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SPIDERS OF SPANISH MOSS IN THE DELTA OF MISSISSIPPI

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ABSTRACT

Arthropods were collected monthly during a 13-month period from Spanish moss on water oak trees in Leroy Percy State Park, Washington County, Mississippi. Of the ca 2000 arthropods collected, spiders (600), beetles (600), chalcidoid wasps (500), and miscellaneous insects (300) represented the major groups. Peak population levels of spiders occurred in spring and fall, as did the occurrence of various crop pests. Spiders were represented by 13 families, 22 genera, and 29 species. Seventy percent of the total spider sample was composed of two species that breed in Spanish moss, *Metaphidippus tillandsiae* Kaston and *Anyphaena maculata* (Banks). Steadily declining non-spider arthropod populations in Spanish moss throughout the fall-winter-spring period suggest that the predatory activity of spiders may have an effect on over-wintering arthropod populations.

INTRODUCTION

Spanish moss (*Tillandsia usneoides* L.) (Bromeliaceae) is an epiphytic member of the Pineapple Family that forms long hanging tufts on branches of trees in damp or swampy areas and is distributed from Texas east to Florida and north to Virginia on the Coastal Plain (Fernald 1950). During the winter, this plant can be quite conspicuous on deciduous trees and locally abundant. During the course of a search of the potential overwintering habitats of the tarnished plant bug, *Lygus lineolaris* (Palisot) (Heteroptera: Miridae), samples from Spanish moss revealed a diverse fauna of arthropods. Spiders were the most abundant taxonomic order in the samples, and information is presented here on their seasonal composition, abundance, and potential impact on other arthropod inhabitants.

METHODS AND MATERIALS

Samples were collected from May 1985 through May 1986 at Leroy Percy (L.P.) State Park, Washington County, Mississippi. This park is a 1000 ha forest

surrounded by agricultural lands planted in rice, soybeans, and cotton. Early-successional habitats (e.g., oldfields and roadside margins) are abundant in the park and contain plants supporting populations of crop pests, particularly *Erigeron* spp. (Compositae) as a host of *Lygus lineolaris*. Approximately one-third m³ of Spanish moss was collected monthly (except November, due to flooding) from each of the same three water oak trees (*Quercus nigra* L.). These trees were located at the south end of a 10 ha mowed field of mixed grasses that was surrounded by low damp woods subject to periodic flooding. Each tree was at least 10 m from the border of the woods and 15 m from each other. Sampling was accomplished by standing on top of a truck cab under each tree, surrounding a clump of moss with a 1/3 m³ fine-mesh organdy bag, cutting off the tree branch at the bag opening, and continuing until the bag was full. The 3 bags were then placed in a large plastic bag and transported to the laboratory, frozen at -20° C for 12-36 hours, and then examined under magnification. Assistance with spider identifications was provided by G. B. Edwards and voucher specimens were deposited at Florida State Collection of Arthropods, Gainesville; Mississippi Entomological Museum, Mississippi State University, Starkville; and USDA-APHIS-PPQ-IFAS, Gulfport, Mississippi.

RESULTS AND DISCUSSION

Collections from Spanish moss over a 13-month period produced approximately 2000 arthropods. The majority of specimens were spiders (600), Coleoptera (600), and chalcidoid Hymenoptera (500), with various other insect groups totaling an additional 300. Crop pest species in the collections included the tarnished plant bug (3); chinch bug, *Blissus* sp. (3); flea beetle, *Altica* sp. (3); stink bug, *Euschistus* sp. (2); cereal leaf beetle, *Oulema* sp. (2); boll weevil, *Anthonomus* sp. (1); and bean beetle, *Cerotoma* sp. (1). These data indicate that, at least for the sites sampled, Spanish moss is not a significant refuge or breeding habitat for insects known to be pests on field crops. Predators and parasites of crop pests were present in low numbers and included *Coleomegilla* sp. and *Lebia* sp. (Coleoptera), *Orius* sp. and *Zelus* sp. (Hemiptera), *Chrysopa* sp. (Neuroptera), and *Micropletis* sp. (Hymenoptera).

Spiders were represented by 13 families, 22 genera, and 615 individuals (Table 1). Identification of immature spiders was particularly difficult and created some tabulation problems. All adult, and most penultimate, specimens were identified to species. Some immatures (e.g., *Metaphidippus tillandsiae* Kaston) could be identified without confusion. Some immatures [e.g., *Phidippus putnami* (Peckhams)] were captured in a silken retreat with an adult female and thus were identified by association. Some immatures [e.g., *Anyphaena maculata* (Banks)] were identified to genus, and the presence of adult specimens of only one species within the genus permitted a tentative species determination. When the adults of two species within a genus were present (e.g., *Philodromus*), the immatures could usually be associated with one of the species. Some immatures (e.g., *Clubionoides* sp.) could be identified to genus, but the absence of adult specimens prevented a species association. With these limitations, Table 1 lists 29 species, of which only 14 are represented by adult specimens. This list also contains 11 additions to the state list as compiled by Dorris (1972).

The abundance of spiders in Spanish moss was greatest in September and May with the appearance of large numbers of immatures and was at low levels in both mid-summer and late winter when adults predominated. The number of species was highest (12) in May and December and lowest (4) in July. Eighty-five percent of the total spider sample was composed of only four species. These four appeared to be the only species reproducing within Spanish moss and warrant further comment.

Metaphidippus tillandsiae Kaston.—Two hundred forty-one specimens of this species were obtained, representing all sampling periods. Overwintering occurs in the adult stage, with an exclusively immature population in the summer and adults first appearing in October. This species was first described by Kaston in 1973 and has only been recorded from Spanish moss. The distribution of *M. tillandsiae* — North Carolina south to Florida, west to Louisiana — is entirely within the range of Spanish moss (Fernald 1950; Kaston 1973). It is probable that this species is restricted to Spanish moss and may be a major predator within that microhabitat.

Anyphaena maculata (Banks).—One hundred eighty-six specimens were obtained, representing all sampling periods except January. Overwintering occurs in both adult and immature stages, with an exclusively immature population in the summer and adults first appearing in October. This species was redescribed in 1974 and has been recorded from Spanish moss, sweeping in bottomland pine and hardwood forests, sifting of leaf litter, and malaise trap (Platnick 1974), as well as from cotton (Whitcomb and Bell 1964). The distribution of *A. maculata* — New York south to Georgia, west to Illinois and Louisiana — is considerably broader than Spanish moss (Platnick 1974), and thus is not restricted to this microhabitat. This predator, combined with *M. tillandsiae*, may exert a dominant influence on the abundance of arthropods in Spanish moss at the L.P. State Park sites.

Philodromus keyserlingi Marx.—Fifty-three specimens were obtained, representing all sampling periods except June. Overwintering occurs in the immature stages, with adults only present in May. This species was redescribed in 1961 and has been recorded from wasp's nests (Dondale 1961), as well as from corn (Plagens 1985), peanuts (Agnew et al. 1985), cotton (Skinner 1974), and soybeans (LeSar and Unzicker 1978). The distribution of *P. keyserlingi* is very broad, occurring from Massachusetts south to Florida, west to Iowa and New Mexico (Dondale 1961). The temporal pattern of occurrence in the L.P. State Park samples, combined with the published records of geographic and habitat distribution, suggests that this species is an occasional vagrant and facultative breeder in Spanish moss.

Nodocion floridanus (Banks).—Forty-four specimens were obtained, representing all sampling periods except July, January, and February. Overwintering may occur in both the adult and immature stages, but the absence of specimens in January and February precludes a definite determination. Adults were present only in May and June, the same pattern of occurrence as reported from Arkansas cotton and pine (Heiss and Allen 1986). This species was redescribed in 1980 and has been reported from houses, wasp's nests, under bark, on pine trees, in bowers and nests (Platnick and Shadab 1980), as well as from cotton (Dean et al. 1982). The distribution of *N. floridanus* is also very broad, occurring from Massachusetts south to Florida, west to Minnesota and Arizona. (Platnick and

Table 1.—Spiders of Spanish moss at Leroy Percy State Park, Mississippi, 1985-1986. Explanation of symbols: Instar: M = male, F = female, PM = penultimate male, PF = penultimate female, IM = immature (juvenile). * = no sample.

Taxon	Instar	M	J	J	A	S	O	N	D	J	F	M	A	M	Total
ANYPHAENIDAE															
<i>Anyphaena maculata</i> (Banks)	M	1							3	1					5
	F						3	1	5	6	1	2	3		20
	PM						3	1						1	5
	PF						2								2
	IM	4	6	10	6	26	10			10	3	2	77		154
<i>Teudis mordax</i> (O.P.-Camb.)	M	2	1											1	4
	IM	1											1		2
ARANEIDAE															
<i>Eustala cepina</i> (Walck.)	M													1	1
<i>Neoscona hentzi</i> (Keys.)	F					1									1
<i>N. domiciliorum</i> (Hentz)	F			1											1
CLUBINONIDAE															
<i>Clubionoides</i> sp.	IM										10				10
DICTYNIDAE															
<i>Dictyna</i> sp.	IM									1					1
GNAPHOSIDAE															
<i>Cesonia bilineata</i> (Hentz)	IM												1		1
<i>Nodocion floridanus</i> (Banks)	M	1												1	2
	F		1											3	4
	PM											1			1
	PF	1							1						2
	IM	2	1		1	8	1			2		2	14	7	38
LINYPHIIDAE															
<i>Ceraticelus</i> sp.	PM								2						2
	PF												1		1
	IM								1	1				2	4
LYCOSIDAE															
<i>Pardosa</i> sp.	IM								2	1					3
MIMETIDAE															
<i>Mimetus</i> sp.	IM								1						1
PHILODROMIDAE															
<i>Philodromus keyserlingi</i> Marx	M	2													2
	F													1	1
	PM													2	2
	IM	1		1	1	3	4		20	5	8	1	1	3	48
<i>P. vulgaris</i> (Hentz)	F													1	1
PISAURIDAE															
<i>Pisaurina</i> sp.	IM					1									1
SALTICIDAE															
<i>Eris militaris</i> (Hentz)	M											1		1	2
<i>Hentzia</i> sp.	IM									1		1			2
<i>H. mitrata</i> (Hentz)	M									1					1
<i>Metaphidippus</i> sp.	IM										1				1
<i>M. tillandsiae</i> Kaston	M						14		14	14	11	7	4	2	66
	F	1					15		22	9	13	6	3	9	78
	PM					8									8
	IM	4	12	21	10	30	11					1			89
<i>Phidippus</i> sp.	IM										1				1
<i>P. putnami</i> (Peckhams)	M								1						1
	F						1								1
	IM					25									25
<i>Platycriptus undatus</i> (DeG.)	IM								1					1	

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