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## The Trichoptera of Panama. III. Updated species list for caddisflies (Insecta: Trichoptera) in the Republic of Panama

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**Abstract.** The fauna of Panama is species-rich due to its location and topography, and the resulting diversity of microclimates and habitats. The last summary of information about the caddisfly fauna (Insecta: Trichoptera) of Panama in 1992 noted 168 taxa in 13 families and 39 genera. Since then, and through 2014, a large number of publications, based on work by a dedicated cadre of individuals, have recorded a net gain of 78 species and six genera. In 2015, 17 new species to science and 38 new country records were added, including one new family and two new genera for the country; and, two species were removed. Thus, 299 species of caddisflies are now known from the Republic of Panama and are distributed among 14 families and 47 genera. Given the higher diversity in neighboring Costa Rica (>500 species), we feel certain that there are many more species yet to be discovered.

**Key words.** Central America, families, genera, species

## **Introduction**

Aguila (1992) published the most recent compilation of caddisflies (Insecta: Trichoptera) known from the Republic of Panama. She listed 168 trichopteran species in 39 genera and 13 families. Through 2014, a large number of papers, dealing either directly or peripherally with Panama, have recorded a net gain of six genera and 78 species to its fauna. The majority of these papers were the result of studies by a dedicated cadre of individuals (e.g., Oliver Flint of the Smithsonian Institution; Ralph Holzenthal, Roger Blahnik, Lourdes Chamorro, Aysha Prather of the University of Minnesota; Fernando Muñoz-Quesada of Universidad de Antioquia, Colombia; Joaquín Bueno-Soria of the Universidad Nacional Autónoma de México; Steven Harris of Clarion University; and, Kjell Arne Johanson of the

Swedish Museum of Natural History, among others). Most recently, Armitage et al. (2015) added 32 new Panamanian species records, including records for one new family (Limnephilidae) and one new genus (*Limnephilus*). Harris and Armitage (2015) described 10 new hydroptilid species, including one genus (*Nothotrichia*) new to Panama. And, Muñoz-Quesada and Holzenthal (2015) added seven new species described from Panama and six new country records in the genus *Wormaldia*. In the latter paper, one species of *Wormaldia* was removed by synonymy, and a second species was determined not to occur in Panama. Thus, the caddisfly fauna of the Republic of Panama now includes 14 families, 47 genera, and 299 species.

Herein, we present an up-to-date list of caddisflies for Panama. We follow the order and hierarchy presented in Holzenthal et al. (2015). Table 1 summarizes the number of genera and species for each family. Table 2 presents all of the species organized by suborder, superfamily, and family, with their

**Table 1.** Summary of genera and species among Trichopteran families found in the Republic of Panama. Family order follows Holzenthal et al. (2015).

Family	Number of Genera	Number of Species
Philopotamidae	3	48
Ecnomidae	1	4
Polycentropodidae	4	20
Xiphocentronidae	3	6
Hydropsychidae	6	46
Glossosomatidae	3	19
Hydroptilidae	15	92
Hydrobiosidae	1	9
Calamoceratidae	2	7
Leptoceridae	5	28
Odontoceridae	1	1
Helicopsychidae	1	11
Limnephilidae	1	1
Lepidostomatidae	1	7
<b>Totals:</b>	<b>47</b>	<b>299</b>

authorities. The right hand column of Table 2 lists the literature citation in which the species was first assigned to Panama, if different from the original description. The Literature Cited section is organized by family, preceded by a short list of general citations, which could be referenced in two or more family sections in Table 2. We chose to limit the literature cited to publications in which species were originally described or were first recorded from Panama. Other publications, not meeting those criteria (e.g., Prather 2004), will be included in an upcoming book chapter that examines the distribution of caddisfly species in Panama by cuenca (watershed) and province.

Panama reflects a similar frequency of species diversity within genera and families as that found in other parts of the Neotropical Region. The Family Hydroptilidae is by far the most species rich, with twice as many species as the next closest family. Given the recent addition of 10 new hydroptilid species from just a few locations (Harris and Armitage 2015), this dominance is not likely to change. Few of the other families have the potential that Hydroptilidae possesses for adding new, undescribed species. However, we anticipate that many families will increase in size by additions of new country records, derived from those known from both Mexico/Central America and northwestern South America. The eastern areas of Panama, including Darién Province, have been poorly and infrequently collected, due in part to the difficulty of travel there. Increased availability of collections from this part of Panama in the future could generate many new records.

This publication also serves as a baseline of information for ongoing work by a number of researchers. In addition, the Instituto Conmemorativo Gorgas de Estudios de la Salud (Gorgas Institute), as well as other Panamanian institutions, will employ this information as part of their continuing efforts to characterize the major cuencas (water basins), and evaluate the water quality of same, throughout Panama.

**Table 2.** Updated list of the Trichoptera of Panama through August, 2015, based on literature records. An asterisk [\*] under “First Source for Panamanian Records” indicates species for which Panama was the location of the holotype or paratype; or, in which Panama was in some manner included in the original description. Other citations given as a “First Source” only include those for which the name “Panama” was specifically mentioned in the text; phrases such as “widespread throughout Central America”, for example, were not accepted.

Species	First Source for Panamanian Records
<b>Suborder Annulipalpia</b> Martynov	
<b>Superfamily Philopotamoidea</b> Stephens	
<b>Family Philopotamidae</b> Stephens	
<i>Chimarra (Chimarra) adelphe</i> Blahnik 1998	*
<i>Chimarra (Chimarra) altmani</i> Blahnik 1998	*
<i>Chimarra (Chimarra) caribea</i> Flint 1968	Blahnik 1998
<i>Chimarra (Chimarra) colmillo</i> Blahnik and Holzenthal 1992	Armitage et al. 2015
<i>Chimarra (Chimarra) dentosa</i> Ross 1948	Blahnik 1998
<i>Chimarra (Chimarra) dolabrifera</i> Flint and Reyes A. 1991	Blahnik 1998
<i>Chimarra (Chimarra) duckworthi</i> Flint 1967	Blahnik 1998
<i>Chimarra (Chimarra) dudosa</i> Blahnik 1998	*
<i>Chimarra (Chimarra) emima</i> Ross 1959	*
<i>Chimarra (Chimarra) flinti</i> Bueno-Soria 1985	Blahnik 1998
<i>Chimarra (Chimarra) jemima</i> Blahnik and Holzenthal 1992	Armitage et al. 2015
<i>Chimarra (Chimarra) longiterga</i> Blahnik and Holzenthal 1992	*
<i>Chimarra (Chimarra) munozi</i> Blahnik and Holzenthal 1992	Blahnik 1998
<i>Chimarra (Chimarra) peineta</i> Blahnik and Holzenthal 1992	Blahnik 1998
<i>Chimarra (Chimarra) pollex</i> Blahnik and Holzenthal 1992	Blahnik 1998
<i>Chimarra (Chimarra) spangleri</i> Bueno-Soria 1985	Blahnik 1998
<i>Chimarra (Chimarra) villalobosi</i> Bueno-Soria 1985	Blahnik 1998

**Table 2.** Updated list of the Trichoptera of Panama through August, 2015, continued.

Species	First Source for Panamanian Records
<i>Chimarra (Chimarra) woldai</i> Blahnik 1998	*
<i>Chimarra (Curgia) aureopunctata</i> Flint 1967	Flint 1998
<i>Chimarra (Curgia) banksi</i> (Ulmer 1907)	Flint 1998
<i>Chimarra (Curgia) barrettiae</i> (Banks 1900)	McElvray 1981
<i>Chimarra (Curgia) bisectilis</i> Flint 1998	*
<i>Chimarra (Curgia) centralis</i> Ross 1959	*
<i>Chimarra (Curgia) costaricensis</i> Flint 1998	Armitage et al. 2015
<i>Chimarra (Curgia) didyma</i> Flint 1998	*
<i>Chimarra (Curgia) lobata</i> Flint 1967	*
<i>Chimarra (Curgia) pablito</i> Flint 1998	*
<i>Chimarra (Curgia) persimilis</i> Banks 1920	Flint 1998
<i>Chimarra (Curgia) purisca</i> Flint 1998	Armitage et al. 2015
<i>Chimarra (Curgia) sarophora</i> Flint 1998	*
<i>Chimarra (Curgia) spatulata</i> Ross 1959	McElvray 1981
<i>Chimarra (Curgia) wilsoni</i> Flint 1967	McElvray 1981
<i>Chimarra (Otarra) rossi</i> Bueno-Soria 1985	Blahnik 1998
<i>Chimarrhodella ulmeri</i> (Ross 1956)	Blahnik and Holzenthal 1992
<i>Wormaldia anhelitus</i> Muñoz-Quesada and Holzenthal 2015	*
<i>Wormaldia chrismark</i> Muñoz-Quesada and Holzenthal 2015	*
<i>Wormaldia contrerasi</i> Muñoz-Quesada and Holzenthal 2015	*
<i>Wormaldia eberhardi</i> Muñoz-Quesada and Holzenthal 2015	*
<i>Wormaldia flinti</i> Muñoz-Quesada and Holzenthal 2015	*
<i>Wormaldia francovilla</i> Muñoz-Quesada and Holzenthal 2015	*
<i>Wormaldia fredycarol</i> Muñoz-Quesada and Holzenthal 2015	*
<i>Wormaldia gallardoi</i> Muñoz-Quesada and Holzenthal 2015	*
<i>Wormaldia lauglo</i> Muñoz-Quesada and Holzenthal 2015	*
<i>Wormaldia machodorum</i> Muñoz-Quesada and Holzenthal 2015	*
<i>Wormaldia planae</i> Ross and King [in Ross 1956]	Flint 1981
<i>Wormaldia savoriorum</i> Muñoz-Quesada and Holzenthal 2015	*
<i>Wormaldia trondi</i> Muñoz-Quesada and Holzenthal 2015	*
<i>Wormaldia zunigarceorum</i> Muñoz-Quesada and Holzenthal 2015	*
<b>Superfamily Psychomyioidea</b> Walker	
<b>Family Ecnomidae</b> Ulmer	
<i>Austrotinodes contubernalis</i> Flint and Denning 1989	*
<i>Austrotinodes fortunata</i> Flint and Denning 1989	*
<i>Austrotinodes panamensis</i> Flint 1973	*
<i>Austrotinodes sedmani</i> Flint 1973	Flint and Denning 1989
<b>Family Polycentropodidae</b> Ulmer	
<i>Cernotina uncifera</i> Ross 1951	Bueno-Soria and Flint 1978
<i>Cyrnellus fraternus</i> (Banks 1905)	Bueno-Soria and Flint 1978
<i>Polycentropus acanthogaster</i> Flint 1980	*
<i>Polycentropus altmani</i> Yamamoto 1967	*
<i>Polycentropus dentoides</i> Yamamoto 1967	*
<i>Polycentropus digitus</i> Yamamoto 1967	*
<i>Polycentropus fortunus</i> Flint 1980	*
<i>Polycentropus lingulatus</i> Flint 1980	*
<i>Polycentropus spicatus</i> Yamamoto 1967	*
<i>Polyplectropus charlesi</i> (Ross 1941)	Bueno-Soria 1990
<i>Polyplectropus clauseni</i> Chamorro-Lacayo and Holzenthal 2004	*
<i>Polyplectropus deltoides</i> (Yamamoto 1967)	*
<i>Polyplectropus insularis</i> Chamorro and Holzenthal 2010	*
<i>Polyplectropus laminatus</i> (Yamamoto 1966)	Bueno-Soria 1990
<i>Polyplectropus maesi</i> Chamorro-Lacayo 2003	Chamorro and Holzenthal 2010
<i>Polyplectropus mathisi</i> Bueno-Soria 1990	*

**Table 2.** Updated list of the Trichoptera of Panama through August, 2015, continued.

Species	First Source for Panamanian Records
<i>Polyplectropus panamensis</i> Bueno-Soria 1990	*
<i>Polyplectropus santiago</i> (Ross 1947)	Bueno-Soria 1990
<i>Polyplectropus woldai</i> Chamorro and Holzenthal 2010	*
<i>Polyplectropus yolandae</i> Chamorro-Lacayo and Holzenthal 2004	Chamorro and Holzenthal 2010
<b>Family Xiphocentronidae</b> Ross	
<i>Cnodocentron (Caenocentron) galesus</i> Schmid 1982	*
<i>Cnodocentron (Caenocentron) pallas</i> Schmid 1982	*
<i>Machairocentron ascanius</i> Schmid 1982	*
<i>Machairocentron teucrus</i> Schmid 1982	*
<i>Xiphocentron (Xiphocentron) aureum</i> Flint 1967	Schmid 1982
<i>Xiphocentron (Sphagocentron) evandrus</i> Schmid 1982	Armitage et al. 2015
<b>Superfamily Hydropsychoidea</b> Curtis	
<b>Family Hydropsychidae</b> Curtis	
<i>Calosopsyche ardisia</i> Flint and Bueno-Soria 1987	Armitage et al. 2015
<i>Calosopsyche bicuspis</i> Flint and Bueno-Soria 1987	Armitage et al. 2015
<i>Calosopsyche continentalis</i> Flint and Bueno-Soria 1987	*
<i>Calosopsyche elachista</i> Flint and Bueno-Soria 1987	*
<i>Centromacronema auripenne</i> (Rambur 1842)	Holzenthal 1988
<i>Leptonema albovirens</i> (Walker 1852)	Flint et al. 1987
<i>Leptonema campanum</i> Flint, McAlpine, and Ross 1987	*
<i>Leptonema cheesmanae</i> Mosely 1933	Flint et al. 1987
<i>Leptonema complexum</i> Mosely 1933	*
<i>Leptonema crassum</i> Ulmer 1905	Flint et al. 1987
<i>Leptonema ekisi</i> Flint, McAlpine, and Ross 1987	*
<i>Leptonema forficulum</i> Mosely 1933	Flint et al. 1987
<i>Leptonema fortunum</i> Flint, McAlpine, and Ross 1987	*
<i>Leptonema hamuli</i> Flint, McAlpine, and Ross 1987	*
<i>Leptonema intermedium</i> Mosely 1933	Flint et al. 1987
<i>Leptonema rafita</i> Muñoz-Quesada 1997	Armitage et al. 2015
<i>Leptonema salvini</i> Mosely 1933	Flint et al. 1987
<i>Leptonema simulans</i> Mosely 1933	Flint et al. 1987
<i>Leptonema sinuatum</i> Mosely 1933	Flint et al. 1987
<i>Leptonema sparsum</i> (Ulmer 1905)	Flint et al. 1987
<i>Leptonema tapanti</i> Muñoz-Quesada 1997	*
<i>Leptonema woldianum</i> Flint, McAlpine, and Ross 1987	*
<i>Macronema burmeisteri</i> Banks 1924	Flint and Bueno 1979
<i>Macronema luteipenne</i> Flint and Bueno-Soria 1979	*
<i>Macronema variipenne</i> Flint and Bueno-Soria 1979	*
<i>Macrostemum ulmeri</i> (Banks 1913)	Flint 1991
<i>Smicridea (Smicridea) bivittata</i> (Hagen 1861)	*
<i>Smicridea (Smicridea) breviuncata</i> Flint 1974	*
<i>Smicridea (Smicridea) campana</i> Flint 1974	*
<i>Smicridea (Smicridea) cartiensis</i> Flint and Denning 1989	*
<i>Smicridea (Smicridea) catherinae</i> Blahnik 1995	*
<i>Smicridea (Smicridea) circinata</i> Flint and Denning 1989	*
<i>Smicridea (Smicridea) cuna</i> Flint 1974	*
<i>Smicridea (Smicridea) filicata</i> Flint and Denning 1989	McElravy et al. 1981
<i>Smicridea (Smicridea) gemina</i> Blahnik 1995	*
<i>Smicridea (Smicridea) hybrida</i> Blahnik 1995	*
<i>Smicridea (Smicridea) latipala</i> Flint and Denning 1989	*
<i>Smicridea (Smicridea) matagalpa</i> Flint 1974	*
<i>Smicridea (Smicridea) mirama</i> Flint and Denning 1989	*
<i>Smicridea (Smicridea) multidens</i> Flint and Denning 1989	*
<i>Smicridea (Rhyacophylax) murina</i> McLachlan 1871	Flint 1974

**Table 2.** Updated list of the Trichoptera of Panama through August, 2015, continued.

Species	First Source for Panamanian Records
<i>Smicridea (Rhyacophylax) radula</i> Flint 1974	*
<i>Smicridea (Rhyacophylax) signata</i> (Banks 1903)	Flint 1974
<i>Smicridea (Rhyacophylax) talamanca</i> Flint 1974	McElravy et al. 1981
<i>Smicridea (Smicridea) turrialbana</i> Flint 1974	Flint and Denning 1989
<i>Smicridea (Smicridea) varia</i> (Banks 1913)	Flint 1974
<b>Suborder Integripalpia</b> Martynov	
<b>Superfamily Glossosomatoidea</b> Wallengren	
<b>Family Glossosomatidae</b> Wallengren	
<i>Culoptila unispina</i> Blahnik and Holzenthal 2006	*
<i>Mortoniella anakantha</i> Blahnik and Holzenthal 2008	*
<i>Mortoniella aviceps</i> Blahnik and Holzenthal 2008	*
<i>Mortoniella munozi</i> Blahnik and Holzenthal 2008	*
<i>Mortoniella panamensis</i> Blahnik and Holzenthal 2008	*
<i>Mortoniella pectinella</i> Blahnik and Holzenthal 2008	*
<i>Mortoniella redunca</i> Blahnik and Holzenthal 2008	Armitage et al. 2015
<i>Mortoniella rovira</i> (Flint 1974)	*
<i>Mortoniella tapanti</i> Blahnik and Holzenthal 2008	*
<i>Mortoniella taurina</i> Blahnik and Holzenthal 2008	*
<i>Mortoniella umbonata</i> Blahnik and Holzenthal 2008	*
<i>Protoptila altura</i> Holzenthal and Blahnik 2006	Armitage et al. 2015
<i>Protoptila cana</i> Flint 1974	*
<i>Protoptila chitaria</i> Holzenthal and Blahnik 2006	Armitage et al. 2015
<i>Protoptila laterospina</i> Flint 1967	Flint et al. 1999
<i>Protoptila orotina</i> Flint 1974	*
<i>Protoptila perdita</i> Bueno-Soria, Santiago-Fragosa, and Barba-Alvarez	*
<i>Protoptila tojana</i> Mosely 1954	Holzenthal and Blahnik 2006
<i>Protoptila trichoglossa</i> Holzenthal and Blahnik 2006	Armitage et al. 2015
<b>Superfamily Hydroptiloidea</b> Stephens	
<b>Family Hydroptilidae</b> Stephens	
<i>Acostatrichia topora</i> Oláh and Flint 2012	*
<i>Alisotrichia asta</i> Harris and Flint 2002	*
<i>Alisotrichia cuernita</i> Harris and Flint 2002	*
<i>Alisotrichia linterna</i> Harris and Flint 2002	*
<i>Alisotrichia panamensis</i> Harris and Flint 2002	*
<i>Alisotrichia woldai</i> Harris and Flint 2002	*
<i>Anchitrichia spangleri</i> Flint 1970	*
<i>Bredinia costaricensis</i> (Flint 1967)	Harris, Holzenthal, and Flint 2002
<i>Bredinia dominicensis</i> Flint 1968	Flint 1996
<i>Ceratotrichia fairchildi</i> Flint 1992	*
<i>Costatrichia panamensis</i> Flint 1967	*
<i>Costatrichia spinifera</i> Flint 1970	*
<i>Costatrichia tripartita</i> Flint 1970	*
<i>Flintiella panamensis</i> Harris, Flint, and Holzenthal 2002	*
<i>Flintiella pizotensis</i> Harris, Flint, and Holzenthal 2002	*
<i>Hydroptila flinti</i> Bueno-Soria 1984	Armitage et al. 2015
<i>Hydroptila grenadensis</i> Flint 1968	Flint 1996
<i>Hydroptila nusagandia</i> Harris and Holzenthal 1999	*
<i>Hydroptila rastrilla</i> Harris and Holzenthal 1999	*
<i>Hydroptila veracruzensis</i> Flint 1967	Armitage et al. 2015
<i>Leucotrichia chiriquiensis</i> Flint 1970	*
<i>Leucotrichia fairchildi</i> Flint 1970	*
<i>Leucotrichia viridis</i> Flint 1967	Flint 1970



**Table 2.** Updated list of the Trichoptera of Panama through August, 2015, continued.

Species	First Source for Panamanian Records
<i>Metrichia biungulata</i> (Flint 1972)	*
<i>Metrichia brevitars</i> Bueno-Soria and Santiago-Fragoso 2002	*
<i>Metrichia continentalis</i> (Flint 1972)	*
<i>Metrichia difusa</i> Bueno-Soria and Santiago-Fragoso 2002	*
<i>Metrichia enigmatica</i> Bueno-Soria and Santiago-Fragoso 2002	*
<i>Metrichia lemniscata</i> (Flint 1972)	*
<i>Metrichia nigriflora</i> (Banks 1907)	Bueno-Soria and Santiago-Fragoso 2002
<i>Metrichia nowaczyki</i> Harris and Armitage 2015	*
<i>Metrichia palida</i> Bueno-Soria and Santiago-Fragoso 2002	*
<i>Metrichia penicillata</i> (Flint 1972)	Bueno-Soria and Santiago-Fragoso 2002
<i>Metrichia pseudopatagonica</i> Bueno-Soria and Holzenthal 2003	Bueno-Soria and Santiago-Fragoso 2002
<i>Metrichia sencilla</i> Harris and Armitage 2015	*
<i>Metrichia sesquipetalis</i> Bueno-Soria and Holzenthal 2003	Bueno-Soria and Santiago-Fragoso 2002
<i>Metrichia triangula</i> Bueno-Soria and Santiago-Fragoso 2002	*
<i>Metrichia triquetra</i> Bueno-Soria and Holzenthal 2003	Bueno-Soria and Santiago-Fragoso 2002
<i>Neotrichia canixa</i> (Mosely 1937)	Armitage et al. 2015
<i>Neotrichia flowersi</i> Harris 1990	*
<i>Neotrichia malickyi</i> Harris [in Harris and Tiemann 1993]	*
<i>Neotrichia pamela</i> Harris and Armitage 2015	*
<i>Neotrichia parbullata</i> Harris and Armitage 2015	*
<i>Neotrichia tauricornis</i> Malicky 1980	Harris and Tiemann 1993
<i>Nothotrichia panama</i> Harris and Armitage 2015	*
<i>Ochrotrichia abrelata</i> Harris and Armitage 2015	*
<i>Ochrotrichia anomala</i> Bueno-Soria and Santiago-Fragoso 1997	*
<i>Ochrotrichia arriba</i> Bueno-Soria and Santiago-Fragoso 1997	*
<i>Ochrotrichia assita</i> Bueno-Soria and Holzenthal 2004	*
<i>Ochrotrichia bicaudata</i> Bueno-Soria and Santiago-Fragoso 1997	*
<i>Ochrotrichia caimita</i> Flint 1972	*
<i>Ochrotrichia corneolus</i> Bueno-Soria and Santiago-Fragoso 1997	*
<i>Ochrotrichia crucecita</i> Bueno-Soria and Santiago-Fragoso 1997	*
<i>Ochrotrichia curvata</i> Bueno-Soria and Holzenthal 2004	*
<i>Ochrotrichia flagellata</i> Flint 1972	*
<i>Ochrotrichia glabra</i> Bueno-Soria and Santiago-Fragoso 1997	*
<i>Ochrotrichia longispina</i> Bueno-Soria and Holzenthal 2004	*
<i>Ochrotrichia lupita</i> Bueno-Soria and Santiago-Fragoso 1997	*
<i>Ochrotrichia nimmoi</i> Harris and Armitage 2015	*
<i>Ochrotrichia pacifica</i> Flint 1972	Flint et al. 1999
<i>Ochrotrichia panamensis</i> Flint 1972	*
<i>Ochrotrichia paraldama</i> Bueno-Soria 2009	*
<i>Ochrotrichia pulgara</i> Harris and Armitage 2015	*
<i>Ochrotrichia regina</i> Bueno-Soria and Santiago-Fragoso 1997	*
<i>Ochrotrichia tenanga</i> (Mosely 1937)	Flint 1972
<i>Oxyethira (Dampftrichia) arizona</i> Ross 1948	Armitage et al. 2015
<i>Oxyethira (Loxotrichia) azteca</i> (Mosely 1937)	Flint 1996
<i>Oxyethira (Dampftrichia) circaverna</i> Kelley 1983	*
<i>Oxyethira (Argyrobothrus) glasa</i> (Ross 1941)	Armitage et al. 2015
<i>Oxyethira (Tanytrichia) hilosa</i> Holzenthal and Harris 1992	*
<i>Oxyethira (Dampftrichia) maya</i> Denning 1947	Flint and Englund 2003
<i>Oxyethira (Loxotrichia) parce</i> (Edwards and Arnold 1961)	Flint 1996
<i>Oxyethira sierruca</i> Holzenthal and Harris 1992	Armitage et al. 2015
<i>Oxyethira (Dampftrichia) simulatrix</i> Flint 1968	Armitage et al. 2015
<i>Oxyethira (Loxotrichia) tica</i> Holzenthal and Harris 1992	Flint 1996
<i>Zumatrichia angulata</i> Flint 1970	*
<i>Zumatrichia antillensis</i> Flint 1968	Oláh and Flint 2012
<i>Zumatrichia attenuata</i> Flint 1970	Armitage et al. 2015

**Table 2.** Updated list of the Trichoptera of Panama through August, 2015, continued.

Species	First Source for Panamanian Records
<i>Zumatrichia bifida</i> Flint 1970	*
<i>Zumatrichia caudifera</i> Flint 1970	*
<i>Zumatrichia chiriquiensis</i> Flint 1970	*
<i>Zumatrichia dereka</i> Oláh and Flint 2012	*
<i>Zumatrichia galtena</i> Mosely 1937	Armitage et al. 2015
<i>Zumatrichia maskara</i> Oláh and Flint 2012	*
<i>Zumatrichia nelkula</i> Oláh and Flint 2012	*
<i>Zumatrichia palmara</i> Flint 1970	Flint and Reyes 1991
<i>Zumatrichia rhamphiodes</i> Flint 1970	*
<i>Zumatrichia saluda</i> Flint 1970	*
<i>Zumatrichia sortetla</i> Oláh and Flint 2012	*
<i>Zumatrichia teribe</i> Harris and Armitage 2015	*
<i>Zumatrichia turuda</i> Oláh and Flint 2012	*
<i>Zumatrichia zegla</i> Harris and Armitage 2015	*
<b>Superfamily Rhyacophiloidea</b> Stephens	
<b>Family Hydrobiosidae</b> Ulmer	
<i>Atopsyche callosa</i> (Navás 1924)	McElravy et al. 1981
<i>Atopsyche chimpuoclo</i> Schmid 1989	Armitage et al. 2015
<i>Atopsyche cira</i> (Mosely 1949)	Armitage et al. 2015
<i>Atopsyche dampfi</i> Ross and King 1952	McElravy et al. 1981
<i>Atopsyche erigia</i> Ross 1947	Bueno-Soria and Flint 1978
<i>Atopsyche huainacapac</i> Schmid 1989	Armitage et al. 2015
<i>Atopsyche implexa</i> (Navás 1924)	McElravy et al. 1981
<i>Atopsyche jaba</i> Blahnik and Gottschalk 1997	Armitage et al. 2015
<i>Atopsyche majada</i> Ross 1947	McElravy et al. 1981
<b>Superfamily Leptoceroidea</b> Leach	
<b>Family Calamoceratidae</b> Ulmer	
<i>Banyallarga fortuna</i> (Resh) [in Denning et al. 1983]	*
<i>Phylloicus aeneus</i> (Hagen 1861)	McElravy et al. 1981
<i>Phylloicus blahniki</i> Prather 2003	*
<i>Phylloicus elegans</i> Hogue and Denning [in Denning et al. 1983]	*
<i>Phylloicus lituratus</i> Banks 1920	Denning et al. 1983
<i>Phylloicus munozi</i> Prather 2003	*
<i>Phylloicus panamensis</i> Prather 2003	*
<b>Family Leptoceridae</b> Leach	
<i>Atanatolica panamensis</i> Holzenthal 1988a	*
<i>Nectopsyche dorsalis</i> (Banks 1901)	Haddock 1977
<i>Nectopsyche gemma</i> (Müller 1880)	Flint 1991
<i>Nectopsyche gemmoides</i> Flint 1981	*
<i>Nectopsyche ortizi</i> Holzenthal 1995	*
<i>Nectopsyche pavida</i> (Hagen 1861)	Haddock 1977
<i>Nectopsyche punctata</i> (Ulmer 1905)	Flint 1991
<i>Nectopsyche spiloma</i> (Ross 1944)	Flint and Reyes 1991
<i>Oecetis acciptrina</i> Blahnik and Holzenthal 2014	*
<i>Oecetis avara</i> (Banks 1895)	Bueno-Soria and Flint 1978
<i>Oecetis constricta</i> Blahnik and Holzenthal 2014	*
<i>Oecetis falicia</i> Denning [in Denning and Sykora 1966]	*
<i>Oecetis inconspicua</i> (Walker 1852)	Bueno-Soria and Flint 1978
<i>Oecetis knutsoni</i> Flint 1981	Armitage et al. 2015
<i>Oecetis mexicana</i> Blahnik and Holzenthal 2014	*
<i>Oecetis protrusa</i> Blahnik and Holzenthal 2014	*
<i>Oecetis pseudoinconspicua</i> Bueno-Soria 1981	*
<i>Oecetis punctipennis</i> (Ulmer 1905)	Maes and Flint 1988

**Table 2.** Updated list of the Trichoptera of Panama through August, 2015, continued.

Species	First Source for Panamanian Records
<i>Triaenodes anomalous</i> Flint 1967	Armitage et al. 2015
<i>Triaenodes clauseni</i> Holzenthal and Andersen 2004	*
<i>Triaenodes delicatus</i> Navás 1924	Holzenthal and Andersen 2004
<i>Triaenodes guadaloupe</i> Holzenthal and Andersen 2004	*
<i>Triaenodes hornitos</i> Holzenthal and Andersen 2004	*
<i>Triaenodes talamanca</i> Holzenthal and Andersen 2004	Armitage et al. 2015
<i>Triaenodes tapanti</i> Holzenthal and Andersen 2004	*
<i>Triaenodes tico</i> Holzenthal and Andersen 2004	*
<i>Triaenodes woldai</i> Holzenthal and Andersen 2004	*
<i>Triplectides flintorum</i> Holzenthal 1988b	*
<b>Family Odontoceridae</b> Wallengren	
<i>Marilia flexuosa</i> Ulmer 1905	Bueno-Soria and Flint 1978
<b>Superfamily Sericostomatoidea</b> Stephens	
<b>Family Helicopsychidae</b> Ulmer	
<i>Helicopsyche blantoni</i> Johanson and Malm 2006	*
<i>Helicopsyche borealis</i> (Hagen 1861)	Bueno-Soria and Flint 1978
<i>Helicopsyche chiriquensis</i> Johanson and Malm 2006	*
<i>Helicopsyche fridae</i> Johanson 2003	*
<i>Helicopsyche incisa</i> Ross 1956	McElravy et al. 1981
<i>Helicopsyche linguata</i> Johanson and Malm 2006	*
<i>Helicopsyche sanblasensis</i> Johanson and Malm 2006	*
<i>Helicopsyche truncata</i> Ross 1956	McElravy et al. 1981
<i>Helicopsyche tuxtlenensis</i> Bueno-Soria 1983	Johanson 2003
<i>Helicopsyche vergelana</i> Ross 1956	Flint 1991
<i>Helicopsyche woldai</i> Johanson 2003	*
<b>Superfamily Limnephiloidea</b> Kolenati	
<b>Family Limnephilidae</b> Kolenati	
<i>Limnephilus hamifer</i> Flint 1963	Armitage et al. 2015
<b>Superfamily Phryganeoidea</b> Leach	
<b>Family Lepidostomatidae</b> Ulmer	
<i>Lepidostoma chiriquiensis</i> Holzenthal and Strand 1992	*
<i>Lepidostoma ectopium</i> Holzenthal and Strand 1992	*
<i>Lepidostoma griseum</i> (Banks 1911)	Armitage et al. 2015
<i>Lepidostoma mexicanum</i> (Banks 1901)	Flint and Bueno-Soria 1977
<i>Lepidostoma polylepium</i> Holzenthal and Strand 1992	Armitage et al. 2015
<i>Lepidostoma reimoseri</i> Flint and Bueno-Soria 1977	Armitage et al. 2015
<i>Lepidostoma tapanti</i> Holzenthal and Strand 1992	Flint et al. 1999

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## Literature Cited

### General (includes citations pertinent to several families below):

- Aguila, Y. 1992.** Systematic catalogue of the caddisflies of Panama (Trichoptera). p. 532-548. *In*: D. Quintero and A. Aiello (eds.). *Insects of Panama and Mesoamerica. Selected Studies*, Oxford University Press; Oxford. 714 p.
- Armitage, B. J., S. C. Harris, and R. W. Holzenthal. 2015.** The Trichoptera of Panama. I. New records for caddisflies (Insecta: Trichoptera) from the Republic of Panama. *Insecta Mundi* 0435: 1-10.
- Bueno-Soria, J., and O. S. Flint, Jr. 1978.** Catálogo sistemático de los tricópteros de México (Insecta: Trichoptera), con algunos registros de Norte, Centro y Sudamérica. *Anales del Instituto de Biología, Universidad Nacional Autónoma de México, Serie Zoología* 49: 189-218.
- Flint, O. S., Jr. 1981.** Studies of Neotropical caddisflies, XXVIII: The Trichoptera of the Río Limon Basin, Venezuela. *Smithsonian Contributions to Zoology* 330: 1-61.
- Flint, O. S., Jr. 1991.** Studies of Neotropical caddisflies, XLV: The taxonomy, phenology, and faunistics of the Trichoptera of Antioquia, Colombia. *Smithsonian Contributions to Zoology* 520: 1-113.
- Flint, O. S., Jr., and L. Reyes A. 1991.** Studies of Neotropical caddisflies, XLVI: the Trichoptera of the Río Moche Basin, Department of La Libertad, Perú. *Proceedings of the Biological Society of Washington* 104: 474-492.
- Flint, O. S., Jr., R. W. Holzenthal, and S. C. Harris. 1999.** Catalog of the Neotropical Caddisflies (Trichoptera). Special Publication, Ohio Biological Survey. Columbus, Ohio.
- McElravy, E. P., V. H. Resh, H. Wolda, and O. S. Flint, Jr. 1981.** Diversity of adult Trichoptera in a non-seasonal tropical environment. p. 149-156. *In*: G. P. Moretti (ed.). *Proceedings of the 3rd International Symposium on Trichoptera*. Dr. W. Junk; The Hague, The Netherlands. 472 p.
- Ulmer, G. 1905.** Zur Kenntniss aussereuropäischer Trichopteren. (Neue Trichoptern des Hamburger und Stettiner Museums und des Zoologischen Instituts in Halle, nebst Beschreibungen einiger Typen Kolenati's und Burmeister's.). *Stettiner Entomologische Zeitung* 66: 1-119.

### Family Philopotamidae:

- Banks, N. 1900.** New genera and species of Nearctic neuropteroid insects. *Transactions of the American Entomological Society* 26: 239-260.
- Banks, N. 1920.** New neuropteroid insects. *Bulletin of the Museum of Comparative Zoology* 64: 297-362.
- Blahnik, R. J. 1998.** A revision of the Neotropical species of the genus *Chimarra*, subgenus *Chimarra* (Trichoptera: Philopotamidae) *Memoirs of the American Entomological Institute* 59: vi+1-318.
- Blahnik, R. J., and R. W. Holzenthal. 1992.** New species of *Chimarra* subgenus *Chimarra* Stephens from Costa Rica (Trichoptera: Philopotamidae). *Proceedings of the Entomological Society of Washington* 94: 409-438.
- Bueno-Soria, J. 1985.** Estudios en insectos acuáticos (III): cinco nuevas especies de *Chimarra* Stephens (1829) de México y Centro América (Trichoptera: Philopotamidae). *Folia Entomológica Mexicana* 63: 13-23.
- Denning, D. G., and J. L. Sykora. 1966.** New North American Trichoptera. *Canadian Entomologist* 98: 1219-1226.

- Flint, O. S., Jr. 1967.** Studies of Neotropical caddis flies, IV: new species from Mexico and Central America. *Proceedings of the United States National Museum* 123: 1-24.
- Flint, O. S., Jr. 1968.** Bredin-Archbold-Smithsonian Biological Survey of Dominica 9. The Trichoptera (Caddisflies) of the Lesser Antilles. *Proceedings of the United States National Museum* 125: 1-86.
- Flint, O. S., Jr. 1998.** Studies of Neotropical caddisflies, LIII: a taxonomic revision of the subgenus *Curgia* of the genus *Chimarra* (Trichoptera: Philopotamidae). *Smithsonian Contributions to Zoology* 594: 1-131.
- Muñoz-Quesada, F., and R. W. Holzenthal. 2015.** Revision of the Neotropical species of the caddisfly genus *Wormaldia* McLachlan (Trichoptera: Philopotamidae). *Zootaxa* 3998: 1-138.
- Ross, H. H. 1948.** New Nearctic Rhyacophilidae and Philopotamidae (Trichoptera). *Annals of the Entomological Society of America* 41: 17-26.
- Ross, H. H. 1956.** *Evolution and Classification of the Mountain Caddisflies*. University of Illinois Press: Urbana, IL. 213 p.
- Ross, H. H. 1959.** New species of *Chimarra* from Mexico and Central America (Trichoptera, Philopotamidae). *Entomological News* 70: 169-178.
- Ulmer, G. 1907.** Trichoptera. p. 1-259. *In*: P. Wytzman (ed.). *Genera Insectorum*, Volume 60. Brussels, Belgium. 259 p.

#### Family Ecnomidae:

- Flint, O. S., Jr. 1973.** Studies of Neotropical caddisflies. XVI: The genus *Austrotinodes* (Trichoptera: Psychomyiidae). *Proceedings of the Biological Society of Washington* 86: 127-142.
- Flint, O. S., Jr., and D. G. Denning. 1989.** Studies of Neotropical caddisflies, XLI: new species and records of *Austrotinodes* (Trichoptera: Psychomyiidae). *Pan-Pacific Entomologist* 65: 108-122.

#### Family Polycentropodidae:

- Banks, N. 1905.** Descriptions of new Nearctic neuropteroid insects. *Transactions of the American Entomological Society* 32: 1-20.
- Bueno-Soria, J. 1990.** Estudios en insectos acuáticos VIII. revisión para México y Centroamérica del género *Polyplectropus* Ulmer (Trichoptera: Polycentropodidae). *Anales del Instituto de Biología, Universidad Nacional Autónoma de México, Serie Zoología* 61: 357-404.
- Chamorro, M. L., and R. W. Holzenthal. 2010.** Taxonomy and phylogeny of New World *Polyplectropus* Ulmer, 1905 (Trichoptera: Psychomyiidae: Polycentropodidae) with the description of 39 new species. *Zootaxa* 2582: 1-252.
- Chamorro-Lacayo, M. L. 2003.** Seven new species of Polycentropodidae (Trichoptera) from Nicaragua and Costa Rica. *Proceedings of the Entomological Society of Washington* 105: 484-498.
- Chamorro-Lacayo, M. L., and R. W. Holzenthal. 2004.** Seven new species of *Polyplectropus* Ulmer (Trichoptera: Polycentropodidae) from Costa Rica. *Proceedings of the Entomological Society of Washington* 106: 202-216.
- Flint, O. S., Jr. 1980.** Studies of Neotropical caddisflies, XXIX: The genus *Polycentropus* (Trichoptera: Psychomyiidae). *Journal of the Washington Academy of Sciences* 70: 148-160.
- Ross, H. H. 1941.** Descriptions and records of North American Trichoptera. *Transactions of the American Entomological Society* 67: 35-126.
- Ross, H. H. 1947.** Descriptions and records of North American Trichoptera, with synoptic notes. *Transactions of the American Entomological Society* 73: 125-168.
- Ross, H. H. 1951.** New American species of *Cernotina* (Trichoptera). *Revista de Entomologia* 22: 343-349.
- Yamamoto, T. 1966.** Five new species of the caddisfly genus *Polycentropus* from South America (Trichoptera: Polycentropodidae). *Canadian Entomologist* 98: 908-912.
- Yamamoto, T. 1967.** New species of the caddisfly genus *Polycentropus* from Central America (Trichoptera: Polycentropodidae). *Journal of the Kansas Entomological Society* 40: 127-32.

**Family Xiphocentronidae:**

- Flint, O. S., Jr. 1967.** Studies of Neotropical caddis flies, V: types of the species described by Banks and Hagen. *Proceedings of the United States National Museum* 123: 1-37.
- Schmid, F. 1982.** La famille des Xiphocentronides (Trichoptera: Annulipalpia). *Memoires de la Société Entomologique du Canada* 121: 1-126.

**Family Hydropsychidae:**

- Banks, N. 1903.** Some new neuropteroid insects. *Journal of the New York Entomological Society* 11: 236-243.
- Banks, N. 1913.** Synopses and descriptions of exotic Neuroptera. *Transactions of the American Entomological Society* 39: 201-242.
- Banks, N. 1924.** Descriptions of new neuropteroid insects. *Bulletin of the Museum of Comparative Zoology at Harvard College* 65: 421-455.
- Blahnik, R. J. 1995.** New species of *Smicridea* (subgenus *Smicridea*) from Costa Rica, with a revision of the *fasciatella* complex (Trichoptera: Hydropsychidae). *Journal of the North American Benthological Society* 14: 84-107.
- Flint, O. S., Jr. 1974.** Studies of Neotropical caddisflies, XVII: the genus *Smicridea* from North and Central America (Trichoptera: Hydropsychidae). *Smithsonian Contributions to Zoology* 167: 1-65.
- Flint, O. S., Jr., and J. Bueno-Soria. 1979.** Studies of Neotropical caddisflies, XXIV: the genus *Macronema* in Mesoamerica (Trichoptera: Hydropsychidae). *Proceedings of the Entomological Society of Washington* 81: 522-535.
- Flint, O. S., Jr., and J. Bueno-Soria. 1987.** Studies of Neotropical caddisflies, XXXVI: the genus *Calosopsyche* in Central America, with descriptions of its immature stages (Trichoptera: Hydropsychidae). p. 29-37. *In*: M. Bournaud and M. Tachet (eds.). *Proceedings of the 5th International Symposium on Trichoptera*. Dr. W. Junk; Dordrecht, The Netherlands. 397 p.
- Flint, O. S., Jr., and D. G. Denning. 1989.** Studies of Neotropical caddisflies, XL: new species of *Smicridea* (*Smicridea*) from Middle America and the West Indies (Trichoptera: Hydropsychidae). *Proceedings of the Biological Society of Washington* 102: 418-433.
- Flint, O. S., Jr., J. F. McAlpine, and H. H. Ross. 1987.** A revision of the genus *Leptonema* Guérin (Trichoptera: Hydropsychidae: Macronematinae). *Smithsonian Contributions to Zoology* 450: 1-193.
- Hagen, H. A. 1861.** Synopsis of the Neuroptera of North America with a list of the South American species. *Smithsonian Institution Miscellaneous Collections* 4: 1-347.
- Holzenthall, R. W. 1988 (1989).** Catálogo sistemático de los Tricópteros de Costa Rica (Insecta: Trichoptera). *Brenesia* 29: 51-82.
- McLachlan, R. 1871.** The species of the trichopterous genus *Plectrocnemia*. *Entomologist's Monthly Magazine* 8: 143-146.
- Mosely, M. E. 1933.** A revision of the genus *Leptonema* (Trichoptera). *British Museum (Natural History)*, London: 1-69.
- Muñoz-Quesada, F. 1997.** Five new species and a new record of Costa Rican *Leptonema* Guérin (Trichoptera: Hydropsychidae). *Proceedings of the Entomological Society of Washington* 99: 115-132.
- Rambur, J. P. 1842.** Histoire naturelle des insectes Névroptères, p. 467-468, 502.
- Walker, F. 1852.** Catalogue of the Specimens of Neuropterous Insects in the Collection of the British Museum, Part I: Phryganides-Perlides. *British Museum*; London. 658 p.

**Family Glossosomatidae:**

- Blahnik, R. J., and R. W. Holzenthall. 2006.** Revision of the genus *Culoptila* (Trichoptera: Glossosomatidae). *Zootaxa* 1233: 1-52.
- Blahnik, R. J., and R. W. Holzenthall. 2008.** Revision of the Mexican and Central American species of *Mortoniella* (Trichoptera: Glossosomatidae: Protoptilinae). *Zootaxa* 1711: 1-72.
- Flint, O. S., Jr. 1967.** Studies of Neotropical caddis flies, V: types of the species described by Banks and Hagen. *Proceedings of the United States National Museum* 123: 1-37, plate 1.

- Flint, O. S., Jr. 1974.** The genus *Culoptila* Mosely in the United States, with two new combinations (Trichoptera: Glossosomatidae). Proceedings of the Entomological Society of Washington 76: 284.
- Flint, O. S., Jr., R. W. Holzenthal, and S. C. Harris. 1999.** Catalog of the Neotropical Caddisflies (Trichoptera). Ohio Biological Survey. Columbus, OH. 239 p.
- Holzenthal, R. W., and R. J. Blahnik. 2006.** The caddisfly genus *Protoptila* in Costa Rica (Trichoptera: Glossosomatidae). Zootaxa 1197: 1-37.
- Mosely, M. E. 1954.** The *Protoptila* group of the Glossosomatinae (Trichoptera: Rhyacophilidae). Bulletin of the British Museum (Natural History) Entomology 3: 317-346.

#### Family Hydroptilidae:

- Banks, N. 1907.** New Trichoptera and Psocidae. Journal of the New York Entomological Society 15: 162-166.
- Bueno-Soria, J. 1984 (1985).** Estudios en insectos acuáticos II. revisión para México y Centroamérica del género *Hydroptila* Dalman, 1819 (Trichoptera: Hydroptilidae). Folia Entomológica Mexicana 59: 79-138.
- Bueno-Soria, J. 2009.** A review of the genus *Ochrotrichia* Mosely (Trichoptera: Hydroptilidae) from Mexico and Central America. Transactions of the American Entomological Society 135: 59-160.
- Bueno-Soria, J., and R. W. Holzenthal. 2003.** New species and records of the microcaddisfly genus *Metrichia* Ross from Costa Rica (Trichoptera: Hydroptilidae). Studies on Neotropical Fauna and Environment 38: 173-197.
- Bueno-Soria, J., and R. W. Holzenthal. 2004.** New species of the genus *Ochrotrichia* Mosely (Trichoptera: Hydroptilidae) from Mexico and Panama. Transactions of the American Entomological Society 130: 245-269.
- Bueno-Soria, J., and S. Santiago-Fragoso. 1997.** Studies in aquatic insects XII: descriptions of nineteen new species of the genus *Ochrotrichia* Mosely (Trichoptera: Hydroptilidae) from Mexico and Central America. Proceedings of the Entomological Society of Washington 99: 359-373.
- Bueno-Soria, J., and S. Santiago-Fragoso. 2002.** Description of five new species of the genus *Metrichia* Ross (Trichoptera: Hydroptilidae) from Panama. Transactions of the American Entomological Society 128: 245-254.
- Denning, D. G. 1947.** Hydroptilidae (Trichoptera) from the southern United States. Canadian Entomologist 79: 12-20.
- Edwards, S. W., and C. R. Arnold. 1961.** The caddis flies of the San Marcos River. Texas Journal of Science 13: 398-415.
- Flint, O. S., Jr. 1967.** Studies of Neotropical caddis flies, V: types of the species described by Banks and Hagen. Proceedings of the United States National Museum 123: 1-37, plate 31.
- Flint, O. S., Jr. 1968.** The Caddisflies of Jamaica. Bulletin of the Institute of Jamaica, Science Series 19: 1-68.
- Flint, O. S., Jr. 1970.** Studies of Neotropical caddisflies, X: *Leucotrichia* and related genera from North and Central America (Trichoptera: Hydroptilidae). Smithsonian Contributions to Zoology 60: 1- 64.
- Flint, O. S., Jr. 1972.** Studies of Neotropical caddisflies, XIII: the genus *Ochrotrichia* for Mexico and Central America (Trichoptera: Hydroptilidae). Smithsonian Contributions to Zoology 118: 1-28.
- Flint, O. S., Jr. 1992.** Studies of Neotropical caddisflies, XXXVIII: a review of the classification and biology of the Neotropical microcaddisflies, with the description of a new genus (Trichoptera: Hydroptilidae: Leucotrichiini). p. 525-531. In: D. Quintero and A. Aiello (eds.), Insects of Panama and Mesoamerica: Selected Studies. Oxford University Press; Oxford. 714 p.
- Flint, O. S., Jr. 1996.** Studies of Neotropical caddisflies LV: Trichoptera of Trinidad and Tobago. Transactions of the American Entomological Society 122: 67-113.

- Flint, O. S., and R. A. Englund. 2003.** A reassessment and new state records of Trichoptera occurring in Halwai'i with discussion on origins and potential ecological impacts. Bishop Museum Occasional Papers 73: 31-40.
- Harris, S. C. 1990.** New species of *Neotrichia* (Trichoptera: Hydroptilidae) from Central and South America. Journal of the New York Entomological Society 98: 246-260.
- Harris, S. C., and B. J. Armitage. 2015.** The Trichoptera of Panama. II. Ten new species of microcaddisflies (Trichoptera: Hydroptilidae). Insecta Mundi 437: 1-17.
- Harris, S. C., and O. S. Flint, Jr. 2002.** New *Alisotrichia* (Trichoptera: Hydroptilidae) from Central and South America and the Greater Antilles. Proceedings of the Entomological Society of Washington 104: 195-210.
- Harris, S. C., and R. W. Holzenthal 1999.** Hydroptilidae (Trichoptera) of Costa Rica: the genus *Hydroptila* Dalman. Studies on Neotropical Fauna and Environment 34: 16-51.
- Harris, S. C., and S. G. Tiemann. 1993.** New species on *Neotrichia* from Texas and Panama, with a preliminary review of the *N. canixa* group (Trichoptera: Hydroptilidae). Proceedings of the Entomological Society of Washington 95: 286-292.
- Harris, S. C., O. S. Flint, Jr., and R. W. Holzenthal. 2002.** Review of the Neotropical genus *Flintiella* (Trichoptera: Hydroptilidae: Stactobiini). Journal of the New York Entomological Society 110: 65-90.
- Harris, S. C., R. W. Holzenthal, and O. S. Flint, Jr. 2002.** Review of the Neotropical genus *Bredinia* (Trichoptera: Hydroptilidae: Stactobiini). Annals of Carnegie Museum 71: 13-45.
- Holzenthal, R. W., and S. C. Harris. 1992.** Hydroptilidae (Trichoptera) of Costa Rica: The genus *Oxyethira* Eaton. Journal of the New York Entomological Society 100: 155-177.
- Kelley, R. W. 1983.** New Neotropical species of *Oxyethira* (Trichoptera: Hydroptilidae). Proceedings of the Entomological Society of Washington 85: 41-54.
- Malicky, H. 1980.** Vier neue Köcherfliegen von den Inseln Guadeloupe (Kleine Antillen, Mittelamerika) (Trichoptera). Entomofauna (Zeitschrift für Entomologie) 1: 219-225.
- Mosely, M. E. 1937.** Mexican Hydroptilidae (Trichoptera). Transactions of the Royal Entomological Society of London 86: 151-189.
- Oláh, J., and O. S. Flint, Jr. 2012.** Description of new species in the Leucotrichiini tribe (Trichoptera: Hydroptilidae). Annales Historico-Naturales Musei Nationalis Hungarici 104: 1-83.
- Ross, H. H. 1941.** New species of Trichoptera from Canada and northern United States. Canadian Entomologist 73: 15-19.
- Ross, H. H. 1948.** Notes and descriptions of Nearctic Hydroptilidae (Trichoptera). Journal of the Washington Academy of Sciences 38: 201-206.

#### Family Hydrobiosidae:

- Blahnik, R. J., and R. M. Gottschalk. 1997.** New species of *Atopsyche* from Costa Rica (Trichoptera: Hydrobiosidae). Entomological News 108: 161-174.
- Mosely, M. E. 1949.** New Trichoptera and a redescription of *Leptocellodes flaveola* Ulmer. Proceedings of the Royal Entomological Society of London (B) 18(3-4): 37-41.
- Navás, L. 1924.** Insectos de la América Central. Brotéria, Série Zoológica 21: 55-86.
- Ross, H. H. 1947.** Descriptions and records of North American Trichoptera, with syoptic notes. Transactions of the American Entomological Society 73: 125-168.
- Ross, H. H., and E. W. King. 1952.** Biogeographic and taxonomic studies in *Atopsyche* (Trichoptera, Rhyacophilidae). Annals of the Entomological Society of America, 45: 177-204.
- Schmid, F. 1989.** Les hydrobiosides (Trichoptera, Annulipalpia). Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, Entomologie 59, (supplement): 1-154.

#### Family Calamoceratidae:

- Banks, N. 1920.** Neuroptera, Panorptata, and Trichoptera collected by the American Museum Congo Expedition, with lists of the species known from the Belgian Congo. Bulletin of the American Museum of Natural History 43: 21-23.
- Denning, D. G., V. H. Resh, and C. L. Hogue. 1983.** New species of *Phylloicus* and a new Neotropical genus of Calamoceratidae (Trichoptera). Aquatic Insects 5: 181-191.



- Prather, A. L. 2003.** Revision of the Neotropical caddisfly genus *Phylloicus* (Trichoptera: Calamoceratidae). *Zootaxa* 275: 1-214.
- Prather, A. L. 2004.** Revision of the Neotropical caddisfly genus *Banyallarga* (Trichoptera: Calamoceratidae). *Zootaxa* 435: 1-76.

**Family Leptoceridae:**

- Banks, N. 1901.** A list of neuropteroid insects from Mexico. *Transactions of the American Entomological Society* 27: 361-371.
- Banks, N. 1895.** New neuropteroid insects. *Transactions of the American Entomological Society* 22: 313-316.
- Blahnik, R. J., and R. W. Holzenthal. 2014.** Review and redescription of species in the *Oecetis avara* group, with the description of 15 new species (Trichoptera, Leptoceridae). *Zookeys* 376: 1-83.
- Bueno-Soria, J. 1981.** Estudios en insectos acuáticos de México I. Trichoptera (Leptoceridae). Cinco nuevas especies de *Oecetis* McLachlan. *Folia Entomológica Mexicana* 49: 103-120.
- Denning, D. G., and J. L. Sykora. 1966.** New North American Trichoptera. *Canadian Entomologist* 98: 1219-26.
- Flint, O. S., Jr. 1967.** Studies of Neotropical caddis flies, V: types of the species described by Banks and Hagen. *Proceedings of the United States National Museum* 123: 1-37, plate 31.
- Haddock, J. D. 1977.** The biosystematics of the caddis fly genus *Nectopsyche* in North America with emphasis on the aquatic stages. *American Midland Naturalist* 98: 382-421.
- Hagen, H. A. 1861.** Synopsis of the Neuroptera of North America with a list of the South American species. *Smithsonian Institution Miscellaneous Collections* 4: 1-347.
- Holzenthal, R. W. 1988a.** Studies in Neotropical Leptoceridae (Trichoptera), VIII: the genera *Atanatolica* Mosely and *Grumichella* Müller (Triplectidinae: Grumichellini). *Transactions of the American Entomological Society* 114: 71-128.
- Holzenthal, R. W. 1988b.** Systematics of Neotropical *Triplectides* (Trichoptera: Leptoceridae). *Annals of the Entomological Society of America* 81: 187-208.
- Holzenthal, R. W. 1995.** The caddisfly genus *Nectopsyche*: new *gemma* group species from Costa Rica and the Neotropics (Trichoptera: Leptoceridae). *Journal of the North American Benthological Society* 14: 61-83.
- Holzenthal, R. W., and T. Andersen. 2004.** The caddisfly genus *Triaenodes* in the Neotropics (Trichoptera: Leptoceridae). *Zootaxa* 511: 1-80.
- Maes, J. M., and O. S. Flint, Jr. 1988.** Catálogo de los Trichoptera de Nicaragua. *Revista Nicaraguense de Entomología* 2: 1-11.
- Müller, F. 1880.** Sobre as casas construidas pelas larvas de insectos Trichópteros da Provincia de Santa Catharina. *Archivos do Museu Nacional, Rio de Janeiro* 3 (1878): 99-134, 209-214, plates 138-111.
- Navás, L. 1924.** Mis excursiones entomológicas del Verano de 1924. *Brotéria, Série Zoológica* 21: 115-150.
- Ross, H. H. 1944.** The caddisflies or Trichoptera of Illinois. *Bulletin of the Illinois Natural History Survey* 23: 1-326.
- Walker, F. 1852.** Catalogue of the Specimens of Neuropterous Insects in the Collection of the British Museum, Part I: Phryganides-Perlides. (British Museum, London). 658 p.

**Family Odontoceridae:** (see the General literature cited section above)

**Family Helicopsychidae:**

- Bueno-Soria, J. 1983.** Five new species of caddisflies (Trichoptera) from Mexico. *Proceedings of the Entomological Society of Washington* 85: 450-455.
- Hagen, H. A. 1861.** Synopsis of the Neuroptera of North America, with a list of the South American species. *Smithsonian Institution Miscellaneous Collections* 4: 1-347.

- Johanson, K. A. 2003.** The *Helicopsyche* (Feropsyche) (Insecta, Trichoptera, Helicopsychidae) from Barro Colorado Island, Panama. *Zootaxa* 283: 1-12.
- Johanson, K. A., and T. Malm. 2006.** Seven new *Helicopsyche* (*Feropsyche*) Johanson, 2002 from the Neotropical region and Nearctic Mexico (Insecta: Trichoptera: Helicopsychidae). *Zootaxa* 1208: 1-24.
- Ross, H. H. 1956.** New species of *Helicopsyche* from the western hemisphere (Trichoptera, Helicopsychidae). *Journal of the Washington Academy of Sciences* 46: 397-401.

**Family Limnephilidae:**

- Flint, O. S., Jr. 1963.** The species of Limnephilidae from Central America and Haiti (Trichoptera: Limnephilidae). *Proceedings of the Entomological Society of Washington* 65: 211-213.

**Family Lepidostomatidae:**

- Banks, N. 1901.** A list of the neuropteroid insects from Mexico. *Transactions of the American Entomological Society* 27: 361-371.
- Banks, N. 1911.** Description of new species of North American neuropteroid insects. *Transactions of the American Entomological Society* 37: 335-360, plates 311-313.
- Flint, O. S., Jr., and J. Bueno-Soria. 1977.** Studies of Neotropical caddisflies, XXI: the genus *Lepidostoma* (Trichoptera: Lepidostomatidae). *Proceedings of the Biological Society of Washington* 90: 375-387.
- Holzenthal, R. W., and R. M. Strand. 1992.** New species of *Lepidostoma* from Mexico and Central America (Trichoptera: Lepidostomatidae). *Proceedings of the Entomological Society of Washington* 94: 490-499.

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