

concentrations of White Cedar (*Chamaecyparis thyoides*) on the Ft. Bragg reservation, but had no luck, and decided not to make an effort to look for the second brood. In July I was collecting hesperids that were visiting Sweet Pepperbush (*Clethra alnifolia*) when I spotted and captured the first *M. hesseli* also visiting these flowers. After realizing what I had captured, I made a quick search of the area and found a small stand of White Cedar (10–12 trees) about 20 yds. from the edge of a powerline cut in which I was collecting. More White Cedar may have been farther back in the wooded area. An hour's worth of additional searching turned up 2 more specimens.

Having found my first *M. hesseli* I checked other promising stands of White Cedar and eventually found the second locality. The two areas in which *M. hesseli* were found were the only areas that had a considerable amount of Sweet Pepperbush in the vicinity of the White Cedar. I tried tapping trunks and throwing sticks into the upper branches of the White Cedar, but never saw *M. hesseli* on its foodplant. In both areas *M. hesseli* was uncommon, and a two hour search would turn up 4–5 specimens. The patches of Sweet Pepperbush could be searched in 10–15 minutes so that most of the time was spent just waiting for *M. hesseli* to appear on the flowers. Most collecting was done during midday, however, some specimens were taken as late as 1700, and almost all were in good condition.

White Cedar is not uncommon along stream banks and in swamps in this part of North Carolina, and in view of the fact that the captures were made over a three county area separated by as much as 23 air miles, further collecting in this part of the state should turn up additional locations. Also it seems that the most promising areas to investigate, in July at least, would be those where Sweet Pepperbush or other productive flowers are in the vicinity of White Cedar.

It is interesting to note similarities in the occurrence of *M. hesseli* in North Carolina and in New Jersey. Rawson & Ziegler (1950, J.N.Y. Entomol. Soc. 58: 69–80) noted that *M. hesseli* in New Jersey was almost always found on flowers, and was not seen arriving or leaving, or flying about the foodplant as does *M. gryneus*. This certainly was the situation in North Carolina.

The range of *M. hesseli* has now been extended to Virginia with the capture of a female on 18 July 1972 in Chesapeake. Mr. Bill Smith captured the specimen on milkweed (*Asclepias syriaca*), along with a female *M. gryneus*, while collecting on the eastern edge of the Dismal Swamp.

There appears to be an unpublished record of *M. hesseli* from Maryland. In the correspondence of Mr. Frank Jones to Mr. J. B. Ziegler regarding the identification of *M. hesseli* in his collection, Jones cited a specimen from Pocomoke, Maryland, dated only 21 July and bearing a dos Passos identification label. The present status of the specimen or why the record has never been published before is unknown.

M. hesseli may occur in many areas along the coastal region of the eastern U.S., but probably has remained uncollected not only because White Cedar often grows in inaccessible swamp lands, but also because *M. hesseli* is inconspicuous in areas where it does occur.

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AN ABERRANT INTERSPECIFIC HYBRID OF *LIMENITIS* (NYMPHALIDAE) FROM WISCONSIN

Interspecific hybrids between the *Limenitis arthemis-astyanax* complex and *Limenitis archippus* (Cramer) are extremely rare in nature. They occur as morphs preserving either more *artemis*-like (*arthechippus* Scudder) or *astyanax*-like (*rubidus* Strecker) phenotypic characters. Each of these can be generally separated into two sub-

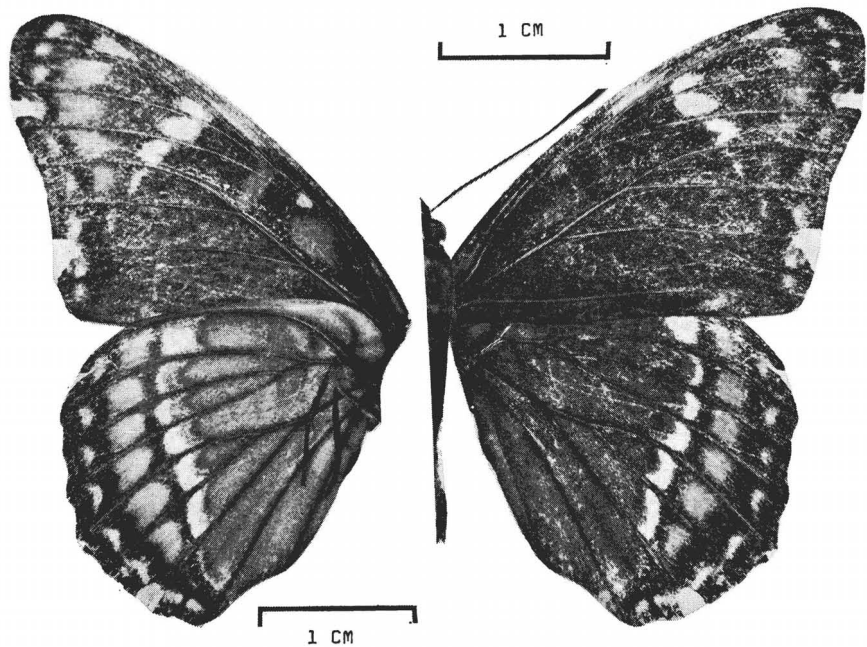


Fig. 1. *Limenitis f. arthechippus* from Stevens Point, Wisconsin. Right: right wings, dorsal; Left: right wings, ventral. Note that the photos are not exactly to same scale.

morphs, light and dark. These interspecific hybrids have been reviewed by Platt, Frearson & Graves (1970, *Can. Entomol.* 102: 513-533) and Platt & Greenfield (1971, *J. Lepid. Soc.* 25: 278-284).

An interspecific male hybrid of *Limenitis*, representing a ninth wild-caught Nearctic record of the hybrid morph *arthechippus* was captured by James M. Malick at Stevens Point (Portage County), Wisconsin, on 8 August 1961. It has been noted in a regional faunal study (Johnson & Malick 1972, *Reports on the Flora and Fauna of Wisconsin* 7: 1-6) and deposited in the Museum of Natural History, University of Wisconsin, Stevens Point. Unfortunately, the genitalia of the specimen were accidentally destroyed after examination. The purpose of this paper is to report and describe the specimen, and speculate about what type of cross it represents.

Platt & Brower (1968, *Evol.* 22: 699-718) and Platt, Frearson & Graves (op. cit.) have demonstrated that banded *L. a. arthemis* (Drury) and unbanded *L. a. astyanax* (Fabricius) are conspecific. Intergrades of this complex show continuous variation which may be divided into six categories. Categories 1 and 6 are the respective parental types; categories 3 and 4 are partially banded morphs referable to the form name *proserpina* Edwards; and categories 2 (banded) and 5 (unbanded) are more applicable to the name of each parent type. Genetic studies to date support the hypothesis that the white banding of *arthemis* is controlled by a major autosomal gene, the alleles of which display incomplete dominance (A. P. Platt, pers. comm.). Platt & Brower (op. cit.) have suggested that this complex exhibits primary, rather than secondary, intergradation, and that their populations in the "blend zones" are held in Hardy-Weinberg equilibrium by the neutralizing effects of selection favoring mimicry (*astyanax*) in southern regions and disruptive

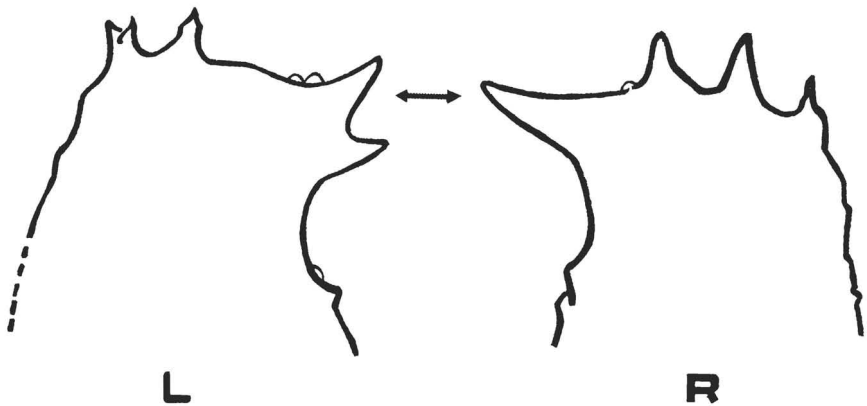


Fig. 2. Distal ends of the valvae, outer lateral view: L (left), R (right). The "hybrid" spines are indicated by the arrows.

coloration (*arthemis*) northward. The intergrade forms presumably survive through some selective advantage of partial banding within the region where these selective forces become reversed (A. P. Platt, pers. comm.).

Random sampling of the genus at the approximate latitude of $44^{\circ}32'$ in Portage and Clark counties in Wisconsin indicates a ratio of 0.79 banded (*arthemis*)/0.08 partially banded (*proserpina*)/0.13 unbanded (*astyanax*) for 24 specimens. This latitude is far enough north to expect the scarcity of the latter two morphs. A recent sampling of 100 specimens at Minneapolis, Minnesota (approx. latitude 45°) (Bergman & Masters 1971, Mid-Continent Lepid. Ser. 2(31): 1-11) reflects a respective ratio of 0.58/0.20/0.22 for the three forms. *L. archippus* is commonly represented in samples taken from the exact collecting locality of the Stevens Point hybrid.

The Stevens Point hybrid (Fig. 1) is unusual because its coloration seems most like that of a *proserpina* intergrade. This was the tentative identification given it by Dr. Platt (from color slides) after its discovery. Only the subsequent genitalic dissection confirmed that the specimen is referable to *arthechippus*. Interestingly, the coloration of the wings is very similar to a group of *proserpina* noted as "form (c)" in an early review by Field (1904, Psyche 11: 1-6). Such specimens of *proserpina* are large, brown in ground color, have narrow and irregular mesial bands, and show prominent red spots on the surface of the secondaries. The new Wisconsin hybrid is large (wing-span = 5.6 cm) and its most distinctive character is the extremely dark ground color of the wings, like that of *proserpina*. The mahogany coloring so characteristic of other interspecific hybrids is reduced.

Outline drawings of the distal ends of the valvae (Fig. 2) were traced from photos taken before the dissection was sent to Dr. Platt. He confirmed the dissection as *arthechippus*. Each valva clearly shows a distal downward pointing, blunted spine representing the intermediate condition between the short teeth of the *arthemis-astyanax* complex and the long downward curving and pointed spine characteristic of *archippus* (see Chermock 1950, Amer. Midl. Nat. 43: 513-569; Nakahara 1924, Bull. Brooklyn Entomol. Soc. 19: 166-180; and Platt, Frearson & Graves, op. cit., Fig. 3). This evidence confirms that the present specimen is an interspecific hybrid. The spine is bifurcate on the left valva, whereas, the right one is somewhat longer and narrower than that figured by Platt, Frearson & Graves (op. cit.). Further research on variability in the distal spines of these interspecific hybrids might link certain morphological characters with specific genotypes.

The Stevens Point specimen represents an aberrant morph, when compared to lab-reared or other wild-caught interspecific hybrids of *Limenitis*. The aberrant phenotypic characters of this specimen suggest that it might represent a case of natural hybridization between an intergrade of the *arthemis-astyanax* complex and *archippus*, or possibly the backcross of a male *arthechippus* to the *arthemis* parent (no females of *arthechippus* are known, presumably due to heterogametic inviability).

Two recent interspecific crosses of female *proserpina* intergrades with *archippus* males in the laboratory have produced a 1:1 ratio of *arthechippus* and *rubidus* siblings (A. P. Platt, pers. comm.). However, the above sampling ratios, and possibly the reduction of mahogany ground color in the wild hybrid, suggest that the latter speculation is more probable.

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EXTENDED RANGE DISTRIBUTION NOTES ON GEOMETRIDAE

Ten years of collecting moths in the Midwest has resulted in many interesting and unusual captures. Some of these species appear to be far out of their previously recorded ranges and these records may prove to be of interest to the researcher and collector alike. Among the most notable of these are *Itame abruptata* (Walker) a northern species previously known to occur in Canada and Northeast United States which was taken in Franklin Co., Missouri (5 and 7 June 1972), and in Washington Co., Missouri (6 June 1972) (several fresh specimens of both sexes); *Euchlaena irraria* (Barnes & McDunnough) another northern species before only known from Canada and as far south as Pennsylvania which was taken twice in Washington Co., Arkansas (27 May 1967 and 1972), and once in Franklin Co., Missouri (6 June 1972) (all fresh males); *Glena cribitaria* (Guenee) an eastern species with the nearest previous record from its type locality of Northern Illinois was taken several times in Carroll Co., Arkansas (May 1965), Washington Co., Arkansas (April 1967, May 1966-9 and June 1971), Benton Co., Missouri (May 1970), and Washington Co., Missouri (June 1973) (in fresh series of males and females); *Lyctrosis sinuosa* Rindge an eastern species with its nearest previous record from Oktibbeha Co., Mississippi was taken in Washington Co., Arkansas (4 June 1971, 27 May 1972) (fresh males), and Franklin and Washington Co., Missouri (5-7 June 1972) (in fresh series of males and females); *Chloroteryx tepperaria* (Hulst) a species of the Gulf States was taken in Washington Co., Arkansas (1 September 1968) (a single male), and 21 August 1971 (three fresh males); and *Heterophleps refusata* (Walker) a northern and eastern species previously taken as far south as Virginia was taken twice in Clay Co., Missouri (29 May 1968, 4 May 1972), and once in DeKalb Co., Missouri (21 June 1972) (all fresh males).

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