

A DISTRIBUTIONAL STUDY OF *SIALIS* (MEGALOPTERA: SIALIDAE) IN NORTH AMERICA

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ABSTRACT: Locality data for 23 North American species of *Sialis* (Megaloptera: Sialidae) are listed by state and county, 31 new state records are presented, and emergence information for each species is discussed.

There are currently 23 described species of *Sialis* in North America (Ross, 1937; Townsend, 1939; Flint, 1964). When Ross (1937) published his revision of the Nearctic Sialidae, distributional records were rather scanty. Since that time, distributional data has increased from two main sources. First, from studies which emphasized the aquatic larvae (Evans, 1971; Canterbury, 1978). Second, from the publication of state records (Bowles, 1989; Flint, 1964; Liechti & Huggins, 1977; Parfin, 1952; Stark & Lago, 1980; Tarter, 1980; Tarter & Woodrum, 1973a, 1973b; Tarter *et al.* 1976, 1977, 1978, Tennessen, 1968).

Data from over 5,000 specimens of *Sialis* representing more than 1300 localities originating from 23 major North American collections have been recorded. These data are combined with all the published data to give the most complete listing of *Sialis* distributions to date. The purpose of this paper is to provide a comprehensive list of distributions for the further study of *Sialis* in North America.

Locality data for each species are organized as follows: the Canadian records are listed alphabetically by province (in caps) followed by county or internal division if applicable, then the United States data are listed alphabetically by state (in caps), followed by county. Both province and state names are abbreviated using official U.S. postal Zip Code abbreviations. If no county data follows a state, it means that none was recorded with the specimen. Square brackets [] around states or provinces indicate new records. Emergence data are given by listing the earliest and the latest date in the year when the species was collected and includes the states from which each early and late record was recorded. A more complete listing including precise locality, dates, and references for each locality are available from the author upon request.

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DISTRIBUTIONS

Sialis aequalis Banks 1920

Type Locality: VA: Falls Church County.

Distribution: CT: Fairfield; DE: Kent; [GA]: Fulton; [KY]: Breathitt; MD: Montgomer [ME]: Oxford; [MI]: Mason; MN: Itasca; NC: Burke; NJ: Middlesex; NY: OH: Champaign Hocking; PA: Delaware; SC: VA: Arlington, Brunswick, Fairfax, Falls Church, Suffol [VT]: Windham; WV: Cabell, Kanawha, Mason, Wayne.

Emergence: March 20 (SC) to June 13 (MN: Itasca).

Sialis americana (Rambur) 1842

Type Locality: America.

Distribution: CT: New Haven; DC: Washington; FL: Alachua, Baker, Columbia, Highland Marion; GA: Wayne; [IN]: Lake; LA: East Baton Rouge, Iberville, St. James; MD: Prince Georges; [MO]: MS: Adams, Hinds, Lafayette; [NH]: Merrimack; [NJ]: Gloucester; OI Summit; SC: TX: VA: Nansemond; WI: Grant.

Emergence: April 23 (LA: Baton Rouge) to August 13 (IN: Lake).

Sialis arvalis Ross 1937

Type Locality: CA: Calaveras County, Mokelumne Hill.

Distribution: CA: Amador, Butte, Calaveras, Humboldt, Lake, Mendocino, Monterey Plumas, San Benito, San Luis Obispo, Santa Barbara, Santa Clara, Santa Cruz, Sonoma Stanislaus, Trinity, Ventura, Yolo; OR: Curry, Douglas, Jackson, Josephine.

Emergence: March 15 (CA: Humboldt) to May 31 (OR: Douglas).

Sialis californica Banks 1920

Type Locality: CA: Kern County, San Emigdio Canyon.

Distribution: AB; BC; CA: Alameda, Amador, Butte, Colusa, Contra Costa, Glen Humboldt, Kern, Lake, Lassen, Los Angeles, Marin, Mendocino, Modoc, Monterey, Napa, Plumas, Sacramento, San Diego, San Joaquin, San Luis Obispo, Santa Mateo, Santa Barbara, Santa Clara, Santa Cruz, Shasta, Siskiyou, Solano, Sonoma, Stanislaus, Tehama, Trinity, Tulare, Ventura, Yolo, Yuba; OR: Baker, Benton, Clackamas, Clatsop Coos, Curry, Deschutes, Douglas, Hood River, Jackson, Jefferson, Lake, Lane, Lincoln Linn, Tillamook, Wasco, Washington; WA: King, Klickitat, Pierce, Skamania.

Emergence: March 3 (CA: San Diego) to July 25 (CA: Tulare).

Sialis concava Banks 1897

Type Locality: NY: Tompkins County, Ithaca.

Distribution: [BC]; ON; MD; [ME]: Oxford; NC: Moore, Wake; NY: Tompkins; VA: Augusta, Montgomery, Tazewell; WV: Pocahontas.

Emergence: April 12 (NC: Moore) to July 15 (BC).

Sialis contigua Flint 1964

Type Locality: VA: Highland County, bridge on Route 220 over East Branch Potomac River.

Distribution: TN: Knox; VA: Giles, Highland, Montgomery, Shenandoah, Smyth.
Emergence: April 21 (TN: Knox) to May 5 (VA: Smyth)

Sialis cornuta Ross 1937

Type Locality: OR: Umatilla County, Blue Mountains.
Distribution: AB: ID: Butte, Caribou, Clearwater, Idaho, Latah, Valley; MT: Gallatin, Glacier, Granite, Ravalli; OR: Curry, Umatilla, Union; UT: Duchesne; WA: Asotin, Walla Walla; WY: Crooks.
Emergence: April 29 (OR: Curry) to July 20 (MT: Glacier).

Sialis driesbachi Flint 1964

Type Locality: MI: Schoolcraft County
Distribution: MI: Schoolcraft; MN: [WI]: Sauk.
Emergence: June 5 (MI: Schoolcraft) to June 12 (WI: Sauk).

Sialis glabella Ross 1937

Type Locality: IL: Wabash County, Mt. Carmel.
Distribution: IL: Wabash; KY: Nelson; MS: Adams.
Emergence: May 13 (MS: Adams) to June 16 (IL: Wabash).

Sialis hamata Ross 1937

Type Locality: UT: Cache County, Logan.
Distribution: AB: BC: ID: Ada, Bear Lake, Caribou, Cassia, Kootenai, Latah; MT: Gallatin, Glacier, Lake, Lewis & Clark, Meagher, Ravalli; NV: Elko; OR: Harney, Klamath, Lake, Umatilla, Wasco; UT: Box Elder, Cache, Fremont, Rich, Salt Lake, Summit, Utah, Wasatch, Wayne; WA: Columbia, Garfield, Spokane, Whitman, Yakima; WY: Fremont, Teton.
Emergence: April 13 (ID: Ada) to July 21 (WY: Fremont).

Sialis hasta Ross 1937

Type Locality: MI: Crawford County, Lovells along Au Sable River.
Distribution: AR: Garland, Washington, Yell; IN: Clark, Monroe, Ripley; KY: Breathitt, Bullitt, Fayette, Jessamine, Oldham, Trimble; MI: Crawford, Emmet, Iosco; MO: Greene; OH: Urbana; PA: Allegheny.
Emergence: April 10 (IN: Monroe) to June 16 (MI: Crawford).

Sialis infumata Newman 1838

Type Locality: NJ: Mercer County, Trenton Falls.
Distribution: [ON]: Ottawa-Carleton; AR: Garland, Pike, Washington; IL: Champaign, Cook, Jo Daviess, Kankakee, McHenry, Mclean, Rock Island, Vermilion, Will; IN: Clark, Tippecanoe; KS: Pottawatomie, Riley, Wabauensee; KY: Oldham, Rowan, Trimble; MI: Tuscola; MN: Lyon; MO: NC: Wake; NJ: Mercer; NY: Genesee, Onodaga, Tompkins; OH: Adams, Butler, Franklin; OK: Pittsburgh; PA: Dauphin, Philadelphia, Snyder; SC: VA: Fauquier, Rockingham; [WV]: Grant.
Emergence: April 7 (KS: Riley) to September 16 (KS: Pottawatomie).

Sialis iola Ross 1937

Type Locality: PA: Allegheny County, Pittsburgh.
Distribution: PQ: L'Assomption, Montreal; CT: Tolland; DC: Washington; [GA]: [IN: Monroe; MN: MS: Marshall, Tishomingo; NC: Wake; NH: Durham; NJ: Burlington; N: Clinton, Franklin, Tompkins, Ulster; OH: Champaign, Miami; PA: Allegheny, Dauphin; SC: VA: Alleghany, Montgomery, York; WV: Fayette, Greenbriar, Pocohantas.
Emergence: April 10 (VA: York) to July 29 (PQ).

Sialis itasca Ross 1937

Type Locality: IL: Kankakee County, Momence along Kankakee River.
Distribution: ON: Ottawa-Carleton; PQ: Laprairie, St. Jean; AR: Craighead; DC: Washington; GA: Bibb, Fulton; IL: Coles, Cook, Kankakee, Knox, Piatt, Winnebago; IN: Lagrange, Monroe, Noble; KS: Pottawatomie, Riley; MD: Montgomery; MI: Branch, Cheboygan, Monroe, Washtenaw; MN: Pine; MO: NC: Chatham, Wake; ND: Cass; N: Chautauqua, Monroe, St. Lawrence, Tompkins; OH: Huron, Washington; OK: Payne; P: Dauphin; TN: Shelby; TX: Brazos; VA: Augusta, Fairfax, Greene, Rockingham; W: Douglas; WV: Wayne.
Emergence: April 1 (TX: Brazos) to September 30 (IN: Lagrange).

Sialis joppa Ross 1937

Type Locality: NC: Jackson County, New Found Gap, Great Smokey Mountain National Park.
Distribution: [ON]: Thunder Bay; AR: Crawford, Montgomery; CT: New Haven; DI [FL]: Liberty; IL: KY: Bullitt, Jefferson, Meade, Oldham; LA: St. James; MD: Montgomery; ME: Cumberland; MI: Cheboygan, Newaygo; NC: Buncombe, Jackson; NE: Coos; NY: Ontario, Schuyler, Tompkins, Ulster, Wyoming, Yates; OH: Jefferson, Noble; OK: Latimer; PA: Delaware, Montgomery, Philadelphia, Westmoreland; VA: Giles, Grayson, Page, Smyth; VT: Orleans; WI: Ozaukee; WV: Pendleton, Summers.
Emergence: April 17 (OH: Jefferson) to July 10 (NH: Coos).

Sialis mohri Ross 1937

Type Locality: WI: Vilas County, Boulder Junction on Trout River.
Distribution: NB: York; ON: Essex, Kenora, Kent, Ottawa-Carleton; PQ: AR: Montgomery, Pike, Washington; CT: New London, Tolland; IL: Champaign, Coles, Cook, D Page, Edgar, Jackson, Kankakee, Lake, Marshall, Mason, Massac, McHenry, Montgomery, Morgan, Rock Island, Washington, Williamson, Winnebago; IN: Clark, Lake, Monroe, Noble, Porter; KS: Douglas, Pottawatomie; KY: Edmondson; MA: Essex, Middlesex, Norfolk; ME: Aroostook; MI: Cheboygan, Crawford, Emmet, Iosco, Lenawee, Mackinac, Oscoda, Roscommon, Washtenaw, Wayne, Wexford; MN: Anoka, Becker, Beltrami, Goodhue, Hennepin, Houston, Koochiching, Mille Lacs, Pine, Ramsey, Red Lake, St. Louis, Stearns, Todd, Washington, Winona; MS: Hinds, Lafayette, Rankin; MO: [NE] NH; NJ: Morris, Ocean, Passaic, Rockland; NY: Oswego, Stockton, Westchester; OH: OK: Payne; PA: Luzerne, Monroe, Wayne; RI: Washington; TN: Lake, Obion, Shelby; [VT] Caledonia; WI: Adams, Barron, Dane, Door, Milwaukee, Sauk, Vilas, Walworth, Winnebago.
Emergence: March 23 (MS: Rankin) to July 14 (WI: Walworth).

***Sialis nevadensis* Davis 1903**

Type Locality: NV: Washoe County, Reno.
Distribution: CA: Amador, El Dorado, Lassen, Madera, Mariposa, Napa, Nevada, Placer, Plumas, Santa Cruz, Shasta, Sierra, Siskiyou, Tehama, Trinity, Tuolumne; NV: Washoe.
Emergence: May 1 (CA: Placer) to 30 July (CA: Nevada).

***Sialis nina* Townsend 1939**

Type Locality: KY: Fayette County, Lexington along North Elkhorn Creek.
Distribution: KY: Fayette
Emergence: April 1 to May 2

***Sialis occidentis* Ross 1937**

Type Locality: CA: Tulare County, Sequoia National Park, Wolverton.
Distribution: CA: Alpine, Amador, Calaveras, El Dorado, Fresno, Glenn, Humboldt, Inyo, Lassen, Los Angeles, Mariposa, Mono, Nevada, Placer, Plumas, San Bernardino, Santa Barbara, Sierra, Sonoma, Stanislaus, Tulare, Tuolumne; NV: Washoe.
Emergence: From March 23 (CA: Sonoma) to August 30 (CA: Fresno).

***Sialis rotunda* Banks 1920**

Type Locality: BC: Bon Accord.
Distribution: BC: CA: Shasta; OR: Benton, Clatsop, Columbia, Coos, Curry, Deschutes, Douglas, Grant, Jackson, Jefferson, Joseph, Klamath, Lake, Lane, Linn, Marion, Polk, Tillamook, Wasco, Washington, Yamhill; WA: Clallam, Clark, Douglas, Grays, Harbor, King, Kitsap, Lewis, Pacific, Pierce, Snohomish, Stevens, Thurston, Whatcom, Yakima.
Note: Tarter *et al.* (1978) list one male from Wisconsin. Because there is no other evidence to support the occurrence of this species in the Eastern United States, this record is highly questionable.
Emergence: From March 21 (OR: Linn) to September 5 (OR: Jackson).

***Sialis spangleri* Flint 1964**

Type Locality: MD: Garrett County, Swallow Falls State Park near Oakland.
Distribution: MD: Garret.
Emergence: May 14.

***Sialis vagans* Ross 1937**

Type Locality: IN: Whitley County, Columbia City along Eel River.
Distribution: NB: York; NS: Greene; ON: Muskoka, Nipissing, Simcoe; PQ; AR: Greene, Johnson; CT; [FL]: Okaloosa; GA: Coweta; IL: Cook, Cumberland, Du Page, Franklin, Kankakee, McHenry, Pope; IN: White, Whitley; [KS]: Douglas; KY: Jefferson, Oldham; MA: Middlesex, Norfolk, Suffolk; [MD]: Prince Georges; [ME]: Lincoln, Washington; MI: Branch, Crawford, Genesee, Grand Traverse, Iosco, Mecosta, Newaygo, Tuscola, Van Buren, Washtenaw; MN: Cook, Itasca, Morrison, Pine; MS: Amite, Greene, Lafayette, Lincoln, Rankin, Stone; NC: Wake; NH: Strafford; NJ: Burlington, Ocean; NY: Bronx; OH: Gallia, Greene, Summit; OK: Latimer; PA: Chester; VA: Brunswick, Culpeper, Floyd, James City, Prince Edward, Prince William; VT: WI: Washburn; WV: Pocahontas.
Emergence: From March 5 (VA: Prince William) to July 20 (ON).

***Sialis velata* Ross 1937**

Type Locality: MI: Roscommon County, Houghton Lake.
Distribution: AB; BC; MB; ON: Bruce, Grenville, Hastings, Kenora, Ottawa-Carl Russell; PQ: Laprairie, Montreal; SK: [CO]: Larimer, Yuma; [CT]: New Haven; Washington; [ID]: Bannock, Cassia, Fremont, Valley; IL: Campaign, Coles, Gal Jersey, Johnson, Madison, Mason, Pope, Rock Island, Wabash, Washington, White Douglas, Franklin, McPherson, Pottawatomie, Riley; KY: MA: Middlesex, Norfolk; Montgomery; ME: Lincoln, Penobscot; MI: Arenac, Benzie, Cheboygan, Crow Gogebic, Ingham, Leelanau, Roscommon, St. Joseph, Washtenaw, Wayne; MN: Au Becker, Beltrami, Cass, Clearwater, Crow Wing, Hubbard, Itasca, Lake, Mille Morrison, Olmstead, Pine, Ramsey, St. Louis, Washington; MO: Boone, Marion; [Flathead, Yellowstone; NC: ND; NB; NH; [NJ]: Rockland; NY: Albany, Clinton, land, Hamilton, Onodaga, Ontario, Oswego, St. Lawrence, Tioga, Tompkins, Yates; Garfield; TN: Marion; TX: Bexar, Kerr, Travis; [UT]: Box Elder, Cache; VA: Appom Giles, Montgomery, Page, Roanoke, Rockbridge, Shenandoah, Smyth, Wythe; VT Dane, Door, Vilas, Waukesha; WV: Jefferson; [WY]: Carbon, Crook, Laramie.
Emergence: From March 24 (TX: Kerr) to September 15 (MI).

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