

A Search for One of Illinois'
Rarest Insects:
the Prairie Walkingstick
(*Diapheromera veliei* Walsh)

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Abstract

In 1992, a non-game check-off grant was awarded to search ten west-central Illinois hill prairies for the Prairie Walkingstick (*Diapheromera veliei* Walsh). Each prairie was searched once between August 15, 1992 and Aug. 23, 1992. The Prairie Walkingstick was found at Revis Prairie in Mason Co., still it's only known Illinois population. The Prairie Walkingstick was observed on three separate prairie lobes at Revis Prairie.

Introduction

Diapheromera veliei (the Prairie Walkingstick) ranges from northern Mexico and Arizona to South Dakota, Minnesota, Iowa, Illinois, Arkansas and Louisiana. The area of greatest frequency of specimens collected is from northern Texas, Oklahoma, eastern Colorado, Kansas, So. Dakota, western Iowa and western Missouri (Catchpole, unpubl.*). *D. veliei* is of local occurrence throughout it's range (Somes, 1916; Masters, 1968; Arnold, 1991 (PC)).

D. veliei was found at Revis Prairie, Mason Co. Illinois (1990), during the course of a non-game check-off grant survey of Orthopterans. This was the first verified occurrence of this species in Illinois, and extends the central portion of the range of this species eastward across the Mississippi.

A survey of collection dates revealed that the highest collection frequency of *D. veliei* is from late July thru August (Catchpole, unpubl.). This is when most *D. veliei* are mature, and thus readily identifiable to the species level. Immature specimens were identified by clearing the heads in KOH, then examining the lacinia of the maxillae. The lacinia are acute in *D. veliei*, and obtuse in *D. femorata*.

Materials & Methods

Ten hill prairies were visited between August 15 and 23rd 1992. Time spent searching prairies ranged from 35 minutes to 5 hours, depending primarily on the size of the prairies, which ranged from less than an acre to over 30 acres. A 15" dia. sweep net was used to collect insects with 5 to 10 sweeps conducted between net checks (samples). Fewer sweeps/sample were taken if many insects were being captured to avoid unnecessary injury to the insects. During each sample, sweeps were made both low and high in the vegetation, in order to collect specimens from all levels in the canopy. Samples were contiguous to each other, creating meandering transects thru each prairie.

Gut analysis of wild populations conducted in Colorado indicate a strong food preference (sometimes homophagous) for *Psoralea tenuiflora* Pursh (Slender Scurfpea) (Ueckert and Hansen, 1972; Capinera, 1985). *P. tenuiflora* commonly occurs in hill prairies in west-central Illinois, and special efforts were made to sweep in areas where *P. tenuiflora* occurred.

All habitats within each prairie were sampled, i.e. ridge tops, base of slopes, north facing slopes, south facing slopes, etc.. A male and female *D. veliei* was collected from Revis Prairie and placed in the collection of the Illinois State Museum as voucher specimens.

An unexpected occurrence was the capture of immature walkingsticks of the genus *Diapheromera*. Immature specimens were collected, reared to maturity, or early death, and identified by genitalia and/or lacinia.

A daily log of weather and conditions at each site was maintained (Appendix 1). Furthermore, a walkingstick identification pamphlet (Appendix 2) was prepared and mailed to The Nature Conservancy newsletter editors in west-central Illinois (Appendix 3). These editors agreed to publish the pamphlet in their newsletters at their earliest possible convenience. This will enable a great many people in west-central Illinois to identify walkingsticks, and fulfill this requirement of the contract.

Results

Table 1 lists sites visited; time actually spent searching for *D. veliei*; number of *D. veliei* seen and the approximate acreage of prairie at each site.

Table 1

Site #	Location	Date Visited	Collecting Time	# of <i>veliei</i>	Acreage of Prairie
1)	Fult's	8/19/92	1:30- 6:30 P.M.	0	>30
2)	Pere Marquette	8/20/92	9:00-10:00 P.M.	0	< 6
3)	Grubb Hollow	8/20/92	12:00- 1:00 P.M.	0	< 2
4)	Meredosia	8/15/92	4:45- 6:30 P.M.	0	>10
5)	Chandlerville	8/15/92	1:30- 4:00 P.M.	0	>30
6)	Revis				>50
	(Strader E)	8/24/92	1:00- 2:30 P.M.	2	<10
	(Strader W)	8/24/92	2:30- 3:10 P.M.	1	<10
	(Big Prairie)	8/24/92	3:20- 4:15 P.M.	7	>10
	(Astragalus)	8/24/92	4:25- 4:50 P.M.	0	<10
	(W Sand Ridge)	8/24/92	4:50- 5:25 P.M.	0	<10
7)	Manito	8/21/92	9:20-10:30 A.M.	0	>10
8)	Ft. Creve Couer	8/21/92	11:40-12:15 P.M.	0	< 6
9)	Detweiler Park	8/21/92	3:30- 3:40 P.M.	0	< 2
10)	Robinson Park	8/21/92	1:50- 2:45 P.M.	0	< 2

Discussion

D. veliei was only found at Revis Prairie, Mason Co.. At Revis, *D. veliei* was found on three prairie lobes, with Big Prairie lobe yielding seven specimens in the sweep transect. This would indicate a very large population on this prairie lobe, since only a small amount of this large lobe could be sampled. The other prairie lobes at Revis yielded two, one or no *D. veliei*, indicating fewer Prairie Walkingsticks. It is notable that *D. veliei* was found only in the three eastern, grade A, loess hill prairies at Revis Prairie N.P.. *D. veliei* was not found in the western lobes of prairie at Revis, which are grade B, loess and sand hill prairies.

All specimens of *D. veliei* were mature when observed. Some specimens of *D. femorata* were mature when observed, but numerous immature specimens of *D. femorata* were collected, reared and identified. *D. femorata* was successfully raised on oak and raspberry leaves, *D. veliei* was not successfully switched over to leadplant (*Amorpha canescens*) as a food source. Leadplant is a widely consumed legume, that is much easier to gather and store as a foodplant than the immediately wilting *Psoralea tenuiflora*.

Summary

The Prairie Walkingstick, (*Diapheromera veliei* Walsh) is known only from Revis Prairie, Mason Co., Illinois. Despite

searching appropriate habitat in west-central Illinois, the Prairie Walkingstick remains disjunct from the main (western) population by 200 miles. The population at Revis Prairie is unevenly distributed, and does not utilize all prairie habitat at this site. The limitation of this species to only a portion of its only known locale in Illinois, and the dramatic population fluctuations that most annual insects experience, indicate a precarious future for this species in Illinois.

Appendix 1: Daily Log

Saturday, Aug. 15. 1992: Chandlerville Prairie. Partly cloudy, dry, light wind, temp. mid-70's. 1:30-4:30 P.M. Swept for walkingsticks, none found. The common Orthoptera were the Big Headed and toothpick.

4:45-6:00 P.M. Meredosia Hill Prairie. Walkingsticks numerous near Black Locust trees in SW prairie. Adult male and female *D. femorata* captured and identified, released. 6 immature walkingsticks collected for rearing. All walkingsticks captured within 50' of trees and in areas containing Black Locust resprouts. Common Orthoptera Big-headed and *Melanoplus femur-rubrum*.

Wed. August 19. 1992. Fults Hill Prairie. Temp. low 80's, high haze to increasingly cloudy, but bright. Swept north prairies first, finding around 10 immature walkingsticks within 50' of trees. Found one immature walkingstick on southern prairies, near cliff and a couple trees, am attempting to raise on legumes (it refused legumes, but ate Oak leaves).

Thurs. Aug. 20, 1992. Pere Marquette Nat. Pres. 70's, calm. 9:00-10:00 A.M. Found handful of immature walkingsticks. No *Psoralea tenuiflora* (Slender Scurfpea) observed.

12:00-1:00 P.M. Grubb Hollow. Small place! depauperate fauna (like Pere Marquette, only worse). No walkingsticks.

Friday, Aug. 21, 1992. Manito Prairie. Sunny, low 70's. 9:20-10:30 A.M. Immature walkingstick in eastern prairie, mature female *D. femorata* in western prairie. No *Psoralea tenuiflora* observed.

11:40-12:15. Fort Creve Coeur. One immature walkingstick found. Helianthus blooming nicely in woods, hooray. No Big-headed hoppers found.

1:50-2:45. Robinson Park. Sunny, low 80's. Two immature walkingsticks captured. very few orthoptera. Decent leafhopper diversity.

3:30-3:40. Detweiler Park. Tiny prairie, no walkingsticks, one unusual grasshopper (female) seen, not collected.

Monday, Aug. 24, 1992. Revis Prairie. Temp. mid 80's, sunny with high haze.

1:00-2:30. Strader East. Many immature walkingsticks, two mature male *D. veliei* on top of front ridge in *P. tenuiflora* patch.

2:30-3:10. Strader West. front half swept, one mature female (*D. veliei*) found.

3:20-4:15. Big Prairie. Found 6 mature females and one mature male *D. veliei*. Found two mature female and two mature male *D. veliei* here in July, 1992. Walkingsticks well distributed through prairie, male and a female found in net together.

4:25-4:50. Astragalus Prairie. two immature walkingsticks found.

4:50-5:25. Western Sands Ridge and Far Western Sands Prairie. No walkingsticks found.

Walkingsticks

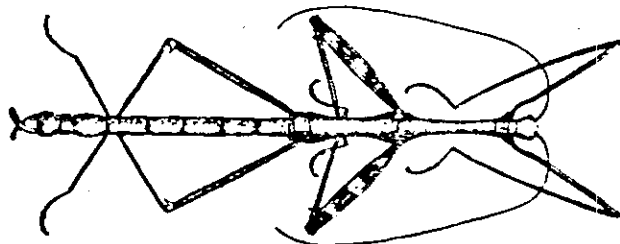
by Floyd Catchpole
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I was out in Revis Prairie with Suzie Barber, when she picked up a walkingstick. No, not a branch, an insect. It looked sort of like a Praying Mantis, only without the big grasping front legs. Suzie wasn't holding just any walkingstick, but a Prairie Walkingstick, a watchlisted species in Illinois.

The watchlist is aptly named. It is a list of rare species, in need of watching to determine whether they are endangered enough to be placed on the Illinois Endangered or Threatened Species List. The watchlist provides no protection to a species. It indicates that it needs more study.

That's where you can help. As part of a non-game check off grant I am about to teach you, the members of TNC, how to identify walkingsticks. Should you find the rare Prairie Walkingstick, let me know.

First, you must be able to tell male from female walkingsticks. This is easy. By mid-July the walkingsticks are mature. The males have a clasping structure (shown below) at the end of their abdomen. They use this to hold the female during sex. The female has a straight structure at the end of her abdomen, like a two pronged fork.



The Common Walkingstick (male)

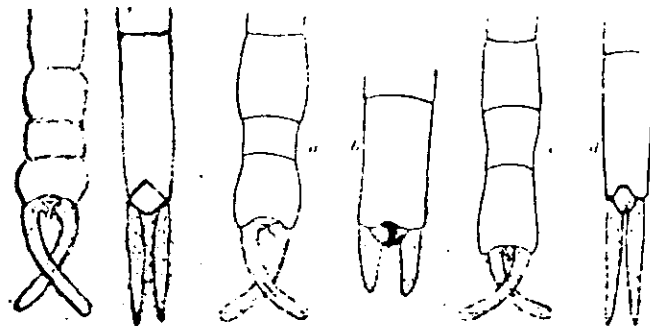
There are three walkingsticks in central Illinois. The males are easy to tell apart. The females of the Common and Prairie Walkingsticks can be separated by looking at the pictures of their abdomens.

Remember, all creatures on a nature preserve are protected. Stick this article in a field guide, and carry it with you. That way you will be able to identify and release walkingsticks you find.

The Wetland Walkingstick (*Manomera blatchleyi*) is a species of wet prairies. It has a head about twice as long as broad. The heads of the others are more nearly square. Also there are no (noticeable) spines in the elbows of the legs. It may be parthenogenetic in Illinois, meaning that the females will produce female young without being fertilized.

The common, or woodland walkingstick (*Diaperomera femorata*), feeds on trees and brambles. It has a thorn-like spine in the elbows of its middle and hind set of legs. The male has several slightly pale bands on the swollen upper arm of the middle set of legs.

The Prairie Walkingstick (*Dispheromera veliei*) lives in dry prairies. It is similar to the Common Walkingstick, except that, in the males, the upper arms of the middle legs are more slender, unbanded, and often sport a few round dark dots on them.



Prairie
Walkingstick

Common
Walkingstick

Wetland
Walkingstick

Appendix 3: Cooperating TNC Editors

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