

***CHILACIS TYPHAE* (PERRIN) AND *HOLCOCRANUM SATUREJAE*
(KOLENATI) (HEMIPTERA: LYGAEOIDEA: ARTHENEIDAE): UPDATED
NORTH AMERICAN DISTRIBUTIONS OF TWO PALEARCTIC
CATTAIL BUGS**

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Abstract.—*Chilacis typhae* and *Holcocranum saturejae*, Palearctic lygaeoids that feed on cattail seeds, were first reported from North America in 1987 and 1995, respectively. Additional fieldwork provided 21 new state records for *C. typhae* and 15 for *H. saturejae*, plus the first records from the Canadian Maritime Provinces for *C. typhae*, which has a more northern distribution than *H. saturejae*. The bugs were syntopic—that is, occurred in the same cattail colonies—in Delaware, Illinois, Indiana, Kentucky, Maryland, Missouri, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. In addition, 25 of the 50 sites from which *C. typhae* was originally collected (1986) in Delaware, Maryland, New York, and Pennsylvania were resampled in 1998. *Holcocranum saturejae*, collected at only two sites in 1986 (but not recognized until 1995), was present in 1998 at nine of the original sites in Delaware, Maryland, and southern Pennsylvania; as in 1986, this species was not found in New York or in more northern sites in Pennsylvania.

Key Words: Insect distribution, adventive species, Heteroptera, *Typha*

When the Old World cattail bug *Chilacis typhae* (Perrin) was reported new to North America (Wheeler and Fetter 1987), it also represented the first Nearctic record of the lygaeid subfamily Artheneinae. The paper by Wheeler and Fetter (1987) seemed straightforward, documenting the establishment of another Palearctic insect in the northeastern United States. But instead of a single immigrant cattail lygaeid of presumed northeastern distribution, the North American fauna, in at least some of the more southern sites for *C. typhae*, actually contained two widely distributed Old World cattail bugs. Since the appearance of Wheeler and Fetter's (1987) paper, a second Old World artheneine, *Holcocranum saturejae* (Kolenati), of similar habitus and seed-feeding habits on cattail, was reported

from the eastern United States (Hoffman and Slater 1995). At two of the 50 localities (New Castle Co., Del.; Chester Co., Pa.) from which *C. typhae* originally was reported, a reexamination of voucher material revealed a few adults of *H. saturejae* that had been overlooked among adults of *C. typhae* (Hoffman 1996, Wheeler and Stoops 1999). Both cattail bugs now have been recorded from the western United States: *C. typhae* in the Pacific Northwest and *H. saturejae* from California to Texas (Wheeler and Stoops 1999). *Chilacis typhae* also is known in Canada from British Columbia and Ontario (Maw et al. 2000). *Holcocranum saturejae* shows a more southern distribution than *C. typhae* in the Old and New Worlds (Hoffman and Slater 1995, Hoffman 1996, Wheeler and Stoops 1999). In addi-

tion, the Artheneinae have recently been accorded family status—Artheneidae—in the Lygaeoidea (Henry 1997).

Holcocranum saturejæ has become established in areas of the eastern United States where only *C. typhae* was collected in 1986. To obtain distributional data that might help subsequent workers assess changes in the ranges of these adventive species, I conducted additional surveys, emphasizing areas of the bugs' syntopy. I also hypothesized, based on the apparent rapid dispersal ability of *H. saturejæ* (Hoffman 1996), that more of the cattail colonies initially sampled for *C. typhae* in 1986 would yield *H. saturejæ* rather than only the one site each in Delaware and Pennsylvania.

METHODS

Because extensive systematic sampling of cattails in Canada and the United States was not feasible, cattail colonies (mainly *T. angustifolia* L. and *T. latifolia* L.) were selected haphazardly from a more limited area of North America. Areas where the two artheneids potentially co-occur were sampled more intensively. Voucher specimens have been deposited in the Cornell University Insect Collection, Ithaca, N.Y., and the National Museum of Natural History, Smithsonian Institution, Washington, D.C.

In 1998, I resampled 25 of the 50 cattail sites from which *C. typhae* was originally collected (Wheeler and Fetter 1987) to determine if *H. saturejæ* was present at the 23 sites that previously yielded only *C. typhae*, and whether *H. saturejæ* might now be the more common artheneid at the two sites where both species were collected in 1986. When the same cattail stands sampled in 1986 could not be located ($n = 1$), no longer existed ($n = 1$), or did not contain old pistillate spikes or heads ($n = 2$), a colony within 1–2 km was substituted. In the field, old cattail heads were pulled apart over a white enamel pan and the numbers of adults of both artheneid species were recorded. All pistillate heads from the previ-

ous season were sampled when five or fewer were accessible; as many as 10 heads were examined in cattail colonies with numerous heads available.

DISTRIBUTION

In the following list of additional records for *C. typhae* and *H. saturejæ* (see also Figs. 1–2), new state and provincial records are indicated by asterisks. Canadian records of *C. typhae* were obtained during fieldwork with E. R. Hoebeke; Florida records of *H. saturejæ* in 1997, during fieldwork with C. A. Stoops; and the records of *C. typhae* from Nebraska in August 1998 and the Kansas record and 1999 Oklahoma records of *H. saturejæ*, during fieldwork with T. J. Henry. Unless otherwise stated, all other collections were made by the author. Table 1 gives the numbers of *C. typhae* and *H. saturejæ* adults observed in 1998 in cattail heads at 25 of the 50 sites at which *C. typhae* was detected in 1986.

Chilacis typhae.—CANADA: *NEW BRUNSWICK: York Co., Fredericton, 27 June 1993. *NOVA SCOTIA: Antigonish Co., Rt. 104, Beaver Meadow Rd./James River Exit, 22 July 1995; Colchester Co., Truro, 22 July 1995; Lunenburg Co., Rt. 3 nr. Mader's Cove (SE of Mahone Bay, NW of Lunenburg), 21 July 1995; Pictou Co., Rt. 104, Thorburn exit, 22 July 1995; Victoria Co., Cape Breton Island, Baddeck, 25 July 1995. *PRINCE EDWARD ISLAND: Kings Co., jct. rts. 4 & 315, SE of Montague, 25 July 1995; Prince Co., Summerside, 26 July 1995; Queens Co., Cavendish, 26 July 1995. UNITED STATES: *CONNECTICUT: Fairfield Co., Rt. 39 S of Rt. 55, SW of Gaylordsville, 13 Aug. 2000; Litchfield Co., Rt. 8, Torrington, 12 Aug. 2000; New Haven Co., Rt. 64, Middlebury, 13 Aug. 2000. *ILLINOIS: Iroquois Co., Rt. 24, Watseka, 2 July 2000; Jackson Co., Rt. 13, Carbondale & Rt. 51, 2 km N of Carbondale, 21 June 1998; La Salle Co., rts. 39 & 51 N of jct. Rt. 80, ca. 5 km NE of LaSalle, 2 July 2000; Lee Co., rts. 39 & 51 exit 82, W of Paw Paw, 2 July 2000; Liv-

Table 1. Numbers of *C. typhae* and *H. saturejae* in cattail heads, 26–30 July 1998, at sites from which *C. typhae* was reported new to North America in 1986. Names of localities follow those of Wheeler and Fetter (1987); asterisks indicate the two sites positive for *H. saturejae* in 1986.

Collection Sites	<i>C. typhae</i>	<i>H. saturejae</i>
DELAWARE		
*New Castle Co., E of Newark	7	272
MARYLAND		
Frederick Co., Emmitsburg	72	7
NEW YORK		
Broome Co., nr. Castle Creek	71	0
Broome Co., S of Kirkwood	39	0
Tompkins Co., Besemer	229	0
Tompkins Co., S of Ithaca	59	0
PENNSYLVANIA		
Adams Co., S of East Berlin	2	0
Adams Co., nr. Gettysburg	53	4
Berks Co., nr. Frystown	34	17
Berks Co., nr. Hamburg	77	0
Berks Co., nr. Rehrersburg	7	0
*Chester Co., Longwood Gardens	25	73
Cumberland Co., nr. Wertzville	10	14
Dauphin Co., nr. Harrisburg Area Community College	2	126
Lackawanna Co., E of Factoryville	18	0
Lebanon Co., W of Licksdale	110	0
Monroe Co., Sciota	46	0
Schuylkill Co., Barnesville	23	0
Schuylkill Co., nr. Ravine	248	0
Susquehanna Co., Great Bend	125	0
Wayne Co., Beach Lake	72	0
Wayne Co., S of Hoadleys	123	0
Wyoming Co., E of Dixon	59	0
York Co., S of Dillsburg	300	5
York Co., SW of Kralltown	1	4

ington Co., Rt. 24, 7.5 km E of Forrest, 2 July 2000; Marion Co., Rt. 51, 1.5 km N of Central City & Rt. 51, S of Centralia nr. Washington Co. line, 21 June 1998; Ogle Co., rts. 39 & 51 exit 111, W of Monroe, 2 July 2000; Pike Co., rts. 36 & 72, 8 km W of Barry, 20 June 1998; Sangamon Co., jct. Rt. 72 & Rt. 4, Springfield, 20 June 1998. *INDIANA: Elkhart Co., jct. rts. 19 & 20, S of Elkhart, 2 July 2000; Floyd Co., Rt. 265, New Albany, 8 July 1997; Gibson Co. Rt. 64, Oakland City, 24 June 2000; LaPorte Co., Rt. 30, 6 km E of Wanatah, 2 July 2000; Marshall Co., Rt. 30, Plymouth, 2 July 2000; Newton Co., Rt. 24, 7.5 km E of Kentland, 2 July 2000; Pulaski Co., Rt.

421, 1.5 km N of Medaryville, 2 July 2000; St. Joseph Co., Pleasant Lake, Lakeville, 2 July 2000; Starke Co., Rt. 30, 2.5 km E of Hamlet, 2 July 2000; White Co., Rt. 421, 2.5 km S of Monon, 2 July 2000. *IOWA: Allamakee Co., Waukon, 3 July 2000; Clayton Co., Rt. 18, Marquette, 3 July 2000. *KENTUCKY: Bullitt Co., Rt. 65, W of Clermont, 9 July 1997 & Rt. 65, 0.5 km S of exit 112, 3.2 km SW of Clermont, 25 June 2000; Carroll Co., Rt. 227 nr. jct. Rt. 71, 8 July 1997; Metcalfe Co., Cumberland Parkway, 12.5 km NE of Edmonton, 3 July 1999; Oldham Co., Rt. 42, S of Skylight, 8 July 1997; Pike Co., Rt. 23, 4 km S of Pikeville, 29 June 2000. *MAINE: Sagadahoc

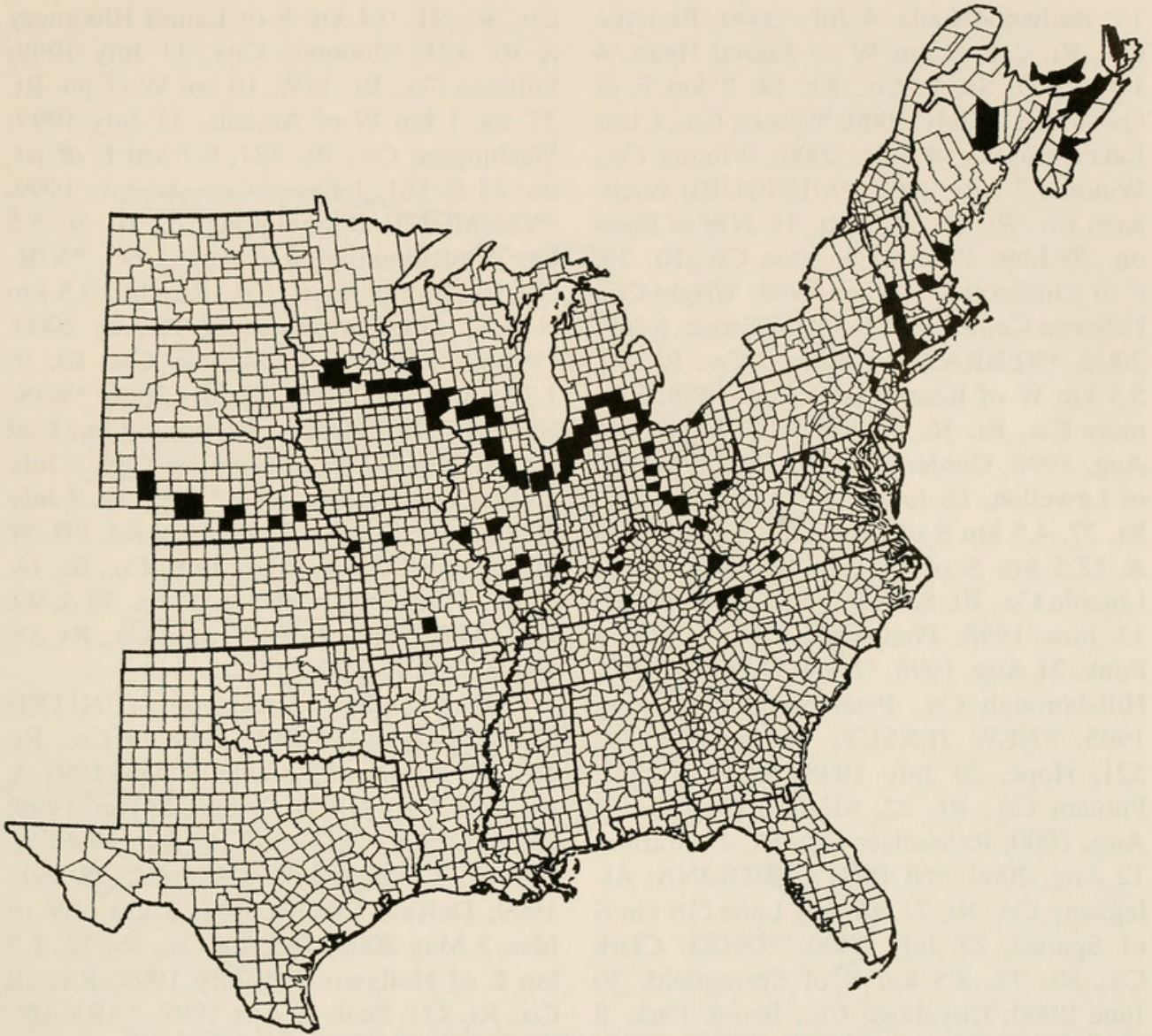


Fig. 1. New eastern North American records for *Chilacis typhae*. Previous eastern U.S. records are not shown but are available in publications by Wheeler and Fetter (1987), Hoffman and Slater (1995), and Hoffman (1996); western U.S. records were given by Wheeler and Stoops (1999).

Co., Rt. 1, Woolrich, 23 June 1993, E.R. Hoebeke and AGW; York Co., Appledore Island, Isles of Shoals, 11 Aug. 2000, W. Reeves; Kittery, 22 July 2000, E.R. Hoebeke; Rt. 1, Moody, 29 June 1989. *MASSACHUSETTS: Barnstable Co., Rt. 6A, West Brewster, 28 May 1989; Berkshire Co., Rt. 8, North Adams & Pittsfield, 12 Aug. 2000; Suffolk Co., Arnold Arboretum, Jamaica Plains, 27 May 1988, E. R. Hoebeke and AGW. *MICHIGAN: Barry Co., jct. rts. 37 & 79, 4 km SE of Hastings, 1 July 2000; Cass Co., Rt. 40, 5 km S of Jones, 1 July 2000; Eaton Co., Rt. 50, 5.5

km E of Charlotte, 1 July 2000; Ingham Co., Holt, 1 July 2000; Jackson Co., Austin Rd., 3.5 km E of Napoleon, 1 July 2000; Kalamazoo Co., bus. rts. 94 & 131, Kalamazoo, 1 July 2000; Monroe Co., Rt. 50, E of Dundee & Rt. 75, W of Newport, 1 July 2000; St. Joseph Co., Rt. 60, 3 km SW of Three Rivers, 1 July 2000; Washtenaw Co., Rt. 12, Saline, 1 July 2000. *MINNESOTA: Brown Co., Rt. 14, Essig, 4 July 2000; Dodge Co., Rt. 14, 1 km W of Dodge, 3 July 2000; Nicollet Co., Rt. 14, North Mankato, 4 July 2000; Olmsted Co., Co. Rd. 10, S of Dover, 3 July 2000; Redwood Co., Rt.

14, Redwood Falls, 4 July 2000; Renville Co., Rt. 212, 2 km W of Sacred Heart, 4 July 2000; Steele Co., Rt. 14, 8 km E of Owatonna, 3 July 2000; Waseka Co., Clear Lake, Waseka, 4 July 2000; Winona Co., Winona, 3 July 2000. *MISSOURI: Buchanan Co., Rt. 36, W of Rt. 31, NW of Easton, 20 June 1998; Livingston Co., Rt. 36, E of Chillicothe, 20 June 1998; Wright Co., Hillcrest Cemetery, Mountain Grove, 8 July 2000. *NEBRASKA: Buffalo Co., Rt. 80, 5.5 km W of Kearney, 18 Aug. 1998; Fillmore Co., Rt. 36, 5.5 km W of Exeter, 21 Aug. 1998; Garden Co., Rt. 26, 3.5 km SE of Lewellen, 16 June 1998; Lancaster Co., Rt. 77, 4.5 km S of Ceresco, 17 Aug. 1998 & 12.5 km S of Lincoln, 16 Aug. 1998; Lincoln Co., Rt. 83, 9 km N of North Platte, 13 June 1998; Phelps Co., 5.5 km N of Funk, 21 Aug. 1998. *NEW HAMPSHIRE: Hillsborough Co., Petersborough, 6 Aug. 1995. *NEW JERSEY: Warren Co., Rt. 521, Hope, 29 July 1998. NEW YORK: Putnam Co., Rt. 22, SE of Patterson, 13 Aug. 2000; Rensselaer Co., Rt. 2, Grafton, 12 Aug. 2000. *NORTH CAROLINA: Alleghany Co., Rt. 21, Cherry Lane (16 km S of Sparta), 27 July 2000. *OHIO: Clark Co., Rt. 72, 8.5 km S of Springfield, 30 June 2000; Cuyahoga Co., Brook Park, 8 Aug. 1992; Erie Co., Huron, 8 Aug. 1992, E. R. Hoebeke; Fayette Co., Rt. 35, 4 km SW of Washington Court House, 30 June 2000; Hancock Co., Rt. 68, 1.3 km S of Williamstown, 30 June 2000; Lawrence Co., Rt. 93 nr. jct. Rt. 52, Ironton, 30 June 2000; Logan Co., Rt. 68, 4 km S of Bellefontaine, 30 June 2000; Lucas Co., 3 km W of Rt. 75, Toledo, 1 July 2000; Pike Co., Rt. 52, Piketon, 30 June 2000; Ross Co., Rt. 35 nr. jct. Co. Rd. 550, NW of Pleasant Valley, 30 June 2000; Washington Co., Marietta, 30 Apr. 1999; Wood Co., Rt. 75, W of Cygnet, 30 June 2000. *RHODE ISLAND: Washington Co., Rt. 138 E of jct. Rt. 112, W of West Kingston, 29 May 1988 (nymphs only). *SOUTH DAKOTA: Moody Co., Rt. 29 exit 114, W of Flaudreau, 4 July 2000. TENNESSEE: Johnson

Co., Rt. 91, 0.4 km S of Laurel Bloomery & Rt. 421, Mountain City, 11 July 1999; Sullivan Co., Rt. 11W, 10 km W of jct. Rt. 37, ca. 1 km W of Arcadia, 11 July 1999; Washington Co., Rt. 321, 0.7 km E of jct. rts. 23 & 181, Johnson City, 10 July 1999. *VERMONT: Bennington Co., Rt. 9, 5.5 km W of Bennington, 6 Aug. 1995. *VIRGINIA: Montgomery Co., Rt. 460, 0.5 km N of Rt. 114, Christiansburg, 15 Aug. 2000. *WEST VIRGINIA: Morgan Co., Rt. 9, 1.35 km W of Holton, 28 July 2000. *WISCONSIN: Buffalo Co., Rt. 54, 2.7 km E of jct. Co. Rd. M, SE of Fountain City, 3 July 2000; Crawford Co., Rt. 35, DeSoto, 3 July 2000; Dane Co., Rt. 18 exit Co. Rd. PB, W of Fitchburg, 3 July 2000; Iowa Co., Rt. 18, Cobb, 3 July 2000; Rock Co., rts. 39 & 90, Janesville, 3 July 2000; Vernon Co., Rt. 35, Genoa, 3 July 2000.

Holcocranum saturejae.—UNITED STATES: *ALABAMA: Barbour Co., Rt. 431, 5.5 km N of Eufaula, 9 Apr. 1997 & Rt. 82, 3.5 km NW of Comer, 23 Oct. 1998; Cherokee Co., nr. Centre, 10 Jan. 1999, W. Reeves; Covington Co., Florala, 28 Feb. 1999; DeKalb Co., Rt. 117, 3 km NW of Ider, 3 May 2000; Jackson Co., Rt. 72, 1.5 km E of Hollywood, 5 July 1999; Russell Co., Rt. 431, Seale, 9 Apr. 1997. *ARKANSAS: Ashley Co., Rt. 82, W of Crossett, 21 Apr. 2000; Clay Co., Rt. 62, Corning, 8 July 2000; Columbia Co., Rt. 82, Magnolia, 22 Apr. 2000; Lafayette Co., Rt. 82, Stamps, 22 Apr. 2000; Lawrence Co., rts. 62 & 412, Ravenden, 8 July 2000; Sevier Co., De Queen, 22 Apr. 2000; Union Co., Rt. 82, Strong, 22 Apr. 2000. FLORIDA: Alachua Co., Orange Heights, 20 Mar. 1997; Bay Co., Panama City Beach, 18 Mar. 1997; Hamilton Co., Rt. 6, Jasper, 16 Sept. 2000; St. Johns Co., Anastasia Island State Recreation Area, SE of St. Augustine, 20 Mar. 1997. *GEORGIA: Dade Co., jct. rts. 24 & 299, 1.7 km NNW of Wildwood, 5 July 1999; McDuffie Co., Rt. 78, 2 km SE of Thomson, 17 June 2000. *ILLINOIS: Jackson Co., Rt. 13, Carbondale, 21 June 1998; Massac Co., Rt. 45, N of Grinnell, 21

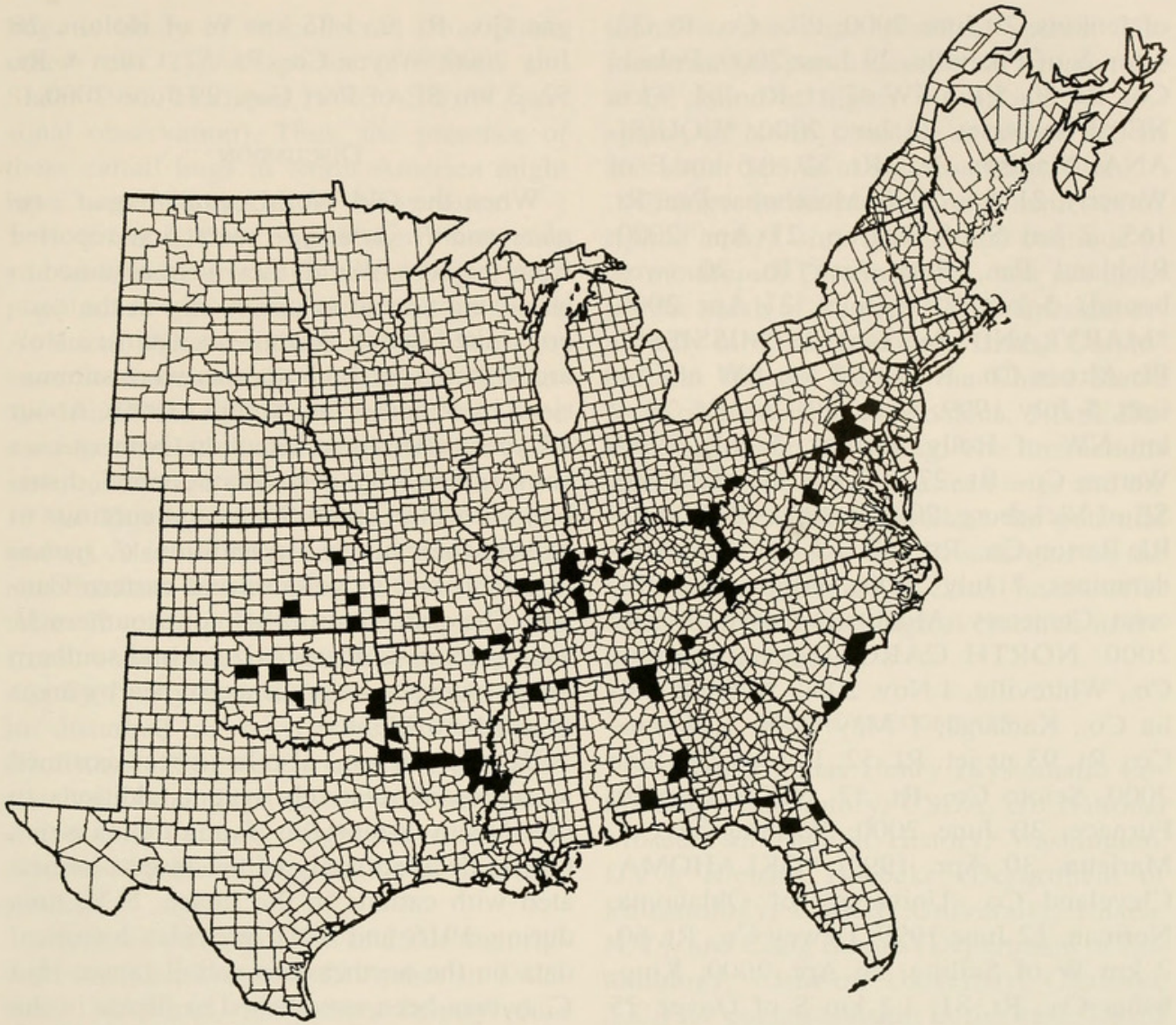


Fig. 2. New eastern U.S. records for *Holcocranum saturejae*. Previous eastern U.S. records are not shown but are available in publications by Hoffman and Slater (1995) and Hoffman (1996); new western U.S. records were given by Wheeler and Stoops (1999).

June 1998; Williamson Co., 3.5 km W of Marion, 7 June 1998. *INDIANA: Dubois Co., Rt. 64, Huntingburg, 24 June 2000; Gibson Co., Rt. 64, Oakland City & Rt. 64, 5 km E of Princeton, 24 June 2000; Posey Co., Rt. 69, 4 km SE of Farmersville & Rt. 165, 4 km S of Poseyville, 24 June 2000; Vanderburgh Co., University of Southern Indiana, W of Evansville, 24 June 2000. *KANSAS: Allen Co., Rt. 169 S of jct. Co. Rd. 224, E of Petrolia, 7 July 2000; Labette Co., Rt. 400, 8 km W of Parsons, 7 July 2000; Sedgwick Co., 53rd St. nr. Rt. 135, ca. 2 km S of Park City, 21 June 1999; Shawnee Co., Rt. 75 S of Rt. 470, Topeka,

7 July 2000. *KENTUCKY: Allen Co., rts. 31E & 231, 7.4 km N of Tennessee state line, NNE of Adolphus, 4 July 1999; Breckinridge Co., Rt. 60, 2 km W of Cloverport, 24 June 2000; Bullitt Co., Rt. 65, 0.5 km S of exit 112, 3.2 km SW of Clermont, 25 June 2000; Christian Co., Pennyriple Parkway, 11 km S of Crofton, 23 June 2000; Greenup Co., Rt. 23, 8 km N of Greenup, 2 May 1999; Henderson Co., Pennyriple Parkway, 0.5 km S of exit 76, S of Henderson, 23 June 2000; Hopkins Co., Pennyriple Parkway, Madisonville, 23 June 2000; Laurel Co., Rt. 80, 3 km W of London, 25 June 2000; Letcher Co., Rt. 23, NE

of Jenkins, 29 June 2000; Pike Co., Rt. 23, 4 km S of Pikeville, 29 June 2000; Pulaski Co., Rt. 80, 5 km SW of jct. Rt. 461, 9 km NE of Somerset, 25 June 2000. *LOUISIANA: Madison Par., Rt. 80, 8.6 km E of Waverly, 21 Apr. 2000; Morehouse Par., Rt. 165, 2 km S of Bastrop, 21 Apr. 2000; Richland Par., Rest Area Rt. 20 (west bound), 5 km W of Delhi, 21 Apr. 2000. *MARYLAND: See Table 1. *MISSISSIPPI: Alcorn Co., Rt. 2, 1.5 km SW of Corinth, 5 July 1999; Marshall Co., Rt. 78, 2 km NW of Holly Springs, 5 July 1999; Warren Co., Rt. 27, 1.3 km SE of Rt. 80, SE of Vicksburg, 20 Apr. 2000. *MISSOURI: Barton Co., Rt. 160, 1.5 km W of Mindenmines, 7 July 2000; Wright Co., Hillcrest Cemetery, Mountain Grove, 8 July 2000. NORTH CAROLINA: Columbus Co., Whiteville, 4 Nov. 2000. *OHIO: Gallia Co., Kanauga, 1 May 1999; Lawrence Co., Rt. 93 nr jct. Rt. 52, Ironton, 30 June 2000; Scioto Co., Rt. 52, NE of Franklin Furnace, 30 June 2000; Washington Co., Marietta, 30 Apr. 1999. *OKLAHOMA: Cleveland Co., University of Oklahoma, Norman, 12 June 1999; Dewey Co., Rt. 60, 2 km W of Seiling, 26 Apr. 2000; Kingfisher Co., Rt. 81, 1.1 km S of Dover, 25 Apr. 2000; LeFlore Co., Rt. 59, Howe, 16 June 1999. PENNSYLVANIA: See Table 1. SOUTH CAROLINA: Charleston Co., James Island County Park, 2 May 1998; Horry Co., Longs, 3 Nov. 2000. *TENNESSEE: Bradley Co., Rt. 75, N of McDonald, 24 June 2000; Monroe Co., Rt. 68, 3.5 km S of Tellico Plains, 7 July 1997; Sullivan Co., Rt. 11W, 10 km W of jct. Rt. 37, ca. 1 km W of Arcadia, 11 July 1999; Washington Co., Rt. 321, 0.7 km E of jct. rts. 23 & 181, Johnson City, 10 July 1999. TEXAS: Bowie Co., Rt. 82, 3 km W of New Boston, 2 May 2000. VIRGINIA: Montgomery Co., Rt. 460, 0.5 km N of Rt. 114, Christiansburg, 15 Aug. 2000; Rockingham Co., New Market, 1 Aug. 1998; Scott Co., Rt. 23, Duffield, 29 June 2000. *WEST VIRGINIA: Mingo Co., Rt. 52, 5 km SE of Naugatuck, 29 June 2000; Mor-

gan Co., Rt. 9, 1.35 km W of Holton, 28 July 2000; Wayne Co., Rt. 52, Crum & Rt. 52, 3 km SE of Fort Gay, 29 June 2000.

DISCUSSION

When the Old World cattail bugs *C. typhae* and *H. saturejae* were first reported from the New World, they were assumed to be adventive and to occur only in the eastern United States. Arguments against a Holarctic status for both species were summarized by Wheeler and Stoops (1999). About 15 years after their detection, both species show essentially a transcontinental distribution in the United States and continue to expand their ranges. In addition, *C. typhae* is established in western and eastern Canada. The collection of the more southern *H. saturejae* in southern Arizona and southern Texas suggests its presence in nearby areas of northern Mexico.

Both cattail bugs also have been assumed to represent relatively recent additions to the North American fauna. Claassen's (1921) detailed study of the insects associated with cattails in the Ithaca, N.Y., area during 1916 and 1918 provides historical data on the northeastern cattail fauna. Had *C. typhae* been established at Ithaca in the early 1900s, Claassen likely would have collected it; he observed a native seed-feeding lygaeid, *Kleidocerys resedae* (Panzer), in cattail heads. *Chilacis typhae*, however, could have been established in the Northeast but not present in the cattail colonies Claassen (1921) studied. His paper cannot be considered a baseline study for *H. saturejae*, which is not known as far north as New York. Cattails received little attention from entomologists in the 65 years between the publication of Claassen's (1921) study and the discovery of *C. typhae* in 1986. A study of insect herbivory in Minnesota cattail stands excluded inflorescence feeders (Penko and Pratt 1987). No North American specimens of either species predating the collections of Wheeler and Fetter (1987) or Hoffman and Slater (1995) are known. In addition, neither of the cattail

bugs is likely to be collected from plants other than *Typha* species (Hoffman and Slater 1995, Hoffman 1996; A. G. W., personal observation). Thus, the presence of these cattail bugs in North America might have been overlooked for many years.

Hoffman (1996) noted the "intriguing entomological mystery" of the bugs' large populations yet recent detection in North America. Whether these lygaeoids might have been accidentally introduced with cattail heads, the "fluff" of which has been used for insulation and as stuffing for cushions, mattresses, pillows, and toys (Morton 1975, Thieret and Luken 1996), is unknown. Also not known is whether separate introductions to the east and west coasts were involved. How these bugs locate small, sometimes remote host patches and rapidly (<5 years) develop large densities in disturbed or newly created wetlands (Hoffman 1996) also is unanswered. Interstate and other highways, with their associated cattail stands, might serve as corridors that facilitate colonization of new host patches.

My resampling in 1998 of 25 of the original detection sites for *C. typhae* in Delaware, Maryland, and eastern Pennsylvania suggests that since 1986 *H. saturejae* has colonized and become the dominant artheineid at three of those sites. The latter species also was found during 2000 in a cattail colony in Bullitt County, Ky., from which it was not collected in 1997. As *H. saturejae* expands its range northward, it might replace *C. typhae* in some cattail colonies. *Kleidocerys resedae*, unlike the two adventive cattail bugs, is a generalist seed feeder. If displaced on cattails by *C. typhae* or *H. saturejae*, *K. resedae* could maintain populations on other hosts, especially birches and ericaceous plants (Wheeler 1976).

Syntopic populations of *C. typhae* and *H. saturejae* were observed in 11 states. Between the latitudes of 36°2' and 40°3'N, these lygaeoids not only were collected from the same cattail colonies, but mixed populations of these species also were

found in the same pistillate spikes. The southernmost populations of *C. typhae* tend to be found at higher elevations, for example, in North Carolina at about 870 m and about 505 m at Johnson City, Tenn.

Changes in the ranges and densities of *C. typhae* and *H. saturejae* should continue to be monitored. Distributional data are lacking for much of western North America, especially in Canada between British Columbia and Ontario, and in the United States for Colorado, Idaho, Montana, North Dakota, Utah, and Wyoming. The interactions among the two adventive seed bugs and the native *K. resedae*, as well as the potential effects of *C. typhae* and *H. saturejae* on the arthropod community of cattail heads, offer opportunities for ecological research in the field and laboratory.

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