placement of baits in areas beyond that. Despite the success of these treatments, reinfestation occurs following mating flights.

The results of studies on the impact of *S. invicta* indicate that without a continuous program of control, cave fauna will continue to be severely impacted. Despite the short-term success of treatment using boiling water and baits, the cost in time and money makes it costly to treat large numbers of caves over long periods of time. Survival of the cave fauna, however, requires that these methods be used until a permanent biological control method is devised.

FAUNA LIST

The following list of records includes all ants known to occur in the caves of Belize, Mexico, and California and Texas (U.S.A.). The only literature cited are those papers that specifically record the species in caves in the areas under consideration. Collection data are provided for all specimens obtained during studies by James Reddell and other speleologists conducting studies in Belize, Mexico, California and Texas. The initials of the taxonomists studying this material are included in parentheses following the record. These are: WLB – W.L. Brown, Jr., Cornell University; ACC – A.C. Cole, The University of Tennessee, Knoxville; JCC – James C. Cokendolpher, Lubbock, Texas; DRS - D.R. Smith, National Museum of Natural History, Smithsonian Institution, Washington, D.C.; RRS – Roy

R. Snelling, Los Angeles County Museum of Natural History. Many of the identifications by DRS were later verified by RRS. Specimens identified by W.L. Brown, Jr., A.C. Cole, and R.R. Snelling are deposited in the Los Angeles County Museum of Natural History. Specimens identified by James C. Cokendolpher are in the collection of the Texas Memorial Museum, The University of Texas at Austin.

Subfamily Ponerinae

Anochetus sp.

Record.—MEXICO: Yucatán: Actún Xpuhil, 3 km S Calcehtok, 18-19 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, 1975).

Comment.—This is an accidental taken from the main entrance sink.

Gnamptogenys strigata (Norton)

Record.—MEXICO: Veracruz: Cueva de la Sala de Agua Grande, 5 km N Cuitlahuac, 4 Jan. 1977 (A. Grubbs, D. McKenzie, J. Reddell, D. McKenzie) (RRS, 1981).

Comment.—This species was found in the main entrance room.

Hypoponera spp.

Records.—MEXICO: Campeche: Actún Huachap, 14 km NNW Bolonchentil, 24 June 1975 (A. Grubbs, D. McKenzie, W. Russell, S. Wiley) (DRS, 1978); Grutas de Xtabambilxunam, 2 km SW Bolonchentil, 13 May 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981). San Luis Potosí: Ventana Jabalí, 20 km NE Ciudad Valles (W. Bell, D. McKenzie, T. Raines) (ACC).

USA: TEXAS: Travis County: Three-Holer Cave, 1 May 1992 (J. Reddell, M. Reyes), Berlese of litter (JCC, 1992). Williamson County: Lobo's Lair, 13 Sept. 1991 (J. Reddell, M. Reyes), Berlese of litter (JCC, 1992); Pussy Cat Cave, 6 June 1991 (D. Allen, W. Elliott) (JCC, 1992).

Comments.—The status of this material is unknown. Members of this genus nest in small colonies generally in soil or rotten wood. They rarely forage on the surface and as far as known (Creighton, 1950) all species feed on insects or other small arthropods.

Hypoponera sp. 1

Records.—MEXICO: Campeche: Grutas de San

Antonio, 10 km NNE Bolonchenticul, 3 Nov. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977). *Oaxaca*: Cueva de Juan Sánchez, 10 km NW Acatlán, 26 Dec. 1976 (A. Grubbs, J. Reddell, C. Soileau) (RRS, 1981). *Yucatán*: Cenote de Sambulha, Motul, 28 March 1973 (S. Murphy, J. Reddell) (DRS, RRS, 1981).

Comment.—The status of this material is unknown.

Hypoponera sp. 2

Records.—MEXICO: *Campeche*: Grutas de San Antonio, 10 km NNE Bolonchenticul, 23-24 Nov. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977). *Tamaulipas*: Sótano de Santa Elena, 14 km SE Antiguo Morelos, 6 Jan. 1971 (W. Elliott, J. Shepperd) (DRS, RRS, 1981). *Veracruz*: Cueva de la Sala de Agua Grande, 5 km N Cuitlahuac, 4 Jan. 1977 (A. Grubbs, D. McKenzie, J. Reddell, C. Soileau) (RRS, 1981).

Comment.—The status of this material is unknown.

Hypoponera sp. 3

Record.—MEXICO: *Yucatán*: Cenote Sucopo, Sucopo, 31 March 1973 (S. Murphy, J. Reddell) (DRS, RRS, 1981).

Comment.—The status of this material is unknown.

Hypoponera sp. 4

Records.—MEXICO: *San Luis Potosí*: Sótano de la Tinaja, 10.5 km NE Ciudad Valles, 4 July 1970 (D. Broussard, J. Cooke, R. Mitchell) (DRS, RRS, 1981); 16 March 1972 (J.M. Rowland) (DRS, RRS, 1981).

Comment.—The status of this material is unknown.

Hypoponera sp. 5

Record.—MEXICO: *San Luis Potosí*: Sótano de Santa Elena, 14 km SE Antiguo Morelos, 6 Jan. 1970 (W. Elliott, W. Russell) (DRS, RRS, 1981).

Comment.—The status of this material is unknown.

Hypoponera sp. 6

Record.—MEXICO: *San Luis Potosí*: Cueva de Taniñul no. 1, 13 km SE Ciudad Valles, 29 March 1970 (W. Elliott, S. Wiley) (DRS, RRS, 1981).

Comment.—The status of this material is unknown.

Hypoponera inexorata (Wheeler)

Record.—USA: TEXAS: *Williamson County*: Deliverance Cave No. 1, 18 Nov. 1993 (J. Reddell, M. Reyes) (JCC, 1994).

Comment.—This species was taken just inside the entrance.

Hypoponera opaciceps (Mayr)

Ponera opaciceps: Wheeler, 1938:251; Pearse, 1945:189; Reddell, 1971b:76.

Records.—MEXICO: *Yucatán*: Cenote de Sambulá, Motul (Wheeler, 1938); Cueva de San Isidro, Mérida (Wheeler, 1938). USA: TEXAS: *Bexar County*: Stealth Cave, 29 Oct. 1997 (P. Sprouse, G. Veni) (JCC, 1998).

Comment.—This species was found from under stones and debris near cave entrances in Mexico. The specimens from Texas probably washed into the cave.

Hypoponera opacior (Forel)

Ponera trigona opacior: Reddell, 1966b:37.

Hypoponera opacior: Davis, 1979:85, 131, 134, 136; Reddell, 1988c:44.

Records.—USA: TEXAS: *Bexar County*: Eagles Nest Cave, 20 April 1999 (J. Reddell, M. Reyes), Berlese of leaf litter (JCC, 1999); Strange Little Cave, 29 Nov. 1993 (J. Reddell, M. Reyes) (JCC, 1994); Voight's Bat Cave, 13 Sept. 1984 (S. Harden, G. Veni) (RRS, 1985). *Coryell County*: Porter Cave, Fort Hood, 8 April 1999 (J. Reddell, M. Reyes), Berlese of leaf litter (JCC, 1999). *Uvalde County*: Indian Creek Cave, 3 Dec. 1963 (J. Reddell), on 60 ft. level (ACC, 1964).

Comments.—This species is probably an accidental; collections for which habitat data are available were taken from near the entrance.

Hypoponera punctatissima (Roger)

Ponera ergatandria: Wheeler, 1938:251; Pearse, 1945:189; Reddell, 1971b:76.

Hypoponera punctatissima: Reddell, 1977b:235; Reddell, 1981:237.

Records.—MEXICO: *Campeche*: Grutas de Monte Bravo, 10 km NW Cantemo, 19 Dec. 1974 (L. Elliott, D. McKenzie, J. Reddell) (RRS, 1977); Grutas de San Antonio, 10 km NNE Bolonchenticul, 23-24 Nov. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977). *San Luis Potosí*: Ventana Jabalí, 20 km NE Ciudad Valles, 12 July 1969 (J. Peck, S. Peck) (RRS, 1977). *Yucatán*: Cenote Sihunchén, Sihunchén, 23 March 1973 (M. Butterwick, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977).

Comments.—Specimens from Grutas de Monte Bravo and Grutas de San Antonio were taken from the

entrance sinks; specimens from Cenote Sihunchén were taken from leaf litter in darkness.

Leptogenys sp.

Record.—MEXICO: Campeche: Grutas de Xkalumkín, 5 km W Cumpich, 20 June 1975 (A. Grubbs, D. McKenzie, J. Reddell, S. Wiley) (DRS, 1978).

Comment.—This material was taken from near the entrance.

Leptogenys sp. 1

Records.—MEXICO: Oaxaca: Cueva del Lencho Virgen, 9 km SSW Acatlán, 3 Jan. 1973 (D. McKenzie, J. Reddell) (DRS, RRS, 1981); Grutas de Monteflor, Monteflor, 6 km N Valle Nacional, 28 Dec. 1973 (D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977).

Comment.—This material was taken from near the entrance.

Leptogenys sp. 2

Records.—MEXICO: Quintana Roo: Cenote de Juan Coh, Felipe Carrillo Puerto, 4 July 1975 (A. Grubbs, D. McKenzie, J. Reddell) (RRS, 1977). Yucatán: Cueva de Orizaba, Orizaba, 8 km S Buenaventura, 1 April 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981).

Comment.—Specimens from these caves were taken from the entrance area.

Leptogenys sp. 3

Record.—MEXICO: Yucatán: Cenote Amil, 6 km S Abalá, 28 March 1973 (J. Reddell, M. Rodríguez) (RRS, 1977).

Comment.—This material was taken from below the entrance drop.

Leptogenys elongata (Buckley)

Leptogenys elongata: Reddell, 1966b:37; Mitchell and Reddell, 1971:83; Reddell, 1988c:44; Reddell, 1992a:137.

Records.—USA: TEXAS: Bell County: Big Ash Tree Sink, Fort Hood, 14 March 1992 (J. Reddell, M.

Reyes) (JCC, 1992); Big Crevice, Fort Hood, 6 June 2000 (J. Reddell, M. Reyes) (JCC, 2000); Chimney Windows Cave, Fort Hood, 19 May 1999 (J. Reddell, M. Reyes) (JCC, 1999); Seven Mile Mountain Cave, Fort Hood, 11 April 1999 (R. Price, M. Warton) (JCC, 1999). Bexar County: Backhole, 9 Sept. 1998 (J. Cokendolpher, J. Krejca) (JCC, 1999); John Wilson Ranch Cave no. 3, 23 Dec. 1962 (O. Knox) (ACC, 1963); Kamikazi Cricket Cave, 3 Oct. 1984 (G. Veni) (RRS, 1985); Skull Cave, 25 Sept. 1984 (G. Veni, R. Waters) (RRS, 1985). Coryell County: Brokeback Cave, 16 Aug. 1964 (D. McKenzie, J. Reddell) (ACC, 1965); Cornelius Cave, Fort Hood, 21 Nov. 1995 (J. Reddell, M. Reyes) (JCC, 1996). Stonewall County: Aspermont Bat Cave, May 1963 (J. Reddell, W. Russell) (ACC, 1964). Travis County: Tooth Cave, 2 March 1963 (J. Reddell) (ACC, 1963). Williamson County: Forest Trail Pit, 10 Nov. 1991 (M. Warton) (JCC, 1992).

Comments.—This species is presumably an accidental; it is usually found near cave entrances. It is known to build its nest in soil or rotten logs and feeds largely on isopods of the genera *Armadillium* and *Oniscus* which are only found in the entrances of caves.

Odontomachus sp.

Record.—MEXICO: Yucatán: Actún Xpuhil, 3 km S Calcehtok, 18-19 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977).

Comment.—This accidental was taken in the main entrance sink.

Odontomachus clarus Roger

Record.—USA: TEXAS: Bexar County: Platypus Pit, 30 May 1996 (J. Ivy), Zone 1 (JCC, 1996).

Comment.—This accidental was taken in the entrance area.

Odontomachus ruginodis M.R. Smith

Odontomachus haematoda: Wheeler, 1938:251; Reddell, 1971b:76.

Records.—MEXICO: Tabasco: Cueva del Azufre, 3.5 km S Tapajulapa, 15 June 1975 (A. Grubbs, D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977). Yucatán: ?Cueva Segunda del Camino a San Roque, on road from Oxkutzcab to San Roque (Wheeler, 1938).

Comment.—This species was taken near the entrance to Cueva Segunda del Camino a San Roque (Wheeler, 1938).

Pachycondyla spp.

Euponera sp.: McKenzie, 1965:35; Reddell, 1971b:75; Reddell and Mitchell, 1971a:158.

Records.—MEXICO: Campeche: Grutas de Xtabambilxunam, 2 km SW Bolonchenticul, 25 Nov. 1974 (D. McKenzie, J. Reddell, S. Wiley) (DRS, RRS, 1978). Chiapas: Cueva del Salto de Agua, 15 km SE Palenque, Dec. 1973 (D. Coons, A. Cochrane) (DRS, RRS, 1981); San Luis Potosí: Ventana Jabalí, 20 km NE Ciudad Valles, 26 March 1964 (W. Bell, D. McKenzie, T. Raines) (ACC).

Comments.—Specimens from Grutas de Xtabambilxunam were taken from the large entrance sink. This is presumably an accidental.

Pachycondyla sp. 1

Records.—MEXICO: Yucatán: Actún Kaua, 1 km S Kaua, 9 Nov. 1974 (J. Reddell) (RRS, 1977); Actún Sabacá, 6 km SW Tekax, 4 Dec. 1974 (J. Andrews, D. McKenzie, R. Mitchell, J. Reddell, S. Wiley) (RRS, 1977).

Comment.—This species was taken from near the cave entrance.

Pachycondyla apicalis (Latreille)

Neoponera latreillei: Wheeler, 1938:251; Pearse, 1945:188; Reddell, 1971b:76.

Pachycondyla apicalis: Reddell, 1977b:235; Reddell, 1981:237.

Records.—MEXICO: Campeche: Grutas de Xtabambilxunam, 2 km SW Bolonchenticul, 13 May 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981). Quintana Roo: Cenote de Juan Coh, Felipe Carrillo Puerto, 4 July 1975 (A. Grubbs, D. McKenzie, J. Reddell) (RRS, 1977); Cenote de Tos Viriol, 13 km S Señor, 4 July 1975 (A. Grubbs, J. Reddell) (RRS, 1977). Yucatán: Cenote Aká Chen, 1 km E Tixcancal, 2 April 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977); Grutas de Balankanche, 4 km E Chichén Itzá, 10-12 Dec. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977); Cueva Segunda del Camino a San Roque, on road from Oxkutzcab to San Roque (Wheeler, 1938); Cueva del Cinco de Mayo, 1 km SW Tekax (Wheeler, 1938); Actún Puz, near Oxkutzcab (Wheeler, 1938); Actún Tucil, 2 km S Muna, 27 March 1973 (J. Reddell) (DRS, RRS, 1981); Actún Xpukil, 3 km S Calcehtok, 18-19 March 1973 (M. Butterwick, D.

McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977).

Comments.—The material reported by Wheeler (1938) was taken near cave entrances. The remaining material for which locality data is available was also taken near cave entrances.

Pachycondyla carinulata (Roger)

Pachycondyla carinulata: Reddell and Veni, 1996:137.

Record.—BELIZE: Cayo: Cebada Cave, Zone B, 9 May 1986 (G. Veni) (RRS, 1986).

Comment.—This species was taken in twilight less than 20 m from the cave entrance.

Pachycondyla ferruginea (F. Smith)

Records.—MEXICO: San Luis Potosí: Sótano de Guadalupe, 10 km W Aquismón, 18 March 1980 (D. Pate) (WLB, 1981); Ventana Jabalí, 20.5 km NE Ciudad Valles, 12 July 1969 (J. Peck, S. Peck) (RRS, 1981); Cueva de Oxtalja, Tamapatz, 30 Aug. 1980 (S. Balsdon, P. Sprouse, T. Treacy) (WLB, 1981). Yucatán: Actún Sabacá, 6 km S Tekax, 4 Dec. 1974 (J. Andrews, D. McKenzie, R.W. Mitchell, J. Reddell, S. Wiley) (RRS, 1981).

Comment.—This species was taken from near the cave entrance of Actún Sabacá.

Pachycondyla harpax (Fabricius)

Pachycondyla harpax montezumia: Wheeler, 1938:251; Pearse, 1945:188; McKenzie, 1965:38; Reddell, 1967f:54; Reddell, 1970c:53; Reddell, 1971b:76 [part—Yucatán record only]; Reddell and Mitchell, 1971a:158; Reddell and Mitchell, 1971b:196; Reddell, 1981:237; Decu, Casale, Scaramozzino, López, and Tinaut, 1998:1021.

Pachycondyla harpax: Reddell, 1977b:235.

Records.—MEXICO: Campeche: Actún Halmensura, 5 km E Cumpich, 31 Oct. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977). Oaxaca: Grutas de Monteflor, Monteflor, 6 km N Valle Nacional, 28 Dec. 1973 (D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977); Sótano Sin Hondo, 5 km SSW Acatlán, 28 Dec. 1976 (R. Hemperly) (RRS, 1981). San Luis Potosí: Sótano del Arroyo, 12 km NNE Ciudad Valles, 25 Nov. 1963 (J. Reddell), found on 10 m level (ACC, 1964); Cueva Chica, 16 km SE Ciudad Valles, 26 March 1964 (W. Bell, D. McKenzie, T. Raines) (ACC, 1964); Sótano de Yerbaniz, 21.5 km N Ciudad Valles, 7 Jan. 1970 (S. Wiley) (DRS, RRS, 1981).

Tamaulipas: Sótano del Molino, 1 km NW Gómez Farías, 168.5 m elev., June 1964 (T. Raines) (ACC, 1964); Sótano de la Joya de Salas, Joya de Salas, 15 km NW Gómez Farías, 1560 m elev., 3 June 1965 (J. Fish, O. Knox, Jr., D. McKenzie) (ACC, 1965). *Yucatán*: Actun Góngora, near Oxkutzcab (Wheeler, 1938); Cueva de Orizaba, Orizaba, 6 km S Buenaventura, 1 April 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981); Actún Sabacá, 6 km SW Tekax, 4 Dec. 1974 (J. Andrews, D. McKenzie, R. Mitchell, J. Reddell, S. Wiley) (RRS, 1977); Grutas de Tzab-Nah, 2 km S Tecoh, 1 Oct. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977); Actún Xpukil, 3 km S Calcehtok, 18-19 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977); Actún Ziz, Oxkutzcab, 3 Dec. 1974 (A. Gamboa, D. McKenzie, R. Mitchell, J. Reddell, S. Wiley) (RRS, 1977).

USA: TEXAS: *Medina County*: Weynand Cave, 12 Aug. 1965 (J. Fish, J. Reddell), in entrance room (ACC, 1966).

Comments.—Wheeler (1938) reported this species from under stones near the mouth of Actún Góngora. It was generally found near the entrance of the other caves.

Pachycondyla stigma (Fabricius)

Euponera stigma: Reddell and Mitchell, 1971b:196.

Records.—MEXICO: *San Luis Potosí*: Cueva de San Pedro, 4 km N Tlamaya, 28 Dec. 1984 (P. Sprouse) (RRS, 1985); Cueva Tepametl, 3 km NE Tlamaya, 26 Dec. 1984 (T. Raines) (RRS); Sótano de Tlamaya, Tlamaya, 2.5 km NNW Xilitla, 26 Nov. 1964 (W. Bell, T. Raines) (ACC, 1965); 21 Nov. 1983 (P. Sprouse) (RRS, 1985). *Tamaulipas*: Sótano de Gómez Farías, 3 km ESE Gómez Farías, 300 m elev., 6 Dec. 1964 (T. Raines) (ACC, 1965).

Comment.—This species is probably an accidental.

Pachycondyla unidentata Mayr

Record.—MEXICO: *San Luis Potosí*: Sótano de Tampamache, 8 km NW Aquismón, 31 Aug. 1986 (P. Sprouse) (RRS, 1986).

Comment.—The status of this material is unknown.

Pachycondyla villosa (Fabricius)

Neoponera villosa inversa: Wheeler, 1938:251; Pearse, 1945:188; Reddell, 1971b:76.

Neoponera villosa: Reddell and Mitchell, 1971b:196.

Pachycondyla villosa: Reddell, 1977b:235; Reddell, 1981:237.

Records.—MEXICO: *Campeche*: Grutas de San Antonio, 10 km NNE Bolonchenticul, 3 Nov. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977). *Quintana Roo*: Cenote de Juan Coh, Felipe Carrillo Puerto, 4 July 1975 (A. Grubbs, D. McKenzie, J. Reddell) (RRS, 1977). *Tamaulipas*: Sótano del Molino, 1 km NW Gómez Farías, 268.5 m elev., June 1964 (T. Raines) (ACC, 1964). *Yucatán*: Cueva del Cinco de Mayo, 1 km SW Tekax (Wheeler, 1938); Actún Silil, 3 km S Calcehtok, 23 June 1975 (W. Russell, W. Wiley) (RRS, 1977); Actún Xpukil, 3 km S Calcehtok, 18-19 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977).

Comments.—Wheeler (1938) reported this species from near the mouth of Cueva del Cinco de Mayo. It was found in cave entrance areas of the other caves. Sótano del Molino floods and the species possibly washed into that cave.

Proceratium sp. prob. *compitale* Ward

Record.—USA: TEXAS: *Val Verde County*: Seminole Sink, Nov. 1984 (L. Bement).

Comments.—This species was taken from the entrance room. RRS, 1985, identified this sample as *Proceratium pergandei* (Emery), but because that identification was before Ward (1988) described *P. compitale*, we assume Snelling's identification is incorrect. Ward noted that the nearest *P. pergandei* record was from Bandera County. All the records Ward presented from Val Verde and Terrell Counties were of *P. compitale*.

Proceratium compitale Ward

Proceratium compitale Ward, 1988:102, 104, 112, 113-115, 117, figs. 6, 10, 13; Cokendolpher and Francke, 1990:14, 15, 45.

Records.—MEXICO: *Coahuila*: Cueva de los Lagos, 15 mi. NW Ciudad Acuña, 27 Jan. 1966 (J. Reddell) (Ward, 1988).

USA: TEXAS: *Sutton County*: Caverns of Sonora, 25 Oct. 1993 (G. Veni). *Val Verde County*: Emerald Sink, 30 Nov. 1984 (J. Reddell, M. Reyes) (Ward, 1988). *Terrell County*: Blackstone Cave, 5 Feb. 1967 (D. Erickson, D. McKenzie) (Ward, 1988). *Uvalde County*: Barn-Sized Fissure Cave, 17 March 1993 (A. Grubbs) (JCC, 1993).

Comments.—Although this species is known only from caves it will certainly be found in other cryptic habitats on the surface. The type-locality is Emerald Sink.

Subfamily Ecitoninae

Members of this subfamily are the army ants. According to Watkins (1985), most of the USA army ants are mostly hypogaeic in their nesting, raiding, and migrating behavior. The few exceptions are species whose raids and migrations are partially epigaeic, especially when the soil moisture is high. Although many species prefer to predate upon brood of ants of other species, others are generalists and will feed upon practically anything with a high protein content, including living and dead arthropods, carrion and pieces of various nuts.

Ecton burchellii (Westwood)

Record.—MEXICO: Yucatán: Actún Xpukil, 3 km S Calcehtok, 18-19 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977).

Comment.—This species was found in the main entrance sink.

Labidus coecus (Latrelle)

Ecton (*Labidus*) *coecus*: McKenzie and Reddell, 1964:42; Reddell, 1966b:36; Reddell, 1967f:27; Reddell, 1970c:53.

Labidus coecus: Davis, 1979:85, 131, 134, 136, 137; Reddell, 1981:237; Reddell, 1988c:44.

Labidus (*Ecton*) *coecus*: Davis, 1979:84-85.

Ecton coecum: Decu, Casale, Scaramozzino, López, and Tinaut, 1998:1021.

Records.—MEXICO: Oaxaca: Cueva de las Bellotas, 5 km NW Santiago Apoala, 2240 m elev., 3 Jan. 1973 (J. Reddell) (DRS, RRS, 1981); Cueva del Guano, 8 km N Valle Nacional, 28 Dec. 1972 (D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981). Tamaulipas: Cueva del Cañón del Burro, 8 km N San Antonio, 700 m elev., 2 Sept. 1984 (D. Pate) (RRS, 1985). Yucatán: Actún Loltún, 7 km SSW Oxkutzcab, 25-26 July 1975 (A. Grubbs, D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977).

USA: TEXAS: Bell County: Camp 6 Cave No. 1, Fort Hood, 22 Feb. 1996 (D. Allen, L.J. Graves, D. Love) (JCC, 1996); Soldiers Cave, Fort Hood, 25 March 1999 (J. Reddell, M. Reyes) (JCC, 1999). Bexar County: Dirtwater Cave, 2 Aug. 1983 (J. Ivy, G. Veni) (RRS, 1984); Poor Boy Baculum Cave, 15 Dec. 1994 (W. Elliott, B. Johnson), Zone 1, 2, 3 (JCC, 1995); Root Canal Cave, 30 Nov. 1994 (G. McDaniel) (JCC, 1995); Stevens Ranch Trash Hole Cave, 12 June 1993 (J. Loftin) (JCC, 1993); Strange Little Cave, 29 Nov. 1993

(J. Reddell, M. Reyes) (JCC, 1994). Burnet County: Longhorn Caverns (Crownover Cave section), 24 Sept. 1999 (A. Cobb) (JCC, 1999). Coryell County: Briar Cave, Fort Hood, 15 Jan. 1992 (L.J. Graves, J. Reddell) (JCC, 1992); Egypt Cave, Fort Hood, 21 Jan. 1992 (J. Reddell, M. Reyes) (JCC, 1992); Frank's Cave, 1 Feb. 1963 (D. McKenzie) (ACC, 1963); Rocket River Cave System (B. R's Secret Cave), 9 Feb. 1992 (L.J. Graves, J. Reddell, M. Reyes) (JCC, 1992); Salt peter Cave, Fort Hood, 8 Sept. 1997 (J. Reddell, M. Reyes) (JCC, 1997). Hays County: Ezell's Cave (Davis, 1979). Kendall County: Pfeiffer's Water Cave, 7 Nov. 1992 (P. Chippendale, A. Grubbs, J. Hunter) (JCC, 1993). Kerr County: Seven Room Cave, Jan. 1966 (J. Fish, J. Reddell), entrance room (ACC, 1966). Medina County: Lutz Cave, Feb. 1966 (D. McKenzie, W. Russell), present in thousands from entrance to end of cave (ACC, 1966). Menard County: Powell's Cave, 23 Feb. 1991 (G. Veni) (JCC, 1991). Sutton County: Caverns of Sonora, entrance to Sam Odom Pit, 27 July 1994 (G. Veni, B. Sawyer) (JCC, 1994); Caverns of Sonora, dome intersected by utility borehole at entrance to Hall of the White Giants, 3 Aug. 1996 (G. Veni) (JCC, 1996). Travis County: Contortionist Cave, Dec. 1994 (M. Warton) (JCC, 1995); Ireland's Cave, 1 March 1986 (D. Pate) (RRS, 1986); Weldon Cave, 6 Feb. 1965 (D. McKenzie, J. Reddell) (ACC). Val Verde County: Emerald Sink, 3 Nov. 1984 (J. Reddell, M. Reyes) (RRS, 1985); Williamson County: Beck Crevice Cave, 3 June 1996 (J. Reddell, M. Reyes), from nest in total darkness (JCC, 1996); Beck Sewer Cave, 23 Jan. 1965 (R. Mitchell, J. Reddell) (ACC, 1966); 27 Sept. 1965 (J. Calvert Reddell, J. Reddell), in two colonies in silt in main first room 75 ft. from entrance in darkness (ACC, 1966); Cricket Cave, 30 March 1965 (J. Reddell) (ACC, 1966); Fern Bluff Cave, 5 July 1986 (W. Elliott) (RRS, 1986); LakeLine Mall Well Trap No. 3, 19 Oct. 1990 (L. Sherrod), lower bottle (JCC, 1991); LakeLine Mall Well Trap No. 4, 15 Oct. 1990 (L. Sherrod), 25 Oct. 1990 (L. Sherrod) (JCC, 1991); LakeLine Mall Well Trap No. 5, 19 Oct. 1990 (L. Sherrod) (JCC, 1991); 29 Oct. 1990 (L. Sherrod); LakeLine Mall Well Trap No. 6, 19 Oct. 1990 (L. Sherrod), lower trap (JCC, 1991); 25 Oct. 1990 (L. Sherrod), lower trap baited with blue cheese; 29 Oct. 1990 (L. Sherrod), lower trap (JCC, 1991); Testudo Tube, Jan. 1991 (L. Sherrod), (JCC, 1992); 21 Dec. 1992 (J. Reddell) (JCC, 1993).

Comments.—This troglobiont is frequently abundant in caves. Bivouacs have been found in Beck Crevice Cave, Beck Sewer Cave, and Testudo Tube in darkness. See discussion on ecology above for further discussion of the species. Decu, Casale, Scaramozzino, López, and Tinaut (1998) erroneously reported that Beck Sewer Cave and Lutz Cave are in Mexico.

Labidus praedator (F. Smith)

Labidus praedator: Reddell, 1981:237.

Records.—MEXICO: *San Luis Potosí*: Sótano de Yerbaniz, 21.5 km NNE Ciudad Valles, 241.5 m elev., 17 Feb. 1970 (collector unknown) (DRS, RRS, 1981). *Yucatán*: Grutas de Balankanche, 4 km E Chichén Itzá, 10-12 Dec. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977); Cenote de Hoctún, 1 km W Hoctún, 16 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981).

Comment.—Specimens from Cenote de Hoctún were taken from bat guano.

Neivamyrmex fallax Borgmeier

Neivamyrmex fallax: Reddell, 1966b:37.

Record.—USA: TEXAS: *Travis County*: Cotterell Cave, 25 Feb. 1963 (W. Russell) (ACC, 1963).

Comment.—This is presumably an accidental.

Nomamyrmex esenbeckii wilsoni (Santschi)

Records.—MEXICO: *Quintana Roo*: Cueva de Kopoil, 0.5 km N Kopoil, 3 July 1975 (A. Grubbs, J. Reddell) (RRS, 1977). *Yucatán*: Cenote Aká Chen, 1 km E Tixcancal, 2 April 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977).

Comment.—These specimens were taken from below cave entrances.

Nomamyrmex hartigii (Westwood)

Record.—MEXICO: *Oaxaca*: Cueva de Juan Sánchez, 10 km NW Acatlán, 26 Dec. 1976 (A. Grubbs, J. Reddell, C. Soileau) (RRS, 1981).

Comment.—This is probably an accidental washed into the cave.

Subfamily Pseudomyrmecinae

Pseudomyrmex sp.

Record.—MEXICO: *Quintana Roo*: Cenote de Las Ruinas, 6 km ENE Polyuc, 29 July 1975 (A. Grubbs, D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977).

Comment.—This accidental species was found near the entrance.

Subfamily Myrmicinae

Acromyrmex octospinosus (Reich)

Acromyrmex ectospinosus ekchuan Wheeler, 1937:74; Wheeler, 1938:252; Pearse, 1945:189; Reddell, 1971b:75.

Acromyrmex octospinosus echinatior: Wheeler, 1938:252.

Acromyrmex octospinosus: Wheeler, 1938:251; Reddell, 1977b:235; Reddell, 1981:237; Zeppelini Filho and Castaño Meneses, 1995:11.

Records.—MEXICO: *Yucatán*: Cenote Aká Chen, 1 km E Tixcancal, 2 April 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977); Cenote Calchum, 1 km E Hacienda San Bernardo, 16 April 1973 (D. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981); Actún Chukum, 2 km S Maxcanú, 29 Nov. 1974 (D. McKenzie, R. Mitchell, J. Reddell, S. Wiley) (RRS, 1977); Cenote G, Ruinas de Aké, 26 March 1973 (M. Butterwick, M. McKenzie, J. Reddell) (DRS, RRS, 1981); Actún Góngora, near Oxkutzcab (Wheeler, 1937); Cueva Luchil, 8 km SSE Mérida (Wheeler, 1937); Actún Puz, Oxkutzcab (Wheeler, 1937); Cenote de Sambulá, Mérida (Wheeler, 1937); Cenote de Sihunchén, Sihunchén, 23 March 1973 (M. Butterwick, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981); Actún Toh (Zeppelini Filho and Castaño Meneses, 1995); Grutas de Tzab-Nah, 2 km S Tecoh, 22 April 1973 (D. McKenzie, J. Reddell) (RRS, 1977); Actún Xkye, 2 km S Calcehtok (Wheeler, 1937); 1 May 1973 (E. Alexander, M. Butterwick, D. McKenzie, J. Reddell) (DRS, RRS, 1981); Actún Ziz, Oxkutzcab (Wheeler, 1937).

Comments.—This leaf-cutter ant was reported by Wheeler (1938) to occur up to 62 m from the entrance of caves in Yucatán. Specimens were found well within the dark zone of several caves during the 1973 and 1974 studies. *Acromyrmex* grow fungi on vegetable matter in their nest. Because the collectors did not note columns of ants carrying cut leaves into the caves, the ants are presumably only visitors to the cave environment.

Aphaenogaster spp.

Aphaenogaster sp.: Palacios-Vargas and Morales-Malacara, 1983:168; Hoffmann, Palacios-Vargas, and Morales-Malacara, 1986:135, 218.

Records.—MEXICO: *Morelos*: Cueva 8 de Julio (Palacios-Vargas and Morales-Malacara, 1983:168). *San Luis Potosí*: Cueva de Potrerillos, 2 km WSW

Ahuacatlán, 1250 m elev., 27 Nov. 1972 (T. Raines, J. Reddell) (DRS, RRS, 1981).

USA: TEXAS: *Coryell County*: Loop-Around Cave, Fort Hood, 16 July 1993 (J. Reddell, M. Reyes) (JCC, 1993).

Comment.—These specimens, presumably not the same species, were taken from the entrance area of Cueva de Potrerillos and Loop-Around Cave.

Aphaenogaster sp. nr. *texana* Emery

Record.—MEXICO: *Tamaulipas*: Sistema Purificación (Cueva del Brinco), 4 Sept. 1978 (W. Elliott) (RRS, 1981).

Comment.—This species was taken from the entrance sink.

Aphaenogaster texana Emery

Aphaenogaster texana: Reddell, 1966b:36; Fieseler and Kunath, 1975:20.

Records.—USA: TEXAS: *Bell County*: Bumelia Well Cave, Fort Hood, 5 Nov. 1998 (J. Cokendolpher, J. Krejca) (JCC, 1999). Creek Bed Sink, Fort Hood, 14 June 2000 (J. Reddell, M. Reyes) (JCC, 2000). *Brewster County*: O.T.L. Cave, 25 June 1963 (J. Reddell, W. Russell), near entrance (ACC, 1964).

Comment.—This species was found near cave entrances.

Apterostigma sp.

Record.—MEXICO: *Veracruz*: Cueva del Ojo de Agua Grande, 5 km N Potrero, 550 m elev., 4 Jan. 1974 (W. Elliott, R. Jameson, D. McKenzie, J. Reddell) (DRS, RRS, 1981).

Comment.—This species was taken from the entrance room.

Atta sp.

Atta sp.: Zeppelini Filho and Castaño Meneses, 1995:11.

Record.—MEXICO: *Yucatán*: Actún Toh (Zeppelini Filho and Castaño Meneses, 1995)

Comment.—The status of this leaf-cutter ant is unknown, but like other leaf-cutters is probably an accidental.

Atta cephalotes (Linnaeus)

Atta cephalotes var. *opaca*: Wheeler, 1938:252.

Atta cephalotes opaca: Pearse, 1945:189; Reddell, 1971b:75.

Record.—MEXICO: *Yucatán*: Cueva Muruztún (Wheeler, 1938)

Comments.—Wheeler (1938) reported that "these leaf-cutting ants were taken in the middle of the cave. They belonged to a mound above, but had come through the roof and deposited a great mound of rubbish."

Atta mexicana (F. Smith)

Records.—MEXICO: *San Luis Potosí*: Cueva de las Lagunitas, 3 km S San Nicolás de los Montes, 13 km N Agua Buena, 2 Jan. 1976 (T. Byrd, M. Cassey, A. Grubbs) (RRS, 1977); Sótano del Pozo, 1 km W Ahuacatlán, 26 Nov. 1964 (W. Bell, T. Raines) (ACC, 1965). *Yucatán*: Actún Kaua, 1 km S Kaua, 9-10 Oct. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977); Cenote Poxil, Poxil, 7 km SE Chemax, 15 Dec. 1974 (J. Reddell) (RRS, 1977).

Comment.—These ants were all taken below the cave entrances.

Atta texana (Buckley)

Records.—USA: TEXAS: *Bandera County*: Fog Fissure, 30 Oct. 1963 (D. McKenzie) (ACC, 1964). *Bexar County*: Jabba's Giant Sink, Camp Bullis, 18 Nov. 1996 (G. Veni) (JCC, 1997).

Comment.—This species was found below cave entrances and is considered an accidental.

Crematogaster spp.

Crematogaster sp.: Reddell, 1966b:36; Reddell, 1967a:19; Reddell, 1970c:53.

Records.—BELIZE: *Cayo*: Balam's Cave (Uchen Balam), 22-26 March 1979 (L. McNatt) (RRS, 1981).

USA: TEXAS: *Bell County*: Septum Pit Cave, Fort Hood, 1 May 1998 (M. Reyes) (JCC, 1998). *Edwards County*: Deep Cave, 4 Sept. 1965 (D. Dickey) (ACC, 1966). *Sutton County*: Felton Cave, 4 July 1964 (J. Reddell) (ACC, 1964). *Travis County*: Enfield Sinkhole, 18 June 1991 (W. Elliott, C. Ladd) (JCC). *Williamson County*: Priscilla's Cave, 6 June 1996 (W. Elliott), on cave gate (JCC, 1996).

Comments.—Most of these specimens were found near entrances; specimens from Felton Cave were taken from cave swallow droppings on top of a stalagmite in the entrance room. Most *Crematogaster* spp. march in long, narrow files, and gather whatever prey or dead insects that they can find. They also depend on the

secretions of aphids and coccids which they tend (Buren, 1958). Several species tend homopterans on plant roots and this might account for the discovery of specimens in cave entrances where roots are often exposed.

Crematogaster (Acrocoelia) sp.

Crematogaster (A.) sp.: Reddell, 1966b:36.

Record.—USA: TEXAS: *Hardeman County*: Campsey Cave, May 1963 (J. Reddell, W. Russell) (ACC, 1964).

Comments.—This species was taken from silt about 60 m from the entrance. The cave floods and the specimens were probably washed into the cave.

Crematogaster (Crematogaster) sp.
prob. *laeviuscula* Mayr

Record.—USA: TEXAS: *Edwards County*: Devil's Sinkhole, 27 July 1974 (W. Elliott, M. McKenzie) (RRS, 1977).

Comment.—This species was found below the cave entrance.

Crematogaster (Crematogaster) laeviuscula Mayr

Record.—USA: TEXAS: *Travis County*: Wildflower Cave, 3 May 1990 (J. Reddell, M. Reyes) (RRS, 1984).

Comment.—This species was found among trash in the entrance room.

Crematogaster sumichrasti Mayr

Crematogaster sumichrasti: Reddell and Veni, 1996:137.

Record.—BELIZE: *Cayo*: Cebada Cave, Zone A, 8 May 1986 (G. Veni) (RRS, 1986).

Comment.—This species was found just inside the entrance.

Cyphomyrmex rimosus (Spinola)

Record.—USA: TEXAS: *Bexar County*: Up the Creek Cave, 14 Nov. 1995 (J. Cokendolpher, J. Reddell, M. Reyes) (JCC, 1996).

Comments.—This species was found in twilight. These ants, like other gardening ants (including the leaf-cutters), feed on fungus which they cultivate in their nest. Creighton (1950) stated that this ant grows its fungus on collected caterpillar droppings, rather than leaf cuttings.

Eurhopalothrix pilulifera Brown and Kempf

Record.—MEXICO: *Yucatán*: Cenote Chen Mul, Ruinas de Mayapán, 24, 26 April 1973 (M. Butterwick, D. McKenzie, M. McKenzie, J. Reddell) (RRS, 1977).

Comment.—This species was found near the entrance.

Leptothorax sp.

Record.—USA: TEXAS: *Coryell County*: Runoff Cave, Fort Hood, 14 May 1992 (J. Reddell, M. Reyes). Berlese of leaf litter (JCC, 1992).

Comment.—This is an accidental known only from leaf litter in the cave entrance. Mackay (2000) described *Leptothorax cokendolpheri* from a colony (including the female) collected in a cave in the Guadalupe Mountains of southern New Mexico. The species is also known from a worker collected on the surface in Big Bend National Park of Texas. The type series was collected under a rock in the large pit entrance to Hidden Cave and shows no special features indicating that it is anything more than a troglobxene.

Monomorium sp.

Record.—MEXICO: *Nuevo León*: Cueva de la Cerca de Piedra, 4.2 km S San José de las Boquillas, 3080 m elev., 21 Jan. 1984 (D. Pate, P. Spouse) (RRS, 1985).

Comment.—The status of this material is unknown.

Monomorium sp. prob. *cyaneum* Wheeler

Record.—USA: TEXAS: *Bexar County*: Bullis Hole, 21 Sept. 1972 (J. Reddell, W. Russell) (DRS)

Comments.—This material probably washed into the cave. It is an accidental. These ants were identified as *Monomorium viridum peninsulae* Gregg by DRS. Since that time, DuBois (1986) revised the New World *Monomorium* and only recorded *viride* from Florida. It seems likely that DRS misidentified the sample using the same taxonomic keys as used by Moody and Francke (1982) when they misidentified Texas samples as *M. viridum peninsulae*. Moody and Francke's material has since been identified as *Monomorium cyaneum* (Cokendolpher, 1990).

Monomorium minimum (Buckley)

Records.—USA: TEXAS: *San Saba County*: Gorman Cave, 12 June 1978 (E. Kastning, J. Reddell), in bat guano between entrance and Separation Lake (RRS, 1981). *Travis County*: Whirlpool Cave, 29 July

1990 (A. Grubbs, J. Reddell) (JCC, 1990). *Williamson County*: Stonewall Ranch Cave, 3 March 1993 (M. Warton) (JCC, 1993).

Comments.—This species was taken from bat guano about 75 m from the entrance in Gorman Cave. In this and Whirlpool Cave it probably had washed into the caves. It is probably an accidental.

Myrmecina americana Emery

Records.—USA: TEXAS: *Bell County*: Big Crevise, Fort Hood, 6 June 2000 (J. Reddell, M. Reyes), Berlese of leaf litter (JCC, 2000); Keilman Cave, Fort Hood, 26 Sept. 1997 (J. Reddell), Berlese of leaf litter (JCC, 1997). *Bexar County*: Charley's Hammer Hole, 9 Oct. 1995 (J. Reddell, M. Reyes) (JCC, 1995). *Coryell County*: Copperhead Cave No. 2, Fort Hood, 20 Feb. 1999 (M. Reyes), Berlese of leaf litter (JCC, 1999); Porter Cave, Fort Hood, 8 April 1999 (J. Reddell, M. Reyes), Berlese of leaf litter (JCC, 1999). *Travis County*: Trapjaw Sink, 7 April 1984 (J. Reddell), Berlese of leaf litter (RRS, 1985); Wade Sink, 7 Feb. 1991 (J. Reddell, M. Reyes), Berlese of litter (JCC, 1991).

Comment.—This accidental species has only been found in leaf litter in cave entrances.

Octostruma sp.

Octostruma sp.: Zeppelini Filho and Castaño Meneses, 1995:11.

Record.—MEXICO: *Yucatán*: Actún Siete Aguas (Zeppelini Filho and Castaño Meneses, 1995)

Comment.—The status of this material is unknown.

Oligomyrmex longii (Wheeler)

Oligomyrmex longii: Reddell, 1992a:137.

Record.—USA: TEXAS: *Coryell County*: Viper Den Cave, 27 Jan. 1990 (J. Reddell, M. Reyes) (JCC, 1990).

Comment.—This accidental was found in the entrance area.

Oligomyrmex urichi (Wheeler)

Spelaeomyrmex urichi: Wheeler, 1938:251, 252; Pearse, 1945:189.

Oligomyrmex urichi: Peck, 1971a:433-434.

Erebomyrma urichi: Reddell, 1971b:75; Reddell, 1981:238; Decu, Casale, Scaramozzino, López, and Tinaut, 1998:1021.

Record.—MEXICO: *Yucatán*: Cenote de Sambulá, Motul (Wheeler, 1938).

Comments.—This species was found on bat guano (Wheeler, 1938). The species is also known from caves in Trinidad and from surface localities in other parts of tropical America and the West Indies.

Pheidole spp.

Pheidole sp.: Reddell, 1966b:37; Reddell, 1967a:19; Reddell, 1970c:54; Elliott and Reddell, 1973:199.

Records.—MEXICO: *San Luis Potosí*: Ventana Jabalí, 20 km NE Ciudad Valles, 12 July 1969 (J. Peck, S. Peck) (DRS, RRS); Sótano de San Francisco no. 2, San Francisco, 17 May 1972 (M. McEachern) (RRS). *Tamaulipas*: Sistema Purificación (Cueva del Brinco entrance sink), 4 Sept. 1978 (W. Elliott) (RRS, 1981). *Yucatán*: Cenote Kabahché, Maní, 5 Oct. 1974 (D. McKenzie, J. Reddell, S. Wiley) (DRS, 1978).

USA: TEXAS: *Bell County*: Streak Cave, Fort Hood, 26 Sept. 1997 (L. J. Graves, J. Reddell, M. Reyes) (JCC, 1997). *Bexar County*: Platypus Pit, 20 May 1996 (J. Ivy), Zone 1 (JCC, 1996). *Burnet County*: Longhorn Caverns, off commercial trail, 23 Sept. 1999 (A. Cobb) (JCC, 1999). *Edwards County*: Punkin Cave, 4 Sept. 1965 (J. Reddell), on rotten log at bottom of entrance drop (ACC, 1966). *Travis County*: Dobie Shelter, 19 Aug. 1984 (W. Elliott, C. Sexton) (RRS, 1985); Jester Estates Well Trap No. 9, 15 March 1991 (L. Sherrod) (JCC, 1991). *Val Verde County*: Diablo Cave, 10 Aug. 1963 (D. McKenzie, J. Reddell) (ACC, 1964).

Comment.—It is not possible to further identify this material without major workers and further study.

Pheidole sp. (*bicarinata*) group

Pheidole sp.: McKenzie, 1965:37; Reddell, 1971b:76. *Pheidole* sp. (*bicarinata* group): Reddell and Mitchell, 1971a:158.

Record.—MEXICO: *San Luis Potosí*: Cueva Grande, 11 km SE Ciudad Valles, 9 June 1964 (D. McKenzie, J. Reddell) (ACC, 1964).

Comment.—This is probably an accidental.

Pheidole sp. 1

Records.—MEXICO: *Quintana Roo*: Cenote de Juan Coh, Felipe Carrillo Puerto, 4 July 1975 (A. Grubbs, D. McKenzie, J. Reddell) (RRS, 1977).

Comment.—This probable accidental was taken from below the entrance drop.

Pheidole sp. 2

Record.—MEXICO: *San Luis Potosí*: Ventana Jabalí, 20 km NE Ciudad Valles, 12 July 1969 (J. Peck, S. Peck) (RRS, 1977).

Comment.—The status of this material is unknown.

Pheidole sp. 3

Record.—MEXICO: *Yucatán*: Cenote Amil, 6 km S Abalá, 28 March 1973 (J. Reddell, M. Rodríguez) (RRS, 1977).

Comment.—This species was taken from near the cave entrance.

Pheidole sp. 4 (*flavens* group)

Pheidole sp. (*flavens* group): Wheeler, 1938:252; Reddell, 1971b:76.

Pheidole sp.: Pearse, 1945:189.

Records.—MEXICO: *Yucatán*: Cenote Chen Mul, Ruinas de Mayapán, 24, 26 April 1973 (M. Butterwick, D. McKenzie, M. McKenzie, J. Reddell) (RRS, 1977); Cenote de Sambulá, Mérida (Wheeler, 1938); Actún Xpukil, 3 km S Calcehtok, 19 March 1973 (J. Reddell), Berlese of entrance litter (RRS, 1977); 3 Aug. 1973 (J. Reddell), from entrance sink (RRS, 1977).

Comment.—This species has been taken from the entrance area of all these caves.

Pheidole *absurda* Forel

Record.—MEXICO: *Yucatán*: Actún Xpukil, 3 km S Calcehtok, 18-19 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977).

Comment.—This species was taken from the entrance sink and is probably an accidental.

Pheidole *dentata* Mayr

Pheidole *dentata*: Reddell, 1988c:44.

Record.—MEXICO: *Tamaulipas*: Sótano del Molino, 1 km NW Gómez Farías, 268.5 m elev., June 1964 (T. Raines) (ACC, 1964).

USA: TEXAS: *Bexar County*: Cave of the Bearded Tree, April 1982 (G. Veni) (RRS, 1984).

Comment.—This is presumably an accidental.

Pheidole *punctatissima* Mayr

Pheidole *punctatissima*: Wheeler, 1938:252; Pearse,

1945:189; Reddell, 1971b:76; Reddell and Veni, 1996:137.

Pheidole *punctatissima* red var.: Wheeler, 1938:252.

Records.—BELIZE: *Cayo*: Cebada Cave, Zone A, 8 May 1986 (G. Veni) (RRS, 1986).

MEXICO: *Yucatán*: Cenote de Sambulá (Motul) (Wheeler, 1938); Actún Xpukil, 3 km S Calcehtok, 18-19 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977).

Comments.—This accidental species was found just inside the cave entrance of Cebada Cave, on swallow guano in Cenote de Sambulá (Wheeler, 1938), and on swallow droppings in the entrance area of Actún Xpukil.

Pheidole *tolteca* Forel

Pheidole *tolteca*: Palacios-Vargas and Morales-Malacara, 1983:168; Hoffmann, Palacios-Vargas, and Morales-Malacara, 1986:135, 143, 218, 225.

Pheidole *tolteca*: Decu, Casale, Scaramozzino, López, and Tinaut, 1998:1021.

Records.—MEXICO: *Morelos*: Cueva del Diablo (Palacios-Vargas and Morales-Malacara, 1983); Cueva del Idolo (Palacios-Vargas and Morales-Malacara, 1983); Cueva 8 de Julio (Palacios-Vargas and Morales-Malacara, 1983). *Puebla*: Unnamed cave-sinkhole, 10 mi. E of road to Derramedero, 200 m N of highway to Izucar de Matamoros, 31 Dec. 1981 (D. McKenzie) (RRS, 1984).

Comment.—The status of this material is unknown.

Pogonomyrmex barbatus (F. Smith)

Pogonomyrmex barbatus: Reddell and Smith, 1965:33; Reddell, 1966b:37; Reddell, 1970c:54; Decu, Casale, Scaramozzino, López, and Tinaut, 1998:1021.

Records.—USA: TEXAS: *Edwards County*: Dunbar Cave, 30 Aug. 1964 (D. McKenzie, T. Raines) (ACC, 1965). *Williamson County*: Shaman Cave, 29 Sept. 1994 (J. Reddell, M. Reyes), 3 Oct. 1994 (J. Reddell, M. Reyes) (JCC, 1994).

Comments.—This accidental was found below the entrance to Shaman Cave. Decu, Casale, Scaramozzino, López, and Tinaut (1998) mentioned that this species is known from caves in San Luis Potosí, Tamaulipas, and Yucatán. This is almost certainly in error.

Pogonomyrmex comanche Wheeler

Record.—USA: TEXAS: *Travis County*: Fossil

Cave, 22 July 1974 (W. Elliott, P. Knoll, B. Welbourn) (RRS, 1977).

Comment.—This certainly is an accidental.

Solenopsis sp.

Solenopsis sp.: Zeppelini Filho and Castaño Meneses, 1995:11.

Records.—MEXICO: *San Luis Potosí*: Sótano de las Piedras, 7.5 km NE Ciudad Valles, 28 March 1970 (W. Elliott) (DRS, RRS, 1981). *Yucatán*: Cueva del Rancho Sambulá (Zeppelini Filho and Castaño Meneses, 1995); Actún Siete Aguas (Zeppelini Filho and Castaño Meneses, 1995); Actún Toh (Zeppelini Filho and Castaño Meneses, 1995).

Comment.—This is probably a trogloxene.

Solenopsis sp. 1

Record.—MEXICO: *Yucatán*: Cenote de Sihunchén, Sihunchén, 23 March 1973 (J. Reddell), Berlese of leaf litter in darkness (RRS, 1977).

Comment.—This species is probably a trogloxene.

Solenopsis sp. 2

Record.—MEXICO: *Yucatán*: Actún Xpukil, 3 km S Calcehtok, 19 March 1973 (J. Reddell), Berlese of entrance litter (RRS, 1977).

Comment.—This species is probably a trogloxene.

Solenopsis (Diplorhoptrum) texana Emery

Record.—USA: TEXAS: *Bell County*: Big Crevice, Fort Hood, 6 June 2000 (J. Reddell, M. Reyes), Berlese of leaf litter (JCC, 2000).

Comment.—Thief ants generally are subterranean (not in caves, but below the surface of the ground) and are rarely found foraging on the surface.

Solenopsis (Solenopsis) geminata (Fabricius)

Solenopsis geminata: Wheeler, 1938:252; Pearse, 1945:189; Reddell, 1971b:76; Reddell, 1977b:235; Reddell, 1981:237; Hoffmann, Palacios-Vargas, and Morales-Malacara, 1986:113, 218; Reddell and Veni, 1996:137; Decu, Casale, Scaramozzino, López, and Tinaut, 1998:1021.

Solenopsis germinata: Palacios-Vargas and Morales-Malacara, 1983:168 [erroneous spelling].

Records.—BELIZE: *Cayo*: Cebada Cave, Zone C, 9 May 1986 (G. Veni) (RRS, 1986).

MEXICO: *Campeche*: Volcán de los Murciélagos, 11 km E Conhuas, 31 July 1975 (A. Grubbs, D. McKenzie, J. Reddell) (RRS, 1977). *Morelos*: Cueva del Diablo (Palacios-Vargas and Morales-Malacara, 1988); *Oaxaca*: Cueva de Juan Sánchez, 10 km NW Acatlán, 26 Dec. 1976 (A. Grubbs, J. Reddell, C. Soileau) (RRS, 1981); Cueva del Lencho Virgen, 9 km SSW Acatlán, 2-3 Jan. 1974 (W. Elliott, R. Jameson, D. McKenzie, J. Reddell) (RRS, 1977); Grutas de Monteflor, Monteflor, 6 km N Valle Nacional, 28 Dec. 1973 (D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977); Cueva del Nacimiento del Río San Antonio, 10 km SSW Acatlán, 26 Dec. 1972 (D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981); Grutas de San Sebastián, 3 km N San Sebastián de las Grutas, 1820 m elev., 31 Dec. 1972 (D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981). *Quintana Roo*: Cueva de Abispa, Tancah, 1 July 1975 (A. Grubbs, J. Reddell, S. Wiley) (RRS). *Puebla*: Cueva Vampiros de la Mona, 3 km W Xicotepec, 24 Feb. 1973 (J. Reddell) (DRS, RRS, 1981). *San Luis Potosí*: Cueva de los Cuates, 16 km SE Ciudad Valles, 29 May 1974 (J. Prentice) (RRS, 1977); Sótano de Guadalupe, 10 km W Aquismón, 24 Nov. 1972 (T. Raines) (DRS, RRS, 1981); Cueva de Taninul no. 1, 13 km SE Ciudad Valles, 29 March 1970 (W. Elliott, S. Wiley) (DRS, RRS, 1981). *Tabasco*: Resumidero del Coconá, 3 km NE Teapa, 14 June 1975 (A. Grubbs, J. Reddell) (RRS, 1977). *Veracruz*: Cueva de Cantil Blanco, 1 km N Buena Vista, 23 Dec. 1976 (A. Grubbs, D. McKenzie, J. Reddell, C. Soileau), in bat guano (RRS, 1981); Cueva del Ojo de Agua Grande, 5 km N Potero, 4 Jan. 1974 (W. Elliott, R. Jameson, D. McKenzie, J. Reddell) (DRS, RRS, 1981); Cueva de Ungurria, 20 km WSW Tezonapa on island in the Río Tonto, 25 Dec. 1972 (D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981). *Yucatán*: Cenote Calchum, 3 km E San Bernardo, 16 April 1973 (D. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981); Actún Góngora, near Oxkutzcab (Wheeler, 1938); Actún Jih, 3 km W Ticul, 18 June 1975 (A. Grubbs, D. McKenzie, J. Reddell) (DRS, 1978); Cenote Kabachén, Maní, 1 Aug. 1973 (J. Reddell) (DRS, RRS, 1981); Actún Puz, near Oxkutzcab (Wheeler, 1938); Cueva de San Isidro, Mérida (Wheeler, 1938); Cenote de Sihunchén, Sihunchén, 23 March 1973 (M. Butterwick, M. McKenzie, S. Murphy, J. Reddell) (RRS); Grutas de Tzab-Nah, 2 km S Tecoh, 22 April 1973 (D. McKenzie, J. Reddell) (RRS, 1977); 16 April 1973 (M. McKenzie, J. Reddell) (DRS, RRS, 1981); Actún Xkye, 2 km S Calcehtok, 1 May 1973 (E. Alexander, M. Butterwick, D. McKenzie, J. Reddell) (DRS, RRS, 1981).

USA: TEXAS: *Bexar County*: Kamikazi Cricket

Cave, 3 Oct. 1984 (G. Veni) (RRS, 1985). *Travis County*: Featherman's Cave, 15 Oct. 1998 (M. Sanders) (JCC, 1999), 25 June 1999 (M. Sanders) (JCC, 1999). *Williamson County*: Squaw Cave, 29 Sept. 1994 (J. Reddell, M. Reyes) (JCC, 1994).

Comments.—This is a troglobiont in the caves of Mexico. In Central Texas the species has been virtually extirpated in areas of heavy infestations by *S. invicta* (Porter and Savignano, 1990).

Solenopsis (Solenopsis) invicta Buren

Solenopsis (Solenopsis) invicta: Reddell, 1988c:44.

Solenopsis invicta: Elliott, 1992:13; Elliott, 1993a:331-332; Elliott, 1993b:1-33; Stanford and Shull, 1993:63328; O'Donnell, Elliott, and Stanford, 1994.

Records.—USA: TEXAS: *Bell County*: Camp 6 Cave No. 1, Fort Hood, 2 Nov. 1998 (J. Cokendolper, J. Reddell) (JCC, 1999); Camp 6 Cave No. 2, Fort Hood, 20 April 1998 (J. Reddell) (JCC, 1998); Canyon Side Sink, Fort Hood, 6 June 2000 (J. Reddell, M. Reyes) (JCC, 2000); Coyote Den Cave, Fort Hood, 8 May 1998 (J. Reddell, M. Reyes) (JCC, 1998); Figure 8 Cave, Fort Hood, 20 April 1998 (L.J. Graves, J. Reddell, M. Reyes) (JCC, 1998); Flapjack Cave, Fort Hood, 24 April 1998 (J. Reddell) (JCC, 1998); Hanging Stump Cave, Fort Hood, Berlese of litter, 9 March 1993 (J. Reddell) (JCC, 1993); Herbert Cave, Fort Hood, 10 Sept. 1997 (L.J. Graves, M. Reyes) (JCC, 1997); 2 Nov. 1998 (J. Cokendolper) (JCC, 1999); Jagged Walls Cave, Fort Hood, Berlese of litter, 4 Dec. 1992 (J. Reddell, M. Reyes) (JCC, 1993); Lunch Counter Cave, Fort Hood, 18 Sept. 1997 (J. Reddell) (JCC, 1997); Berlese of leaf litter, 18 Sept. 1997 (J. Reddell) (JCC, 1997); Medusa Cave, Fort Hood, 18 Sept. 1997 (J. Reddell, M. Reyes) (JCC, 1997); Monkey Walk Cave No. 2, Fort Hood, 23 April 1998 (L.J. Graves) (JCC, 1998); Mystery Rock Sink, Fort Hood, 20 May 1998 (J. Reddell) (JCC, 1998); Newby Cave, Fort Hood, 19 March 1999 (J. Reddell, M. Reyes) (JCC, 1999); Owl Mountain Cave, Fort Hood, 27 June 2000 (J. Reddell, M. Reyes) (JCC, 2000); Peep in the Deep Cave, Fort Hood, Berlese of leaf litter, 8 May 1998 (J. Reddell, M. Reyes) (JCC, 1998); Rock Ring Sink, Fort Hood, 6 May 1998 (J. Reddell) (JCC, 1998); Root Sink, Fort Hood, 21 April 1998 (M. Reyes) (JCC, 1998); Talking Crows Cave, Fort Hood, 8 Feb. 1996 (M. Warton) (JCC, 1996); 20 April 1998 (L.J. Graves, J. Reddell, M. Reyes) (JCC, 1998); Valentine Cave, Fort Hood, 14 Feb. 1996 (M. Warton) (JCC, 1996); 18 Sept. 1997 (J. Reddell, M. Reyes) (JCC, 1997); Violet Cave, Fort Hood, Nov. 1995 (M. Warton) (JCC, 1996). *Bexar County*: B.J. Pit, 22 June 1993 (J. Loftin) (JCC, 1993); Backhole, 9 Sept. 1998 (J.

Cokendolper, J. Krejca) (JCC, 1998); Bone Pile Cave, Government Canyon State Natural Area, 29 Sept. 1996 (G. Veni) (JCC, 1996); Bullis Hole, Zone 2, 20 Nov. 1996 (W. Elliott) (JCC, 1997); Buzzard Egg Cave, 29 March 1995 (J. Reddell, M. Reyes) (JCC, 1995); Caracol Creek Coon Cave, 15 June 1993 (J. Loftin, J. Reddell, M. Reyes, G. Veni) (JCC, 1993); Cross the Creek Cave, 6 Oct. 1995 (J. Reddell, M. Reyes) (JCC, 1995); Dangerfield Cave, 21 April 1999 (J. Reddell, M. Reyes) (JCC, 1999); Eagles Nest Cave, 15 Nov. 1993 (J. Ivy, L. McNatt, G. Veni) (JCC, 1994); Elmore Cave, 14 July 1993 (J. Reddell, M. Reyes) (JCC, 1993); Flying Buzzworm Cave, 4 Oct. 1995 (J. Reddell, M. Reyes) (JCC, 1995); Goat Cave, Government Canyon State Natural Area, 24 May 1998 (J. Reddell, M. Reyes) (JCC, 1998); Berlese of leaf litter (JCC, 1998); Government Canyon Bat Cave, Government Canyon State Natural Area, 24 May 1998 (J. Reddell, M. Reyes) (JCC, 1998); Haz Mat Pit, 8 Sept. 1998 (J. Reddell) (JCC, 1998); Headquarters Cave, Zone 1, 20 Oct. 1997 (W. Elliott) (JCC, 1997); Isocow Cave, entrance crawl, 20 Sept. 1994 (G. Veni) (JCC, 1994); John Wagner Ranch Cave No. 3, 15 June 1993 (J. Loftin, J. Reddell, M. Reyes, G. Veni) (JCC, 1993); Kamikazi Cricket Cave, 10 June 1993 (J. Reddell, M. Reyes) (JCC, 1993); Linda's First Cave Find, 13 June 1993 (J. & L. Loftin, S. Woods) (JCC, 1993); Logan's Cave, 10 May 1992 (G. Veni); 8 June 1993 (J. Loftin, J. Reddell, M. Reyes, G. Veni) (JCC, 1993); Lone Gunman Pit, 23 Oct. 1997 (P. Spouse, G. Veni) (JCC, 1997); Madla's Drop Cave, 8 June 1993 (J. Loftin, J. Reddell, M. Reyes, G. Veni) (JCC, 1993); MARS Cave, 29 March 1995 (J. Reddell, M. Reyes) (JCC, 1995); MARS Pit, 29 March 1995 (J. Reddell, M. Reyes) (JCC, 1995); 21 May 1996 (W. Elliott), Zone 1 (JCC, 1996); Mastodon Pit, 17 June 1993 (S. Harden, G. Veni) (JCC, 1993); Matteke Cave, 10 June 1993 (D. McKenzie, J. Reddell, M. Reyes) (JCC, 1993); Meusebach Flats Cave, 14 Nov. 1997 (J. Ivy, B. Johnson, P. Spouse) (JCC, 1998); 21 Nov. 1997 (G. Veni) (JCC, 1998); 25 March 1998 (J. Reddell, M. Reyes) (JCC, 1998); 8 Sept. 1998 (J. Reddell, M. Reyes) (JCC, 1998); 21 April 1999 (J. Reddell, M. Reyes) (JCC, 1999); NBC Cave, 15 Dec. 1993 (L. McNatt, G. Veni) (JCC, 1994); Poison Ivy Pit, 15 Aug. 1981 (K. Menking, E. Short, G. Veni, R. Waters) (RRS, 1984); Ponytail Pit, 7 Nov. 1997 (G. Veni) (JCC, 1998); Poor Boy Ranch Cave, 13 Aug. 1983 (G. Veni) (RRS, 1984); Pot-Bellied Stove Cave, 2 June 1993 (J. Loftin) (JCC, 1993); Rattlesnake Cave, 19 July 1989 (A. Cobb) (JCC, 1989); Record Fire 1 Pit, 20 Sept. 1994 (G. Veni), bottom of entrance (JCC, 1994); Robbers Cave, 22 June 1993 (J. Loftin, J. Reddell, M. Reyes) (JCC, 1993); Root Toupee Cave, 20 April 1999 (J. Reddell), entrance crawlway (JCC, 1999); SARA Site 4 Cave, 17 Oct. 1993 (G. Veni)

(JCC, 1993); 6 June 1994 (J. Ivy, G. Veni) (JCC, 1994); Scorpion Cave, 1 June 1993 (J. Loftin, J. Reddell, M. Reyes, G. Veni) (JCC, 1993); Sink Hole, 17 June 1993 (S. Harden, G. Veni) (JCC, 1993); Stahl Cave, upper level leaf litter, 8 Sept. 1998 (J. Cokendolpher, J. Reddell) (JCC, 1998); Stevens Ranch Cave No. 1, 1 June 1993 (J. Loftin, J. Reddell, M. Reyes, G. Veni) (JCC, 1993); Stevens Ranch Trash Hole Cave, 12 June 1993 (J. Loftin) (JCC, 1993); Strange Little Cave, 5 Oct. 1995 (J. Reddell, M. Reyes) (JCC, 1995); Surprise Sink, Government Canyon State Natural Area, 21 April 1996 (G. Veni, K. Veni, J. Kennedy) (JCC, 1996); 24 May 1998 (J. Reddell, M. Reyes) (JCC, 1998); Three Fingers Cave, 22 June 1993 (J. Loftin, J. Reddell, M. Reyes) (JCC, 1993); Two Raccoon Cave, 1 June 1993 (J. Loftin, J. Reddell, M. Reyes) (JCC, 1993); Vera Cruz Shaft, 9 Sept. 1998 (J. Krejca, M. Reyes) (JCC, 1998); Winston's Cave, 13-14 Dec. 1993 (J. Ivy, L. McNatt, G. Veni) (JCC, 1994); Zone 1, 21 Sept. 1994 (W. Elliott, J. Ivy) (JCC, 1995); Zone 2, 21 Sept. 1994 (W. Elliott, J. Ivy) (JCC, 1995); World News Cave, 14 July 1993 (J. Reddell, M. Reyes) (JCC, 1993); Wurzbach Bat Cave, 22 May 1993 (J. Loftin, J. Reddell, M. Reyes) (JCC, 1993); 22 May 1993 (J. Reddell, M. Reyes), Berlese of litter (JCC, 1993); Young Cave No. 1, 6 Sept. 1993 (J. Reddell, M. Reyes) (JCC, 1993). *Comal County*: Camp Bullis Cave No. 1, 21 Nov. 1996 (B. Johnson, J. Reddell, M. Reyes), Zone 3 (JCC, 1997); Ebert Cave, 21 May 1994 (G. Veni) (JCC, 1994); Fischer Pit, 14 July 1989 (A. Grubbs, A. H., C. T.) (JCC, 1989). *Coryell County*: Cicurina Sink, 14 June 2000 (J. Reddell, M. Reyes) (JCC, 2000); Egypt Cave, Fort Hood, 16 Sept. 1997 (L.J. Graves, J. Reddell, M. Reyes) (JCC, 1997); Ingram Cave, Fort Hood, 16 Sept. 1997 (L.J. Graves, M. Reyes) (JCC, 1997); 7 April 1999 (J. Reddell, M. Reyes) (JCC, 1999); Mixmaster Cave, Fort Hood, 9 Sept. 1997 (L.J. Graves, D. McKenzie, J. Reddell, M. Reyes) (JCC, 1997); Porter Cave, 8 April 1999 (J. Reddell, M. Reyes), Berlese of leaf litter (JCC, 1999); Price Pit, Fort Hood, 6 May 1999 (J. Reddell, M. Reyes) (JCC, 1999); Shults Cave, Fort Hood, 16 Sept. 1997 (J. Reddell) (JCC, 1997). *Hays County*: Antioch Cave, March 1994 (W. Russell) (JCC, 1994); Autumn Woods Well, 22 Aug. 1993 (W. Russell), potato peal bait trap (JCC, 1993). *Kendall County*: Covered Hole, 17 July 1991 (D. Allen, L.J. Graves) (JCC, 1991); Pfeiffer's Water Cave, 21 May 1994 (G. Veni) (JCC, 1994). *Travis County*: Balcones Sink, 12 July 1990 (J. Reddell, M. Reyes) (JCC, 1990); Bulldozer Cavern, 4 Oct. 1997 (W. Elliott, P. Sprouse) (JCC, 1997); Cave Z, 2 July 1990 (M. Reyes) (JCC, 1990); Central Sink, 18 Aug. 1990 (J. Reddell, M. Reyes) (JCC, 1990); Disbelievers Cave, 28 June 1995 (J. Reddell, M. Reyes) (JCC, 1995); District Park Cave, 20 Sept. 1990 (J. Reddell, M. Reyes) (JCC, 1990); 19 Jan. 1991, Berlese of litter (J. Reddell, M. Reyes) (JCC, 1991); Driskill Cave, 29 July 1990 (J. Reddell, M. Reyes, W. Russell) (JCC, 1990), 1 Sept. 1990 (J. Reddell, M. Reyes) (JCC, 1990); Enfield Sinkhole, 18 June 1991 (W. Elliott, C. Ladd) (JCC, 1991); Five Pocket Cave, 22 Oct. 1993 (B. Keeley, Fraiser) (JCC, 1993); Flint Ridge Cave, 28 June 1999 (M. Sanders) (JCC, 1999); Fossil Garden Cave, 22 June 1990 (J. Reddell, M. Reyes) (JCC, 1990); Gallifer Cave, 12 Sept. 1990 (J. Reddell); 8 Aug. 1991 (J. Cokendolpher) (JCC, 1990), 17 May 1993 (J. Reddell) (JCC, 1993); Geode Cave, 21 July 1994 (W. Elliott, P. Sprouse) (JCC, 1994); 11 Aug. 1994 (P. Sprouse) (JCC); 13 Sept. 1994 (W. Elliott) (JCC, 1994); Hawk Tract Well Trap No. 1, 2 Nov. 1990 (J. Reddell) (JCC, 1990); Hawk Tract Well Trap No. 3, 2 Nov. 1990 (J. Reddell) (JCC, 1990); Hawk Tract Well Trap No. 5, 2 Nov. 1990 (J. Reddell) (JCC, 1990); Hawk Tract Well Trap No. 7, 2 Nov. 1990 (J. Reddell) (JCC, 1990); Hole in the Road, 20 Sept. 1998 (J. Reddell, M. Reyes) (JCC, 1998); Homestead Cave, 11 April 1995 (A.G. Grubbs, G. Waid) (JCC, 1995); Japygid Cave, 3 Jan. 1995 (M. Warton) (JCC, 1995); 19 Sept. 1995 (J. Reddell, M. Reyes) (JCC, 1995); Jest John Cave, 22 June 1993 (W. Elliott); 29 May 1993 (W. Russell, J. Sigmond) (JCC, 1993); Jollyville Jewel Cave, 14 March 1991 (J. Reddell, M. Reyes) (JCC, 1991); Kretschmarr Salamander Cave, 15 Feb. 1990 (J. Reddell, M. Reyes) (JCC, 1990); Lamm Cave, 2 Dec. 1992 (M. Warton) (JCC, 1993); M.W.A. Cave, 19 July 1995 (J. Reddell, M. Reyes) (JCC, 1995); Midden Sink, 18 Aug. 1990 (J. Reddell, M. Reyes) (JCC, 1990); Moss Pit, 5 March 1991 (J. Reddell, M. Reyes), Berlese of litter (JCC, 1991); Outhouse Hole Sink, 18 Aug. 1990 (J. Reddell, M. Reyes) (JCC, 1990); Rock Top Cave, 14 April 1991 (W. Elliott) (JCC, 1991); Singletary Cave, 26 June 1990 (D. Green, J. Reddell, M. Reyes) (JCC, 1990); 27 June 1990 (J. Reddell) (JCC, 1990); 6 July 1990 (J. Reddell) (JCC, 1990); Spyglass Cave, 18 Aug. 1992 (M. Warton) (JCC, 1992); Stoneworks Sink, 18 Aug. 1990 (J. Reddell, M. Reyes) (JCC, 1990); Three-Holer Cave, 18 Aug. 1990 (J. Reddell, M. Reyes) (JCC, 1990); 27 March 1991 (J. Reddell, M. Reyes), Berlese of litter (JCC, 1991); 1 May 1992 (J. Reddell, M. Reyes), Berlese of litter (JCC, 1992); Tight Pit Cave, 19 June 1997 (M. Reyes) (JCC, 1997); Tooth Cave, 12 Sept. 1990 (J. Reddell) (JCC, 1990); Two Trunks Cave, 19 June 1997 (J. Reddell, M. Reyes) (JCC, 1997); Weldon Cave, 30 April 1996 (M. Warton) (JCC, 1996); Weldon Windmill Cave, 6 June 1990 (J. Reddell, M. Reyes) (JCC, 1990); Whirlpool Cave, 29 July 1990 (A. Grubbs, J. Reddell) (JCC, 1990); Yaupon Ridge Cave, 23 Nov. 1993 (J. Reddell, M. Reyes) (JCC, 1994). *Williamson County*: Agave Cave, 6 April 1993 (J. Reddell, M. Reyes) (JCC, 1993); 14 Aug. 1994 (J. Reddell, M. Reyes) (JCC, 1994);

Avery Avenue Cave, March 1994 (M. Warton) (JCC, 1994); Bat Well, 11 Aug. 1992 (J. Hunter, W. Russell) (JCC, 1992); Beck Bat Cave, Oct. 1989 (J. Reddell) (JCC, 1989); Beck Bridge Cave, 19 June 1992 (M. Warton) (JCC, 1992); Beck Cowcatcher Cave, 3 June 1996 (J. Reddell, M. Reyes) (JCC, 1996); Beck Creek Cave, 3 June 1996 (J. Reddell, M. Reyes) (JCC, 1996); Beck Pride Cave, 1 Oct. 1991 (W. Elliott, J. Reddell, M. Reyes) (JCC, 1991); Beck Rattlesnake Cave, 5 April 1993 (D. Allen, L.J. Graves, D. Love), big half (JCC, 1993); Beck Salamander Cave, 21 May 1996 (J. Reddell, M. Reyes) (JCC, 1996); Beck Tex-2 Cave, 21 May 1996 (J. Reddell, M. Reyes) (JCC, 1996); Beck's Beside Road Cave, April 1994 (M. Warton) (JCC, 1994); Big Oak Cave, 12 June 1997 (M. Reyes) (JCC, 1997); Blue Wasp Cave, 4 June 1991 (J. Reddell, M. Reyes) (JCC, 1991); Bone Cave, 27 Aug. 1990 (D. Allen, W. Elliott) (JCC, 1990); Borgarigmie Cave, 21 Sept. 1994 (J. Reddell, M. Reyes) (JCC, 1994); Broken Plate Cave, 20 April 1993 (M. Warton) (JCC, 1993); Buttercup Blow Hole Cave, 27 Feb. 1995 (D. Allen, D. Love) (JCC, 1995); Cannibal Lector Cave, 14 April 1994 (J. Reddell, M. Reyes) (JCC, 1994); Cat Cave; 11 April 1994 (J. Reddell, M. Reyes) (JCC, 1994); Cat Hollow Bat Cave, 13 July 1992 (M. Warton) (JCC, 1992); Chagas Cave, 24 Aug. 1994 (J. Reddell, M. Reyes) (JCC, 1994); Circle Sink Cave, 2 Oct. 1991 (J. Reddell, M. Reyes) (JCC, 1991); Coon Crawl Cave, 30 April 1996 (M. Warton) (JCC, 1996); Crescent Cave, April 1994 (M. Warton) (JCC, 1994); Deliverance Cave No. 1, 17 Nov. 1993 (J. Reddell, M. Reyes) (JCC, 1994); Dion Cave, 18 April 1994 (J. Reddell, M. Reyes) (JCC, 1994); 20 July 1994 (J. Reddell, M. Reyes) (JCC, 1994); Do Drop In Cave, 28 Sept. 1995 (W. Elliott) (JCC, 1995); Dragon Fly Cave, 11 July 1994 (J. Reddell, M. Reyes) (JCC, 1994); East Fork Fissure, 12 July 1991 (D. Allen, W. Elliott) (JCC, 1991), 13 June 1995 (J. Reddell, M. Reyes) (JCC, 1995); Eclipse Cave, April 1994 (M. Warton) (JCC, 1994); Electro-Mag Cave, 24 July 1995 (J. Reddell, M. Reyes) (JCC, 1995); Fence-Line Cave, 7 Sept. 1992 (J. Reddell, M. Reyes) (JCC, 1992); Fern Cave, March 1994 (M. Warton) (JCC, 1994); Fire Ant Cave, 2 Oct. 1991 (J. Reddell) (JCC, 1991); Flat Rock Cave, 25 May 1992 (R. Aalbu, J. Reddell, M. Reyes) (JCC, 1992); Flathead Cave, 29 Sept. 1994 (J. Reddell, M. Reyes) (JCC, 1994); Flint Wash Cave, 4 June 1991 (J. Reddell, M. Reyes) (JCC, 1991); Floral Cave, April 1994 (M. Warton) (JCC, 1994); Formation Forest Cave, 31 March 1993 (J. Reddell, M. Reyes) (JCC, 1993); Fortune 500 Cave, 28 April 1998 (J. Reddell, M. Reyes) (JCC, 1998); Gasch Cave, 14 Aug. 1994 (J. Reddell, M. Reyes) (JCC, 1994); Godwin's Goat Grave Cave, 31 Oct. 1990 (J. Reddell, M. Reyes) (JCC, 1990); Good Omen Spring, 30 Sept. 1994 (J. Reddell, M. Reyes) (JCC, 1994); Hawk

Tract Well Trap No. 2, 2 Nov. 1990 (J. Reddell) (JCC, 1990); Holler Hole Cave, 29 March 1994 (J. Reddell, M. Reyes) (JCC, 1994); Jackhammer Cave, 24 June 1993 (D. Allen) (JCC, 1993); Joker Cave, April 1994 (M. Warton) (JCC, 1994); Knife Cave, 21 July 1994 (J. Reddell, M. Reyes) (JCC, 1994); Ku Klux Klan Cave, 2 Sept. 1990 (D. Allen, W. Elliott) (JCC, 1990); LakeLine Cave, 16 Feb. 1990 (J. Reddell, M. Reyes) (JCC, 1990); 16 Feb. 1990 (J. Reddell, M. Reyes), Berlese of leaf litter (JCC, 1990); 24 Sept. 1991 (W. Elliott), on cheese bait (JCC, 1991); 15 Oct. 1992 (W. Elliott), entrance plate (JCC, 1992); 24 April 2000 (J. Krejca, P. Sprouse) (JCC, 2000); LakeLine Mall Well Trap No. 2, 10 Oct. 1990 (L. Sherrod) (JCC, 1990); 12 Oct. 1990 (L. Sherrod) (JCC, 1990); 15 Oct. 1990 (L. Sherrod) (JCC, 1990); 19 Oct. 1990 (L. Sherrod) (JCC, 1990); 29 Oct. 1990 (L. Sherrod) (JCC, 1990); LakeLine Mall Well Trap No. 3, 10 Oct. 1990 (L. Sherrod), lower and upper bottles (JCC, 1990); 12 Oct. 1990 (L. Sherrod), lower and upper bottles (JCC, 1990); 15 Oct. 1990 (L. Sherrod), lower bottle (JCC, 1990); LakeLine Mall Well Trap No. 6, 10 Oct. 1990 (L. Sherrod), lower bottle and upper bottles (JCC, 1990); 12 Oct. 1990 (L. Sherrod), upper bottle (JCC, 1990); Leaning Tree Cave, 18 April 1996 (M. Warton) (JCC, 1996); Lineament Cave, 12 June 1993 (J. Reddell, M. Reyes) (JCC, 1993); Lorfin's Unseen Rattler Cave, 10 Nov. 1990 (W. Elliott, J. Reddell, M. Reyes) (JCC, 1991); Man-With-A-Spear Cave, 2 Sept. 1990 (D. Allen, W. Elliott) (JCC, 1990); Medicine Man Cave, 25 July 1995 (J. Reddell, M. Reyes) (JCC, 1995); Mushroom Cave, 27 April 1992 (M. Warton) (JCC, 1992); Mustard Cave, 31 May 1993 (J. Reddell, M. Reyes) (JCC, 1993); 12 June 1993 (J. Reddell, M. Reyes) (JCC, 1993); Nostromos Cave, 16 April 1994 (J. Reddell, M. Reyes) (JCC, 1994); 20 July 1994 (J. Reddell, M. Reyes) (JCC); O'Connor Cave, 31 March 1993 (D. Allen, L.J. Graves) (JCC, 1993), 12 April 1993 (M. Warton) (JCC, 1993); Ominous Entrance Cave, 30 March 1993 (J. Reddell, M. Reyes) (JCC, 1993); On Campus Cave, 18 May 1992 (J. Reddell, M. Reyes) (JCC, 1992); Overlooked Cave, 7 Sept. 1994 (J. Reddell, M. Reyes) (JCC, 1994); Paleospring Cave, 28 July 1994 (B. Larsen, P. Sprouse) (JCC, 1994); 2 Aug. 1994 (B. Larsen, P. Sprouse) (JCC, 1994); Pow Wow Cave, 29 Sept. 1994 (J. Reddell, M. Reyes) (JCC, 1994); Priscilla's Cave, 6 June 1996 (W. Elliott), on gate (JCC, 1996); Pussy Cat Cave, 6 June 1991 (D. Allen, W. Elliott) (JCC, 1991); Quinceñera Cave, 16 Aug. 1994 (J. Reddell, M. Reyes) (JCC, 1994); Raccoon Cave, 16 March 1990 (J. Reddell, M. Reyes) (JCC, 1990); 18 March 1990 (J. Reddell, M. Reyes), Berlese of leaf litter (JCC, 1990); 27 March 1990 (J. Reddell, M. Reyes) (JCC, 1990); Red Crevice Cave, 24 April 1991 (W. Elliott, J. Reddell, M. Reyes) (JCC,

1991); Scoot Over Cave, May 1994 (M. Warton) (JCC, 1994); Shaman Cave, 29 Sept. 1994 (J. Reddell, M. Reyes) (JCC, 1994); 13 June 1996 (P. Sprouse) (JCC, 1996); Shawnee Pit Cave, 3 Oct. 1994 (J. Reddell, M. Reyes) (JCC, 1994); Short Stack Cave, April 1994 (M. Warton) (JCC, 1994); Sierra Vista Cave, 28 July 1991 (J. Reddell) (JCC, 1991); Spiny Tortilla Cave, 25 Aug. 1994 (J. Reddell, M. Reyes) (JCC, 1994); Sting Cave, 14 June 1996 (W. Elliott) (JCC, 1996); Temples of Thor Cave, 13 May 1991 (J. Reddell, M. Reyes), Berlese of raccoon scat (JCC, 1991); 17 May 1991 (W. Elliott, L.J. Graves) (JCC, 1991); 2 July 1991 (W. Elliott) (JCC, 1991); 1 Sept. 1993 (W. Elliott) (JCC, 1993); 3 Aug. 1995 (P. Sprouse), Zone 6 (JCC, 1995); Testimony Cave, 14 Aug. 1994 (J. Reddell, M. Reyes) (JCC, 1994); Testudo Tube, 2 Aug. 1995 (W. Elliott), zone 0 (JCC, 1995); Texella Cave, 24 Sept. 1991 (J. Reddell, M. Reyes); 2 Oct. 1991 (W. Elliott) (JCC, 1991); The Chimney, 24 April 1991 (M. Reyes) (JCC); Thin Roof Cave, 28 April 1998 (J. Reddell, M. Reyes, J. Wolff) (JCC, 1998); Turner Goat Cave, 17 Nov. 1993 (J. Reddell, M. Reyes) (JCC, 1994); 16 April 1994 (J. Reddell, M. Reyes) (JCC, 1994); 21 July 1994 (J. Reddell, M. Reyes) (JCC, 1994); Undercut Cave, 18 Nov. 1993 (J. Reddell, M. Reyes) (JCC, 1994); 18 April 1994 (J. Reddell, M. Reyes) (JCC); 21 July 1994 (J. Reddell, M. Reyes) (JCC, 1994); Undertaker Cave, 24 June 1993 (L.J. Graves, C. Savvas) (JCC, 1993); Ute Cave, 24 July 1995 (J. Reddell, M. Reyes) (JCC, 1995); Valley Cave, March 1994 (M. Warton) (JCC, 1994); Varicose Cave, April 1994 (M. Warton) (JCC, 1994); Villa de Indios Cave, 6 April 1994 (J. Reddell, M. Reyes) (JCC, 1994); Village Idiot Cave, 31 Oct. 1994 (M. Warton) (JCC, 1994); 17 Nov. 1994 (J. Reddell, M. Reyes) (JCC, 1995); Walsh Pasture Cave, 14 May 1992 (J. Reddell) (JCC, 1992); Wigglewise Cave, March 1994 (M. Warton) (JCC, 1994); Wild Card Cave, April 1994 (M. Warton) (JCC, 1994); Williams Cave No. 1, 1 Aug. 1991 (W. Elliott, J. Reddell, M. Warton) (JCC, 1991); Zee End Cave, 25 Oct. 1994 (J. Reddell) (JCC, 1994).

Comments.—See the discussion under ecology in the introduction for further information on this troglobiont. What is presumed to be this species has been reported as sight records for numerous other caves, but the only records given here are for collections.

Solenopsis (Solenopsis) xyloni McCook

Solenopsis (Solenopsis) xyloni: Reddell, 1988c:44.

Records.—USA: TEXAS: Bexar County: Braken Bat Cave, 18 Oct. 1983 (E. Short, G. Veni) (RRS, 1985); Val Verde County: Seminole Sink, 21 May 1984 (L. Bement, R. Ralph) (RRS, 1985). Williamson County: Hanging Branch Cave, 5 July 1986 (W. Elliott, M.

Tuttle) (RRS, 1986). CALIFORNIA: Tuolumne County: McLean's Cave, 4.6 km NW Columbia, 12 Dec. 1977 (W.R. Elliott, A.G. Grubbs) (RRS as *S. maniosa* Wheeler, 1981).

Comments.—This species was taken from the entrance talus cone in Seminole Sink. Like *S. geminata*, the distribution of this native fireant is shrinking with the invasion of the exotic *S. invicta*.

Stenamma prob. n.sp.

Records.—MEXICO: Quintana Roo: Cenote de Santo Domingo, 5 km NE Kilometer 50, 29 July 1975 (A. Grubbs, D. McKenzie, J. Reddell) (RRS, 1977).

Comment.—This species was taken from the entrance room.

Strumigenys languinosa Wheeler

Record.—MEXICO: Yucatán: Actún Xpuhil, 3 km S Calcehtok, 18-19 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977).

Comment.—This species was taken from the main entrance sink.

Tetramorium bicarinatum (Nylander)

Record.—MEXICO: Yucatán: Actún Nohcacab, Santa Elena, 15 Nov. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977, as *Tetramorium guineense* (Fabricius)).

Comment.—This species was taken from the entrance area.

Tetramorium lanuginosum Mayr

Records.—MEXICO: Yucatán: Cenote de Hoctún, 1 km W Hoctún, 16 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981). Cenote Kabachchén, Maní, 5 Oct. 1974 (D. McKenzie, J. Reddell, S. Wiley) (DRS, 1978); Cenote de los Pinos, 7 km S Buenaventura, 23 July 1983 (J. Reddell) (RRS, 1984, as *Triglyphothrix lanuginosa* and *T. striatidens*).

Comments.—This is probably an accidental. The specimens from Cenote de Hoctún were taken from bat guano in the main cave passage.

Trachymyrmex sp.

Record.—MEXICO: Yucatán: Grutas de Tzab-Nah, 2 km S Tecoh, 22 April 1973 (D. McKenzie, J. Reddell) (DRS).

Comments.—This is an accidental. *Trachymyrmex* ants are fungus growers, a behavior not suited for life in a cave. These ants collect vegetable matter which they use to culture their fungal gardens.

The species appears to be able to adapt to varying habitats and it is therefore not surprising to find it in a cave. Because the nests are populous, it is unlikely the ants were nesting in the cave because they would have to leave the cave to find enough food to thrive.

Wasmannia auropunctata (Roger)

Wasmannia auropunctata: Reddell and Veni, 1996:137.

Records.—BELIZE: Cayo: Cebada Cave, Zone A, 8 May 1986 (G. Veni) (RRS, 1986).

MEXICO: San Luis Potosí: Sótano de Tampamache, 8 km NW Aquismón, 31 Aug. 1986 (P. Sprouse) (RRS, 1986). Veracruz: Cueva del Río Atoyac, 3 km E Atoyac, 6 Jan. 1977 (D. McKenzie, J. Reddell), in swallow guano (RRS, 1981). Yucatán: Cenote Amil, 6 km S Abalá, 28 March 1973 (J. Reddell, M. Rodríguez), Berlese of litter (RRS, 1977, 1981).

Comments.—This species was taken from just inside the entrance of Cebada Cave; from cave swallow guano in Cueva del Río Atoyac, and from leaf litter below the entrance of Cenote Amil.

Subfamily Dolichoderinae

Azteca sp.

Azteca sp.: Reddell and Veni, 1996:137.

Record.—BELIZE: Cayo: Cebada Cave, Zone A, 8 May 1986 (G. Veni) (RRS, 1986).

Comment.—This species was found just within the entrance zone of the cave.

Dolichoderus bispinosus (Olivier)

Dolichoderus (Monacus) bispinosus: Wheeler, 1938:252; Reddell, 1971b:75.

Dolichoderus bispinosus: Pearse, 1945:189; MacKay, 1993:43.

Records.—MEXICO: Quintana Roo: Cueva de Abispa, 2 km N Tancah, 1 July 1975 (A. Grubbs, J. Reddell, S. Wiley) (RRS, 1977). Yucatán: Actún Xconsacab (Wheeler, 1938).

Comments.—Wheeler (1938) reported this species from "inner part 46 m. from mouth" of Actún Xconsacab. It was found in the entrance room of Cueva de Abispa. MacKay (1993) reported that this species is common and widely distributed in the southern half of Mexico and the northern half of South America. This species occurs in many different habitats and tends to produce insects as well as being an effective predator.

Forelius mccooki (McCook)

Forelius mccooki: Wheeler, 1938:252; Pearse, 1945:189; Reddell, 1971b:76.

Record.—MEXICO: Yucatán: Cenote de San Isidro, Mérida (Wheeler, 1938).

Comment.—A single worker was found below the cave entrance.

Liometopum apiculatum Mayr

Liometopum apiculatum: Reddell, 1982a:275.

Records.—MEXICO: Chihuahua: Cueva del Salitre, 16 km W Villa Matamoros, 22 July 1965 (J. Fish, J. Reddell) (ACC, 1966).

USA: TEXAS: Brewster County: O.T.L. Cave, 25 June 1963 (J. Reddell, W. Russell) (ACC, 1964).

Comments.—This accidental species was found in the entrance area on cave swallow guano in Cueva del Salitre and in the entrance sink of O.T.L. Cave.

Liometopum luctuosum Wheeler

Record.—USA: CALIFORNIA: Amador County: Fern Frond Cave, 4 mi. NW Volcano, 15 April 1979 (D.C. Rudolph, S. Winterath, E. van Ingen, D. Cowan) (RRS, 1981).

Comment.—It is not known where in the cave this accidental was found.

Liometopum occidentale Emery

Record.—USA: CALIFORNIA: Tuolumne County: Confluence Cave, NW 1/4, Sec. 34, T3N, R14E, 2.5 mi. NW Columbia, 8 April 1979 (D.C. Rudolph, D. Cowan) (RRS, 1981).

Comment.—It is not known where in the cave this accidental was found.

Tapinoma sp.

Tapinoma sp.: Elliott and Reddell, 1973:199.

Record.—MEXICO: *San Luis Potosí*: Sumidero de Fantasmas, 5 Aug. 1966 (J. Reddell) (DRS).

Comment.—This species was taken from the bottom of the entrance sink.

Tapinoma sessile (Say)

Record.—USA: CALIFORNIA: *Tuolumne County*: McNamee's Cave, 2.5 mi. E Columbia, June 1977 (D. Cowan, B. Martin) (RRS, 1981).

Comments.—It is not known where in the cave this accidental was found.

Subfamily Formicinae

Acropyga sp.

Record.—MEXICO: *Quintana Roo*: Cueva de Tancah, Tancah, 1 July 1975 (J. Reddell, A. Grubbs, S. Wiley) (DRS, 1984).

Comment.—This accidental species was taken from the entrance area.

Brachymyrmex cavernicola Wheeler

Brachymyrmex cavernicola Wheeler, 1938:251, 252-254; Pearse, 1945:189; Wilson, 1962:68, 70; Reddell, 1971b:75; Reddell, 1977b:235; Reddell, 1981:238; Decu, Casale, Scaramozzino, López, and Tinaut, 1998:1021.

Records.—MEXICO: *Oaxaca*: Cueva de las Maravillas, 6 km SSW Acatlán, 29 Dec. 1976 (A. Grubbs, D. McKenzie, J. Reddell, C. Soileau) (RRS, 1981). *Yucatán*: Grutas de Balankanché, Chichén Itzá (Wheeler, 1938); Cueva de Cenote Xtolok, Chichén Itzá, 26 July 1983 (J. Reddell) (RRS, 1984).

Comments.—Wheeler (1938) reported this species from "under a stone near the mouth." It was found in numerous small nests under rocks in total darkness in Cueva de Cenote Xtolok.

Camponotus spp.

Camponotus sp.: Reddell, 1971a:228; Reddell, 1982a:275.

Probablemente *Camponotus*: Navarro-Mendoza, 1988:117.

Camponotus: Decu, Casale, Scaramozzino, López, and Tinaut, 1998:1021.

Records.—MEXICO: *Chihuahua*: Socavón de las Moscas, 8 km NW Santo Tomas, 16 June 1980 (J. Reddell) (RRS, 1981); Socavón del Pino, 8 km NW

Santo Tomas, 14 June 1980 (J. Reddell) (RRS, 1981). *Quintana Roo*: ?Cenote Tan Kah (Navarro-Mendoza, 1988). *San Luis Potosí*: Cueva de Ojita de Agua, 3 km SSE San Nicolás de los Montes, 13 km N Agua Blanca, 2 Jan. 1976 (T. Byrd, M. Cassey, A. Grubbs, J. Rodemaker) (RRS, 1977). *Veracruz*: Sótano del Profesor, Tequila, 2 June 1964 (W. Bell, T. Raines) (ACC, 1964).

USA: TEXAS: *Bell County*: Herbert Cave, Fort Hood, 10 Sept. 1997 (L.J. Graves, M. Reyes) (JCC, 1997). *Coryell County*: Chigioux's Cave, Fort Hood, 10 Sept. 1997 (J. Reddell, M. Reyes) (JCC, 1997). *Kendall County*: Glen Rose Cave, 4 March 1999 (M. Reyes, M. Warton) (JCC, 1999).

Comments.—This genus was usually taken from near cave entrances. Specimens tentatively identified as *Camponotus* were taken from the stomach contents of the fish *Poecilia velifera* Regan in Cenote Tan Kah (Navarro-Mendoza, 1988).

Camponotus atriceps (F. Smith)

Camponotus abdominalis: Reddell and Veni, 1996:137.

Record.—BELIZE: *Cayo*: Cebada Cave, Zone A, 8 May 1986 (G. Veni) (RRS as *C. abdominalis* (Fabricius), 1986).

Comment.—This species was taken just inside the cave entrance.

Camponotus decipiens Emery

Record.—USA: TEXAS: *Burnet County*: Simons Road Side Sink No. 1, 20 Nov. 1990 (J. Reddell) (JCC, 1991).

Comment.—This species was abundant just below the cave entrance.

Camponotus festinatus (Buckley)

Camponotus furnidus festinatus: Reddell, 1966b:36.

Record.—USA: TEXAS: *Sutton County*: Felton Cave, 4 July 1964 (J. Reddell) (ACC, 1964).

Comment.—This species was taken from cave swallow droppings on top of a stalagmite in the entrance room.

Camponotus nearcticus Emery

Record.—USA: TEXAS: *Bexar County*: Backhole, 7 June 1994 (J. Ivy, G. Veni) (JCC, 1994).

Comment.—This species was taken from the bottom of the entrance drop.

Camponotus picipes (Olivier)

Record.—MEXICO: *Tamaulipas*: Cueva del Camino, 1 km W Rancho Nuevo, 34 km WNW Ciudad Victoria, 2500 m elev., 23 Aug. 1973 (D. McKenzie) (DRS, RRS, 1981).

Comments.—It is not known where in the cave this species was found.

Camponotus planatus Rogers

Record.—MEXICO: *Yucatán*: Actún Xpukil, 3 km S Calcehtok, 18-19 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977).

Comment.—This species was found in the main entrance sink.

Camponotus rectangularis Emery

Record.—MEXICO: *Yucatán*: Actún Loltún, 7 km SSW Oxkutzcab, 25-26 July 1975 (A. Grubbs, D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977).

Comment.—This species was taken from near the cave entrance. It normally nests in twigs, and thus was apparently only a forager.

Camponotus sansabeanus (Buckley)

Camponotus sansabeanus: Reddell, 1966b:36; Davis, 1979:84, 131, 134.

Records.—USA: TEXAS: *Hays County*: Ezell's Cave (Davis, 1979). *Williamson County*: Elm Water Cave, 24 Aug. 1963 (J. Reddell, W. Russell) (ACC, 1964).

Comment.—This species was abundant in the downstream water passage and possibly washed into the cave.

Camponotus semitestaceus Snelling

Record.—USA: TEXAS: *Williamson County*: Yearwood Gold Mine Cave, 19 Oct. 1994 (J. Reddell, M. Reyes) (JCC, 1994).

Comment.—This species was taken from among trash and small rocks on the crawlway leading from the bottom of the entrance to the main part of the cave.

Camponotus texanus Wheeler

Records.—USA: TEXAS: *Bell County*: Nolan Creek Cave, Fort Hood, 19 May 1998 (J. Reddell, M. Reyes) (JCC, 1998). *Bexar County*: Encino Park Cave

(=Here Today, Gone Tomorrow Cave), 1 July 1994 (J. Loftin) (JCC, 1994); Headquarters Cave, 21 Oct. 1997 (W. Elliott) (JCC, 1997).

Comment.—This species was found in the entrance area of these caves. As nests are found in dead tree limbs, these records are undoubtedly for foragers only.

Formica sp. (*fusca* group)

Formica sp. (*fusca* group): Reddell, 1966b:36.

Record.—USA: TEXAS: *Hardeman County*: Campsey Cave, May 1963 (J. Reddell, W. Russell) (ACC, 1964).

Comments.—This species was found on silt about 60 m from the entrance. It had probably washed into the cave.

Formica sp. (*rufibarbis* group)

Formica sp. (*rufibarbis* group): Reddell, 1971a:228.

Record.—MEXICO: *Veracruz*: Sótano del Profesor, Tequila, 2 June 1964 (W. Bell, T. Raines) (ACC, 1964).

Comments.—This is presumably an accidental. It was found in the vicinity of the decaying remains of a human body at the bottom of the entrance drop.

Formica moki Wheeler

Record.—USA: CALIFORNIA: *Calaveras County*: Barren Cave, NW 1/4, Sec. 34, T3N, R14E, 3 mi. N Columbia, 30 March 1979 (D.C. Rudolph, B. Martin, S. Winterath, W. Elliott, J. Reddell) (RRS, 1981).

Comment.—It is not known in what part of the cave this accidental was found.

Paratrechina spp.

Paratrechina sp.: Reddell and Veni, 1996:137.

Records.—BELIZE: *Cayo*: Cebada Cave, Zone A, 8 May 1986 (G. Veni) (RRS, 1986).

MEXICO: *Oaxaca*: Grutas de Monteflor, Monteflor, 6 km N Valle Nacional, 28 Dec. 1973 (D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977). *Yucatán*: Actún Sabacá, 6 km SW Tekax, 4 Dec. 1974 (J. Andrews, D. McKenzie, R. Mitchell, J. Reddell, S. Wiley) (RRS, 1977); Actún Xpukil, 3 km S Calcehtok, 18-19 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977); 3 Aug. 1973 (J. Reddell) (RRS, 1977).

USA: TEXAS: *Kinney County*: Baker's Crossing Cave, 30 April 1995 (A. Grubbs) (JCC, 1995). *Travis*

County: Dobie Shelter, 19 Aug. 1984 (W. Elliott, C. Sexton) (JT, 1985). *Williamson County*: Beck Horse Cave, 29 May 1996 (J. Reddell, M. Reyes), Berlese of leaf litter (JCC, 1995); Priscilla's Cave, 6 June 1996 (W. Elliott), on cave gate (JCC, 1996).

Comment.—This material was taken from cave entrance areas.

Paratrechina sp. (*caeciliae* group)

Records.—MEXICO: *Yucatán*: Actún Dxibi, 25 km NE Valladolid, 1 June 1986 (G. Veni) (RRS, 1986).

Comment.—The status of this material is unknown.

Paratrechina sp. 1

Records.—MEXICO: *Hidalgo*: Cueva de El Ocote, 1.5 km N Palomas, 22 July 1973 (J. Reddell, J.M. Rowland) (DRS, RRS, 1981). *Puebla*: Waterfall Cave, near Xocoyolo, 30 Dec. 1979 (J. Hooper, M. Minton, L. Wilk) (RRS, 1981). *San Luis Potosí*: Cueva de Potrerillos, Rancho de Potrerillos, 2 km WSW Ahuacatlán, 27 Nov. 1972 (T. Raines, J. Reddell) (DRS, RRS, 1981).

Comment.—The status of this material is unknown.

Paratrechina sp. 2 [possibly *caeciliae* (Forel)]

Records.—MEXICO: *Puebla*: Grutas de Jonotla, 1.5 km SSW Cuetzalan, 26 Dec. 1973 (W. Elliott, R. Jameson, D. McKenzie, J. Reddell) (DRS, RRS, 1981); Sima Chica de Xochitlán, Xochitlán, 28 Dec. 1973 (W. Elliott) (DRS, RRS, 1981). *San Luis Potosí*: Cueva de los Viet Cong, Xilitla Plateau, 1 April 1980 (T. Treacy) (RRS, 1981).

Comment.—This species was found in the entrance sink of Cueva de los Viet Cong.

Paratrechina pearsei (Wheeler)

Nylanderia pearsei Wheeler, 1938:251, 254-255; Pearse, 1945:190; Decu, Casale, Scaramozzino, López, and Tinaut, 1998:1021.

Paratrechina (*Nylanderia*) *pearsei*: Wilson, 1962:68; Reddell, 1971b:76.

Paratrechina pearsei: Reddell, 1977b:235; Reddell, 1981:238.

Records.—MEXICO: *Campeche*: Grutas de Xkalumkín, 5 km W Cumpich, 20 June 1975 (A. Grubbs, D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977). *Quintana Roo*: Cenote Aká Chen, Ruinas de Cobá, 30 June 1975 (A. Grubbs, J. Reddell, S. Wiley)

(RRS, 1977); Cueva del Fermín, 3 km E Pamul, 19-20 July 1983 (J. Reddell) (RRS, 1984). *Yucatán*: Cenote Aká Chen, 1 km E Tixcancal, 2 April 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (RRS, 1977); Grutas de Balankanche, 4 km E Chichén Itzá, 10-12 Dec. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977); Cueva de Cenote Xtolok, Chichén Itzá, 26 July 1983 (J. Reddell), abundant in nests under rocks in total darkness (RRS, 1984); Cueva Chac Mol, Tohil (Wheeler, 1938); Actún Coch Leb, 3 km S Calcehtok, 16 April 1973 (J. Reddell) (DRS, RRS, 1981); Actún Kaua, 1 km S Kaua, 9-10 Oct. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977); 20-21 Oct. 1974 (D. McKenzie, J. Reddell, S. Wiley) (RRS, 1977); 9 Nov. 1974 (J. Reddell) (RRS, 1977); Cueva Muruztún, 5 km S Tizimín (Wheeler, 1938); Cueva de Orizaba, Orizaba, 8 km S Buenaventura, 1 April 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981); Cenote de los Pinos, 7 km S Buenaventura, 1 April 1973 (S. Murphy, J. Reddell) (DRS, RRS, 1981); Actún Silil, 3 km S Calcehtok, 23 June 1975 (W. Russell, S. Wiley) (RRS, 1977); Cenote Salud (=Soldado), S of Tekom, 12 April 1973 (S. Murphy) (DRS, RRS, 1981); Grutas de Tzab-Nah, 2 km S Tecoh, 22 April 1973 (D. McKenzie, J. Reddell) (RRS, 1977); Actún Xpukil, 3 km S Calcehtok, 18-19 March 1973 (M. Butterwick, D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981); 4-5 April 1973 (D. McKenzie, M. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981); Cenote Xtacabihá, 9 km NNE Tikuch, 11 April 1973 (D. McKenzie, S. Murphy, J. Reddell) (DRS, RRS, 1981); 25 July 1983 (J. Reddell) (RRS, 1981, 1984); Actún Ziz, Oxkutzcab, 3 Dec. 1974 (A. Gamboa, D. McKenzie, R. Mitchell, J. Reddell, S. Wiley) (RRS, 1977).

Comments.—The type-locality of this species is Cueva Muruztún. Wheeler (1938) reported this species from a “big midden pile of a leaf-cutter [*Atta cephalotes*] mound” in Cueva Muruztún; from the “Temple Pool, 260 m. from mouth” in Grutas de Balankanche. It was also found in abundance in nests in total darkness in Cueva del Cenote Xtolok. This species should be considered a troglophile.

Paratrechina terricola (Buckley)

Paratrechina melanderi: Reddell, 1982a:275.

Records.—MEXICO: *Coahuila*: Cueva de Empalme, 1.5 km E Entronque la Cuchilla, 24 Feb. 1966 (W. Bell, J. Reddell) [ACC as *P. melanderi* (Wheeler, 1966)].

USA: TEXAS: *Bexar County*: Droll Cave, 2 June

1993 (J. Reddell, M. Reyes, G. Veni) (JCC, 1993). *Sutton County*: Caverns of Sonora, 27 July 1994 (B. Sawyer, G. Veni), entrance to Sam Odom Pit (JCC, 1994).

Comments.—This species was found in total darkness in Caverns of Sonora. The status of the species is uncertain, but it may be a troglobiome in that cave. The record from Mexico is an accidental found in the entrance area.

Prenolepis imparis (Say)

Records.—USA: CALIFORNIA: *Amador County*: Connie's Cave, 0.5 mi. N Volcano, 15 April 1979 (D.C. Rudolph, S. Winterath, E. van Ingen, D. Cowan) (RRS, 1981); Fern Frond Cave, 4 mi. NW Volcano, 15 April 1979 (D.C. Rudolph, S. Winterath, E. van Ingen, D. Cowan) (RRS, 1981); Fiddler Cave, 6 mi. NW Volcano, 15 April 1979 (D.C. Rudolph, S. Winterath, E. van Ingen, D. Cowan) (RRS, 1981); Violin Cave, 6 mi. NW Volcano, 15 April 1979 (D.C. Rudolph, S. Winterath, E. van Ingen, D. Cowan) (RRS, 1981); *Calaveras County*: Cave of Skulls, NE 1/4, Sec. 33, T3N, R14E, 3 mi. NW Columbia, 25 March 1979 (D.C. Rudolph) (RRS, 1981); Coral Cave, SE 1/4, Sec. 27, T3N, R14E, 3 mi. N Columbia, 22 March 1979 (D.C. Rudolph, B. Martin, S. Winterath, W. Elliott, J. Reddell) (RRS, 1981); Grapevine Gulch Cave, SW 1/4, Sec. 22, T3N, R14E, 4 mi. N Columbia, 15 March 1979 (D.C. Rudolph, S. Winterath, B. Martin); Porcupine Cave, SW 1/4, Sec. 22, T3N, R14E, 4 mi. N Columbia (D.C. Rudolph, B. Martin, S. Winterath) (RRS, 1981); Scat Cave, NE 1/4, Sec. 6, T2N, R14E, 4 mi. NW Columbia, 25 March 1979 (D.C. Rudolph, B. Martin, S. Winterath) (RRS, 1981). *Mariposa County*: Damp Cave, SE 1/4, Sec. 29, T2S, R18E, 7 April 1979 (D.C. Rudolph, B. Martin, S. Winterath) (RRS, 1981). *Tuolumne County*: Crystal Tuolumne Cave, 8 mi. SE Tuolumne, 16 June 1979 (D. Cowan, J. Espinal) (RRS, 1981); Transplant Mine, 3.7 mi. N Columbia, 10 Jan. 1978 (W.R. Elliott, A.G. Grubbs, S.A. Winterath) (RRS, 1981).

Comments.—This species was taken from near the entrance of Grapevine Gulch Cave and in the tailings at the entrance of the Transplant Mine. It was found in all parts of Porcupine Cave. Normally, *P. imparis* feeds on liquids, especially the honey-dew of homopterans, nectar and exudates of plants as well as juices of dead and dying earthworms (Wheeler, 1930). This ant is well known for its dislike of dry warm habitats and possibly its occurrence in caves is a means by which it can escape the undesired conditions normally found on surface habitats. Although this ant shows a preference for honey-dew, it has not been recorded tending dew producing homopterans.

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