

New Distribution Records for Mosquitoes (Diptera: Culicidae) in St. Joseph County, Indiana

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Introduction

Prior to the formation of the St. Joseph County Mosquito Surveillance Program in 1976 only one species of mosquito, *Aedes hendersoni*, had been recorded from the county (4). During the first year of the Surveillance program over 2,000 larval sites were sampled and more than 15,000 adults collected in 13 New Jersey Light Traps. As a result of this program 35 species of mosquitoes were reported from the county (5). Subsequent to 1976 the program has continued to monitor the mosquitoes of the county. 16 New Jersey Light Traps have collected more than 300,000 adults, over 5000 larval sites have been identified and 4 new species recorded (Table 1). This program has allowed us to determine what potential vector species of mosquitoes are present, to propose control measures and to monitor population size.

Materials and Methods

A series of 16 New Jersey Light Traps was placed throughout the county in many different habitats including urban, suburban and rural sites (Figure 1). The traps were operated 7 nights a week and collections were made 3 times a week

TABLE 1. *The mosquitoes of St. Joseph County, Indiana***

<i>Aedes</i>	<i>Coquillettidia</i>
<i>abserratus</i>	<i>perturbans</i>
<i>atropalpus</i> (Restifo & Lanzaro 1980)	<i>Culex</i>
<i>aurifer</i>	<i>erraticus</i>
<i>canadensis</i>	<i>pipiens</i>
<i>cinereus</i>	<i>restuans</i>
<i>dorsalis</i>	<i>salinarius</i>
<i>excrucians</i>	<i>tarsalis</i>
<i>fitchii</i>	<i>territans</i>
<i>flavescens*</i>	<i>Culiseta</i>
<i>hendersoni</i>	<i>inornata</i>
<i>sollicitans*</i>	<i>melanura</i>
<i>sticticus</i>	<i>morsitans</i>
<i>stimulans</i>	<i>minnesotae</i>
<i>triseriatus</i>	<i>Orthopodomyia</i>
<i>trivittatus</i>	<i>alba</i>
<i>vexans</i>	<i>signifera</i>
<i>Anopheles</i>	<i>Psorophora</i>
<i>barberi</i>	<i>ciliata</i>
<i>crucians</i>	<i>columbiae</i>
<i>punctipennis</i>	<i>cyanescens*</i>
<i>quadrimaculatus</i>	<i>ferox</i>
<i>walkeri</i>	<i>Uranotaenia</i>
	<i>sapphirina</i>

** Shroyer et al. 1977

* New records

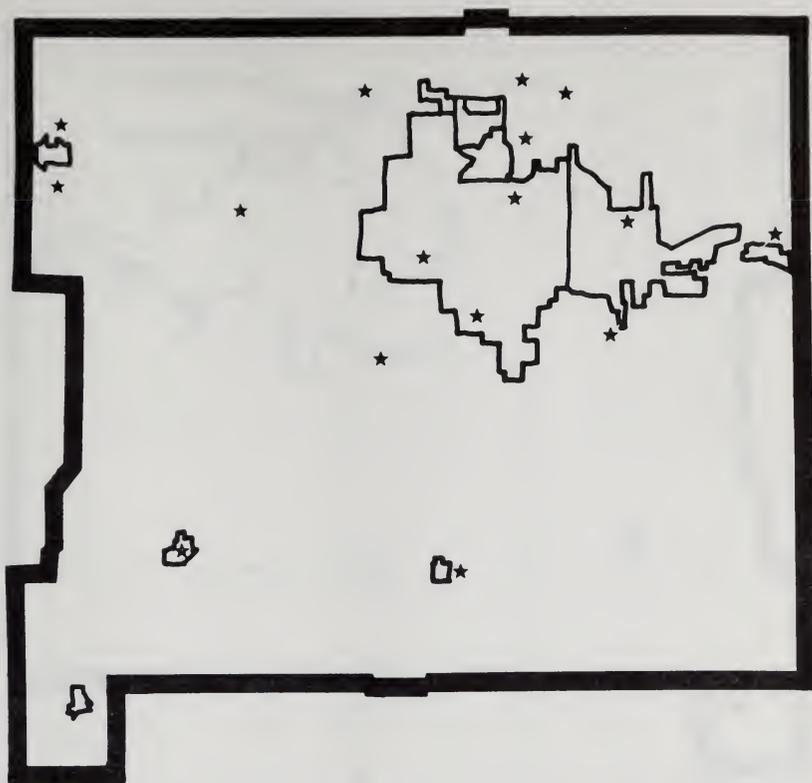


FIGURE 1. Locations of light traps in St. Joseph County, Indiana.

from the beginning of May until the middle of October for the summers of 1976 through 1980. During the summers of 1976 through 1979 a larval survey was conducted by dividing the county into square mile sections and systematically inspecting each section twice a year for mosquito breeding sites. Several other surveillance techniques have also been used such as Fay, suction, and oviposition traps. Representative specimens have been placed in either the collection of the author or that of the University of Notre Dame.

Results and Discussion

During the summer of 1979 an intensive urban survey was conducted to locate the possible breeding sites of *Ae. triseriatus*, the vector of LaCrosse Encephalitis, in urban areas. During this survey larvae of *Aedes atropalpus* (Coquillett) were found in tires at two locations on the south side of South Bend (6) (Figure 2). *Ae. atropalpus* normally is found in rock pools along the shores of lakes or streams in northern and eastern United States. The strain of *Ae. atropalpus* found in tires, unlike its feral conspecifics, feeds readily on man; therefore, it could become a health threat as a domestic species (2). Despite an intensive search no *Ae. atropalpus* were found during the summer of 1980. This leaves doubt as to whether or not this species has become established in the county.

On 22 September 1978 a single female of *Psorophora cyanescens* (Coquillett)

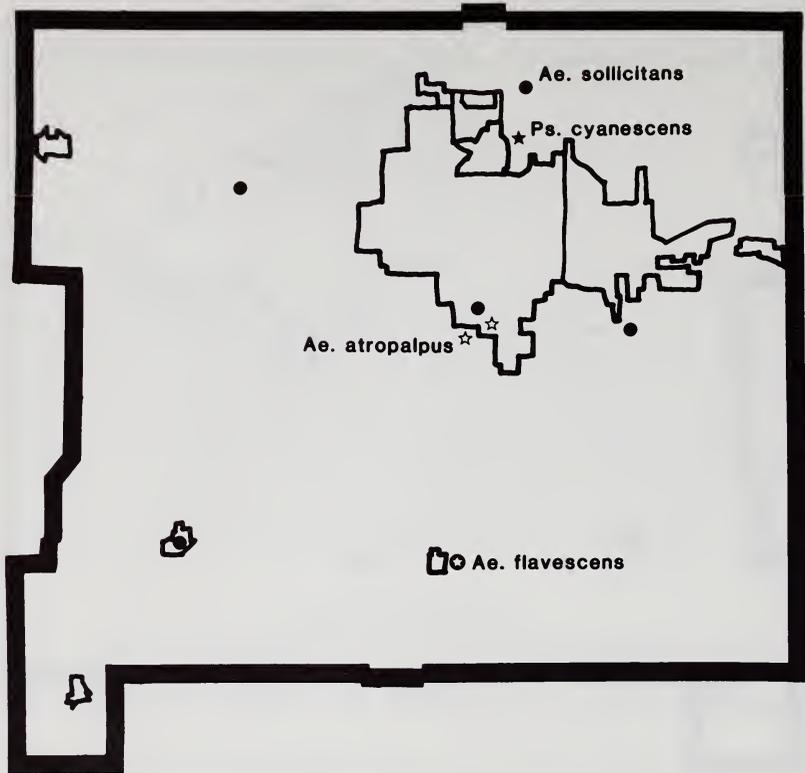


FIGURE 2. Sites of new species records in St. Joseph County, Indiana.

was collected biting a human near St. Joseph Lake on the campus of the University of Notre Dame (Figure 2). *Ps. cyanescens* is primarily a species of the southeastern United States (1). It has been collected in 10 other counties in Indiana (Figure 3), the northernmost of which was Wayne County. The present record for St. Joseph County is the most northern record of this species in the United States.

During the past 5 years 340,860 adult mosquitoes have been collected in the light traps. Table 2 gives a summary of the light trap data for the years 1976 through 1980. The total number of mosquitoes has increased every year since the program began. Relocation of some of the traps and increasing the number from 13 to 16 could be partially responsible for this increase. The magnitude, however, indicates that there has been an actual increase in the number of mosquitoes over the past five years.

On 1 June 1979 a single female of *Aedes flavescens* (Mueller) was collected in the Lakeville light trap. No larval sites were found in the vicinity of the light trap and there have been no additional specimens collected. Siverley stated that this species is predominately a prairie species and has been recorded from only two other counties in Indiana, Delaware and Steuben (Figure 3).

On the 14th of July 1980 a female *Aedes sollicitans* (Walker), was caught in the Blair Hills light trap located just south of Mishawaka in the central portion of the

TABLE 2. Summary of New Jersey light traps collections, 1976-1980

Species	Year of collection					Five year total
	1976	1977	1978	1979	1980	
<i>Aedes</i>						
abserratus	7	—	—	—	1	8
aurifer	—	—	2	3	31	36
canadensis	12	49	509	623	28	1221
cinereus	4	24	16	194	80	318
dorsalis	6	1	11	6	74	98
exrucians	25	3	5	—	11	44
fitchii	—	1	9	1	22	33
flavescens	—	—	—	1	—	1
sollicitans	—	—	—	—	7	7
sticticus	1592	113	818	451	51	3025
stimulans	271	237	468	6705	2349	10030
triseriatus/hendersoni	55	141	239	345	546	1326
trivittatus	23	180	760	328	2362	3653
vexans	9380	8913	40748	42122	138356	239519
<i>Anopheles</i>						
barberi	3	1	4	2	3	13
crucians	5	—	19	—	—	24
punctipennis	469	518	897	1840	2216	5940
quadrimaculatus	330	376	688	795	2067	4256
walkeri	108	62	65	492	458	1185
<i>Coquillettidia</i>						
perturbans	284	699	277	1027	2277	4564
<i>Culex</i>						
erraticus	4	1	12	48	21	86
pipiens/restuans	5238	3262	7088	18141	16424	50153
salinarius	1005	572	135	1058	55	2825
tarsalis	7	88	38	16	7	156
territans	306	305	486	1505	1482	4084
<i>Culiseta</i>						
inornata	10	103	336	265	85	799
melanura	3	1	5	2	4	15
morsitans	2	4	7	2	1	16
minnesotae	—	—	5	5	8	18
<i>Orthopodomyia</i>						
alba/signifera	24	7	8	16	34	89
<i>Psorophora</i>						
ciliata	30	20	17	43	62	172
columbiae	2	8	—	114	321	445
ferox	2	—	1	—	1	4
<i>Uranotaenia</i>						
sapphirina	203	96	897	1141	1570	3907
Undetermined	16	—	2242	413	119	2790
Total	19426	15785	56812	77704	171133	340860

county. Subsequently 6 additional specimens were collected from 5 different light traps representing almost the entire county (Figure 2). This species is a very strong flier, reportedly being able to disperse over 160 km (1), making it difficult to locate the larval sites. The large number of widespread collections indicate that this species is well established in the county. *Ae. sollicitans* is primarily a coastal mosquito breeding in water with a high salt content. It has, however, been reported from several sites as far inland as North Dakota and Arizona (3), usually

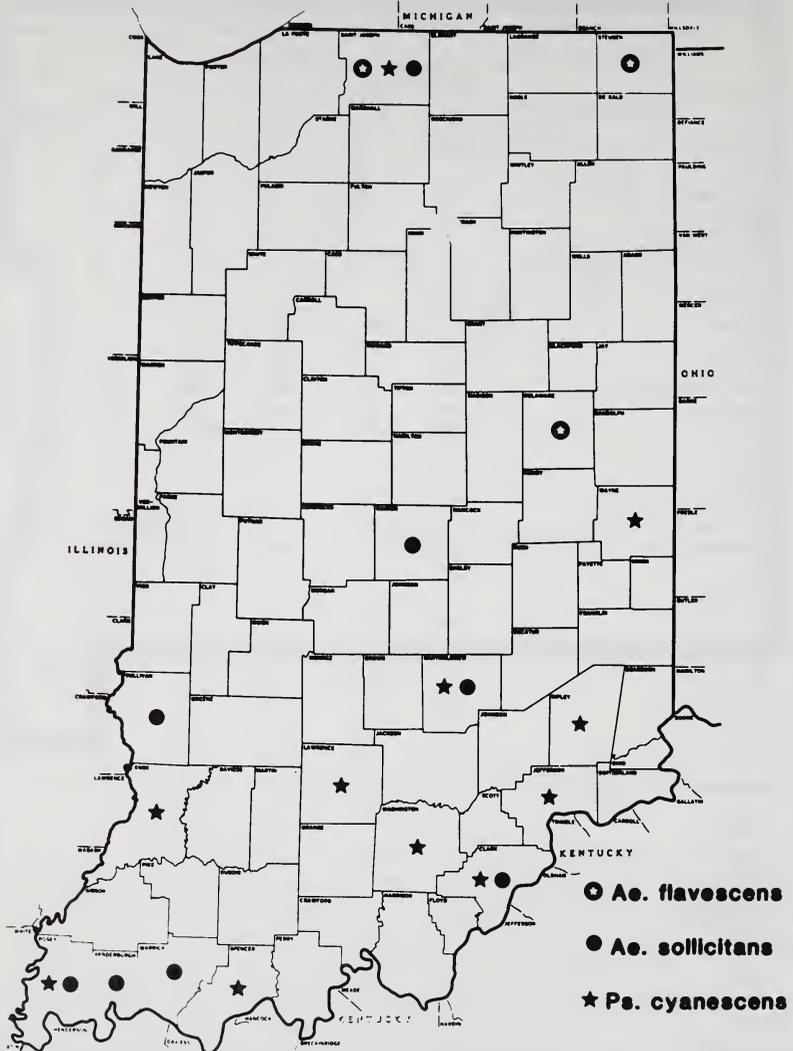


FIGURE 3. Counties from which *Ae. flavescens*, *Ae. sollicitans* and *Ps. cyanescens* have been recorded in Indiana.

associated with some form of salt pollution. *Ae. sollicitans* had only been reported from two counties in Indiana previously, Posey and Vanderburgh, both in the extreme southwest corner of the state. Both of these sites were associated with high salinity. Recently *Ae. sollicitans* has been recorded from 6 additional counties in southern Indiana (Figure 3) and is probably present in most of the counties south of Indianapolis (M. Sinsko 1980, personal communication). In Ohio *Ae. sollicitans* has been recorded in 19 counties (Figures 4) (R. Berry 1980, personal communication). Some of the larval sites in Ohio are run-off from fly ash dumps, salt mining operations, brine pits near oil wells and industrial waste with high salinity. *Ae.*

sollicitans has become a locally serious pest near some of these sites. In addition this species is also a vector of Eastern Equine Encephalitis in eastern coastal endemic areas. The proximity of St. Joseph County to a known endemic focus of EEE in northwestern Indiana and southwestern Michigan is of concern.

The ability of *Ae. sollicitans* to disperse over great distances and the increasing number of sites polluted by salt have allowed this species to expand its range from the coastal United States to the point where it can now be found in nearly every state east of the Rocky Mountains.

Acknowledgement

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FIGURE 4. Distribution of *Ae. sollicitans* in Ohio.

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