Evaniidae of Cuba (Insecta: Hymenoptera)

Andrew R. DEANS
Department of Entomology, North Carolina State University,
Campus Box 7613, 2301 Gardner Hall, Raleigh, NC, U.S.A. E mail: adeans@gmail.com

INTRODUCTION

Wasps in the family Evaniidae, also known as ensign or hatchet wasps, exhibit numerous fascinating biological phenomena worthy of future research: color pattern mimicry complexes, radically heterogeneous wing venation patterns between genera, potential for non-chemical control of pestiferous cockroaches, etc. Until relatively recently, however, there has been a paucity of papers treating the taxonomy and biology of ensign wasps. The major obstacle has been (and continues to be) a distressed taxonomy that prevents one from being able to confidently identify specimens to species and even to genus. This problem is disappearing, however, with recent papers that summarize and key the genera of the world (Deans & Huben, 2003), catalog the species of the world (Deans, 2005), and test the generic classification phylogenetically using DNA data (Deans *et al.*, 2006). Hopefully the summary of the Cuban fauna provided below will encourage more entomologists to become students of this interesting and charismatic family.

Biology. Ensign wasps develop as predators of cockroach eggs (Dictyoptera: "Blattaria"). Female wasps typically oviposit a single egg within a cockroach egg (Smith, 1945) or between the cockroach eggs (Edmunds, 1954) inside an ootheca. The subsequent evaniid larva then develops and grows by consuming all or most of the eggs in the ootheca, where it then pupates, ecloses, chews a large and characteristic hole in the wall of the oothecae, and emerges. Female evaniids are known to dig up buried oothecae (burying is a common defense tactic employed by cockroaches; see McKittrick, 1964), oviposit into them, and then rebury them (Brown, 1973). Deans (2005) summarized the known host records, which reveal verifiable data for approximately 15 species (only 0.034% of all valid, extant species). The hosts and oviposition behaviors for the vast majority of evaniid species, including all but one Cuban species, remain entirely unknown.

METHODS

The taxa are organized alphabetically by genera and then by species. A basic taxonomic

history is provided, as well as any references of interest to people working on the Cuban fauna.

Type specimen repositories are referred to using the following acronyms:

AMNH: American Museum of Natural History, U.S.A

ANSP: The Academy of Natural Sciences, U.S.A.

CUIC: Cornell University Insect Collection, Comstock Hall, Cornell University, U.S.A.

IES: Instituto de Ecología y Sistemática, Ciudad de La Habana, Cuba, (formely Instituto de Zoología).

LSUK: The Linnean Society of London, Burlington House, United Kingdom.

MCZ: Department of Entomology, Museum of Comparative Morphology, U.S.A.

MCSN: Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy.

MNHN: Muséum National d'Histoire Naturelle, Paris, France

MRSN: Museo Regionale di Scienze Naturali, Torino, Italy

MVMA: Museum Victoria, Melbourne Museum, Victoria, Australia.

NHM: The Natural History Museum, Cromwell Road, London, United Kingdom.

NHRS: Department of Entomology, Swedish Museum of Natural History, Sweden.

NMNH: National Museum of Natural History, Washington, D. C., U.S.A.

NMW: International Research Institute for Entomology, Naturhistorisches Museum, Vienna, Austria.

SEMC: University of Kansas Natural History Museum, Division of Entomology, Snow Entomological Collection, University of Kansas, Lawrence, U.S.A.

UMO: Oxford University Museum of Natural History, United Kingdom

ZMHU: Humboldt-Universität zu Berlin, Museum für Naturkunde, Institut für Systematische Zoologie, Berlin, Germany

ZMKU: Zoological Museum, Entomology Department, Copenhagen, Denmark.

Evaniidae

Evaniidae comprises 435 extant, valid species worldwide, classified in 20 genera. Several of these valid names will likely fall as synonyms upon future taxonomic work and comparison of the type specimens, but at least 800 species have yet to be described (educated guess based on my observations of museum specimens and recently collected material). There are no modern reviews of the Caribbean fauna, and the species of this region need to be revised. Alayo (1972, 1973) provided the last catalog of the evaniid species of Cuba. Wolcott (1927, 1936, 1948) published checklists to the evaniids of Haiti and Puerto Rico. These papers, combined with several individual species descriptions, constitute the extent of taxonomic work on the evaniids of the Caribbean. I list below the species that have been confirmed to exist in Cuba, plus some species that might stray or even have steady populations on the island but have yet to be collected or identified from there (indicated by asterisks).

Evania Fabricius, 1805

Evania appendigaster (Linnaeus)

Ichneumon appendigaster Linnaeus, 1758: 566. Holotype, NEW WORLD "America" (LSUK).

Sphex appendigaster (Linnaeus); Linnaeus, 1767: 943.

Evania appendigaster (Linnaeus); de Geer, 1773: 594.

Ichneumon niger de Geer, 1773: 594. Type specimen(s) unknown; listed as a synonym of *E. appendigaster* in de Geer, 1773.

Evania laevigata Olivier, 1792: 452. Type specimen(s) unknown, SOUTH AMERICA "l'Amérique méridionale". Synonymized by Curtis, 1837: 87.

Evania unicolor Say, 1824: 57. Type specimen lost, U.S.A. Synonymized by Dalla Torre, 1902: 1077.

Evania desjardinsi Blanchard, 1840: 299. Holotype ♂, MAURITIUS (MNHN?). Synonymized by Schletterer 1886a: 12.

Evania affinis Le Guillou, 1841: 326. Type specimen(s) unknown, "Hamoa" (MNHN?). Synonymized by Schletterer, 1886a: 12.

Evania cubae Guérin-Méneville, 1844: 405. Type specimen(s) unknown, CUBA. Synonymized by Cresson 1865: 8.

Evania peringueyi Cameron, 1906b: 19. Holotype ♀, SOUTH AFRICA "Cape Colony, Cape Town" (NHM). Synonymized by Brues, 1924: 8.

Distribution in Cuba: This species is easily found throughout urban areas in Cuba (Alayo, 1972, 1973; see also Portuondo and Fernández, 2004), especially in houses and other buildings where it predates on the egg cases of *Periplaneta* and possibly *Blatta* spp. (Dictyoptera: Blattidae).

Comments: In Cuba *E. appendigaster* is colloquially referred to as "zángano monito" (Alayo, 1972). The species likely originates from the Middle East and has been transported around the world in the holds of ships (Haldeman, 1847; read also an account involving Havana, Cuba in Myers, 1934).

Evaniella Bradley, 1905

**Evaniella ruficaput* (Dewitz)

Evania ruficaput Dewitz, 1881: 205. Holotype ♂, "Puerto Rico" (ZMHU).

Evaniella ruficaput (Dewitz); Deans, 2005: 52.

Distribution in Cuba: Evaniella ruficaput has only been recorded in Puerto Rico, but this species may occur in Cuba or possibly represents a synonym of other species in Cuba.

Comments: This species is very similar morphologically to *Evaniella semaeoda,* and the types of these two nominal species should be compared.

**Evaniella semaeoda* Bradley

Evaniella semaeoda Bradley, 1908: 144. Holotype ♀, U.S.A., (CUIC).

Distribution in Cuba: *Evaniella semaeoda* is widespread throughout North and Central America and is likely to occur in Cuba. Its presence, however, has yet to be confirmed.

Comments: Deyrup and Atkinson (1993) commented on a confirmed cockroach host (*Ischnoptera deropeltiformis* (Brunner) and several potential hosts (*Parcoblatta fulvescens* (Saussure & Zehntner), *Latiblattella rehni* Hebard, *Arenivaga floridensis* Caudell).

I have not seen the type for *Evaniella semirubra*, but I suspect that *Evaniella semaeoda* is morphologically similar to (if not a synonym of) *E. semirubra*. No taxonomic changes should be made, however, until the morphology and biology of each species can be studied in more depth.

Evaniella semirubra (Cresson)

Evania semirubra Cresson, 1865: 8. 2 syntypes ♀♂, CUBA (♂ ANSP,♀ "Gundlach collection").

Evaniella semirubra (Cresson); Bradley, 1908: 177.

Evaniella semirubra (Cresson); Alayo, 1972: 4, 13.

Evaniella semirubra (Cresson); Alayo, 1973: 93.

Distribution in Cuba: Cuban endemic. Alayo (1972, 1973; see also Portuondo and Fernández 2004) reported that this species has been collected extensively in "la Sierra Maestra Oriente (Pico Cuba, Alto de Cardero, Loma del Gato, Gran Piedra, La Siberia, etc.)"

Hyptia Illiger, 1807

Hyptia bradleyana Kieffer

Hyptia bradleyana Kieffer, 1910: 74. 3 syntypes, CUBA (CUIC).

Distribution in Cuba: Cuban endemic.

Comments: *H. bradleyana* was new name proposed by Kieffer (1910) for *Hyptia poeyi* as interpreted and redescribed by Bradley (1908), to remove homonymy with *H. poeyi* Guérin-Méneville, 1843. The undesignated syntypes were keyed and labeled by Bradley as *H. poeyi,* and it is very likely that *H. bradleyana* is a synonym of *H. poeyi.*

**Hyptia floridana* Ashmead

Hyptia floridana Ashmead, 1901: 303. Holotype ♂, U.S.A. "Jacksonville and Biscayne Bay, Florida" (NMNH).

Brachygaster floridanus (Ashmead); Kieffer, 1904: 5.

Hyptia floridana Ashmead; Bradley, 1905: 64.

Distribution in Cuba: *H. floridana* has only been collected in Panama, Guatemala, and the southern U.S.A. This species has not yet been reported from Cuba, but it can be found throughout Florida.

Comments: Deyrup and Atkinson (1993) report on some potential cockroach host species for *H. floridana* in Florida: *Cariblatta lutea* (Saussure & Zehntner), *Cariblatta minima*

Hebard, *Compsodes cucullatus* (Saussure & Zehntner), *Euthlastoblatta gemma* Hebard, and *Chorisoneura texensis* (Saussure & Zehntner).

**Hyptia johnsoni* Ashmead

Hyptia johnsoni Ashmead, 1901: 303. Holotype ♂, "Philadelphia, PA" [in error] (NMNH).

Brachygaster johnsoni (Ashmead); Kieffer, 1904: 5.

Hyptia johnsoni Ashmead; Bradley, 1905: 64 (corrected type locality="Jamaica").

Distribution in Cuba: This distinctive species is currently known only from Jamaica.

**Hyptia manni* (Brues)

Chalcidopterella manni Brues, 1916: 719. Holotype ♀, HAITI "collected by W. M. Mann at Manneville, Haiti" (AMNH or MCZ?).

Hyptia manni (Brues); Deans, 2005: 62.

Distribution in Cuba: *H. manni* is currently known only from Haiti.

**Hyptia ocellaria* (Schletterer)

Evania ocellaria Schletterer, 1886b: 233. Holotype ♂, MEXICO "Orizaba - Bilimek leg." (NMW).

Hyptia ocellaria (Schletterer); Enderlein, 1909: 261.

Hyptia ocellaria (Schletterer); Alayo, 1972: 6.

Hyptia ocellaria (Schletterer); Alayo, 1973: 94.

Distribution in Cuba: Schletterer (1886b) reported that this species has been collected in Cuba, but its presence remains unconfirmed and, based on my observations of the type and knowing the geography of Orizaba, unlikely.

**Hyptia petiolata* (Fabricius)

Evania petiolata Fabricius, 1798: 242. 2 ♀ syntypes, CARIBBEAN "Habitat in Americae insulis" (ZMKU).

Hyptia petiolata (Fabricius); Illiger, 1807a: 193.

Distribution in Cuba: This species has been collected in Puerto Rico and other Caribbean islands and might be found in Cuba as well.

Hyptia pinarensis Alayo

Hyptia pinarensis Alayo, 1972: 6. Holotype ♀, CUBA "...Febrero de 1965, en los pinares cercanos a Viñales, Pinar del Rio" (IES).

Hyptia pinarensis Alayo; Alayo, 1973: 94.

Distribution in Cuba: This species was described from a single specimen collected in "los pinares cercanos a Viñales, Pinar del Rio".

Hyptia poeyi (Guérin-Méneville)

Evania (*Hyptiam*) *poeyi* Guérin-Méneville, 1843: 335. 2 Syntypes ♀♂, "Cuba" (MCSN).

Evania poeyi Guérin-Méneville; Dalla Torre, 1902: 1085.

Hyptia poeyi (Guérin-Méneville); Bradley, 1908: 187

Hyptia poeyi (Guérin-Méneville); Alayo, 1973: 93.

Distribution in Cuba: This species has been collected throughout Cubain agricultural areas, lowland habitats, and forest in all provinces. (Alayo, 1972; 1973; see also Portuondo and Fernández 2004). The type should be compared to *H. petiolata* (Fabricius) for possible synonymy.

**Hyptia rufipectus* Dewitz

Hyptia rufipectus Dewitz, 1881: 205. Holotype PUERTO RICO "Antillen (Portorico)" (ZMHU).

Evania rufipectus (Dewitz); Schletterer, 1886a: 35.

Distribution in Cuba: This species has not yet been found in Cuba but may be present on the island or may be a synonym of other species found in Cuba.

Hyptia stimulata (Schletterer)

Evania stimulata Schletterer, 1889a: 131. Holotype ♂ CUBA "Antillen (Cuba)" (ZMHU).

Evania stimulata Schletterer; Schletterer, 1889b: 335.

Hyptia stimulata (Schletterer); Bradley, 1908: 187.

Distribution in Cuba: Alayo (1972) suspected that this species was a synonym of *H. poeyi:* "Quizás esta especie sea la misma *H. poeyi* enumerada anteriormente".

**Hyptia thoracica* (Blanchard)

Evania thoracica Blanchard, 1840: 299. Type(s) unknown, "...de la Caroline" [=U.S.A.: North Carolina?] (MNHN?).

Hyptiam thoracicum Shuckard, 1841: 120. Type destroyed, "Inhabits North Carolina".

Hyptiam thoracicum Shuckard; Bradley, 1908: 155 as synonym of *Evania thoracic*a Blanchard.

Hyptiam thoracicum (Blanchard); Hedicke, 1939: 44.

Hyptiam thoracicum Shuckard; Townes, 1949: 534 taxonomic history.

Hyptiam thoracicum Shuckard; Townes, 1951: 656 as synonym of *H. thoracica* (Blanchard).

Hyptiam thoracicum Shuckard; Poole, 1996: 161 as junior homonym of *H. thoracica* (Blanchard).

Evania dorsalis Westwood, 1851: 214. New name to eliminate homonymy with *thoracica* Leach and *thoracica* Klug, neither of which are in Evaniidae. Synonymized by Hedicke, 1939: 44, as synonym of *H. thoracica* (Blanchard).

Hyptia brevicalcar Kieffer, 1904: 541. Holotype ♂, U.S.A. "Wisconsin" (NHRS). Synonymized by Townes 1949: 534, as synonym of H. thoracica (Blanchard).

Hyptia mylacridomanes Bradley, 1908: 150. Holotype ♀, U.S.A. "New York (Ithaca, J. H. Comstock)" (CUIC). Treated by Townes, 1949: 534, as synonym of *H. thoracica* (Blanchard).

Hyptia hyptiogastris Bradley, 1908: 160. Holotype, U.S.A. "Georgia (Tifton)" (NMNH).

Treated by Townes, 1949: 534, as synonym of *H. thoracica* (Blanchard).

Hyptia texana Bradley, 1908: 161. Holotype ♀, U.S.A. "Texas (Galveston, May, F. H. Snow)" (SEMC). Treated by Townes, 1949: 534, as synonym of *H. thoracica* (Blanchard).

Distribution in Cuba: Deans (2005) reports this species as inhabiting Cuba, but the reference from which this information was derived remains elusive. *H. thoracica* is found throughout Florida, however, and may yet be present in Cuba.

Comments: This species specializes on the oothecae of *Parcoblatta* spp. (Dictyoptera: Blattellidae) in North America.

**Hyptia weithi* Ashmead

Hyptia weithi Ashmead, 1901: 302. Holotype ♀ [described as ♂], Haiti (NMNH).

Distribution in Cuba: This species has only been recorded in Haiti, though M. Huben reports that he has seen a specimen from Cuba (pers. comm.). Deans (2005) indicates that *H. weithi* may be a synonym of *H. poeyi*.

Prosevania Kieffer, 1911

**Prosevania fuscipes* (Illiger)

Evania appendigaster: Panzer, 1799: plate 12 [misinterpretation of *E. appendigaster* (Linnaeus); actually refers to the then undescribed *P. fuscipes*].

Evania fuscipes Illiger, 1807b: 83. New name for Panzer's (1799) interpretation of *Evania appendigaster*. Type(s) unknown.

Evania flavicornis Curtis, 1829: plate 257 + 3 pages. New name for *E. appendigaster* as described by Latreille, 1805. Type(s) unknown (MVMA?) Synonymized by Schletterer, 1886a: 12.

Evania punctata Brullé, 1832: 378. Type(s) unknown, GREECE "Morea", (MNHN?). Synonymized by Carlson, 1979: 1110.

Evania striata Smith, 1860: 58. Holotype ♀, INDONESIA "Makassar" (UMO). Synonymized by Dalla Torre, 1902: 1083.

Evania coxalis Kieffer, 1904b: 19. Holotype ♀, SPAIN "Espagne: Madrid. Collection de M. Maindron" (MNHN). Synonymized by Wall, 1994: 142.

Evania urbana Bradley, 1908: 140. 2 syntypes ♀♂, U.S.A. "Philadelphia, Pa, August 5th (Mr. Stone); Washington, D.C., July 26, 1900; New York and Brooklyn, N.Y. (Messrs. Daecke, Brues, Franck)", (ANSP ♂ syntype, CUIC ♀ syntype). Synonymized by Bequaert, 1919: 23.

Prosevania punctata (Brullé); Townes, 1949: 528.

Prosevania fuscipes (Illiger); Carlson, 1979: 1110.

Distribution in Cuba: This species has never been confirmed to occur in Cuba, but to the geographic proximity to the U.S.A. the scenario remains possible. *P. fuscipes* is known from urban areas (exclusively) throughout the eastern U.S.A. and is likely native to sub-Saharan Africa.

Comments. Reported cockroach prey include *Blattella germanica* (L.) [unlikely host],

Periplaneta americana (L.) [unconfirmed but possible], and *Blatta orientalis* Linnaeus [confirmed].

Semaeomyia Bradley, 1908

Semaeomyia cubensis (Alayo)

Brachygaster cubensis Alayo, 1972: 8. Holotype sex???, CUBA "en Marianao, Habana (alrededores del Laguito), en Marzo de 1965" (IES).

Brachygaster cubensis Alayo; Alayo, 1973: 94.

Semaeomyia cubensis (Alayo): Deans, 2005: 97.

Distribution in Cuba: Alayo (1972, 1973) reports that this Cuban endemic has been collected in Marianao, La Habana (alrededores del Laguito), and Tortuguilla, Guantánamo, Oriente. Portuondo and Fernández (2004) extend this range into the Nipe-Sagua-Baracoa (pluvisilva and bosque siempreverde).

Comments: There are no known host records for any species of *Semaeomyia*.

**Semaeomyia pygmaea* (Fabricius)

Evania pygmaea Fabricius, 1804: 180. Holotype ♂? [antennae and genitalia missing], SOUTH AMERICA "Habitat in America meridionali Dom. Smidt. Mus. Dom. de Sehestedt". (ZMKU).

Evania (*Hyptia*) *pygmaea* (Fabricius); Westwood, 1843: 245.

Hyptia pygmaea (Fabricius); Kieffer 1912: 31.

Brachygaster pygmaeus (Fabricius); Wolcott, 1936: 514 ("on sugarcane" and "on papaya").

Brachygaster pygmaeus (Fabricius); Wolcott, 1948: 763 (adults feeding on "*Rauwolfia tetraphylla*" in Guyana).

Semaeomyia pygmaea (Fabricius); Deans, 2005:100.

Distribution in Cuba: This species, while being described from "South America", has only ever been reported from the Caribbean region plus Guyana. It has yet to be reported from Cuba.

Comments: The specimens observed by Wolcott should be compared to the type, as they are likely not conspecific. There are no known host records for any species of *Semaeomyia*.

Acknowledgments.- I gratefully acknowledge E. Gutierrez (National Museum of Natural History of Cuba) for comments regarding potential cockroach prey. This information was gathered with financial assistance from the University of Illinois Research Board, the Society of Systematic Biologists (Graduate Research Award), and the National Science Foundation (DEB-041544081 and DEB-0842289).

REFERENCES

Alayo Dalmau, P. 1972. Estudios sobre los himenópteros de Cuba VI. Familias Evaniidae y Gasteruptiidae. Poeyana 95: 1-15.

Alayo Dalmau, P. 1973. Superfamilia Evanioidea. Pp. 93-95. *In:* Catálogo de los

himenópteros de Cuba. Instituto Cubano del Libro, La Habana, Cuba. 218 pp.
Ashmead, W. H. 1901. New species of Evaniidae. Canadian Entomologist 33: 300-304.
Bequaert, J. 1919. The identity of *Evania urbana* Bradley, 1908 and *Evania punctata* Brullé 1832. Bulletin of the Brooklyn Entomological Society, N. S. 14: 23.
Bradley, J. C. 1908. The Evaniidae, ensign flies, an archaic family of Hymenoptera. Transactions of the American Entomological Society 34: 101-194.
Brown, V. K. 1973. The biology and development of *Brachygaster minutus* Olivier (Hymenoptera: Evaniidae) a parasite of the oothecae of *Ectobius* spp. (Dictyoptera: Blattidae). Journal of Natural History 7: 665-674.
Brues, C. T. 1916. Three new species of Evaniidae. Bulletin of the American Museum of Natural History 35: 717-720.
Brues, C. T. 1924. Some South African parasitic Hymenoptera of the families Evaniidae, Bracenidae [sic], Alysiidae, and Plumariidae, in the South African Museum with a catalogue of the known species. Annals of the South African Museum 19: 1-150.
Brullé, A. 1832. Expédition scientifique de Morée. Volume III. Paris, France. 400 + 4 pp.
Cameron, P. 1906. Descriptions of new species of parasitic Hymenoptera chiefly in the collection of the South African Museum, Capetown. Annals of the South African Museum 5 (2): 17-186.
Carlson, R. W. 1979. Superfamily Evanioidea. Pp. 1109-1118. *In*: Catalog of Hymenoptera in America North of Mexico, volume 1, Symphyta and Apocrita (Parasitica). K. V. Krombein, P. D. Hurd, D. R. Smith, and B. D. Burks (eds.) Smithsonian Institution Press, Washington, D. C., U.S.A. 1198 pp.
Cresson, E. T. 1865. On the Hymenoptera of Cuba. Proceedings of the Entomological Society of Philadelphia 4: 1-200.
Curtis, J. 1829. British Entomology; Being Illustrations and Descriptions of the Genera of Insects Found in Great Britian and Ireland: Containing Coloured Figures from Nature of the Most Rare and Beautiful Species, and in Many Instances of the Plants upon Which They are Found. Volume 3. Dermaptera, Dictyoptera, Orthoptera, Strepsiptera, and Hymenoptera part I. E. Ellis and Co., London, U. K.
Dalla Torre, C. G. de. 1902. Evaniinae. Pp. 1076-1085 in: Volumen III: Trigonalidae, Megalyridae, Stephanidae, Ichneumonidae, Agriotypidae, Evaniidae, Pelecinidae. Catalogus Hymenopterorum hucusque descriptorum systematicus et synonymicus. Pars II. Sumptibus Gulilmi Englemann, Lipsiae.
Deans, A. R. 2005. Annotated catalog of the world's ensign wasp species (Hymenoptera: Evaniidae). Contributions of the American Entomological Institute 34 (1): 1-164.
Deans, A. R. & M. Huben. 2003. Annotated key to the ensign wasp (Hymenoptera: Evaniidae) genera of the world, with descriptions of three new genera. Proceedings of the Entomological Society of Washington 105: 859-875.
de Geer, C. 1773. Mémoires Pour Servir a l'Histoire de Insectes. Vol. 3. l'Imprimiere de Pierre Hesselberg. Stockholm, Sweden. III-VIII + 697 pp. [plates 1-44 are in Vol. 8]
Dewitz, H. 1881. Hymenopteren von Portorico. Berliner Entomologische Zeitschrift 25:

197- 208 + plate V.

Deyrup, M. & T. H. Atkinson. 1993. Survey of evaniid wasps (Hymenoptera: Evaniidae) and their cockroach hosts (Blattodea) in a natural Florida habitat. Florida Entomologist 76: 589-593.

Edmunds, L. R. 1954. A study of the biology and life history of *Prosevania punctata* (Brulle) with notes on additional species (Hymenoptera). Annals of the Entomological Society of America 47 (4): 575-592.

Fabricius, J. C. 1798. Supplementum entomologiae systematicae. Hafniae [= Copenhagen]: Proft and Storch. 572 p.

Fabricius, J. C. 1804. Systema Piezatorum, Secundum Ordines, Genera, Species, Adiectis, Synonymus, Locis, Observationibus, Descriptionibus. Brunsvige, Apud Carolum Reichard. iii-xiv + 438 pp. + 1-30.

Guérin-Méneville, F. E. 1843. Note sur le genre *Evania*, de l'ordre des Hyménoptères. Revue Zoologique 6: 333-335.

Guérin-Méneville, F. E. 1844. IV. Mélanges et nouvelles. Revue Zoologique 7: 39-40.

Hedicke, H. 1939. Evaniidae. In: Hymenoptorum Catalogus. H. Hedicke (ed.) Pars 9. Dr. W. Junk. 's-Gravenhage. 50 pp.

Illiger, K. 1807. Vergleichung der Gattungen der Hautflügler Piezata Fabr. Hymenoptera Linn. Jur. Magazin für Insektenkunde 6: 189-199.

Illiger, K. [spelled "Carl"] 1807b. Fauna Etrusca sistens Insecta quae in provinciis Florentina et Pisana praesertim collegit Petrus Rossius, Tomus Secundus. C. G. Fleckeisen, Helmstadii. 511 pp.

Kieffer, J. J. 1904. Description de Stéphanides et d'Evaniides nouveaux. Bulletin de la Société d'Histoire Naturelle de Metz 23 (2): 1-30.

Kieffer, J. J. 1904a. Beschreibung neuer Proctotrypiden und Evaniiden. Arkiv för Zoologi 1 (4): 525-565.

Kieffer, J. J. 1910. Nouveaux évaniides d'Amérique [Hym.]. Annales de la Société Entomologique de France 79: 57-81.

Latreille, P. A. 1805. Histoire Naturelle, Generale et Particuliere des Crustaces et des Insectes, Vol. 3. F. Dufart, Paris. 432 pp.

McKittrick, F. A. 1964. Evolutionary study of cockroaches. Cornell University Agricultural Experiment Station Memoirs 389: 1-197.

Myers, J. G. 1934. The arthropod fauna of a rice-ship, trading from Burma to the West Indies. Journal of Animal Ecology 3 (2): 146-149.

Panzer, G. W. 1799. Faunae Insectorum Germanicae Initia oder Deutschlands Insecten. fasc 62. Felssecker, Nürnberg, Germany.

Portuondo, E. & J. L. Fernández. 2004. Biodiversidad del orden Hymenoptera en los macizos montañosos de Cuba oriental. Boletin de la Sociedad Entomologica Aragonesa 35: 121-136.

Say, T. 1824. Order Hymenoptera. Appendix pp. 50-86 in: Narrative of an Expedition to the Source of St. Peter's River, Lake Winnepeek, Lake of the Woods, etc. Performed in the Year 1823 by Order of the Hon. J. C. Calhoun, Secretary of War, under the Command

of Stephen H. Long, U.S.T.E. Compiled from the Notes of Major Long, Messrs. Say, Keating and Calhoun by W. H. Keating. Vol. 2. Geo. B. Whittaker, London [1824 Philadelphia]. v-vi + 1-248 + 3-144 appendix + 2 plates.

Schletterer, A. 1886a. Ueber die Hymenopteren-Gattung *Evania* Fabr. Verhandlungen zoologisch-botanischen Gesellschaft 36: 1-46.

Schletterer, A. 1886b. Zwei neue Arten der Hymenopteren-Gattung *Evania*. Verhandlungen zoologisch-botanischen Gesellschaft 36: 231-234.

Schletterer, A. 1889a. Die Hymenopteren – Gruppe der Evaniiden I. Annalen des k.k. Naturhistorischen Hofmuseums 4 (2): 107-180.

Schletterer, A. 1889b Die Hymenopteren – Gruppe der Evaniiden II. Annalen des k.k. Naturhistorischen Hofmuseums 4 (3): 289-338.

Smith, F. 1860. Descriptions of new species of hymenopterous insects collected by Mr. A. R. Wallace at Celebes. Journal of the Proceedings of the Linnean Society, Zoology 5: 57-93.

Smith, J. H. 1945. Useful parasitic insects. Queensland Agricultural Journal 61: 340-351.

Townes, H. K. 1949. The Nearctic species of Evaniidae (Hymenoptera). Proceedings of the United States National Museum 99: 525-539.

Townes, H. K. 1951. Evaniidae. Pp. 655-657. *In*: Hymenoptera of America North of Mexico, Synoptic Catalog. Muesebeck, C. F. W., K. V. Krombein, and H. K. Townes (eds.) United States Department of Agriculture, Agriculture Monograph 2. Washington, D.C., U.S.A. 1420 pp.

Wall, I. 1994. Seltene Hymenopteren aus Mittel-, West- und Südeuropa (Hymenoptera Apocrita: Stephanoidea, Evanioidea, Trigonalyoidea). Entomofauna 15 (14): 137-184.

Westwood, J. O. 1843. On *Evania* and some allied genera of hymenopterous insects. Transactions of the Entomological Society of London 3 (4): 237-278 + plates XIV-XV.

Westwood, J. O. 1851. Descriptions of some new species of exotic Hymenoptera belonging to *Evania* and the allied genera, being a supplement to a memoir on those insects published in the third volume of the Transactions of the Entomological Society. Transactions of the Entomological Society of London, new series 1: 213-234.

Wolcott, G. N. 1927. Entomologie d'Haiti. Service Technique du Département de l'Agriculture et d l'Enseignement Professionnel. Port-au-Prince, Haiti. 440 pp.

Wolcott, G. N. 1936. Insectae Borinquensis, a revision of "Insectae Portoricensis, a preliminary annotated checklist of the insects of Portorico, with descriptions of some news [sic] species" and "First supplement to Insectae Portoricensis". The Journal of Agriculture of the University of Puerto Rico 20 (1): 513-514.

Wolcott, G. N. 1948. The insects of Puerto Rico. The Journal of Agriculture of the University of Puerto Rico 32: 749-975.