

HOST PLANTS OF *TAYLORILYGUS PALLIDULUS* AND
POLYMERUS BASALIS (HEMIPTERA: MIRIDAE) IN
THE DELTA OF ARKANSAS, LOUISIANA, AND
MISSISSIPPI

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ABSTRACT

Cultivated crops and wild host plants were sampled with a sweepnet at 15 locations in the delta of Arkansas, Louisiana, and Mississippi from September 1981 through October 1982 for populations of *Taylorilygus pallidulus* Blanchard (TP) and *Polymerus basalis* (Reuter) (PB). Thirteen host plant species of TP and 18 of PB are reported. The majority of these hosts TP (12 spp.) and PB (13 spp.) were in the family Asteraceae. All of the host plants of TP and PB were also hosts of the tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois) (TPB). TP and PB populations were highest during the fall, and sometimes exceeded those of the TPB on the same plant species. The importance of having populations of TP or PB (or both species) along with populations of the TPB on the same host plants species is discussed.

RESUMEN

Cosecha y plantas hospedera salvajes fueron muestreadas usando un "sweepnet" en 15 lugares en el delta de Arkansas, Louisiana, y Mississippi desde Septiembre 1981 a través de Octubre 1982, de las poblaciones de *Taylorilygus pallidulus* Blanchard (TP) y *Polymerus basalis* (Reuter) (PB). Trece especies de plantas hospederas de TP y 18 de PB son reportadas. La mayoría de los hospederos TP (12 spp.) y PB (13 spp.) eran de la familia Asteraceae. Todos los hospederos TP y PB también eran hospederos de *Lygus lineolaris* (Palisot de Beauvois) (TPB). Poblaciones de TP y PB fueron más altas durante el otoño, y a veces excedieron aquellas de TPB en la misma especie de planta. La importancia de tener poblaciones de TP o PB (o ambas especies) junto con poblaciones de TPB en la misma especie de planta hospedera es discutida.

During a survey of the species of Miridae found in the delta of Arkansas, Louisiana, and Mississippi, *Taylorilygus pallidulus* Blanchard (TP) and *Polymerus basalis* (Reuter) (PB), were commonly found on the same host plants with the tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois) (TPB). All 3 mirid species are related in the tribe Mirini and distributed throughout much of the United States (Knight 1941). However, little information on the host plants of TP and PB has been reported. Blatchley (1926) found PB feeding on weeds, especially ragweed, *Ambrosia* spp., and dog-fennel, *Eupatorium capillifolium* (Lamarck) Small in Indiana. Golden-

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rod, *Solidago* spp., and horseweed, *Erigeron canadensis* L., were listed as hosts of TP. Knight (1941) found fleabane, *Erigeron* spp., to be a host of TP. He also listed dog-fennel; plantain, *Plantago aristata* Michaux; daisy, *Chrysanthemum* spp.; sunflower, *Helianthus* spp.; and tickseed, *Coreopsis* spp. as hosts of PB. In the mid-Mississippi Delta, Cleveland (1982) found *Polymerus* spp. on mayweed, *Anthemis cotula* L.; bitterweed, *Helenium amarum* (Rafinesque) H. Rock; fleabane; and horseweed.

Neither TP nor PB have been reported to be pests of crops in the Delta, although the TPB is an annual pest of cotton in the Delta and throughout the eastern cotton belt (Strong 1968). Surveys of TPB populations taken on wild host plants in the fall could be used to help predict the size of the overwintering adult generation, while surveys taken during the spring could be used to help predict movement of the TPB into cotton. Since both TP and PB were found on the same host plants utilized by the TPB, misidentification of adults and nymphs in population surveys taken on wild host plants could occur. We are reporting, therefore, the wild host plant species on which we found TP and PB.

MATERIALS AND METHODS

The study was conducted at 15 sample locations in the delta of Arkansas, Louisiana, and Mississippi (Fig. 1). Samples were taken at each location with a 38-cm sweepnet from the main crops, and from as many different species of wild host plants as possible growing nearby. The number of net sweeps taken in a sample depended on the abundance of the plant species and varied from 1 to 100. Mirid populations were compared by converting the number of each mirid species captured each month on each plant species to a mean number/40 net sweeps. Sampling was begun in September 1981, and was continued at each location at monthly intervals through October 1982. All mirid adults and nymphs from each sample were aspirated from the sweepnet, and placed separately in petri dishes. The petri dishes containing the mirids were kept cool in an ice chest, then brought back to the laboratory for final identification and tabulation. Nymphs of TP and PB were reared on host plant material to determine if they could complete development on each plant species.

A voucher specimen of each host plant species was preserved and placed at the Institute for Botanical Exploration, Mississippi State University, Mississippi State, MS. Voucher specimens of PB and TP were kept for each plant species. The majority of these specimens are now located at the Mississippi Entomological Museum, Entomology Department, Mississippi State University; representative specimens are also deposited in the National Museum of Natural History, Washington, DC.

RESULTS

TP was collected on 63 plant species representing 19 families and 47 genera, while PB was found on 31 species representing 10 families and 22 genera. Most of these plant species were not utilized by TP or PB for food and/or reproduction unless flower buds were present. The majority of the plant species probably served only as adult feeding hosts, since nymphs were not collected on them. TP nymphs completed development on 13 hosts,

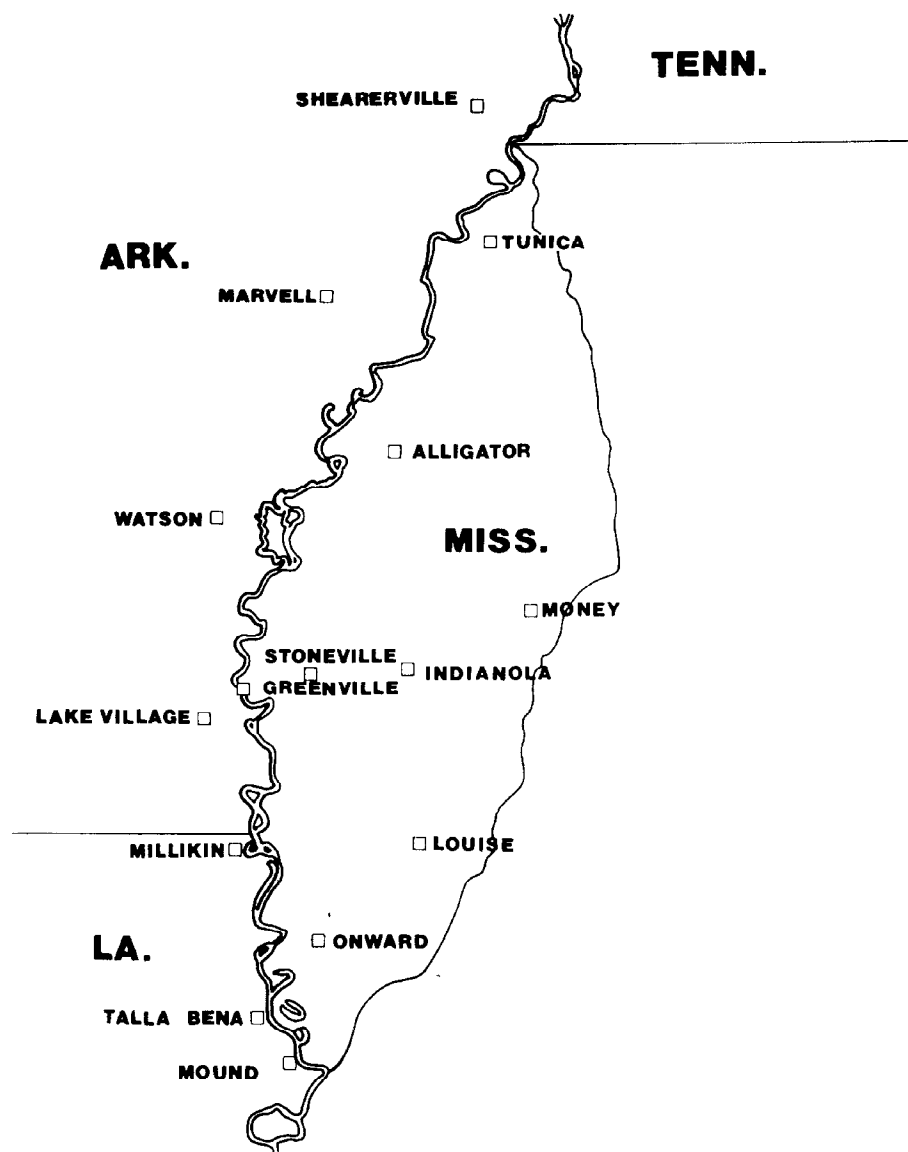


Fig. 1. Locations in the delta of Arkansas, Louisiana, and Mississippi at which wild and cultivated host plants were sampled for *T. pallidulus* and *P. basalis* at monthly intervals, September 1981-October 1982.

while PB could complete development on 18 (Table 1). The majority of these hosts TP (12 spp.) and PB (13 spp.) were in the family Asteraceae. The host plants with the highest densities (mean number/40 net sweeps) of TP (8 spp.) and PB (10 spp.) are shown in Tables 2 and 3, respectively. All of these host plants along with the additional ones listed in Table 1, were also hosts of the TPB. Populations of TP and PB were small during the spring and summer as compared to TPB populations on the same host plant species (Tables 2 and 3). However, during the fall TP and PB populations sometimes exceeded those of the TPB on the same host plant species.

TABLE 1. HOST PLANTS OF *T. pallidulus* AND *P. basalis* IN THE DELTA OF ARKANSAS, LOUISIANA, AND MISSISSIPPI.

Host plant species	Plant family	Mirid species		Month(s) nymphs were collected
		TP	PB	
<i>Amaranthus palmeri</i> S. Watson	Amaranthaceae		x	Sept.
<i>Ambrosia trifida</i> L.	Asteraceae	x		Sept.-Oct.
<i>A. artemisiifolia</i> L.	Asteraceae	x		Oct.
			x	Oct.
<i>Anthemis cotula</i> L.	Asteraceae		x	June
<i>Aster pilosus</i> Willdenow	Asteraceae	x		Oct.-Dec.
<i>A. subulatus</i> Michaux var. <i>ligulatus</i> Shinnars	Asteraceae	x		Sept.-Nov.
			x	Oct.
<i>Bidens frondosa</i> L.	Asteraceae	x		Sept.
<i>Coreopsis tinctoria</i> Nuttall	Asteraceae		x	June-Aug.
<i>Diodia virginiana</i> L.	Rubinaceae		x	July
<i>Dracopis amplexicaulis</i> (Vahl) Cassini	Asteraceae		x	June
<i>Erigeron annuus</i> (L.) Persoon	Asteraceae	x		June-July, Sept.
			x	June-July
<i>E. bonariensis</i> L.	Asteraceae		x	July
<i>E. canadensis</i> L.	Asteraceae	x		July-Nov.
			x	Aug.-Sept.
<i>Eupatorium capillifolium</i> (Lamarek) Small	Asteraceae	x		Oct.-Nov.
<i>E. serotinum</i> Michaux	Asteraceae	x		Oct.
<i>Haplopappus divaricatus</i> (Nuttall) Gray	Asteraceae		x	Aug.-Oct.
<i>Helenium amarum</i> (Rafinesque) H. Rock	Asteraceae		x	June-Oct.
<i>Helianthus grosse-serratus</i> Martens	Asteraceae	x		Oct.
			x	Oct.
<i>Iva annua</i> L.	Asteraceae		x	Sept.
<i>Oenothera laciniata</i> Hill	Onagraceae		x	May-June
<i>Parthenium hysterophorus</i> L.	Asteraceae	x		Sept.-Nov.
			x	July, Oct.
<i>Polygonum pensylvanicum</i> L.	Polygonaceae	x		Oct.-Nov.
<i>Solidago altissima</i> L.	Asteraceae	x		Sept.-Dec.
<i>Trifolium repens</i> L.	Fabaceae		x	Apr.
<i>Verbena brasiliensis</i> Vellozo	Verbenaceae		x	June, Sept., Oct.

TABLE 2. HOST PLANT SPECIES WITH THE HIGHEST DENSITIES OF *T. pallidulus* IN THE DELTA OF ARKANSAS, LOUISIANA, AND MISSISSIPPI, SEPTEMBER 1981 THROUGH OCTOBER 1982. THE DENSITIES OF *L. lineolaris* FOUND IN THE SAME SAMPLES ON EACH PLANT SPECIES ARE ALSO SHOWN.

Month	Host plant	Mean No. of TP and TPB adults and nymphs/40 net sweeps			
		TP		TPB	
		adults	nymphs	adults	nymphs
May	<i>Erigeron annuus</i> (L.) Persoon	1	0	42	53
June	<i>E. annuus</i>	1	0	71	65
July	<i>E. canadensis</i> L. <i>Lythrum lanceolatum</i> Elliott	4	2	26	66
August	<i>E. canadensis</i> <i>E. strigosus</i> Willdenow	2	0	0	4
September ^a	<i>Solidago altissima</i> L.	3	7	44	147
	<i>E. canadensis</i>	3	0	1	0
	<i>Aster subulatus</i> Michaux var. <i>ligulatus</i> Shinnery	12	3	35	24
October ^a	<i>E. canadensis</i>	19	34	86	212
	<i>S. altissima</i>	7	1	22	17
	<i>Parthenium</i> <i>hysterophorus</i> L.	25	21	56	35
	<i>E. canadensis</i>	39	10	43	30
November	<i>A. subulatus</i> var. <i>ligulatus</i>	32	22	49	21
	<i>P. hysterophorus</i>	18	6	35	11
	<i>E. canadensis</i>	38	3	18	1
	<i>A. pilosus</i> Willdenow	16	3	17	0
	<i>A. subulatus</i> var. <i>ligulatus</i>	12	2	14	2
December	<i>A. pilosus</i>	7	7	19	6
	<i>S. altissima</i>	6	2	2	0
	<i>A. subulatus</i> var. <i>ligulatus</i>	4	3	2	0
		5	0	1	0

^aThe mean numbers of TP and TPB in September and October are the average number captured on these hosts in 1981 and 1982.

No adults or nymphs of PB or TP were collected in cultivated crops, despite the large number of samples taken: cotton (222 samples); soybeans (238 samples); and rice (83 samples).

DISCUSSION

All of the TP hosts listed in Table 2, except for *L. lanceolatum* (in the family Lythraceae), are in the family Asteraceae. These species, except for *P. hysterophorus*, are all in the tribe Astereae, and thus are closely related. The host plants of PB listed in Table 3 are distributed in 5 families,

TABLE 3. HOST PLANT SPECIES WITH THE HIGHEST DENSITIES OF *P. basalis* IN THE DELTA OF ARKANSAS, LOUISIANA, AND MISSISSIPPI, SEPTEMBER 1981 THROUGH OCTOBER 1982. THE DENSITIES OF *L. lineolaris* FOUND IN THE SAME SAMPLES ON EACH PLANT SPECIES ARE ALSO SHOWN.

Month	Host plant	Mean no. of PB adults and nymphs/40 net sweeps			
		PB		TPB	
		adult	nymphs	adult	nymphs
April	<i>Trifolium repens</i> L.	1	2	6	25
	<i>Erigeron philadelphicus</i> L.	2	0	33	13
May	<i>Verbena brasiliensis</i> Vellozo	3	1	6	1
	<i>Anthemis cotula</i> L.	1	0	25	19
June	<i>Parthenium</i> <i>hysterophorus</i> L.	18	0	26	19
	<i>A. cotula</i>	6	4	36	19
	<i>Coreopsis tinctoria</i> Nuttall	15	2	39	15
July	<i>Helenium amarum</i> (Rafinesque)				
	H. Rock	11	11	3	2
	<i>P. hysterophorus</i>	12	1	33	6
	<i>C. tinctoria</i>	21	15	14	9
August	<i>H. amarum</i>	8	3	4	1
	<i>Haplopappus</i> <i>divaricatus</i> (Nuttall) Gray	21	37	4	5
	<i>Amaranthus palmeri</i> S. Watson	19	0	31	21
September ^a	<i>H. amarum</i>	9	13	6	4
	<i>H. divaricatus</i>	30	57	13	17
	<i>A. palmeri</i>	15	2	69	19
October ^a	<i>H. amarum</i>	18	6	26	10
	<i>H. divaricatus</i>	48	20	18	0
	<i>P. hysterophorus</i>	12	4	43	30
November	<i>P. hysterophorus</i>	5	0	18	1
	<i>H. divaricatus</i>	13	0	8	0
	<i>Oenothera laciniata</i> Hill	5	0	20	1

^aThe mean numbers of PB and TPB in September and October are the average number captured on these hosts in 1981 and 1982.

but the majority of the hosts (6 spp.) are in the family Asteraceae. *H. divaricatus* and *E. philadelphicus* are in the tribe Astereae, while *C. tinctoria*, *H. amarum*, and *P. hysterophorus* are also closely related and found in the tribe Heliantheae. The reasons for the higher populations of TP and PB for these host plant species are unknown.

Results of this study provide useful information on the host plants of 2

abundant and widely distributed mirids found in the United States. Although the study was not designed to measure interactions between their populations and populations of the TPB, the occurrence of TP and/or PB on the same plant species utilized by the TPB could be important. Competition between the 3 mirid species for the same food resources could occur, especially during the fall when TP and PB populations were the highest. This competition could help reduce the overwintering TPB population. Parasites and predators of the TPB might also utilize TP or PB as hosts or prey, since all 3 mirid species are related and found together on the same host plants. These additional hosts or prey might affect the amount of control exerted by natural enemies of the TPB. Consequently, additional research on the possible interactions between the 3 mirid species and their parasites and predators is needed.

ACKNOWLEDGEMENT

We are grateful to Dr. Sidney McDaniel, Department of Biological Sciences, Mississippi State University, for his identification of the plant species collected in the study. We are also indebted to Mr. Thomas Henry, Systematic Entomology Laboratory, IIBIII, ARS-USDA, Washington, DC, for his identification of the voucher specimens of TP and PB. This research was funded, in part, through Cooperative Agreement No. 58-7B30-1-300 between the Department of Entomology, Mississippi State University, and the Southern Field Crop Insect Management Laboratory, USDA-ARS.

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