

# INSECTA MUNDI

A Journal of World Insect Systematics

---

0400

New distributional records for Neotropical spongillaflies  
(Neuroptera: Sisyridae)

David E. Bowles  
National Park Service  
Heartland Inventory and Monitoring Network  
c/o Department of Biology  
Missouri State University  
901 South National Ave.  
Springfield, MO 65897 USA

Date of Issue: January 9, 2015

David E. Bowles

New distributional records for Neotropical spongillafies (Neuroptera: Sisyridae)

*Insecta Mundi* 0400: 1–7

ZooBank Registered: urn:lsid:zoobank.org:pub:56634624-2806-44FD-903C-FAC2A60A6CC1

**Published in 2015 by**

Center for Systematic Entomology, Inc.

P. O. Box 141874

Gainesville, FL 32614-1874 USA

<http://centerforsystematicentomology.org/>

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

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

**Chief Editor:** Paul E. Skelley, e-mail: [insectamundi@gmail.com](mailto:insectamundi@gmail.com)

**Head Layout Editor:** Eugenio H. Nearn

**Editorial Board:** J. H. Frank, M. J. Paulsen, Michael C. Thomas

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

**Manuscript Preparation Guidelines and Submission Requirements** available on the *Insecta Mundi* webpage at: <http://centerforsystematicentomology.org/insectamundi/>

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

CSIRO, Canberra, ACT, Australia

Museu de Zoologia, São Paulo, Brazil

Agriculture and Agrifood Canada, Ottawa, ON, Canada

The Natural History Museum, London, UK

Muzeum i Instytut Zoologii PAN, Warsaw, Poland

National Taiwan University, Taipei, Taiwan

California Academy of Sciences, San Francisco, CA, USA

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

Field Museum of Natural History, Chicago, IL, USA

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

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

**Electronic copies (Online ISSN 1942-1354, CDROM ISSN 1942-1362) in PDF format:**

Printed CD or DVD mailed to all members at end of year. Archived digitally by Portico.

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

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

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

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

**Layout Editor for this article:** Eugenio H. Nearn

---

---

## New distributional records for Neotropical spongillaflies (Neuroptera: Sisyridae)

David E. Bowles  
National Park Service  
Heartland Inventory and Monitoring Network  
c/o Department of Biology  
Missouri State University  
901 South National Ave.  
Springfield, MO 65897 USA  
david\_bowles@nps.gov

**Abstract.** Distributional data are presented for Neotropical spongillaflies (Sisyridae). New country records from Uruguay are presented for *Climacia carpenteri* Parfin and Gurney, *C. insolita* Flint, *C. versicolor* Flint. *Climacia desordenata* Monserrat is synonymized with *Climacia basalis* Banks, **NEW SYNONOMY**. For the first time, *Sisyra apicalis* Banks is reported from Guatemala, Suriname, and Uruguay, and *S. panama* Parfin and Gurney is reported from Peru. Additional distributional data are presented for other species.

**Key words.** Neuroptera, Sisyridae, *Climacia*, *Sisyra*, Neotropics

### Introduction

The distribution of Neotropical spongillaflies (Neuroptera: Sisyridae) is becoming increasingly better known. The monograph on sisyrids published by Parfin and Gurney (1956) provided the most substantial description of the Neotropical fauna to date. Subsequently, the works of Penny (1981, 2002), Penny and Rafael (1982), Flint (1998, 2006), and Monserrat (2005) described additional species and added distributional records. Monserrat (2005) found female syntypes of *Climacia basalis* Navás in Barcelona (Museu de Zoologia) as well as another 10 specimens in Berlin (Zoologisches Museum, Museum für Naturkunde) with identical data, including males. Since *C. basalis* Navás from Brazil and *C. basalis* Banks from Brazil and Guyana are homonyms, Monserrat (2005) renamed the Navás species *C. desordenata* considering it a valid species. Flint (2006), however, synonymized *C. basalis* Navás with *C. basalis* Banks because the male of the latter species is unknown and the wing patterns of the two species cannot be distinguished. Based on this synonymy, records of *C. desordenata* Monserrat, **NEW SYNONYMY**, are attributable to *C. basalis* Banks. Monserrat (2005) also established *Sisyra nocturna* Navás as a synonym of *S. apicalis* Banks, and he provided a distributional record for this species from Brazil. Monserrat (2005) also reported distributional records for *C. californica* Chandler (Mexico), *C. townesi* Parfin and Gurney (Brazil), and *S. elongata* Penny and Rafael (Brazil).

Despite those studies, the sisyrid fauna of the Neotropics remains relatively poorly described. Prior to this study, there are no reported occurrences of spongillaflies from Belize, El Salvador, and Guatemala in Central America, or from Colombia, Ecuador, French Guiana or Uruguay in South America. There are no occurrence records from the Galápagos Islands or Falkland Islands as well. Distributional data for spongillaflies in the Caribbean also are scant. Although *S. apicalis* Banks is known from the Cayman Islands, and *S. apicalis* Banks and *C. antillana* Alayo are known from Cuba (Banks 1908; Parfin and Gurney 1956; Alayo 1968), there are no known occurrences of spongillaflies from Jamaica, Haiti, Dominican Republic, Puerto Rico, or the Lesser Antilles.

Recently, I examined spongillaflies from several museum collections that yielded several new country records for these insects in the Neotropics as well as new distributional information for countries where species were previously reported. Those records and an assessment of diversity among spongillaflies and freshwater sponge hosts in the Neotropics are presented in this paper.

## Methods and Materials

I examined adult spongillaffies from the American Museum of Natural History (AMNH), National Museum of Natural History, Smithsonian Institution (NMNH), and the Florida State Collection of Arthropods (FSCA). Several of the spongillaffies were sorted from bulk blacklight trap samples belonging to the FSCA. Genitalia were removed and cleared in room temperature, saturated NaOH until internal structures could be seen with magnification. Genitalia were rinsed in 70 percent ethanol, stored in a genitalia vial with glycerin, and mounted on the pin below the specimen or stored in the vial. Data contained within brackets [ ] was added by the author.

## Results

I report distributional records for eight species of spongillaffies from Brazil, Chile, Guatemala, Nicaragua, Paraguay, Peru, Suriname, and Uruguay. The specimens from Guatemala and Uruguay represent the first report of spongillaffies from those countries. The record of *Sisyra apicalis* from Suriname represents the first report of the genus and species from that country. I also present a list of the species of Sisyridae known from southern Mexico, Central and South America (Table 1).

### *Climacia carpenteri* Parfin and Gurney, 1956

This species previously was reported from Brazil, and Paraguay (Parfin and Gurney 1956; Flint 1998, 2006; Monserrat 2005). González Olazo (1983) published a new distributional record for *C. carpenteri* Parfin and Gurney from Argentina, but Monserrat (2005) showed this record was a misidentification of *Climacia versicolor* Flint. The discovery of this species in Uruguay represents a new country record. Flint (1998) reported on *C. carpenteri* collected from Departamento Concepción, Paraguay. I examined 20 additional specimens from Paraguay collected by the same collector (J. A. Kochalka) from which Flint reported records. Flint's records were from specimens taken August through December. Some of the specimens I examined were collected during July. *C. carpenteri* appears to be the most widely distributed of the Neotropical species of *Climacia*.

**PARAGUAY:** [Concepción Dept.], Concepción, 19–21.vii.1989, 1 male (FSCA); same, but 8–16.viii.1989, J. Kochalka, UV-light trap, 1 male (FSCA); same, but 17–19.vii.1989, 4 males, 2 females (FSCA); same, but 2–3.x.1989, 7 males, 4 females (FSCA); same, but 18–21.x.1989, 1 male (FSCA). **URUGUAY:** Soriano, [Rincon del] Arroyo Cololo, 15.i.1962, Carbonell, 5 males, 1 female (in alcohol) (FSCA); same, but “Segundo”, C.S.C., M.A.M., C.S.M., 43 males, 15 females (in alcohol) (FSCA).

### *Climacia chilena* Parfin and Gurney, 1956

This species is known only from Argentina and Chile and is readily distinguished from other species of *Climacia* in having entirely hyaline wings (Parfin and Gurney 1956; Flint 1998). The record reported here is located 235 km north, northeast of the type locality at Puerto Varas, Llanquihe Province and represents a new provincial record within Chile.

**CHILE:** Cautín [Prov.], Pucón, 4.ii.1968, B. Heineman, 1 female (AMNH).

### *Climacia insolita* Flint, 1998

This species previously was known from the type series collected in Argentina and Brazil (Flint 1998, 2006). Uruguay represents a new country record for *C. insolita* and further expands the range of this species in South America.

**URUGUAY:** Artigas [Dept.], Sepulturas, Picada del Negro Muerto, 15.xii.1957, C. Carbonell, Río Cuareim, at light, 1 male, 4 females (FSCA).

### *Climacia punctulata* Flint, 2006

Flint (2006) described this species from Minas Gerais Province, Brazil. I report it here as an additional provincial record in that country. This is only the second known report of this species.

**BRAZIL:** Rondônia [Prov.], 62 km SW Ariquemes, nr. Fzda. Rancho Grande, 8–20–xi–1994, J. E. E[illegible]er, blacklight trap, 1 male (FSCA).

### *Climacia versicolor* Flint, 1998

Flint (1998) described this species from Argentina and it previously was known only from the type series collected from the Río Uruguay, Provincia Entre Ríos. Uruguay represents a new country record and the second known collection of this species.

**URUGUAY:** Artigas [Dept.], San Gregorio, Río Uruguay, 29.xi.1959, C. S. Carbonell, at light, 1 female (FSCA); same, but Salto [Dept.], Salto Grande, 10.xi.1955, S. S. Carbonell, light near waterfall, 2 males, 3 females (FSCA).

### *Climacia* sp.

A single female specimen of this species was collected in the small Nicaraguan department of Carazo on the Pacific Coast. It was first reported by Maes and Flint (1994). It is distinct from all other known *Climacia*, primarily in the wing maculations (Fig. 1) and banding of the antennae. The antennae have the basal 8–9 segments whitish, the next 13 segments dark brown, the next 10 segments are whitish, and the last 27–28 segments are light brown. The female genitalia are similar to those of several other species of *Climacia* (Fig. 2), and are insufficient for a comparative diagnosis. This specimen likely represents an undescribed species, but formal description will be postponed until additional material becomes available for study.

**NICARAGUA:** Dept. Carazo, Bioreserva de Chacocente (86°10' N, 11°30' W), 11–13.ix.1992, Maes, Martínez and López, 1 female (USNM).

### *Sisyra apicalis* Banks, 1908

This species is widespread throughout the Americas (Parfin and Gurney 1956; Penny 1981, 2002; Bowles 2006; Flint 2006), and it has the greatest latitudinal range among all the sisyrid species in the Western Hemisphere. The occurrence of *S. apicalis* in Guatemala, Suriname, and Uruguay represents new country records for this species and further expands its known distributional range in the Americas. This species was co-collected in Peru with *S. panama* Parfin and Gurney.

**GUATEMALA:** Guatemala [Dept.], Amatitlán, Lago de Amatitlán, km 29.5, 2–9.vi.2002, S. Hagen 1 female (FSCA) (in alcohol) (FSCA). **PERU:** Loreto [Region], Yacumama Lodge, 73.5° W, 4.8°S, nr. Jct. Río Marañon and Río Ucayali, 6–20.viii.1994, D. Nickle, P. Skelley et al., small light in woods, 3 males (FSCA). **SURINAME:** Saramacca [District], Damboentong, 27.vi to 9.vii.2006, Malaise, Alies van Sauers-Muller, 1 female, abdomen missing (FSCA); same but 31.viii to 10.ix.2006, sex undetermined, abdomen missing (FSCA). **URUGUAY:** Cerro Lago [Dept.], Sierra del Vaz, Río Tucari, 20 km SE Melo, 23–26.iii.1963, J. K. Bouseman, 1 male (AMNH).

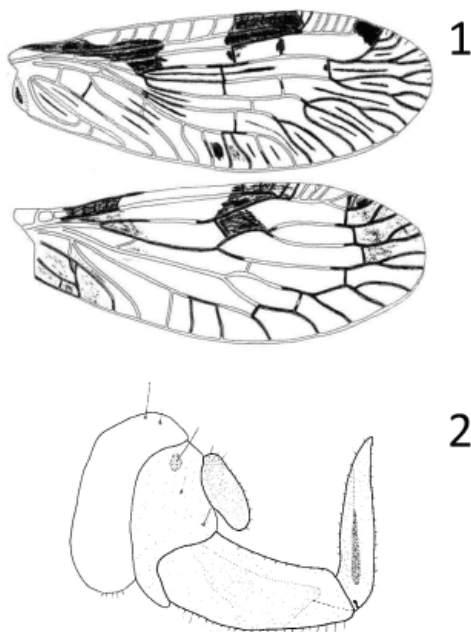
***Sisyrta panama* Parfin and Gurney, 1956**

This species has been previously reported from Bolivia, Brazil, and Panama (Parfin and Gurney 1956; Penny 1981; Flint 2006). Here, I report four specimens from Peru where it was co-collected with *S. apicalis* Banks. Although this is a new country record for this species it is not unexpected given that it also occurs in Brazil and Bolivia.

**BRAZIL:** Rondônia [Prov.], 62 km SW Ariquemes, nr. Fzda. Rancho Grande, U. Schmitz, BL trap, 27.iv.1992, 3 females (FSCA); same, but 6.v.1992, 2 females (FSCA); same, but 20.viii.1992, 1 female (FSCA); same, but 12.ix.1992, 2 females (FSCA). **PERU:** Loreto [Región], Yacumama Lodge, 73.5° W, 4.8°S, nr. Jct. Río Marañon and Río Ucayali, 6–20.viii.1994, D. Nickle, P. Skelley et al., small light in woods, 2 males, 2 females (in alcohol), 1 male, 2 females (pinned) (FSCA).

**Discussion**

The distribution and diversity of spongillafies in the Americas is becoming increasingly better known. *Sisyrta apicalis* is the most widespread sisyrid in the Americas being distributed from the southern portion of North America southward throughout much of South America, particularly along coastal areas. Similarly, *Climacia carpenteri* (Parfin and Gurney 1956; Flint 1998, 2006; Monserrat 2005; this study) is the most widespread species in South America. Most species of *Climacia* and other *Sisyrta* species have more restricted distributions. There are now four species of spongillafies known from Uruguay for the first time (*C. carpenteri*, *C. insolita*, *C. versicolor*, and *S. apicalis*). In addition, the finding of *S. apicalis* in Guatemala marks the first time spongillafies have been reported from that Central American country. Similarly, the finding of *S. apicalis* in Suriname marks the first time representatives of this genus have been collected in that country. The occurrence of *S. panama* in Peru also expands the known range of that species. Although the data here expands the known distributions of spongillafies in the Neotropics, there are no known occurrences of this family in Belize, El Salvador, Colombia, Ecuador, or French Guiana. Spongillafies also have not been documented for most of the Caribbean.



**Figures 1–2.** Female *Climacia* sp. from Nicaragua. 1) Wings. 2) Genitalia (lateral).



The obligate dependence of larval sisyrids on freshwater sponges (Porifera: Demospongiae) as a food source and developmental site likely plays a crucial role in their distribution. Freshwater sponge host data for spongillafly larvae in the Americas is limited primarily to studies completed in North America (Canada and USA) (Brown 1952; Parfin and Gurney 1956; Isom 1968; Poirrier 1969; Poirrier and Arceneaux 1972; Clark 1985). Little data is available for the Neotropics. Sponges are biogeographically sparse in some areas (Caribbean) or understudied in others (Mexico, Central and South America). Freshwater sponges are poorly represented in Caribbean: Cuba (4 species), Puerto Rico (1 species), Virgin Islands (1 species), Barbados and Nevis Islands (1 species), Curaçao (2 species) (Smith 1994; Bass and Volkmer-Ribeiro 1998; Bass 2003; Manconi and Pronzato 2005). Recent studies have shown that the sponge diversity in the Neotropics is quite high and it may be the most diverse sponge fauna in the world (Volkmer-Ribeiro 2007). Not surprisingly, the greatest sponge diversity for the Neotropics is in Brazil where 54 species have been reported (Nicacio et al. 2011; Buso et al. 2012; Pinheiro and Nicacio 2012; Ulisses Pinheiro, personal communication), which also has the greatest diversity of spongillafly (Parfin and Gurney 1956; Penny 1981, 2002; Penny and Rafael 1982; Flint 1998, 2006; Monserrat 2005). Conversely, the poor diversity of freshwater sponges in Caribbean inland waters may well be the reason for an equally poor diversity of spongillafly in that region. The high diversity of both freshwater sponges and spongillafly in the Neotropics implies a strong coevolutionary relationship between these two groups. More detailed study on host specificity and distribution of these animals may result in a better description of such relationships.

### Acknowledgments

I thank Oliver S. Flint, Jr., Smithsonian Institution, and Daniel Reynoso-Velasco, University of Missouri, for reviewing an earlier draft of this paper and for providing constructive comments. Andy Rasmussen, Florida A&M University, also provided constructive editorial comments. I also thank the American Museum of Natural History, National Museum of Natural History, and the Florida State Collection of Arthropods for loaning me specimens. A special thanks to Paul Skelley, Florida State Collection of Arthropods, for giving me access to many of the specimens presented in this paper.

### Literature Cited

- Alayo D., P. 1968.** Los Neuropteros de Cuba. Poeyana Instituto de Biología (B)2: 1–127.
- Banks, N. 1908.** Neuropteroid Insects: Notes and Descriptions. Transactions of the American Entomological Society 34: 255–267.
- Banks, N. 1913.** New exotic neuropteroid insect. Proceedings of the Entomological Society of Washington 15: 137–143.
- Bass, D. 2003.** A comparison of freshwater macroinvertebrate communities on small Caribbean islands. BioScience 53: 1094–1100.
- Bass, D., and C. Volkmer-Ribeiro. 1998.** *Radiospongilla crateriformis* (Porifera, Spongillidae) in the West Indies and taxonomic notes. Iheringia Serie Zoologia 85: 123–128.
- Bowles, D. E. 2006.** Spongillafly (Neuroptera: Sisyridae) of North America with a key to the larvae and adults. Zootaxa 1357: 1–19.
- Bowles, D. E. 2006.** Spongillafly (Neuroptera: Sisyridae) of North America with a key to the larvae and adults. Zootaxa 1357: 1–19.
- Brown, H. P. 1952.** The life history of *Climacia areolaris* (Hagen), a neuropterous ‘parasite’ of freshwater sponges. American Midland Naturalist 47: 130–160.
- Buso, A. A., Jr., C. Volkmer-Ribeiro, L. C. Ruiz Pessenda, and V. de Souza Machado. 2012.** *Anheteromeyenia vitrea* (Porifera: Demospongiae) new species of continental sponge in Brazil Neotropical Biology and Conservation 7: 148–157.
- Chandler, H. P. 1953.** A new species of *Climacia* from California (Sisyridae, Neuroptera). Journal of the Washington Academy of Science 43: 182–184.

- Clark, W. H. 1985.** First record of *Climacia californica* (Neuroptera: Sisyridae) and its host sponge, *Ephydatia mulleri* (Porifera: Spongillidae), from Idaho with water quality relationships. Great Basin Naturalist 45: 391–394.
- Esben-Petersen, P. 1935.** Two new species of Neuroptera. Konowia 14: 151–153.
- Flint, O. S., Jr. 1998.** New species and records of *Climacia* from the Neotropics (Neuroptera, Sisyridae). Acta Zoologica Fennica 209: 107–117.
- Flint, O. S., Jr. 2006.** New species and records of Neotropical Sisyridae with special reference to *Sisyra* (Insecta: Neuroptera). Proceedings of the Biological Society of Washington 119: 279–286.
- González Olazo, E. V. 1983.** Contribución al conocimiento de *Climacia carpenteri* Parfin and Gurney 1956 (Neuroptera, Sisyridae), nueva cita para la República Argentina. Acta Zoologica Lilloana 37: 115–117.
- Isom, B. G. 1968.** New distribution records for aquatic neuropterans, Sisyridae (spongilla-flies) in the Tennessee River drainage. Journal of the Tennessee Academy of Science 43: 109–110.
- Maes, J. M., and O. S. Flint, Jr. 1994.** Dilaridae, Berothidae y Sisyridae (Planipennia): tres familias nuevas para la fauna de Nicaragua. Revista Nicaragüense de Entomología 29: 3–5.
- Manconi, R. and R. Pronzato. 2005.** Freshwater sponges of the West Indies: Discovery of Spongillidae (Haplosclerida, Spongillina) from Cuba with biogeographic notes and a checklist for the Caribbean area. Journal of Natural History 39: 3235–3253.
- Montserrat, V. J. 2005.** Nuevos datos sobre algunas pequeñas familias de neurópteros (Insecta: Neuroptera: Nevrothidae, Osmylidae, Sisyridae, Dilaridae). Heteropterus: Revista de Entomología 5: 1–26.
- Navás, L. 1933.** Insectos Neotropicos. 8a. Revista Chilena Historia Natural 37: 194–197.
- Nicacio, G., W. Severi, and U. Pinheiro. 2011.** New species of *Radiospongilla* (Porifera: Spongillidae) from Brazilian inland waters. Zootaxa 3132: 56–63.
- Oswald, J. D., A. Contreras-Ramos, and N. D. Penny. 2002.** Neuroptera (Neuropterida), p. 559–581. *In*: J. Llorente and J. J. Morrone (eds.). Biodiversidad, taxonomía y biogeografía de artrópodos de México: hacia una síntesis de su conocimiento, Vol. III. Universidad Nacional Autónoma de México; Distrito Federal, Mexico. 690 p.
- Parfin, S. I., and A. B. Gurney. 1956.** The spongilla-flies, with special reference to those of the western hemisphere (Sisyridae, Neuroptera). Proceedings of the United States National Museum 105: 421–529.
- Penny, N. D. 1981.** Neuroptera of the Amazon Basin. Part 1. Sisyridae. Acta Amazonica 11: 157–169.
- Penny, N. D., and J. A. Rafael. 1982.** Two new species of Sisyridae (Neuroptera) from the Amazon Basin. Neuroptera International 2: 53–58.
- Penny, N. D. 2002.** A guide to the lacewings (Neuroptera) of Costa Rica. Proceedings of the California Academy of Sciences 53: 161–457.
- Pinheiro, U., and G. Nicacio. 2012.** Resurrection and redefinition of the genus *Tubella* (Porifera: Spongillidae) with a worldwide list of valid species. Zootaxa 3269: 65–68.
- Poirrier, M. A. 1969.** Some freshwater sponge hosts of Louisiana and Texas spongilla-flies, with new locality records. American Midland Naturalist 81: 573–575.
- Poirrier, M. A., and Y. M. Arceneaux. 1972.** Studies on southern Sisyridae (spongilla-flies) with a key to the third-instar larvae and additional sponge-host records. American Midland Naturalist 88: 455–458.
- Pupedis, R. J. 1980.** Generic differences among new world spongilla-fly larvae and a description of the female of *Climacia striata* (Neuroptera: Sisyridae). Psyche 87: 305–314.
- Smith, D. G. 1994.** First report of freshwater sponges (Porifera: Spongillidae) from the West Indies. Journal of Natural History 28: 981–986.
- Volkmer-Ribeiro, C. 2007.** South American continental sponges: state of the art of the research, p. 17–121. *In*: M. R. Custódio, et al. (eds.). Porifera research: biodiversity, innovation and sustainability. Museu Nacional; Rio de Janeiro, Brazil. 659 p.

Received October 6, 2014; Accepted October 30, 2014.

Review Editor Andy Rasmussen.



**Table 1.** Spongillaflies known to occur in southern Mexico, Central and South America. Countries shown in bold font represent new country records.

| Species                                | Distribution   | References   |
|--|--|--|
| <i>Climacia amalla</i> Flint           | Peru, Venezuela  | Flint (1998), Flint (2006)   |
| <i>C. basalis</i> Banks                | Brazil, Guyana   | Banks (1913), Parfin and Gurney (1956), Monserrat (2005), Flint (2006)   |
| <i>C. bifasciata</i> Penny and Rafael  | Brazil   | Penny and Rafael (1982)  |
| <i>C. bimaculata</i> Banks             | Brazil, Guyana, Suriname   | Parfin and Gurney (1956), Penny (1981), Flint (1998)   |
| <i>C. californica</i> Chandler         | Mexico   | Chandler (1953), Oswald et al. (2002), Monserrat (2005), Bowles (2006)   |
| <i>C. carpenteri</i> Parfin and Gurney | Brazil, Paraguay, <b>Uruguay</b>   | Parfin and Gurney (1956), Flint (1998), Monserrat (2005), Flint (2006), this study   |
| <i>C. chapini</i> Parfin and Gurney    | Mexico   | Parfin and Gurney (1956); Flint (1998), Oswald et al. (2002), Bowles (2006)  |
| <i>C. chilena</i> Parfin and Gurney    | Argentina, Chile   | Parfin and Gurney (1956), Flint (1998), this study   |
| <i>C. doradensis</i> Flint             | Venezuela  | Flint (1998)   |
| <i>C. insolita</i> Flint               | Argentina, Brazil, <b>Uruguay</b>  | Flint (1998), Flint (2006), this study   |
| <i>C. lemniscata</i> Flint             | Argentina  | Flint (1998)   |
| <i>C. negrense</i> Penny               | Brazil, Guyana   | Penny (1981), Flint (1998)   |
| <i>C. nota</i> Parfin and Gurney       | Bolivia, Brazil, Venezuela   | Parfin and Gurney (1956), Flint (1998)   |
| <i>C. punctulata</i> Flint             | Brazil   | Flint (2006), this study   |
| <i>C. striata</i> Parfin and Gurney    | Panama   | Parfin and Gurney (1956), Pupedis (1980), Flint (1998)   |
| <i>C. tenebra</i> Parfin and Gurney    | Honduras   | Parfin and Gurney (1956), Penny (1981)   |
| <i>C. townesi</i> Parfin and Gurney    | Brazil, Guyana, Peru, Venezuela  | Parfin and Gurney (1956), Flint (1998), Monserrat (2005), Flint (2006)   |
| <i>C. triplehorni</i> Flint            | Argentina, Brazil  | Flint (1998)   |
| <i>C. versicolor</i> Flint             | Argentina, <b>Uruguay</b>  | Flint (1998), Monserrat (2005), this study   |
| <i>Sisyra amazonica</i> Penny          | Brazil, Guyana, Paraguay   | Penny (1981), Flint (2006)   |
| <i>S. apicalis</i> Banks               | Belize, Brazil, <b>Guatemala</b> , Mexico, Nicaragua, Panama, Peru, <b>Suriname</b> , <b>Uruguay</b> | Banks (1908), Parfin and Gurney (1956), Penny (1981), Maes and Flint (1994), Oswald et al. (2002), Monserrat (2005), Flint (2006), Bowles (2006), this study |
| <i>S. ariasi</i> Penny                 | Brazil   | Penny (1981)   |
| <i>S. elongata</i> Penny and Rafael    | Brazil, Peru   | Penny and Rafael (1982), Monserrat (2005), Flint (2006)  |
| <i>S. minuta</i> Ebsen-Petersen        | Brazil   | Ebsen-Petersen (1935), Penny (1981), Flint (2006)  |
| <i>S. panama</i> Parfin and Gurney     | Bolivia, Brazil, Panama, <b>Peru</b>   | Parfin and Gurney (1956), Penny (1981), Flint (2006); this study   |

