

A journal of world insect systematics

# INSECTA MUNDI

---

---

0824

Selenopidae (Arachnida: Araneae), a new host spider family for  
the spider wasp *Tachypompilus ferrugineus* (Say)  
(Hymenoptera: Pompilidae: Pompilini)

Frank E. Kurczewski

1188 Converse Drive NE  
Atlanta, GA 30324

Rick C. West

6365 Willowpark Way  
Sooke, BC, Canada V9Z 1L9

Sarah C. Crews

Department of Entomology  
California Academy of Sciences  
San Francisco, CA 94118

N. R. Jenzen-Jones

P.O. Box 2178  
Churchlands, WA 6018  
Australia

Date of issue: November 27, 2020

**Kurczewski FE, West RC, Crews SC, Jenzen-Jones NR. 2020.** Selenopidae (Arachnida: Araneae), a new host spider family for the spider wasp *Tachypompilus ferrugineus* (Say) (Hymenoptera: Pompilidae: Pompilini). *Insecta Mundi* 0824: 1–6.

Published on November 27, 2020 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:**

CSIRO, Canberra, ACT, Australia  
Museu de Zoologia, São Paulo, Brazil  
Agriculture and Agrifood Canada, Ottawa, ON, Canada  
The Natural History Museum, London, UK  
Muzeum i Instytut Zoologii PAN, Warsaw, Poland  
National Taiwan University, Taipei, Taiwan  
California Academy of Sciences, San Francisco, CA, USA

Florida Department of Agriculture and Consumer Services,  
Gainesville, FL, USA  
Field Museum of Natural History, Chicago, IL, USA  
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, CDROM ISSN 1942-1362) in PDF format.**

Printed CD or DVD mailed to all members at end of year. 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/>

# Selenopidae (Arachnida: Araneae), a new host spider family for the spider wasp *Tachypompilus ferrugineus* (Say) (Hymenoptera: Pompilidae: Pompilini)

Frank E. Kurczewski

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

Rick C. West

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

Sarah C. Crews

Department of Entomology  
California Academy of Sciences  
San Francisco, CA 94118  
screwsemail@gmail.com

N. R. Jenzen-Jones

P.O. Box 2178  
Churchlands, WA 6018  
Australia  
nic@armamentresearch.com

**Abstract.** Four online photographs from Oaxaca, Mexico taken by N. R. Jenzen-Jones and posted on inaturalist.org reveal *Selenops* sp., probably *S. mexicanus* Keyserling (Arachnida: Araneae: Selenopidae), as a new host spider species, genus and family for the common and widespread American spider wasp *Tachypompilus ferrugineus* (Say) (rusty spider wasp). The wasp transported the immobilized spider up an exterior stucco wall of a house, dorsal side upward, walking backwards for 3 m to her nest in a gap between the wooden planking and stucco wall beneath the roof, while grasping the femur of its right pedipalp with her mandibles.

**Key words.** *Selenops mexicanus*, flatties or wall crab spiders, rusty spider wasp, Oaxaca, Mexico, prey transport, oligophagous, Lycosoidea.

**ZooBank registration.** urn:lsid:zoobank.org:pub:D9A2E4B3-EAB3-4716-A248-AA86C7AD7A10

## Introduction

*Tachypompilus ferrugineus* (Say) is a rather large (~20 mm long), brightly colored, easily recognizable, wide-ranging American spider wasp (Hymenoptera: Pompilidae). Adult females are castaneo-ferruginous, often with a variable amount of black on the head, mesosoma and metasoma, with fuliginous wings that reflect violet in sunlight (Fig. 1; Evans 1950, 1966). This species occurs 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, 1966; Colomo de Correa 1985 [1987]; Kurczewski et al. 2020).

*Tachypompilus ferrugineus* frequently uses 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, and beneath buildings, cemetery monuments and fallen signs 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). The prey-deposition chamber of *T.*





**Figure 1.** *Tachypompilus ferrugineus* female with immobilized *Selenops* sp., probably *S. mexicanus*, adult or sub-adult female, San Pablo Etla (Valles Centrales region), Oaxaca, Mexico. The wasp grasped the apex of the femur of the spider's right pedipalp with her mandibles and dragged it backwards, dorsal side upward, up the exterior stucco wall of a house. Photograph: N. R. Jenzen-Jones, Churchlands, Western Australia 6018, Australia.



*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; Kurczewski et al. in prep.). 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 involves the wasp, usually grasping a pedipalp or chelicera with her mandibles, and dragging the comparatively heavy prey backwards, dorsal side upward, on the ground or often up a vertical man-made surface—a sometimes long and cumbersome process over and around various obstacles.

Based on 1802 predominantly North American host records *T. ferrugineus* provisions its nests mainly with Lycosidae (wolf spiders) and, secondarily, Pisauridae (fishing spiders) in the United States and northern Mexico; Trechaleidae (banana spiders) in southern Mexico and Central America; and, Ctenidae (wandering spiders) in Central America and northern South America (Table 1). Rarely, Sparassidae (huntman or giant crab spiders), Zoropsidae (false wolf spiders), and Agelenidae (funnel-web weaving or grass spiders) are also captured by *T. ferrugineus* in North America (Kurczewski et al. 2020). The number of host records from the United States and Canada, where Lycosidae and Pisauridae are abundant, far exceeds (88.8%) those from Mexico, Central America and South America (11.2%).

**Table 1.** Host spider families of *Tachypompilus ferrugineus* (based on Kurczewski et al. 2020; F. E. Kurczewski, pers. obs.).

Family	Number of records	% of total records
Lycosidae	1215	67.4
Pisauridae	414	23.0
Trechaleidae	106	5.9
Ctenidae	28	1.6
Sparassidae	24	1.3
Zoropsidae	9	0.5
Agelenidae	5	0.3
Selenopidae	1	<0.1
TOTALS	1802	100

## Materials and Methods

The first author, in his daily perusal of online sites with Pompilidae photos, immediately recognized on inaturalist.org a highly atypical host spider for *Tachypompilus ferrugineus*, a species he has been studying since 1973 (Kurczewski 1981, 1989, 1990, 2010; Kurczewski and Edwards 2012; Kurczewski et al. 2017). N. R. Jenzen-Jones, Churchlands, Australia had taken four photographs of the female wasp transporting an immobilized spider up the exterior stucco wall of a house in San Pablo Etla, Oaxaca, Mexico. When contacted about use of his photographs, Jenzen-Jones sent us high resolution images for publication. The first author sent the photographs to six arachnologists and two of them, Rick West, Sooke, BC, Canada and Sarah Crews, California Academy of Sciences, San Francisco, CA replied with the correct family and genus identification—Selenopidae and *Selenops* sp. Sarah Crews, an authority on the family Selenopidae, further indicated the species was likely *Selenops mexicanus* Keyserling, a common species in the region in the *S. mexicanus* group (Crews 2011). She sent the first author via emails extensive information and references on this species. The second author, an authority on spiders belonging to the suborder Mygalomorphae, formulated Table 1 in Excel and configured Figure 1. The second and third authors re-configured Figure 2 from a photograph sent by the fourth author. The first author, using the literature at his disposal and information from his three co-authors, wrote the text. Images of specimens of the largest females of *Selenops mexicanus* from the American Museum of Natural History, New York, NY and Museum of Comparative Zoology, Harvard University, Cambridge, MA were measured for body length with a scale bar using Fiji software at the California Academy of Sciences by Sarah Crews.

## Results

A new host family, Selenopidae, and *Selenops* sp., probably *mexicanus* Keyserling, is introduced for *T. ferrugineus* based on four online photographs taken at San Pablo Etla (Valles Centrales region), Oaxaca, Mexico, 6 August 2020, by N. R. Jenzen-Jones (Fig. 1). *Selenops mexicanus* is quite common and one of the most widespread species of selenopids occurring naturally from northern Mexico to Colombia, Ecuador and the Galapagos Islands (Crews 2011). This species lives underneath rocks, bark, concrete blocks and other debris, on fence posts, in and on houses, and on trees and banana plants during the day and night (Crews 2011). *Selenops mexicanus* females can attain a body length of ~15 mm (Crews 2011). Nine of the largest females in the American Museum of Natural History and Museum of Comparative Zoology insect collections averaged 15.64 mm (14.14–16.41) in body length (S. C. Crews, pers. obs.).

*Selenops* Latreille species are frequently found on vertical surfaces, especially on or beneath the bark of upright tree trunks on which they are highly camouflaged. These spiders are exceedingly rapid in their predatory and escape movements and difficult to capture, the probable reason for the scarcity of Selenopidae host records. There is a South American record of a *Tachypompilus* sp., either *T. erubescens* (Taschenberg) or *T. xanthopterus* (Rohwer), two species that typically capture Sparassidae, a look-alike but unrelated spider family (Wheeler et al. 2017), preying on *Selenops* sp. and nesting in a wall crevice (Kurczewski et al. in prep.). The spider captured by *T. ferrugineus* in Oaxaca, Mexico may have been flushed from its retreat on the outside of the house where the wasp nested, knocked or dropped to the ground when attacked by the wasp, chased, captured and stung. The wasp, with spider in tow, traveled a distance of 3 m from the ground where she probably captured and stung her prey to her nest in a gap between the wooden planking and stucco wall beneath the house roof (Fig. 2).

Carriage of the spider by the wasp was typical *T. ferrugineus* prey transport (Kurczewski and Edwards 2012; Kurczewski et al. 2017). The wasp grasped the immobilized spider's right pedipalp at the apex of the femur with her mandibles and pulled it backwards, dorsal side upward, up the exterior stucco wall of the house (Fig. 1, 2). The body length of the wasp was 1.08 times longer than that of the spider, supporting the 1:1 body length ratio of many large-size spider wasps and their large-size cursorial host spiders (Kurczewski and Kiernan 2015). In that study *T. ferrugineus* females averaged 197.5 mg in (wet) body weight and their host spiders, 492.5 mg or ~2.5 times as much (Kurczewski and Kiernan 2015). To haul a spider weighing perhaps three times as much a distance of 3 m, mostly up a vertical wall, was a monumental task for the wasp!

## Discussion

Selenopidae is the eighth host spider family associated with *T. ferrugineus*. Four of the host spider families of *T. ferrugineus*, Zoropsidae, Agelenidae, Sparassidae and, now, Selenopidae, are probably incidental prey captures, as indicated by their low numbers (Table 1)—apparently, these spiders were simply in the wrong place at the wrong time. The four other host spider families of *T. ferrugineus*, Lycosidae, Pisauridae, Trechaleidae and Ctenidae, are typical prey captures based on geography (Table 1; Kurczewski et al. 2020). These four families of cursorial-hunting spiders are in the superfamily Lycosoidea (Griswold 1993; Polotow et al. 2015; Piacentini and Ramirez 2019) and, combined, represent 1763/1802 prey captures (97.8%) of the known total host records for *T. ferrugineus* (Table 1). *Tachypompilus ferrugineus* could, therefore, be labeled as being oligophagous on species of Lycosoidea.

## Acknowledgments

We thank Matthias Buck, Royal Alberta Museum, Edmonton, AB; Elijah Talamas, Florida Department of Agriculture and Consumer Services, Gainesville, FL; and Kevin Williams, California Department of Food and Agriculture, Sacramento, CA for reviewing the manuscript. Marshal Hedin, San Diego State University, San Diego, CA, and Jorge Mendoza, Instituto de Biología, UNAM, Mexico City, Mexico aided in the identification of the spider species.



**Figure 2.** Route traveled (black line with arrow) by *Tachypompilus ferrugineus* female with immobilized *Selenops* sp., probably *S. mexicanus*, adult or subadult female, up the exterior stucco wall of a house to her nest in a gap between the wooden planking and stucco wall beneath the house roof. Photograph: N. R. Jenzen-Jones, Churchlands, Western Australia 6018, Australia.

## Literature Cited

- Colomo de Correa MV. 1987 [1985].** Revisión de las avispas argentinas del género *Tachypompilus* Ashmead (Hymenoptera: Pompilidae). *Revista de la Sociedad Entomológica Argentina* 44: 201–237.
- 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.
- 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. 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.



- Griswold CE. 1993.** Investigations into the phylogeny of lycosoid spiders and their kin (Arachnida: Araneae: Lycosoidea). *Smithsonian Contributions to Zoology* 539: 1–39.
- 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 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. 2010.** Prey and nesting behavior of some North American spider wasps (Hymenoptera: Pompilidae). *North-eastern 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, Stoll JW, West RC, Kissane KC, Cobb NS. 2020.** 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, Waichert C, Pitts JP, Kissane KC, Ubick D. In preparation.** New and unusual host records for North American and South American spider wasps (Hymenoptera: Pompilidae).
- Piacentini L, Ramirez M. 2019.** Hunting the wolf: A molecular phylogeny of the wolf spiders (Araneae, Lycosidae). *Molecular Phylogenetics and Evolution* 136: 227–240.
- Polotow D, Carmichael A, Griswold CE. 2015.** Total evidence analysis of the phylogenetic relationships of Lycosoidea spiders (Araneae, Entelegynae). *Invertebrate Systematics* 29: 124–163.
- Strandtmann RW. 1953.** Notes on the nesting habits of some digger wasps. *Journal of the Kansas Entomological Society* 26: 45–52.
- Wheeler WC, Coddington JA, Crowley LM, Dimitrovc D, Goloboff PA, Griswold CE, Hormiga G, Prendini L, Ramirez MJ, Sierwald P, Almeida-Silva L, Alvarez-Padilla F, Arnedo MA, Silva LRB, Suresh P, Benjamin SP, Bond JE, Gris-mado CJ, Hasand E, Hedin M, Izquierdo MA, Labarque FA, Ledford J, Lopardo L, Maddison WP, Miller JA, Piacentini LN, Platnick NI, Polotow D, Silva-Davila D, Scharff N, Szüts T, Ubick D, Vink CJ, Wood HM, Zhang J. 2017.** The spider tree of life: phylogeny of Araneae based on target-gene analyses from an extensive taxon sampling. *Cladistics* 33: 574–616.

Received October 7, 2020; accepted October 22.

Review editor Elijah Talamas.