The Northern Widow Spider, Latrodectus Variolus (Araneae: Theridiidae), in Michigan

Louis F. Wilson
Michigan State University

Follow this and additional works at: https://scholar.valpo.edu/tgle

Recommended Citation
Available at: https://scholar.valpo.edu/tgle/vol1/iss5/1
THE NORTHERN WIDOW SPIDER, LATRODECTUS VARIOLUS
(ARANEAE: THERIDIIDAE), IN MICHIGAN

Louis F. Wilson
North Central Forest Experiment Station
Michigan State University, East Lansing, Michigan 48823

INTRODUCTION

Until recently the species of widow spider occurring in Michigan was considered a variant of the black widow, Latrodectus mactans (Fabricius). Levi (1959) summarized and revised the worldwide genus Latrodectus, placing the southern areas of Illinois, Indiana, and Iowa as the northern limit of mactans on the North American continent. Widow spiders located north of this became part of the widespread curavacaviensis group. After further information was available McCrone and Levi (1964) revised the curavacaviensis group establishing the species that extended north of mactans as the northern widow, L. variolus, originally described by Walckenaer (1837).

L. variolus is the most northern representative of the genus in North America, but its range extends from southern Canada and the northern States south to northern Florida west through Texas to central California. It is sympatric with L. mactans in many southern states, and it is sympatric with both L. mactans and L. bishopi in Florida (McCrone and Levi, 1964).

The northern widow is known from many localities in Michigan, but in recent years it has been abundant in the northwestern part of the Lower Peninsula--particularly in Kalkaska, Grand Traverse, and Wexford counties. McCrone and Levi (1964) recorded specimens from Calhoun, Cheboygan, and Barry counties. In addition, specimens have been collected or reported from Antrim, Charlevoix, Crawford, Emmet, Livingston, Otsego, and Wayne counties. Observations were made in several localities in 1965 and 1966 in order to learn more about this spider's coloration, abundance, and habits.

MORPHOLOGY AND MARKINGS

The mature female northern widow has a brownish black carapace and black legs and sternum. The background color of the abdomen is generally black but specimens with dark brown abdomens occur. The median line of the abdomen is marked by a row of 4 reddish spots (Fig. 1A) each composed of clumped granules. The elongated rear marking may coalesce with the third or it may be broken into several smaller spots. All mature females examined that had one or more egg batches had these markings. The markings may be reduced or faint in some, but no completely black specimens were found as in L. mactans. Most mature females also retain 2 to 4 pairs of faint reddish brown streaks on the front and sides of the abdomen which are remnants of the juvenile markings (Fig. 1A).
The mature male is more gaily colored and retains more of the juvenile pattern than the female. The legs are marked with orange and black bands. The background of the carapace and abdomen is black. The median line of the abdomen is occupied by 4 reddish-orange spots, the first 3 are encircled by a narrow white area (Fig. 1B). Four pairs of white streaks mark the front and sides.

The "hourglass" on the venter of all female specimens I have collected consists of 2 red or orange-red triangles or bars. It is also composed of clumped granules like the markings on the dorsum. Three typical markings are illustrated without granules in Fig. 1C. The hourglass of the male is orange or orange-red and sometimes partly white. It is more irregular than that of the female. It may be a complete hourglass or separated into 2 irregular triangles (Fig. 1D). McCrone and Levi (1964) reported the northern widow's hourglass may consist of 2 transverse red bars or the anterior one may be triangular. They reported one male with a complete hourglass. Kaston (1953) noted the reduction also in northern specimens. Hutson (1936) reported the markings may vary from a single spot to four spots suggesting a Maltese cross. In contrast, L. mactans in the eastern and southern U.S. has a complete hourglass on the venter. However, specimens from southern Texas and Mexico are exceptions (McCrone and Levi, 1964).

The mature female varies in size from 3/4 to 1-1/2 inches overall;

Fig. 1. Markings on the abdomens of *L. variolus* in Michigan. A, B, dorsal abdomen of female and male respectively; C, D, configuration of "hourglass" markings from typical female and male specimens, respectively.
the male is about two-thirds the size of the female but larger than comparable *L. mactans* males. McCrone and Levi (1964) attribute the large size of *L. mactans* males to 5-7 molts, while *L. mactans* has 4-5 molts.

The male *L. variolus* is separable from male *L. mactans* by genitalic structures. The female can be separated reasonably well by its markings and by electrophoresis of the venom (McCrone and Netzloff, 1965).

**HABITAT AND SPIDER ABUNDANCE**

The web of *L. variolus* is usually spun near the ground. It is placed in an open and usually sunlit area but includes a dark retreat or sheltered portion. One common habitat is under downed fence posts (Fig. 2A). Other habitats include animal holes (Fig. 2B), brush piles, grass clumps, small pits, logs, and boards. Spiderlings are found in more diverse habitats than adults--probably because they are capable of ballooning and they can occupy smaller areas. One spiderling was found in a web under a small rock in a gravel pit.

The web is wiry and may vary from a few inches to nearly 3 feet across; usually it is 6-10 inches and very irregular in shape. The central strands "funnel" down to the retreat area of the web which may be small or large, depending upon the habitat restrictions. Retreat webs spun in rodent holes are generally large, often extending more than a foot beneath the ground.

In 1965 and 1966 *L. variolus* was particularly abundant in young red pine (*Pinus resinosa* Aiton) plantations in the northwestern corner of the lower peninsula of Michigan--especially in plantations where the lower branches of the trees had been pruned off. There, most of the spiders constructed their snares in brush piles and near the trees under the overhanging edges of planting furrows. In contrast, they constructed their webs mostly in grass clumps and abandoned animal holes in untreated plantations.

One pruned plantation near Williamsburg, Grand Traverse County, Mich. had numerous spiders in 1965. Of 10 trees picked at random, 6 had one widow spider web nearby and one tree had three webs nearby. This was noted in early September a few weeks after a fresh brood of young appeared. To further check abundance, 14 different rows of downed fence posts were examined in July 1966 in Kalkaska, Grand Traverse, and Wexford counties. Fence rows varied from 6 to 19 posts, and all but one fence row had at least one spider. One fence row with 12 downed posts had 7 posts with one spider under each.

So far I have found all stages of *L. variolus* close to the ground in mesic to moderately xeric sites. McCrone and Levi (1964) report that *L. variolus* is abundant in mesic and xeric sites in Florida. There the immatures occupy the forest litter, while the adults dwell in dome-shaped retreats in branches of trees 3 to 20 feet above the ground. They found all stages of *L. mactans* dwelling near the ground in Florida in habitats similar to those of *L. variolus* in Michigan.
BEHAVIOR AND HABITS

*L. variolus* is extremely timid. It remains in the retreat of the web during the day awaiting its prey, and it can usually be coaxed out by dropping a living insect into the snare. At dark it comes out to feed, construct egg cases, and work on its web. Some feeding occurs in the daytime also.

Fig. 2. Some habitats of *L. variolus* in Michigan. A, downed fence posts; and B, small-mammal hole; note egg sac to right of hole.
For its size the mature female moves very rapidly and with great agility. When in the open it will retreat rapidly if the web is touched or if a shadow passes over it. I touched the web of one adult female which was at least 6 inches out on the snare feeding on a beetle. It actually leaped into the retreat under a brush pile. When disturbed or sought after in the retreat the female frequently drops to the ground and folds its legs tightly against its body. Although the female is by no means small it is extremely difficult to locate after this occurrence. A spider in a web placed over a rodent hole will often escape by moving far into the hole.

Large bees, wasps and other insects are eaten by the northern widow. It is cautious with its prey and always remains one-half inch or more below and to one side of its victim; there it encases it in silken strands guided by the rear pair of legs. Once encased, the prey is frequently bitten in the head or in a joint of one of the legs. The spider will often move the prey to a central location in the web, perhaps to be closer to the retreat. After feeding, the empty husk of the prey is usually discarded, so there are rarely more than a few husks in the web at any time. McCrone and Levi (1964) found *L. variolus* webs festooned with insects and husks in Florida.

The insect species in the webs vary with the season. Most species are those that seek cover during part of the day. Interestingly, I found pine root collar weevil (*Hylobius radicis* Buchanan) adults in the webs on 3 occasions. This insect is a very destructive pine plantation pest in Michigan. This particular plantation averaged about 700 adult weevils per acre and perhaps 50 spiders per acre. Fortunately the spiders were not eating enough weevils to justify propagating them for control purposes, as we would dislike having *L. variolus* more abundant than it is! There were sufficient spiders to control the weevil, but the weevil's habits prevented good control. The weevil seldom flies. Robinson (1947) reported that *L. mactans* (this might have been *L. variolus*) in Philadelphia consumed large quantities of the scarab *Autoserica castanea*. He counted 78 beetle husks under one web. *Autoserica*, however, is more vulnerable to such perils than the pine root collar weevil, because it is a strong flier and seeks sheltered areas each day to hide.

The nearly spherical papery egg sac of *L. variolus* is usually situated in the retreat strands, but is so placed to receive maximum solar radiation (Fig. 2B). Three sacs were the maximum observed per web in any one season. Thorp and Woodson (1945) reported that up to 9 egg sacs may be laid in the lifetime of *L. mactans*.

The length of life of the spider was not determined. It lives at least one year and probably longer. Most overwinter as late instar juveniles which mature in early spring. Spiders were found in their webs from April to early November in Michigan. Gaul (1949) in New York found *L. mactans* in webs from April to January and thought it could be found all year round in some years. In Florida McCrone and Levi (1964) noted that *L. variolus* females take 153 (range 125-199) days to mature and males 130 (range 122-135) days. This contrasts with 64 (range 53-90)
days and 42 (range 32-58) days to mature for female and male *L. mactans*, respectively.

**DISCUSSION**

The northern widow has been given little attention in Michigan, probably because it is a cryptic spider, the web is generally inconspicuous, and most of all it is not especially common near human habitation. Few people pay attention to downed fence posts, small mammal holes, or brush piles. Further, the immatures would be most frequently seen, and few people would envisage "black widow" in them.

Although abundant in localized areas, *L. variolus* is not a common spider like the related *L. mactans* in the South. Hutson (1936) indicated its relative rarity in Michigan by noting that of several hundred spiders sent to him for identification only one was a widow spider. Previous to this he recalled that only two other widow spider reports were known for Michigan, and these were widely separated, spatially and temporally. Thorp and Woodson (1945) reported there were no widow spider bite cases or deaths known for Michigan up to 1943. To my knowledge no bites have been authenticated to date.

Nevertheless, normal precautions should be taken when in areas where the northern widow is locally abundant—the spider will probably bite in self defense if carelessly handled. The agony following a widow spider bite and the cases resulting in death are well dramatized by Thorp and Woodson (1945). In addition, *L. variolus* might be more poisonous than the other North American species. McCrone (1964) found the venom of *L. variolus* averaged .254 mg/spider while the venom for *L. mactans* averaged .190 mg/spider. However, it is not known if *L. variolus* will attack as readily as *L. mactans* and if as much poison is injected with the bite.

**LITERATURE CITED**


Kaston, B.J. and Elizabeth Kaston. 1953. How to know the spiders. Dubuque, Iowa.


NEW DISTRIBUTION RECORDS OF MICHIGAN
MOSQUITOES, 1948-1963

Carl B. Obrecht
Department of Biology, Mercy College of Detroit,
Detroit, Michigan 48219

The following records result from data accumulated from the years 1948-63. A total of more than 175 field samples, usually from different locations, have been taken from 27 counties in the upper and lower peninsulas of Michigan. The total of 2199 specimens includes 241 larvae, 452 adult males, and 1506 adult females.

The usual techniques were employed in collecting samples. Adults were taken while biting or resting, and a few were captured in a simplified light trap. Large numbers of larvae and most of the pupae were reared. In case of any doubt, sex was confirmed by genital examination.

These records are compiled from data accumulated since Obrecht (1949), the only exception being some records from 1947 that I have incorporated to provide more precise information about seasonal appearance. The "County Records" cited in the present paper are supplementary to those in Obrecht (1949).

Anopheles earlei Vargas: Records of this species are few, and remain confused due to an uncertain taxonomic status. Specimens previously reported (Obrecht, 1949) as A. occidentalis are found to be A. earlei. Other collections, such as Pederson (1947), Sabrosky (1946) and Irwin (1941) should be included here. The extensive distribution of A. earlei is substantiated by its frequent appearance on Isle Royale (Beadle, 1963). A single county record is reported here. COUNTY RECORD: Muskegon.

Anopheles punctipennis (Say): From these and previous records,