

A journal of world insect systematics

# INSECTA MUNDI

---

---

0925

Geographic variation in host selection in the spider wasps  
*Entypus unifasciatus* (Say) and *Tachypompilus ferrugineus* (Say)  
(Hymenoptera: Pompilidae), II

Frank E. Kurczewski

1188 Converse Drive NE  
Atlanta, GA 30324

Joseph W. Stoll

Department of Geography, Syracuse University  
Syracuse, NY 13210

Rick C. West

6365 Willowpark Way  
Sooke, BC, V9Z 1L9, Canada

Kelly C. Kissane

Department of Natural Sciences  
Trinidad State College  
Alamosa, CO 81101

Paige R. Chesshire

Department of Biological Sciences  
Northern Arizona University  
Flagstaff, AZ 86011-6077

Neil S. Cobb

Biodiversity Outreach Network  
Flagstaff, AZ 86001-1354

Date of issue: March 31, 2022

**Kurczewski FE, Stoll JW, West RC, Kissane KC, Chesshire PR, Cobb NS. 2022.** Geographic variation in host selection in the spider wasps *Entypus unifasciatus* (Say) and *Tachypompilus ferrugineus* (Say) (Hymenoptera: Pompilidae), II. *Insecta Mundi* 0925: 1–73.

Published on March 31, 2022 by  
**Center for Systematic Entomology, Inc.**  
P.O. Box 141874  
Gainesville, FL 32614-1874 USA  
<http://centerforsystematicentomology.org/>

**INSECTA MUNDI** is a journal primarily devoted to insect systematics, but articles can be published on any non-marine arthropod. Topics considered for publication include systematics, taxonomy, nomenclature, checklists, faunal works, and natural history. *Insecta Mundi* will not consider works in the applied sciences (i.e. medical entomology, pest control research, etc.), and no longer publishes book reviews or editorials. *Insecta Mundi* publishes original research or discoveries in an inexpensive and timely manner, distributing them free via open access on the internet on the date of publication.

*Insecta Mundi* is referenced or abstracted by several sources, including the Zoological Record and CAB Abstracts. *Insecta Mundi* is published irregularly throughout the year, with completed manuscripts assigned an individual number. Manuscripts must be peer reviewed prior to submission, after which they are reviewed by the editorial board to ensure quality. One author of each submitted manuscript must be a current member of the Center for Systematic Entomology.

Guidelines and requirements for the preparation of manuscripts are available on the *Insecta Mundi* website at <http://centerforsystematicentomology.org/insectamundi/>

**Chief Editor:** David Plotkin, [insectamundi@gmail.com](mailto:insectamundi@gmail.com)

**Assistant Editor:** Paul E. Skelley, [insectamundi@gmail.com](mailto:insectamundi@gmail.com)

**Layout Editor:** Robert G. Forsyth

**Editorial Board:** Davide Dal Pos, Oliver Keller, M. J. Paulsen

**Founding Editors:** Ross H. Arnett, Jr., J. H. Frank, Virendra Gupta, John B. Heppner, Lionel A. Stange, Michael C. Thomas, Robert E. Woodruff

**Review Editors:** Listed on the *Insecta Mundi* webpage

**Printed copies (ISSN 0749-6737) annually deposited in libraries**

Florida Department of Agriculture and Consumer Services, Gainesville, FL, USA

The Natural History Museum, London, UK

National Museum of Natural History, Smithsonian Institution, Washington, DC, USA

Zoological Institute of Russian Academy of Sciences, Saint-Petersburg, Russia

**Electronic copies (Online ISSN 1942-1354) in PDF format**

Archived digitally by Portico

Florida Virtual Campus: <http://purl.fcla.edu/fcla/insectamundi>

University of Nebraska-Lincoln, Digital Commons: <http://digitalcommons.unl.edu/insectamundi/>

Goethe-Universität, Frankfurt am Main: <http://nbn-resolving.de/urn/resolver.pl?urn:nbn:de:hebis:30:3-135240>

**Copyright held by the author(s).** This is an open access article distributed under the terms of the Creative Commons, Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited. <http://creativecommons.org/licenses/by-nc/3.0/>

Geographic variation in host selection in the spider wasps  
*Entypus unifasciatus* (Say) and *Tachypompilus ferrugineus* (Say)  
(Hymenoptera: Pompilidae), II

Frank E. Kurczewski

1188 Converse Drive NE  
Atlanta, GA 30324  
kurczewskifrank@gmail.com

Joseph W. Stoll

Department of Geography, Syracuse University  
Syracuse, NY 13210  
jwstoll@maxwell.syr.edu

Rick C. West

6365 Willowpark Way  
Sooke, BC, V9Z 1L9, Canada  
rickcwest@shaw.ca

Kelly C. Kissane

Department of Natural Sciences  
Trinidad State College  
Alamosa, CO 81101  
kelly.kissane@trinidadstate.edu

Paige R. Chesshire

Department of Biological Sciences  
Northern Arizona University  
Flagstaff, AZ 86011-6077  
prc43@nau.edu

Neil S. Cobb

Biodiversity Outreach Network  
Flagstaff, AZ 86001-1354  
neilscobb@gmail.com

**Abstract.** This paper is the sequel to a 20 year-long (2002–2021) study of geographic variation in host selection in the common American spider wasps (Hymenoptera: Pompilidae) *Entypus unifasciatus* (Say) (Pepsini) and *Tachypompilus ferrugineus* (Say) (Pompilini) (rusty spider wasp). Geography and host spider family are strongly linked in both species when 3387 host spider locality records from the years 1918–2021 are mapped. *Entypus unifasciatus* lycosid host records are plentiful from 43–44° N in the United States and southern Ontario to northern Mexico. *Tachypompilus ferrugineus* lycosid host records are abundant from southern Ontario and New England southward to Mexico east of the Rocky Mountains. The vast majority (~80%) of *E. unifasciatus* and *T. ferrugineus* pisaurid host records are from the southeastern United States. Trechaleid host records for *E. unifasciatus* and *T. ferrugineus* are predominant in southern Mexico and Central America, while ctenid host records for these spider wasps are prevalent in Central America and, especially, South America. All *E. unifasciatus* sparassid host records are from extreme southwestern United States and northern Mexico, whereas *T. ferrugineus* sparassid host records are scattered from Texas, Florida and Hispaniola/Puerto Rico southward to Panama and Brazil. Based on this study Lycosidae is the predominant host spider family in the Americas for *E. unifasciatus* (83.1%) and *T. ferrugineus* (64.0%) followed by Pisauridae (4.9%, 24.8%), Trechaleidae (4.2%, 6.0%), Ctenidae (4.3%, 2.7%), and Sparassidae (3.1%, 1.6%). Lycosidae and Pisauridae are overrepresented in this study as most host records (88.1%) are from the United States and Ontario, Canada where such species are abundant. Trechaleidae and Ctenidae are grossly underrepresented as host records from Mexico, Central America and South America are scarce (11.9%). Zoropsidae/Miturgidae

and Zoropsidae/Agelenidae/Selenopidae are atypical host spider families for *E. unifasciatus* (0.2%, 0.2%) and *T. ferrugineus* (0.7%, 0.2%, <0.1%), respectively. *Rabidosia rabida* (Walckenaer) (Lycosidae) (rabid wolf spider) is the predominant host spider species for both *E. unifasciatus* (47.7%) and *T. ferrugineus* (48.0%) based mainly on United States host records.

**Key words.** Lycosoidea, Lycosidae, Pisauridae, Trechaleidae, Ctenidae, Sparassidae, Zoropsidae, Agelenidae, Miturgidae, Selenopidae, *Rabidosia rabida*.

**ZooBank registration.** urn:lsid:zoobank.org:pub:8DEE1DF1-0D28-4FE4-8EFE-036C93805B94

## Introduction

Spider wasps (Hymenoptera: Pompilidae) provision their nests only with spiders (Arachnida: Araneae). Spider wasps are energetic, highly active insects with long legs to run fast and relatively long wings to fly rapidly across short distances. The female spends much time searching for and locating a suitable host spider. Their eventual contact involves the spider wasp and spider cohabiting the same area--on the ground, on vegetation, near the spider's web, or, rarely, in water. Most species of Pompilidae are habitat-limited in their selection of host spiders (Krombein 1953; Evans and Yoshimoto 1962). The female pursues the spider on foot or in flight, subdues it with one or more stings to the underside of its cephalothorax, cleans herself, and waits momentarily for the partial paralysis of the spider. She periodically examines it with her antennae and mouthparts, evidently inspecting the degree of the paralysis. If the spider moves its appendages too much, she will administer an additional sting or two. Sometimes, the wasp feeds on fluids exuding from the spider's mouthparts, sting puncture or wound after biting off a leg. She then transports the spider to a temporary holding place in most Pompilini or, in many Pepsini and Ageniellini, takes the prey directly to a previously prepared nest-cell. After placing the paralyzed spider in the cell in a certain position, she lays an egg on the spider's abdomen in a species-specific location (Evans 1953; Evans and Yoshimoto 1962). The wasp then closes the nest with fill and, depending on the species, may conceal the site with soil, various debris or plant litter. The egg hatches in a few days, the wasp larva's mandibles readily penetrate the thin cuticle of the spider's abdomen, and the larval wasp begins feeding at the site of its attachment. The wasp larva consumes the edible portions of the spider's body, grows rapidly over the next several days, constructs a parchment-like cocoon, pupates, and emerges as an adult spider wasp several weeks or up to a year later (Kurczewski et al. 2017).

Size equivalence between spider wasp and spider is important. It provides the quicker, aggressive and instinct-driven hunting wasp an advantage in outmaneuvering, overpowering and subduing the spider. Large spider wasps capture large spiders, moderate-size spider wasps capture moderate-size spiders, and small spider wasps capture small spiders (Kurczewski and Kurczewski 1968a, 1968b, 1972, 1973). There is a strong positive correlation between spider wasp and host spider body length, although the spider's (wet) weight is usually several times that of the wasp (Kurczewski and Kiernan 2015). Unlike other spider-hunting solitary wasps, there is only a single prey item per offspring in Pompilidae. Provisioning with a spider substantially heavier and more robust than herself enables the use of a single, comparatively large prey per cell. A smaller spider would not provide a sufficient amount of food for the developing spider wasp larva or, perhaps, only provide enough food for the usually smaller male offspring.

There is a strong positive correlation between spider wasp size and sex and stage of spider (Kurczewski and Kiernan 2015). Large pompilids capture mainly large adult or subadult female spiders whereas small spider wasps often capture small immature spiders (Kurczewski and Kurczewski 1968a, 1968b, 1972, 1973). Large spider wasps usually have only a single generation annually in mid-late summer in temperate faunal zones (Evans and Yoshimoto 1962; Kurczewski 1999). Their flight season is closely synchronized to when the host female spider reaches sexual maturity and maximal size and weight (Kurczewski and Kiernan 2015). Conversely, small spider wasps and their small, immature host spiders are active from late spring-early summer through mid-late summer, often with two or more generations per year in temperate faunal zones (Evans and Yoshimoto 1962; Kurczewski 1999, 2001; Kurczewski and Kiernan 2015).

*Entypus unifasciatus* (Say) and *Tachypompilus ferrugineus* (Say), the subjects of this study, demonstrate size-equivalent host capture and female spider sexual preference of predominantly cursorial-hunting families in the Superfamily Lycosoidea (Lycosidae, Trechaleidae, Pisauridae, Ctenidae). In the predation process the two species

illustrate distinct geographic variation in host spider family selection across North America and South America (Kurczewski et al. 2020a). A wealth of data gathered over more than a century definitively links host spider family selection and geography in both spider wasp species when their host record locations are plotted on a map. This relationship is further strengthened when the historical data is supplemented with an immense amount of 21<sup>st</sup> century host spider information from several publications and a multitude of internet photographs and videos.

*Entypus unifasciatus* and *Tachypompilus ferrugineus* are rather large, brightly colored, easily recognizable, wide-ranging American spider wasp species. The females average 22.1 and 19.9 mm in body length, respectively (F. E. Kurczewski pers. obs.). *Entypus unifasciatus* is black with yellow/orange antennal flagella and mostly black to mainly orange wings, wing color varying with geographic region (Townes 1957). Individuals from humid continental/subtropical eastern United States have black wings with a large subapical orange patch (Fig. 1), while those from semiarid/desert regions of western United States and tropical wet/dry regions of Mexico, Central America and northwestern South America have orange wings with the base and apex narrowly to moderately infuscate (Fig. 2–6). *Entypus unifasciatus* occurs commonly from southern Ontario and New England westward to extreme southern Oregon and southward through North America to Colombia, Venezuela and Ecuador (Banks 1945, 1946; Townes 1957; Krombein 1979; Fernández 2000; Cambra-Torok et al. 2004; Horta Vega et al. 2009; Bradley 2010; Corro-Chang and Cambra-Torok 2011; Kurczewski et al. 2020a; M. Buck, Royal Alberta Museum, Edmonton, AB, 2017 pers. comm.; A. M. R. Bennett, Canadian National Collection of Insects, Ottawa, ON, 2018 pers. comm.; S. M. Paiero, University of Guelph, Guelph, ON, 2018 pers. comm.; C. S. Ferguson, Southern Oregon University, Ashland, OR, 2019 pers. comm.). *Entypus unifasciatus* reportedly occurs farther southward in South America (Townes 1957), although its identification there remains debatable (Roig-Alsina 1981). *Entypus unifasciatus* may not occur farther northward in the Pacific Northwest as its natural host spider species are absent, rare or scarce (Kurczewski et al. 2020a). Host records and online visual images for *E. unifasciatus* from the treeless Great Plains, dense forest of the Appalachian Region, and extensively sandy soils of the South Atlantic coastal region and peninsular Florida are scant (Townes 1957, Leavengood et al. 2011).

*Entypus unifasciatus* occurs in dry, open habitats—overgrown fields, woodland edges, open woodland and savanna in southern Ontario and eastern United States, arid quasi-desert and sparse scrubland/grassland in western United States and northern Mexico, and fields, savanna, thinly dispersed woodland and woodland borders in southern Mexico, Central America, Colombia, Venezuela and Ecuador (Townes 1957; Evans and Yoshimoto 1962; Kurczewski and Edwards 2012; Kurczewski and Kiernan 2015; Kurczewski et al. 2017, 2020a). The nest entrance is a wasp-modified hole in the ground concealed among rocks or other irregularities in the soil such as crevices and entangled rootlets (McCormac 2008; Taulman 2017). Each cell in the multi-celled nest is excavated prior to prey search and capture by stinging (Janvier 1930). The wasp usually grasps the immobilized spider's pedipalp or chelicera with her mandibles and drags the relatively heavy prey backwards on the ground, dorsal side upward, to her nest (Kurczewski and Edwards 2012; Kurczewski et al. 2017). Prey transport is usually lengthy and cumbersome with periodic reconnaissance interruptions and circumvention of various obstacles across rough terrain (McCormac 2008; Taulman 2017; Dodge 2019; M. Powers, Cumberland, MD, 2020 pers. comm.). All *E. unifasciatus* host records from the 1900s are for Lycosidae (wolf spiders) under the obsolete genus name *Lycosa* (Krombein 1979).

*Tachypompilus ferrugineus* is castaneo-ferruginous with a variable amount of black on the head, antennae, thorax, legs and metasoma, and fuliginous wings that reflect violet in sunlight (Evans 1950, 1966). According to Evans (1966), the subspecies *T. f. affinis* from Panama and South America has yellowish brown wings. The wings of other subspecies vary from violaceous to brownish. Some subspecies have uniformly colored wings while others, e.g., *T. f. bicolor*, *T. f. affinis*, show a weak banding pattern (Evans 1966). Individuals from humid continental/subtropical/tropical wet regions of North America and South America have black markings on the head, antennae, thorax, legs and metasoma while those from semiarid/desert/tropical dry regions are entirely or mainly castaneo-ferruginous (Fig. 7–12). *Tachypompilus ferrugineus bicolor* (Banks), a melanistic variant from Hispaniola and Puerto Rico, has much black on the head, antennae, thorax, propodeum and coxae, ferruginous metasoma, femora, tibiae and tarsi, and fuliginous wings (Evans 1966; Waichert et al. 2012). *Tachypompilus ferrugineus bicolor* and *T. ferrugineus affinis* from Panama and South America are valid subspecies (Evans 1966), whereas *T. ferrugineus erythrus* (Smith) from Jamaica and *T. ferrugineus uniformis* (Cresson) from Cuba may be separate species based on their distinct external morphology (F. E. Kurczewski pers. obs.). *Tachypompilus*

*ferrugineus* occurs commonly from southern Ontario and New England southward and westward through the United States, Mexico and Central America into South America, mainly east of and including the Rocky Mountains, and in Hispaniola and Puerto Rico (Evans 1950, 1951, 1966; Krombein 1979; Colomo de Correa 1987 [1985]; Fernández 2000; Cambra-Torok et al. 2004; Horta Vega et al. 2009; Corro-Chang and Cambra-Torok 2011; Waichert et al. 2012; Santos Murgas et al. 2018; Kurczewski et al. 2020a; M. Buck, 2017 pers. comm.; A. M. R. Bennett, 2018 pers. comm.; S. M. Paiero, 2018 pers. comm.; C. Waichert, Vila Velha University, Vila Velha, Brazil, 2019 pers. comm.). *Tachypompilus ferrugineus* ecological and behavioral counterparts in the western United States are *T. u. unicolor* (Banks) and *T. unicolor cerinus* Evans (Evans 1966; Wasbauer and Kimsey 1985). Host records for *T. ferrugineus* from South America are scarce (Evans 1966; Colomo de Correa 1987 [1985]; Kurczewski et al. 2020c).

*Tachypompilus ferrugineus* often adopts man-made structures for nesting sites. Nest-cells are found in rock piles, openings in stone and concrete walls and fences, exteriors of stone and wooden buildings, beneath buildings, cemetery monuments and fallen billboards, and inside PVC pipes in sandy, gravelly and loamy soils or artificial composite (Evans 1950, 1951; Strandtmann 1953; Evans and Yoshimoto 1962; Kurczewski 1989, 1990, 2010; Kurczewski and Edwards 2012; Kurczewski and Kiernan 2015; Kurczewski et al. 2017, 2020a, 2020b, 2020c, in prep.; Santos Murgas et al. 2018). Prior to earliest human habitation *T. ferrugineus* females may have exploited soil cliffs or stony or gravelly inclines for nesting purposes. Rau and Rau (1918) believed this species ancestrally nested in loose stones of bluffs and hillsides. Martins (1991) observed *T. xanthopterus* Rohwer females nesting in hollows and crevices in a sand bank in Brazil. The prey-deposition chamber of *T. ferrugineus* is a shallow concave depression dug by the wasp in loose soil or powdered substrate material in which a single paralyzed spider is placed and the wasp's egg laid on its abdomen (Strandtmann 1953; Santos Murgas et al. 2018; Kurczewski et al. 2020c). Unlike *E. unifasciatus*, the nest-cell of *T. ferrugineus* is not excavated by the wasp until after the spider is captured and immobilized by stinging. Transport of the spider to the nest is the same as for *E. unifasciatus*, with the wasp usually grasping a pedipalp or chelicera with her mandibles and dragging the comparatively heavy prey backwards, dorsal side upward, on the ground and, sometimes, up a vertical man-made surface—an often long, time-consuming and unwieldy process over and around various obstacles (Kurczewski and Edwards 2012; Kurczewski et al. 2017, 2020c, in prep.). Host records for *T. ferrugineus* from the 1900s include only Lycosidae and Pisauridae (fishing or nursery-web spiders) (Krombein 1979).

The purpose of this paper is to research, analyze, map and discuss geographic variation in host spider family selection of *E. unifasciatus* and *T. ferrugineus* in order to more accurately characterize their behavioral and ecological parameters. Both species, especially *T. ferrugineus*, occur across a wide range of habitats with different conditions of climate, soil, vegetation, and host spider availability. In these broadly defined regions the predominant and subordinate host spider families are Lycosidae (Fig. 3, 4) and Pisauridae (Fig. 1, 2, 7) in eastern United States and Ontario, Canada; Lycosidae and Sparassidae (giant crab or huntsman spiders) in western United States and Mexico; and Trechaleidae (banana spiders; Fig. 10–12), Ctenidae (alarm or wandering spiders; Fig. 5, 6) and Sparassidae in southern Mexico, Central America and South America (Kurczewski and Edwards 2012; Santos Murgas et al. 2018, Kurczewski et al. 2017, 2020a, 2020c, in prep.). Zoropsidae (false wolf spiders, Fig. 9; Kurczewski et al. 2020a, 2020c, in prep.)/Miturgidae (prowling spiders), Zoropsidae/Agelenidae (funnel-web or grass spiders, Fig. 8; Kurczewski et al. 2020a, 2020c) /Selenopidae (wall crab spiders, Kurczewski et al. 2020b) are atypical host spider families for *E. unifasciatus* and *T. ferrugineus*, respectively, in temperate and tropical North America.

## Materials and Methods

This paper is the sequel of a 20 year-long (2002–2021) study of geographic variation in host selection in the common American spider wasps *E. unifasciatus* and *T. ferrugineus*. It includes 1356 previously unreported host records from the Western Hemisphere, provides updated and expanded host geographic distribution maps, reveals a new host spider family (Selenopidae) and 24 new host spider species, introduces recent photographs to show host spider variation at the family level, and adds previously unreported insect museum records, literature references and notes on nesting behavior. Rare host information for previously unstudied *Tachypompilus ferrugineus affinis* (Banks) is presented from little studied South American countries such as Brazil and Ecuador.

A total of 3387 host records (*E. unifasciatus*, 1087; *T. ferrugineus*, 2300) were located, studied and charted for the two spider wasp species. Because of their rather large size and visual attractiveness, both spider wasp species are frequently seen, often photographed, and readily identified by persons familiar with the family Pompilidae. Photographic images and videos of females of the two species with immobilized host spiders were located on ~200 online websites, downloaded, and the information cataloged. Many of the visual host records are from national parks and preserves; state, county and local parks; and heavily populated metropolitan areas where camera phones are in constant use. In addition to online photographs and videos, spider wasp literature and insect museum host records were searched and cataloged. Thirty-nine papers and online host descriptions published over more than a century (1918–2020) revealed pertinent host spider and prey transport behavior information for *E. unifasciatus* and/or *T. ferrugineus* (see Literature Cited).

Neither wasp nor spider were identified in many of the online visual examples. The first author identified both highly distinct spider wasp taxa to genus and species. The third and fourth authors plus other arachnologists identified host spider family, genus and/or species (see Acknowledgments). Country, state, province, region, department, arrondissement, district, county, municipality, parish and locality, if known, along with host spider family of the spider wasp–host spider association were categorized and tabulated (Tables 1, 2). Using information from Tables 1 and 2, the second author created host spider family geographic distribution maps for the two spider wasp species (Fig. 13, 14) by (1) downloading a Natural Earth II color relief map from <http://www.shadedrelief.com/natural2/index.html>; (2) using Adobe Photoshop, cropped the maps to the appropriate areas, deleting the ocean color and smallest islands; and (3) imported the relief map into Adobe Illustrator, thereby producing structural layers for (a) [hidden] county outlines, (b) host locality dot symbols, (c) legend text; and (d) Texas and Florida outline enlargements (Fig. 14). The fifth author created the host spider family distribution map (Fig. 15) with R version 4.0.2 using ggmap and ggplot2 packages to visualize spatial data overlying maps provided by Stamen and/or Google maps. Latitudinal and longitudinal coordinates for each host spider specimen were provided in occurrence data. A total of 19,097 such records were harvested from SCAN (Symbiota Collection of Arthropods Network) and GBIF (Global Biodiversity Information Facility) databases on 18 April 2021 and used in the geographic distribution analyses (Table 3). Figure 15 includes eight host spider families and their respective number of records: Agelenidae, 391; Ctenidae, 1361; Lycosidae, 7467; Pisauridae, 8158; Selenopidae, 87; Sparassidae, 1258; Trechaleidae, 361; and Zoropsidae, 14. The host spider heat map (Fig. 16) was created by the fifth author using the Spatial Module feature on SCAN-bug.orgs with the same set of host spider family occurrence records as for the host spider family distribution map. Table 4, made by the first and third authors, is a summary of the spider family host records for *E. unifasciatus* and *T. ferrugineus*.

The following insect collections and museums were solicited and provided host spider and wasp geographic distribution information or lack thereof during the years 1960–2021:

Allegheny College, Meadville, PA Insect Collection  
Archbold Biological Station Insect Collection  
Brigham Young University Bean Science Museum  
California Academy of Sciences  
California Polytechnique State University  
Canadian National Collection of Insects, Arachnids and Nematodes  
Carnegie Museum of Natural History  
Chicago Academy of Sciences  
Clemson University  
Colorado State University Department of Zoology and Entomology  
Cornell University Department of Entomology and Limnology  
Denver Museum of Nature and Science  
Field Museum of Natural History Collection of Insects, Arachnids, and Myriapods  
Florida State Collection of Arthropods  
Instituto de Biología, UNAM, Mexico  
Lyman Entomology Museum of McGill University  
Milwaukee Public Museum

Montana State University Department of Zoology and Entomology  
 Museum of Comparative Zoology, Harvard University  
 Museum of Southwestern Biology, Division of Arthropods  
 New Mexico State Collection of Arthropods  
 Northern Arizona University, Colorado Plateau Museum of Arthropod Diversity  
 Oklahoma State University, The Sam Noble Museum  
 Oregon State University Arthropod Collection  
 Royal Alberta Museum  
 Royal British Columbia Museum  
 Royal Ontario Museum  
 San Diego State University  
 Smithsonian Tropical Research Institute, Ancon, Panamá  
 Southern Oregon University Insect Collection  
 State of Oregon Department of Agriculture  
 State University of New York College of Environmental Science and Forestry Insect Collection  
 Texas Tech University, Invertebrate Zoology Collection  
 United States National Museum  
 Universidad Nacional de Colombia, Instituto de Ciencias Naturales  
 Universidad de la Habana  
 University of Alaska Museum  
 University of British Columbia, Spencer Entomological Collection  
 University of California–Berkeley, Essig Museum of Entomology  
 University of California–Davis, Bohart Museum of Entomology  
 University of Costa Rica Insect Museum  
 University of Georgia Department of Entomology  
 University of Guelph Centre for Biodiversity Genomics  
 University of Idaho Department of Entomology  
 University of Kansas, Snow Entomological Museum  
 University of Michigan Museum of Zoology  
 University of Panama Museo de Invertebrados G. B. Fairchild  
 University of Puerto Rico Invertebrate Collection  
 University of Wisconsin Department of Entomology  
 University of Wyoming Department of Entomology  
 Utah State University Department of Zoology  
 Vila Velha University, Brazil Insect Collection  
 Washington State University Department of Entomology

## Results

The vast majority of host records (2985/3387, 88.1%) are from North America north of Mexico. *Entypus unifasciatus* and *T. ferrugineus* stocked their nest-cells mainly (3305/3387, 97.6%) with adult or subadult female cursorial-hunting Lycosidae, Trechaleidae, Pisauridae and Ctenidae, all in the Superfamily Lycosoidea, and Zoropsidae, a closely related family (Griswold 1993, Piacentini and Ramírez 2019, Polotow et al. 2015). Lycosidae is the predominant host spider family in the Americas for *E. unifasciatus* (903/1087, 83.1%) and *T. ferrugineus* (1472/2300, 64.0%; Tables 1, 2, 4; Fig. 13, 14). *Rabidosia rabida* (Lycosidae) comprised slightly less than half of all host records for both species: *E. unifasciatus*, 519/1087, 47.7%; *T. ferrugineus*, 1103/2300, 48.0%. Species of Pisauridae are also captured by *E. unifasciatus* (53/1087, 4.9%) and *T. ferrugineus* (570/2300, 24.8%) in eastern United States and Ontario, Canada (Tables 1, 2, 4; Fig. 13, 14). Of 623 pisaurid host records for both species, 611 (98.1%) are for the arboreal *Dolomedes albineus* and semi-woodland *D. tenebrosus*. Most pisaurid host records for *E. unifasciatus* (45/53, 84.9%) and *T. ferrugineus* (439/570, 77.0%) are from southeastern United States. Trechaleidae



(*Cupiennius*) (46/114, 40.4%) and Ctenidae (mainly *Phoneutria*) (47/114, 41.2%) are the predominant *E. unifasciatus* host spider families in southern Mexico, Central America and South America but represent only 4.2% (46/1087) and 4.3% (47/1087), respectively, of the total host records for this species due to scarce information from tropical America (Tables 1, 4; Fig. 13). Trechaleidae (*Cupiennius*) (137/252, 54.4%) and Ctenidae (mainly *Phoneutria*) (63/252, 25.0%) are also the prevalent host spider families in that region for *T. ferrugineus* but account for only 6.0% (137/2300) and 2.7% (63/2300), respectively, of the total host records for this species because of scant information from tropical America (Tables 2, 4; Fig. 14). Sparassidae comprised only 1.6% (36/2300) and 3.1% (34/1087) of the total host records for *T. ferrugineus* and *E. unifasciatus*, respectively (Tables 1, 2, 4; Fig. 13, 14). Zoropsidae (2/1087, 0.2%) and Miturgidae (2/1087, 0.2%) are highly unusual host families for *E. unifasciatus* (Tables 1, 4; Fig. 13). Zoropsidae (16/2300, 0.7%), Agelenidae (5/2300, 0.2%) and Selenopidae (1/2300, <0.1%) are atypical host families for *T. ferrugineus* (Tables 2, 4; Fig. 14).

*Entypus unifasciatus* and *T. ferrugineus* provision their nests mostly with the same or related species of predominantly lycosoid spiders (United States unless indicated otherwise); \* designates new host species record: ***Entypus unifasciatus***: LYCOSIDAE—*Arctosa littoralis* (Hentz), *Hogna antelucana* (Montgomery), *H. baltimoriana* (Keyserling), *H. carolinensis* (Walckenaer), *H. carolinensis* species group, *H. coloradensis* (Banks), *H. lenta* (Hentz), *H. sp.* (Mexico), *Lycosa* spp. (Colombia), *Rabidosa punctulata* (Hentz), *R. rabida*, *R. santrita* (Chamberlin and Ivie), *Rabidosa* sp. (Mexico), *Schizocosa maxima* Dondale and Redner, *S. mccooki* (Montgomery), *Tigrosa annexa* (Chamberlin and Ivie), *T. aspersa* (Hentz), *T. georgicola* (Walckenaer), *T. grandis* (Banks), *T. helluo* (Walckenaer), *T. sp.* (Mexico, Colombia), unidentified Lycosidae spp. (Mexico, Colombia); TRECHALEIDAE—*Cupiennius coccineus* F. O. Pickard-Cambridge (Costa Rica, Panama, Ecuador), *C. getazi* Simon (Nicaragua, Costa Rica, Panama), *C. salei* (Keyserling) (Mexico), *C. sp.* (Costa Rica); PISAURIDAE—*Dolomedes albineus* Hentz, *D. scriptus* Hentz, *D. tenebrosus* Hentz; CTENIDAE—*Ancylometes bogotensis* (Keyserling) (Panama, Colombia), *A. sp.* (Venezuela), ?*Ctenus* spp. (Mexico, Costa Rica), ?*Kiekie* sp. (Costa Rica), *Phoneutria boliviensis* (F. O. Pickard-Cambridge) (Costa Rica, Panama, Colombia), *P. fera* Perty (Colombia), *P. sp.* (Costa Rica, Colombia), unidentified Ctenidae sp. (Mexico); ZOROPSIDAE—*Zorocrates fuscus* Simon (Mexico), *Zorocrates* sp. (Mexico); MITURGIDAE—*Syspira* sp.; SPARASSIDAE—\**Curicaberis peninsulanus* Banks, *Curicaberis* sp. (Mexico, Costa Rica), *Olios giganteus* Keyserling (Mexico); ***Tachypompilus ferrugineus***: LYCOSIDAE—*Hogna antelucana*, *H. baltimoriana*, *H. carolinensis*, *H. carolinensis* species group, *H. coloradensis*, \**H. ?ericeticola* (Wallace), *H. lenta*, *H. lenta* species group, *H. miami* (Wallace), *H. osceola* (Gertsch and Wallace), *H. timuqua* (Wallace), *H. sp.* (Mexico), *Lycosa* sp. near *impavida* Walckenaer, *Lycosa* sp. (Mexico), *Rabidosa carrana* (Bryant), *R. punctulata*, *R. rabida*, *R. santrita* (Mexico), *Schizocosa avida* Walckenaer, *S. mccooki*, \**S. sp.* (Honduras), *Tigrosa annexa*, *T. aspersa*, *T. georgicola*, *T. grandis*, *T. helluo*, \*\*unidentified Lycosidae spp. (Mexico, Belize, El Salvador, Honduras, Colombia, Guyana, Dominican Republic); TRECHALEIDAE—\**Cupiennius chiapanensis* Medina (Ecuador), *C. coccineus* (Costa Rica, Panama), *C. getazi* (Costa Rica, Panama), *C. salei* (Mexico, Nicaragua, Costa Rica), \**C. sp.* (Costa Rica, Ecuador, Panama); PISAURIDAE—*Dolomedes albineus*, \**D. okefnokensis* Bishop, *D. scriptus*, *D. tenebrosus*, *D. vittatus* Walckenaer, *D. sp.*, *Pisaurina mira* (Walckenaer); CTENIDAE—*Ancylometes bogotensis* (Honduras, Panama), \**Ancylometes* sp. (Brazil), \**Ctenus medius* Keyserling (Brazil), \**Ctenus ornatus* (Keyserling) (Brazil), \*?*Ctenus* sp. (Costa Rica), \**Enoploctenus cyclothorax* (Bertkau) (Brazil), \**E. maculipes* Strand (Brazil), ?*Kiekie* sp. (Costa Rica), *Phoneutria boliviensis* (Panama, Colombia), \**P. eickstedtae* Martins and Bertani (Brazil), *P. fera* (French Guiana), \**P. ?keyserlingi* (F. O. Pickard-Cambridge) (Brazil), \**P. nigriventer* (Keyserling) (Brazil), *Phoneutria* sp. (Ecuador), unidentified Ctenidae spp. (Costa Rica, Guyana, Suriname, Brazil); ZOROPSIDAE—\**Zorocrates fuscus* Simon (Mexico), \**Z. gnaphosoides* (O. P.-Cambridge) (Guatemala), *Z. unicolor* (Banks) (Mexico), *Zorocrates* sp. (Mexico, Guatemala, Costa Rica); AGELENIDAE—*Agelenopsis aperta* Gertsch (Mexico), *A. ?naevia* (Walckenaer), *Agelenopsis* sp.; SELENOPIIDAE—\**Selenops mexicanus* Keyserling (Mexico); SPARASSIDAE—\**Caayguara* sp. (Brazil), *Curicaberis* spp. (Mexico, Panama), *Heteropoda venatoria* Linnaeus (Mexico, Nicaragua), \**Heteropoda* sp. (Puerto Rico), *Neostasina bicolor* (Banks) (Dominican Republic, Puerto Rico), *Olios giganteus* (Mexico), \**O. pictitarsis* (Simon) (Panama), \**Polybetes ?pythagoricus* (Holmberg) (Brazil), \**Polybetes* spp. (Brazil).

## Discussion

*Entypus unifasciatus* and *Tachypompilus ferrugineus* have adapted morphologically, especially colorwise, behaviorally and ecologically to the different environmental conditions of the various geographic areas they inhabit. Both spider wasp species retained their basic nesting pattern in these regions but modified their hunting and prey capture methods accordingly to conform to the evasive and defensive compartment of the host spider species in different geographic regions. Both wasp species mainly capture and immobilize relatively large lycosoid spiders that they encounter in their hunting arenas. The Superfamily Lycosoidea includes the families Lycosidae, Trechaleidae, Pisauridae and Ctenidae based on morphological and molecular data (Griswold 1993; Polotow et al. 2015; Piacentini and Ramírez 2019). The family Zoropsidae, once included in the Superfamily Lycosoidea (Griswold 1993), is now considered a closely related group. These spider families are robust, agile and cursorial, relatively large, superficially alike morphologically, and related as evidenced by their genetic similarity.

The burrowing lycosid genus *Geolycosa*, although appropriate in size, taxonomically and morphologically, is not included among the host spiders of *E. unifasciatus* or *T. ferrugineus* as their characteristically deep, straight vertical burrows are evidently not part of the wasps' hunting locale. However, there is a recent host record of *Geolycosa wrighti* (Chamberlin) being captured and transported across the ground by *E. aratus* (Townes) (Kurczewski et al. in prep.). The woodland lycosids *Hogna frondicola* (Emerton), *Gladicosa gulosa* (Walckenaer), and the arboreal *G. pulchra* (Keyserling) are not selected as prey by *E. unifasciatus* or *T. ferrugineus* because of their strictly sylvan habitat, nocturnal activity, and slightly smaller size (Eubanks and Miller 1992; F. E. Kurczewski 2020 pers. obs.). There are no host records for either spider wasp species among the temperate zone Nearctic ctenids *Ctenus capitosus* Gertsch, *C. exlineae* Peck or *C. hibernalis* Hentz, which occur, sometimes commonly, in leaf litter and on low vegetation in mesic habitats in peninsular Florida, Arkansas and Alabama, respectively (Peck 1981; Corey and Taylor 1988; Edwards 1989). The three ctenid species average slightly smaller than the preferred host size of these two spider wasp species, although female body lengths of *C. capitosus*, *C. exlineae* and *C. hibernalis* can attain 16, 18 and 18 mm, respectively (F. E. Kurczewski 2021, pers. obs.).

The genus *Entypus* is restricted to the Western Hemisphere and has ~30 species (Townes 1957; Roig-Alsina 1981), of which the majority capture and stock Lycosidae in their multi-celled nests (Janvier 1930; Townes 1957; Krombein 1979; Roig-Alsina 1981; Contreras 2017). In addition to Lycosidae there are host records of *Syspira* sp. (Miturgidae) and *Zorocrates fuscus* (Zoropsidae) for *E. aratus*, unidentified Ctenidae species for *E. ferruginipennis* (Haliday), *Dolomedes tenebrosus* (Pisauridae) for *E. fulvicornis* (Cresson), *Agelenopsis naevia* (Walckenaer) for *E. magnus* (Cresson), and unidentified species of Sparassidae and Ctenidae for unidentified *Entypus* spp. (Kurczewski et al. 2017, 2020c, in prep.). *Entypus unifasciatus* provisions its nests predominantly with Lycosidae and, much less so, Trechaleidae, Pisauridae, Ctenidae and Sparassidae based on abundant United States and Ontario, Canada and sparse tropical America host information (Tables 1, 4; Fig. 13). The dry, open habitat of *E. unifasciatus* in southern Ontario, United States and northern Mexico is conducive to providing a plentiful supply of relatively large, often adult or subadult female Lycosidae. Seasonal synchronicity in host female spider adulthood and adult wasp emergence solidifies this predator-prey relationship. The ground-searching hunting behavior of *E. unifasciatus* is in harmony with the vagrant activity of host Lycosidae species. Trechaleidae in southern Mexico and Central America and Ctenidae in northern South America are the prevalent, appropriate size, cursorial host spider families of *E. unifasciatus* in those regions (Tables 1, 4; Fig. 13). The number of *E. unifasciatus* host records for Pisauridae and Sparassidae is far less than for Lycosidae as these families have fewer species and are habitat limited in North America (World Spider Catalog 2020). The vast majority of pisaurid host records for *E. unifasciatus* are from southeastern United States, while all sparassid host records for this species are from extreme southwestern United States and northern Mexico (Tables 1, 4; Fig. 13). *Syspira* (Miturgidae) and *Zorocrates* (Zoropsidae) are highly unusual host genera and families for *E. unifasciatus* in southwestern United States and Mexico, respectively (Tables 1, 4; Fig. 13).

Unlike some other areas of North America relatively large (body length 15–30 mm) actual and potential host spider species of Lycosidae, Trechaleidae, Pisauridae, Ctenidae, Zoropsidae, Agelenidae, Miturgidae, Sparassidae and Selenopidae are absent, rare or scarce in the Pacific Northwest (Fig. 15, 16). *Lycosa*, *Rabidosa*, *Sosippus* and *Tigrosa* (Lycosidae); *Cupiennius* (Trechaleidae); *Dolomedes* and *Pisaurina* (Pisauridae), except for the aquatic *D. triton* (Walckenaer); *Ancylometes*, *Ctenus*, *Kiekie* and *Phoneutria* (Ctenidae); *Zorocrates* (Zoropsidae); *Agelenopsis*

(Agelenidae); *Syspira* (Miturgidae); and *Selenops* (Selenopidae) are absent from Oregon, Washington and British Columbia (Carico 1973; Olmstead 1975; Peck 1981; Dondale and Redner 1990; Brady and McKinley 1994; Brady 2007, 2012; Platnick and Ubick 2007; Crews 2011; Whitman-Zai et al. 2015; Piacentini and Ramirez 2019). The absence, rarity or scarcity of such host spider species in this region may restrict the northward geographic distribution of *E. unifasciatus* whose northernmost reported localities are Medford and Brownsboro, Jackson County, OR (C. S. Ferguson, 2019 pers. comm.). Only four appropriate-size, host lycosid species of *E. unifasciatus* are found in the Pacific Northwest. *Hogna carolinensis*, a host species of *E. unifasciatus* in the southwestern United States (Kurczewski et al. 2017, 2020c), is rare in Oregon (Dondale and Redner 1990). *Schizocosa maxima*, a host spider for *E. unifasciatus* in California (2 records; Kurczewski and Edwards 2012, F. E. Kurczewski 2019 pers. obs.) is known from only a single locality in Oregon: Celilo Falls, Wasco County (Dondale and Redner 1978). *Arctosa littoralis*, an extremely rare (1 record) host lycosid species of *E. unifasciatus* in the southwestern U. S. (Kurczewski et al. 2020c), is relatively common in Oregon on sandy soils near water (Dondale and Redner 1983), a highly atypical hunting locale for *E. unifasciatus*. *Schizocosa mccoocki* is scarce to common in the Pacific Northwest and the most likely host species for *E. unifasciatus* in that region. There are 44 records of this spider wasp-spider host association from Oregon (Medford), California, Colorado, Idaho, Utah, Baja California Norte and Sonora, Mexico (Kurczewski and Edwards 2012; Kurczewski et al. 2020c; F. E. Kurczewski 2021 pers. obs.).

The genus *Tachypompilus* has 14 species in the Americas (Evans 1950, 1966; Colomo de Correa 1987; Fernández 2000). Host selection in this genus is more diverse than in *Entypus*. In South America *T. banksi* Colomo de Correa, *T. erubescens* (Taschenberg), *T. pallidus* (Banks), *T. vulpes* (Dalla Torre), and *T. xanthopterus* (Rohwer) provision with Sparassidae and, rarely, Selenopidae (*T. erubescens*, *T. xanthopterus*). *T. pallidus* also captures Ctenidae (Kurczewski et al. in prep.). *T. mendozae* is mainly host-specific on Lycosidae and, rarely, stocks Ctenidae, Trechaleidae and Xenoctenidae (Genise 1983; Martins 1991; Kurczewski et al. 2020b, 2020c, in prep.). In North America *T. u. unicolor* preys on Lycosidae and Sparassidae while *T. unicolor cerinus* captures Lycosidae, Trechaleidae, Ctenidae, Zoropsidae, Miturgidae and Sparassidae (Kurczewski and Edwards 2012; Kurczewski et al. 2017, 2020c). *Tachypompilus ferrugineus* provisions its nests mostly with the same genera and species of Lycosidae, Trechaleidae, Pisauridae, Ctenidae, Zoropsidae and Sparassidae as *E. unifasciatus* (Tables 2, 4; Fig. 14). The factors of predator-prey association involving size equivalence, cohabitation and seasonal synchronicity of wasp and host spider for *E. unifasciatus* apply also to *T. ferrugineus* in its predominant use of adult, mainly female Lycosidae in southern Ontario, United States and northern Mexico. Relatively frequent capture of *Dolomedes* (Pisauridae) by *T. ferrugineus* results from spider wasp and spider co-occurring in moist, predominantly deciduous woodland (Tables 2, 4; Fig. 14). Trechaleidae in southern Mexico and Central America and Ctenidae in South America are the prevalent host spider families for *T. ferrugineus* in those regions (Tables 2, 4; Fig. 14). Near absence of Sparassidae host records in southwestern United States and meager use in Mexico by *T. ferrugineus* is related to limited wasp distribution in arid quasi-desert and sparse scrubland/grassland-habitat frequented by *E. unifasciatus* and *Olios giganteus* (Sparassidae) (Tables 1, 2, 4; Fig. 13, 14). Zoropsidae (*Zorocrates*), Agelenidae (*Agelenopsis*) and Selenopidae (*Selenops*) are atypical host families for *T. ferrugineus* (Tables 2, 4; Fig. 14). Unlike other host spider families of *T. ferrugineus*, Agelenidae do not wander to hunt but remain on their funnel-web to capture prey. Barthélémy (2010) reported Agelenidae as an “unusual” host for the congener *T. analis* (Fabricius), a species that captures mainly Sparassidae in Hong Kong, and described the wasp’s search on the spider’s web, pursuit of the spider off its web, and its subsequent capture on the ground.

## Summary

*Entypus unifasciatus* and *Tachypompilus ferrugineus* stock their nest-cells with a single immobilized, often adult or subadult female cursorial-hunting spider belonging mainly to the superfamily Lycosoidea. *Tachypompilus ferrugineus* is more polyphagous than *Entypus unifasciatus*.

Lycosidae are the predominant host spider family for *Entypus unifasciatus* and *Tachypompilus ferrugineus* in North America based on extensive United States host records.

*Entypus unifasciatus* captures a larger percentage of Lycosidae than *Tachypompilus ferrugineus* resulting from a high degree of cohabitation and seasonal synchronicity in dry overgrown fields, savanna, open woodland and woodland edges.

*Tachypompilus ferrugineus* preys on a larger percentage of Pisauridae than *Entypus unifasciatus* based on the co-occurrence of wasp and spider in moist, mainly deciduous woodland.

*Entypus unifasciatus* and *Tachypompilus ferrugineus* capture a relatively high percentage of Trechaleidae in southern Mexico and Central America and Ctenidae in South America, but an overall equally low percentage of these families in the Americas based on a scarcity of host records from the tropics. *Entypus unifasciatus*, a slightly larger species than *T. ferrugineus*, captures a higher percentage of Ctenidae than *T. ferrugineus*, while *T. ferrugineus* captures a higher percentage of Trechaleidae than *E. unifasciatus*.

*Entypus unifasciatus* captures a larger percentage of Sparassidae than *Tachypompilus ferrugineus* in southwestern United States and Mexico where *E. unifasciatus* and giant crab spiders are common inhabitants and *T. ferrugineus* has a limited and sparse distribution. *Tachypompilus ferrugineus* provisions with a wider variety of Sparassidae over a larger geographic area than *Entypus unifasciatus*.

Zoropsidae (*Zorocrates*) is an unusual host spider family for *Entypus unifasciatus* and *Tachypompilus ferrugineus* in southwestern United States, Mexico and Central America.

Agelenidae (*Agelenopsis*) is an atypical host spider family for *Tachypompilus ferrugineus* in western United States and Mexico, the funnel-web perhaps acting as an initial deterrent to capture.

Miturgidae (*Syspira*) is a highly unusual host spider family for *Entypus unifasciatus* in southwestern United States and, likely, Mexico.

Selenopidae (*Selenops*) is an extremely rare host spider family for *Tachypompilus ferrugineus* in Mexico and probably Central America.

## Acknowledgments

We thank Matthias Buck, Royal Alberta Museum, Edmonton, AB; and Chris Starr, University of West Indies, St. Augustine, Trinidad & Tobago, for reviewing the manuscript. Roberto Cambra-Torok, Universidad de Panamá, Chitré, Panama, provided information on the geographic distribution and host species of *Entypus unifasciatus* [as *E. unifasciatus urichi* (Banks) or *E. urichi*] in Panama. Arturo Roig-Alsina, Museo Argentino de Ciencias Naturales, Buenos Aires, added information on the geographic distribution of *Entypus unifasciatus* [as *E. urichi*] in Colombia and Venezuela. Julio A. Genaro, Toronto, ON; James P. Pitts, Utah State University; Elijah Talamas, Florida State Collection of Arthropods, Gainesville, FL; and Cecília Waichert, Universidade Vila Velha, Vila Velha ES, Brazil, aided in the identification of *Tachypompilus ferrugineus* subspecies and *T. spp.* from the Caribbean region and South America. Andrew Bennett, Matthias Buck, and Steven Paiero sent geographic and host information for both spider wasp species from southern Ontario. Carol Ferguson sent information that extended the range of *Entypus unifasciatus* northward to Jackson County, Oregon. Richard Westcott, Oregon Department of Agriculture, Salem, OR, forwarded photographs of *Entypus unifasciatus* with an immobilized *Arctosa littoralis* (Lycosidae) from Cochise County, AZ. Jonathan Foster, Redding, CA, sent us a host record for *Entypus unifasciatus* with an immobilized *Schizocosa mccoocki*. Malecia Powers, Cumberland, MD, sent us a photograph and video of *Entypus unifasciatus* with *Dolomedes tenebrosus*. Dirk J. Stevenson, Altamaha Environmental Consulting, Hinesville, GA sent us a color slide of *Tachypompilus ferrugineus* with its host spider. Rogerio Bertani, IBB, UNESP, São Paulo, Brazil (Ctenidae); David Bixler, Boreal Studies Research Labs, Tower, MN (Lycosidae); Antonio Brescovit, IBB, UNESP, São Paulo, Brazil (Ctenidae); Daniela T. Candia Ramirez, Instituto de Biología, UNAM, MX, D. F., MX (Zoropsidae); Sarah C. Crews, California Academy of Sciences, San Francisco, CA (Selenopidae); Paula Cushing, Denver Museum of Nature and Science, Denver, CO (Agelenidae); Glavis B. Edwards, Florida State Collection of Arthropods, Gainesville, FL (Sparassidae); Marshal Hedin, San Diego State University, San Diego, CA (Lycosidae, Zoropsidae, Miturgidae); Dariana R. Guerrero-Fuentes, Instituto de Biología, UNAM, Coyoacán, D. F., MX (Zoropsidae); Cristina A. Rheims, Laboratório Especial de Coleções Zoológicas, Instituto Butantan, São Paulo, Brazil (Sparassidae); Antonio Tosto, Las Galeras, Samaná, Dominican Republic (Sparassidae); Darrell Ubick, California Academy of Sciences, San Francisco, CA (Ctenidae, Miturgidae, Sparassidae);

and, Carlos Viquez, Instituto Nacional de Biodiversidad–Arthropods, Heredia, Costa Rica (Ctenidae) identified families, genera and species of host spiders. Chris Barthélémy, Hong Kong, China, provided an observation on the highly unusual use of Agelenidae by *Tachypompilus analis*. We acknowledge numerous insect museum curators, collection managers, and their assistants who searched for host and geographic distribution records in their respective insect collections and museums and the several hundred individuals for their online photographs and videos of wasps with immobilized host spiders. We thank the following persons for use of their spider wasp/host spider copyright images: Morgan Cantrell, German Leonel Sarmiento Cruz, Tripp Davenport, Steven Easley, Chris Lloyd, Rigoberto Pantoja, Andrius Pasukonis, Mike Quinn, Eric Ramírez Rodríguez, Ruthanne Thomas, and unknown photographer.

## Literature Cited

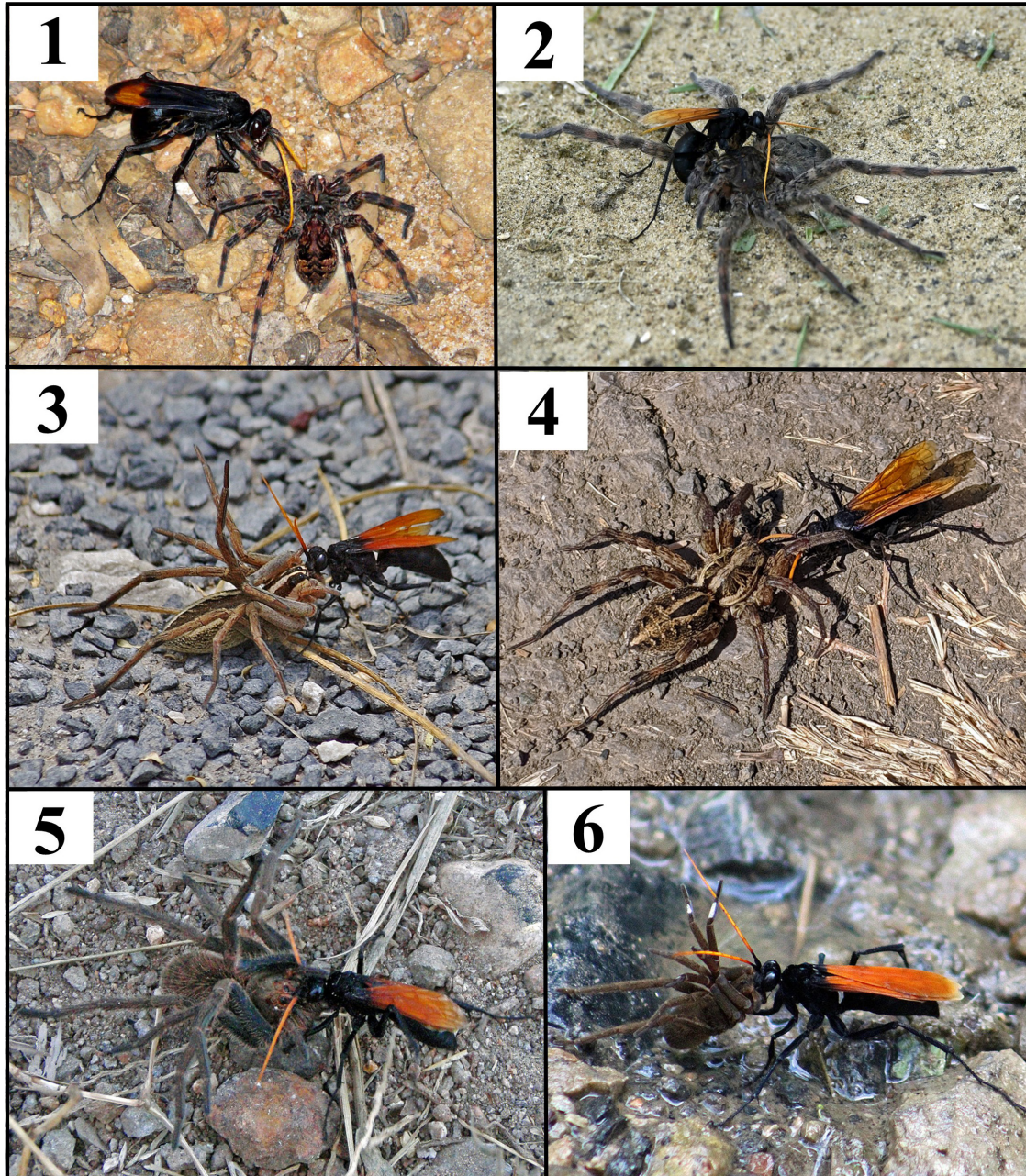
- Allred L. 2009.** Enchanted rock: a national and human history. University of Texas Press, Austin, TX. 314 p.
- Banks N. 1945.** The Psammocharidae (Spider-Wasps) of northern South America. Part I. Boletín de Entomología Venezolana 4: 81–126.
- Banks N. 1946.** Studies of South American Psammocharidae. Part I. Bulletin of the Museum of Comparative Zoology at Harvard College 96: 311–525.
- Barthélémy C. 2010.** Preliminary description of the predatory and nesting behavior of *Tachypompilus analis* (Pompilidae: Pompilinae) in Hong Kong, China. Hong Kong Entomological Bulletin 4: 3–9.
- Benson E. 2020.** Bug Bites. Rusty Spider Wasp. South Carolina Pest Control Association. Available at <https://scpca.net/2020/07/22/rusty-spider-wasp/> (Last accessed February 2022.)
- Bradley RA. 2010.** Common spiders of Ohio: Field guide. Ohio Division of Wildlife Publication 5140: 1–79.
- Brady AR. 2007.** *Sosippus* revisited: review of a web-building wolf spider genus from the Americas (Araneae: Lycosidae). Journal of Arachnology 35: 54–83.
- Brady AR. 2012.** Nearctic species of the new genus *Tigrosa* (Araneae: Lycosidae). Journal of Arachnology 40: 182–208.
- Brady AR, McKinley KS. 1994.** Nearctic species of the wolf spider genus *Rabidosa* (Araneae: Lycosidae). Journal of Arachnology 22: 138–160.
- Cambra-Torok RA, Quintero Arias D, Miranda RJ. 2004.** Presas, comportamiento de anidación y nuevos registros de distribución en pompilidos neotropicales (Hymenoptera: Pompilidae). Tecnociencia 6: 95–109.
- Carico JE. 1973.** The Nearctic species of the genus *Dolomedes* (Araneae: Pisauridae). Bulletin of the Museum of Comparative Zoology, Harvard University 144: 435–488.
- Chiri A. 2017.** Common wasps, bees, and ants (Order Hymenoptera) in the Wichita Mountains and surrounding areas. U.S. Fish & Wildlife Service; Wichita Mountains National Wildlife Refuge, OK. 14 p.
- Colomo de Correa MV. 1987 [1985].** Revisión de las avispa argentinas del género *Tachypompilus* Ashmead (Hymenoptera: Pompilidae). Revista de la Sociedad Entomológica Argentina 44: 201–237.
- Contreras JM. 2017.** Nuevos registros de caza de *Entypus unifasciatus dumosus* (Spinola, 1951) (Hymenoptera: Pompilidae) en Chile. Arquivos Entomológicos 18: 253–258.
- Corey DT, Taylor WK. 1988.** Ground surface spiders in three central Florida plant communities. Journal of Arachnology 16: 213–221.
- Corro-Chang PE., Cambra-Torok RA. 2011.** Diversidad de avispa (Hymenoptera: Pompilidae) cazadoras de arañas del Parque Nacional Darién, Republica de Panamá. Tecnociencia 13: 77–90.
- Crews SC. 2011.** A revision of the spider genus *Selenops* Latreille, 1819 (Arachnida, Araneae, Selenopidae) in North America, Central America and the Caribbean. ZooKeys 105: 1–182.
- Darby DF. 2017.** Rabid wolf spider and *Entypus* spider wasp. Available at <https://taneycomo.wordpress.com/2016/01/20/rabid-wolf-spider-and-entypus-spider-wasp/>. (Last accessed 23 December 2018.)
- Dodge G. 2019.** Spider Wasp. Available at <http://www.natureblog.org/spider-wasp/>. (Last accessed 10 May 2021.)
- Dondale CD, Redner JH. 1978.** Revision of the Nearctic wolf spider genus *Schizocosa* (Araneida: Lycosidae). Canadian Entomologist 110: 143–181.
- Dondale CD, Redner JH. 1983.** Revision of the wolf spiders of the genus *Arctosa* C. L. Koch in North and Central America (Araneae: Lycosidae). Journal of Arachnology 11: 1–30.
- Dondale CD, Redner JH. 1990.** The insects and arachnids of Canada. Part 17. The wolf spiders, nurseryweb spiders, and lynx spiders of Canada and Alaska, Araneae: Lycosidae, Pisauridae, and Oxyopidae. Research Branch Agriculture Canada Publication 1856: 1–383.
- Edwards GB. 1989.** The Florida false wolf spider, *Ctenus capitosus* (Araneae: Ctenidae). Florida Department of Agriculture & Consumer Services, Division of Plant Industry, Entomology Circular 319: 1–2.

- Eubanks MD, Miller GL. 1992.** Life cycle and habitat preference of the facultatively arboreal wolf spider, *Gladicosa pulchra* (Araneae, Lycosidae). *Journal of Arachnology* 20: 157–164.
- Evans HE. 1950.** A taxonomic study of the Nearctic spider wasps belonging to the tribe Pompilini (Hymenoptera: Pompilidae). Part I. *Transactions of the American Entomological Society* 75: 133–270.
- Evans HE. 1951.** A taxonomic study of the Nearctic spider wasps belonging to the tribe Pompilini (Hymenoptera: Pompilidae). Part III. *Transactions of the American Entomological Society* 77: 203–330.
- Evans HE. 1953.** Comparative ethology and the systematics of spider wasps. *Systematic Zoology* 2: 155–172.
- Evans HE. 1966.** A revision of the Mexican and Central American spider wasps of the subfamily Pompilinae (Hymenoptera: Pompilidae). *Memoirs of the American Entomological Society* 20: 1–442.
- Evans HE, Yoshimoto CM. 1962.** The ecology and nesting behavior of the Pompilidae (Hymenoptera) of the northeastern United States. *Miscellaneous Publications of the Entomological Society of America* 3: 65–119.
- Fernández FC. 2000.** Avispas cazadoras de arañas (Hymenoptera: Pompilidae) de la región neotropical. *Biota Colombiana* 1: 3–24.
- Genise JF. 1983.** Comportamiento de nidificación de *Tachypompilus erubescens* (Tasch.) y *T. mendozae* (D. T.) (Hym.: Pompilidae) con la descripción de un nuevo tipo de nido multicelular. *Revista de la Sociedad Entomología Argentina* 42: 305–312.
- Griswold CE. 1993.** Investigations into the phylogeny of lycosoid spiders and their kin (Arachnida: Araneae: Lycosoidea). *Smithsonian Contributions to Zoology* 539: 1–39.
- Horta-Vega JV, García-Gutiérrez ME, Benavides-Martínez MI, Correa-Sandoval A. 2009.** Pompilidae (Hymenoptera) de algunos municipios del centro y sur de Tamaulipas, México. *Acta Zoológica Mexicana (nueva serie)* 25: 71–81.
- Hurd PD Jr., Wasbauer MS. 1956.** New host records for North American spider-wasps (Hymenoptera: Pompilidae). *Journal of the Kansas Entomological Society* 29: 168–169.
- Janvier H (Claude-Joseph MF). 1930.** Recherches biologiques sur les prédateurs du Chili. *Annales de Sciences Naturelles* (10)13: 235–354.
- Krombein KV. 1953.** Biological and taxonomic observations on the wasps in a coastal area of North Carolina (Hymenoptera: Aculeata). *Wasmann Journal of Biology* 10: 261–341.
- Krombein KV. 1979.** Family Pompilidae. p. 1523–1570. In: Krombein KV, Hurd PD Jr., Smith DR, Burks BD (eds.). *Catalog of Hymenoptera in America north of Mexico. Volume 2, Apocrita (Aculeata)*. Smithsonian Institution Press; Washington, DC. 1198 p.
- Kurczewski FE. 1981.** Observations on the nesting behaviors of spider-wasps in southern Florida (Hymenoptera: Pompilidae). *Florida Entomologist* 64: 424–437.
- Kurczewski FE. 1989.** Ecology, mating, and nesting behavior of *Tachypompilus ferrugineus nigrescens* (Hymenoptera: Pompilidae). *Great Lakes Entomologist* 22: 75–78.
- Kurczewski FE. 1990.** Additional observations on *Tachypompilus ferrugineus* with emphasis on male behavior (Hymenoptera: Pompilidae). *Great Lakes Entomologist* 23: 159–163.
- Kurczewski FE. 1999.** Comparison of spider wasp faunas from two ecologically distinct sites in Erie County, Pennsylvania (Hymenoptera: Pompilidae). *Journal of the Kansas Entomological Society* 72: 339–360.
- Kurczewski FE. 2001.** Comparative nesting behavior of *Episyron quinquenotatus* (Hymenoptera: Pompilidae) in the northeastern United States. *Northeastern Naturalist* 8: 403–426.
- Kurczewski FE. 2010.** Prey and nesting behavior of some North American spider wasps (Hymenoptera: Pompilidae). *Northeastern Naturalist* 17: 115–124.
- Kurczewski FE, Edwards GB. 2012.** Hosts, nesting behavior, and ecology of some North American spider wasps (Hymenoptera: Pompilidae). *Southeastern Naturalist* 11 (Monograph 4): 1–71.
- Kurczewski FE, Edwards GB, Pitts JP. 2017.** Hosts, nesting behavior, and ecology of some North American spider wasps (Hymenoptera: Pompilidae), II. *Southeastern Naturalist* 16 (Monograph 9): 1–82.
- Kurczewski FE, Kiernan DH. 2015.** Analysis of spider wasp host selection in the eastern Great Lakes Region (Hymenoptera: Pompilidae). *Northeastern Naturalist* 22 (Monograph 11): 1–88.
- Kurczewski FE, Kurczewski EJ. 1968a.** Host records for some North American Pompilidae (Hymenoptera) with a discussion of factors in prey selection. *Journal of the Kansas Entomological Society* 41: 1–33.
- Kurczewski FE, Kurczewski EJ. 1968b.** Host records for some North American Pompilidae (Hymenoptera). First supplement. *Journal of the Kansas Entomological Society* 41: 367–382.
- Kurczewski FE, Kurczewski EJ. 1972.** Host records for some North American Pompilidae, Second supplement. Tribe Pepsini. *Journal of the Kansas Entomological Society* 45: 181–193.
- Kurczewski FE, Kurczewski EJ. 1973.** Host records for some North American Pompilidae (Hymenoptera). Third supplement. Tribe Pompilini. *Journal of the Kansas Entomological Society* 46: 65–81.

- Kurczewski FE, Stoll JW, West RC, Kissane KC, Cobb NS. 2020a.** Geographic variation in host selection in the spider wasps *Entypus unifasciatus* (Say) and *Tachypompilus ferrugineus* (Say) (Hymenoptera: Pompilidae). *Insecta Mundi* 0759:1–38.
- Kurczewski FE, West RC, Crews SC, Jenzen-Jones, NR. 2020b.** Selenopidae (Arachnida: Araneae), a new host family for the spider wasp *Tachypompilus ferrugineus* (Say) (Hymenoptera: Pompilidae: Pompilinae). *Insecta Mundi* 0824: 1–6.
- Kurczewski FE, West RC, Waichert C, Kissane KC, Ubick D, Pitts JP. 2020c.** New and unusual host records for some North American and South American spider wasps (Hymenoptera: Pompilidae). *Zootaxa* 4891: 1–112.
- Kurczewski FE, West RC, Waichert C, Pitts JP. [In rev.]**. Additional new and unusual host records for Western Hemisphere spider wasps (Hymenoptera: Pompilidae). *Insecta Mundi*.
- Leavengood JM Jr, Waichert C, Rodriguez J. 2011.** A distributional checklist of the spider wasps (Hymenoptera: Pompilidae) of Florida. *Insecta Mundi* 0161: 1–8.
- Martins RP. 1991.** Nesting behavior and prey of *Poecilopompilus algidus fervidus* and *Tachypompilus xanthopterus* (Hymenoptera: Pompilidae). *Journal of the Kansas Entomological Society* 64: 231–236.
- McCormac J. 2008.** Battle of the Titans. Available at <http://jimccormac.blogspot.com/2008/08/battle-of-titans.html>. (Last accessed 10 May 2021.)
- Olmstead JV. 1975.** A revision of the spider genus *Syspira* (Araneida: Clubionidae). Unpublished Master of Science Thesis, California State University, Long Beach, CA. 89 p.
- Peck WB. 1981.** The Ctenidae of temperate zone North America. *Bulletin of the American Museum of Natural History* 170: 157–169.
- Piacentini L, Ramírez M. 2019.** Hunting the wolf: A molecular phylogeny of the wolf spiders (Araneae, Lycosidae). *Molecular Phylogenetics and Evolution* 136: 227–240.
- Platnick NI, Ubick D. 2007.** A revision of the spider genus *Zorocrates* Simon (Araneae, Zorocratidae). *American Museum Novitates* 3579: 1–44.
- Polotow D, Carmichael A, Griswold CE. 2015.** Total evidence analysis of the phylogenetic relationships of Lycosoidea spiders (Araneae, Entelegynae). *Invertebrate Systematics* 29: 124–163.
- Rau P. 1922.** Ecological and behavior notes on Missouri insects. *Transactions of the Academy of Science of St. Louis* 24: 1–41.
- Rau P, Rau N. 1918.** Wasp studies afield. Princeton University Press; Princeton, NJ. 372 p.
- Roig-Alsina A. 1981.** Revision del genero *Entypus* Dahlbom en la Argentina (Hymenoptera: Pompilidae). *Revista de la Sociedad Entomológica Argentina* 40: 311–336.
- Santos Murgas A, Quintero Arias D, Ramírez Silva JA. 2018.** Nuevos registros de presas, comportamiento de anidación y parasitoides de *Tachypompilus ferrugineus* (Say, 1824) (Hymenoptera: Pompilidae) en la Provincia de Darién, Panamá. *Boletín de la Sociedad Entomológica Aragonesa (S.E.A.)* 63: 243–247.
- Strandtmann RW. 1953.** Notes on the nesting habits of some digger wasps. *Journal of the Kansas Entomological Society* 26: 45–52.
- Taulman JF. 2017.** Note on the unusual long distance transport of a wolf spider by a spider wasp, *Entypus unifasciatus*. *Transactions of the Kansas Academy of Science* 120: 223–226.
- Townes H. 1957.** Nearctic wasps of the subfamilies Pepsinae and Ceropalinae. *United States National Museum Bulletin* 209: 1–286.
- Wahis R. 1993.** Yellow pan, an easy and very effective way for catching spider wasps. *Sphecos* 26: 9.
- Waichert C, Rodriguez J, Van Dohlen CD, Pitts JP. 2012.** Spider wasps (Hymenoptera: Pompilidae) of the Dominican Republic. *Zootaxa* 3353: 1–47.
- Wasbauer MS. 1982.** Prey records for some North American spider wasps (Hymenoptera: Pompilidae). *Pan-Pacific Entomologist* 58: 223–230.
- Wasbauer MS, Kimsey LS. 1985.** California spider wasps of the subfamily Pompilinae (Hymenoptera: Pompilidae). *Bulletin of the California Insect Survey* 26: 1–130.
- Wasbauer MS, Powell JA. 1962.** Host records for some North American spider wasps with notes on prey selection (Hymenoptera: Pompilidae). *Journal of the Kansas Entomological Society* 35: 393–401.
- Whitman-Zai J, Francis M, Geick M, Cushing PE. 2015.** Revision and morphological phylogenetic analysis of the funnel web spider genus *Agelenopsis* (Araneae: Agelenidae). *Journal of Arachnology* 43: 1–25.
- Wilson JS, Pitts JP. 2007.** New host associations for New World spider wasps (Hymenoptera: Pompilidae). *Journal of the Kansas Entomological Society* 80: 223–228.
- World Spider Catalog. 2020.** Version 21.0. Natural History Museum Bern. Available at <http://wsc.nmbe.ch>. (Last accessed 12 November 2020.)

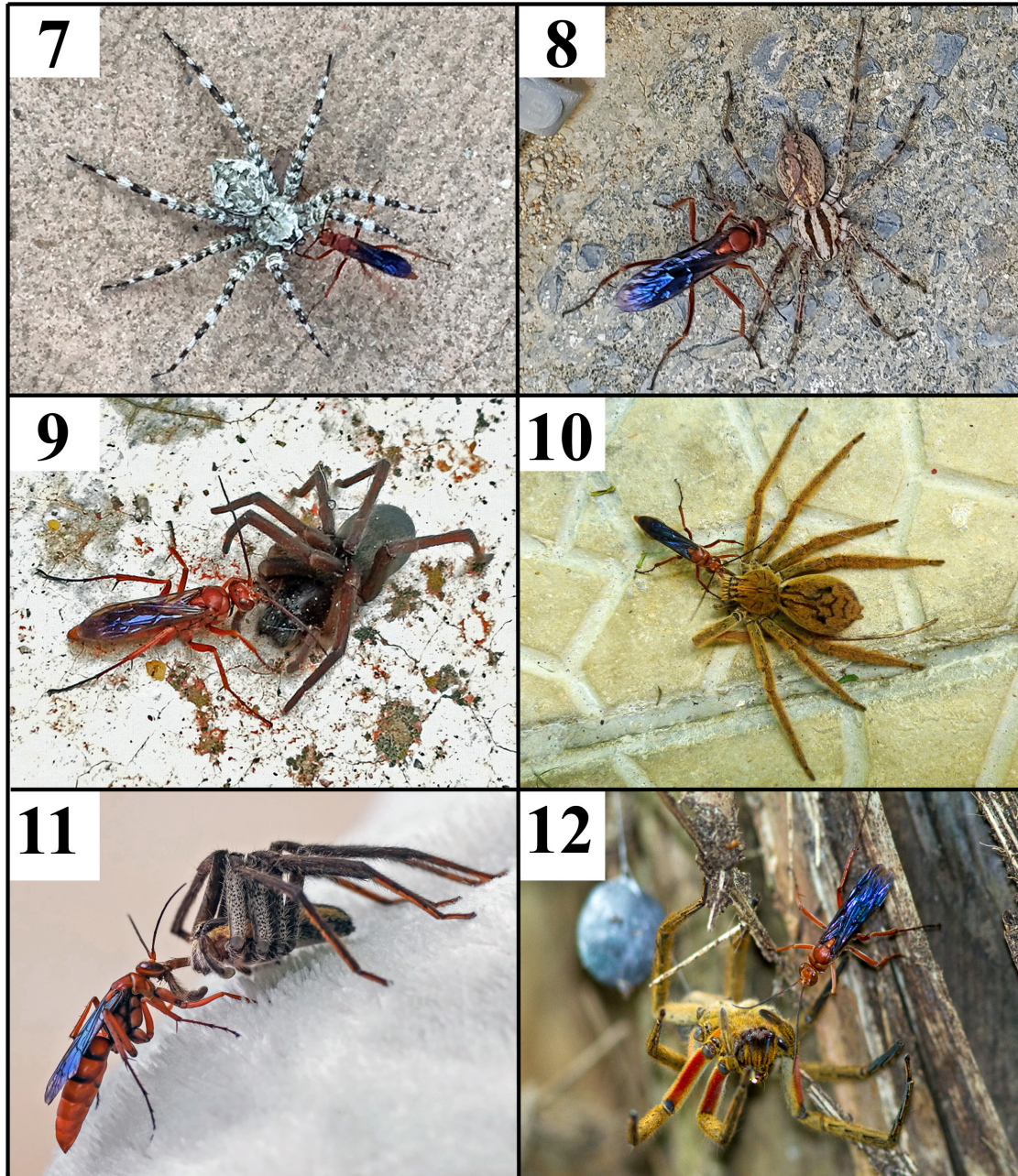
Received January 4, 2022; accepted March 10, 2022.

Review editor Kevin Williams.



**Figures 1–6.** *Entypus unifasciatus*. 1) *Entypus unifasciatus unifasciatus* (Say), female, with immobilized *Dolomedes tenebrosus* Hentz (Pisauridae), adult female, Caitlin Dunbar Nature Center, Litchester, Howard County, MD. © Photographer unknown. 2) *Entypus unifasciatus cressoni* (Banks), female, attempting to re-sting immobilized *Dolomedes tenebrosus*, adult female, Lewisville, Denton County, TX. Photograph © Ruthanne Thomas. 3) *Entypus unifasciatus cressoni*, female, with immobilized *Rabidososa rabida* (Walckenaer) (Lycosidae), adult female, Cook's Slough Nature Park, Uvalde County, TX. Photograph © Tripp Davenport. 4) *Entypus unifasciatus californicus* (Townes), female, with immobilized *Schizocosa mccooki* (Montgomery) (Lycosidae), adult female, San Luis Obispo, San Luis Obispo County, CA. Photograph © Morgan Cantrell. 5) *Entypus unifasciatus cressoni*, female, with immobilized *Ctenus* sp. (Ctenidae), adult or subadult female, Tequila, Jalisco State, Mexico. Photograph © Chris Lloyd. 6) *Entypus unifasciatus urichi* (Banks), female, with immobilized *Ancylometes bogotensis* (Keyserling) (Ctenidae), subadult female or juvenile, San Antonio del Tequendama, Cundinamarca Department, Colombia. Photograph © German Leonel Sarmiento Cruz.





**Figures 7–12.** *Tachypompilus ferrugineus*. **7)** Female with immobilized *Dolomedes albineus* Hentz, adult female, Austin, Travis County, TX. Photograph © Mike Quinn. **8)** Female with immobilized *Agelenopsis aperta* (Gertsch) (Agelenidae), adult female, Santiago, Nuevo Leon State, Mexico. Photograph © Rigoberto Pantoja. **9)** Female with immobilized *Zorocrates fuscus* Simon (Zoropsidae), adult or subadult female, Comonfort, Guanajuato State, Mexico. Photograph © Eric Ramírez Rodríguez. **10)** Female with immobilized *Cupiennius coccineus* F. O. Pickard-Cambridge (Trechaleidae), adult female, Verbena, Turrialba Canton, Cartago Province, Costa Rica. Photograph © Steven Easley. **11)** Female with immobilized *Cupiennius getazi* Simon, adult or penultimate male, Verbena, Turrialba Canton, Cartago Province, Costa Rica. Photograph © Steven Easley. **12)** Female with immobilized *Cupiennius coccineus*, adult female, Bastimento, Bocas del Toro Province, Panama. Photograph © Andrius Pasukonis.

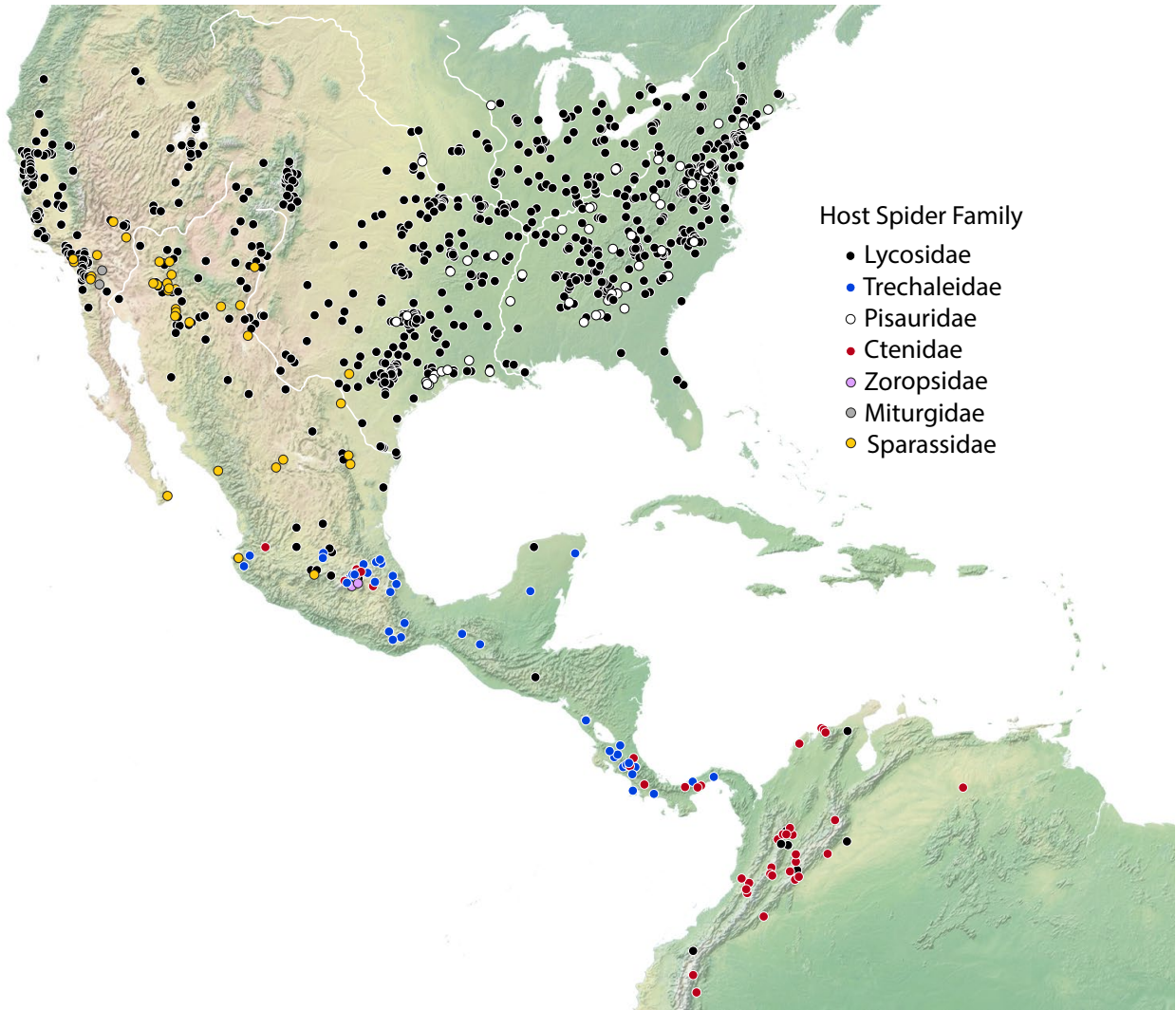


Figure 13. Host spider family distribution for *Entypus unifasciatus*.

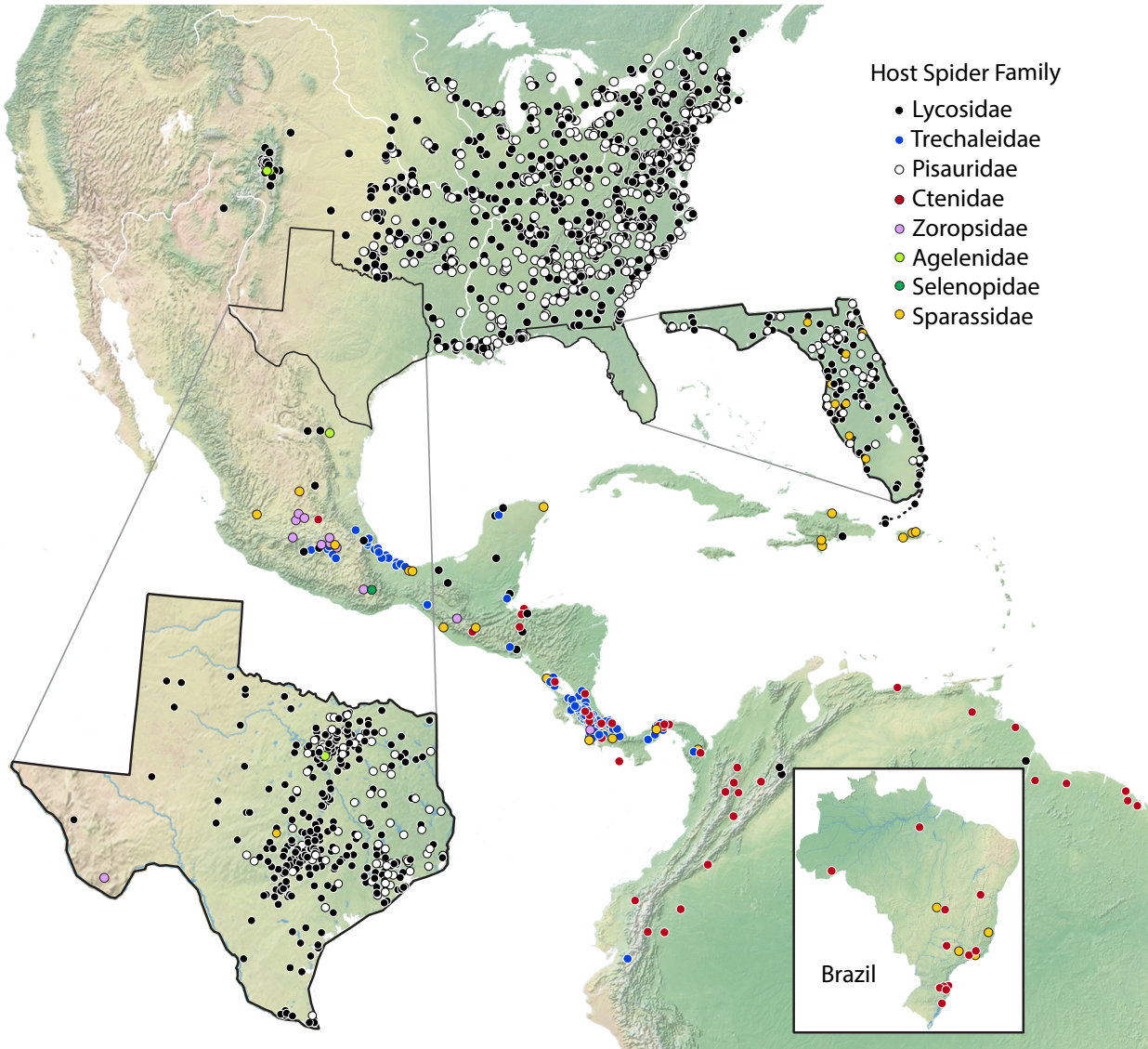
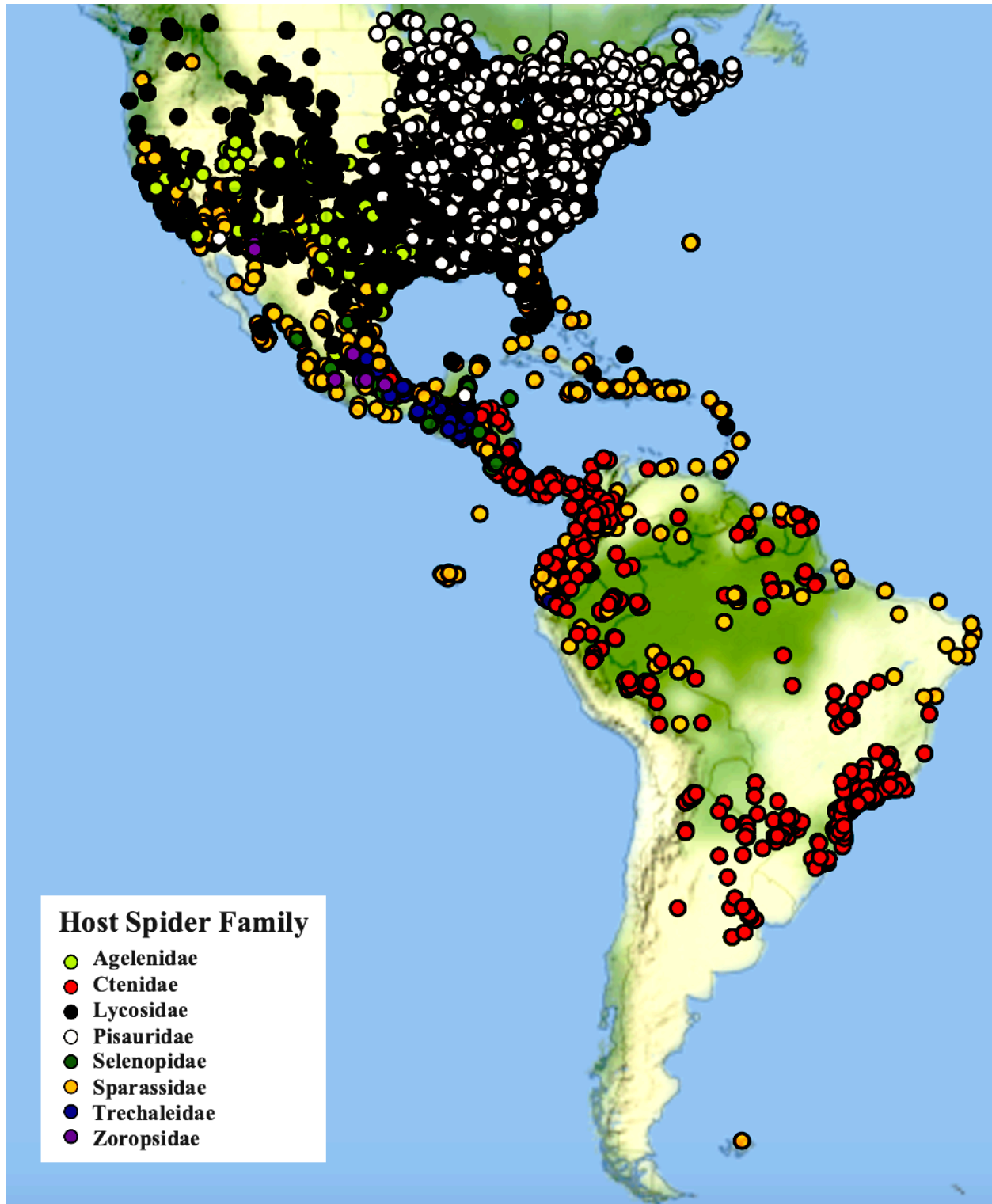
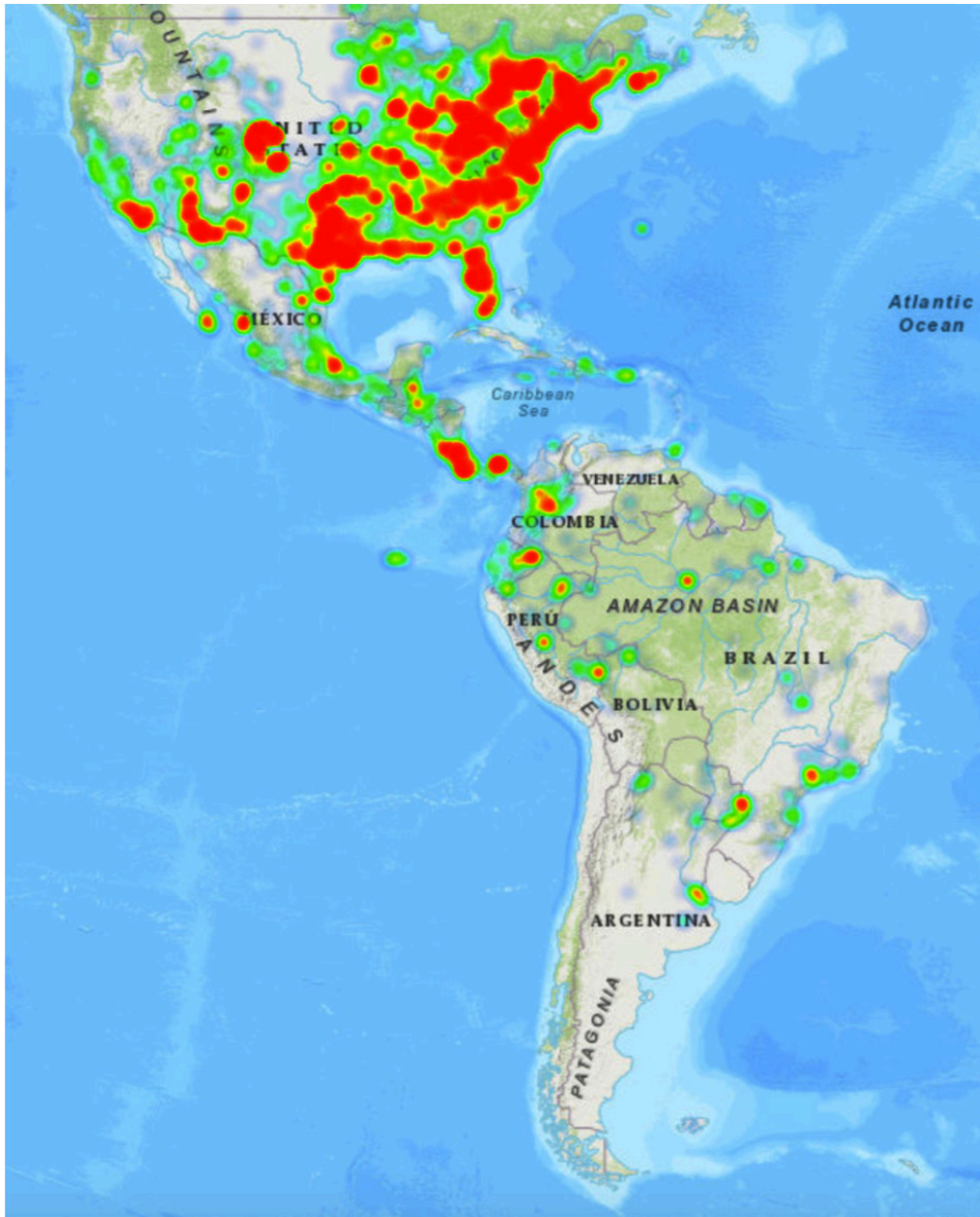


Figure 14. Host spider family distribution for *Tachypompilus ferrugineus*.



**Figure 15.** Geographic occurrence records of host species of Agelenidae, Ctenidae, Lycosidae, Pisauridae, Selenopidae, Sparassidae, Trechaleidae and Zoropsidae for *Entypus unifasciatus* and *Tachypompilus ferrugineus* based on 19,097 SCAN and GBIF collection records and online images. Northwestern Mexico is poorly sampled on this map. Note scarcity of records from the Pacific Northwest.



**Figure 16.** Combined geographic occurrence records of host species of Agelenidae, Ctenidae, Lycosidae, Pisauridae, Selenopidae, Sparassidae, Trechaleidae and Zoropsidae for *Entypus unifasciatus* and *Tachypompilus ferrugineus* based on 19,097 SCAN and GBIF collection records and online images. Northwestern Mexico is poorly sampled on this map. Note scarcity of records from the Pacific Northwest.

**Table 1.** Host spider family records for *Entypus unifasciatus*. Host spider family records are arranged regionally and alphabetically by country, state, district, province, department or county, and locality. Abbreviations for host spider families: L, Lycosidae; T, Trechaleidae; P, Pisauridae; C, Ctenidae; Z, Zoropsidae; M, Miturgidae; S, Sparasidae. Numbers in parentheses represent the number of host spider family records per locality.

This table is based on the following references and personal communications: Cambra-Torok 2017 pers. comm.; Cambra-Torok et al. 2004; Darby 2017; Dodge 2019; Evans and Yoshimoto 1962; Hurd and Wasbauer 1956; Krombein 1979; Kurczewski 2010; Kurczewski and Edwards 2012; Kurczewski et al. 2017, 2020a, b, c; Kurczewski and Kiernan 2015; McCormac 2008; Taulman 2017; Townes 1957; Wasbauer and Powell 1962; M. Powers 2020 pers. comm.; numerous insect collection records and ~200 online website reports.

Country	State/province	County (if in USA)	Locality	Family
USA	AL	Auburn	Auburn	P
USA	AL	Cullman	Cullman	L
USA	AL	Cullman	Logan	L
USA	AL	DeKalb	Hammondville	L
USA	AL	DeKalb	Little River Canyon Preserve	L
USA	AL	Jackson	Woodville	L
USA	AL	Jefferson	Concord	P
USA	AL	Lauderdale	Anderson	L
USA	AL	Lauderdale	Florence	L
USA	AL	Lauderdale	St. Florian	L
USA	AL	Lee	Auburn	P
USA	AL	Limestone	Athens	L
USA	AL	Madison	Huntsville	L
USA	AL	Madison	Madison	L (2)
USA	AL	Madison	New Hope	L
USA	AL	Montgomery	Montgomery	L
USA	AL	Montgomery	Montgomery	P
USA	AL	Morgan	Somerville	L
USA	AL	Shelby	Pelham	L
USA	AL	Tuscaloosa	Lake View	L
USA	AL	Tuscaloosa	Tuscaloosa	L
USA	AL	Walker	Jasper	L
USA	AR	Benton	Bella Vista	L
USA	AR	Benton	Bentonville	L
USA	AR	Benton	Rogers	L
USA	AR	Benton	Springdale	L
USA	AR	Conway	Petit Jean State Park	L
USA	AR	Craighead	Jonesboro	L
USA	AR	Crawford	Alma	P
USA	AR	Crawford	Van Buren	L
USA	AR	Faulkner	Conway	L (2)
USA	AR	Faulkner	Vilonia	L
USA	AR	Garland	Hot Springs	L
USA	AR	Greene	Paragould	L
USA	AR	Izard	Melbourne	L
USA	AR	Marion	Lead Hill	L
USA	AR	Newton		P
USA	AR	Pope	Russellville	L
USA	AR	Prairie	DeValls Bluff	L
USA	AR	Pulaski	Little Rock	L (3)
USA	AR	Sharp	Evening Shade	P
USA	AR	Union	El Dorado	L

Country	State/province	County (if in USA)	Locality	Family
USA	AR	Washington	War Eagle Creek	L
USA	AZ	Apache	Petrified Forest National Park	L
USA	AZ	Cochise	Bonnie Blink, Sierra Vista	L
USA	AZ	Cochise	San Pedro River, NE of Sierra Vista	L
USA	AZ	Cochise	San Simon	L
USA	AZ	Cochise	Southwest Research Station	L
USA	AZ	Cochise	Tombstone	S
USA	AZ	Coconino	Flagstaff	L
USA	AZ	Coconino	Sedona	L (4)
USA	AZ	Coconino	Williams	L
USA	AZ	Maricopa	Fountain Hills	S
USA	AZ	Maricopa	Gilbert	S
USA	AZ	Maricopa	Gilbert Riparian Reserve	S
USA	AZ	Maricopa	Goodyear	L
USA	AZ	Maricopa	Mesa	L
USA	AZ	Maricopa	Mesa	S
USA	AZ	Maricopa	Phoenix	L
USA	AZ	Maricopa	Tolleson	S
USA	AZ	Maricopa	Waddell	L
USA	AZ	Mohave	Kingman	L
USA	AZ	Navajo	Pinetop-Lakeside	L
USA	AZ	Pima	Green Valley	L
USA	AZ	Pima	Green Valley	S
USA	AZ	Pima	Picture Rocks	S
USA	AZ	Pima	Tucson	L (2)
USA	AZ	Pima	Tucson	S
USA	AZ	Pinal	Apache Junction	S
USA	AZ	Pinal	Maricopa City	L
USA	AZ	Pinal	Queen City	L
USA	AZ	Pinal	Sun Tan Valley	L
USA	AZ	Pinal	Superior, Boyce-Thompson Arboretum Botanical Garden	L
USA	AZ	Santa Cruz		L
USA	AZ	Santa Cruz	Patagonia	L
USA	AZ	Yavapai	Horseshoe Reservoir	S
USA	AZ	Yavapai	Mayer	L
USA	AZ	Yavapai	Montezuma Castle Monument	S
USA	AZ	Yavapai	Prescott Valley	L
USA	AZ	Yavapai	Rimrock, Camp Verde	S
USA	CA	Alameda	Berkeley	L
USA	CA	Alameda	Fremont, Lake Elizabeth	L (4)
USA	CA	Butte	Chico	l
USA	CA	Colusa	Williams	L
USA	CA	Contra Costa	Antioch	L
USA	CA	Contra Costa	Concord	L
USA	CA	Contra Costa	Danville	L
USA	CA	Contra Costa	Richmond	L
USA	CA	El Dorado	Placerville	L
USA	CA	Fresno	Coalinga	L
USA	CA	Fresno	Fresno	L
USA	CA	Imperial	Ocotillo	M
USA	CA	Kern	Bakersfield	L (2)
USA	CA	Kern	Mohave	L

Country	State/province	County (if in USA)	Locality	Family
USA	CA	Kings	Hanford	L
USA	CA	Los Angeles	Los Angeles	L (3)
USA	CA	Los Angeles	Manhattan Beach	L
USA	CA	Los Angeles	San Fernando	L
USA	CA	Los Angeles	Santa Clarita	L
USA	CA	Los Angeles	Santa Monica	L
USA	CA	Madera	Coarsegold	L
USA	CA	Mono	Bridgeport	L
USA	CA	Monterey	Castroville	L
USA	CA	Monterey	Monterey	L
USA	CA	Napa	St. Helena	L
USA	CA	Nevada	Grass Valley	L
USA	CA	Orange	Anaheim	S
USA	CA	Orange	Capistrano Beach	S
USA	CA	Orange	Carbon Canyon Regional Park	L
USA	CA	Placer	Newcastle	L
USA	CA	Riverside	Banning	L
USA	CA	Riverside	Hemet	L
USA	CA	Riverside	Mecca	M
USA	CA	Riverside	Moreno Valley	L
USA	CA	Riverside	Murrieta	L
USA	CA	Riverside	Palm Springs	L
USA	CA	Riverside	Perris	L
USA	CA	Riverside	Riverside	L
USA	CA	Riverside	Temecula	L
USA	CA	Sacramento	Folsom	L
USA	CA	Sacramento	Sacramento	L (2)
USA	CA	San Benito	Hollister	L (2)
USA	CA	San Bernardino	Montclair	L
USA	CA	San Bernardino	San Bernardino	L
USA	CA	San Bernardino	Victorville	L
USA	CA	San Bernardino	Yucca Valley	S
USA	CA	San Diego	Anza-Borrego Desert State Park	S
USA	CA	San Diego	Chula Vista	L
USA	CA	San Diego	Guajome Regional Park	L
USA	CA	San Diego	Julian	L
USA	CA	San Diego	Julian	S
USA	CA	San Diego	Mission Trails Regional Park	L
USA	CA	San Diego	Ramona	L
USA	CA	San Diego	San Marcos	L
USA	CA	San Francisco	San Francisco Bay	L
USA	CA	San Luis Obispo	Atascadero	L
USA	CA	San Luis Obispo	Los Osos	L
USA	CA	San Luis Obispo	Montana de Oro State Park	L
USA	CA	San Luis Obispo	Paso Robles	L (2)
USA	CA	San Luis Obispo	San Luis Obispo	L
USA	CA	San Luis Obispo	Templeton	L
USA	CA	San Mateo	Portola Valley	L
USA	CA	San Mateo	Redwood City	L
USA	CA	Santa Barbara	Goleta	L
USA	CA	Santa Barbara	Lompoc	L
USA	CA	Santa Barbara	Los Padres National Forest	L



Country	State/province	County (if in USA)	Locality	Family
USA	CA	Santa Barbara	Santa Barbara	L (2)
USA	CA	Santa Clara	Gilroy	L
USA	CA	Santa Clara	Joseph D. Grant County Park	L
USA	CA	Santa Clara	Los Altos	L
USA	CA	Santa Clara	Milpitas	L (2)
USA	CA	Santa Clara	Morgan Hill	L
USA	CA	Santa Clara	San Jose	L
USA	CA	Santa Clara	Santa Clara	L
USA	CA	Santa Cruz	Santa Cruz	L
USA	CA	Shasta	Redding	L
USA	CA	Solano	Suisun/Fairfield	L (4)
USA	CA	Sonoma	Santa Rosa	L
USA	CA	Sonoma	Sonoma	L
USA	CA	Stanislaus	Turlock	L
USA	CA	Tulare	Tulare	L
USA	CA	Tulare	Visalia	L
USA	CA	Yolo	Davis	L
USA	CA	Yolo	Winters	L
USA	CO	Arapahoe	Aurora	L
USA	CO	Arapahoe	Littleton	L (3)
USA	CO	Archuleta	Pagosa Springs	L
USA	CO	Boulder	Boulder	L (2)
USA	CO	Boulder	Lyons	L
USA	CO	Broomfield	Broomfield	L (2)
USA	CO	Delta	Paonia	L
USA	CO	Douglas	Castle Rock	L
USA	CO	El Paso	Cheyenne Mountain State Park	L
USA	CO	El Paso	Colorado Springs	L (3)
USA	CO	El Paso	Manitou Springs	L
USA	CO	Fremont	Cañon City	L
USA	CO	Jefferson	Denver	L (5)
USA	CO	Jefferson	Golden	L
USA	CO	Jefferson	Westminster	L (2)
USA	CO	La Plata	Durango	L (2)
USA	CO	Larimer	Bellevue	L
USA	CO	Larimer	Fort Collins	L
USA	CO	Larimer	Loveland	L
USA	CO	Mesa	Grand Junction	L
USA	CO	Montrose	Montrose	L
USA	CO	Pueblo	Pueblo West	L
USA	CO	Routt	Steamboat Springs	L
USA	CO	Summit	Wheat Ridge	L
USA	CO	Teller	Woodland Park	L
USA	CO	Weld	Hudson	L
USA	CO	Weld	Longmont	L
USA	CT	Fairfield	New Canaan	L
USA	CT	New Haven	New Haven	L
USA	CT	New London	Gales Ferry	P
USA	DE	Kent	Dover	L
USA	DE	Kent	Frederica	L
USA	DE	New Castle	Bear	L
USA	FL	Brevard	Titusville	L

Country	State/province	County (if in USA)	Locality	Family
USA	FL	Duval	Jacksonville	L (2)
USA	FL	Leon	Tallahassee	L
USA	FL	Seminole	Sanford	L
USA	GA	Athens-Clarke	Athens	P
USA	GA	Athens-Clarke	Athens	L (3)
USA	GA	Bartow	Adairsville	L
USA	GA	Bartow	White	L
USA	GA	Catoosa	Fort Oglethorpe	L
USA	GA	Catoosa	Ringgold	L
USA	GA	Cherokee	Woodstock	L
USA	GA	Clayton	Forest Park	P
USA	GA	Cobb	Marietta	L
USA	GA	Cobb	Powder Springs	L
USA	GA	Columbia	Harlem	L
USA	GA	Coweta	Sharpsburg	P
USA	GA	Dawson	Dawsonville	L
USA	GA	Douglas	Douglasville	L
USA	GA	Fayette	Fayetteville	L
USA	GA	Fulton	Sandy Springs	L
USA	GA	Haralson	Waco	L
USA	GA	Macon-Bibb	Macon	P
USA	GA	Muscogee	Columbus	L
USA	GA	Paulding	Dallas	L
USA	GA	Richmond	Augusta	L (2)
USA	GA	Rockdale	Conyers	L
USA	GA	Rockdale	Conyers	P
USA	GA	Spalding	Griffin	L
USA	GA	Walker	Rossville	L
USA	IA	Black Hawk	Waterloo	L
USA	IA	Johnson	Iowa City	L
USA	IA	Linn	Cedar Rapids	L (2)
USA	IA	Plymouth	Broken Kettle Wildlife Refuge	L
USA	IA	Polk	Altoona	L
USA	IA	Polk	Ankeny	L
USA	IA	Polk	Des Moines	L
USA	ID	Ada	Boise	L (2)
USA	ID	Bannock	Pocatello	L (3)
USA	ID	Franklin	Weston	L
USA	ID	Payette	Fruitland	L
USA	IL	Adams	Payson	L
USA	IL	Adams	Quincy	L
USA	IL	Champaign	Champaign	L
USA	IL	Coles	Charleston	L
USA	IL	Cook	Chicago	L
USA	IL	Cook	Glenview	L
USA	IL	DuPage	Bartlett	L
USA	IL	DuPage	Winfield	L
USA	IL	Edgar		L
USA	IL	Hancock	Fountain Green	L
USA	IL	Jefferson	Mount Vernon	L
USA	IL	LaSalle	Ottawa	L
USA	IL	Lee	Dixon	L

Country	State/province	County (if in USA)	Locality	Family
USA	IL	Macon	Decatur	L (2)
USA	IL	Madison	Glen Carbon	L
USA	IL	McDonough	Colchester	L
USA	IL	Tazewell	Pekin	L
USA	IL	Union	Jonesboro	L (2)
USA	IL	Wayne	Fairfield	L
USA	IL	Will	Matteson	L
USA	IL	Will	New Lenox, Hickory Creek Forest Preserve	L
USA	IL	Williamson	Marion	L (2)
USA	IN	Bartholomew	Columbus	L
USA	IN	Clark		L (2)
USA	IN	Clark	Memphis	L
USA	IN	Franklin	Brookville	L
USA	IN	Hendricks	Brownsburg	L
USA	IN	Jackson	Muscatatuck Wildlife Refuge	L
USA	IN	Monroe	Bloomington	L
USA	IN	Newton		L
USA	IN	Vigo		L
USA	IN	Warrick	Newburgh	L
USA	IN	Wayne	North Judson	L
USA	KS	Barton	Great Bend	L
USA	KS	Butler	Towanda	L (2)
USA	KS	Coffey	Burlington	L
USA	KS	Dickinson	Manchester	L
USA	KS	Douglas	Lawrence	L (2)
USA	KS	Ford	Dodge City	L
USA	KS	Franklin	Princeton	L
USA	KS	Johnson	Lenexa	L
USA	KS	Johnson	Overland Park	L (3)
USA	KS	Johnson	Shawnee	L
USA	KS	Leavenworth	Leavenworth	L
USA	KS	Lyon	Emporia	L
USA	KS	Osage	Overbrook	L
USA	KS	Pawnee	Larned	L
USA	KS	Riley	Manhattan	L
USA	KS	Sedgwick	Derby	L
USA	KS	Sedgwick	Wichita	L (5)
USA	KS	Shawnee	Topeka	L (3)
USA	KS	Sumner	Wellington	L
USA	KS	Wyandotte	Kansas City	L
USA	KY	Adair	Columbia	P
USA	KY	Allen	Scottsville	L
USA	KY	Calloway	Murray	L
USA	KY	Christian	Hopkinsville	L
USA	KY	Floyd	Garrett	L
USA	KY	Franklin	Frankfort, Cove Spring Park	P
USA	KY	Garrard	Lancaster	L (2)
USA	KY	Garrard	Paint Lick	L
USA	KY	Jefferson	Jeffersontown	L
USA	KY	Kenton	Crescent Springs, Fort Mitchell	L (2)
USA	KY	LaRue	Mount Sherman	L
USA	KY	Lawrence	Louisa	L

Country	State/province	County (if in USA)	Locality	Family
USA	KY	Lyon	Eddyville	L
USA	KY	Madison	Bearea	L
USA	KY	McCracken	Paducah	L
USA	KY	Muhlenberg	Paradise	P
USA	KY	Shelby	Shelbyville	L
USA	KY	Shelby	Shelbyville	P
USA	LA	Beauregard	De Ridder	P
USA	LA	Bossier	Haughton	L
USA	LA	Calcasieu	Lake Charles	L
USA	LA	Calcasieu	Woodlawn	L
USA	LA	East Baton Rouge	Baton Rouge	L
USA	LA	Lafayette	Acadiana Park Nature Station	P
USA	LA	Lafayette	Lafayette	L
USA	LA	Livingston	Albany	L
USA	LA	Orleans	New Orleans	L (2)
USA	LA	Ouachita	Monroe	L
USA	MA	Norfolk	Canton	L
USA	MA	Plymouth	Brockton	L
USA	MD	Allegany	Cumberland	P
USA	MD	Ann Arundel	Fort Meade	L
USA	MD	Baltimore	Baldwin	L
USA	MD	Baltimore	Catonsville	L
USA	MD	Baltimore	Nottingham	L
USA	MD	Charles	Indian Head	L
USA	MD	Frederick	Frederick	L
USA	MD	Frederick	Tuscarora	L
USA	MD	Frderick	Walkersville	L
USA	MD	Howard	Lichester, Caitlin Dunbar Nature Center	P
USA	MD	Howard	Waterloo Park	L
USA	MD	Montgomery	Great Falls Park, Potomac	P
USA	MD	Prince George's	Patuxent River Park	L
USA	MD	Prince George's	Riverdale Park	L
USA	MD	Wicomico	Salisbury	L
USA	MI	Cass	Edwardsburg	L
USA	MI	Genesee	Montrose	L
USA	MI	Kalamazoo	Portage	L
USA	MI	Kent	Grand Rapids	L
USA	MI	Macomb	Utica	L
USA	MI	Montcalm	Douglass Township	L
USA	MI	Muskegon	Muskegon	L
USA	MI	Ottawa		L
USA	MI	Tuscola	Caro	L
USA	MI	Washtenaw	Ann Arbor	L
USA	MI	Wayne	Grosse Ile	L
USA	MO	Boone	Ashland	L
USA	MO	Boone	Columbia	L (2)
USA	MO	Boone	Perche Township	L
USA	MO	Buchanan	St. Joseph	L
USA	MO	Cole	Jefferson City	L (3)
USA	MO	Greene	Springfield	L
USA	MO	Callaway	Holts Summit	L
USA	MO	Callaway	New Bloomfield	L

Country	State/province	County (if in USA)	Locality	Family
USA	MO	Franklin		L
USA	MO	Jackson	Kansas City	L (2)
USA	MO	Jasper	Carthage	L
USA	MO	Jefferson	Morse Mill	L
USA	MO	Johnson	Warrensburg	L
USA	MO	Lafayette	Higginsville	L
USA	MO	Miller	Brumley	L
USA	MO	Miller	Iberia	L
USA	MO	Newton	Neosho, Neosho National Fish Hatchery	L
USA	MO	Phelps	Rolla	L
USA	MO	Platte	Parkville	L (2)
USA	MO	Saint Charles	Wentzville	L
USA	MO	Scott	Caney Creek	L
USA	MO	St. Louis	Powder Valley Nature Center, Kirkwood	L
USA	MO	St. Louis	Wildwood	L
USA	MO	Wayne	Greenville	L
USA	MS	Bolivar	Dahomey National Wildlife Refuge	P
USA	MS	DeSoto	Olive Branch	L
USA	MS	Hinds	Jackson	L
USA	NC	Alamance	Burlington	L
USA	NC	Alamance	Snow Camp	L
USA	NC	Buncombe	Asheville	L (3)
USA	NC	Buncombe	Barnardsville	L
USA	NC	Buncombe	Weaverville	L
USA	NC	Cabarrus	Concord	L
USA	NC	Caswell		L
USA	NC	Catawba	Hickory	L
USA	NC	Chatham	Pittsboro	L
USA	NC	Cumberland	Fayetteville	L (2)
USA	NC	Davidson	Lexington	L
USA	NC	Durham	Chapel Hill	L (4)
USA	NC	Durham	Chapel Hill	P
USA	NC	Durham	Durham	P (2)
USA	NC	Durham	Durham	L
USA	NC	Gaston	High Shoals	L
USA	NC	Gates	Corapeake	L
USA	NC	Henderson	Flat Rock	L
USA	NC	Iredell	Mooresville	P
USA	NC	Johnston	Clayton	L
USA	NC	Johnston	Micro	L
USA	NC	Lee	Sanford	L
USA	NC	Madison	Marshall	L
USA	NC	Madison	Mars Hill	L
USA	NC	Mecklenburg	Charlotte	L (2)
USA	NC	Mecklenburg	Davidson	L
USA	NC	Mecklenburg	Huntersville	L
USA	NC	Mecklenburg	Mount Holly	L
USA	NC	Orange	Chapel Hill	L (2)
USA	NC	Person	Moriah	L
USA	NC	Randolph	Liberty	L
USA	NC	Rutherford	Rutherfordton	L
USA	NC	Wake	Apex	L

Country	State/province	County (if in USA)	Locality	Family
USA	NC	Wake	Raleigh	L (2)
USA	NC	Warren		L
USA	NC	Watauga	Boone, Turtle Island Preserve	L
USA	NC	Yancey	Burnsville	L
USA	NC	Yancey	Green Mountain	L
USA	NE	Adams	Juniata	L
USA	NE	Dixon	Newcastle	L
USA	NE	Douglas	Boys Town	L
USA	NE	Douglas	Omaha	L (3)
USA	NE	Johnson	Tecumseh	L
USA	NE	Lancaster	Lincoln	L (2)
USA	NE	Sarpy	Bellevue, Fontenelle Forest	L (2)
USA	NE	Sarpy	Bellevue, Fontenelle Forest	P
USA	NE	Washington	Blair	L (2)
USA	NJ	Cape May	Cape May	L
USA	NJ	Gloucester	Gloucester	L
USA	NJ	Hunterdon	Flemington	L
USA	NJ	Hunterdon	Hampton	L
USA	NJ	Mercer	Lawrence Township	L
USA	NJ	Mercer	Trenton	L (2)
USA	NJ	Middlesex	New Brunswick	L
USA	NJ	Monmouth	Lincroft	L
USA	NJ	Ocean	Toms River	L
USA	NJ	Somerset	Bedminster Township	L
USA	NJ	Somerset	Hillsborough Township	L
USA	NJ	Somerset	Negri-Nepote Grassland Preserve	L (3)
USA	NJ	Union	Mountainside	L
USA	NM	Bernalillo	Albuquerque	L (2)
USA	NM	Bernalillo	Albuquerque	S
USA	NM	Cibola	Grants	L
USA	NM	Curry	Clovis	L
USA	NM	Doña Ana	Mesilla	L
USA	NM	Doña Ana	White Sands Monument	L
USA	NM	Grant	Pinos Altos	S
USA	NM	Los Alamos	Bandelier National Monument	L
USA	NM	Luna	Deming	L
USA	NM	Otero	Chaparral	L
USA	NM	Otero	Tularosa	L
USA	NM	Rio Arriba	Cañones	L
USA	NM	Sandoval	Bernalillo	L
USA	NM	Sandoval	Regina	L
USA	NM	San Juan	San Juan	L
USA	NM	Santa Fe	Edgewood	L
USA	NM	Santa Fe	Santa Fe	L (2)
USA	NM	Sierra	Caballo	S
USA	NM	Socorro	Cibola National Forest	L
USA	NM	Socorro	San Antonio	L
USA	NV	Clark	Clark County Wetlands Park	L (2)
USA	NV	Clark	Las Vegas	L (2)
USA	NV	Clark	Moapa, Warm Springs Natural Area	L
USA	NV	Clark	Searchlight	S
USA	NV	Elko	Elko	L

Country	State/province	County (if in USA)	Locality	Family
USA	NV	Nye	Pahrump	L
USA	NV	Nye	Pahrump	S
USA	NV	Washoe	Reno	L (2)
USA	NV	Washoe	Sparks	L
USA	NY	Columbia	Hudson	L
USA	NY	Columbia	Kinderhook	L
USA	NY	Columbia	Livingston	L
USA	NY	Columbia	Old Chatham	L
USA	NY	Erie	Orchard Park	L
USA	NY	Monroe	Fairport	L
USA	NY	Onondaga	Syracuse, Onondaga Hill	L
USA	NY	Orange	Huguenot	L
USA	NY	Putnam		L
USA	NY	Richmond	Staten Island	L
USA	NY	Rockland	Nyack to Haverstraw Trail	P
USA	NY	Suffolk	Oakdale	L
USA	NY	Tompkins	Ithaca	L (3)
USA	NY	Tompkins	Lansing	L (2)
USA	NY	Tompkins	Trumansburg	L
USA	NY	Ulster	Kingston	L
USA	NY	Westchester	Peekskill	L
USA	OH	Athens	Carthage Township	L
USA	OH	Belmont	Richland Township	L
USA	OH	Butler	Hamilton	L (2)
USA	OH	Butler	Oxford	L
USA	OH	Delaware	Africa	L
USA	OH	Franklin	Columbus	P
USA	OH	Franklin	Columbus	L (4)
USA	OH	Franklin	Groveport	L
USA	OH	Fulton	Wauseon	L
USA	OH	Gallia		L (2)
USA	OH	Hamilton	Cincinnati	L (4)
USA	OH	Hancock	Houcktown	L
USA	OH	Lawrence	Ironton	L
USA	OH	Lorain	Oberlin	L
USA	OH	Lucas	Kitty Todd Nature Preserve	L
USA	OH	Lucas	Toledo	L (2)
USA	OH	Montgomery	Dayton	L (2)
USA	OH	Montgomery	Vandalia	L (2)
USA	OH	Morgan	Chesterhill	L
USA	OH	Scioto	Shawnee State Forest, Nile Twp.	L
USA	OH	Summit	Akron	L
USA	OH	Summit	Cuyahoga Falls	L
USA	OK	Canadian	Mustang	L
USA	OK	Canadian	Yukon	L
USA	OK	Cleveland	Norman	L (3)
USA	OK	Cleveland	Oklahoma City	L (4)
USA	OK	Delaware	Cleora	L
USA	OK	Harper	Laverne	L
USA	OK	Le Flore	Le Flore	L
USA	OK	McCurtain	Bethel	L
USA	OK	Oklahoma	Choctaw	L

Country	State/province	County (if in USA)	Locality	Family
USA	OK	Oklahoma	Edmond	L
USA	OK	Osage	Fairfax	L
USA	OK	Pottawatomie	Shawnee	L
USA	OK	Rogers	Owasso	L
USA	OK	Texas	Texhoma	L
USA	OK	Tulsa	Glenpool	L
USA	OK	Tulsa	Owasso	L
USA	OK	Washington	Bartlesville	L
USA	OR	Jackson	Medford	L
USA	PA	Adams	Gettysburg	L (2)
USA	PA	Allegheny	Penn Hills	L
USA	PA	Allegheny	Pittsburgh	L (3)
USA	PA	Berks	Reading	L
USA	PA	Butler	Butler	L
USA	PA	Chester	Downingtown Township	L
USA	PA	Crawford	Meadville	L
USA	PA	Dauphin	Harrisburg	L
USA	PA	Erie	Erie, S City Limit	L
USA	PA	Erie	North East	L
USA	PA	Erie	Wintergreen Gorge Cemetery	L
USA	PA	Franklin	Chambersburg	L
USA	PA	Lackawanna	Scranton	P
USA	PA	Lancaster	Lititz	L
USA	PA	Lebanon	Cold Spring Township	L
USA	PA	Lehigh	Bethlehem	L
USA	PA	Lycoming	Montoursville	L
USA	PA	Montgomery	Lansdale	L
USA	PA	Montgomery	Norristown	L
USA	PA	Montgomery	Oreland	L
USA	PA	Washington	Eighty Four	P
USA	PA	Westmoreland	Roaring Run Natural Area	L
USA	SC	Blythewood		L
USA	SC	Charleston	Ravenel	L
USA	SC	Greenville	Greenville	P
USA	SC	Greenwood	Greenwood	L
USA	SC	Kershaw	Elgin	P
USA	SC	Lancaster	Buford	L
USA	SC	Lexington	Lexington	L
USA	SC	Lexington	West Columbia	L
USA	SC	Oconee	Sumter National Forest	L
USA	TN	Blount	Maryville	L
USA	TN	Bradley	Cleveland	L (2)
USA	TN	Clay	Hermitage Springs	L
USA	TN	Coffee	Manchester	L
USA	TN	Cumberland	Crossville	L (2)
USA	TN	Cumberland	Cumberland Mountain State Park	L
USA	TN	Davidson	Nashville	L (4)
USA	TN	Davidson	Old Hickory	L
USA	TN	DeKalb	Smithville	L
USA	TN	Knox	Knoxville	P
USA	TN	Overton	Standing Stone State Park	L
USA	TN	Putnam	Cookeville	L



Country	State/province	County (if in USA)	Locality	Family
USA	TN	Rhea	Spring City	L
USA	TN	Sequatchie	Dunlap	L
USA	TN	Sevier	Pigeon Forge	L
USA	TN	Shelby	Collierville	P
USA	TN	Sullivan	Kingsport	L
USA	TN	Sullivan	Kingsport	P
USA	TN	Sumner	Hendersonville	L
USA	TN	Washington	Johnson City	L
USA	TX	Archer	Lakeside City	L
USA	TX	Bandera	Bandera	L (2)
USA	TX	Bastrop	Bastrop	L
USA	TX	Bastrop	Wyldwood	L
USA	TX	Bell	Belton	L
USA	TX	Bexar	Live Oak, City Park	L
USA	TX	Bexar	San Antonio	L (4)
USA	TX	Blanco	Blanco	L (2)
USA	TX	Bowie	New Boston	L
USA	TX	Brazos	College Station	L
USA	TX	Brewster	Alpine	L (2)
USA	TX	Burnet	Highland Haven	L
USA	TX	Burnet	Meadowlakes	L
USA	TX	Caldwell	Fentress	L
USA	TX	Cameron	Brownsville	L
USA	TX	Cameron	Sabal Palm Sanctuary	L
USA	TX	Cherokee	Jacksonville	L
USA	TX	Collin	McKinney	L (2)
USA	TX	Collin	Princeton	L
USA	TX	Collin	Sachse	L
USA	TX	Collin	Wylie	L
USA	TX	Comal	Canyon Lake	L
USA	TX	Coryell	Gatesville	L
USA	TX	Cottle	Matador Wildlife Management Area	L
USA	TX	Dallas	Cedar Hill State Park	L
USA	TX	Dallas	Coppell, Andy Brown Park	L
USA	TX	Dallas	Dallas	L (2)
USA	TX	Dallas	Garland	L
USA	TX	Dallas	Sunnyvale	L
USA	TX	Denton	Denton	L (2)
USA	TX	Denton	Lewisville	P
USA	TX	Denton	Little Elm	L
USA	TX	Denton	Roanoke	L
USA	TX	Edwards		S
USA	TX	Ellis	Midlothian	L
USA	TX	El Paso	El Paso	L (3)
USA	TX	Fort Bend	Cinco Ranch	P
USA	TX	Fort Bend	Richmond	L
USA	TX	Fort Bend	Sandy Point	P
USA	TX	Fort Bend	Sugar Land	P
USA	TX	Gaines	Seagraves	L
USA	TX	Grayson	Eisenhower State Park	L
USA	TX	Guadalupe	Seguin	L (2)
USA	TX	Guadalupe	Schertz	L

Country	State/province	County (if in USA)	Locality	Family
USA	TX	Hardin	Lumberton	L
USA	TX	Hardin	Saratoga	P
USA	TX	Harris	Baytown	P
USA	TX	Harris	Houston	P (3)
USA	TX	Harris	Humble, Jesse H. Jones Park	P
USA	TX	Harris	Katy	L
USA	TX	Harris	Spring	L
USA	TX	Harris	Tomball	L
USA	TX	Harrison	Latex	L
USA	TX	Hays	Buda	L
USA	TX	Hays	Hays	L
USA	TX	Hays	Kyle	L
USA	TX	Hays	San Marcos	L
USA	TX	Hidalgo	Donna	L
USA	TX	Hidalgo	Edinburg	L (2)
USA	TX	Hidalgo	Hidalgo	L
USA	TX	Hidalgo	McAllen	L
USA	TX	Hill	Hillsboro	L
USA	TX	Hopkins	Sulphur Springs	L
USA	TX	Hunt	Quinlan	L
USA	TX	Jackson	Lolita	L
USA	TX	Jefferson	Beaumont	L
USA	TX	Jeff Davis	Fort Davis	L
USA	TX	Jeff Davis		L
USA	TX	Kendall	Comfort	L
USA	TX	Kendall	Kendalia	L
USA	TX	Kent	Clairemont	L
USA	TX	Kimble	South Llano River State Park	L
USA	TX	Kinney	Brackettville	L
USA	TX	Lampasas	Kempner	L
USA	TX	Liberty	Big Thicket	P
USA	TX	Lubbock	Lubbock	L (2)
USA	TX	McLennan	Waco	L (2)
USA	TX	Menard	Menard	L
USA	TX	Milam	Burlington	L
USA	TX	Milam	San Gabriel	L
USA	TX	Montgomery	Montgomery	L
USA	TX	Montgomery	Willis	L
USA	TX	Nacogdoches	Nacogdoches	L
USA	TX	Navarro	Corsicana	L
USA	TX	Nueces	Corpus Christi	L
USA	TX	Parker	Cool	L
USA	TX	Parker	Weatherford	L (2)
USA	TX	Presidio	Chinati Mountains Natural Area	L
USA	TX	Rockwall	Rockwall	L
USA	TX	San Saba	San Saba	L
USA	TX	Scurry	Snyder	L
USA	TX	Smith	Arp	L
USA	TX	Smith	Tyler	L
USA	TX	Sutton	Sonora	L (2)
USA	TX	Tarrant	Colleyville	L (2)
USA	TX	Tarrant	Fort Worth, Arcadia Trail Park	L (5)

Country	State/province	County (if in USA)	Locality	Family
USA	TX	Taylor	Abilene	L (2)
USA	TX	Travis	Austin	L (6)
USA	TX	Travis	Austin, Crystal Downs Cove	L
USA	TX	Travis	Manchaca	L
USA	TX	Travis	Spicewood, Pace Bend Park	L
USA	TX	Trinity	Apple Springs	L
USA	TX	Uvalde	Uvalde, Cooks Slough Nature Park	L (2)
USA	TX	Val Verde	Del Rio	L
USA	TX	Ward	Wickett	L
USA	TX	Webb	Laredo	L
USA	TX	Wichita	Wichita Falls	L
USA	TX	Williamson	Georgetown	L (3)
USA	TX	Williamson	Granger	L
USA	TX	Williamson	Round Rock	L (2)
USA	TX	Wilson	Deweese	L
USA	TX	Wilson	Floresville	L
USA	UT	Beaver	Milton	L
USA	UT	Cache	Logan	L
USA	UT	Cache	Smithfield	L
USA	UT	Davis	Farmington	L
USA	UT	Davis	Kaysville	L
USA	UT	Davis	Wasatch-Cache National Forest	L
USA	UT	Emery	Orangeville	L
USA	UT	Garfield	Bryce Canyon National Park	L
USA	UT	Iron	Cedar City	L
USA	UT	Juab	Nephi	L
USA	UT	Millard	Kanosh	L
USA	UT	Salt Lake	Salt Lake City	L (3)
USA	UT	Summit	Park City	L
USA	UT	Toole	Erda, N of Tooele	L
USA	UT	Toole	Grantsville	L
USA	UT	Utah	Lehi	L
USA	UT	Utah	Provo	L
USA	UT	Wasatch	Heber City	L
USA	UT	Washington	Springdale, Zion National Park	L
USA	UT	Washington	St. George	L (4)
USA	UT	Washington	Washington	L (2)
USA	VA	Albemarle	Charlottesville	L (3)
USA	VA	Augusta	Fishersville	L
USA	VA	Augusta	Shenandoah National Park	L
USA	VA	Botetourt	Eagle Rock	L
USA	VA	Buchanan	Grundy	L
USA	VA	N/A	Charlottesville	L (2)
USA	VA	Chesterfield	Richmond	L (5)
USA	VA	Chesterfield	Huguenot	L
USA	VA	Clarke	Berryville	L
USA	VA	Fairfax	Alexandria	L
USA	VA	Fairfax	Chantilly	L
USA	VA	Fairfax	Great Falls Park	L
USA	VA	Fairfax	Lorton	L (2)
USA	VA	Fairfax	Vienna	L (2)
USA	VA	Fauquier	The Plains	L

Country	State/province	County (if in USA)	Locality	Family
USA	VA	Fluvanna	Palmyra	L
USA	VA	Frederick	Winchester	L
USA	VA	N/A	Fredericksburg	L (2)
USA	VA	Goochland	Goochland	L
USA	VA	Greenville	Skippers	L
USA	VA	N/A	Hampton	L
USA	VA	Hanover	Ashland	L (2)
USA	VA	Hanover	Montpelier	L
USA	VA	Hanover	Rockville	L
USA	VA	Henrico	Glen Allen	L
USA	VA	Loudon	Leesburg	L
USA	VA	Loudon	Sterling	L
USA	VA	Montgomery	Blacksburg	L (2)
USA	VA	Montgomery	Radford, Wildwood Park	L
USA	VA	Prince Edward	Farmville	L (3)
USA	VA	Prince William	Bristow	L
USA	VA	Prince William	Dale City	L
USA	VA	Prince William	Occoquan Bay National Wildlife Reserve	L
USA	VA	Prince William	Prince William Forest Park	L
USA	VA	Pulaski	Draper	L
USA	VA	Rappahannock	Sperryville	P
USA	VA	Rockingham	Dayton	L
USA	VA	Rockingham	Elkton	L
USA	VA	Rockingham	Rockingham	L
USA	VA	Scott	Duffield	L
USA	VA	Shenandoah	Woodstock	L
USA	VA	Stafford	Stafford	L
USA	VA	Washington	Abingdon	L
USA	VA	Westmoreland	Nomini	L
USA	VT	Addison	Middlebury	L
USA	WI	Dane	Madison	L
USA	WI	Dane	Middleton	L
USA	WI	Dane	Rutland	L
USA	WI	La Crosse	Onalaska	P
USA	WI	Milwaukee	Milwaukee	L
USA	WI	Monroe	Tomah	L
USA	WV	Berkeley	Martinsburg	L
USA	WV	Braxton	Flatwoods	L
USA	WV	Cabell	Green Bottom Wildlife Area	L
USA	WV	Greenbrier	Ronceverte	P (2)
USA	WV	Kanawha	Charleston	L
USA	WV	Monongalia	Morgantown	L (2)
USA	WV	Morgan	Hancock	L
USA	WV	Nicholas	Kessler's Cross Lanes	P
USA	WV	Putnam	Hurricane	L (2)
USA	WV	Randolph	Elkins	L
USA	WV	Upshur	Ruraldale	L
Canada	Ontario	Ontario	Guelph	L
Canada	Ontario	Ontario	Kingsville	L (3)
Canada	Ontario	Ontario	Niagara Falls	L (2)
Canada	Ontario	Ontario	Pelee Island	L
Canada	Ontario	Ontario	Point Pelee National Park	L

Country	State/province	County (if in USA)	Locality	Family
Canada	Ontario	Ontario	St. Thomas	L
Canada	Ontario	Ontario	Toronto, East York Borough	L
Mexico	Aguascalientes	Aguascalientes	Aguascalientes	L
Mexico	Baha California N		Ensenada	L
Mexico	Baha California N		Mexicali	L
Mexico	Baha California N		Tijuana	L
Mexico	Baha California Sur		Parque Nacional Cabo Pulmo	S
Mexico	Campeche		Reserva de la Biosfera Calakmul	T
Mexico	Chiapas		Chiapa de Corzo	T
Mexico	Chiapas		Tzimol	T
Mexico	Chihuahua		Chihuahua, Pavis Barunda	L
Mexico	Chihuahua		Manuel Benavides	L
Mexico	Coahuila		Ocampo	L
Mexico	Coahuila		Zaragoza	S
Mexico	Durango		Ciudad Lerdo	S
Mexico	Durango		Parque Estatal Cañón de Fernández	S
Mexico	Guanajuato		Acámbaro	L
Mexico	Guanajuato		Celaya	T (2)
Mexico	Hidalgo		Pachuca de Soto	T
Mexico	Hidalgo		San Agustín Tlaxiaca	T
Mexico	Jalisco		El Corridos	T
Mexico	Jalisco		Mascota	T
Mexico	Jalisco		San Miguel el Alto	L
Mexico	Jalisco		Tequila	C
Mexico	Jalisco		Yelapa	S
Mexico	México		Metepc	T
Mexico	México		Mexico City	T (3)
Mexico	México		Mexico City	L
Mexico	México		Mexico City	Z (2)
Mexico	México		Santa María, Apaxco	T
Mexico	México		Santa María, Apaxco	C
Mexico	México		Temoaya	C
Mexico	México		Teotihuacán	T
Mexico	México		Tepotztlán	T
Mexico	México		Tepotztlán, San Mateo Xoloc	C
Mexico	México		Tequixquiác	C (2)
Mexico	México		Tlalnepantla de Baz	T
Mexico	Michoacán		Morelia	L (4)
Mexico	Michoacán		Morelia	S
Mexico	Morelos		Tepotztlán	Z
Mexico	Nuevo León		Montemorelos	S
Mexico	Nuevo León		Monterrey	L
Mexico	Nuevo León		Monterrey, Guadalupe	S
Mexico	Nuevo León		Monterrey, Parque Ecológico Chipinque	S
Mexico	Oaxaca		Huautla de Jiménez Municipality	T
Mexico	Oaxaca		San Nicolás	T
Mexico	Puebla		Amozoc de Mota	C
Mexico	Puebla		Cuatinchán	T
Mexico	Puebla		Puebla	T
Mexico	Puebla		Zihuateutla	T
Mexico	Puebla		Near Zihuateutla	T

Country	State/province	County (if in USA)	Locality	Family
Mexico	Querétaro		El Llano	L
Mexico	Querétaro		Saldarriaga	L
Mexico	Quintana Roo		Playacar	T
Mexico	San Luis Potosi		San Luis Potosi	L
Mexico	Sinaloa		Culiacán	S
Mexico	Sonora		Cajon Bonito, Rancho El Pinito	L
Mexico	Sonora		Nogales	L
Mexico	Sonora		Rancho Las Anitas	L
Mexico	Sonora		San Luis Rio Colorado	L
Mexico	Tamaulipas		Ejido El Ebano	L
Mexico	Veracruz		Coatepec	T
Mexico	Veracruz		Orizaba	T
Mexico	Veracruz		Xico	T
Mexico	Yucatán		Mérida	L (2)
Honduras	Ocotepeque		Las Cruces	L
Nicaragua	Managua		Chiltepe Peninsula Reserve	T
Costa Rica	Alajuela		Los Chiles	T
Costa Rica	Cartago		Paraíso	C (2)
Costa Rica	Cartago		Trey Rios	T
Costa Rica	Guanacaste		Nuevo Arenal	T
Costa Rica	Heredia		San Rafael	T
Costa Rica	Limón		Suerre	C
Costa Rica	Puntarenas		Las Cruces Biological Station	C
Costa Rica	Puntarenas		Monteverde Cloud Forest	T
Costa Rica	Puntarenas		Monteverde Biological Reserve	T (5)
Costa Rica	Puntarenas		Parque Nacional Corcovado	T
Costa Rica	San José		San Isidro	T
Costa Rica	San José		San José	T
Costa Rica	San José		San Marcos	T
Panama	Chiriquí		Boquet	T
Panama	Colón		Donoso	C
Panama	Colón		Villa Guadalupe	T
Panama	Panamá		Chorrera, Rio Perequete	C
Panama	Panamá		Panama City	T
Panama	Panamá		Sorá	C
Colombia	Antioquia		Cisneros	C
Colombia	Antioquia		El Carmende Viboral	C
Colombia	Antioquia		Envigado	L
Colombia	Antioquia		Guarne	L
Colombia	Antioquia		La Ceja	C
Colombia	Antioquia		Retiro	L
Colombia	Antioquia		Retiro	C
Colombia	Antioquia		Valle de Aburrá	C
Colombia	Bolivar		Santa Rosa	C
Colombia	Boyacá		Tibasosa	C
Colombia	Boyacá		Villa de Leyva	L
Colombia	Capital		Bogotá	L
Colombia	Capital		Bogotá	C
Colombia	Cundinamarca		Anolaima	C
Colombia	Cundinamarca		Nocaima	C (3)
Colombia	Cundinamarca		Pasca	C
Colombia	Cundinamarca		San Antonio del Tequendama	C

Country	State/province	County (if in USA)	Locality	Family
Colombia	Cundinamarca		Villa de San Diego de Ubaté	C
Colombia	Huila		Tarqui	C
Colombia	La Guajira		Fonseca	L
Colombia	Magdalena		Ciudad Perdida	C (2)
Colombia	Magdalena		Minca	C
Colombia	Magdalena		Santa Marta	C (2)
Colombia	Quinidío		Calarcá	C
Colombia	Quinidío		Salento	C
Colombia	Risaralda		Pereira City	C (3)
Colombia	Santander		Barichara	C
Colombia	Valle del Cauca		Cali	C
Colombia	Valle del Cauca		Dagua	C
Colombia	Valle del Cauca		La Castilla	C
Colombia	Valle del Cauca		Reserva Natural de San Cipriano	C
Venezuela	Guárico		Masaguatal Biological Reserve	C
Ecuador	Napo		Tena, Reserva de la Biosfera Sumaco	C
Ecuador	Pastaza		Puyo	C
Ecuador	Pinchincha		Quito	L

**Table 2.** Host spider family records for *Tachypompilus ferrugineus*. Host spider family records are arranged regionally and alphabetically by country, region, district, arrondissement, state, province, department, municipality, county or parish, and locality. Abbreviations for host spider families: L, Lycosidae; T, Trechaleidae; P, Pisauridae; C, Ctenidae; Z, Zoropsidae; A, Agelenidae; E, Selenopidae; S, Sparassidae. Numbers in parentheses represent the number of host spider family records per locality.

This table is based on the following references and personal communications: Allred 2009; Benson 2020; Cambra-Torok, et al. 2004; Chiri 2017; Evans 1950, 1951; Evans and Yoshimoto 1962; Krombein 1979; Kurczewski 1981, 1989, 1990, 2010; Kurczewski and Edwards 2012; Kurczewski et al. 2017, 2020a, b, c; Kurczewski and Kiernan 2015; Kurczewski and Kurczewski 1968a, 1973; Rau 1922; Rau and Rau 1918; Strandtmann 1953; Waichert 2019 pers. comm.; Wahis 1993; Wasbauer 1982; Wasbauer and Kimsey 1985; Wilson and Pitts 2007; numerous insect collection records and ~200 online website reports.

Country	State/province	County (if in USA)	Locality	Family
USA	AL	Baldwin	Daphne	L (2)
USA	AL	Baldwin	Meaher State Park	P
USA	AL	Baldwin	Orange Beach	L
USA	AL	Baldwin	Robertsdale	P
USA	AL	Baldwin	Spanish Fort	P
USA	AL	Calhoun	Anniston	L
USA	AL	Crenshaw	Dozier, Patsaliga River Tract	P
USA	AL	Crenshaw	Luverne	P
USA	AL	Cullman	Hanceville	P
USA	AL	Dale	Daleville	L
USA	AL	DeKalb	Mentone	L
USA	AL	Elmore	Eclectic	P (2)
USA	AL	Etowah	Gadsden	P
USA	AL	Jackson	Scottsboro	L
USA	AL	Jackson	Scottsboro	P
USA	AL	Jefferson	Birmingham	L (4)
USA	AL	Lauderdale	Anderson	P
USA	AL	Lee	Auburn	L

Country	State/province	County (if in USA)	Locality	Family
USA	AL	Macon	Tuskegee	P
USA	AL	Madison	Huntsville	P (3)
USA	AL	Marengo	Linden	L
USA	AL	Marshall	Grant	P
USA	AL	Mobile	Coden	L
USA	AL	Mobile	Mobile	L
USA	AL	Mobile	Mobile	P (2)
USA	AL	Mobile	Saraland	L
USA	AL	Monroe	Goodway	L
USA	AL	Montgomery	Montgomery	L (7)
USA	AL	Montgomery	Montgomery	P (2)
USA	AL	Perry	Pinetucky	P
USA	AL	Russell	Seale	L
USA	AL	Tuscaloosa	Tuscaloosa	L (2)
USA	AL	Tuscaloosa	Northport	P
USA	AR	Baxter	Norfolk Lake	P
USA	AR	Benton	Highfill	L
USA	AR	Benton	Siloam Springs	P
USA	AR	Benton	Springdale	L
USA	AR	Benton	Rogers	P
USA	AR	Carroll	Berryville	L
USA	AR	Carroll	Eureka Springs	L
USA	AR	Cleburne	Higden	P
USA	AR	Craighead	Jonesboro	L (2)
USA	AR	Craighead	Jonesboro	P
USA	AR	Faulkner	Conway	L
USA	AR	Faulkner	Conway	P
USA	AR	Faulkner	Vilonia	L
USA	AR	Garland	Hot Springs	L
USA	AR	Jefferson	Jefferson Springs	P
USA	AR	Johnson	Hagarville	L
USA	AR	Johnson	Ozark National Forest	P
USA	AR	Lonoke	Cabot	L
USA	AR	Lonoke	Cooper Lake, Kia Kima Reservation	P
USA	AR	Newton		L
USA	AR	Phillips	Lexa	L
USA	AR	Pulaski	Jacksonville	P
USA	AR	Pulaski	Little Rock	L
USA	AR	Pulaski	Little Rock	P
USA	AR	Pulaski	Sherwood	P
USA	AR	Saline	Alexander	L
USA	AR	Saline	Benton	L
USA	AR	Searcy	Ozark Mountains	L
USA	AR	Sebastian	Barling	L
USA	AR	Washington	Fayetteville	L
USA	CO	Arapahoe	Aurora	L
USA	CO	Arapahoe	Cherry Creek Lake Recreation Area	L
USA	CO	Arapahoe	Littleton	L



Country	State/province	County (if in USA)	Locality	Family
USA	CO	Boulder	Boulder	L (7)
USA	CO	Boulder	Boulder	A
USA	CO	Boulder	Eldorado Springs	L (2)
USA	CO	Boulder	Longmont	L
USA	CO	Boulder	Lyons	L (2)
USA	CO	Boulder	Niwot	L
USA	CO	Boulder	North Boulder	L
USA	CO	Boulder	South Mesa Trail	L
USA	CO	Broomfield	Broomfield	L
USA	CO	Denver	Denver	L (2)
USA	CO	Douglas	Franktown	L
USA	CO	El Paso	Colorado Springs	L
USA	CO	Jefferson	Golden	L (2)
USA	CO	Jefferson	Golden	A
USA	CO	Jefferson	Red Rocks Park	L (2)
USA	CO	La Plata	Durango	L
USA	CO	Larimer	Bobcat Ridge Natural Area	L
USA	CO	Larimer	Fort Collins	L
USA	CT	Fairfield	Danbury	L
USA	CT	Fairfield	Westport	P
USA	CT	Fairfield	Wilton	P
USA	CT	Middlesex	Portland	L
USA	CT	New Haven	Hamden	L
USA	CT	New Haven	Seymour	L
USA	CT	New Haven	West Haven	P
USA	CT	New London	Ledyard	L
USA	CT	New London	Mystic	P
USA	CT	New London	Old Lyme	L
USA	CT	Newton	Sandy Hook	P
USA	DC	District of Columbia	Washington	L (3)
USA	DC	District of Columbia	Washington	P (2)
USA	DE	Kent	Dover	P
USA	DE	New Castle	Bear	L (2)
USA	DE	New Castle	Middletown	L
USA	DE	New Castle	Wilmington	P (2)
USA	DE	Sussex	Selbyville	P
USA	FL	Alachua	Archer	L
USA	FL	Alachua	Archer	P
USA	FL	Alachua	Earleton	P
USA	FL	Alachua	Gainesville	P (17)
USA	FL	Alachua	Gainesville	L (10)
USA	FL	Alachua	Hawthorne	L (4)
USA	FL	Alachua	High Springs	P (3)
USA	FL	Alachua	Newberry	L (2)
USA	FL	Bay	Lynn Haven – Youngstown	P
USA	FL	Bradford	Brooker	L
USA	FL	Bradford	Starke	L
USA	FL	Brevard	Satellite Beach	L

Country	State/province	County (if in USA)	Locality	Family
USA	FL	Broward	Coral Springs	L
USA	FL	Broward	Davie	L
USA	FL	Broward	Fort Lauderdale	P
USA	FL	Broward	Weston	P
USA	FL	Charlotte	Lemon Bay Conservancy Preserve	L
USA	FL	Charlotte	Rotonda West	P
USA	FL	Citrus	Crystal River	L
USA	FL	Citrus	Hernando	L
USA	FL	Citrus	Homosassa	L
USA	FL	Clay	Keystone Heights	P
USA	FL	Clay	Orange Park	L
USA	FL	Collier	Naples	L
USA	FL	Columbia	Lake City	L
USA	FL	Dixie	Old Town	L
USA	FL	Dixie	Old Town	P
USA	FL	Duval	Jacksonville	L (5)
USA	FL	Duval	Jacksonville	P (2)
USA	FL	Duval	Neptune Beach	L
USA	FL	Escambia	Cantonment	P
USA	FL	Escambia	Pensacola	L (3)
USA	FL	Gilchrist	Trenton	P
USA	FL	Hamilton		L
USA	FL	Hendry	LaBelle	P
USA	FL	Hernando	Croom Wildlife Management Area	L
USA	FL	Hernando	Spring Hill	L
USA	FL	Hernando	Spring Hill	S
USA	FL	Highlands	Archbold Biological Station	L (3)
USA	FL	Hillsborough	Plant City	L
USA	FL	Hillsborough	Plant City	S
USA	FL	Hillsborough	Ruskin	L
USA	FL	Hillsborough	Sun City Center	P
USA	FL	Hillsborough	Valrico	L
USA	FL	Indian River	Sand Lakes Restoration Area	L
USA	FL	Indian River	Vero Beach	L (3)
USA	FL	Jefferson	Monticello	P
USA	FL	Lafayette	Mayo	L
USA	FL	Lake	Lady Lake	L
USA	FL	Lake	Mount Dora	P
USA	FL	Lee	Bonita Springs	S
USA	FL	Lee	Cape Coral	L
USA	FL	Lee	Estero	L
USA	FL	Lee	Lehigh Acres	L
USA	FL	Leon	Bradfordville	L
USA	FL	Leon	Felkel	P
USA	FL	Leon	Miccosukee	P
USA	FL	Leon	Tallahassee	L (2)
USA	FL	Levy	Cedar Keys Wildlife Reserve	L (3)
USA	FL	Levy	Chiefland	P

Country	State/province	County (if in USA)	Locality	Family
USA	FL	Liberty	Bristol, Apalachicola National Forest	L (2)
USA	FL	Manatee	Sun City	L
USA	FL	Manatee	Terra Ceia Preserve	L
USA	FL	Marion	Dunnellon	L (2)
USA	FL	Marion	Ocala	L (3)
USA	FL	Marion	Ocala	S
USA	FL	Marion	Silver Springs	P
USA	FL	Martin	Palm City	L
USA	FL	Martin	Seabranh Preserve State Park	L
USA	FL	Miami-Dade	Hialeah	L
USA	FL	Miami-Dade	Homestead	L
USA	FL	Miami-Dade	Miami	L (3)
USA	FL	Miami-Dade	Miami Beach	L
USA	FL	Monroe	Big Pine Key	L (2)
USA	FL	Monroe	Everglades National Park	L
USA	FL	Monroe	Key West	L
USA	FL	Monroe	Lignumvitae Botanic State Park	L
USA	FL	Monroe	Tavernier	L
USA	FL	Nassau	Fernandina Beach	L
USA	FL	Nassau	Fernandina Beach	P
USA	FL	Okaloosa	Crestview	L
USA	FL	Okaloosa	Destin	L
USA	FL	Okaloosa	Fort Walton Beach	L
USA	FL	Okeechobee	Okeechobee	L (2)
USA	FL	Orange	Apopka	L (2)
USA	FL	Orange	Apopka	P
USA	FL	Orange	Bay Lake	P
USA	FL	Orange	Belle Isle	P
USA	FL	Orange	Ocoee	L
USA	FL	Orange	Orlando	L (2)
USA	FL	Osceola	Kissimmee	L (2)
USA	FL	Palm Beach	Lake Worth	L
USA	FL	Palm Beach	Boca Raton	L
USA	FL	Palm Beach	Tequesta	L
USA	FL	Pasco	Dade City	P (2)
USA	FL	Pasco	Elfers	P
USA	FL	Pasco	Land o' Lakes	L
USA	FL	Pasco	San Antonio	L
USA	FL	Pinellas	Largo	P
USA	FL	Pinellas	St. Petersburg	L (2)
USA	FL	Pinellas	Tarpon Springs	P
USA	FL	Pinellas	Tierra Verde, Fort De Soto Park	S
USA	FL	Polk	Davenport	L (2)
USA	FL	Polk	Highland Park	L
USA	FL	Polk	Lakeland	L
USA	FL	Polk	Lake Wales	P
USA	FL	Polk	Loughman	L
USA	FL	Polk	Walk-in-Water	L

Country	State/province	County (if in USA)	Locality	Family
USA	FL	Putnam	Ocala National Forest	L
USA	FL	Putnam	Ordway-Swisher Biological Station	L
USA	FL	Santa Rosa	Milton	P (2)
USA	FL	Sarasota	North Port	S
USA	FL	Seminole	Little Big Econ State Forest	L
USA	FL	Seminole	Oviedo	P
USA	FL	St. Johns	Crescent Beach	S
USA	FL	St. Johns	Elkton	P
USA	FL	St. Johns	St. Augustine	L (2)
USA	FL	St. Johns	St. Augustine Beach	L
USA	FL	St. Johns	St. Johns	L
USA	FL	St. Lucie	Port St. Lucie	L (2)
USA	FL	Sumter	Lake Panasoffkee	P
USA	FL	Suwanee	Live Oak	S
USA	FL	Taylor	Perry	L
USA	FL	Union	Lake Butler	P
USA	FL	Volusia	Deltona	L
USA	FL	Volusia	New Smyrna Beach	P (2)
USA	FL	Volusia	Pierson	P
USA	FL	Wakulla	Crawfordville	L
USA	FL	Wakulla	Newport	L
USA	FL	Wakulla	Wakulla Springs	P
USA	GA	Athens-Clarke	Athens	P (3)
USA	GA	Athens-Clarke	Athens	L (3)
USA	GA	Athens-Clarke	Athens, Ben Burton Park	P
USA	GA	Bulloch	Portal	L
USA	GA	Butts	Jackson	P
USA	GA	Camden	Kingsland	L
USA	GA	Camden	Piney Bluff	L
USA	GA	Carroll	Bowdon	L
USA	GA	Catoosa	Fort Oglethorpe	P
USA	GA	Chatham	Savannah	P (3)
USA	GA	Cherokee	Ball Ground	P
USA	GA	Cherokee	Holly Springs	L
USA	GA	Cobb	Austell	L
USA	GA	Cobb	16 km NW Atlanta	P
USA	GA	Cobb	Marietta	L (2)
USA	GA	Coffee	Nicholls	L
USA	GA	Columbia	Appling	P
USA	GA	Coweta	Sharpsburg	P
USA	GA	Crawford	Roberta	L
USA	GA	Decatur	Bainbridge	L
USA	GA	DeKalb	Stone Mountain Park	P
USA	GA	Dougherty	Albany	L
USA	GA	Douglas	Winston, Moccasin Lake	L
USA	GA	Douglas	Winston, Moccasin Lake	P
USA	GA	Fannin	Blue Ridge	P
USA	GA	Fayette	Fayetteville	L (2)

Country	State/province	County (if in USA)	Locality	Family
USA	GA	Floyd	Cave Spring	P
USA	GA	Floyd	Rome	P
USA	GA	Fulton	Atlanta	L (5)
USA	GA	Fulton	Atlanta	P (2)
USA	GA	Fulton	College Park	L
USA	GA	Glynn	Brunswick	L
USA	GA	Glynn	Brunswick	P (3)
USA	GA	Glynn	Jekyll Island	P
USA	GA	Grady	Cairo	L
USA	GA	Gwinnett	Dacula	L
USA	GA	Gwinnett	Peachtree Corners	P
USA	GA	Gwinnett	Snellville	L
USA	GA	Hall	Gainesville	P
USA	GA	Harris		P
USA	GA	Harris	Hamilton	P
USA	GA	Henry	Hampton	L
USA	GA	Henry	Stockbridge	P
USA	GA	Jackson	Pendergrass	P
USA	GA	Jeff Davis		L
USA	GA	Lanier	Lakeland	L
USA	GA	Laurens	Rentz	P
USA	GA	Liberty	Hinesville	P
USA	GA	Macon-Bibb	Macon	L
USA	GA	Macon-Bibb	Macon	P
USA	GA	McDuffie	Thomson	P
USA	GA	Morgan	Madison	L
USA	GA	Muscogee	Columbus	L
USA	GA	Newton	Covington	L (3)
USA	GA	Oglethorpe	Wolfskin District	P
USA	GA	Oglethorpe	Wolfskin District	L
USA	GA	Richmond	Augusta	L (2)
USA	GA	Richmond	Augusta	P
USA	GA	Tift	Tifton	L
USA	GA	Upson	Thomaston	P
USA	GA	Walker	Chickamauga	L (2)
USA	GA	Walton	Social Circle	L
USA	GA	White	Helen	P
USA	IA	Des Moines	Burlington	P
USA	IA	Des Moines	Sperry	L
USA	IA	Henry	Mount Pleasant	L (2)
USA	IA	Humboldt	Ottosen	L
USA	IA	Marion	Knoxville	L
USA	IA	Marion	Melcher-Dallas	L
USA	IA	Mills	Glenwood	L
USA	IA	Polk	Des Moines	L
USA	IA	Polk	Des Moines	P
USA	IA	Polk	Johnston	P (2)
USA	IA	Scott	Davenport	L

Country	State/province	County (if in USA)	Locality	Family
USA	IA	Sioux	Orange City	L
USA	IA	Woodbury	Sloan	L
USA	IL	Champaign	Champaign	L
USA	IL	Cook	Chicago	L
USA	IL	Cook	Evanston	L
USA	IL	Cook	Homewood – Flossmoor	L
USA	IL	Cook	Palos Hills	P
USA	IL	Crawford	Robinson	L
USA	IL	DuPage	Schaumburg	L
USA	IL	Effingham	Watson	L
USA	IL	Hancock	Warsaw	P
USA	IL	Henry	Coal Valley	L
USA	IL	Iroquois	Sheldon	L
USA	IL	Jefferson	Mount Vernon	L
USA	IL	Lake	Long Grove	L
USA	IL	Lake	Waukegan	L
USA	IL	McHenry	Island Lake	L
USA	IL	Morgan	Jacksonville	L
USA	IL	Peoria	Peoria Heights	L
USA	IL	Saline	Rudement	L
USA	IL	Stark	Wyoming	L
USA	IL	St. Clair	Shiloh	L
USA	IL	Union	Wolf Lake	P
USA	IL	Washington	Nashville	L
USA	IL	White	Norris City	L
USA	IL	Whiteside	Rock Falls	L
USA	IL	Will	Plainfield	L
USA	IL	Woodford	Washburn	L
USA	IN	Allen	Fort Wayne	P
USA	IN	Bartholomew	Columbus	L
USA	IN	Bartholomew	Columbus	P
USA	IN	Clark	Jeffersonville	L
USA	IN	Clark	Memphis	L
USA	IN	Decatur	Greensburg	L
USA	IN	Delaware	Muncie	L
USA	IN	Floyd	New Albany	L
USA	IN	Greene	Bloomfield	L
USA	IN	Henry	Knightstown	P
USA	IN	Henry	Middletown	L
USA	IN	Howard	Kokomo	L (2)
USA	IN	Lake	Hobart	P
USA	IN	Marion	Indianapolis	L (2)
USA	IN	Monroe	Bloomington	L
USA	IN	Monroe	Bloomington	P
USA	IN	Monroe	Hindustan	P
USA	IN	Monroe	Van Buren Township	L
USA	IN	Newton	Morocco	L
USA	IN	Owen	Spencer	P

Country	State/province	County (if in USA)	Locality	Family
USA	IN	Porter	Valparaiso	P
USA	IN	Tippecanoe	Lafayette	P
USA	IN	Vigo	Terre Haute	L
USA	IN	Warrick	Newburgh	L
USA	IN	Wayne	North Judson	L
USA	KS	Brown	Horton	L
USA	KS	Brown	Powhattan	L
USA	KS	Butler	Andover City	L (2)
USA	KS	Butler	Augusta	L
USA	KS	Cowley	Winfield	L
USA	KS	Dickinson	Manchester	L
USA	KS	Douglas	Lawrence	L
USA	KS	Franklin	Peoria	L
USA	KS	Gray		L
USA	KS	Johnson	Lenexa	L
USA	KS	Kingman	Norwich	P
USA	KS	Leavenworth	Leavenworth	L
USA	KS	Lyon	Emporia	L
USA	KS	McPherson	Lindsborg	L
USA	KS	Montgomery	Elk City Lake	P
USA	KS	Ottawa		L
USA	KS	Pottawatomie	Blackjack Creek	L
USA	KS	Pottawatomie	Blackjack Creek	P
USA	KS	Pottawatomie	Manhattan	L(2)
USA	KS	Riley	Konza Prairie Biological Station	L
USA	KS	Saline	Salina	L (2)
USA	KS	Sedgwick	Clearwater	L
USA	KS	Sedgwick	Wichita	L (7)
USA	KS	Shawnee	Flint Hills	L
USA	KS	Shawnee	Tecumseh	L
USA	KS	Shawnee	Topeka	L
USA	KS	Shawnee	Wakarusa	L
USA	KS	Sumner	Belle Plain	L
USA	KY	Boone	Walton	P
USA	KY	Bullitt	Clermont, Bernheim Research Forest	P (2)
USA	KY	Bullitt	Shepherdsville	L (2)
USA	KY	Calloway	Murray	L
USA	KY	Casey	Liberty	L
USA	KY	Christian	Hopkinsville	P
USA	KY	Christian	Hopkinsville	L
USA	KY	Christian	Oak Grove	L
USA	KY	Edmonson	Brownsville	P
USA	KY	Fayette	Lexington	L (2)
USA	KY	Floyd		L
USA	KY	Franklin	Frankfort	L
USA	KY	Jefferson	Louisville	L (5)
USA	KY	Jessamine	Nicholsville	P (2)
USA	KY	Kenton	Covington	P

Country	State/province	County (if in USA)	Locality	Family
USA	KY	Lincoln	Eubank	L
USA	KY	Madison	Richmond	L
USA	KY	Marshall	Benton	L
USA	KY	Mason	Maysville	P
USA	KY	McCreary	Stearns	L
USA	KY	Meade	Payneville	L
USA	KY	Mercer	Harrodsburg	L
USA	KY	Powell	Stanton	P
USA	KY	Trigg	Cadiz	L
USA	KY	Warren	Bowling Green	L (2)
USA	LA	Ascension	Prairieville	P
USA	LA	Beauregard	De Ridder	L
USA	LA	Beauregard	Longville	L
USA	LA	Caddo	Shreveport	L (2)
USA	LA	Calcasieu	Lake Charles	P
USA	LA	De Soto	Logansport	L
USA	LA	E Baton Rouge	Baton Rouge	L (2)
USA	LA	Franklin	Winnsboro	P
USA	LA	Iberville	St. Gabriel	L
USA	LA	Jefferson	Gretna	L
USA	LA	Jefferson	Kenner	L
USA	LA	Jefferson	Metairie	L
USA	LA	Jefferson Davis	China	L
USA	LA	Lafayette	Lafayette	L
USA	LA	Livingston	Denham Springs	P
USA	LA	Livingston	Watson	P
USA	LA	Natchitoches	Natchitoches	P (2)
USA	LA	Orleans	New Orleans	L (6)
USA	LA	Plaquemines	Belle Chasse	L
USA	LA	Plaquemines	Belle Chasse	P
USA	LA	St. Charles	Destrehan	L
USA	LA	St. Charles	Luling	L
USA	LA	St. James	Vacherie	L
USA	LA	St. Landry	Lawtell	L
USA	LA	St. Martin	Cecilia	P
USA	LA	St. Tammany	Covington	P
USA	LA	St. Tammany	Mandeville	L
USA	LA	Tangipahoa	Hammond	L
USA	LA	Vermilion	Maurice	L
USA	MA	Berkshire	Stockbridge	L
USA	MA	Bristol	Attleboro Springs Wildlife Sanctuary	P
USA	MA	Bristol	Taunton	L
USA	MA	Dukes	Oaks Bluffs	L
USA	MA	Essex	Amesbury	L
USA	MA	Essex	Peabody	L
USA	MA	Hampshire	Amherst	L
USA	MA	Middlesex	Hopkinton	L
USA	MA	Middlesex	Hopkinton	P



Country	State/province	County (if in USA)	Locality	Family
USA	MA	Middlesex	Malden	L
USA	MA	Norfolk	Charlestown	L
USA	MA	Suffolk	Brighton/Boston	L
USA	MD	Allegany	Cumberland	L
USA	MD	Allegany	Rocky Gap State Park	L (2)
USA	MD	Anne Arundel	Fairhaven	L (2)
USA	MD	Anne Arundel	Fairhaven	P
USA	MD	Anne Arundel	Glen Burnie	L
USA	MD	Anne Arundel	Millersville	L
USA	MD	Anne Arundel	Pasadena, Fort Smallwood Park	L
USA	MD	Baltimore	Baltimore	L (6)
USA	MD	Baltimore	Baltimore	P
USA	MD	Baltimore	Catonsville	L
USA	MD	Baltimore	Glyndon	P
USA	MD	Baltimore	Owing Mills	L
USA	MD	Baltimore	Reisterstown	L
USA	MD	Baltimore	White Marsh	L
USA	MD	Calvert	Lusby	L
USA	MD	Caroline		L
USA	MD	Carroll	Keymar	P
USA	MD	Carroll	Westminster	L
USA	MD	Cecil	Charlestown	P
USA	MD	Cecil	Elkton	L
USA	MD	Cecil	Fair Hill	P
USA	MD	Frederick	Frederick	L (5)
USA	MD	Frederick	Frederick	P
USA	MD	Frederick	Myersville	P
USA	MD	Frederick	Thurmont	L
USA	MD	Harford	Aberdeen	L
USA	MD	Harford	Bel Air	L
USA	MD	Harford	Jarrettsville	L
USA	MD	Howard	Elkridge	P
USA	MD	Howard	Woodstock	L
USA	MD	Montgomery	Gaithersburg	P
USA	MD	Montgomery	Great Falls Park	P
USA	MD	Montgomery	Olney	P
USA	MD	Montgomery	Rockville	P (2)
USA	MD	Montgomery	Silver Spring	L
USA	MD	Prince George's	Bowie	L
USA	MD	Prince George's	Laurel	L (3)
USA	MD	Prince George's	Temple Hills	P
USA	MD	Queen Anne's	Kent Island	L
USA	MD	Queen Anne's	Stevensville	P
USA	MD	St. Mary's	California	L
USA	MD	St. Mary's	St. Mary's City	L (2)
USA	MD	Washington	Hagerstown	L (2)
USA	MD	Wicomico	Salisbury	L
USA	ME	Lincoln	Edgecomb	L

Country	State/province	County (if in USA)	Locality	Family
USA	ME	Penobscot	Bangor	L
USA	ME	Somerset	Fairfield	L
USA	MI	Alcona	Curran	P
USA	MI	Allegan	Allegan	L
USA	MI	Cass	Cassopolis	L
USA	MI	Clinton	East Lansing	L
USA	MI	Genesee	Flushing	L
USA	MI	Grand Traverse	Fife Lake	P
USA	MI	Kalamazoo	Kalamazoo	P
USA	MI	Kent	Grand Rapids	P
USA	MI	Kent	Lowell	P
USA	MI	Kent	Sparta	P
USA	MI	Macomb	Clinton	P
USA	MI	Macomb	River Bends Park	P
USA	MI	Macomb	Sterling Heights	L
USA	MI	Missaukee	Lake City	L
USA	MI	Monroe	Dundee	L
USA	MI	Muskegon	Muskegon	L
USA	MI	Oakland	Northville	P
USA	MI	Oakland	White Lake	P
USA	MI	St. Joseph	Three Rivers	P
USA	MI	Washtenaw	Ann Arbor	P
USA	MI	Washtenaw	Ypsilanti	L
USA	MI	Wayne	Livonia	P
USA	MI	Wexford	Cadillac	P
USA	MN	Dakota	Eagan	P
USA	MN	Dakota	Hastings	P
USA	MN	Dakota	Katherine Ordway Natural Area	P
USA	MN	Dakota	Lakeville	L
USA	MN	Hennepin	Minneapolis	L
USA	MN	Ramsey	St. Paul	L
USA	MN	Winona	Winona	P
USA	MO	Andrew	Savannah	L (5)
USA	MO	Barry	Shell Knob	P
USA	MO	Boone	Harrisburg	L
USA	MO	Boone	Columbia	L
USA	MO	Buchanan	St. Joseph	L
USA	MO	Cape Girardeau	Jackson	L
USA	MO	Cole	Jefferson City	P
USA	MO	Douglas	Zenda	L
USA	MO	Gasconade	Owensville	L
USA	MO	Greene	Springfield	L (2)
USA	MO	Jackson	Grandview	L
USA	MO	Jackson	Kansas City	L (2)
USA	MO	Jasper	Carl Junction	L
USA	MO	Jefferson	Arnold	L (4)
USA	MO	Johnson	Warrensburg	P
USA	MO	Lafayette	Odessa	L

Country	State/province	County (if in USA)	Locality	Family
USA	MO	Osage	Westphalia	P
USA	MO	Platte	Platte Woods, Weatherby Lake	P
USA	MO	St. Charles	St. Charles	L
USA	MO	St. Charles	Wentzville	L
USA	MO	St. Francois	Farmington	P
USA	MO	St. Louis	Kirkwood	L
USA	MO	St. Louis	St. Louis	P (2)
USA	MO	St. Louis	St. Louis	L (3)
USA	MO	Wayne	Greenville	L
USA	MS	Alcorn	Rienzi	P
USA	MS	De Soto	Nesbit	P
USA	MS	Hancock	Waveland	P
USA	MS	Harrison	Biloxi	P
USA	MS	Hind	Jackson	P
USA	MS	Jackson	Ocean Springs	L
USA	MS	Jackson	Pascagoula	L
USA	MS	Jackson	Vance	L
USA	MS	Jones	Ellisville	P
USA	MS	Jones	Laurel	L
USA	MS	Jones	Laurel	P
USA	MS	Lafayette	Oxford	P
USA	MS	Leake	Carthage	P
USA	MS	Lee/Prentiss	Baldwyn	L
USA	MS	Lee	Longville	P
USA	MS	Lee	Tupelo	P
USA	MS	Marion	Columbia	P
USA	MS	Noxubee	Brooksville	P
USA	MS	Oktibbeha	Starkville	L
USA	MS	Oktibbeha	Longview	P
USA	MS	Pearl River	Picayune	P
USA	MS	Perry	New Augusta	L
USA	MS	Perry	Runnelstown	P
USA	MS	Prentiss	Marietta	P
USA	MS	Simpson	Magee	P
USA	MS	Stone	Texas	L
USA	MS	Washington	Greenville	L
USA	MS	Yazoo	Yazoo City	L
USA	NE	Buffalo	Miller	L
USA	NE	Douglas	Omaha	L (8)
USA	NE	Douglas	Omaha	P (2)
USA	NE	Lancaster	Firth	L
USA	NE	Lancaster	Hickman	L
USA	NE	Lancaster	Lincoln	L
USA	NE	Sarpy	Bellevue	P
USA	NE	Scotts Bluff	Scottsbluff	L
USA	NC	Alamance	Burlington	L
USA	NC	Alamance	Mandale	L
USA	NC	Alamance	Snow Camp	L

Country	State/province	County (if in USA)	Locality	Family
USA	NC	Beaufort	Belhaven	L
USA	NC	Brunswick	Bald Head Island	P
USA	NC	Brunswick	Leland	L
USA	NC	Brunswick	Shalotte	P
USA	NC	Buncombe	Asheville	L
USA	NC	Buncombe	Weaverville	L
USA	NC	Cabarrus	Concord	L
USA	NC	Cabarrus	Kannapolis	L
USA	NC	Caldwell	Granite Falls	L
USA	NC	Caldwell	Lenoir	P
USA	NC	Carteret	Pine Knoll Shores	P
USA	NC	Chatham	Pittsboro	L (2)
USA	NC	Chatham	Pittsboro	P
USA	NC	Chatham	Jordan Lake State Forest	P
USA	NC	Columbus	Lake Maccamaw State Park	P
USA	NC	Columbus	Tabor City	L
USA	NC	Cumberland	Eastover	L
USA	NC	Cumberland	Fayetteville, Cape Fear River	P
USA	NC	Dare	Buxton, Hatteras Island	L
USA	NC	Dare	Duck	L
USA	NC	Dare	East Lake	P
USA	NC	Dare	Kill Devil Hills	L
USA	NC	Dare	Nag's Head	L
USA	NC	Dare	Nag's Head	P (2)
USA	NC	Davidson	Lexington	L
USA	NC	Davidson	Thomasville	L
USA	NC	Davis	Mocksville	P
USA	NC	Durham	Blands	P
USA	NC	Durham	Durham	L (2)
USA	NC	Durham	Durham	P (2)
USA	NC	Durham	Rougemont	L
USA	NC	Forsythe	Winston-Salem	L (2)
USA	NC	Franklin	Youngsville	L
USA	NC	Gates	Corapeake	L
USA	NC	Guilford	Greensboro	P
USA	NC	Guilford	Oak Ridge	L (2)
USA	NC	Haywood	Clyde	L
USA	NC	Henderson	Flat Rock	L
USA	NC	Henderson	Flat Rock	P
USA	NC	Henderson	Hendersonville	L
USA	NC	Henderson	Hendersonville	P
USA	NC	Lincoln	Iron Station	P
USA	NC	Lincoln	Lincolnton	L (3)
USA	NC	Macon	Highlands	P
USA	NC	Madison	Marshall	L
USA	NC	McDowell	Nebo. Lake James State Park	P
USA	NC	Mecklenburg	Charlotte	L (4)
USA	NC	Mecklenburg	Charlotte	P

Country	State/province	County (if in USA)	Locality	Family
USA	NC	Mecklenburg	Huntersville	L (3)
USA	NC	Mecklenburg	Mint Hill	P
USA	NC	Mitchell	Spruce Pine	P
USA	NC	Moore	Southern Pines	P (2)
USA	NC	New Hanover	Carolina Beach State Park	L
USA	NC	New Hanover	Wilmington	L (3)
USA	NC	New Hanover	Wilmington	P (3)
USA	NC	Onslow	Hubert	P
USA	NC	Onslow	Jacksonville	L
USA	NC	Orange	Cedar Grove	L (2)
USA	NC	Orange	Chapel Hill	L (5)
USA	NC	Pamlico	Oriental	P
USA	NC	Pasquotank	Elizabeth City	L
USA	NC	Pender	Hampstead	P
USA	NC	Pender	Rocky Point	L
USA	NC	Person	Timberlake	L
USA	NC	Randolph	Randleman	P
USA	NC	Robeson	Lumberton	P
USA	NC	Rockingham	Madison	L
USA	NC	Scotland	Gibson	P
USA	NC	Stanly	Locust	L
USA	NC	Surry	Pine Mountain State Park	P
USA	NC	Swain	Bryson City	L
USA	NC	Union	Wingate	P
USA	NC	Wake	Apex	L (3)
USA	NC	Wake	Fuquay-Varina	L
USA	NC	Wake	Garner	P
USA	NC	Wake	Holly Springs	P
USA	NC	Wake	New Hill	L (2)
USA	NC	Wake	Raleigh	P (2)
USA	NC	Wake	William B. Umstead State Park	P
USA	NC	Wake	Wendell	P
USA	NC	Watauga	Blowing Rock	P
USA	NC	Watauga	Boone	L
USA	NC	Watauga	Boone	P
USA	NH	Hillsborough	Bedford	L
USA	NH	Hillsborough	Nashua	L (2)
USA	NH	Rockingham	Deerfield	P
USA	NJ	Atlantic	Egg Harbor City, Township	L (2)
USA	NJ	Atlantic	Elwood	L
USA	NJ	Atlantic	Mullica Township, E of Hammonton	L
USA	NJ	Bergen	Meadowlands Nature Area	L (2)
USA	NJ	Bergen	Rochelle Park	L
USA	NJ	Bergen	Wallington	P
USA	NJ	Burlington	Browns Mills	L (2)
USA	NJ	Burlington	Chatsworth	P
USA	NJ	Burlington	Columbus	L
USA	NJ	Burlington	Kinkora	L

Country	State/province	County (if in USA)	Locality	Family
USA	NJ	Burlington	Medford	P
USA	NJ	Burlington	Marlton	P (2)
USA	NJ	Camden	Collingswood	P
USA	NJ	Cape May	Cape May	L
USA	NJ	Cape May	Cape May	P
USA	NJ	Cape May	Tuckahoe	L
USA	NJ	Essex	Bloomfield	L
USA	NJ	Gloucester	Glassboro	L
USA	NJ	Gloucester	Newfield, Unexpected Wildlife Refuge	L
USA	NJ	Gloucester	Newfield, Unexpected Wildlife Refuge	P (3)
USA	NJ	Gloucester	West Deptford Township	L (2)
USA	NJ	Hunterdon	Annandale	L
USA	NJ	Hunterdon	Annandale	P
USA	NJ	Hunterdon	Flemington	L (2)
USA	NJ	Hunterdon	Raritan Township	L
USA	NJ	Mercer	Ewing Township	P
USA	NJ	Mercer	Princeton	L
USA	NJ	Mercer	Titusville	L
USA	NJ	Middlesex	Edison	L (2)
USA	NJ	Middlesex	Old Bridge	L
USA	NJ	Monmouth	Cream Ridge	L
USA	NJ	Monmouth	Matawan	L (3)
USA	NJ	Monmouth	Red Bank	L
USA	NJ	Morris	Budd Lake	L
USA	NJ	Morris	Succasunna	L
USA	NJ	Ocean	Barnegat Light	L
USA	NJ	Somerset	Bridgewater Township	L
USA	NJ	Somerset	Somerset near Highland Park	L
USA	NJ	Warren	Asbury	L
USA	NJ	Warren	Mansfield	L
USA	NJ	Warren	Merrill Creek Reserve	P
USA	NY	Albany	Altamont	L
USA	NY	Albany	Cohoes	L
USA	NY	Albany	Cohoes	P
USA	NY	Allegany	Alfred	L
USA	NY	Broome	Endicott	L
USA	NY	Broome	Vestal	P
USA	NY	Cayuga	Auburn	L
USA	NY	Chautauqua	Jamestown	L
USA	NY	Chenango	McDonough	P
USA	NY	Columbia	Livingston	P
USA	NY	Dutchess	Tivoli	L
USA	NY	Erie	Buffalo	L
USA	NY	Erie	Holland	L
USA	NY	Erie	Tonawanda	L
USA	NY	Genesee	LeRoy	L
USA	NY	Jefferson	Watertown	L
USA	NY	Jefferson	Watertown	P

Country	State/province	County (if in USA)	Locality	Family
USA	NY	Livingston	Hemlock	L
USA	NY	Livingston	West Sparta	L
USA	NY	Monroe	Webster	P
USA	NY	Montgomery	Amsterdam	P
USA	NY	Onondaga	Fayetteville	P
USA	NY	Onondaga	Jamesville, Clark Reservation	L (3)
USA	NY	Onondaga	Syracuse, Oakwood Cemetery	L (8)
USA	NY	Orange	Deerpark	P
USA	NY	Orange	Newburgh	L
USA	NY	Orange	Newburgh	P
USA	NY	Orange	Pine Bush	L
USA	NY	Orange	Poret Jervis	P
USA	NY	Otsego	Mount Vision	L
USA	NY	Saratoga	Lake Luzerne	L
USA	NY	St. Lawrence	Cranberry Lake Biological Station	P
USA	NY	Suffolk	Fishers Island	L
USA	NY	Suffolk	Fort Salonga, near Smithtown	P
USA	NY	Suffolk	Huntington	L
USA	NY	Suffolk	Sayville	L
USA	NY	Tompkins	Ithaca	L (2)
USA	NY	Tompkins	Lansing	L (2)
USA	NY	Ulster	Kingston	L
USA	NY	Ulster	Stone Ridge	P
USA	NY	Ulster	West Hurley	P
USA	NY	Ulster	Woodstock	L
USA	NY	Warren	North Creek	L
USA	NY	Warren	Queensbury	L (2)
USA	NY	Westchester	Bedford	L
USA	NY	Westchester	Jefferson Valley	P
USA	NY	Westchester	Lewisboro	P
USA	NY	Westchester	Tarrytown	L
USA	OH	Adams	Edge of Appalachia Preserve	L
USA	OH	Ashtabula	Geneva	P
USA	OH	Ashtabula	North Kingsville	P
USA	OH	Athens	Athens	L (4)
USA	OH	Butler	Oxford	L
USA	OH	Clark	Springfield	L
USA	OH	Columbiana	East Liverpool	P
USA	OH	Cuyahoga	Bay Village	P
USA	OH	Cuyahoga	Cleveland	P
USA	OH	Cuyahoga	Broadway Heights	L
USA	OH	Cuyahoga	Independence	P
USA	OH	Franklin	Columbus	L (2)
USA	OH	Franklin	Dublin	L
USA	OH	Fulton	Delta	L
USA	OH	Fulton	Wauseon	L
USA	OH	Gallia		L
USA	OH	Hamilton	Cincinnati	L (6)

Country	State/province	County (if in USA)	Locality	Family
USA	OH	Hamilton	Cincinnati	P (3)
USA	OH	Hamilton	Colerain	L
USA	OH	Hamilton	Evendale	L
USA	OH	Hancock	Findlay	L
USA	OH	Harrison	Adena	L
USA	OH	Huron	Norwalk	P
USA	OH	Jefferson	Jefferson State Park	P
USA	OH	Lake	North Madison	L
USA	OH	Lake	Painesville	L
USA	OH	Licking	Newark	L
USA	OH	Mahoning	Campbell	L
USA	OH	Mercer	Fort Recovery	L
USA	OH	Miami	Piqua	P
USA	OH	Montgomery	Dayton	L
USA	OH	Montgomery	Moraine	P
USA	OH	Ottawa	Marblehead	P
USA	OH	Ottawa	Oak Harbor	P
USA	OH	Portage	Ravenna	L (2)
USA	OH	Ross	Chillicothe	P
USA	OH	Ross	Kingston	L
USA	OH	Scioto	Shawnee State Forest	P
USA	OH	Summit	Cuyahoga Falls	P
USA	OH	Summit	Twinsburg	P
USA	OK	Bryan	Durant	L
USA	OK	Canadian	El Reno	L
USA	OK	Canadian	El Reno	P
USA	OK	Carter	Ardmore	P
USA	OK	Cleveland	Lexington Wildlife Mgt. Area	L
USA	OK	Cleveland	Moore	L
USA	OK	Cleveland	Norman	L (4)
USA	OK	Comanche	Wichita Mountains Wildlife Refuge	L
USA	OK	Creek	Stroud	L
USA	OK	Garvin	Paoli	P
USA	OK	Garvin	Paul's Valley	L
USA	OK	Latimer	Wilburton	P
USA	OK	Le Flore	Le Flore	P
USA	OK	Lincoln	Prague	L (2)
USA	OK	Logan	Guthrie	P
USA	OK	Love	Marietta	L
USA	OK	Marshall	Kingston	L
USA	OK	Marshall	Willis	L
USA	OK	Mayes	Locust Grove	L
USA	OK	Mayes	Pryor	L
USA	OK	Noble	Red Rock	L
USA	OK	Nowata	Nowata	L
USA	OK	Oklahoma	Harrah	L
USA	OK	Oklahoma	Newalla	L
USA	OK	Oklahoma	Oklahoma City	L (6)



Country	State/province	County (if in USA)	Locality	Family
USA	OK	Osage	Pawhuska	L
USA	OK	Pawnee	Westport	P
USA	OK	Pontotoc	Ada	L
USA	OK	Rogers	Claremore	L
USA	OK	Rogers	Collinsville	L
USA	OK	Rogers	Inola	L
USA	OK	Sequoyah	Vian	L
USA	OK	Stephens	Empire City	L
USA	OK	Tulsa	Broken Arrow	L
USA	OK	Tulsa	Skiatook	L
USA	OK	Tulsa	Tulsa	L (4)
USA	OK	Wagoner	Broken Arrow	L
USA	OK	Wagoner	Broken Arrow	P
USA	OK	Wagoner	Stonebluff	L
USA	PA			L
USA	PA	Allegheny	Clairton	L
USA	PA	Allegheny	Monroeville	L
USA	PA	Allegheny	Munhall	L
USA	PA	Allegheny	Oakmont	L
USA	PA	Allegheny	Pittsburgh	L (3)
USA	PA	Allegheny	Pittsburgh	P
USA	PA	Allegheny	Sewickley	L
USA	PA	Armstrong	Ford City	P
USA	PA	Armstrong	Freeport	L
USA	PA	Armstrong	Kittanning	L
USA	PA	Beaver	Beaver	L
USA	PA	Bedford	Schellsburg	L
USA	PA	Berks	Blue Marsh Lake	L
USA	PA	Berks	Douglasville	L
USA	PA	Berks	Mohnton Borough	L
USA	PA	Berks	Reading	L (2)
USA	PA	Bucks	Buckingham	P
USA	PA	Bucks	Haycock Township	L
USA	PA	Bucks	Pipersville, Ralph Stover State Park	L
USA	PA	Bucks	Quakertown	L (2)
USA	PA	Cambria		P
USA	PA	Centre	State College	L
USA	PA	Chester	Phoenixville	L
USA	PA	Chester	Phoenixville	P
USA	PA	Chester	Valley Forge	P
USA	PA	Crawford	Meadville	L
USA	PA	Dauphin	Harrisburg	L
USA	PA	Dauphin	Hershey	L (2)
USA	PA	Dauphin	Swatara Township	L
USA	PA	Delaware	Chester	L
USA	PA	Erie	Presque Isle State Park	L
USA	PA	Erie	Presque Isle State Park	P
USA	PA	Fayette	Dawson	P

Country	State/province	County (if in USA)	Locality	Family
USA	PA	Fayette	Redstone Township	L
USA	PA	Lancaster	Delta	P
USA	PA	Lancaster	Holtwood	P
USA	PA	Lebanon	Annaville	L
USA	PA	Lehigh	Allentown	L
USA	PA	Lehigh	Bethlehem	L
USA	PA	Lehigh	Copersburg	L
USA	PA	Luzerne	West Pittston Township	L
USA	PA	Lycoming	Williamsport	L
USA	PA	Lycoming	Williamsport	P
USA	PA	Monroe	Kunkletown	L (2)
USA	PA	Northampton	Nazareth	L
USA	PA	Northumberland	Herndon	P
USA	PA	Philadelphia	Philadelphia	L
USA	PA	Philadelphia	Philadelphia	P (5)
USA	PA	Schuylkill	Auburn	P
USA	PA	Schuylkill	East Brunswick Township	L
USA	PA	Schuylkill	Rush Township	L
USA	PA	Washington	Canonsburg	P
USA	PA	Washington	Charleroi	L
USA	PA	Washington	Coal Center	L
USA	PA	Westmoreland	Champion, Roaring Run Park	L
USA	PA	Westmoreland	Irwin	L
USA	PA	Wyoming	Mehoopany	L
USA	PA	York	Fawn Grove	L
USA	RI	Block Island	New Shoreham	P
USA	RI	Kent	Coventry	P
USA	RI	Newport	Sachuest Point Wildlife Refuge	L
USA	SC	Aiken	Aiken	L
USA	SC	Anderson	Belton	L
USA	SC	Anderson	Honea Path	L
USA	SC	Beaufort	Bluffton	P
USA	SC	Beaufort	Fripp Island	P
USA	SC	Beaufort	Hilton Head Island	P
USA	SC	Beaufort	Lady's Island	L
USA	SC	Beaufort	Laurel Bay	P
USA	SC	Berkeley	Bonneau	L
USA	SC	Berkeley	Goose Creek	L
USA	SC	Charleston	Awendaw	P (2)
USA	SC	Charleston	Charleston	P (2)
USA	SC	Charleston	Edisto Island	L (2)
USA	SC	Charleston	Ravenel	P (2)
USA	SC	Charleston	Seabrook Island	L
USA	SC	Charleston	Wadmalaw Island	P
USA	SC	Cherokee	Chesnee	L
USA	SC	Cherokee	Gaffney	L
USA	SC	Chester	Chester	P
USA	SC	Dorchester	Summerville	L (2)

Country	State/province	County (if in USA)	Locality	Family
USA	SC	Edgefield	Clarks Hill	P
USA	SC	Florence	Coward	L
USA	SC	Georgetown		L
USA	SC	Greenville	Dunean	L
USA	SC	Greenville	Greenville	P (2)
USA	SC	Greenville	Marietta, Jones Gap State Park	P
USA	SC	Horry	Conway	P
USA	SC	Horry	Myrtle Beach	L
USA	SC	Horry	Myrtle Beach	P
USA	SC	Lexington	Irmo	L
USA	SC	Oconee	Seneca	P
USA	SC	Orangeburg	Orangeburg	L (2)
USA	SC	Orangeburg	Orangeburg	P
USA	SC	Orangeburg	Santee	P (2)
USA	SC	Pickens	Clemson	P
USA	SC	Pickens	Pickens	P
USA	SC	Pickens	Six Mile	P
USA	SC	Richland	Columbia	L (2)
USA	SC	Richland	Columbia	P (3)
USA	SC	Richland	Harbison State Forest	P
USA	SC	Spartanburg	Lyman	P
USA	SC	Spartanburg	Spartanburg	L
USA	SC	Sumter	Rembert	L
USA	SC	Sumter	Sumter	P
USA	SC	York	Rock Hill	P (2)
USA	TN	Anderson	Claxton	P
USA	TN	Bedford	Unionville	L
USA	TN	Campbell	Duff	P
USA	TN	Carter	Elizabethton	L
USA	TN	Cocke	Cosby	P
USA	TN	Davidson	Brentwood	L
USA	TN	Davidson	Nashville	L (6)
USA	TN	Davidson	Nashville	P
USA	TN	Dekalb	Silver Point	L
USA	TN	Dickson	Dickson	L (2)
USA	TN	Dyer	Dyersburg	L
USA	TN	Greene	Greeneville	P
USA	TN	Hamilton	Chattanooga	L
USA	TN	Hamilton	Soddy-Daisy	L
USA	TN	Jackson	Gainesboro	L
USA	TN	Knox	Knoxville	L
USA	TN	Knox	Knoxville	P
USA	TN	Madison	Jackson	L
USA	TN	Montgomery	Clarksville	L
USA	TN	Robertson	Portland	L
USA	TN	Sevier	Gatlinburg, Elkmont Campground	L
USA	TN	Sevier	Pittman Center	L
USA	TN	Sevier	Sevierville	P

Country	State/province	County (if in USA)	Locality	Family
USA	TN	Shelby	Memphis	L (3)
USA	TN	Smith	Chestnut Mound	L
USA	TN	Smith	Enigma	L
USA	TN	Sullivan	Colonial Heights	L
USA	TN	Sullivan	Kingsport, Warriors' Path State Park	L
USA	TN	Sumner	Hendersonville	P
USA	TN	Unicoi	Unicoi	P
USA	TN	Washington	Jonesborough	L
USA	TN	Washington	Limestone	P
USA	TN	Washington	Watauga	L
USA	TN	Wayne	Waynesboro	P
USA	TN	Williamson	Spring Hill	L
USA	TN	Wilson	Lebanon	L (2)
USA	TN	Wilson	Mount Juliet	P
USA	TN	Wilson	Watertown	L
USA	TX	Anderson	Elkhart	P
USA	TX	Anderson	Tennessee Colony	L
USA	TX	Atascosa	Pleasanton	L
USA	TX	Atascosa	Poteet	L
USA	TX	Austin	New Ulm	L
USA	TX	Austin	Wallis	L
USA	TX	Bastrop	Bastrop	L (3)
USA	TX	Bastrop	Elgin	L
USA	TX	Bastrop	Red Rock	L
USA	TX	Bastrop	Red Rock	P (2)
USA	TX	Bastrop	Stengl Lost Pines Biological Station	P
USA	TX	Bastrop	String Prairie	L
USA	TX	Bastrop	Webberville	P
USA	TX	Bee	Beeville	L
USA	TX	Bell	Killeen, Fort Hood	L
USA	TX	Bell	Salado	L (2)
USA	TX	Bell	Temple	L (2)
USA	TX	Bexar	Adkins	L (2)
USA	TX	Bexar	Bulverde	L
USA	TX	Bexar	Converse	L
USA	TX	Bexar	Elmendorf	L
USA	TX	Bexar	Helotes	L
USA	TX	Bexar	Mitchell Lake Nature Center	L
USA	TX	Bexar	San Antonio	L (14)
USA	TX	Bexar	Timberworld Park	L
USA	TX	Bexar	Von Ormy	L
USA	TX	Blanco	Blanco	L (4)
USA	TX	Blanco	Johnson City	L (3)
USA	TX	Blanco	Round Mountain	L
USA	TX	Bosque	Morgan	L (2)
USA	TX	Bowie	Nash	L
USA	TX	Brazoria	Brazoria	L (3)
USA	TX	Brazoria	Damon	L

Country	State/province	County (if in USA)	Locality	Family
USA	TX	Brazoria	Freeport	L
USA	TX	Brazoria	Pearland	P (3)
USA	TX	Brazoria	Rosharon	P
USA	TX	Brazoria	Sandy Point	L
USA	TX	Brazoria	West Columbia, Columbia Lakes	P
USA	TX	Brazos	Bryan	L
USA	TX	Brazos	College Station	L (5)
USA	TX	Brazos	College Station	P
USA	TX	Brewster	Terlingua, Big Bend National Park	Z
USA	TX	Brown	Brownwood, Brownwood State Park	L (2)
USA	TX	Burleson	Somerville	L (2)
USA	TX	Burnet	Lake Travis	L
USA	TX	Burnet	Burnet	P
USA	TX	Burnet	Spicewood	L
USA	TX	Caldwell	Lockhart	L (3)
USA	TX	Caldwell	Luling	L
USA	TX	Caldwell	Pettytown	L
USA	TX	Cameron	Brownsville	L
USA	TX	Cameron	Laguna Atascosa National Wildlife Refugs	P
USA	TX	Cameron	South Padre Island	L
USA	TX	Chambers	Lake Charlotte	P
USA	TX	Childress	Childress	L
USA	TX	Clay	Lake Arrowhead State Park	L
USA	TX	Collin	Anna	L
USA	TX	Collin	Fairview	P
USA	TX	Collin	Lavon, Lavonia Park	L
USA	TX	Collin	McKinney	L
USA	TX	Collin	Nevada	L (2)
USA	TX	Collin	Princeton	L (2)
USA	TX	Collin	Wylie	L (2)
USA	TX	Comal	Bulverde	L
USA	TX	Comal	Canyon Lake	L
USA	TX	Comal	Fair Oaks Ranch	L
USA	TX	Comal	New Braunfels	L (5)
USA	TX	Comal	New Braunfels	P
USA	TX	Comal	Spring Branch	L
USA	TX	Comanche	Comanche	L
USA	TX	Cooke	Gainesville	P
USA	TX	Cooke	Ray Roberts Lake State Park	P
USA	TX	Coryell	Copperas Cove	L
USA	TX	Dallas	Coppell	L
USA	TX	Dallas	Dallas	L (6)
USA	TX	Dallas	Garland	L
USA	TX	Dallas	Garland	P (2)
USA	TX	Dallas	Irving	L
USA	TX	Dallas	Lancaster	L
USA	TX	Dallas	Lancaster	P
USA	TX	Dallas	Grand Prairie	L

Country	State/province	County (if in USA)	Locality	Family
USA	TX	Denton	Bartonville	L
USA	TX	Denton	Carrollton	L
USA	TX	Denton	Denton	L (3)
USA	TX	Denton	Denton	P
USA	TX	Denton	Flower Mound	L (2)
USA	TX	Denton	Grapevine Lake	L
USA	TX	Denton	Justin	L
USA	TX	Denton	Little Elm	L
USA	TX	Denton	Oak Point	L
USA	TX	DeWitt	Cuero	L
USA	TX	Ector	Odessa	L
USA	TX	Ellis	Ennis	L (3)
USA	TX	Ellis	Ferris	L
USA	TX	Ellis	Italy	L
USA	TX	Ellis	Red Oak	L
USA	TX	Ellis	Waxahachie	L
USA	TX	Fannin	Big Tussle	L
USA	TX	Fannin	Honey Grove	L
USA	TX	Fannin	Leonard	L
USA	TX	Fayette	La Grange	L
USA	TX	Fayette	Round Top	L (2)
USA	TX	Fayette	Warrenton	L
USA	TX	Fayette	West Point	L
USA	TX	Foard	Crowell	L
USA	TX	Fort Bend	East Bernard	L
USA	TX	Fort Bend	Fresno	L
USA	TX	Fort Bend	Needville, Brazos Bend State Park	P (2)
USA	TX	Fort Bend	Needville, Brazos Bend State Park	L
USA	TX	Fort Bend	Richmond	L
USA	TX	Fort Bend	Sienna Plantation	P
USA	TX	Franklin	Winnsboro	L
USA	TX	Freestone	Oakwood	P
USA	TX	Galveston	Galveston	L
USA	TX	Galveston	Pelican Island	L
USA	TX	Galveston	Santa Fe	L
USA	TX	Galveston	Texas City	L
USA	TX	Gillespie	Crabapple	L
USA	TX	Gillespie	Fredericksburg	L (3)
USA	TX	Gillespie	Stonewall	L
USA	TX	Gonzales	Gonzales	L (2)
USA	TX	Grayson	Denison	L (2)
USA	TX	Grayson	Knollwood	L
USA	TX	Grayson	Gunter	L
USA	TX	Grayson	Sherman	L
USA	TX	Grayson	Sherman	P
USA	TX	Grayson	Tioga	L
USA	TX	Gregg	White Oak	L (2)
USA	TX	Grimes	Navasota	L

Country	State/province	County (if in USA)	Locality	Family
USA	TX	Grimes	Navasota	P
USA	TX	Guadalupe	Seguin	L
USA	TX	Hale	Plainview	L
USA	TX	Hamilton	Hamilton	L (4)
USA	TX	Hamilton	Hamilton	P
USA	TX	Hardeman	Copper Breaks State Park	L
USA	TX	Hardin	Lumberton	P (2)
USA	TX	Hardin	Silsbee	P
USA	TX	Harris	Aldine	P
USA	TX	Harris	Atascocita	L
USA	TX	Harris	Baytown	L (2)
USA	TX	Harris	Cypress	P
USA	TX	Harris	Houston	L (22)
USA	TX	Harris	Houston	P (4)
USA	TX	Harris	Huffman	L
USA	TX	Harris	Humble	L (2)
USA	TX	Harris	Humble, Jesse H. Jones Park	L
USA	TX	Harris	Humble, Jesse H. Jones Park	P
USA	TX	Harris	Katy	L (3)
USA	TX	Harris	La Porte	L
USA	TX	Harris	La Porte	P (2)
USA	TX	Harris	Mission Bend	L (3)
USA	TX	Harris	Spring	L (2)
USA	TX	Harris	Tomball	P
USA	TX	Harris	Webster	L
USA	TX	Harrison	Hallsville	L
USA	TX	Harrison	Marshall	L
USA	TX	Harrison	Uncertain	P
USA	TX	Haskell	O'Brien	L
USA	TX	Hays	Driftwood	L (2)
USA	TX	Hays	Dripping Springs	L (2)
USA	TX	Hays	Hays	L
USA	TX	Hays	Henly, near Dripping Springs	L
USA	TX	Hays	Kyle	L (2)
USA	TX	Hays	San Marcos	L (9)
USA	TX	Hays	Wimberley	L (3)
USA	TX	Henderson	Athens	P
USA	TX	Henderson	Chandler, Lake Palestine	P
USA	TX	Hidalgo	McAllen	L
USA	TX	Hidalgo	Mission	L
USA	TX	Hidalgo	Pharr	L
USA	TX	Hill	Hillsboro	L
USA	TX	Hopkins	Cumby	L
USA	TX	Hopkins	Sulphur Springs	P
USA	TX	Houston	Grapeland	L
USA	TX	Hunt	Greenville	L
USA	TX	Hunt	Quinlan	L
USA	TX	Hunt	Royse City	P

Country	State/province	County (if in USA)	Locality	Family
USA	TX	Hunt	Wolfe City	L
USA	TX	Jasper	Martin Dies Jr. State Park	L
USA	TX	Jeff Davis	Valentine	L
USA	TX	Jefferson	Beaumont	P
USA	TX	Jim Wells	Premont	L
USA	TX	Jim Wells	Sandia	L (2)
USA	TX	Johnson	Cleburne	L
USA	TX	Johnson	Godley	L
USA	TX	Johnson	Joshua	L
USA	TX	Kaufman	Scurry	L (2)
USA	TX	Kaufman	Terrell	L
USA	TX	Kendall	Boerne	L
USA	TX	Kendall	Comfort	L
USA	TX	Kerr	Kerrville	L (2)
USA	TX	Kerr	Kerrville	P (2)
USA	TX	Kerr	Kerr Wildlife Management Area	P
USA	TX	Kimble	Junction	L
USA	TX	Lamar	Paris	L (3)
USA	TX	Lamb	Olton	L
USA	TX	Lampasas	Lampasas	L (4)
USA	TX	Lampasas	Lometa	L
USA	TX	Lasalle	Cotulla	L
USA	TX	Lavaca	Hallettsville	L
USA	TX	Lavaca	Shiner	L
USA	TX	Lavaca	Sublime/Sheridan	P
USA	TX	Lee	Fedor	L
USA	TX	Lee	Lexington	L
USA	TX	Lee	Lexington	P (2)
USA	TX	Leon	Normangee	P
USA	TX	Liberty	Big Thicket	P
USA	TX	Liberty	Dayton	P
USA	TX	Liberty	Hardin	L
USA	TX	Liberty	Liberty	P
USA	TX	Limestone	Lake Limestone	P
USA	TX	Live Oak	Sandia	L
USA	TX	Llano	Llano	L
USA	TX	Llano	Enchanted Rock State Natural Area	S
USA	TX	Lubbock	Lubbock	L (2)
USA	TX	Madison	Madisonville	L
USA	TX	McCulloch	Melvin	L
USA	TX	McLennan	Bruceville-Eddy	L
USA	TX	McLennan	China Spring	L
USA	TX	McLennan	Moody	L
USA	TX	McLennan	Robinson	L
USA	TX	McLennan	Waco	L (4)
USA	TX	McLennan	Waco, North Lake	L
USA	TX	McLennan	West	L (2)
USA	TX	McLennan	Woodway	L



Country	State/province	County (if in USA)	Locality	Family
USA	TX	Medina	Devine	L
USA	TX	Medina	Natalia	L
USA	TX	Milam	Burlington	L (2)
USA	TX	Milam	Milano	P
USA	TX	Milam	Round Rock	L
USA	TX	Milam	San Gabriel	L (4)
USA	TX	Montgomery	Conroe	L (4)
USA	TX	Montgomery	Conroe	P (3)
USA	TX	Montgomery	Magnolia	P (2)
USA	TX	Montgomery	Montgomery	L (2)
USA	TX	Montgomery	Montgomery	P (3)
USA	TX	Nacogdoches	Nacogdoches	L (2)
USA	TX	Nacogdoches	Nacogdoches	P
USA	TX	Nueces	Corpus Christi	L (6)
USA	TX	Orange	North Orange	P
USA	TX	Orange	Orange	L
USA	TX	Palo Pinto	Mineral Wells	L
USA	TX	Palo Pinto	Santo	L
USA	TX	Parker	Aledo	L (2)
USA	TX	Parker	Azle	L (3)
USA	TX	Parker	Reno	P
USA	TX	Parker	Springtown	L (3)
USA	TX	Parker	Springtown	P
USA	TX	Parker	Weatherford	L
USA	TX	Polk	Livingston	P
USA	TX	Rains	Point	P
USA	TX	Refugio	Bayside	L
USA	TX	Rockwall	Fate	L
USA	TX	Rockwall	Rockwall	L (2)
USA	TX	Rockwall	Rockwall	P
USA	TX	Rockwall	Rowlett	L
USA	TX	Rockwall	Royse City	L (2)
USA	TX	Sabine	Hemphill	P (2)
USA	TX	San Augustine	Sabine National Forest	P
USA	TX	San Patricio	Portland	L
USA	TX	San Patricio	Taft	L
USA	TX	Schleicher	Eldorado	L (2)
USA	TX	Smith	Bullard	P
USA	TX	Smith	Tyler	L (2)
USA	TX	Somervell	Dinosaur Valley State Park	P
USA	TX	Somervell	Glen Rose	L (2)
USA	TX	Tarrant	Arlington	L (3)
USA	TX	Tarrant	Azle	P
USA	TX	Tarrant	Bedford	L
USA	TX	Tarrant	Benbrook	L (4)
USA	TX	Tarrant	Crowley	L
USA	TX	Tarrant	Fort Worth	L (13)
USA	TX	Tarrant	Fort Worth	P (3)

Country	State/province	County (if in USA)	Locality	Family
USA	TX	Tarrant	Grapevine	L
USA	TX	Tarrant	Lake Worth	L
USA	TX	Tarrant	Mansfield	L (4)
USA	TX	Tarrant	Mansfield	A (2)
USA	TX	Tarrant	North Richland Hills	P
USA	TX	Tarrant	Rendon	L (2)
USA	TX	Tarrant	Saginaw	L
USA	TX	Tarrant	Southlake	L (2)
USA	TX	Taylor	Potosi	L
USA	TX	Titus	Mount Pleasant	L
USA	TX	Tom Green	San Angelo	L
USA	TX	Travis	Austin	L (42)
USA	TX	Travis	Austin	P (8)
USA	TX	Travis	Highland Lakes, Lake Travis	L
USA	TX	Travis	Liberty Hill	L (3)
USA	TX	Travis	Manchaca	L (2)
USA	TX	Travis	McKinney Falls State Park	L
USA	TX	Travis	Pflugerville	L
USA	TX	Travis	San Leanna	L
USA	TX	Travis	Southland Oaks	L
USA	TX	Travis	Sunset Valley	L (2)
USA	TX	Travis	Walter E. Long Lake	L
USA	TX	Travis	Webberville	L
USA	TX	Tyler	Colmesneil	L
USA	TX	Tyler	Woodville	P
USA	TX	Upshur	Gladewater	L
USA	TX	Upshur	Longview	L
USA	TX	Victoria	Mission Valley	P
USA	TX	Victoria	Victoria	L (2)
USA	TX	Walker	Huntsville	L (2)
USA	TX	Waller	Pattison	L
USA	TX	Washington	Brenham	L
USA	TX	Washington	Carmine	L
USA	TX	Webb	Laredo	L
USA	TX	Wichita	Wichita Falls	L (4)
USA	TX	Williamson	Bartlett	L
USA	TX	Williamson	Cedar Park, Muir Lake Trail	L
USA	TX	Williamson	Georgetown	L (6)
USA	TX	Williamson	Hutto	L
USA	TX	Williamson	Jarrell	L
USA	TX	Williamson	Liberty Hill	L
USA	TX	Williamson	Pflugerville	L
USA	TX	Williamson	Round Rock	L (3)
USA	TX	Williamson	Taylor	L
USA	TX	Wilson	Calaveras	L (2)
USA	TX	Wilson	Floresville	L
USA	TX	Wilson	Graytown	L
USA	TX	Wise	Decatur	L (3)

Country	State/province	County (if in USA)	Locality	Family
USA	TX	Wise	Boyd	L
USA	TX	Wood	Hawkins	P
USA	VA	Accomack	Belle Haven	L
USA	VA	Alleghany	Covington	P
USA	VA	Amherst	Amherst	P
USA	VA	Arlington	Arlington	P
USA	VA	Augusta	George Washington National Forest	L
USA	VA	Buckingham	Rosney	L
USA	VA	Caroline	Milford	L
USA	VA	Chesterfield	Chester	L (4)
USA	VA	Chesterfield	Midlothian	P
USA	VA	Chesterfield	North Chesterfield	L
USA	VA	Fairfax	Chantilly	P
USA	VA	Fairfax	Herndon	L (2)
USA	VA	Floyd	Pizzaro	L
USA	VA	Floyd	Willis	L
USA	VA	Goochland	Crozier	P
USA	VA	Halifax	Alton	L
USA	VA	Henrico	Wyndham	L
USA	VA	Henry	Bassett	L
USA	VA	Henry	Martinsville	L
USA	VA	Highland		L
USA	VA	Lee	Ewing	L
USA	VA	Louisa	Mineral	P
USA	VA	Madison	Madison	L
USA	VA	Montgomery	Blacksburg	L (2)
USA	VA	Montgomery	Blacksburg	P
USA	VA	Montgomery	Christiansburg	P
USA	VA	Montgomery	Radford, Wildwood Park	P
USA	VA	Prince Edward	Green Bay	P
USA	VA	Prince William	Catlett	L
USA	VA	Prince William	Occoquan Bay National Wildlife Reserve	P
USA	VA	Prince William	Quantico	P
USA	VA	Rockbridge	Lexington, Boxerwood Nature Center	P
USA	VA	Rockingham	Harrisonburg	L (2)
USA	VA	Shenandoah	Strasburg	L
USA	VA	Fairfax	Clifton	P
USA	VA	Fairfax	Vienna	L (2)
USA	VA	Fairfax	Waynewood/Fort Hunt	P
USA	VA	Fauquier	Calverton	L
USA	VA	Giles	Newport News	P
USA	VA	Greene	Standardsville	P
USA	VA		Alexandria	L
USA	VA		Alexandria	P (4)
USA	VA		Arlington	L (2)
USA	VA		Charlottesville	L (2)
USA	VA		Chesapeake	P
USA	VA		Hampton	P

Country	State/province	County (if in USA)	Locality	Family
USA	VA		Harrisonburg	L (2)
USA	VA		Newport News	L
USA	VA		Richmond	P
USA	VA		Staunton	L
USA	VA		Virginia Beach	L
USA	VA		Virginia Beach	P (2)
USA	VA		Winchester	L (2)
USA	VA		Winchester	P
USA	VA	King William		L
USA	VA	Louisa	Zion Crossroads	L
USA	VA	Washington	Abingdon	L
USA	VA	Washington	Damascus	L
USA	VA	Wise	Giles	L
USA	VA	York	Yorktown	P (2)
USA	VT	Chittenden	Colchester	L
USA	VT	Chittenden	Shelburne	P
USA	VT	Grand Isle	Grand Isle	L
USA	VT	Washington	Montpelier	L
USA	VT	Windsor	Quechee	P
USA	VT	Windsor	Weathersfield	L
USA	WV	Barbour	Phillipi	L
USA	WV	Berkeley	Martinsburg	L (3)
USA	WV	Berkeley	Martinsburg	P
USA	WV	Cabell	Huntingdon	P
USA	WV	Clay	Wallback	P
USA	WV	Greenbrier	Ronceverte	L
USA	WV	Harrison	Bridgeport	P
USA	WV	Harrison	Kincheloe	P
USA	WV	Jefferson	Harpers Ferry	L (2)
USA	WV	Jefferson	Harpers Ferry	P
USA	WV	Jefferson	Kearneysville	L
USA	WV	Jefferson	Kearneysville	P
USA	WV	Jefferson	Shepherdstown	L
USA	WV	Mercer	Bluefield	P
USA	WV	Monroe	Union	L
USA	WV	Upshur	Ruraldale	L (2)
USA	WV	Wood	Williamstown	L
USA	WI	Buffalo	Mondovi	P
USA	WI	Dane	Madison	L (2)
USA	WI	Dane	Madison	P
USA	WI	Dane	Sun Prairie	P
USA	WI	Dunn	Menomonie	L
USA	WI	Eau Claire	Eau Claire	P
USA	WI	La Crosse	New Amsterdam	L
USA	WI	Milwaukee	Milwaukee	L
USA	WI	Ozaukee	Riveredge Nature Center	P
USA	WI	Sauk	Baraboo, Devil's Lake State Park	L
USA	WI	Sauk	Baraboo, Devil's Lake State Park	P

Country	State/province	County (if in USA)	Locality	Family
USA	WI	Vernon	Ontario	L
USA	WI	Waukesha	Delafield	L
USA	WI	Waukesha	Oconomowoc	L
USA	PUERTO RICO	Bayamón		S
USA	PUERTO RICO	Guayanilla		S
USA	PUERTO RICO	San Juan		S
Belize	Toledo		Punta Gorda	T (2)
Belize	Belize		W of City of Belize	L
Brazil	Acre		Rio Branco	C
Brazil	Bahia		Rio de Contas	C
Brazil	Espírito Santo		Alfredo Chaves	S
Brazil	Federal District		Brasília	C
Brazil	Goiás		Aruanã	S
Brazil	Pará		Altamira	C
Brazil	Rio de Janeiro		Petrópolis	C (3)
Brazil	Rio de Janeiro		Rio de Janeiro	C (2)
Brazil	Rio de Janeiro		Rio de Janeiro	S
Brazil	Rio Grande do Sul		Osório	C
Brazil	Santa Catarina		Bombinas	C
Brazil	Santa Catarina		Florianópolis, Armação Beach	C (2)
Brazil	Santa Catarina		Parque Nacional da Serra do Itajaí	C
Brazil	Santa Catarina		Santo Amaro	C
Brazil	São Paulo		Cotia	C (2)
Canada	Ontario		Beamsville	L
Canada	Ontario		Belleville	L
Canada	Ontario		Brockville	P
Canada	Ontario		Cambridge	P
Canada	Ontario		Dundas	L
Canada	Ontario		Fort Erie	L (2)
Canada	Ontario		Kincardine	L
Canada	Ontario		Kingston	L
Canada	Ontario		Kingsville	L
Canada	Ontario		Markham	P
Canada	Ontario		Mississauga	L
Canada	Ontario		Port Weller East	L
Canada	Ontario		Saint Anns	P
Canada	Ontario		St. Catherine's	L
Canada	Ontario		St. Williams Conservation Reserve	L
Canada	Ontario		Windsor	L
Canada	Ontario		Elgin County, St. Thomas	L
Canada	Ontario		Essex County, Kingsville	L (2)
Canada	Ontario		Hamilton	P (2)
Canada	Ontario		Hastings County, Belleville	L
Canada	Ontario		Niagara Falls	L
Canada	Ontario		Paris	P
Canada	Ontario		Pelee Island	P
Colombia	Antioquia		Girardota	C

Country	State/province	County (if in USA)	Locality	Family
Colombia	Antioquia		Pueblorrico	C
Colombia	Antioquia		Reserva La Selva de Ventanas	C
Colombia	Antioquia		Reserva Natural Rio Claro	C
Colombia	Boyacá		Villa de Leyva	L
Colombia	Huila		Tarqui	C
Colombia	Santander		Güepsa	L
Colombia	Tolima		Ibagué	C
Colombia	Boyacá		Villa de Leyva	C
Costa Rica	Alajuela		Alajuela	T
Costa Rica	Alajuela		La Fortuna	T
Costa Rica	Alajuela		Parque Nacional Volcan Arenal	T
Costa Rica	Alajuela		Bijagua, 26 km S of Upala	T
Costa Rica	Alajuela		Upala	T
Costa Rica	Cartago		Cartago	T (3)
Costa Rica	Cartago		Cartago	C
Costa Rica	Cartago		Paraiso	C (2)
Costa Rica	Cartago		Turrialba, Rancho Naturalista Lodge	T (2)
Costa Rica	Cartago		Refugio de Vida Silvestre La Marta	T
Costa Rica	Cartago		Turrialba, Santa Teresita	T (2)
Costa Rica	Cartago		Verbena	T (2)
Costa Rica	Guanacaste		Parque Nacional Volcan Tenorio	T
Costa Rica	Heredia		Chilamate	T
Costa Rica	Heredia		Flaminia	T
Costa Rica	Heredia		La Selva Biological Station	T (6)
Costa Rica	Heredia		Puerto Viejo de Sarapiquí	T
Costa Rica	Heredia		Sarapiquí, Tírimbina Lodge	C
Costa Rica	Limón		Amistad National Park	T
Costa Rica	Limón		Braulio Carrillo National Park	T
Costa Rica	Limón		Rios Tropicales Lodge	T
Costa Rica	Limón		Cahuita National Park	T (2)
Costa Rica	Limón		Guapiles	T (2)
Costa Rica	Limón		Manzanillo	T (2)
Costa Rica	Limón		Puerto Limón	T (2)
Costa Rica	Limón		Puerto Viejo de Talamanca	T (3)
Costa Rica	Puntarenas		Campanario Biological Station	S
Costa Rica	Puntarenas		Golfito	T
Costa Rica	Puntarenas		Golfo Dulce Forest Reserve	T
Costa Rica	Puntarenas		San Vito	C
Costa Rica	Puntarenas		Uvita	T
Costa Rica	Puntarenas		Uvita	Z
Costa Rica	Puntarenas		Corcovado National Park	T (3)
Costa Rica	Puntarenas		Coto Brus	T
Costa Rica	Puntarenas		Dominical	T
Costa Rica	Puntarenas		Drake Bay Wilderness Resort	T
Costa Rica	Puntarenas		Las Cruces Biological Station	T (3)
Costa Rica	Puntarenas		Monteverde	T (2)
Costa Rica	Puntarenas		Oso Peninsula	T (2)
Costa Rica	Puntarenas		Piñuela Beach	T

Country	State/province	County (if in USA)	Locality	Family
Costa Rica	Puntarenas		Platanillo	S
Costa Rica	San José		Platanillo Community Center	T
Costa Rica	San José		San Isidro de El General	T
Costa Rica	San José		San José	T
Costa Rica	Talamanca		Talamanca Mountains	T (4)
Costa Rica	Talamanca		Yorkin Indigenous Reserve	C
Dominican Republic	Barahona		Enriquillo	S
Dominican Republic	Independencia		Duvergé, Vila Barrancoli	S
Dominican Republic	Puerto Plata		Altamira	S
Dominican Republic	San Cristóbal		San Cristóbal	L
Ecuador	Azuay		Cuenca	T
Ecuador	Napo		Tena, Puerto Misahualli	C
Ecuador	Pastaza		Puyo	C
Ecuador	Pichincha		Nanegal	C
Ecuador	Sucumbos		Nueva Loja	C
El Salvador	Cabañas		Ilobasco	T
El Salvador				L
French Guiana	Cayenne		Kourou	C
French Guiana	Cayenne		Régina, Les Nouragues Nature Reserve	C
French Guiana	Cayenne		Cayenne	C
Guatemala	Guatemala		Guatemala City	S
Guatemala	Huehuetenango		San Pedro Soloma	Z
Guatemala	Sacatepéquez		Antigua	C
Guyana	Barima-Waini		Mabaruma	C (4)
Guyana	Demerara-Ber- bice		Iwokrama Research Centre	C
Guyana	Demerara-Ma- haica		Vicinity of Georgetown	L
Honduras	Comayagua		Siguatepeque	L
Honduras	Cortés		Omoa	C
Honduras	Cortés		San Pedro Sula	C
Honduras	Cortés		Villanueva	L
Honduras	Santa Bárbara		Las Vegas	C
Mexico	Campeche		Calakmul	L
Mexico	Chiapas		Cacahoatán	S
Mexico	Chiapas		Villa Corzo	T
Mexico	Chiapas		Yajalón	L
Mexico	Coahuila		Arteaga	L
Mexico	Guanajuato		Celaya	Z
Mexico	Guanajuato		Comonfort	Z (2)
Mexico	Jalisco		Guadalajara	S
Mexico	México		Acoxta, Tlalpan	T
Mexico	México		Ciudad de Mexico	S
Mexico	México		Mexico City	Z (4)
Mexico	México		Mexico City, Iztapalapa	T (4)
Mexico	México		Nezahualcóyotl	Z
Mexico	México		Tepotzotlán	Z
Mexico	México		Toluca	L

Country	State/province	County (if in USA)	Locality	Family
Mexico	México		Toluca	Z
Mexico	México		Valle de Bravo	T
Mexico	Michoacán		Ceibas De Trujillo	L
Mexico	Michoacán		Morelia	Z
Mexico	Morelos		Atlatlahucan	T
Mexico	Morelos		Tepalcingo	T
Mexico	Nuevo León		Monterrey	L
Mexico	Nuevo León		Santiago	A
Mexico	Oaxaca		San Pablo Etlá	Z (2)
Mexico	Oaxaca		San Pablo Etlá	E
Mexico	Puebla		Cuetzalan del Progreso	T
Mexico	Querétaro		Cadereyta de Montes	T
Mexico	Quintana Roo		Cancún	S
Mexico	San Luis Potosí		Guadalcázar	L
Mexico	San Luis Potosí		Pedro Montoya	S
Mexico	Tabasco		Villahermosa, Centro	L
Mexico	Veracruz		16 km N of Sontecomapan	T
Mexico	Veracruz		Alvarado	T
Mexico	Veracruz		Alvarado, Lomas del Estero	T
Mexico	Veracruz		Boca del Río	T
Mexico	Veracruz		Catemaco	T
Mexico	Veracruz		City of Veracruz	T (3)
Mexico	Veracruz		City of Veracruz	T
Mexico	Veracruz		Coatepec	T (2)
Mexico	Veracruz		Coatzacoalcos	T
Mexico	Veracruz		Coatzacoalcos	S
Mexico	Veracruz		Cosoleacaque, Estero del Pantano	S
Mexico	Veracruz		Playa de Vacas-Medellin	T
Mexico	Veracruz		Reservado la biosfera Los Tuxtlas	T
Mexico	Veracruz		Xalapa-Enríquez	T (6)
Mexico	Veracruz		Xico	T
Mexico	Yucatán		Mérida	L
Mexico	Yucatán		Mérida	T
Mexico	Yucatán		Telchac Puerto	L
Nicaragua	Carazo		San Marcos	T
Nicaragua	Managua		Managua	S
Nicaragua	Masaya		Laguna de Apoyo Natural Reserve	C (2)
Nicaragua	Masaya		Laguna de Apoyo Natural Reserve	T
Nicaragua	Rio San Juan		El Castillo	T
Nicaragua	Rio San Juan		El Castillo	C
Nicaragua	Rivas		Ometepe Biological Field Station	T
Panama	Bocas del Toro		Isla Bastimento	T (5)
Panama	Bocas del Toro		Isla Bastimento, Bluff Beach	T (2)
Panama	Bocas del Toro		Isla Bastimento, Laloma Lodge	T
Panama	Bocas del Toro		Isla Bastimento, Old Bank	T (3)
Panama	Bocas del Toro		Isla Colón	C (3)
Panama	Bocas del Toro		S shore of Dolphin Bay	T
Panama	Chiriquí		Boquete	T (2)



Country	State/province	County (if in USA)	Locality	Family
Panama	Chiriquí		Jarimillo	S
Panama	Coclé		El Valle de Antón	T
Panama	Colón		Gamboa	T (2)
Panama	Colón		Sabanitas	T
Panama	Colón		Galeta Island Protected Landscape	T
Panama	Colón		Gamboa	C
Panama	Colón		Rio Frijoles	T
Panama	Colón		San Lorenzo Protected Forest	T
Panama	Darién		Darién Nacional Parque	T (6)
Panama	Darién		Darién Nacional Parque	C (2)
Panama	Darién		Darién Nacional Parque	S (3)
Panama	Panamá		Cocobolo Nature Reserve	C
Panama	Panamá		Isla Barro Colorado	S (2)
Panama	Panamá		Isla Barro Colorado	C
Panama	Panamá		Panama City	T (2)
Panama	Panamá		Panama City	C
Panama	Panamá Oeste		Altos del Maria	T
Panama	Veraguas		Coiba National Park	C
Suriname	Sipaliwini		Paloemeu	C
Venezuela	Bolívar		Ciudad Guayana	C
Venezuela	Capital		Caracas	C

**Table 3.** Institutions, institutional codes, associated collections, and number of host spider occurrence records for *Entypus unifasciatus* and *Tachypompilus ferrugineus*.

Institution full name	Associated collection	Institution code	# of records
Actualización de la Colección de Artrópodos con importancia médica	Laboratorio de Entomología, InDRE	CAIM	2
Alexander von Humboldt Biological Resources Research Institute	Entomology Collection	IaVH-E	1
California Academy of Sciences	Department of Entomology	CAS	5
California Polytechnic University, San Luis Obispo	Entomology Collection	OBI	1295
Chicago Academy of Sciences	Entomology Collection	CHAS	32
Comisión nacional para el conocimiento y uso de la biodiversidad	Entomology Collection	CONABIO	10
Denver Museum of Natural History	Arachnology Collection	DMNS	1492
Dugway Proving Ground Natural History Collection	Dugway Entomological Institute	DUGWAY	5
El Colegio de la Frontera Sur (Mexico)	Entomology Collection	ECOSUR	6
Estonian University of Life Sciences	Entomological Collection	IZBE	2
Field Museum of Natural History	Collection of Insects, Arachnids, and Myriapods	FMNH	277
Forschungsinstitut und Naturmuseum Senckenberg	Entomology Collection	SMF	13
Harvard University	Museum of Comparative Zoology	MCZ	464
iNaturalist	NA	INAT	13029
Instituto Amazónico de Investigaciones Científicas	Entomology Collection	SINCHI	3
Instituto Colombiano de Estudios Superiores de Incolda	Entomology Collection	Icesi	1
Instituto de Biología, Universidad Nacional Autónoma de México	Department of Zoology	IBUNAM	4
Instituto Nacional de Biodiversidad	Entomology Collection	INBio	34
Inventaire National du Patrimoine Naturel	Le Monde des Insectes	UMS Patri-Nat	2
Inventaire National du Patrimoine Naturel	INPN Espèces	INPN	1
McGill University	Lyman Entomological Museum	LEMQ	2
Museo Argentino de Ciencias Naturales	Entomology National Collection	MACN	147
Museu Paraense Emilio Goeldi	Entomology of the Goeldi Museum	MPEG	30
Naturgucker.de	Entomology Collection	naturgucker	5
New Mexico State University	Collection of Arthropods	NMSU	68
Northern Arizona University	Colorado Plateau Museum of Arthropod Biodiversity	NAUF	39
Ohio State University	The Arcarology Collection	OSAL	646
Ohio State University	Borrer Laboratory of Bioacoustics	BLB	15
Royal Ontario Museum	Entomology Collection	ROM	23
San Diego Natural History Museum	The SDNHM Entomology Collection	SDNHM	12
Smithsonian National Museum of Natural History	Entomology Collection	USNM	4
Texas A&M University	Insect Collection	TAMU	33
Texas Tech University	Invertebrate Zoology Collection	TTU	3
The State Museum of Natural History Karlsruhe	Entomology Collection	SMNK	73

Institution full name	Associated collection	Institution code	# of records
United States Geological Survey	Biodiversity Information Serving Our Nation (BISON)	USGS	520
Universidad Autónoma de San Luis Potosí	The Zoological Collection of the Desert Zones	BDCHZD-UASLP	1
Universidad de Ibagué (Unibague)	Entomology Collection	UIBA	191
Universidad de la Salle, Museo La Salle Bogotá	Colección de Invertebrados	MLS	39
Universidade Estadual de Campinas - Instituto de Biologia	Museu de Zoologia	ZUEC	21
University of Alaska Museum	Insect Collection	UAM	4
University of British Columbia	Spencer Entomological Collection	UBCZ	126
University of California, Berkeley	Essig Museum of Entomology	EMEC	3
University of Copenhagen	Zoological Museum	ZMUC	1
University of Guelph, Biodiversity Institute of Ontario	The Centre for Biodiversity Genomics	UOG	155
University of New Mexico, Museum of Southwestern Biology	Division of Arthropods	UNM	162
University of Oklahoma	Sam Noble Oklahoma Museum of Natural History, Recent Invertebrates Collection	OMNH	95
University of the West Indies	Zoology Museum	UWIZM	1

**Table 4.** Counts of *Entypus unifasciatus* and *Tachypompilus ferrugineus* records per host spider family, and percentages of host records.

Host spider family	<i>Entypus unifasciatus</i>		<i>Tachypompilus ferrugineus</i>	
	# of records	% of records	# of records	% of records
Lycosidae	903	83.1	1472	64
Pisauridae	53	4.9	570	24.8
Trechaleidae	46	4.2	137	6
Ctenidae	47	4.3	63	2.7
Sparassidae	34	3.1	36	1.6
Zoropsidae	2	0.2	16	0.7
Agelenidae	–	–	5	0.2
Miturgidae	2	0.2	–	–
Selenopidae	–	–	1	<0.1
TOTAL	1087	100	2300	100

