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REVISION OF THE *LIMENITIS WEIDEMEYERII* COMPLEX, WITH DESCRIPTION OF A NEW SUBSPECIES (NYMPHALIDAE).

STEPHEN F. PERKINS AND EDWIN M. PERKINS, JR.
Oregon Regional Primate Research Center, Beaverton, Oregon

INTRODUCTION

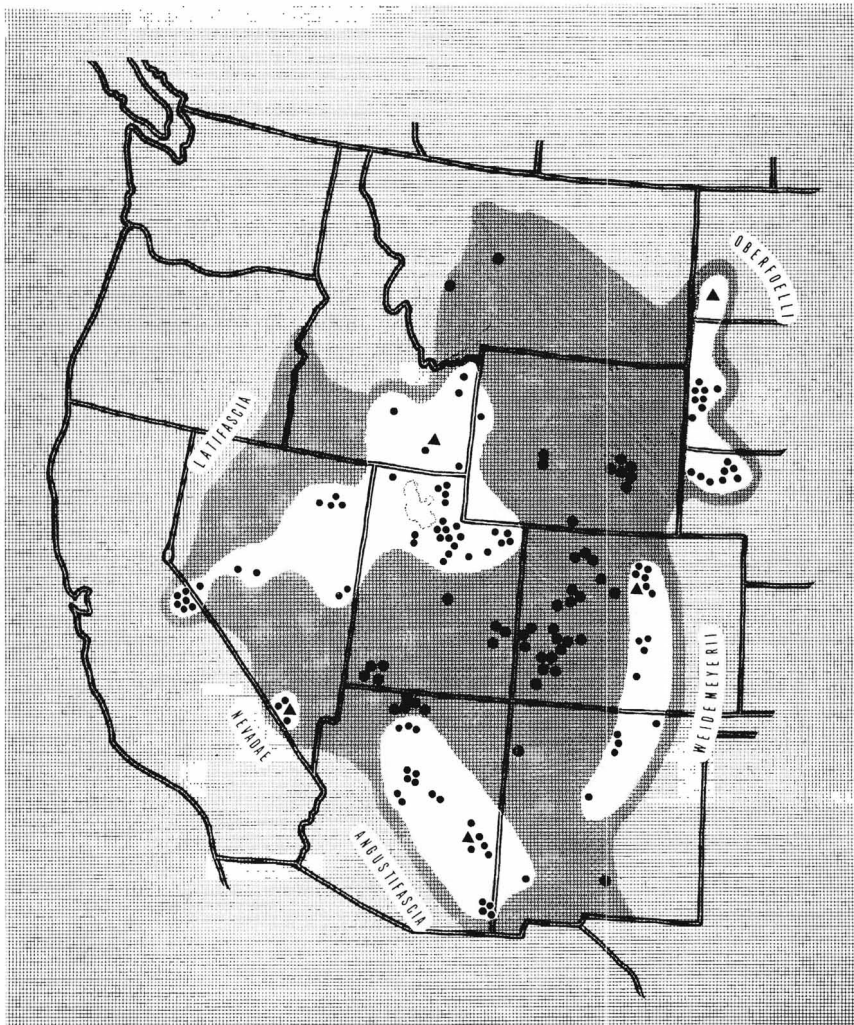
There is no single work which presents a comprehensive analysis of a given species group of the genus *Limenitis* Fabricius, 1807, in North America. Our present knowledge is largely dependent on R. L. Chermock's generic revision (1950). It seems peculiar that the scattered descriptions of specific and subspecific members of the North American *lorquini* complex of *Limenitis* were not presented as a unit until very recently (Perkins and Perkins, 1966). This second paper deals with the *Limenitis weidemeyeri* Edwards (1861) complex; historical background data, original descriptions, geographic ranges, and overt discrepancies are included.

Although the *weidemeyeri* complex inhabits nearly one-fifth the total area of the United States (Map 1), there is no evidence that components of the complex occur in either Canada or Mexico. In the United States *weidemeyeri* is established in Arizona, California, Colorado, Idaho, Montana, Nebraska, Nevada, New Mexico, North Dakota, South Dakota, Utah and Wyoming. In addition, stray individuals have been reported from Kansas (Field, 1938: 98) and Oregon (Fender, 1931: 185). The latter record, from the "foothills south of McMinnville," Yamhill County, probably was an import.

LIMENITIS WEIDEMEYERII WEIDEMEYERII Edwards (figs. 1-4)

Limenitis weidemeyeri Edwards, 1862, Proc. Acad. Nat. Sci. Phil. [13]: 162, ["1861"].

Brown (1964: 222) inadvertently reversed the dates of publication for *weidemeyeri* and *Cercyonis pegala wheeleri* (Edwards, 1873). dos



EXPLANATION OF MAP 1

Distribution of *Limenitis weidemeyerii*: triangles denote type localities of respective subspecies; white areas delineate distribution of typical races; heavily shaded areas represent regions of intergradation and possible range extension. All circles indicate locales from which specimens were examined by the authors.

Passos (1964: 75) cites the date of publication for *weidemeyerii* as "1861-3" (1861) and Brown (1964: 211) restricts it to 1861, after 30 September and before 28 December.

The following is Edwards' original description:

"Expands 2.6 inch. *Male*.—Upper side brownish-black, with a broad common white band a little beyond the middle, making an obtuse angle within on the primaries and tapering towards the abdominal margin of secondaries, divided into long spots by the nervules; posterior to this band on secondaries an obsolete row of fulvous spots; within the hind margin of both wings a series of small white spots, minute on secondaries; between these and the band on costal margin of primaries a short transverse row of four white spots, the second largest, the fourth minute; crenations white. Under side paler, with a common white band and four white spots on primaries as above; on secondaries a row of fulvous spots posterior to the band; a little within the hind margin of both wings a series of large lunules cut transversely and unequally by a crenated black line parallel to the margin; these lunules are bluish-white except towards apex of primaries, where the inner row is white; on primaries a narrow ferruginous band upon the discal arc, followed within the cell successively by blue atoms, a bluish-white band and a ferruginous band, both narrow, transversely and oblique; next the base blue atoms; costa ferruginous; on secondaries the broad abdominal margin is bluish-white; the entire space between the band and the base is striped transversely with white and bluish-white, divided into spots by the nervules, with ferruginous lines between the stripe; costa white; body above black; beneath white, with a black stripe along the side of abdomen; palpi and legs white; antennae and club brownish-black."

The type locality for *weidemeyerii* was simply designated: "Rocky Mountains. From the collection of Mr. J. W. Weidemeyer." Edwards (Butterflies of North America, Vol. I.) further elaborated on the range of *weidemeyerii* by stating: "Found in Colorado; common in the vicinity of Pikes Peak, according to Mr. Ridings, who collected in that region in 1864." Brown (1960: 2) suggested that Edwards' type was collected by Wood, and has suggested (in litt.) restricting the type locality to an area "on the Platte River above Denver or in the Denver area." Finding no evidence to the contrary, the authors choose to accept Brown's recommendation. Since the type specimen no longer exists, a neotype (figs. 1 and 2) will be officially designated by Brown in his continuing series of papers dealing with W. H. Edwards' types of Nymphalidae.

ABERRATION NIGERRIMA (Cockerell)

(Holotype, figs. 32 and 33)

Basilarchia weidemeyerii ab. *nigerrima* Cockerell, 1927, Bull. So. Calif. Acad. Sci., 26(1): 5.

The dorsal and ventral photographs of the holotype offer sufficient, superficial descriptiveness to preclude the necessity of quoting from the text of the original description.

The type locality of *nigerrima* is Boulder, (Boulder County) Colorado. Described as an aberration, *nigerrima* must be treated as an infrasubspecific entity [Article 45. (d) (iii), International Code of Zoological Nomenclature].

ABERRATION SINEFASCIA Edwards, new status

(Holotype, figs. 34 and 35).

Limenitis weidemeyerii aber. *sine-fascia*, Edwards, 1882, Papilio (New York Ent. Club). 2 (2): 22.

Original Description:

"This extraordinary example lacks the broad, common white band on both surfaces, also the white patch in cell of primaries; all the submarginal and apical spots are present as in the type [typical]."

Although Edwards originally described *sinefascia* as an aberration, it has been treated as a subspecies for over forty years. The authors disagree with this ambiguous placement for the following reasons. During the year in which Edwards described *sinefascia*, the only transcendent, nomenclatorial Code in existence in the United States was the Dall Code of 1877. Although not conclusive, it is reasonable to suggest that Edwards did abide by the Dall Code because (1) of his affiliation with its organization and (2) it was the only systematic, as well as uniform, presentation of nomenclatorial standards then in existence. Articles LXVI, #3 (p.48) and LXXIII, (p.52—"or other subdivisions of a species"—) of the Dall Code support the contention that Edwards' use of the word aberration was not abstract, but intentional.

Conflicting opinions regarding the status of *sinefascia* have recently been based on interpretation of Article 45. of the I.C.Z.N. An opposing school of thought suggests that although Edwards used the word aberration, it is not to be interpreted as an express statement of infrasubspecific rank and, therefore, the name is available according to Article 45. (e) of the code. Article 45. (e) (i) specifies terms "variety" and "form" along with the statement that before 1961, the use of either term should not "be interpreted as an express statement of either subspecific or infrasubspecific rank." The word aberration is not mentioned although it is intimated in Article 1 (I.C.Z.N.) where reference is made to "teratological specimens" and their exclusion from the rules of the Code.

A second entity from Arizona, *L. angustifascia* (B. & McD.), which is discussed below, was described in 1912. Twelve years later Barnes and Benjamin (1924: 99) raised *sinefascia* to the level of subspecies. They did not apply a concept to it which had developed subsequent to the time of Edwards, but rather applied the rules set forth in the International Administration of Zoological Nomenclature (adopted in Berlin in 1901 and introduced, in English, in the United States in 1905). This Code emphasized the law of priority (whether or not a name was representative of an aberration). Thus, Edwards' *sinefascia* should have appeared as *Limenitis weidemeyerii sinefascia* (Barnes & Benjamin).

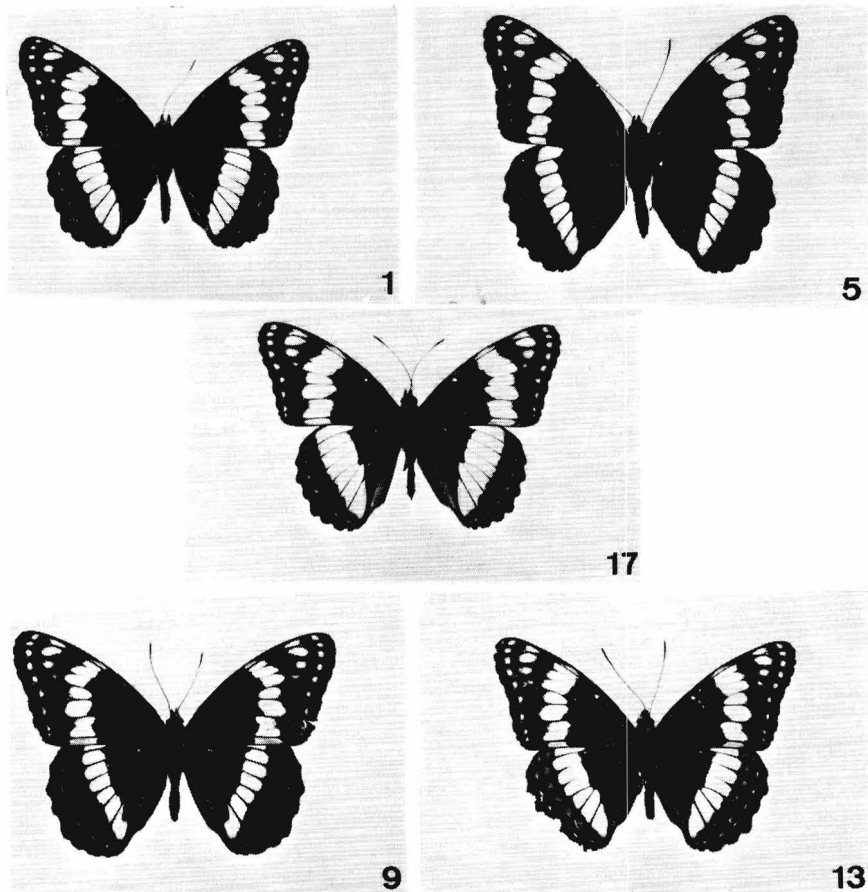
Having clarified the status of *sinefascia* (an aberration, both by the original description as well as by the superficial appearance of the holotype), it becomes evident that *angustifascia* represents the valid subspecies name of the narrow-banded race. Because Barnes and Benjamin raised *sinefascia* to a subspecific level, it now becomes necessary to reduce it to the original level of aberration thus enabling the name *angustifascia* to be given subspecific position. There are two methods by which this may be accomplished; (1) Article 23. of the I.C.Z.N. states: "The valid name of a taxon is the oldest available name applied to it. . . ." When Barnes and Benjamin raised *sinefascia* to a subspecific rank, *angustifascia* became the *oldest* available name by twelve years and (2) by reducing *sinefascia* to its originally described level of aberration (invoking Articles 45. (c), 45. (d) (iii) and 1. (I.C.Z.N.)), it would no longer be considered a part of the species group; thus, Articles 23. and 45. (e) (i) (I.C.Z.N.) would be irrelevant.

The first of these two methods is less acceptable because it would place *sinefascia* as a synonym of *angustifascia* (as much of an error as assigning a subspecific status to *sinefascia*). The second method permits *sinefascia* to be construed as an infrasubspecific entity, associated but not synonymous with *angustifascia*. Therefore, *sinefascia* is hereby returned to its original, infrasubspecific level of aberration, and *angustifascia* is resurrected to its originally described rank of subspecies.¹

The type locality of *sinefascia* is questionable. Edwards cited the "vicinity of Tucson, Arizona." However, current data supports Prescott, Arizona as the type locality: (1) Bauer (1954: 129-130) described a specimen which he had collected in the Verde Valley region of central Arizona in 1952 as being similar to Edwards' *sinefascia*; (2) the locality label accompanying the holotype of *sinefascia* states: "Prescott, Arizona."; (3) Jacob Doll, who collected the holotype, was in the vicinity of Prescott in 1881; (4) another species from the same Doll lot (*Agathymus neumoenigeni* (Edwards), 1882), was given the type locality—"southern Arizona." Freeman (1963: 139) corrected this locality designation to "approx. 9 mi. S. Prescott, Ariz." and (5) the known range of the Arizona subspecies of *weidemeyerii* does not encompass the vicinity of Tucson (including the Santa Catalina Mts., N.E. of Tucson).

Until conclusive evidence is uncovered, the type locality for *sinefascia* will have to remain questionable. The authors suggest that Prescott be given due consideration, however.

¹ Without the able assistance of N. D. Riley, and M. Doyle (on behalf of W. E. China) of the International Commission on Zoological Nomenclature, questions relative to the status and priority of *sinefascia* vs. *angustifascia* might still be unresolved.



EXPLANATION OF PLATE I

Dorsal adult ♂♂ of *Limenitis weidemeyerii* complex: 1) *weidemeyerii* Edwards (neotype), Lakewood, Jefferson Co., Colo., 11-VI-61; 5) *angustifascia* (B. & McD.) (topotype), Greer, White Mts., Apache Co., Ariz., 10-VII-53; 9) *nevadae* (B. & Benj.) (topotype), Kyle Canyon, Mt. Charleston, Clark Co., Nevada, 7-VI-62; 13) *oberfoelli* Brown, Lead, Lawrence Co., S.D., 24-VII-58; 17) *latifascia* Perk. & Perk. (holotype), 10 mi. S. Pocatello, Bannock Co., Idaho, 24-VI-41.

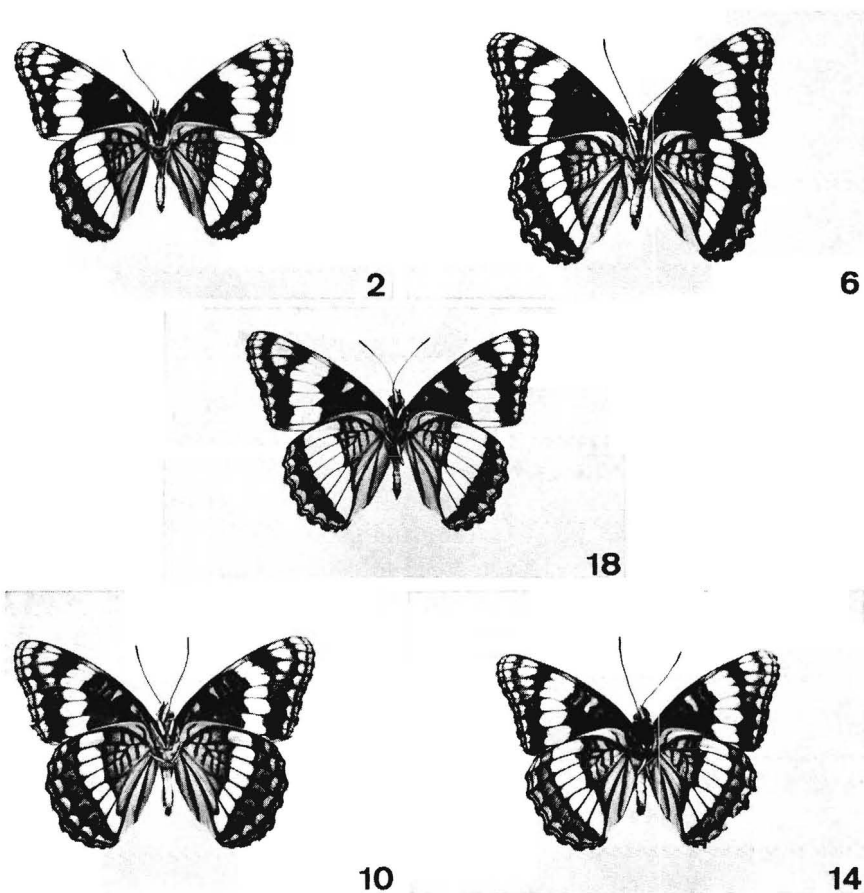
LIMENITIS WEIDEMEYERII ANGSTIFASCIA (Barnes and McDunnough)

(figs. 5-8; Holotype, figs. 36 and 37)

Basilarchia weidemeyerii angustifascia Barnes and McDunnough, 1912, Canadian Ent. 44(5): 163.

The following is quoted from the original description:

"A series of 2 ♂♂ and 5 ♀♀, collected last summer in the White Mts., Arizona, differs from the typical form from Colorado and Utah, as depicted by Edwards



EXPLANATION OF PLATE II

Ventral Adult ♂♂ of *Limenitis weidemeyerii* complex, same specimens as in plate 1: 2) *weidemeyerii*; 6) *angustifascia*; 10) *nevadae*; 14) *oberfoelli*; 18) *latifascia*.

(Vol. 1, pl. 42), in that the median white band is much reduced in width, and the intersecting veins, especially on the primaries, are more broadly black. This difference is most noticeable in the ♀s, the band on the primaries being distinctly broken up into an irregular row of white semiquadrate spots, of which the third from the costa is greatly reduced in size; on the secondaries the spots are *not* broader than long. As this feature is remarkably constant in all the specimens before us, and as, furthermore, we have had for years a ♀ labelled Arizona in the collection which shows the same peculiarities, we consider a varietal name for the Arizona form warranted; the extreme form of this race, in which the white band has entirely disappeared, is the ab. *sinefascia* Edw., also from Arizona. The males are normal in size, having a wing expanse of 2½ in. (63 mm.); the females are

somewhat larger than usual, all our specimens measuring 3 in. (76 mm.) The types are in coll. Barnes."

The type locality is cited "White Mts., Arizona." We further restrict this to: White Mountains, southeast of McNary, Apache County, Arizona. Specimens examined from various populations within this area (extending through the Blue Range in Greenlee County) compare favorably to the original description.

As was previously concluded, *angustifascia* (not *sinefascia*) represents the subspecific name for the southern, narrow-banded populations of *weidemeyerii*, exclusive of Nevada. Typical *angustifascia* is contained within a relatively small area (Map 1). In blend-zones such as Jacob Lake, Coconino County, Arizona, specimens of *angustifascia* may be phenotypically expressive of more than one race; e.g., the ventral ground color is often lighter and the dorsal, postmedian–median row of white spots is perceptibly wider.

Exploration of that region of northern Mexico, contiguous to southeastern Arizona, could be rewarding inasmuch as one peculiarity was noted, common to material from the Chiricahua Mountains of Cochise County; moderate, distinctive, ferruginous to red-brown scaling was conspicuous on the ventral primaries and secondaries of all specimens examined.

LIMENITIS WEIDEMEYERII NEVADAE (Barnes and Benjamin)

(figs. 9–12; Holotype, figs. 38 and 39)

Basilarchia weidemeyerii race *nevadae* Barnes and Benjamin, 1924, Contrib. Nat. Hist. Lepid. N. Amer., 5(3): 99.

Barnes and Benjamin described *nevadae* as follows:

"Not conspicuously different from some narrow banded specimens of *weidemeyerii* on the upper side, but quite uniformly narrow banded, practically as in the normal form, *angustifascia* [sic!], of the Aroniza [sic!] race *sinefascia*. The underside is conspicuously different from the described races, the normal red and orange-red markings being replaced by dull brown, those of the primaries being obsolete and almost lost in the blackish ground."

The holotype was collected in "Clark Co., Nevada." However, the type locality is herein restricted to the Spring Mountain Range of Clark County, Nevada; specimens from this area are the only ones in the western United States which are consistent with the original description.

It appears that the Mt. Charleston and other Spring Mountain Range material represents either a western extension of the Arizona subspecies *angustifascia* or a distinct isolate worthy of subspecific nomen. Geographic isolation, suppression of ventral, red-orange maculation, and the presence of a bluish scaling on the medial half of the ventral secondaries

(unique to Spring Mountain Range material) lend support to the latter and the authors recommend that *nevadae* be accordingly treated as a subspecies.

Struck by the marked difference between Mt. Charleston specimens (*nevadae*) and those taken in the vicinity of Mono Lake, Mono County, California (formerly referred to as *nevadae*), the authors sought to elucidate this apparent discrepancy in terminology.

The examination of numerous specimens from the Great Basin of east-central California, Nevada, northwestern Utah, and southeastern Idaho; the Colorado Basin of northwestern Utah, and southwestern Wyoming; and the Pacific Northwest Basin of southeastern Idaho and west-central Wyoming disclosed that all shared characteristics possessed neither by *nevadae* nor by the other recognized races of *weidemeyerii* (Table I).

***Limenitis weidemeyerii latifascia* Perkins and Perkins, new subspecies**
(figs. 17-20)

Males: Dorsal LFW (Expanse: 34.65 ± 1.39 mm.), holotype 34.95 mm.

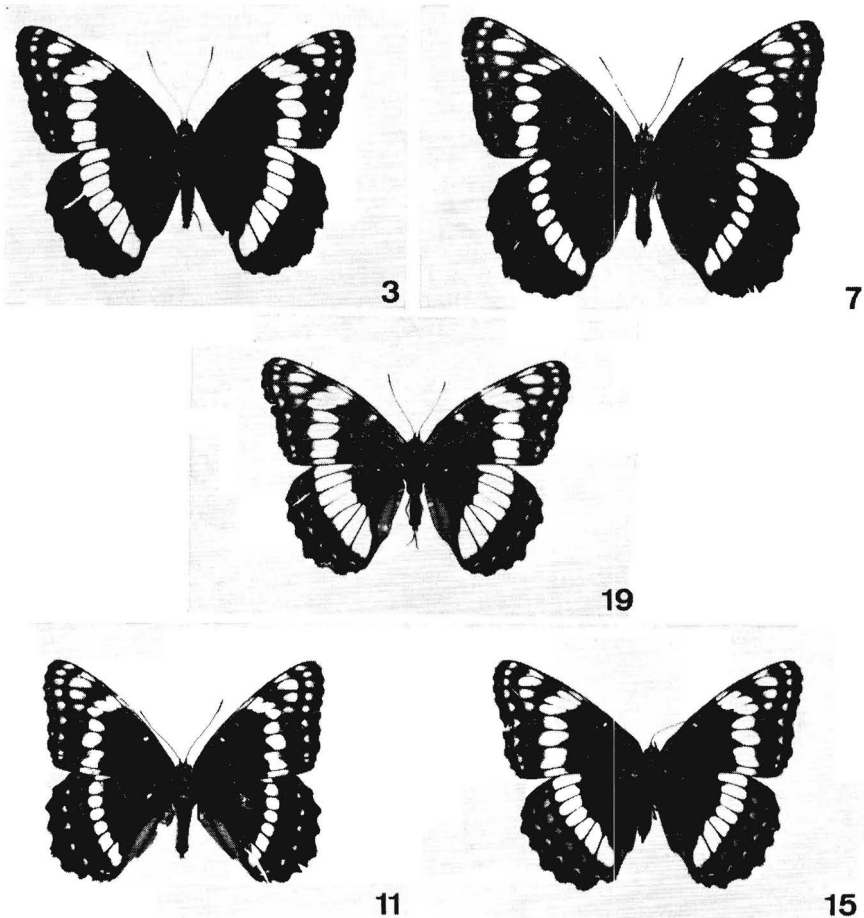
Females: Dorsal LFW (Expanse: 39.18 ± 3.04 mm.), allotype 37.45 mm.

Differs from all other *weidemeyerii* subspecies by possessing overt, wide, post-median-median white bands on primaries and secondaries. Measurements of cell Cu, along vein Cu, on ventral RHW of 42 specimens indicate that ♂♂ have a value of 7.85 ± 1.06 mm. and ♀♀ have a value of 7.48 ± 2.15 mm. Ventral ground color least dark (white scaling extensive) compared to other *weidemeyerii* races. Submarginal lunules on ventral hindwings bluish-white. . . . seldom blue, blue-green or blue-violet. Males and females similar in appearance.

Holotype male: Idaho, 10 mi. S. Pocatello, Mink Creek, Bannock Range, Bannock Co., 24 June 41 (J. Manning), and Allotype, female, same locality, 19-VI-41 (J. Manning); placed in the collection of the American Museum of Natural History, New York City, New York.

Paratypes (27): IDAHO: Bannock Co., 10 mi. S. Pocatello, Mink Creek, Bannock Range, 13-VI-41, 16-VI-41, 17-VI-41, 19-VI-41 and 24-VI-41, 14 ♂♂, 3 ♀♀ (J. Manning); Fremont Co., Ashton, 14-VII-59, 1 ♂ (collector unknown). UTAH: Cache Co., Logan Canyon, northeast Logan, 1-VIII-64, 3 ♂♂ (J. Pease), Logan, VII-55, 1 ♂ (collector unknown); Summit Co., City Creek Canyon, 23-VII-01, 1 ♀ (collector unknown—LACM coll. figs. 29-30); Utah Co., Payson Canyon, 20-VII-65, 2 ♂♂ (J. A. Justice), 6-VII-34, 2 ♂♂ (L. M. Martin—LACM coll.). Six ♂♂ have been deposited with the holotype and allotype; 7 ♂♂ and 1 ♀ have been deposited in the collection of the Los Angeles County Museum; 2 ♂♂ and 1 ♀ have been placed in both the California Academy of Sciences, San Francisco, California and the Smithsonian Institute of the United States National Museum, Washington, D. C. 2 ♂♂ have been deposited in the collection of F. M. Brown, Colorado Springs, Colorado and 4 ♂♂ and 1 ♀ have been retained by the authors.

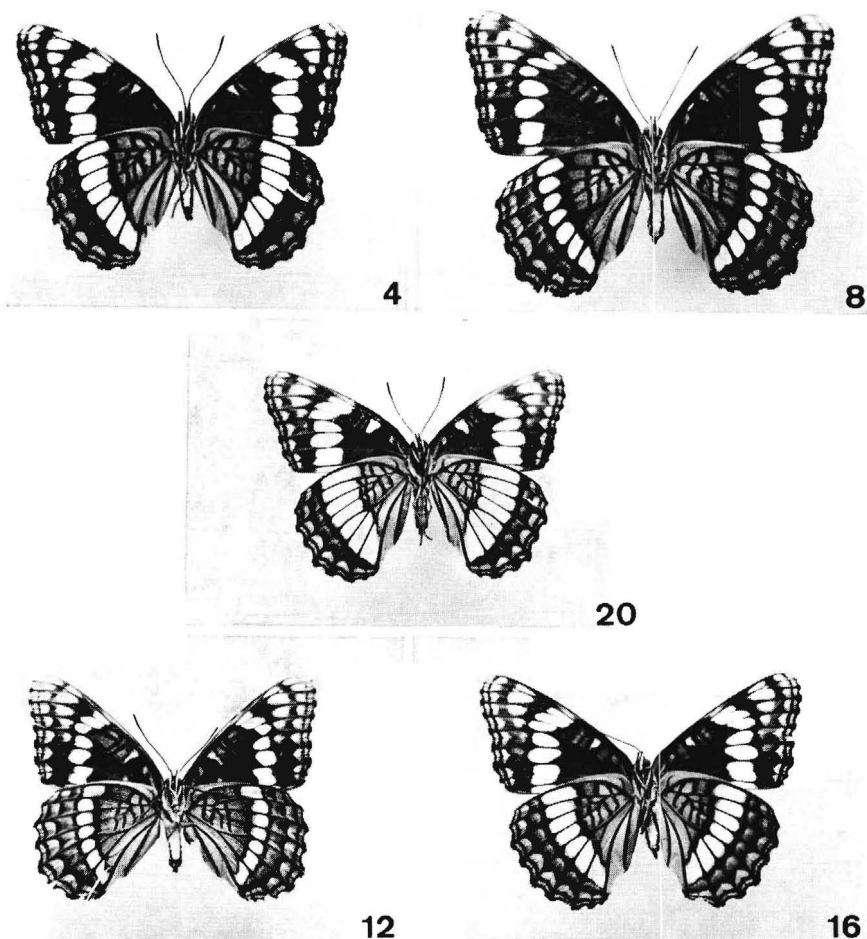
It should be noted that *latifascia* is encountered in southern Idaho, northern Utah, western Colorado, western Wyoming, northern Nevada,



EXPLANATION OF PLATE III

Dorsal adult ♀♀ of *Limenitis weidemeyerii* complex: 3) *weidemeyerii* Edwards, Florissant, Teller Co., Colo., 6-VIII-65; 7) *angustifascia* (B. & McD.) Oak Creek Canyon, Coconino Co., Ariz., 16-VI-58; 11) *nevadae* (B. & Benj.) (topotype), Mountain Springs Pass, Clark Co., Nevada, 30-VI-63; 15) *oberfoelli* Brown, nr. Harrison, Sioux Co., Nebraska, 26-VI-62; 19) *latifascia* Perk. & Perk. (allotype), S. Pocatello, Bannock Co., Idaho, 19-VI-41.

and east-central California. In western Colorado, one may take specimens which resemble *w. weidemeyerii*, *w. latifascia*, or in the southwest portion of the state, *w. angustifascia*; however, the majority of specimens examined are closest in appearance to *w. latifascia* and not nominotypic *w. weidemeyerii*.



EXPLANATION OF PLATE IV

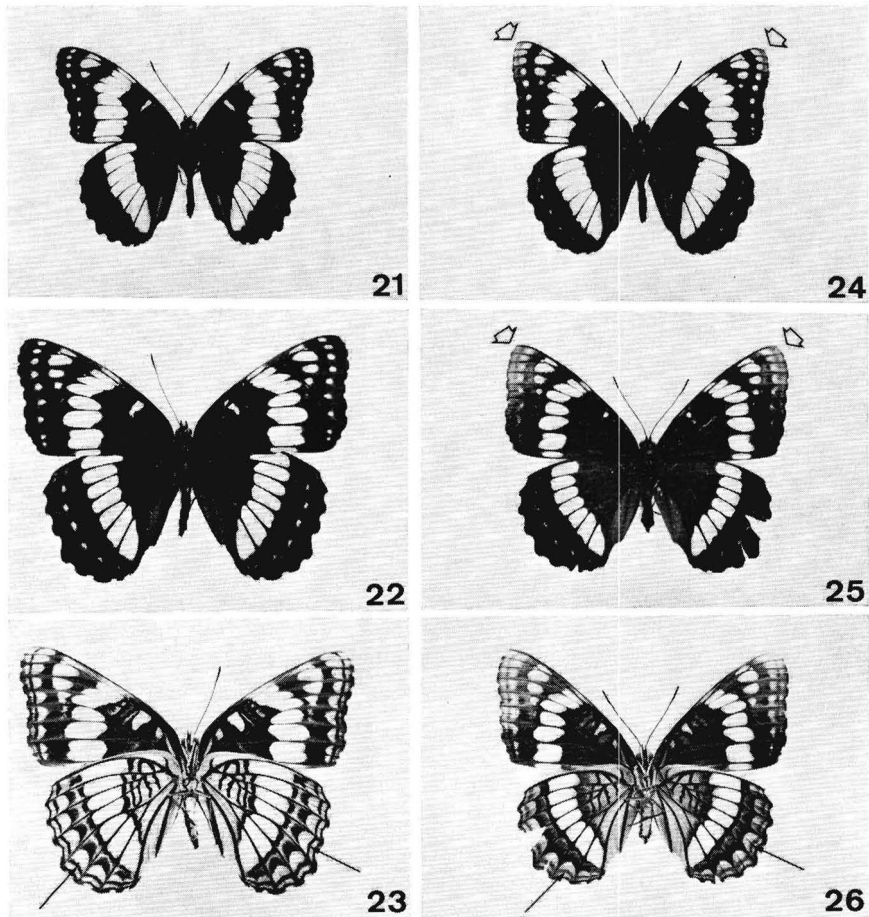
Ventral adult ♀♀ of *Limenitis weidemeyerii* complex, same specimens as in plate III: 4) *weidemeyerii*; 8) *angustifascia*; 12) *nevadae*; 16) *oberfoelli*; 20) *latifascia*.

HYBRID FRIDAYI (Gunder)
(figs. 24-26)

Basilarchia lorquini form *fridayi* Gunder, 1932, *Canad. Ent.*, 64(12): 284.

The type locality of *fridayi* is "Leevening Creek [spelled Leevining Creek], near Mono Lake, Mono County, Calif." The holotype was not illustrated.

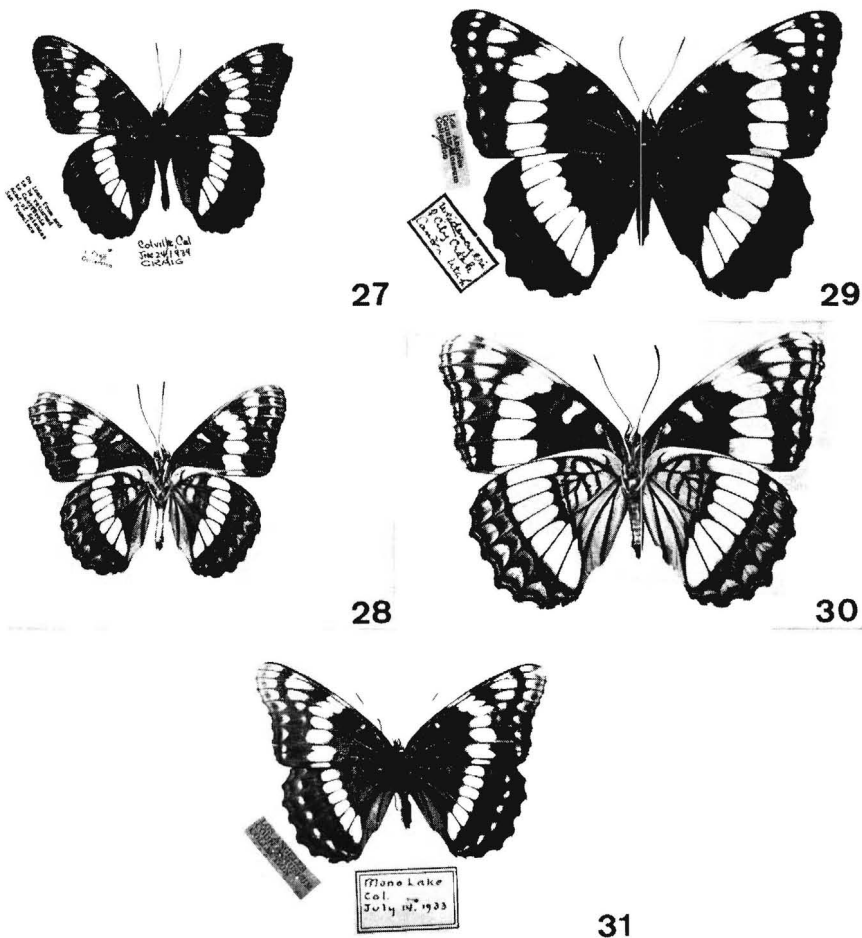
In discussing *fridayi*, Garth and Tilden (1963: 33) stated: "The



EXPLANATION OF PLATE V

Comparison of Mono Lake entities in *Limenitis*: 21) dorsal ♂ *latifascia*, Mono Lake, Mono Co., Calif., 20-VII-58; 22) dorsal ♀ *latifascia*, Mono Lake, Mono Co., Calif., 19-VII-58; 23) same, ventral aspect; 24) dorsal ♂ *fridayi* (topotype), Mono Lake, Mono Co., Calif., 16-VII-58; 25) dorsal ♀ *fridayi* (topotype), Mono Lake, Mono Co., Calif., 17-VII-58; 26) same, ventral aspect.

Nevada Admiral *nevadae* is a Great Basin race of the Rocky Mountain Weidemeyer's Admiral, *Limenitis* (L.) *weidemeyerii* (Edw.), found at Mono Lake on the eastern side of the Sierra Nevada. At Lee Vining, where its range overlaps that of the following species, *L. (L.) lorquini* Bdv., the hybrid *L. (L.) fridayi* (Gund.) occurs. Since the blend is an even one, in which the characteristics of neither species predominate,

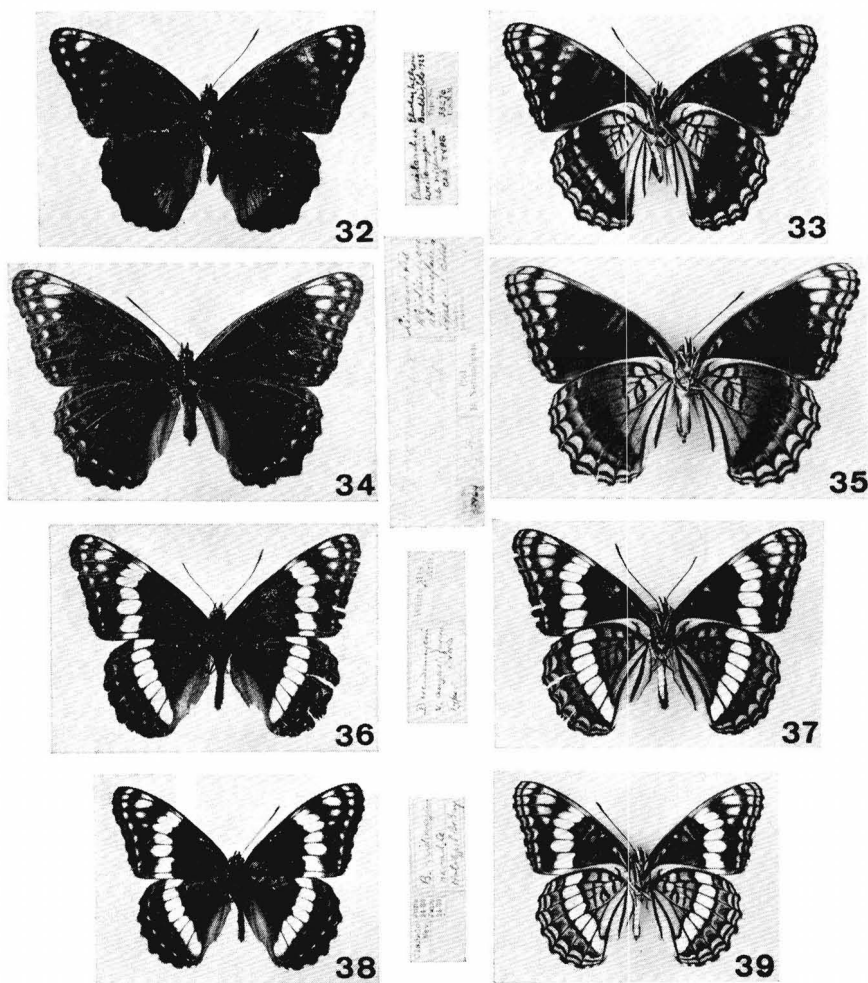


EXPLANATION OF PLATE VI

Limenitis species: 27) dorsal ♂ *lorquini*, Coleville, Mono Co., Calif., 24-VI-34; 28) same, ventral aspect; 29) dorsal ♀ *latifascia* (paratype), City Creek Canyon, Summit Co., Utah, 23-VII-01; 30) same, ventral aspect; 31) dorsal ♀ *fridayi* (topotype), Mono Lake, Mono Co., Calif., 14-VII-33.

we would prefer to indicate it as *L. w. nevadae* × *L. lorquini*, rather than as a form of the above." The present authors support this treatment of *fridayi* as a hybrid (as did also McDunnough, 1938: 22; Martin and Truxal, 1955: 19; and dos Passos, 1964: 75).

In appearance, *fridayi* generally exhibits a prominent, white sub-marginal ocellation, dorsally (similar to the Mono Lake *latifascia*, fig.



EXPLANATION OF PLATE VII

Type specimens (in *Limnitis weidemeyerii* complex): 32) dorsal ♂ *nigerrima* (type), Boulder, Colo., 1925; 33) same, ventral aspect; 34) dorsal ♀ *sinefascia* (type), Prescott, Arizona, no date; 35) same, ventral aspect; 36) dorsal ♂ *angustifascia* (holotype), White Mts., Arizona, no date; 37) same, ventral aspect; 38) dorsal ♂ *nevadae* (holotype), Clark Co., Nevada, 24-30 June; 39) same, ventral aspect.

22); this spotting often extends into the secondaries (fig. 31). Although only a means of defining an arbitrary section of a continuum, all *fridayi* specimens examined (including those in which the orange of the apices was lacking) possessed *one* distinction by which they could be readily

separated from *weidemeyeri latifascia*. Figure 26 (arrows) illustrates this distinction. It will be observed that the area medial to the submarginal lunules is lighter in appearance than the comparable area in figure 23. This lighter maculation is due to an orange replacement of black—a characteristic consistently noted in *fridayi* and found to be lacking in the Mono Lake *latifascia*.

Examples of *fridayi* are most commonly encountered within a 15 mile radius of Mono Lake; in this area *latifascia* and *fridayi* predominate—*lorquini* is rare.

The Mono Basin offers a fertile area for hybridization study; and, examples such as the *lorquini* specimen with the melanic apices (figs. 27–28), from Coleville, Mono County, California, only serve to add to the enigma of this region.

LIMENITIS WEIDEMEYERII OBERFOELLI BROWN

(figs. 13–16)

Limenitis weidemeyeri oberfoelli Brown, 1960, Amer. Mus. Novitates, 2018: 1–6.

F. Martin Brown (1960) described *oberfoelli* in order to make the name available for the faunal work by Puckering and Post (1960). However, dos Passos (1964) credits *oberfoelli* to “Puckering & Post, 1960” on the basis of priority. In their publication Puckering and Post attempt to credit the authorship of *oberfoelli* to Brown.

In following the International Code of Zoological Nomenclature, five Articles [numbers 13, 45 (b), 50, 72 (a), and 72 (b)], two Recommendations (numbers 73A and 73C) and four General Recommendations (numbers 1, 7, 17, and 23) are applicable to this problem. Brown's original description complies with all eleven Articles and Recommendations; Puckering and Post's publication violates all but Article 50. Of special interest are Article 45 (b), Recommendation 73A, and General Recommendation (Appendix E) 23; Brown complies with each of these, Puckering and Post comply with none. Furthermore, Article 50 automatically gives authorship to Brown since Puckering and Post consistently credit *oberfoelli* to and associate the name with F. Martin Brown. Therefore, Brown should be credited with the authorship of *oberfoelli*.

From Brown's original description, four of the primary distinctions (in comparison to typical *weidemeyeri*) are herein quoted:

(1)—dorsal primaries—“On the upper side of the forewing the submarginal row of white lunules tends to be more prominent on *oberfoelli* than on *weidemeyeri*.”

(2)—dorsal secondaries—“On seven of the nine North Dakota specimens before me, there is a well-developed row of reddish spots between the white submarginal lunules and the white band across the disc. None of the Colorado males before me presents these so boldly as does the average northern specimen.”

TABLE I. COMPARISON OF THE FIVE RACES OF *Limenitis weidemeyerii*¹

Race	<i>weidemeyerii</i>	<i>oberfoelli</i>	<i>angustifascia</i>	<i>nevadae</i>	<i>latifascia</i>
Number of typical specimens examined	21 ♂ ♂ 8 ♀ ♀	24 ♂ ♂ 7 ♀ ♀	60 ♂ ♂ 12 ♀ ♀	11 ♂ ♂ 5 ♀ ♀	35 ♂ ♂ 7 ♀ ♀
Geographic range	Rocky Mts. (east slope) Colo. & N.M.	N.D., S.D. & Nebraska	Arizona, S. Utah, W. New Mexico & S.W. Colorado	Spring Mts. of Nevada only	Idaho, N. Utah, N. Nevada, W. Wyo., W. Colo. & E. Cent. Calif.
♂ LFW radius (mm.)	33.96 ± 1.21	33.28 ± 2.43	36.35 ± 1.69	36.80 ± 3.35	34.65 ± 1.39
♀ LFW radius (mm.)	40.62 ± 6.89	38.84 ± 2.39	42.89 ± 4.25	37.80 ± 3.77	39.18 ± 3.04
♂ 99% limits med-postmed. white band (mm.) ²	6.28 ± 0.80	6.43 ± 1.70	4.74 ± 0.88	4.65 ± 0.80	7.85 ± 1.06
♀ 99% limits med-postmed. white band (mm.) ²	6.17 ± 2.01	6.16 ± 1.86	4.07 ± 1.73	3.65 ± 0.67	7.48 ± 2.15
Percent of individuals with orange spotting	24%	57%	18%	5%	34%
Percent of individuals with white in cell	77%	82%	33%	57%	92%
Darkness of ventral ground color	+++	++	+++++	++++	+
Ventral orange markings	Red-orange	Bright	Deep maroon	Blue scales	Lt. to dark
VHW submarginal lunules	Lt. blue	Lt. blue	Dark blue-green	Lt. blue-violet	Lt. blue-gray

¹ Based on the examination of 190 typical specimens (not including material from zones of intergradation).² Through statistical analysis (following Brown, 1951: pp. 43-45) it was determined that the width of the white postmedian-median band does not vary in proportion to the overall size of the specimens' wings. Thus the width of this band may be used as a suitable differentiate among the subspecies of the *L. weidemeyerii* complex.

(3)—ventral primaries—"The red transverse marks within the cell of *oberfoelli* tend to be larger and redder and are more prominent than those of *weidemeyeri*."

(4)—ventral secondaries—"The light markings of *oberfoelli* are broader and brighter than those of *weidemeyeri*, and the submarginal red is less suffused with dark scales . . . on the whole the underside of the hind wings of *oberfoelli* is the lighter and more delicately marked of the two."

The holotype and allotype are figured. The type locality is cited: "Badlands, Slope County, North Dakota."

The range of *oberfoelli* extends from the Slope County badlands of western North Dakota, south through the Black Hills of western South Dakota and the Pine Ridge region of northwestern Nebraska. The present authors were unable to acquire specimens from the eastern limits of Montana and northeastern Wyoming. However, this does not preclude the possibility that *oberfoelli* occurs in these areas.

In view of the preceding presentation, the authors recommend that the following, revised nomenclatorial treatment of the *weidemeyeri* complex be utilized:

- w. weidemeyeri* Edwards, "1861-2" (1861)
- w. weidemeyeri* Edwards, "1861-2" (1861)
 - ab. *nigerrima* (Cockerell), 1927
- w. angustifascia* (Barnes & McDunnough), 1912
 - ab. *sinefascia* Edwards, 1882
- w. nevadae* (Barnes & Benjamin), 1924
- w. oberfoelli* Brown, 1960
- w. latifascia* Perkins & Perkins, 1967
 - hybrid *fridayi* (Gunder), 1932 (in part)

The following records represent the 529 examples of *Limenitis weidemeyeri* examined by the authors during the course of this study (collectors are listed alphabetically at the conclusion):

ARIZONA

APACHE Co.: White Mts., S.E. McNary, 23-VI-58, (D.D.); Greer, White Mts., 10-VII-53, (C.W.K.—LACM coll.); COCHISE Co.: Onion Saddle, Chiricahua Mts., 19-VI-60, (K.R.); Turkey Creek, Chiricahua Mts., 2-VII-65, (A.M.S.); Fly Park, Chiricahua Mts., 29-VI-65, 3-VII-65, (A.M.S.); Chiricahua Mts., 23-VI-08, 15-VI-16, (V.W.O.—LACM coll.); Paradise, (?), (J.A.C.—LACM coll.); COCONINO Co.: Oak Creek Canyon, 13 mi. N. Sedona, 4-VI-63, 15-VI-63, (F.T.T.); Cave Springs Camp, Oak Creek Canyon, 9-VIII-60, (D.D.); Oak Creek Canyon, 19-VI-56, 22-VIII-57, 16-VI-58, 8-VIII-60, (D.D.); 9-VI-63, 11-VI-63, (A.O.S.), 20-VI-55, (C.W.K.—LACM coll.); near Jacob Lake, Kaibab Forest, 10-VII-64, (K.B.T.); 6.8 mi. W. Jacob Lake, 3-VII-65, (T.C.E.); 9.9 mi. N. Jacob Lake, 5-VII-65, (T.C.E.); 11.2 mi. N. Jacob Lake, 23-VIII-64, (T.C.E.); Kanabownits, Grand Canyon National Park, 4/5-VII-47, (?—LACM coll.); Neal Springs, N. Rim Grand Canyon National Park, 22-VIII-64, (T.C.E.); 8 mi. N. Indian Gardens, Oak Creek Canyon, 9-VI-63, (K.R.); Roaring Springs, N. Rim Grand Canyon National Park, 22-VIII-64, (T.C.E.);

N. rim Grand Canyon National Park, 13-VII-36, (C.N.R.—LACM coll.); 13/14-VII-36, (D.M.—LACM coll.); GILA Co.: Christopher Creek, Mogollon Rim, 17-VI-57, (L.M.M., J.A.C., W.A.R.—LACM coll.); Tonto Creek State Fish Hatchery, Mogollon Rim, 25-VI-56, 21-VI-57, (L.M.M., J.A.C., W.A.R.—LACM coll.); Kohl's Ranch, Mogollon Rim, 23-VI-57, (L.M.M., J.A.C., W.A.R.—LACM coll.); GREENLEE Co.: Hannagan, 13-VII-52, (?); Hannagan Meadows, 2-VII-64, 3-VII-64, 4-VII-64, 5-VII-64, (R.F.S.), 1/3-VII-37, (D.M.—LACM coll.); Strayhorse Camp, 28/30-VI-37, (D.M.—LACM coll.); YAVAPAI Co.: 2 mi. S. W. Jerome, 8-VI-63, (A.O.S.), 17-VI-58, (D.D.); 2 mi. W. Jerome, 29-V-63, 14-VI-63, 23-VI-63, (F.T.T.).

CALIFORNIA

MONO Co.: Cottonwood Canyon, S. Bodie, 10-VII-64, 24-VII-65, (A.O.S.); N.W. corner Mono Lake, 6/7-VII-58, 16/17-VII-58, 20-VII-58, 30-VI-58, 24-VII-59, 26-VI-61, (A.O.S.); .75 mi. S. Mono Inn, Mono Lake, 24-VII-65, (A.O.S.); .5 mi. N.E. Mono Inn, Mono Lake, 1-VIII-65, 5-VIII-65, 19-VIII-65, (A.O.S.); Mono Lake, 11-VII-33, 19-VII-33, (C.B.—LACM coll.), 6-VII-35, 9-VII-35, 10-VII-35, 11-VII-35, 19-VII-35, 8-VII-36, 10-VII-36, (L.M.M.—LACM coll.), 4-VII-33, 14/15-VII-33, 25-VII-33, (?—LACM coll.); Bridgeport, 14-VII-37, (?—LACM coll.); Mono Basin, (?), (C.M.D.—LACM coll.); 9 mi. N. Lee Vining, 20-VIII-62, (M.R.L.—CAS coll.); 10 mi. N. Lee Vining, 6-VIII-61, (C.D.M., D.C.R., M.R.L.—CAS coll.), 9-VIII-61, (D.C.R., M.R.L.—CAS coll.); Lee Vining, 4-VII-61, (P.A.O.—CAS coll.).

COLORADO

ALAMOSA Co.: Great Sand Dunes National Monument, 25-VII-63, (T.C.E.); BOULDER Co.: Gregory Canyon, 9-VI-64, (J.A.J.); Stapps Lake, 29-VII-02, (H.C.—LACM coll.); DELTA Co.: 9 mi. W. Crawford, 14-VII-63, (T.C.E.); Lerorex Creek Road, 21-VI-65, (T.C.E.); EAGLE Co.: Gores Range, 5-VIII-02, 6-VIII-02, (J. & H.C.—LACM coll.); EL PASO Co.: Rocks Creek, 23-VI-62, (S.E.); FREMONT Co.: Oak Creek, 3-VII-32, (?—LACM coll.); GARFIELD Co.: 2.5 mi. E. Glenwood Springs, 20-VII-63, 24-VII-64, 13-VII-65, (T.C.E.); Roan Plateau, near Baxter Lake, 12-VII-62, (K.B.T.); Glenwood Canyon, 15-VI-62, (J.S.); Glenwood Springs, 11-VII-20, (R.A.L.—LACM coll.); GRAND Co.: 0.6 mi. S.E. Muddy Pass, 10-VII-63, (T.C.E.); Sulphur Springs, 10-VII-1898 (?—LACM coll.), 3-VIII-02, (J. & H.C.—LACM coll.); GUNNISON Co.: Erickson Springs Campground, 5 mi. E. Somerset, 15-VII-65, 22-VIII-65, (T.C.E.); Coal Creek, 20-VI-65, (T.C.E.), 23-VI-64, (S.E.); Gold Creek Canyon, Gunnison National Forest, 25-VII-63, (W.H.H.); JEFFERSON Co.: Lakewood, 11-VI-61, 10-VI-62, 12-VI-62, 24-V-63, 14-VI-63, 15-VI-64, (J.S.); LARIMER Co.: Pingree Park, 16-VIII-33, (F.M. & H.H.B.—LACM coll.); Rocky Mountain National Park, 4-VII-31, 12-VII-31, 14-VII-31, 15-VII-31, 24-VII-31, (?—LACM coll.); MESA Co.: Pinon Mesa, 2-VII-63, (T.C.E.); 10 mi. E. Gateway, 4-IX-65, (T.C.E.); MONTEZUMA Co.: Mesa Verde, 18-VI-56, (K.P.—LACM coll.); MONTROSE Co.: near Buckeye Reservoir, 21-VI-64, (S.E.); N. rim Black Canyon of the Gunnison National Monument, 25-VII-64, (T.C.E.); Uncompahgre Plateau, 11-VII-62, (K.B.T.); OURAY Co.: Sexter Creek, 25-VIII-65, (T.C.E.); ROUTT Co.: Rabbit Ears Pass, 17-VII-65, 7-VIII-64, (J.A.J.), 11-VII-62, (J.S.), 21-VII-59, (A.O.S.); 3.2 mi. W. Rabbit Ears Pass, 11-VII-63, (T.C.E.); SAN MIGUEL Co.: Telluride, 16-VII-?, (C.W.H.—LACM coll.); TELLER Co.: Big Springs Ranch, Florissant, 3-VIII-65, 6-VIII-65, (T.C.E.).

IDAHO

BANNOCK Co.: 10 mi. S. Pocatello, 13-VI-41, 16-VI-41, 19-VI-41, 22-VI-41, 24-VI-41, 10-VII-41, (J.M.); BEAR LAKE Co.: Bloomington, 15-VII-50, 13-VIII-50, (R.H.P.—USU coll.); BUTTE Co.: 1 mi. W. Craters of the Moon National Monument, 8-VIII-65, (E.M.P.); FREMONT Co.: Ashton, 14-VII-59, (?); Ripley Butte, Island Park, 17-VI-57, (B.K.—USU coll.).

MONTANA

LEWIS & CLARK Co.: Helena, 11-VIII-07, (W.M.M.—LACM coll.); POWELL Co.: Race Track Creek Canyon, 20 mi. N. Anaconda, 21-VII-65, 22-VII-65, 26-VII-65, (H.H.).

NEBRASKA

DAWES Co.: Chadron State Park, Pine Ridge, 16-VI-61, (K.J.); 5 mi. S. Chadron, Pine Ridge, 19-VI-65, (E.S.N.); Deadhorse Canyon, Pine Ridge, 2-VII-65, 3-VII-65, (E.S.N.); Whitney, 17-VI-65, (E.S.N.); Kings Canyon, Pine Ridge, 4-VI-65, 6-VII-65, (E.S.N.); Chadron, (?), (M.W.); SIOUX Co.: Sowbelly Canyon, Pine Ridge, 20-VI-64, (K.J.), 26-VI-62, (J.C.D.); Monroe Canyon, N. Harrison, 26-VI-62, (J.C.D.).

NEW MEXICO

COLFAX Co.: Raton, 20-VII-64, (J.R.M.); GRANT Co.: Cherry Creek, Pinos Altos Mts., 10-VI-58, (J.P.H.); MCKINLEY Co.: Ft. Wingate, 8-VI-09, 14-VI-09, 3-VII-09, (J.W.—LACM coll.); OTERO Co.: near Clouderoft, 20-VII-58, (A.N.); SANDOVAL Co.: Las Huertes Canyon Road, 5.6 mi. S. Placitas, Sandia Mts., 15-VII-63, (T.C.E.); Juan Tabo, Sandia Mts., 8-VII-45, (W.O.G.—LACM coll.); TAOS Co.: Hondo Canyon, near Taos, 19-VIII-64, (T.C.E.).

NEVADA

CLARK Co.: Charleston Mtn. Park, Kyle Canyon, 10-VIII-63, (T.C.E.), 6-VI-52, 7-VI-52, (T.D.), 2-VII-36, (D.M.—LACM coll.), 29-VII-66, (E.M.P.); Mountain Springs Pass, Spring Mtn. Range, 30-VI-63, (K.R.); ELKO Co.: Spruce Mtn., 18-VII-60, (J.B.); Lamoille Canyon, Ruby Mts., 19-VII-60, (J.B.), 24-VII-59, (A.O.S.), 10-VII-58, (W.A.H.); Ruby Valley, 20-VI-33, (L.M.M.—LACM coll.); LANDER Co.: Kingston Canyon, Toiyabe Mts., 20-VII-64, (T.C.E.); Hy. 50, S. Carroll Summit, 13-VII-59, (A.O.S.); MINERAL Co.: Corey Creek Canyon, 17-VII-65, (P.J.H.); WHITE PINE Co.: Snake Creek, Mt. Wheeler, 1-VII-60, (W.A.H.); Lehman Creek, Mt. Wheeler, 1-VII-60, (W.A.H.).

SOUTH DAKOTA

CUSTER Co.: W. of Custer, "1929-1930," (J.M.); LAWRENCE Co.: Spearfish Canyon, Black Hills National Forest, 25-VII-58, 23-VI-61, (E.M.P.), 23-VI-61, (S.F.P.), 12-VIII-65, (T.C.E.); Lead, 24-VII-58, (E.M.P.); MEADE Co.: Bethlehem, 29-VI-63, (W.B.); PENNINGTON Co.: Deerfield Lake, 26-VII-58, (S.F.P.); .25 mi. E. Black Fox Campground, 26-VII-58, (E.M.P.).

UTAH

BOX ELDER Co.: near Holstein R. S., Raft River Mts., 23-VII-63, (J.S.); CACHE Co.: Logan Canyon, N.E. Logan, 20-VII-48, (C.G.F.—USU coll.), 18-VI-54, 9-VII-54, (R.P.O.—USU coll.), 13-VII-48, (B.H.—USU coll.), 10-VII-48, (R.S.B.—USU coll.), VI-54, (?—USU coll.), VII-53, (H.A.A.—USU coll.), 14-VIII-59, (?—USU coll.), VII-55, (?); Green Canyon, 2-VII-54, (D.W.D.—USU coll.), 27-VII-64, (W.J.H.—USU coll.); Blacksmith Fork Canyon, 10-V-60, (W.A.R.—USU coll.); DAGGETT Co.: Palisade Park Camp, 20-VII-62, (R.Y.—USU coll.), 20-VII-63, (C.G.—USU coll.), 19-VII-62, (B.A.H.—USU coll.); Ashley Dam, 17-VI-62, (J.S.); DAVIS Co.: Muller Park, Wasatch Mts., 11-VI-65, (K.B.T.); DUCHESNE Co.: Roosevelt, 14-VIII-37, (F.C.H.—USU coll.); near Fruitland, 8-VIII-63, (K.B.T.); GRAND Co.: Castle Valley, 9-VI-63, (J.R.P.); Mill Creek, La Sal Mts., 11-VII-62, (K.B.T.); IRON Co.: Midway Summit, Hy. 14, 9-VIII-63, (T.C.E.); SALT LAKE Co.: Big Cottonwood Canyon, Mill River Fork, 2-VII-65, (K.B.T.); Salt Lake City, 5-VI-59, (J.R.P.—USU coll.), 14-VIII-25, (L.V.B.—LACM coll.); Lamb's Canyon, Wasatch Mts., 21-VII-64, 14-VII-64, 5-VII-62, (K.B.T.); City Creek Canyon, 22-VI-60, (J.C.D.); SAN JUAN Co.: Brumley Ridge, road to Geyser

Pass from Moab, 22-VII-64, (T.C.E.), 23-VI-63, (K.B.T.); SANPETE Co.: Ephraim Canyon, 28-VI-34, (L.M.M.—LACM coll.); SUMMIT Co.: N. Fork Provo River, Uinta Mts., 18-VII-65, (J.A.J.); Shingle Creek, Uinta Mts., 12-VII-65, (K.B.T.); Park City, 28-VII-1895, (?—LACM coll.); TOOELE Co.: South Willow Canyon, Stansbury Mts., 20-VII-64, 30-VII-64, 1-VII-65, 18-VII-65, 21-VII-65, 5-VIII-65, (K.B.T.), 19-VII-65, 21-VII-65, (J.A.J.); UTAH Co.: Merkle Park, 29-VIII-65, (K.B.T.); Kabell Hollow, Uinta Mts., 12-VII-63, 14-VII-63, (K.B.T.); UTAH Co.: 6 mi. E. Timpanogos Cave National Monument, 8-VII-65, (T.C.E.); Payson Canyon, 20-VII-65, (J.A.J.), 7-VII-64, 20-VII-65, (K.B.T.), 22-VI-34, 6-VII-34, (L.M.M.—LACM coll.); WASHINGTON Co.: Leeds Canyon, Pine Valley Mts., 19-VI-64, (K.B.T.); Pine Valley, 6-VII-36, (C.N.R.—LACM coll.); near St. George, 4-VII-25, (J.A.C.—LACM coll.).

WYOMING

ALBANY Co.: La Bonte Canyon, 4-VII-63, (R.H.); Eagle Peak, 14-VII-63, (R.H.); CONVERSE Co.: Mill Creek, 9-VIII-64, (R.H.); La Prele Canyon, 23-VI-64, (R.H.); Cold Springs, Medicine Bow National Forest, 23-VI-63, (R.H.); Camel Creek, 19-VII-64, 15-VII-65, (R.H.); CARBON Co.: 9 mi. W. Encampment, Sierra Madre Mts., 9-VII-60, (J.C.D.); FREMONT Co.: Louis Lake, Shoshone National Forest, 18-VII-63, (E.M.P.); TETON Co.: 4 mi. W. Teton Pass, Targhee National Forest, 8-VIII-65, 10-VIII-65, (E.M.P.).

INDEX OF COLLECTORS

(H.A.A.) H. A. Arfaa; (R.S.B.) R. S. Bailey; (J.B.) J. Baker; (W.B.) W. Boscoe; (L.V.B.) L. V. Bower; (C.B.) C. Brown; (F.M.B.) F. M. Brown; (H.H.B.) H. H. Brown; (H.C.) H. Comstock; (J.A.C.) J. A. Comstock; (C.M.D.) C. M. Dammers; (T.D.) T. Davies; (D.W.D.) D. W. Davis; (D.D.) D. Dirks; (J.C.D.) J. C. Downey; (S.E.) S. Ellis; (T.C.E.) T. C. Emmel; (G.G.F.) G. G. Fleener; (C.G.) C. Granam; (W.O.G.) W. O. Griesel; (W.A.H.) W. A. Hammer; (W.J.H.) W. J. Hanson; (R.H.) R. Hardesty; (F.C.H.) F. C. Harmston; (B.H.) B. Harris; (B.A.H.) B. A. Haws; (P.J.H.) P. J. Herlan; (C.W.H.) C. W. Herr; (H.H.) H. Holmes; (W.H.H.) W. H. Howe; (J.P.H.) J. P. Hubbard; (K.J.) K. Johnson; (J.A.J.) J. A. Justice; (C.W.K.) C. W. Kirkwood; (B.K.) B. Knapp; (R.A.L.) R. A. Leussler; (M.R.L.) M. R. Lundgren; (C.D.M.) C. D. MacNeill; (W.M.M.) W. M. Mann; (J.M.) J. Manning; (L.M.M.) L. M. Martin; (D.M.) D. Meadows; (J.R.M.) J. R. Merritt; (E.S.N.) E. S. Nixon; (A.N.) A. Nymeyer; (R.P.O.) R. P. Olson; (P.A.O.) P. A. Opler; (V.W.O.) V. W. Owen; (J.R.P.) J. R. Pease; (E.M.P.) E. M. Perkins, Jr.; (S.F.P.) S. F. Perkins; (R.H.P.) R. H. Piggott; (K.P.) K. Phillips; (W.A.R.) W. A. Reese; (D.C.R.) D. C. Rentz; (K.R.) K. Roever; (W.A.R.—USU coll.) W. A. Rowley; (C.N.R.) C. N. Rudkin; (J.S.) J. Scott; (A.M.S.) A. M. Shapiro; (A.O.S.) A. O. Shields; (R.F.S.) R. F. Sternitzky; (F.T.T.) F. T. Thorne; (K.B.T.) K. B. Tidwell; (M.W.) M. Wood; (S.L.W.) S. L. Wood; (J.W.) J. Woodgate; (R.Y.) R. Young.

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