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New host records for Nearctic and Neotropical  
spider wasps (Hymenoptera: Pompilidae)

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# New host records for Nearctic and Neotropical spider wasps (Hymenoptera: Pompilidae)

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**Abstract.** We present new and atypical host records for 78 species, subspecies, species-groups, and variants of spider wasps (Hymenoptera: Pompilidae) from North America and South America. The records are listed in modified taxonomic order following the Catalog of Hymenoptera in America North of Mexico, Volume 2, Apocrita (Aculeata) (Krombein 1979). These records are an extension of previous host records reported by Kurczewski (2010), Kurczewski and Edwards (2012), and Kurczewski et al. (2017, 2020, 2022b). New genus and species host records are given for the genera and subgenera *Calopompilus* Ashmead, *Chirodamus* Haliday, *Pepsis* Fabricius, *Hemipepsis* Dahlbom, *Priocnessus* Banks, *Entypus* Dahlbom, *Pompilocalus* Roig-Alsina, *Priocnemis* Schiödte, *Auplopus* Spinola, *Ageniella* Banks, *?Aridestus* Banks, *Agenioideus* (*Agenioideus*) Ashmead, *Sericopompilus* Howard, *Episyrus* Schiödte, *Poecilopompilus* Ashmead, *Tachypompilus* Ashmead, *Lophopompilus* Radoszkowski, *Notiochares* Banks, *Arachnoproctonus* Howard, *Anoplius* Dufour, *Xerochares* Evans, *Ammosphex* Wilcke, *Arachnospila* Kincaid, and *Priochilus* Banks. New host families are presented for species of *Chirodamus* (Pycnothelidae), *Pepsis* (Actinopodidae, Idiopidae, Lycosidae), *Priocnessus* (Lycosidae), *Pompilocalus* (Barychelidae), *Priocnemis* (Araneidae), *Ageniella* (Trechaleidae), *?Aridestus* (Theraphosidae), *Agenioideus* (*Agenioideus*) (Pimoidae), *Tachypompilus* (Theraphosidae, Amaurobiidae, Sicariidae), *Lophopompilus* (Tracheleidae), *Arachnoproctonus* (Theraphosidae), and *Anoplius* (Corinnidae, Cybaeidae). First-time host spider families are introduced for *Chirodamus hirsutululus* (Spinola) (Pycnothelidae), *Pepsis albocinta* Smith (Actinopodidae), *P. elevata* Fabricius (Theraphosidae, Lycosidae), *P. plutus* Erichson (Theraphosidae), *P. amyntas* Mocsáry (Actinopodidae), *P. ?chrysoptera* Burmeister (Pycnothelidae), *P. viridisetosa* Spinola (orange-winged variant) (Theraphosidae); *Priocnessus apache* Banks (Agelenidae), *P. nebulosus* (Lycosidae), *P. nuperus* (Cresson) (Agelenidae, Lycosidae), *Entypus velutinus* (Taschenberg) (Ctenidae), *Pompilocalus nemequene* Roig-Alsina (Barychelidae), *Priocnemis* sp. (Araneidae), *Auplopus comparatus* (Smith) (Sparassidae), *Ageniella* (*Ageniella*) *coronata* Banks (Gnaphosidae), *Ageniella* (*Ageniella*) *cupida* (Cresson) species-group (Agelenidae), *Ageniella* (*Ameragenia*) *sanguinolenta* (Smith) (Trechaleidae), *?Aridestus bergi* (Holmberg) (Theraphosidae), *Agenioideus* (*Agenioideus*) *humilis* (Cresson) (Pimoidae), *Poecilopompilus costatus* (Taschenberg) (Araneidae), *P. familiaris* (Banks) (Thomisidae), *P. fervidus* (Smith) (Araneidae), *Tachypompilus ferrugineus* (Amaurobiidae), *T. pallidus* (Banks) (Theraphosidae), *T. unicolor cerinus* Evans (Sicariidae), *Tachypompilus* sp. (Theraphosidae), *Anoplius* (*Lophopompilus*) *carolina* (Banks) (Trachelidae), *Anoplius* (*Notiochares*) *triquetrus* (Fox) (Lycosidae), *Anoplius* (*Arachnoproctonus*) *vividus* (Smith) (Theraphosidae), *?Anoplius* (*Anoplius*) *imbellis* Banks (Cybaeidae), *Anoplius triquetrus* (Fox) (Lycosidae), *Anoplius* sp. [undescribed] (Corinnidae), *Arachnospila imitatrix* Wahis or *A. trochilinus* (Holmberg) (Lycosidae), *A. titicacaensis* (Strand) (Lycosidae), and *Priochilus regius* (Fabricius) (Cyrtoucheniidae). Actinopodidae (mouse spiders), Idiopidae (true trapdoor spiders), Sicariidae (recluse and violin spiders), Cybaeidae (water spiders), and Pimoidae are reported as first-time pompilid host spider families. Our new records on nesting behavior and host spiders for the diverse family Pompilidae highlight the valuable information provided by citizen science and the use of such platforms as iNaturalist.org.

**Key words.** Citizen science, Actinopodidae, Idiopidae, Sicariidae, Cybaeidae, Pimoidae, *Pepsis*, *Priocnessus*, *Ageniella*, *Poecilopompilus*, *Tachypompilus*, *Anoplius*.

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## Introduction

Spider wasps (Hymenoptera: Pompilidae) typically capture and provision their nests with a single paralyzed spider. Their long legs and relatively long wings allow them to run and fly rapidly across short distances in search of prey. A female spends much time searching on the ground, vegetation, a web, or, rarely, in water for a suitable host spider. Once the spider is found, the wasp subdues it with one or more stings to the underside of its cephalothorax, cleans herself, and waits for the paralyzing effect of the venom to act. She periodically examines the spider with her antennae and mouthparts, inspecting the degree of the paralysis. Sometimes, she feeds on fluids exuding from the spider's mouthparts or the sting puncture. Size equivalence between spider wasp and spider provides the more rapid and instinct-driven hunting wasp an advantage in outmaneuvering and subduing the spider. After preening and resting temporarily, the provisioning wasp transports the spider to a temporary holding place in most Pompilini or takes the host directly to a previously prepared nest-cell in many Pepsini and Ageniellini (Kurczewski et al. 2020). She places the paralyzed spider in a certain position in the cell and lays an egg in a species-specific site on the spider's abdomen (Evans 1953; Evans and Yoshimoto 1962). She then closes the nest, often a burrow, with fill and, depending on the species, may conceal the site with soil or plant material. Her egg hatches in a few days, the young wasp larva's mandibles readily penetrate the thin exoskeleton of the spider's abdomen, and the larval wasp begins feeding at its attachment site. 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 a year later (Evans 1953; Evans and Yoshimoto 1962; Kurczewski et al. 2022b).

Spider wasps can be separated into genera and species that are highly specific in host selection, usually at the spider family, rarely genus or species level (Kurczewski et al. 2022b). Many other spider wasp species are narrowly to broadly polyphagous in host selection, capturing many families of spiders within a certain habitat, but usually distinguishing web-makers from ground dwellers. These spider wasps could be called spider "ecologists" rather than spider "taxonomists." Evans and Yoshimoto (1962) provided the first major study of spider wasps and their host spiders in the Western Hemisphere. Kurczewski and Kurczewski (1968), Krombein (1979), and Wasbauer and Kimsey (1985) followed suit with sizeable host record documents on Nearctic spider wasps. Early 21<sup>st</sup> century papers on spider wasp host selection in the Americas are those by Cambra-Torok et al. (2004), Wilson and Pitts (2007), Kurczewski (2010), Kurczewski and Edwards (2012), and Kurczewski et al. (2013, 2017). This paper represents a continuation of recently completed studies on host selection, ecology, and nesting behavior of Western Hemisphere spider wasps by Kurczewski et al. (2020, 2022b). The present work highlights the contribution from citizen scientists to the knowledge of biodiversity, having numerous records described from shared observations on social networks. It contains a substantial amount of new host selection information on a variety of pompilid species from North America and South America mainly provided by records from citizen science, a practice that engages scientists and non-professionals in authentic scientific research to generate data on biodiversity (Dickinson et al. 2012). In this paper we concentrated on species of unidentified Neotropical species for which there were no prior host records and, therefore, it was necessary to identify both spider wasp and host spider.

## Materials and Methods

We located, identified, and associated 78 species, subspecies, species-groups, and variants of spider wasps and their new and unusual host spiders from North America and South America. Host records were primarily obtained from active online platforms including BugGuide (<https://bugguide.net>), Facebook (<https://www.facebook.com>), Flickr (<https://www.flickr.com>), iNaturalist (<https://www.inaturalist.org>), and Instagram (<https://www.instagram.com>) with support photographs, emails, and telephone conversations from and with many of the photographers. Other spider wasp host records were acquired from the University of Guelph Insect Museum,

Guelph, Ontario, Canada. Several individuals from Mexico, Central America, and South America sent us pompilid host records and their names are credited with the individual spider wasp and spider species.

The species of spider wasps are presented in taxonomic order following their arrangement in the Catalog of Hymenoptera in America North of Mexico, Volume 2, Apocrita (Aculeata) (Krombein 1979) with additions and emendations from Vardy (2000, 2002, 2005) and Waichert et al. (2015). The spider wasp species were identified by Frank E. Kurczewski; Cecilia Waichert; James P. Pitts, Utah State University, Logan, Utah; and Steve Marshall, University of Guelph, Guelph, Ontario, Canada. Matthias Buck, Royal Alberta Museum, Edmonton, Alberta, Canada; Roberto A. Cambra-Torok, Universidad de Panama, Chitré, Panama; M. Virginia Colomo de Correa, Universidad Nacional de Tucumán, San Miguel de Tucumán, Argentina; Fernando Fernández, Universidad Nacional de Colombia, Bogotá, Colombia; and Arturo Roig-Alsina, Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina, sent us taxonomic revisions and species lists from Central America or South America that aided in identification. We concluded that much more sampling and study is required to resolve taxonomic issues and intraspecific variation in the South American *Pepsis* Fabricius species.

The families of spiders listed under the various spider wasp species are arranged in modified taxonomic order following the World Spider Catalog (2020). The host spiders were identified by Rick C. West; Diana Fernanda Silva Davila, UNMSM, Lima, Peru; Nelson Ferretti, CERZOS-CONICET, UNS, Bahia Blanca, Argentina; Christian J. Grismado, CONICET, Buenos Aires, AR; Luciano Peralta, Mar del Plata, Argentina; Jaime Pinzon, Natural Resources Canada–Canadian Forest Service, Edmonton, Alberta, Canada; Stuart Longhorn, Arachnology Research Association, United Kingdom; Cristina Rheims, Laboratório Especial de Coleções Zoológicas, São Paulo, Brazil; Rogerio Bertani, IBB, São Paulo, Brazil; Richard Bradley, The Ohio State University, Columbus, OH; Rod Crawford, Burke Museum, University of Washington, Seattle, WA; Sarah C. Crews, California Academy of Sciences, San Francisco, CA; Glavis B. Edwards, Arachnida & Myriapoda, Florida State Collection of Arthropods, Gainesville, FL; Pablo A. Goloboff, CONICET, Buenos Aires, Argentina; Marshal Hedin, San Diego State University, San Diego, CA; Jorge Mendoza, Instituto de Biología, UNAM, Mexico City, Mexico; Daniela T. Candia Ramírez, Colección Nacional de Arácnidos (CNAN), Departamento de Zoología, Instituto de Biología, UNAM, Mexico City, MX; Pablo Scazzina, Antonio Tosto, Las Galeras, Samaná, Dominican Republic; Darrell Ubick, California Academy of Sciences, San Francisco, CA; Carlos Viquez, Investigador Arácnidos, National System of Conservation Areas (SINAC), San José, Costa Rica (Araneidae); and Josh Vlach, Oregon Department of Agriculture, Salem, OR.

Frank E. Kurczewski, with assistance from Rick C. West and Cecilia Waichert, wrote the manuscript. The locality, date of observation/image/video or collection, time of observation, type of habitat, if known, and name of observer/photographer or collector are given for each spider wasp–spider host record. The state or country with the exact locality are alphabetized or regionalized under the individual pompilid species. States in the United States of America are alphabetized and appear before foreign countries which are alphabetized by country, state, arrondissement, department or province and locality. Rick C. West and Frank E. Kurczewski selected the most interesting and colorful photographs from which Rick C. West configured Plates 1, 2, and 3. Permission was obtained from each photographer to include their respective photograph(s) in this publication. Rick C. West and Frank E. Kurczewski wrote the captions for each figure.

## Results and Discussion

Family Pompilidae

Subfamily Pepsinae

Tribe Pepsini

*Calopompilus pyrrhomelas* species-group (Townes 1957)

### *Calopompilus pyrrhomelas* (Walker)

CALIFORNIA: Alameda County, Oakland, Buckingham Boulevard; 14 July 2022, 1728 PDT; K. Blackwell. Host: *Calisoga longitarsis* (Simon) (Nemesiidae) [det. M. Hedin], adult or subadult female. Several photographs show

the immobilized funnel-web trapdoor spider lying dorsal side upward near or slightly inside of its burrow with the wasp standing nearby. The wasp, using her mandibles and legs, enticed or extracted the spider from its retreat, grappled with and stung it, then used the spider's burrow as a nest (Blackwell 2022).

MEXICO: Zacatecas State, Susticacán Municipality, El Chiquihuite; 8 July 2023, 1349 CDT; M. Sykes. Host: *Eucteniza ?panchovillai* Bond and Godwin (Euctenizidae), adult female. The wasp walked backwards on the ground, maintaining the immobilized spider ventral side upward, while grasping the patella of its left hindleg with her mandibles. She pulled the spider up a soil embankment holding it dorsal side upwards and sideways, released it on its right side next to its trapdoor, raised the trapdoor with her mandibles and forelegs, and entered the opening upside down. She exited from beneath the flap several seconds later, grasped and pulled the spider, ventral side upward, into its burrow by its spinnerets with her mandibles (Fig. 1; Sykes 2023a, b).

*Calopompilus pyrrhomelas*, a common western states species, is host specific on trapdoor spiders belonging to the families Antrodiaetidae, Euctenizidae, and Nemesiidae (Krombein 1979; Kurczewski et al. 2020, 2022b, 2023). Additional studies of this species confirm that *C. pyrrhomelas* uses the spider's burrow as a nest (Kurczewski et al. 2023).

### ***Chirodamus hirsutulus* (Spinola)**

ARGENTINA: Santa Cruz Province, Río Chico County, Meseta del Lago Strobel; 14 January 2023, 1753 PM; E. Racker. Host: *Acanthogonatus patagonicus* (Simon) (Pycnothelidae), subadult female. The wasp stood atop the trapdoor spider as she stung it in the underside of its cephalothorax, examined it with her antennae and mouthparts, and rested. She then pulled the immobilized spider backwards, dorsal side upward, across the ground, grasping the patella of its right foreleg with her mandibles (Racker 2023).

*Acanthogonatus patagonicus* (Pycnothelidae) is a new host family, genus, and species for *Chirodamus hirsutulus*. This is only the second record of a South American *Chirodamus* Haliday with a host spider, the first prey being a *Lycosa* sp. (Lycosidae) for an unidentified *Chirodamus* sp. in Chile (Kurczewski et al. 2020).

### *Pepsis rubra* species-group (Vardy 2000)

#### ***Pepsis albocincta* Smith (black-winged variant)**

BRAZIL: Minas Gerais State, Betim; 1 December 2020, 14 March 2023; V. F. Rodrigues. Host: ?*Actinopus* sp. (Actinopodidae), adult or subadult female. Photographs show the wasp standing beside or straddling the paralyzed mouse spider, venter to dorsum, while examining it with her antennae as it laid dorsal side upward on the ground. Two videos show the wasp manipulate, then grasp the host spider's leg with the mandibles, and drag the spider backwards (Rodrigues 2023a, b, c, d).

This is the first host record and new host family and genus for *Pepsis albocincta* and indicates a selectivity for species of Actinopodidae (mouse spiders).

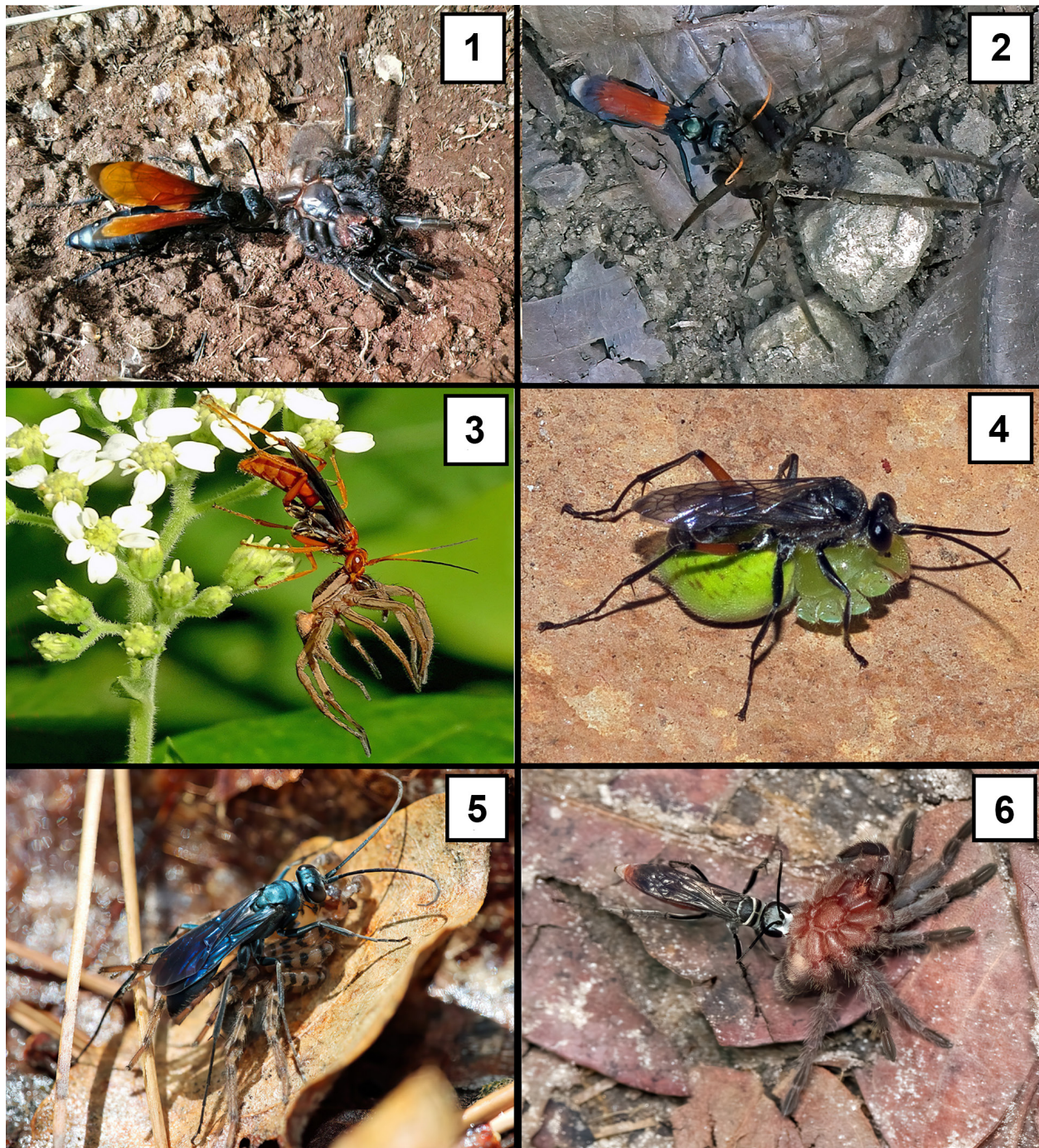
#### ***Pepsis heros* (Fabricius)**

FRENCH GUIANA: Saint-Laurent-du-Maroni, Saül; 20 November 2022; G. Léotard. Host: *Theraphosa blondi* (Latreille) (Theraphosidae) (Goliath birdeater), subadult female. The wasp dragged the paralyzed tarantula backwards across forest floor leaf litter, dorsal side upward, grasping the underside base of its second right leg (Léotard 2022).

This is the second *Pepsis heros* host record for *Theraphosa blondi* from French Guiana (Kurczewski et al. 2020).

#### ***Pepsis petiti* Guérin**

PERU: Chiclayo Province, Lambayeque Department, Chaparri Ecological Reserve; 22 October 2013; C. Díaz. Host: *Tmesiphantes* sp. (Theraphosidae), adult male. The wasp examined the paralyzed tarantula with her antennae as it laid on the ground, dorsal side upward (Díaz 2013).



**Figures 1–6.** Pompilid species with host spiders. 1) *Calopompilus pyrromelas* (Walker) with *Eucteniza ?panchovillai* Bond and Godwin (Euctenizidae), adult female. © Miguee Sykes. 2) *Pepsis cassiope* Mocsáry with *Ancylometes bogotensis* (Keyserling) (Ctenidae), adult or subadult female. © Hilde Vandevoorde. 3) *Priocnessus nuperus* (Cresson) with *Rabidosa punctulata* (Hentz) (Lycosidae), adult or subadult female. © Rachel Miller. 4) *Auplopus comparatus* (Smith) with *Macrinus* sp. (Sparassidae). © Christian Marty. 5) *Ageniella (Ageniella) cupida* (Cresson) species-group with *Coras* sp. (Agelenidae), penultimate male. © Herschel Raney. 6) *?Aridestus bergi* (Holmberg) with unidentified host species (Theraphosidae, Theraphosinae), immature. © Antonino Gonçalves Medina.

*Tmesiphantes* Simon is a new host genus for *Pepsis petittii*. The only previous host record for this pompilid species is for the genus *Linothele* Karsch (Dipluridae) (Kurzewski et al. 2022b).

### ***Pepsis rubra* (Drury)**

DOMINICAN REPUBLIC: San Cristobal; 28 January 2022; A. M. Peguero. Host: *Phormictopus* sp. (Theraphosidae), immature. A series of photographs and a short video show the wasp pulling the paralyzed tarantula backwards up a vertical wooden wall, dorsal side upward, grasping the base of its right pedipalp with her mandibles (Peguero 2022b).

This is the first host record for *P. rubra* from the Dominican Republic and for the genus *Phormictopus* Pocock. Previous host records for *P. rubra* from other Caribbean Islands are for the genus *Cyrtopholis* Simon (Kurzewski et al. 2020).

### *Pepsis elevata* species-group (Vardy 2002)

### ***Pepsis elevata* Fabricius**

BRAZIL: Mato Grosso do Sul State, Bonito; 2 January 2023; C. D. Timm. Host: *Lycosa erythrognathus* Lucas (Lycosidae), adult female. The wasp pulled the paralyzed wolf spider backwards across the ground, dorsal side upward, grasping the base of its left pedipalp with her mandibles (Timm 2023).

Lycosidae is a new host family only for *P. elevata* of 56 other species of *Pepsis* (Kurzewski et al. 2020, 2022b).

BRAZIL: Paraiba State, Santa Rita; 2 December 2021; M. Soares de Lucena. Host: *Acanthoscurria natalensis* Chamberlin (Theraphosidae) [det. R. Bertani], immature. The wasp ran across the ground, chased, grappled with, and stung the tarantula between the third and fourth right coxae. She then, momentarily, examined the immobilized tarantula before dragging it backwards on the ground, dorsal side upward, grasping its right foreleg with her mandibles. The tarantula fell to a ventral side upward position, after which the wasp released her grasp and proceeded to imbibe regurgitated fluid from its mouthparts (Soares de Lucena 2021).

This is the first host record for *Pepsis elevata*.

### ***Pepsis marginata* Palisot de Beauvois**

DOMINICAN REPUBLIC: San Cristobal; 14 January 2022; A. M. Peguero. Host: *Phormictopus* sp. (Theraphosidae), immature [det. A. Tosto]. The wasp dragged the paralyzed tarantula backwards across the ground, dorsal side upward, grasping the base of its right foreleg with her mandibles (Peguero 2022a).

This is the first record of this host association from the Dominican Republic.

### ***Pepsis terminata* Dahlbom**

BRAZIL: Pará State, Novo Progresso; 3 January 2023; T. S. Peper. Host: *Acanthoscurria theraphosoides* (Dole-schall) (Theraphosidae) [det. R. Bertani], adult female. A short video shows the wasp pulling the paralyzed tarantula backwards up a freshly excavated slope, dorsal side upward, grasping the base of its left pedipalp with her mandibles (Peper 2023).

ECUADOR: Napo Province, Tena, Parque Amazonico “La Isla”; 4 October 2022, 1651 PM; E. Hjalmarson. Host: *Acanthoscurria theraphosoides*, adult female. One photograph shows the wasp grasping the tarantula by its second left leg tibia/patella joint with her mandibles as it laid dorsal side upward on the leaf-covered rainforest floor. A second photograph shows the wasp standing in front of the paralyzed tarantula. A third photograph shows the wasp re-grasped the tarantula by the base of its second left leg with her mandibles and pulled it backwards across the ground (Hjalmarson 2022).

*Acanthoscurria theraphosoides* from Brazil and Ecuador is a new host species for *Pepsis terminata*. Species of *Acanthoscurria* are common host spiders for *P. terminata* in Brazil, Ecuador, Martinique, and St. Lucia (Kurzewski et al. 2020, 2022b).



*Pepsis pretiosa* species-group (Vardy 2002)***Pepsis egregia* Mocsáry**

PERU: Madre de Dios Region, Manú Province, Manú National Park, Manú Research Learning Research Center; 5 December 2019; J. Shorma. Host: *Linothele fallax* (Mello-Leitão) (Dipluridae) (curtain web spider), adult or subadult female. “Seen attempting to hunt a *Linothele fallax*. It found the web and ran inside the burrow. Shortly after, the spider ran out and went to safety.” (Shorma 2019).

*Linothele fallax* would be a new host species for *Pepsis egregia* and other species of *Pepsis* Fabricius. *Pepsis completa* Smith and *P. montezuma* Smith reportedly hunt species of ?*Linothele* Karsch in Brazil and Peru, respectively (Kurczewski et al. 2020). *Pepsis petiti* Guérin hunts and captures *Linothele ?uniformis* Droishagen and Bäckstam in Peru (Kurczewski et al. 2022b).

*Pepsis brevicornis* species-group (Vardy 2002)***Pepsis cassiope* Mocsáry**

PANAMA: Panamá Province, Chepo District, San Francisco Reserve; 22 January 2023; H. Vandevoorde. Host: *Ancylometes bogotensis* (Keyserling) (Ctenidae), adult or subadult female. The wasp dragged the paralyzed wandering spider backwards across the ground, dorsal side upward, grasping its chelicerae with her mandibles (Fig. 2; Vandevoorde 2023).

*Pepsis cassiope* host records are for species of Ctenidae, including previous host records of *Phoneutria boliviensis* (F. O. P. Pickard-Cambridge) and ?*Ancylometes bogotensis* (Keyserling) (Kurczewski et al. 2022b).

*Pepsis sumptuosa*-group (Vardy 2002)***Pepsis plutus* Erichson**

BRAZIL: Amazonas State, 40 km N Manaus, INPA Experimental Station - ZF2; 31 January 2023; T. Mahlmann. Host: *Bumba horrida* (Schmidt) (Theraphosidae) (Brazilian redhead tarantula), adult or subadult female. The wasp pulled the paralyzed tarantula backwards across low branches, dorsal side upward, grasping the base of its right foreleg with her mandibles (Mahlmann 2023).

There is a previous host record from French Guiana for *P. plutus* with an armed spider of the genus *Phoneutria* Perty (Ctenidae) (Kurczewski et al. 2022b).

***Pepsis sumptuosa* Smith**

COLOMBIA: Cundinamarca Department, Tequendama Province, San Antonio del Tequendama; 8 October 2021; B. L. C. Bonilla. Host: *Pamphobeteus* sp. (Theraphosidae), adult or subadult female. The wasp dragged the paralyzed tarantula backwards on the ground, dorsal side upward, grasping the base of its left foreleg with her mandibles (Bonilla 2021).

There are several other host records for *P. sumptuosa* from Colombia with various genera of Theraphosidae (Kurczewski et al. 2020).

*Pepsis inclyta* species-group (Vardy 2005)***Pepsis atalanta* Mocsáry**

COSTA RICA: San Jose Province, Cerro de Escazu Protected Zone; 29 March 2023; A. Delgado. Host: *Megaphobema peterklaasi* Schmidt (Theraphosidae), adult or subadult female. The wasp dragged the paralyzed tarantula backwards on the ground, dorsal side upward, grasping the base of its left pedipalp with her mandibles (Delgado 2023a, b).

The only previous host record for *P. atalanta* is *Aphonopelma seemanni* (F. O. P.-Cambridge) (Theraphosidae) (Kurczewski et al. 2020).

### ***Pepsis inclyta* Lepeletier**

ARGENTINA: Misiones Province, Ruiz de Montoya; 12 December 2018; B. Fengler. Host: *Vitalius paranaensis* Bertani (Theraphosidae), subadult female. The wasp struggled to pull the paralyzed tarantula backwards on the ground, dorsal side upward, grasping the base of its left pedipalp with her mandibles (Fengler 2018).

*Vitalius paranaensis* (Theraphosidae) is a new host genus and species for *Pepsis inclyta*. The only previous host record for *P. inclyta* is *Acanthoscurria ?musculosa* Simon (Theraphosidae) (Kurczewski et al. 2020).

### ***Pepsis xanthocera* Dahlbom**

SURINAME: Para District, Zanderij, Palulu Camping Jungle Resort; 1 March 2022; K. Lashley. Host: *Avicularia avicularia* (Linnaeus) (Theraphosidae), male. The wasp initially engaged the wandering pinktoe tarantula in the foliage, then followed it when it defensively dropped to the ground. In the video, the wasp dragged the paralyzed tarantula along the ground, ventral side upward, grasping the base of its left foreleg with her mandibles (Lashley 2022).

Vardy (2005) reported *P. xanthocera* from Muyuna, Napo Province, Ecuador pinned with an *Avicularia* sp. [det. A. Smith].

### *Pepsis menechma* species-group (Vardy 2005)

### ***Pepsis amyntas* Mocsáry**

ARGENTINA: Marcos Juárez Department, Córdoba Province, Cruz Alta; May 2017; G. Paoloni. Host: *Actinopus cordobensis* Río-Tamayo and Goloboff (Actinopodidae), adult female (BL, ~20 mm). A series of six photographs shows the wasp (Fig. 7) attacking the mouse spider as it walked across the grass; (Fig. 8) atop, beside and in front of the spider as she repositioned herself to sting and immobilize it; (Fig. 9) transporting it to its nearby burrow, grasping it with her mandibles by different legs as she moved it; (Fig. 10) positioning its abdomen near the opening; and (Fig. 11) entering its burrow, turning around inside, grasping the immobilized spider by its left hindleg with her mandibles, and (Fig. 12) pulling it slowly into its burrow (Fig. 7–12; Paoloni 2017).

BOLIVIA: Santa Cruz Department, Amboro National Park; February 2014; M. A. Jiménez. Host: *Actinopus ?cochabamba* Ríos-Tamayo, adult or subadult female. The wasp held the paralyzed mouse spider ventral side upward as it laid on the ground, grasping the base of its right rear leg with her mandibles (Jiménez 2014).

*Actinopus ?cochabamba* and *A. cordobensis* (Actinopodidae) are the first host records and new host family, genus and species for *Pepsis amyntas* (Kurczewski et al. 2020, 2022b).

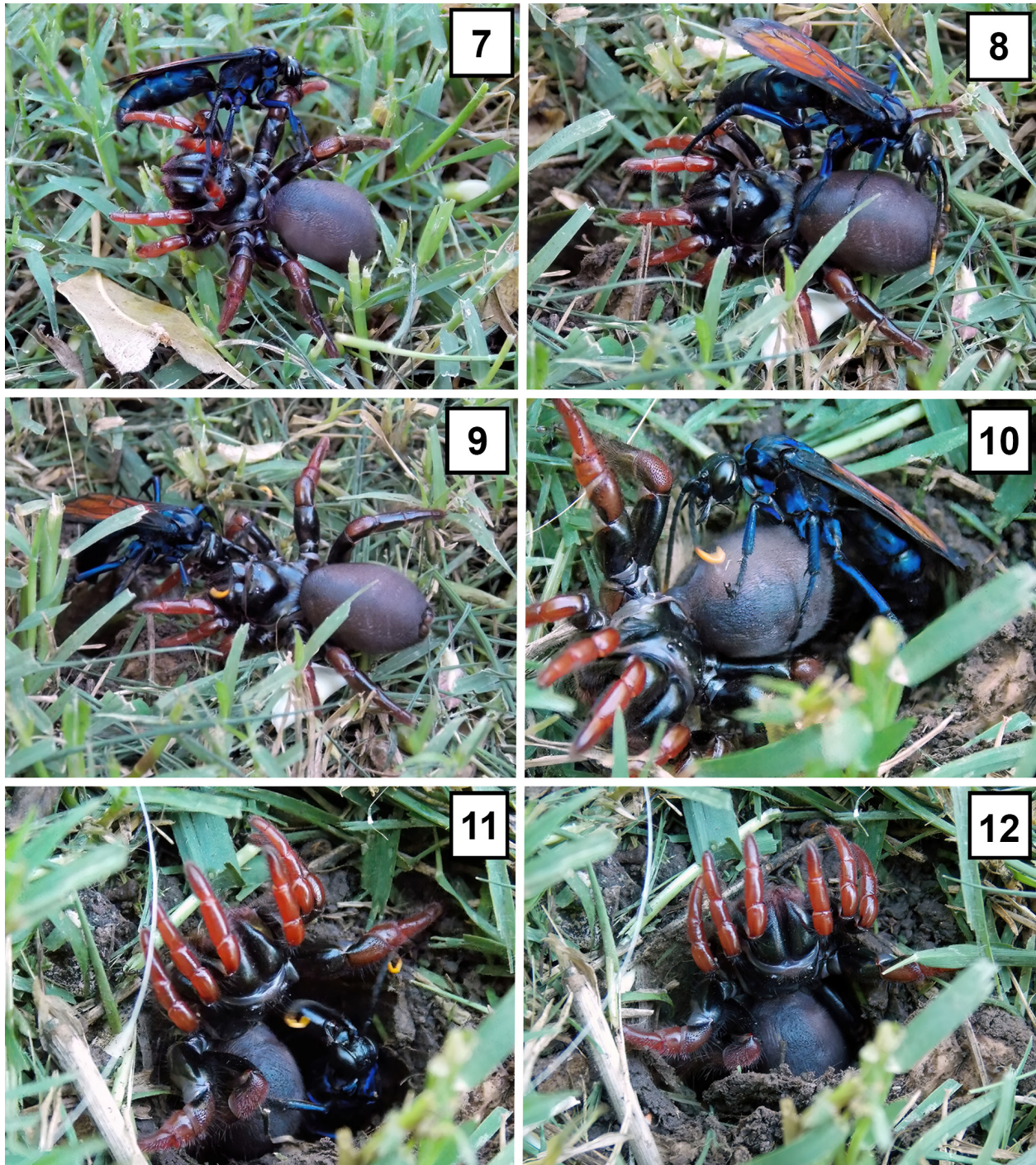
### ***Pepsis basifusca* Lucas (Errata from Kurczewski et al. 2020)**

All host records listed under *Pepsis basifusca* in Kurczewski et al. (2020) represent wasp misidentification. The four wasps are *Entypus* sp., either *E. aratus* (Townes), *E. austrinus* (Banks), or *E. texanus* (Cresson). Three of the host spiders were identified as *Hogna carolinensis* species-group (Lycosidae) and the fourth host spider from Mexico City, Mexico, as unidentified species (Lycosidae). Lycosidae is the predominant host family for species of *Entypus* Dahlbom (Kurczewski et al. 2020, 2022a, 2022b).

### ***Pepsis ?chrysoptera* Burmeister**

BRAZIL: Rio Grande do Sul State, Rio Grande County; 27 August 2017, 1328–1500 PM; V. S. Domingues. Host: Unidentified species (Pycnothelidae) [det. R. Bertani], adult or subadult female. The wasp stung the funnel-web trapdoor spider in its ventral cephalothorax near the base of its left foreleg as it laid on its left side on the bare sand. She then dragged the immobilized trapdoor spider across the sand for 3 m, leaving an impression trail in the sand surface, grasping the base of its left hindleg with her mandibles. She released the funnel-web trapdoor spider on the sand, during transport, and examined it with her antennae (Domingues 2023).

*Pepsis chrysoptera* Burmeister (BL, 21–30 mm; Vardy 2005) captured *Ctenus ?medius* Keyserling (Ctenidae) (BL, ~25 mm) in southeastern Brazil (Luiz 2017; Kurczewski et al. 2020), if the wasp identification is correct (Luiz 2017; Kurczewski et al. 2020). Based on our more recent study of *P. ?chrysoptera* from the same region of Brazil the host spider is a funnel-web trapdoor spider in the family Pycnothelidae (Domingues 2017), a new host family for *P. chrysoptera*.



**Figures 7–12.** *Pepsis amyntas* (Pompilidae) with *Actinopus cordobensis* (Actinopidae). 7–9) After stinging and immobilizing the mouse spider, the wasp transported it to its nearby burrow, grasping it with her mandibles by different legs. © Graciela Paoloni. 10) The wasp dragged the mouse spider to its burrow entrance and positioned it with its abdomen over the open entrance. The trapdoor made of soil, silk, and debris is at the lower right. © Graciela Paoloni. 11–12) The mouse spider is pulled slowly down the open burrow. The wasp’s head and thorax are seen in Figure 11 but not in Figure 12. The trapdoor is seen at the lower right in Figure 12. © Graciela Paoloni.

*Pepsis lampas* species-group (Vardy 2005)***Pepsis varipennis* Lepeletier**

BRAZIL: São Paulo State, Rifaina; 31 August 2021; F. Baraldi. Host: *Vitalius dubius* (Mello-Leitão, 1923) (Theraphosidae), subadult female. The wasp dragged the paralyzed tarantula backwards across the ground and low vegetation, dorsal side upward, grasping the base of its second left leg with her mandibles. She released the spider in the entrance, entered the burrow, reappeared in the entrance, grasped the tarantula in the same manner, and dragged it inside (Baraldi 2021).

There are two previous host records for *P. varipennis*, both species of Theraphosidae (Kurczewski et al 2020). *Vitalius dubius* is a new host genus and species for *P. varipennis*.

*Pepsis montezuma* species-group (Vardy 2005)***Pepsis completa* Smith**

PERU: Madre de Dios Region, Tambopata Province; 3 October 2023, 0741 AM; G. Gallice. Host: Unidentified species of Dipluridae, adult or subadult female. The wasp grasped the immobilized curtain web spider, dorsal side upward, by the base of its second right leg with her mandibles and dragged it backwards across the soil (Gallice 2023).

Although unidentified, Dipluridae from Peru probably represents a new host genus and species for *Pepsis completa*. *Pepsis completa* from Brazil and Venezuela is rather polyphagous in host selection with previous host records for Dipluridae, Pycnothelidae, Nemesiidae, Theraphosidae, and Ctenidae (Kurczewski et al. 2020, 2022b).

***Pepsis montezuma* Smith**

COLOMBIA: Antioquia Department, Puerto Nare; 30 March 2023; H. de la Peña. Host: *Linothele* sp. (Dipluridae), adult or subadult female. The wasp entered and exited a preexisting burrow in the ground while the paralyzed curtain-web spider laid, dorsal side upward, beside the burrow (de la Peña 2023).

This is the first host record for *P. montezuma* from Colombia.

***Pepsis smaragdina* Dahlbom**

BRAZIL: Rio de Janeiro State; Nova Iguaçu; Tinguá Biological Reserve; 16 December 2022; D. Luiz. Host: *Idiops camelus* (Mello-Leitão) (Idiopidae), adult female. The wasp stood beside the immobilized armored trapdoor spider and examined it with her antennae and mouthparts as it laid ventral side upward or on its right side on the ground (Luiz 2022).

The genus *Idiops* Perty has been captured by *Pepsis smaragdina* before in Brazil (Vardy 2005). *Idiops camelus*, however, is a new host species for *P. smaragdina*.

*Pepsis ruficornis* species-group (Vardy 2005)***Pepsis mildei* Stål (orange-winged variant)**

COSTA RICA: Guanacaste Province, Abangares; 24 October 2019, 1013 AM; H. Lopez. Host: *Sericopelma* sp. (Theraphosidae), adult or subadult female. The wasp grasped the immobilized tarantula by its right pedipalp, dorsal side upward, and dragged it backwards across the ground through vegetation (Lopez 2019).

*Sericopelma* is a new host genus for the common spider wasp *Pepsis mildei* (orange-winged variant).

MEXICO: Hidalgo State, El Chico National Park, near Mirador de la Peña viewpoint; 18 July 2023, 1730 CDT; D. Barrales. Host: *Hemirrhagus* sp. (undescribed species) (Theraphosidae) [det. J. Mendoza], adult female. The wasp dragged the paralyzed tarantula backwards across leaf litter, dorsal side upward, grasping the base of its second left leg with her mandibles (Barrales 2023).

Undescribed troglobitic species of *Hemirrhagus* is a new host tarantula species for *P. mildei* (orange-winged variant).

***Pepsis mildei* Stål (black-winged variant)**

HONDURAS: Cortes Department, Cusuco National Park (1300 meters); 25 July 2023; L. Díaz. Host: *Longilyra* sp. (undescribed species) (Theraphosidae) [det. S. Longhorn], adult or subadult female. The wasp struggled to drag the paralyzed tarantula across the ground, dorsal side upward, grasping the base of its right pedipalp with her mandibles (Díaz 2023).

*Longilyra* Gabriel is a new host record, genus, and species for *Pepsis mildei* (black-winged variant).

MEXICO: Yucatan State, Merida; 16 January 2023; C. A. Benitez Rosado. Host: *Tliltocatl epicureanus* (Chamberlin), adult or subadult female. The wasp approached the partly paralyzed tarantula from its right side as it laid, dorsal side upward, on the ground. She walked over the tarantula, grasped its left hind patella with her mandibles, dragged it backwards for a short distance, and released it on the ground on its left side (Benitez Rosado 2023).

*Tliltocatl epicureanus* is a new host species for *Pepsis mildei* (black-winged variant). *Tliltocatl* Mendoza and Francke is a common host genus for this black-winged variant of *P. mildei* in Belize, Guatemala, Honduras, and Mexico (Kurczewski et al. 2020).

***Pepsis ruficornis* (Fabricius)**

PUERTO RICO: Ponce; 20 June 2016; J. A. Torres. Host: *Caribena laeta* (C. L. Koch) (Theraphosidae), immature. The wasp straddled the paralyzed tarantula, venter to dorsum, as it laid on the leaf-littered ground (Torres 2016).

*Caribena laeta* is a new host genus and species for *Pepsis ruficornis* (Kurczewski et al. 2020, 2022b). This tarantula is arboreal and the wasp probably flushed it from its retreat in vegetation. The spider fell to the ground to escape but the wasp followed and captured it.

***Pepsis viridisetosa* Spinola (orange-winged variant)**

FRENCH GUIANA: Cayenne arrondissement, Kourou Commune; 1 October 2017; V. Fogliani. Host: *Avicularia avicularia* (Linnaeus) (Theraphosidae), adult male. After engaging and paralyzing the male tarantula, the wasp dragged the immobilized spider backwards through low vegetation, ventral side upward, grasping its ventral pedicel with her mandibles (Fogliani 2017).

*Avicularia avicularia* is a first-time host record and new host family, genus, and species for *Pepsis viridisetosa*. The male spider wandered in search of a sexually receptive female in her arboreal tubular silken retreat on the side of a tree or human structure near a shaded forest. The wasp likely encountered the male in the above-ground vegetation. The male instinctively dropped to the ground to avoid capture with the wasp in pursuit (West, pers. obs.).

FRENCH GUIANA: Kourou Commune, 40 km S on the bank of the Kourou River; 9 November 2019; F. and J. Launay. Host: *Amazonicus germani* Cifuentes and Bertani (Theraphosidae) (orange tree spider), subadult female. The wasp dragged the paralyzed tarantula backwards up the side of a tree, ventral side upward, grasping the base of its right hindleg with her mandibles (Launay and Launay 2019; J. Launay, pers. comm.).

This is the second host record and new host genus and species for *Pepsis viridisetosa*. The two host records we present for *Avicularia avicularia* indicates this pompilid hunts arboreal theraphosids in their tubular silken retreats on the sides of trees and among leafy foliage above ground.

*Pepsis viridis* species-group (Vardy 2005)

***Pepsis aciculata* Taschenberg**

ARGENTINA: Córdoba Province, San Javier; 18 February 2021; P. Scazzina. Host: *Plesiopelma longisternale* (Schiapelli and Gerschman) (Theraphosidae), adult or subadult female. The wasp examined the paralyzed tarantula as it laid on its left side on the ground. She then dragged the paralyzed tarantula backwards across a dirt road, grasping the base of its right foreleg with her mandibles (Scazzina 2022).

*Pepsis aciculata* has been reported previously with *Plesiopelma longisternale* and *Grammostola vachoni* Schiapelli and Gerschman in Argentina (Copperi et al. 2011).

### ***Hemipepsis toussainti* (Banks)**

MEXICO: Veracruz, Huatusco; 27 June 2020, 1143 CDT; G. U. Tejada Sartorius. Host: *Cupiennius salei* Keyserling (Trechaleidae), adult or subadult male. The wasp pursued the potential host spider on the ground through dense undergrowth (Tejada Sartorius 2020).

Five of six host records for *H. toussainti* from Costa Rica and Mexico are for species of Ctenidae or Trechaleidae, including *Cupiennius* (Kurczewski et al. 2020). There is one other record of *Cupiennius salei* from Pueblo, Mexico (Kurczewski et al. 2020).

### ***Priocnessus apache* Banks**

ARIZONA: Cochise County, SW of Portal, Chiricahua Mountains; 18 September 2022, 1646 MST; L. Nessel. Host: Unidentified species (Agelenidae), adult or subadult female. The wasp straddled the immobilized grass spider, dorsal side upward, grasped its chelicerae with her mandibles, and walked forward across vegetation (Nessel 2022).

UTAH: Utah County, N of Eagle Mountain; 9 July 2020, 0945 MDT; K. Densley. Host: *Agelenopsis* sp. (Agelenidae), adult female (gravid). The wasp just dismounted and is grasping the grass spider by its left chelicera as they laid side-by-side on a concrete sidewalk or patio (Densley 2020).

These are the first host records and new host family and subfamily for *Priocnessus apache*.

### ***Priocnessus nebulosus* (Dahlbom)**

FLORIDA: Okeechobee County, Kissimmee Prairie Preserve State Park; 6 July 2022, 1433 EDT; C. Welch. Host: *Sossipus floridanus* Simon (Lycosidae) [det. G. B. Edwards], adult male. The wasp grasped the immobilized grass spider by its right chelicera and, holding it dorsal side upward, hung downward while grasping an upright twig with her legs. Maintaining this grasp of the spider, she transported it for more than 2 meters across grasses and small woody shrubs and, eventually, into a very small hole into the ground (Welch 2022).

Kurczewski and Kiernan (2015) reported eight host records for five different species of *Agelenopsis* Giebel (Agelenidae) for *Priocnessus nebulosus*, indicating a high degree of prey specificity. *Sossipus floridanus* (Lycosidae) is a new host family, genus, and species for *P. nebulosus*. *Sossipus* Simon is the only wolf spider (Lycosidae) genus that makes a sheet-web with a funnel-shaped retreat, similar to the funnel web of Agelenidae. *Sossipus* is apparently filling an ecological niche in certain areas in replacing *Agelenopsis* as host spider for *P. nebulosus*. The method of prey transport of *P. nebulosus* whereby the wasp straddles the spider, grasps its chelicera with her mandibles, and walks forward on the ground without amputating the prey's legs at the coxa-trochanter joints is a highly unusual method in the Pompilidae (Evans and Yoshimoto 1962; Kurczewski 2010).

### ***Priocnessus nuperus* (Cresson)**

KENTUCKY: Jessamine County, Wilmore; 6 September 2020, 0927 EDT; R. Miller. Host: *Rabidosa punctulata* (Hentz) (Lycosidae), adult or subadult female. The wasp grasped the immobilized wolf spider by the base of its right chelicera, dorsal side upward, with her mandibles while dangling in mid-air by grasping the top of a flowering plant with her legs (Fig. 3; Miller 2020).

This is the first host record and new host family, genus, and species for *Priocnessus nuperus*.

KENTUCKY: Jessamine County, 4 km NW Wilmore; 31 July 2013; R. Miller. Host: *Rabidosa punctulata* (Hentz) (Lycosidae), adult or subadult female. The wasp dragged the paralyzed wolf spider, dorsal side upward, across the ground, grasping the base of a chelicera with her mandibles, interspersed with periodic antenna examinations in the low grasses as the spider laid in a ventral side upward position (Miller 2023).

This is the second host record for *Rabidosa punctulata* at a site a few miles from the first record.

NORTH CAROLINA: Orange County, Brumley Nature Preserve North Section; June 2022; C. Darnell. Host: *Agelenopsis* sp. (Agelenidae), juvenile. The immobilized grass spider laid ventral side upward on a broad leaf above ground level. The wasp had just "incapacitated" it by stinging and is imbibing hemolymph from the sting puncture wound on the underside of its cephalothorax. The wasp is squeezing the underside of the spider's cephalothorax with her mandibles to increase the amount of exuding hemolymph (Darnell 2022).

This is a new host family and genus for *Priocnessus nuperus*.

***Priocnessus prominens* Banks**

COLOMBIA: Magdalena State, Sana Marta County; 14 August 2023, 1130 AM; R. D. Wilcox. Host: Undescribed genus and species (Corinnidae) [det. R. C. West], adult or subadult female. The wasp grasped the immobilized spider by the base of its right chelicera with her mandibles and walked forward across the ground (Wilcox 2023).

Corinnidae is a new host family for *Priocnessus prominens*. Corinnid diversity is high in Colombia and most species remain undescribed (R. C. West, pers. obs.). There are two previous host records of *Priocnessus prominens* from Colombia with unidentified species of Ctenidae (Kurczewski et al. 2020).

***Entypus fulvicornis* (Cresson)**

MISSOURI: Clinton County, Plattsburg; 1 September 2022, 1028 CDT; R. Tharp. Host: *Rabidosa punctulata* (Hentz) (Lycosidae), adult female. The wasp hung upside down from vegetation, grasping the immobilized wolf spider by its left chelicera with her mandibles (Tharp 2022).

OHIO: Wyandot County, Harpster, Killdeer Plains Wildlife Area; 1317 EST; I. Adams. Host: *Tigrosa helluo* (Walckenaer) (Lycosidae), adult or subadult female. The wasp grasped the immobilized wolf spider by its right chelicera and, retaining this grasp, dragged it backwards through dense foliage (Adams 2020).

*Entypus fulvicornis* is usually host specific on large, cursorial-hunting and funnel-web weaving spiders belonging to the families Lycosidae and, rarely, Pisauridae and Agelenidae (Townes 1957; Krombein 1979; Kurczewski and Edwards 2012; Kurczewski et al. 2017, 2020, 2022). *Rabidosa punctulata* and *Tigrosa helluo* are new host lycosid species for *E. fulvicornis* which often captures *Rabidosa rabida* (Walckenaer) (Kurczewski et al. 2017, 2020).

***Entypus unifasciatus californicus* (Townes)**

MEXICO: Baja California Sur State, La Paz; 17 September 2022, 0925 MDT; C. Lim. Host: *Olios giganteus* Keyserling (Sparassidae), adult or subadult female. A series of photographs shows the wasp (1) atop the dorsal side upward giant crab spider in a stinging posture; (2) examining the immobilized spider with her antennae as it lies, dorsal side upward, on the ground surface; and (3) dragging the spider, dorsal side upward, backwards across the ground, grasping its right chelicera with her mandibles (Lim 2022).

This is only the second record of an *Entypus unifasciatus californicus*-*Olios giganteus* host association from the Baja California Peninsula, Mexico. Sparassidae is a rare host family (3.1%) for *Entypus unifasciatus* (Kurczewski et al. 2022a).

***Entypus unifasciatus cressoni* (Banks)**

ARIZONA: Cochise County, Huachuca Mountains, Scotia Canyon, Elevation 5980'; 16 April 2023; C. W. Melton. Host: *Schizocosa mccoocki* (Montgomery) (Lycosidae), adult female. A large wolf spider ran out from a clump of dried grass onto a dirt road pursued by the spider wasp. A minute later two female spider wasps were observed fighting over possession of the paralyzed wolf spider, using their legs and mandibles. Eventually, one wasp left and the remaining wasp dragged the wolf spider into a hole at the base of a clump of grass. She grasped the spider, dorsal side upward, by its right pedipalp and walked backwards to the opening. The nest entrance was not closed and over the next few days this female entered and left the nest repeatedly inferring she roosted in the nest at night (Melton 2023).

*Schizocosa mccoocki* is a previously reported host spider for *Entypus unifasciatus cressoni* (Kurczewski et al. 2022a). This observation substantiates that *E. unifasciatus cressoni* makes multi-celled nests in soil cavities concealed among rocks, entangled rootlets, and other vegetation (Kurczewski et al. 2022a).

MEXICO: Sonora State, Agua Prieta/Cabullona; 9 July 2022, 1758 MST; H. D. Pinto Santana. Host: *Syspira* sp. (Miturgidae) [det. D. T. Candia Ramírez], adult female. Two photographs show the wasp examining the immobilized spider with her antennae as it laid dorsal side upward on the sand with its legs spread outward; and the wasp dragging the immobilized spider, dorsal side upward, backwards across sand and stones of a desert, grasping its left pedipalp with her mandibles (Pinto Santana 2022).

*Syspira* sp. (Miturgidae) is an extremely rare host spider for *Entypus unifasciatus cressoni* with only two of

1087 (<0.2%) *E. unifasciatus* host records for this spider genus, both from southern California deserts (Kurczewski et al. 2022a). The genus *Syspira* Simon sorely needs taxonomic revision.

### ***Entypus urichi* (Banks)**

COLOMBIA: Quindío State, La Tebaida County; 12 March 2023, 1414 PM; E. A. Rodriguez. Host: *Phoneutria depilata* (Strand)(Ctenidae), adult or subadult female. The wasp grasped the immobilized armed spider by its left chelicera and dragged it backwards, dorsal side upwards, through dense grasses. She paused during transport several times and examined the spider with her antennae (Rodriguez 2023).

*Phoneutria depilata* is a new host species for *E. urichi*. Previous host records for this species from Colombia include unidentified species of Ctenidae and Lycosidae, *Phoneutria boliviensis* (F. O. Pickard-Cambridge), and *P. fera* Perty (Kurczewski et al. 2020, 2022b).

### ***Entypus velutinus* (Taschenberg)**

BRAZIL: Minas Gerais State, Lagoa Formosa; 1 July 2014, 1615 PM; L. Rabelo de Almeida. Host: *Phoneutria nigriventer* (Keyserling) (Ctenidae), adult or subadult female. The wasp stood beside and examined the immobilized Brazilian wandering spider with her antennae as it laid, dorsal side upward, on the ground (Rabelo de Almeida 2014).

BRAZIL: Minas Gerais State, Lagoa Formosa; 29 November 2017, 1745 PM; L. Rabelo de Almeida. Host: *Phoneutria nigriventer*, adult or subadult female. The wasp stood next to and examined the immobilized Brazilian wandering spider with her antennae and mouthparts as it laid, dorsal side upward, on the ground and dragged it backwards, dorsal side upward, grasping its right chelicera with her mandibles (Rabelo de Almeida 2017).

*Phoneutria nigriventer* (Ctenidae) is the first host record and new host family, genus, and species for *Entypus velutinus*.

### ***Entypus* sp.**

ARGENTINA: La Pampa; 4 April 2020; U. S. Zaldua. Host: *Polybetes pallidus* Mello-Leitão (Sparassidae), adult or subadult female. The wasp pulled the paralyzed huntsman spider backwards across the ground, dorsal side upward, grasping the base of its right chelicera with her mandibles (Zaldua 2020).

*Polybetes pallidus* is a new host genus and species for an *Entypus* species in the Americas. Sparassidae is an uncommon host family for *Entypus* in South America (Kurczewski 2020, 2022b).

### ***Pompilocalus nemequene* Roig-Alsina**

COLOMBIA: Risaralda Department. Marsella County, Belalcazar Municipality, Caldas; 24 January 2023, 1437 PM; J. D. Arango. Host: *Strophaeus* sp. (Barychelidae), juvenile. The wasp entered the spider's burrow with the trapdoor partly open and must have enticed or chased the brush-footed trapdoor spider onto the ground surface whereupon she stung and immobilized it. The wasp then grasped the spider by its right hind coxa-trochanter joint with her mandibles and began dragging it backwards across the ground, possibly into its own burrow (Arango 2023a).

*Strophaeus* sp. (Barychelidae) is a new host family and genus for *Pompilocalus nemequene*. Two previous host records for *P. nemequene* from Bolivia and Colombia are for species of Ctenidae (Kurczewski et al. 2020, 2022b).

### ***Priocnemis* sp.**

NICARAGUA: León State, León County; 9 July 2023, 1206 CST; A. Chalatz. Host: *Micrathena funebris* (Marx) (Araneidae), adult female. The wasp held the orb-weaving spider off the ground and ventral side upward, as it walked forward, grasping the base of its third left leg with her mandibles (Chalatz 2023).

Nearctic species of *Priocnemis*, except the subgenus *Priocnemissus* Haupt, are highly polyphagous in host selection capturing small species of nearly every common spider family in North America, including Dysderidae, Linyphiidae, and Theridiidae (Evans and Yoshimoto 1962; Krombein 1979; Kurczewski and Edwards 2012; Kurczewski and Kiernan 2015; Kurczewski et al. 2017, 2020, 2022b). *Micrathena funebris* (Araneidae) is the first North American host record of an orb-weaving spider for a species of *Priocnemis*.



## Tribe Ageniellini

***Auplopus comparatus* (Smith)**

FRENCH GUIANA: Cayenne State, Matoury County; 30 July 2023, 1303 PM; C. Marty. Host: *Macrinus* sp. (Sparassidae), sex undetermined due to detached pedipalps. The wasp straddled the huntsman spider dorsal side upward, grasped its right chelicera with her mandibles, and proceeded forward across the ground (Fig. 4; Marty 2023).

This is the first host record and new family and genus for *Auplopus comparatus*. Prey transport in *Auplopus* Spinola species is always forward and nearly always ventral side upward, the female grasping the spider's spinnerets with her mandibles (Evans and Yoshimoto 1962; Kurczewski et al. 2020, 2022b). Neotropical *Auplopus* diversity is large enough that divergent prey transport behavior is expected in some of the species, as in this observation of *A. comparatus*.

***Auplopus pratens* Dreisbach**

COLOMBIA: Valle del Cauca Department, Cartago County; 23 February 2023; J. D. Arango. Host: *Lyssomanes ?viridis* (Walckenaer) (Salticidae) (magnolia green jumper), adult or subadult female. The wasp held the delimbed paralyzed jumping spider, mainly by its pedicel, venter to venter, on the surface of a large leaf (Arango 2023b).

*Lyssomanes ?viridis* is a new host genus and species for *Auplopus pratens*. Previous host spiders for this spider wasp species from Brazil comprised unidentified species of Salticidae (Kurczewski et al. 2020, 2022b).

***Auplopus* unidentified sp. (Erratum from Kurczewski et al. 2022b)**

PERU: Cusco Department, Manu National Park, Coche Cashu Biological Station; 25 October 2021; P. Bertner. Host: Unidentified species (Salticidae), adult or subadult species. The wasp straddled the immobilized jumping spider, ventral side upward, and grasped its spinnerets with her mandibles. She amputated all but the prey's hind-legs at the coxa-trochanter joints to facilitate forward transport (Bertner 2021).

This species was erroneously identified as *Poecilopompilus mixtus* (Fabricius) in Kurczewski et al. (2022b).

***Ageniella (Ageniella) coronata* Banks**

NEVADA: Washoe County, Reno; 2 July 2023, 1518 PDT; G. R. Newblom. Host: *Scotophaeus blackwalli* (Thorell) (Gnaphosidae), adult female. The wasp stung the ground spider in its cephalothorax near the base of its second left coxa while maintaining a dorsal side upward position as it curved its abdomen and sting underneath the host (Newblom 2023).

*Scotophaeus blackwalli* (Gnaphosidae) is a new host species, genus, and family for *Ageniella coronata*. Prior host records for this species include Lycosidae, Tengellidae, and Clubionidae (Krombein 1979; Kurczewski and Edwards 2012).

***Ageniella (Ageniella) cupida* (Cresson) species-group**

ARKANSAS: Faulkner County, west of Conway; September 2022; H. Raney. Host: *Coras* sp. (Agelenidae), penultimate male, with all appendages intact. The wasp grasped the immobilized grass spider by the base of its right chelicera, dorsal side upward, with her mandibles and walked forward. She may have used her wings to assist in the forward thrust. She paused, dismounted, and examined the spider with her mouthparts and antennae (Fig. 5; Raney 2022).

*Coras* Simon is a new host genus for species in the *Ageniella cupida* species-group. *Ageniella norata* has been reported previously with a juvenile female of Agelenidae with all legs amputated at the coxa-trochanter joints (Kurczewski et al. 2020).

GEORGIA: Whitfield County, west of Dalton; 22 August 2022, 1728 EDT; L. Dasher. Host: *Coras* sp., adult or subadult female, with all appendages intact. The wasp grasped the grass spider by the base of its left chelicera with her mandibles and, straddling it dorsal side upward, walked forward. She used her wings to assist in the forward thrust and in short forward flights (Dasher 2022).

This is the second host record of *Coras* sp. (Agelenidae) for *Ageniella cupida* species-group. The method of prey transport of both spiders was identical.

### ***Ageniella (Ameragenia) sanguinolenta* (Smith)**

COLOMBIA: Valle del Cauca Department, Cartago County; 17 July 2023, 1319 PM; J. D. Arango. Host: Undescribed species (Trechaleidae), immature. The wasp held the immobilized banana spider, dorsal side upward, grasping its left chelicera with her mandibles as she walked forward across dried leaves (Arango 2023e).

COLOMBIA: Valle del Cauca Department, Cartago County; 3 August 2023, 1456 PM; J. D. Arango. Host: Undescribed species (Trechaleidae), adult or subadult female. The wasp straddled the immobilized banana spider, ventral side upward, and grasped its spinnerets with her mandibles as she walked up the vertical substrate (Arango 2023f).

These are the first two host records and new host family, genus, and species for *Ageniella (Ameragenia) sanguinolenta*.

## Subfamily Pompilinae Tribe Pompilini

### **?*Aridestus bergi* (Holmberg)**

BRAZIL: Mato Grosso State, Nova Ubiratã; 16 November 2021; A. G. Medina. Host: Unidentified species (Theraphosidae, Theraphosinae), immature. The wasp dragged the paralyzed immature tarantula backwards on the ground, left side upward, grasping the base of its rear leg with her mandibles (Fig. 6; Medina 2021).

Unidentified theraphosine tarantula is the first host record and new host family and subfamily for the tropical genus *Aridestus* Banks.

### ***Agenioideus (Agenioideus) humilis* (Cresson)**

WASHINGTON: Yakima County, near Goose Prairie, Naches Peak Loop Trail; 22 August 2022; L. Ramseyer. Host: *Pimoida curvata* Chamberlin and Ivie (Pimoidae) [det. R. Crawford], adult female. The wasp dragged the immobilized pimoid spider backwards across bare ground, dorsal side upward, grasping a left leg with her mandibles (Ramseyer 2022).

*Pimoida curvata* (Pimoidae) represents a new host family, genus, and species for *Agenioideus (Agenioideus) humilis*. Pimoidae is a first-time host spider family for the family Pompilidae. The recently reassigned host family Pimoidae Wunderlich is closely related to the family Linyphiidae Blackwall. Linyphiidae is a host family of *Agenioideus (Agenioideus) sericeus* (Vander Linden) in Europe (Gros and Durand 2013).

### ***Sericopompilus apicalis* (Say)**

FLORIDA: Escambia County, Perdido Key; May 2020; E. Blomberg. Host: *Hibana gracilis* (Hentz) (Anyphaenidae), adult or subadult female. The wasp was photographed on white sand, lying sideways atop the garden ghost spider. She was also seen hanging downward on vegetation, grasping the garden ghost spider with her mandibles by the base of a chelicera (Blomberg 2022).

ILLINOIS: Lake County, Illinois Beach State Park; 31 July 2020; S. Ivanov. Host: Unidentified species (Salticidae), adult or subadult female (wasp, 12 mm). The wasp rested on a broadleaf, above ground level, and grasped the jumping spider, dorsal side upward, by the base of a chelicera with her mandibles (Ivanov 2020).

*Sericopompilus apicalis* is strongly polyphagous in host selection, provisioning nests with species of Araneidae, Lycosidae, Oxyopidae, Anyphaenidae, Philodromidae, Thomisidae, and Salticidae (Kurczewski and Edwards 2012).

### ***Episyron biguttatus californicus* (Banks)**

ARIZONA: Pima County, Madera Canyon; 6 September 2017; J. H. Cowles. Host: *Neoscona arabesca* (Walckenaer) (Araneidae), adult female. The wasp examined the immobilized arabesque orbweaver with her antennae as it laid, dorsal side upward, on the substrate (Cowles 2019).

The nominate subspecies, *Episyron b. biguttatus*, has been host-associated with species of *Neoscona* several times (Evans and Yoshimoto 1962; Krombein 1979; Kurczewski and Edwards 2012; Kurczewski et al. 2017). *Neoscona arabesca* is a new host species for *Episyron biguttatus californicus*, although *N. oaxacensis* (Keyserling) is a previous congeneric host record from California (Kurczewski et al. 2017).

### ***Episyron conterminus* Smith**

PERU: Huánuco Region, Puerto Inca Province, Panguana Conservation Area; 21 September 2022, 1624–1700 PM; D. Schulten. Host: *Alpaida bicornuta* (Taczanowski) (Araneidae), adult female, ~8–9 mm. The wasp grasped the immobilized spider by the base of its first or second right leg with her mandibles and, holding it in a perpendicular position, dragged it backwards across the ground, eventually releasing it dorsal side upward in the entrance (Schulten 2022).

*Episyron conterminus* is family-specific on orb-weaving Araneidae in the genera *Acacesia*, *Araneus*, *Argiope*, *Eriophora*, *Eustala*, *Gea*, *Larinia*, *Neoscona* and *Neosconella* (Kurczewski and Edwards 2012; Kurczewski et al. 2013, 2017, 2020). *Alpaida bicornuta* is a new host genus and species for *Episyron conterminus*.

### ***Episyron quinquenotatus quinquenotatus* (Say)**

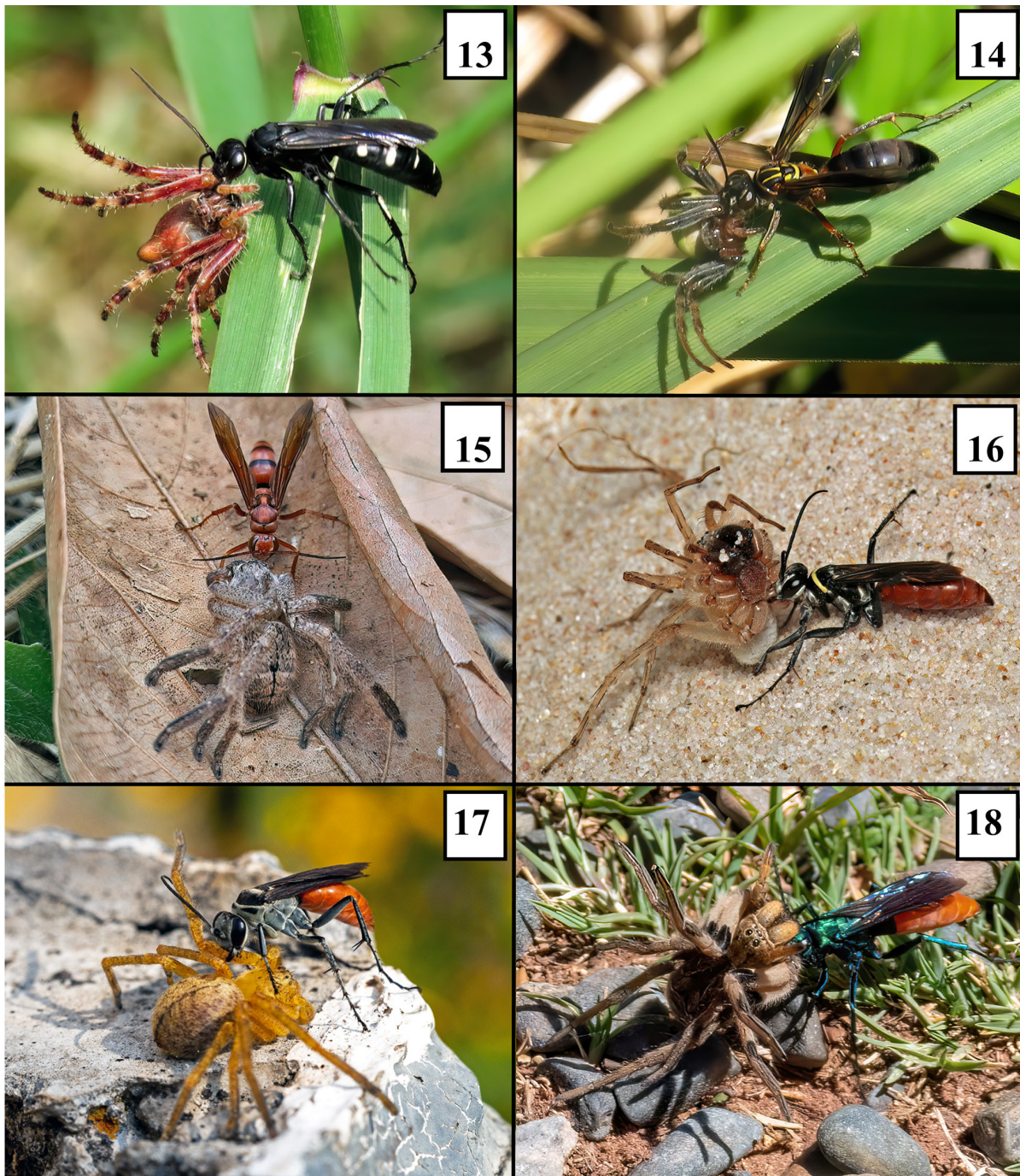
CANADA: Saskatchewan Province, Division No. 18; 10 June 2023; 1525 CST; L. Mikolayenko. Host: *Araneus gemmoides* Chamberlin and Ivie (Araneidae), adult female. The wasp grasped two long thin leaves with its tarsi, above ground level, while holding the immobilized orb-weaver, dorsal side upward, by the base of its left forecoxa with her mandibles (Fig. 13; Mikolayenko 2023).

*Araneus gemmoides* is a new host species for this common spider wasp species. Host records for *Episyron quinquenotatus* are for various genera and species of Araneidae (Evans and Yoshimoto 1962; Kurczewski 2001; Kurczewski and Kiernan 2015).

### ***Poecilopompilus costatus costatus* (Taschenberg)**

BRAZIL: Brasilia, Distrito Federal, Universidade de Brasilia, Campus Darcy Riberio; 26 February 2022; J. P. F. T. Cavalcanti. Host: *Araneus horizonte* Levi (Araneidae), adult female. Capture and immobilization of the host spider was not seen. The wasp cached the paralyzed spider, dorsal side upward with legs spread, on a large broad leaf, many centimeters above the ground. She walked around the spider with wings raised at >45° angle, cleaned her face and mouthparts as they extended downward, and cleaned her stinger with her hind tarsi. She flew to the ground and began loosening the reddish soil surface with her mandibles and moving the soil backwards using her forelegs alternately, depositing the soil in front of the excavation. She continued to use her mandibles considerably to loosen the soil as she dug deeper and raked the soil backwards with the forelegs moving alternately, holding her wings at a 45° angle as she backed from the opening. After several minutes of digging, she paused and flew to the immobilized spider, then to the ground surface holding the orb-weaver, and, without hesitation, dragged it rapidly backwards across the ground and released it on the ground near her burrow, keeping her wings raised at a >45° angle. During transport she held the spider dorsal side upward, grasping the base of its third right leg with her mandibles. She entered and re-inspected the burrow, emerged quickly, grasped the spider with her mandibles by the tibia of its third right leg and pulled it downward into the burrow. It is likely that the wasp grasped the spider by its spinnerets to pull it further down and into the ovoid cell. After several minutes, the wasp appeared headfirst in the burrow as she flung soil backward into the opening, using her forelegs alternately. She finished the nest closure by vigorously hammering the soil fill with the apex of her metanotum, her entire body and wings shaking vigorously in the process (Cavalcanti 2022a, b, c, d).

*Araneus horizonte* is a new host family, genus, and species for *Poecilopompilus costatus*. Martins (1991) reported *P. algidus fervidus* capturing and provisioning nests with *Trichonephila clavipes* (Linnaeus) (Nephilidae) in June and *Parawixia* sp., *Argiope argentata* Linnaeus, and *Araneus* sp. (all Araneidae) later in the year at Rio Claro, São Paulo State, Brazil.



**Figures 13–18.** Pompilid species with host spiders. **13** *Episyron quinquenotatus quinquenotatus* (Say) with *Araneus gemmoides* Chamberlin and Ivie, female. © Linda Mikolayenko. **14** *Poecilopompilus costatus oenochrous* (Schultz) with *Araneus lathyrinus* (Holmberg) (Araneidae), adult or subadult female. © Martin Arregui. **15** *Tachypompilus vulpes* (Dalla Torre) with *Polybetes ?pythagoricus* (Holmberg) (Sparassidae), adult or subadult female. © Paulo Aranã. **16** *Anoplius (Notiochaes) triquetrus* (Fox) with *Pavocosa* sp. (Lycosidae), adult or subadult male. © Alexandre Ferreira Righi. **17** *Xerochaes expulsus* (Schulz) with *Curicaberis minax* (O. Pickard-Cambridge) (Sparassidae), penultimate male. © Georgia Born-Schmidt and M. Schmidt. **18** *Arachnospila titicacaensis* (Strand) with *Hogna ?rufimanoides* (Strand) (Lycosidae), adult or subadult female. © Francesco Romano and Nirvana Angela Marting Vidaurre.

***Poecilopompilus costatus oenochrous* (Schultz)**

ARGENTINA: Buenos Aires Province, Magdalena; 4 December 2022, 3:06 PM; M. Arregui. Host: *Araneus lathyrius* (Holmberg) (Araneidae), adult or subadult female. The wasp stood on a leaf above ground level grasping the immobilized orb-weaver by the base of its left foreleg with her mandibles, retaining it in a perpendicular position (Fig. 14; Arregui 2023).

This is the first host record for *Poecilopompilus costatus oenochrous*, *Araneus lathyrius*, which is the typical host spider family for most species in this genus (Kurczewski et al. 2020, 2022b).

ARGENTINA: Santa Fe Province, Nueve de Julio County; 3 March 2023, 1703 PM; I. M. Churruarin. Host: *Ocrepeira venustula* (Keyserling) (Araneidae), adult female. The wasp, clinging upside down to an upright narrow stem, held the orb-weaver cephalothorax upward, grasping the base of its left foreleg with her mandibles (Churruarin 2023).

*Ocrepeira venustula* (Keyserling) (Araneidae) is a new host genus and species for *Poecilopompilus costatus oenochrous*. This is the second host record for *P. costatus oenochrous*.

***Poecilopompilus familiaris* (Smith)**

PARAGUAY: Guairá State, Independencia District, Salto Suizo; 12 March 2023, 1410 PM; A. Berger. Host: *Misumenops* sp. (Thomisidae), adult or subadult female. The wasp dragged the paralyzed crab spider backwards, dorsal side upward, grasping the base of its left foreleg with her mandibles. She kept her wings raised at more than a 45° angle to her body during transport (Berger 2023).

*Misumenops* sp. (Thomisidae) is the first host record and new family, genus, and species for *P. familiaris*. *Poecilopompilus familiaris* may be one of several Neotropical species of *Poecilopompilus* that specialize in provisioning their nests with crab spiders (Thomisidae) (Kurczewski et al. 2020, 2022b).

***Poecilopompilus fervidus* (Smith)**

ARGENTINA: Buenos Aires Province, Fatima; 26 December 2022, 1109 AM; I. Laravidal. Host: *Parawixia audax* (Blackwall) (Araneidae), adult or subadult female. The wasp grasped the immobilized orb-weaver by the base of its third left leg with her mandibles. She raised and kept her wings at a >45° angle during backward prey transport (Laravidal 2022).

BRAZIL: Mato Grosso State, Cotriguaçu, Fazenda São Nicolau; 3 September 2019, 1644 PM; A. Hopkins. Host: *Parawixia* sp. (Araneidae), adult female. The wasp stood beside the immobilized orb-weaver, with raised wings, as the spider laid dorsal side upward atop a fallen log (Hopkins 2019).

*Parawixia audax* and *P. sp.* (Araneidae) are the first host records and new genus and species for *Poecilopompilus fervidus*.

***Poecilopompilus interruptus* (Say)**

DELAWARE: Sussex County, Ellendale; 18 August 2022, 1623 EDT; E. Green. Host: *Araneus marmoreus* Clerck (Araneidae), adult female. The wasp dragged the marbled orbweaver across a path, dorsal side upward, grasping a leg with her mandibles. She released the spider, dorsal side upward, on the path and examined it with her antennae (Green 2022).

*Araneus marmoreus* is a new host species for *Poecilopompilus interruptus* (Evans and Yoshimoto 1962; Krombein 1979; Kurczewski and Edwards 2012; Kurczewski et al. 2017, 2020, 2022).

FLORIDA: Leon County, Miccosukee Land Cooperative; 26 June 2023, 1916 EDT; T. Kelley. Host: *Trichonephila clavipes* (Linnaeus) (Araneidae), adult or subadult female. The wasp grasped the golden silk orb-weaver by its pedicel with her mandibles (Kelley 2023).

*Trichonephila clavipes* (Araneidae) is a new host genus and species for *Poecilopompilus interruptus* (Evans and Yoshimoto 1962; Krombein 1979; Kurczewski and Edwards 2012; Kurczewski et al. 2017, 2020, 2022).

***Poecilopompilus ?interruptus* (Say)**

PANAMA: Herrera Province, Patria District, Patria; 28 May 2021; A. D. Ortiz. Host: *Cyrtophora citricola* (Forskål) (Araneidae) (tropical tent-web spider), adult or subadult female. The wasp stood above the paralyzed tropical

tent-web spider as it laid dorsal side upward on low vegetation above the ground. She later grasped the spider, ventral side upward, by its foreleg with her mandibles while still on vegetation to move it elsewhere (Ortiz 2021).

*Cyrtophora citricola* is a new host genus and species for *Poecilopompilus ?interruptus* (Kurczewski et al. 2020, 2022b).

### ***Poecilopompilus mixtus* (Fabricius)**

BRAZIL: Rio Grande do Sul State, São Martinho da Serra; 2 February 2009, 1948 EST; P. Reck. Host: *Misumenops callinurus* Mello-Leitão (Thomisidae), adult female. The wasp examined the immobilized crab spider with its antennae and mouthparts as it laid dorsal side upward on a large rock. She grasped the spider by its right pedipalp or chelicera with her mandibles, dorsal side upward, and dragged it backwards across the ground (Reck 2009).

*Misumenops callinurus* is a new host species and uncommon family for *Poecilopompilus mixtus*. *Poecilopompilus mixtus* is unusual among congeners in provisioning nests with immobilized Araneidae or Thomisidae in Brazil, Costa Rica, and Dominican Republic (Kurczewski et al. 2022b).

BRAZIL: São Paulo State, São Sebastião da Grama; 27 March 2023; P. L. C. Dias. Host: *Nephilingis cruentata* (Fabricius) (Araneidae) (African hermit spider), immature. The wasp stood on the ground holding the paralyzed African hermit spider, ventral side upward, grasping its chelicera with her mandibles. The wasp would have found this introduced and established species of spider in its arboreal web, engaged it, and chased it to the ground. (Dias 2023).

*Nephilingis cruentata* is a new host araneid genus and species for *Poecilopompilus mixtus*.

COLOMBIA: Cundinamarca Department, Tena Municipality; 17 July 2022, 1247 PM; D. Amaya. Host: ?*Wagneriana* sp. (Araneidae), adult female. The wasp grasped the immobilized orb-weaver by its left forecoxa-trochanter joint with her mandibles and walked backwards through a tangle of grasses, holding the spider in a cephalothorax upward position (Amaya 2022).

*Wagneriana* sp. (Araneidae), if correct, has been reported once previously for *Poecilopompilus mixtus* from Peru (Kurczewski et al. 2020). This pompilid species preys on a variety of araneid genera and Thomisidae (Kurczewski et al. 2020, 2022b).

COLOMBIA: Valle de Cauca Department, Cartago; 4, 8 June 2023, 1323–1700 PM; J. D. Arango. Host: *Metazygia laticeps* (O. P.-Cambridge) (Araneidae), adult male. The wasp stood atop the surface of a leaf holding the paralyzed orb-weaver, left side upright, grasping the coxal joint of its left foreleg with her mandibles and stood over the immobilized male orb-weaver as it laid ventral side upward (Arango 2023c).

*Metazygia laticeps* is a new host species for *Poecilopompilus mixtus*.

COSTA RICA: Alajuela Province, San Ramón, Soltis Center; 9 May 2022; S. Marshall. Host: *Eustala* sp. (Araneidae) [det. C. Viquez], adult female. There are three photographs of this wasp with an immobilized orb-weaver on a broad leaf plant above ground level. The wasp's wings are held upward at a 45–60° angle above her dorsum. The smaller orb-weaver is retained ventral side upward or on its left or right side. In the first photograph, the wasp is lapping up regurgitated fluid from the spider's mouthparts using her own mouthparts. The second and third photographs show the wasp grasping the coxa-trochanter joint of the spider's left foreleg or second left leg with her mandibles (Marshall 2022; S. Marshall, pers. comm.).

*Eustala* sp. (Araneidae) is reported herein as a new host genus for *P. mixtus*. *Poecilopompilus mixtus* is rather polyphagous in host selection having been photographed or collected with immobilized species of Araneidae in Mexico, Costa Rica, Ecuador, French Guiana, Peru, Puerto Rico, Haiti, and Cuba; and Thomisidae in Costa Rica and Dominican Republic (Kurczewski et al. 2013, 2020, 2022b).

HAITI: Ouest Department, Croix-des-Bouquets Arrondissement, Thomazeau Commune; 11 January 2015; R. Durocher. Host: *Metazygia ?gregalis* (O. P.-Cambridge) (Araneidae) [det. R. C. West, A. Tosto], adult female. The wasp stood beside the paralyzed orb-weaver as it laid, dorsal side upward, on low grasses (Durocher 2015).

*Metazygia ?gregalis*, a new host genus and species for *P. mixtus* from Haiti, was the correct host but wrong location information in Kurczewski et al. (2022b).

### ***Tachypompilus ferrugineus* (Say)**

MARYLAND: Baltimore County, Freeland; 28 August 2022, 1619 EDT; C. Campbell. Host: *Amaurobius ferox* (Walckenaer) (Amaurobiidae), adult female. The wasp grasped the black lace weaver by its right pedipalp with

her mandibles, dorsal side upward, and dragged it backwards across crushed rocks and dried leaves (Campbell 2022).

This is the first host record for *T. ferrugineus* for the family Amaurobiidae of ~3000 Western Hemisphere host records (Kurczewski, pers. obs.). *Amaurobius ferox* is usually found near man-made structures. The host spider prefers dark areas, such as underneath logs or inside cellars, and often lives in moist, shaded crevices underneath stones or dilapidated walls. *Tachypompilus ferrugineus* frequently nests in openings in man-made structures (Kurczewski 2022a).

NEW YORK: Kings County, Brooklyn, Greenwood Heights; 17 August 2022; 1354–1414 EDT; M. Wills. Host: *Tigrosa helluo* (Walckenaer) (Lycosidae) [det. G. B. Edwards], subadult female and juvenile. The first wasp pulled the much smaller *T. helluo* backwards up and over a 1.5 m-high tombstone and disappeared into a shrub behind it. She grasped the spider by its right fore patella with her mandibles while retaining it dorsal side upward throughout the transport. This wasp was twice the body length of the juvenile spider. Twenty minutes later and 70 m away, another wasp attacked and stung a much larger *T. helluo* of equal size, ~20 mm long. She stood on her mid- and hindlegs, positioned her entire abdomen underneath her head and thorax, and stung the spider several times in the underside of its abdomen. The spider staggered away in partial paralysis, probably because it was stung in its abdomen instead of the usual place, in the underside of the cephalothorax near the leg bases. The wasp flew away as the spider continued to walk around in a sluggish manner (Wills 2022a, b, c, d).

*Tigrosa helluo* (Lycosidae) is not a new host record for *Tachypompilus ferrugineus* (Kurczewski et al. 2022). However, the observations of the wasps and host spiders were so unusual that they were deemed recordable. Kurczewski (1989) reported on an aggregation of *T. ferrugineus* that was capturing wolf spiders and nesting underneath an upright cemetery monument in Oakwood Cemetery, Syracuse, NY.

NORTH CAROLINA: Stokes County, Meadows; 12 August 2023; 1920 EDT; C. Hicks. Host: *Agelenopsis naevia* (Walckenaer) (Agelenidae), adult male. The wasp grasped the grass or funnel-weaver spider by its left or right pedipalp with her mandibles and dragged it backwards across mostly barren ground (Hicks 2023).

This is the first *T. ferrugineus* host record for Agelenidae from the eastern United States. Agelenidae is a very rare host spider family for *T. ferrugineus*. We are aware of only five *Agelenopsis* (Agelenidae) host records of ~3000 total host records for this Western Hemisphere spider wasp species, all others being from the western U. S. and Mexico (Kurczewski et al. 2022a, pers. obs.).

VIRGINIA: Henrico County, near Richmond; 21 July 2022, 1056 EDT; A. Harris. Host: *Agelenopsis* Giebel, *Calilena* Chamberlin and Ivie, or *Melpomene* O. Pickard-Cambridge sp. [det. R. Bradley], adult or subadult female. The wasp grasped the grass spider by its right pedipalp with her mandibles and, maintaining it dorsal side upward, dragged it backwards across the ground, stones, pavement, and dried leaves (Harris 2022).

This is only the second agelenid host record for *T. ferrugineus* from the eastern United States of ~3000 host records for this spider wasp species (Kurczewski, pers. obs.).

BRAZIL: Rio de Janeiro State, Itatiaia County; 9 November 2011. 1220 PM; P. Romano. Host: *Enoploctenus cyclothorax* (Bertkau) (Ctenidae) [det. R. Bertani], adult or subadult female. The wasp grasped the left pedipalp of the wandering spider with her mandibles and, maintaining it dorsal side upward, pulled it backwards across a concrete patio or sidewalk (Romano 2011).

This is the third host record for *Enoploctenus cyclothorax* of ~3000 total host records for *Tachypompilus ferrugineus* in the Western Hemisphere. Both males and females of *E. cyclothorax* are captured (Kurczewski 2022b).

BRAZIL: Santa Catarina State, Garopaba County; 20 January 2023, 1647 PM; L. Zanella. Host: *Phoneutria keyserlingi* (F. O. Pickard-Cambridge) (Ctenidae), adult female. The wasp examined the immobilized spider with her antennae from several different positions as it laid on the sand dorsal side upward. She attempted to drag the very large spider backwards across the ground, dorsal side upward, by grasping its left chelicera or left pedipalp with her mandibles. She may have been unable to transport the much larger spider because of its overwhelming size and weight as it continued to lie on the sand (Zanella 2023).

There is one other host record for *Phoneutria keyserlingi* by *Tachypompilus ferrugineus* in Brazil (Kurczewski et al. 2022a). The genus *Phoneutria* Perty is a predominant host genus of *T. ferrugineus* in Brazil (Kurczewski et al. 2022a).

ECUADOR: Pastaza Province, Pastaza Canton; 27 November 2004, 1116 AM; S. H. Brøndum. Host: *Sadala ?rufa* (Keyserling) (Sparassidae), adult or subadult female. The wasp walked backwards up a tree trunk, grasping the left pedipalp of the huntsman spider with her mandibles while retaining it in a dorsal side upward position (Brøndum 2004).

*Sadala ?rufa* (Sparassidae) is a new host genus and species for *T. ferrugineus*. *Tachypompilus ferrugineus* is polyphagous in host selection, capturing mainly lycosoid spiders (Lycosidae, Pisauridae, Trechaleidae, Ctenidae) and, rarely, other cursorial hunting spiders. Sparassidae constituted the host family for *T. ferrugineus* in only 36 (1.6%) of 2300 host records (Kurczewski et al. 2022a).

MEXICO: Chihuahua State, Satevó Municipality; 5 July 2022, 1936 MDT; R. Torres. Host: *Olios giganteus* Keyserling (Sparassidae), adult or subadult female. The wasp grasped the immobilized huntsman spider by its left pedipalp with her mandibles and, retaining it dorsal side upward, walked backwards across a concrete ledge (Torres 2022).

Sparassidae is an uncommon host spider family for *T. ferrugineus* in northern Mexico and is the first such record from the State of Chihuahua (Kurczewski 2022a). There is one record of *Olios giganteus* as host spider of *T. ferrugineus* from south-central Texas and several records from central and southern Mexico (Kurczewski et al. 2022a).

MEXICO: Colima State, Comala; 1 March 2023; C. Joel. Host: *Selenops actophilus* Chamberlin (Selenopidae), adult or subadult female. The wasp straddled the wall crab spider, venter to dorsum, and stung it near its right chelicera and pedipalp. She dismounted and walked around the paralyzed spider, periodically examining it with her antennae, as it laid dorsal side upward on the ground (Castillo 2023).

Selenopidae is a highly unusual host spider family for *T. ferrugineus* (Kurczewski et al. 2022a). This is only the second record for this spider family of ~3000 *T. ferrugineus* host records (Kurczewski, pers. obs.).

MEXICO: Michoacán State, Morelia; 2 July 2022, 1840 CDT; M. Riensche. Host: *Zorocrates fuscus* Simon (Zoropsidae), adult or subadult female. The wasp grasped the immobilized false wolf spider, dorsal side upward, by the tibia of its left foreleg and pulled it backwards across bare soil and a sidewalk (Riensche 2022).

Previous records for *Zorocrates fuscus* as host spider of *T. ferrugineus* from Mexico are from the States of Guanajuato, México, and Oaxaca (Kurczewski et al. 2020, 2022b).

### ***Tachypompilus pallidus* (Banks)**

PERU: Ancash Region, Huaylas Province, 2 km N Caraz; 17 October 2022; J. Ubillas. Host: Unidentified genus and species (Theraphosidae, Ischnocolinae), adult or subadult female. The wasp walked backwards on the ground with the tarantula, grasping the base of the spider's right foreleg with her mandibles (Ubillas 2022).

Theraphosidae and Ischnocolinae are a surprisingly new host family and subfamily for *Tachypompilus pallidus* and the second record of the use of a mygalomorph spider for this spider wasp genus (Kurczewski et al. 2022b).

### ***Tachypompilus unicolor cerinus* Evans**

COLOMBIA: Nariño Department, Samaniego; 23 September 2023. 11:22 PM?; N. Jimenez. Host: Unidentified Sparassidae [det. G. B. Edwards], adult or subadult female. The wasp grasped the immobilized huntsman spider by the end of its left pedipalp with her mandibles, and maintaining it dorsal side upward, pulled it up a stucco wall (Jimenez 2023).

Sparassidae is a rarely captured host family for *Tachypompilus unicolor cerinus* (Kurczewski et al. 2020, 2022b).

MEXICO, Jalisco State, Toluimán; 5 August 2023, 1343 CDT; A. Bastian. Host: *Loxosceles ?colima* Gertsch (Sicariidae), adult male. The wasp grasped the immobilized recluse spider by its right fore trochanter with her mandibles and pulled it backwards up a vertical stucco wall (Bastian 2023).

*Loxosceles ?colima* (Sicariidae) is a new host family, genus, and species for the spider wasp genus *Tachypompilus* (Kurczewski et al. 2020, 2022b). Furthermore, Sicariidae is a first-time host spider family for the family Pompilidae.



***Tachypompilus vulpes* (Dalla Torre)**

BRAZIL: Minas Gerais State; Itambacuri; 12 August 2021; P. Aranã. Host: *Polybetes ?pythagoricus* (Holmberg) (Sparassidae), adult or subadult female. A series of photographs show the wasp positioned in front of the paralyzed huntsman spider as it laid, dorsal side upward, on a fallen leaf and, then, dragging the huntsman spider off the leaf and over low ground vegetation, dorsal side upward, grasping its right pedipalp with her mandibles (Fig. 15; Aranã 2021).

*Polybetes ?pythagoricus* (Sparassidae) is a new host species for *Tachypompilus vulpes*. Four previous host records for this spider wasp species, all from Brazil, indicate that huntsman spiders (Sparassidae) of various genera are the preferred hosts (Kurczewski et al. 2022b). These records reveal the provisioning wasps raising and holding the wings upward and outward at a ~45° angle as in the genus *Poecilopompilus* Howard (Kurczewski et al. 2022b).

***Anoplius (Lophopompilus) carolina* (Banks)**

VIRGINIA: Bedford County, Peaks of Otter Lake, deciduous forest; 7 July 2022, 1406 EDT; M. Mulligan. Host: *Trachelas tranquillas* (Hentz) (Trachelidae), adult female, 10 mm long (wasp, 9 mm long). The wasp dragged the immobilized ground sac spider backwards across the ground, holding it perpendicular to the main axis of her body while grasping it by the coxa of its third or fourth left leg with her mandibles. She released the spider, ventral side upward, on a stone trail and, dorsal side upward, on dried ground litter while she reconnoitered ahead. She arrived at a hole in the soil, possibly a rodent burrow, entered, came out, and pulled in the spider backwards grasping its spinnerets with her mandibles (Mulligan 2022).

Until recently, *Anoplius carolina* was reportedly host specific only on species of Amaurobiidae (Evans 1951; Evans and Yoshimoto 1962; Krombein 1979; Kurczewski and Kiernan 2015; Kurczewski et al. 2017). Then, Kurczewski and West (In Rev.) surprisingly recorded *Anoplius carolina* with an immobilized trapdoor spider, *Antrodiaetus unicolor* (Hentz) complex (Antrodiaetidae). *Trachelas tranquillas* (Trachelidae) is yet another new family, genus, and species for this primarily deciduous forest spider wasp.

***Anoplius (Notiochares) triquetrus* (Fox)**

BRAZIL: Minas Gerais State, Diamantina; 22 July 2023, 1353 PM; A. Ferreira Righi. Host: *Pavocosa* sp. (Lycosidae), adult or subadult male. The wasp grasped the third left coxa of the immobilized wolf spider with her mandibles and dragged in across bare ground, retaining the spider in a perpendicular position relative to the wasp's body position (Fig. 16; Ferreira Righi 2023).

This is the second host record and new host family, genus, and species for *Anoplius triquetrus*. The first observation of *A. triquetrus* implicated the host spider as being an unidentified species of Pisauridae (fishing spider) (Rapoza et al. 2019). Lycosidae and Pisauridae are both families in the superfamily Lycosoidea.

***Anoplius (Arachnoproctonus) ?vividus* (Smith) (det. J. P. Pitts)**

BRAZIL: Amazonas State, Iranduba; 31 December 2022; R. F. Sobreiro. Host: Unidentified species (Theraphosidae), immature. The wasp dragged the paralyzed immature tarantula up the side of a tree, venter to dorsum, grasping its left foreleg with her mandibles (Sobreiro 2022).

The unidentified tarantula represents the first host record and new family, genus, and species for *Anoplius (Arachnoproctonus) ?vividus*.

***Anoplius (Anoplius) fulgidus* (Cresson)**

TEXAS: Wilson County, Floresville; 21 August 2022, 2118 CDT; W. Copas. Host: *Rabidosa rabida* (Walckenaer) (Lycosidae) [det. W. Copas], adult female. Several photographs show the wasp examining with her antennae or standing beside the immobilized rabid wolf spider, which is lying on its right side on fallen dried leaves (Copas 2022).

*Anoplius fulgidus* is a tropical species that enters the extreme southern section of the U. S. (Evans 1951). *Anoplius fulgidus* mainly captures species of Lycosidae but there is a single record of this species with Agelenidae (Kurczewski et al. 2017). *Rabidosia rabida* is a new host species for *A. fulgidus*.

### ***Anoplius (Anoplius) ?imbellis* Banks**

OREGON: Lincoln County, Seal Rock, with a creek at the edge of woodland; 15 July 2022; R. L. Westcott. Host: *Calymmaria suprema* Chamberlin and Ivie (Cybaeidae) [det. J. Vlach, S. C. Crews], adult or penultimate male. The wasp grasped the immobilized water spider, dorsal side upward, by its swollen right pedipalp with her mandibles and dragged it backwards across a porch (Westcott 2022; R. Westcott, pers. comm.).

The family Cybaeidae is reported for the first time as a pompilid host spider. Species of *Calymmaria* are common in cool, damp forests of the West Coast, and their webs can be found along streams (Heiss 2004). *Anoplius imbellis* is particularly abundant on the West Coast (Wasbauer and Kimsey 1985). This spider wasp is quite small, averaging 7.5 (5–10) mm long (Evans 1951). The typical host spider of *A. imbellis*, *Pardosa ramulosa* McCook, lives near water and hunts aquatic insects. *Anoplius imbellis* hunts this spider along the margins of still water. Species of *Pardosa* C. L. Koch have long legs and are called “thin-legged wolf spiders.” *Calymmaria* Chamberlin and Ivie also has long legs and wandering males may visually resemble *Pardosa ramulosa*.

### ***Anoplius* sp. [undescribed]**

BRAZIL: Paraná State, Porto Vitória; 16 April 2023, 0932 AM; C. R. Telles. Host: *Corinna* sp. (Corinnidae), adult female. The wasp examined the immobilized ground sac spider with her antennae and mouthparts, rested on a nearby leaf, and stood beside the spider as it laid dorsal side upward on the ground with legs spread laterally. The wasp then grasped the spider at the base of its second left leg and dragged it backwards across the ground (Telles 2023).

Corinnidae is a highly unusual host spider family for a species of *Anoplius*.

### ***Xerochares expulsus* (Schulz)**

MEXICO: Morelos State, Cuernavaca; 5 November 2022, 1532 CST; M. Schmidt and G. Born-Schmidt. Host: *Curicaberis minax* (O. Pickard-Cambridge) (Sparassidae), penultimate male. The wasp grasped the immobilized giant crab spider by the base of its right pedipalp or base of left foreleg with her mandibles and, maintaining it in an upright or dorsal side upward position, dragged it backwards across a large rock (Fig. 17; Schmidt and Born-Schmidt 2022).

There are two prior host records for *Xerochares expulsus*, *Olios giganteus* (Keyserling), juvenile, and *Curicaberis ?culiacan* Rheims, adult female (both Sparassidae) (Kurczewski et al. 2022b). The wasp with *Curicaberis ?culiacan* also grasped the immobilized spider’s pedipalp with her mandibles during transport, whereas the wasp with the larger *Olios giganteus* grasped the trochanter of its left foreleg with her mandibles during transport (Kurczewski et al. 2022b).

MEXICO: Sonora State, Álamos Municipality; 19 January 2023, 1253 MST; J. Gorey. Host: *Curicaberis abnormis* (Keyserling), adult female. The wasp stood atop the immobilized huntsman spider and examined it with her antennae as it laid, dorsal side upward, on leaf litter. She, then, grasped the spider by its left chelicera with her mandibles and started to drag it backwards, dorsal side upward, through the duff (Gorey 2023).

*Curicaberis abnormis* is a new host species for *Xerochares expulsus*. This is the third host record of the genus *Curicaberis* Rheims for *X. expulsus*, all from Mexico (Kurczewski et al. 2022). The four known host records reported for *X. expulsus* are for species of Sparassidae (huntsman or giant crab spiders) (Kurczewski et al. 2022b).

### ***AmmospheX solonus* (Banks)**

ARIZONA: Cochise County, Miller Canyon, Huachuca Mountains, “Elevation 5,300 feet”; 18 November 2018; C. W. Melton. Host: Unidentified species (Lycosidae), 12 mm (wasp, 11 mm). A series of photographs shows the wasp examining the immobilized wolf spider with her antennae as it laid dorsal side upward on the ground and

dragging it backwards across the ground, dorsal side upward, grasping the patella of its left hindleg or base of second left leg with her mandibles (Melton 2018).

COLOMBIA: Magdalena State, Santa Marta; 18 February 2023, 1252 PM; R. de Minca. Host: Unidentified species (Ctenidae), adult female. The wasp examined the wandering spider with her mouthparts as it laid ventral side upward on the ground surface. She then lapped up hemolymph from the sting puncture wound near the base of the spider's left hind leg. She transported the spider backwards across the bare ground in a cephalothorax upright position, grasping its left hind coxa with her mandibles (De Minca 2023).

*Ammosphex solonus* provisions its nests predominantly with wolf spiders (Lycosidae) and, rarely, Gnaphosidae (Krombein 1979; Kurczewski and Edwards 2012) and Zoropsidae [as Tengellidae] (Kurczewski et al. 2017). Our recent host records for this species are in accord with this host spider selection.

### ***Arachnospila arcta* (Cresson)**

OREGON: Clackamas County, West Linn; 14 July 2022, 1535 PDT; M. D. Barton. Host: *Callobius severus* Simon (Amaurobiidae), adult or penultimate male. The spider was dragged backwards through dense grasses, being held cephalothorax upright and grasped with the wasp's mandibles by its right forecoxa-trochanter joint or end of right pedipalp (Barton 2022).

*Callobius severus* is a new host species for *A. arcta*. *Arachnospila arcta* is strongly polyphagous in host selection having been reported with seven families of host spiders, including Amaurobiidae (Evans and Yoshimoto 1962; Kurczewski and Kiernan 2015, Kurczewski et al. 2017).

OREGON: Marion County, Salem; 29 August 2015, 2040 PDT; S. Braden. Host: *Eratigena duellica* (Simon) (Agelenidae), subadult female. The wasp, walking backwards up the siding of a house or garage, grasped the immobilized giant house spider by the base of its left hind coxa or pedicel with her mandibles (Braden 2015).

*Eratigena duellica* is a new host spider species for *A. arcta*. Kurczewski et al. (2017) reported *Arachnospila arcta* provisioning with *Eratigena agrestis* Walckenaer (hobo spider) in Portland, Multnomah County, OR. Other recent records for *A. arcta* from the West Coast include other genera of Agelenidae (*Hololena* sp., *Novalena pina* Chamberlin and Ivie) and Segestriidae (*Segestria* sp.), other funnel-web and tube-web spiders (Kurczewski et al. 2017).

### ***Arachnospila trochilinus* (Holmberg) (Erratum from Kurczewski et al. 2020)**

ARGENTINA: Mendoza Province, Las Heras; 24 August 2022, 2:54 PM; D. Ganime. Host: *Lycosa erythrognatha* Lucas (Lycosidae), adult or subadult female. The wasp grasped the immobilized wolf spider by the base of its left pedipalp with her mandibles and pulled it backwards, dorsal side upward, across stones and large rocks. She interrupted prey transport to move into grasses to groom herself before resuming transport of the spider (Ganime 2022).

This is the first host record and new host family, genus, and species for *Arachnospila trochilinus*, if it is that species. The host spider is the same as for *A. imitatrix*, *Lycosa erythrognatha*, reported simply as ?*Lycosa* sp. (Kurczewski et al. 2020). In that paper, the wasp captor was erroneously reported as *Anoplius* (*Arachnophroctonus*) *sobrinus* (Spinola).

### ***Arachnospila titicacaensis* (Strand)**

BOLIVIA: La Paz Department, Ingavi Province, Tiwanaku; 23 January 2023; F. Romano and N. A. Marting Vidarre. Host: *Hogna ?rufimanooides* (Strand) (Lycosidae), adult or subadult female. The wasp pulled the wolf spider across the ground in an upright position, grasping its ventral coxal area with her mandibles (Fig. 18; Romano and Marting Vidarre 2023).

PERU: Puno Region, Puno Province; 13 November 2013; S. Littledale. Host: *Hogna ?rufimanooides* (Strand) (Lycosidae), adult or subadult female. The wasp examined the paralyzed wolf spider with her antennae as it laid ventral side upward with legs spread laterally on the ground (Littledale 2022).

These are the first host records and new family, genus, and species for *Arachnospila titicacaensis*.

Tribe Prioichilini (Waichert et al. 2015)

***Priocheilus gloriosum* (Cresson)**

PERU: San Martín Province, Tarapoto; 22 October 2022, 1135 AM; M. Montag. Host: *Enoploctenus* sp. (Ctenidae), adult or subadult female. The wasp stood beside the immobilized wandering spider as it laid dorsal aide upward with legs spread laterally on a large leaf. She then straddled the spider headfirst and grasped its left pedipalp or chelicera with her mandibles (Montag 2022).

*Enoploctenus* sp. (Ctenidae) is a new host genus for *Priochilus gloriosum*. Other host spider families for *P. gloriosum* include Trechaleidae, Sparassidae, and Theraphosidae (Kurczewski et al. 2020, 2022b).

***Priochilus regius* (Fabricius)**

BRAZIL: Mato Grosso State, Alta Floresta; 12 August 2022; J. C. Sullivan. Host: *Fufius* sp. (Cyrtaucheniidae), adult or subadult female. The wasp grasped the wafer trapdoor spider near the end of its left pedipalp with her mandibles, straddled it dorsal side upward, and walked forward, using its wings for added thrust (Sullivan 2022).

*Fufius* sp. (Cyrtaucheniidae) is a new host family, genus, and species for *Priochilus regius*. Previous host records for *P. regius* from Ecuador and Peru include unidentified species of Ctenidae (Kurczewski et al. 2020), and from Brazil, *Ctenus* sp. (Ctenidae) (Kurczewski et al. 2022b).

***Priochilus sericeifrons* (Fox)**

ECUADOR: El Oro Province, Piñas, Reserva Buenaventura, Umbrellabird Lodge; 10 February 2023; J. Higgott. Host: *Ctenus* sp., adult or subadult female. The wasp straddled the wandering spider, its body being perpendicular to that of the spider, as she stung it in its cephalothorax between the bases of its left foreleg and second leg. The spider stood on the ground, dorsal side upward, as it was being stung (Higgott 2023).

*Priochilus sericeifrons* has been observed with host spiders several times: *Kiekie* sp. (Ctenidae) in Costa Rica; *Spinoctenus* sp. (Ctenidae) in Colombia; and unidentified ctenid in Brazil (Kurczewski et al. 2020, 2022b). *Ctenus* sp. is a new host genus and species for *P. sericeifrons*.

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