

Butterflies and Moths of the Black Range and Doña Ana County

A Sampler - August 2023

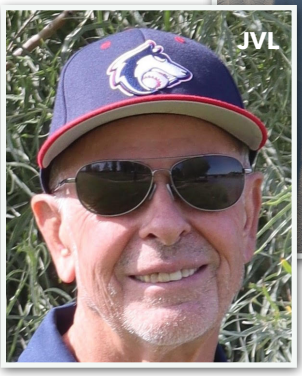
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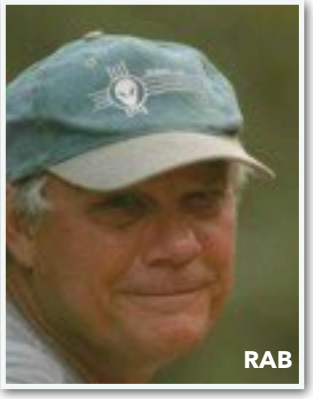
Some of The Contributors



BLACK RANGE RAILWAY
TL

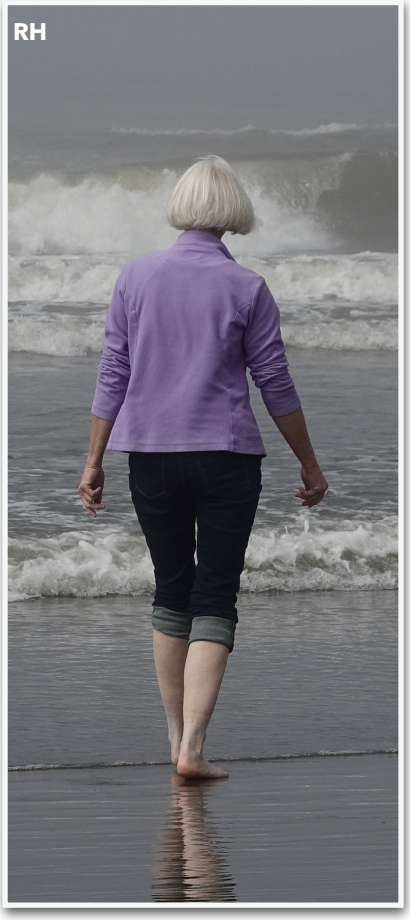




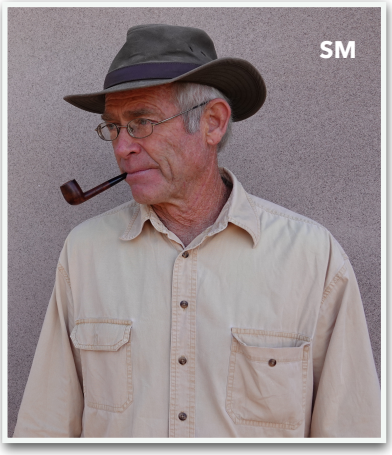


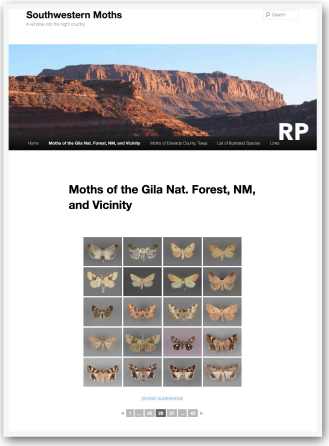
















Butterflies and Moths of the Black Range and Doña Ana County

A Sampler - August 2023

In this sampler we have gathered photographs of many of the butterflies, and a few moths, found in the Black Range and Doña Ana County, New Mexico. Although most of the photographs shown in this work are the products of special efforts made by people who perform research in this region, some are from a bit farther away. When we say research we use the term in an unstructured manner, research can be simple observation, even incidental observation. What is important is that observation occurs and insight is gained. That insight can be subtle and nuanced but our hope is that through efforts like this Sampler it will become additive to our common knowledge. All of this effort falls within the realm of what we call non-institutional science. This Sampler is not the result of a large institution funding a multi-year project. This is a volunteer project, from start to finish. A product of people who want to share the fruits of their efforts so that we can all flourish.

The Black Range Naturalist (Volume 5, Number 2) of April 2022, dealt extensively with Butterflies and Moths. Most of the images/narrative in that issue were the work of James Von Loh. This Sampler, is in many ways a reworking of that issue. BRN 5-2 included several butterfly natural history articles by Von Loh. Even though this sampler has a focus on species identification, material in those articles is pertinent. The full articles have not been included here, but portions of them are included in the species specific accounts which follow. This sampler and BRN 5-2 work well together and we encourage you to visit www.blackrange.org and download that issue to use with this sampler.

All of the species described in this sampler are found in the Black Range and Doña Ana County. Photographs from the Black Range are from a variety of sources, while James Von Loh and Gordon Berman contributed photographs from the Organ Mountains and Doña Ana County generally. We have also included some images from Ron Parry's website (moths from the Big Burro Mountains south of Silver City, for example) and a limited series of photographs by Todd Stout and Berry Nall. These photographs were taken farther afield.

With such a large amount of material from such a wide range of sources, attribution of each image can become intrusive. Therefore, throughout this work you will find the initials of the individuals who contributed the work. They are; Bob Barnes (RAB), Gordon Berman (GB), Nicky Davis (ND), Véronique De Jaegher (VDJ), Margie Gibson (MG), Rebecca Hallgarth (RH), Matilde Holzwarth (MH), Tom Lander (TL), Steve Morgan (SM), Berry Nall (BN), Debora Nicoll (DN), Ron Parry (RP), Bob Sivinski (BS), Todd Stout (TS), Nichole Trushell (NT), and James Von Loh (JVL). Although all of these contributors have eagerly agreed to share the products of their efforts with you, they retain all copyright to those products. Except, Bob Barnes who makes his work available for all non-commercial use under the provision of a Creative Commons license. Please honor their copyrights.

Species not included in the original (BRN 5-2) publication have been added to the Sampler, a process we hope to continue in future versions of the sampler. We look forward to a second edition and your submitted material which will make that possible. Works like this are never complete, it is a process, if you have or come across material which should be included in the second edition (or intermediate versions), please contact rabarnes@blackrange.org.

Species are arranged in alphabetical order according to their Latin binomial name. If the genus of the species has recently changed we include the older name in parenthesis. Especially of late, and contrary to what you might have learned in some science class, the latin binomial system has not been particularly stable. In part this is the result of new assessment techniques which have enabled new understandings about the relationships between various species. Although we have not included a complete list of synonyms for the species in this Sampler we have included some and we have included links to references which provide full lists.

This sampler is designed, produced, and distributed as electronic media. That allows us to add some splash which would be expensive in printed material, it allows easy distribution (and transport - it will fit on your digital device), and it allows us to link to other sources which enables a more thorough exploration of a the natural history of these species. But digital comes at a cost, it is not static, "the web" changes. If you find a broken link let us know and we will change it in future versions.

Enjoy and thanks for your support.

R. A. Barnes, Editor
rabarnes@blackrange.org

Some Resources

The Black Range Naturalist, Vol. 5, No. 2, April 2022. For free downloads of all publications of the Black Range website visit this link.

Butterflies and Moths of North America. A wealth of information, including extensive species specific pages, is available at this site.

North American Moth Photographers Group at the Mississippi Entomological Museum at Mississippi State University. Species specific pages on the moths and butterflies of North America and substantial amounts of other information, like an extensive links page to other resources.

BugGuide. You have to see it to believe it.

Butterflies of America. No moths but an extensive photograph collection, including breakouts by subspecies.

Pajarito Environmental Education Center. The section of this website devoted to butterflies, by Steven J. Cary and Michael E. Toliver is a New Mexico gem. Steve Cary's New Mexico Butterfly Blog site is a great resource with reports from various people around the state.

Native Plant Society of New Mexico provides a substantial amount of information about plant pollinators, like butterflies, on its website and in its newsletter.

Southwestern Moths, and the Links page in particular. This is Ron Parry's website, a resource which we are extremely lucky to have access to, for study and pleasure.

New Mexico butterflies: checklist, distribution and conservation - Steven J. Cary and Richard Holland, Journal of Research on the Lepidoptera 21(1-2):57-82, 1992

Starr County Butterflies. A bit far afield perhaps, but Berry Nall's website has thousands of images of species found in the Black Range and often images of several life stages.

Pacific Northwest Moths. Website. We share many species with the Pacific Northwest. This website includes species accounts, which are exceptional, in its portfolio. The link will take you to the glossary at Pacific Northwest Moths. If you want to know about the markings on moths - this is a must have!! The images below and on the following page are examples (there is so much more) of the material which supports the narrative of the glossary. The website also offers a free Android app for moth identification.

iNaturalist. Website. iNaturalist describes itself as "an online social network of people sharing biodiversity information to help each other learn about nature", with its primary goal being to connect people to nature. Although it is not a science project itself, iNaturalist is a platform for science and conservation efforts, providing valuable open data to research projects, land managers, other organizations, and the public.

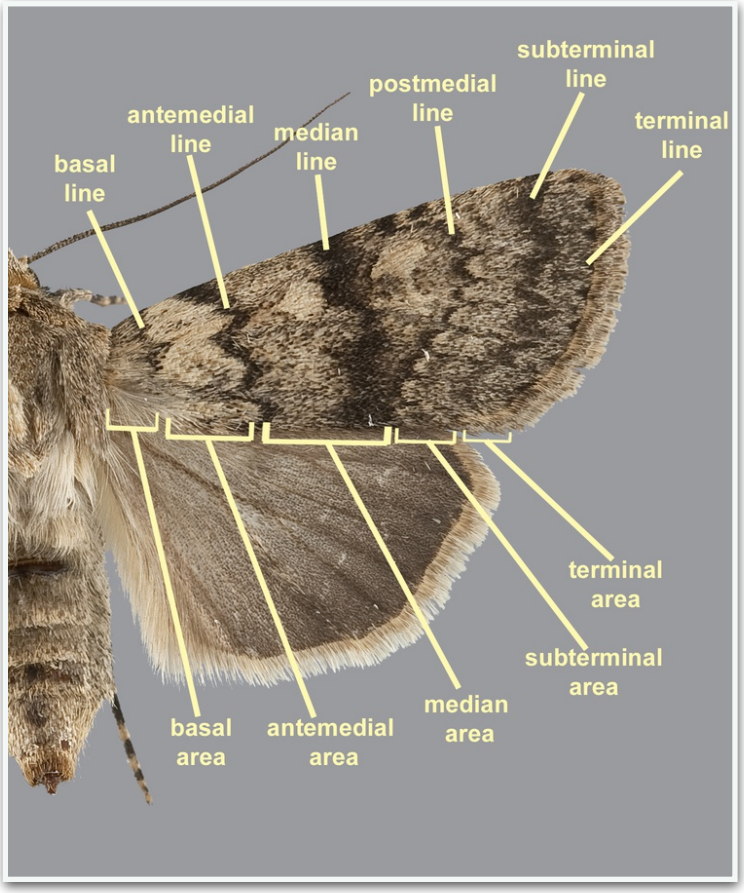
Southwestern Arizona Butterflies, Rich Bailowitz and Jim Brock. This guide is an updated sequel to the ground-breaking 1991 guide by the same two authors. It provides an in depth survey of all 273 species recorded in the region; includes more than 700 photographs of butterfly species; it includes more than 300 regional larval host plant records and images of common nectar sources, caterpillars and habitats, and range maps for all but the most common and widespread species, and an illustrated comparison guide to the difficult-to-identify duskywings.

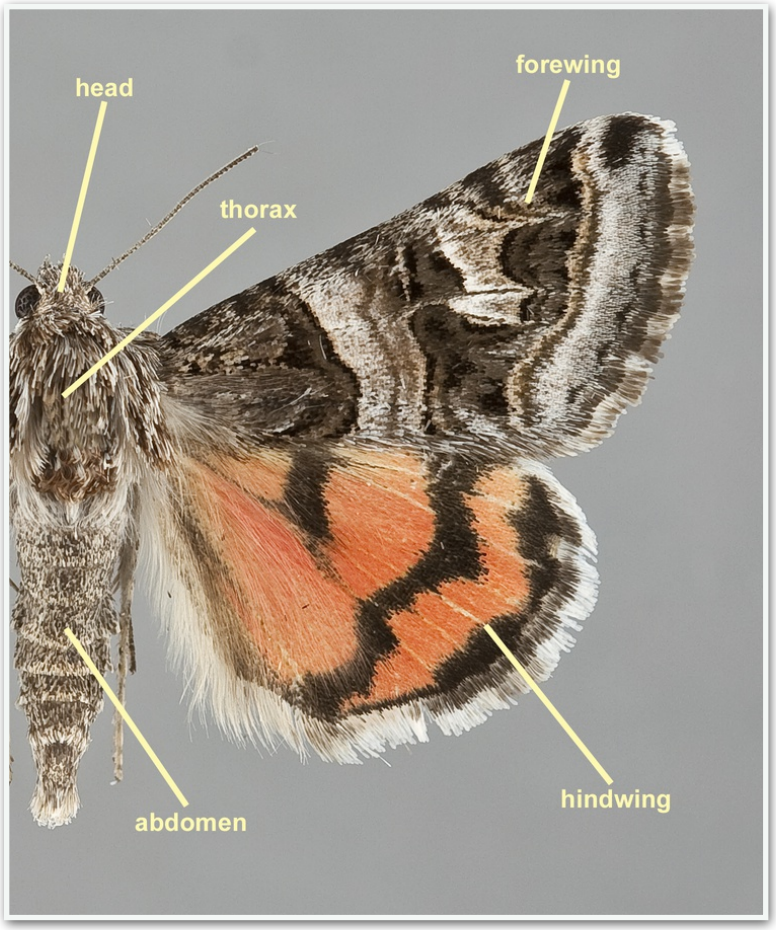
Tidbits and Terms

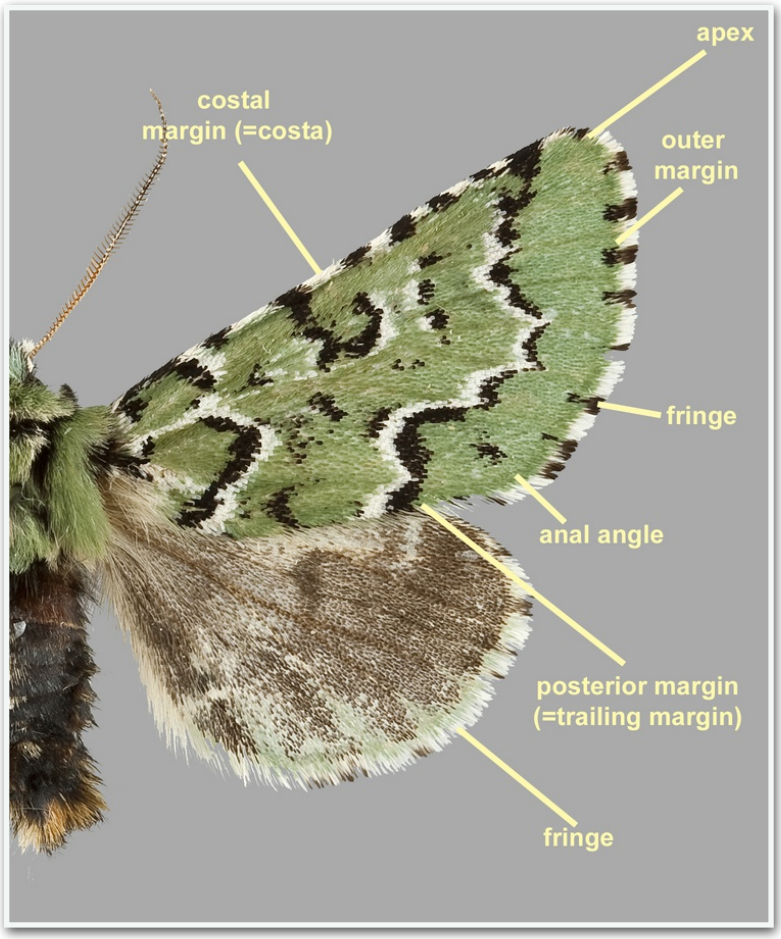
Knowing the terms being used in any field is the key to understanding. Some terms (like "puddlers") are used in some sources or subfields and not others. We have tried to avoid (or explain) such terms as we go along.

Puddle Club/Puddlers etc. is a behavioral term used to describe the activities of some adult butterflies. At pages 66-67 there is an extended discussion of this behavior and the term.

Instars are the stages of a caterpillar's life. As informative as diagrams like that at the bottom left on page 6 are they obfuscate by omission. A Monarch caterpillar, for instance, has five instars and the process of hatching from egg to forming a chrysalis will take about two weeks. The various instar stages may look very similar or they may look so unalike as to be thought different species.

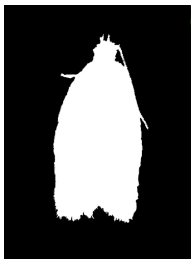




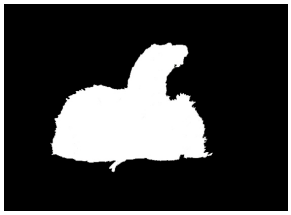


Moth Silhouettes

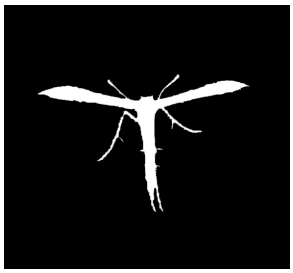
Moths can be very difficult to identify. A moth silhouette key developed by Lynette Elliott is useful in the initial identification sort. See her link for copyright information.



Tortricid Moths. Wingspan from 8 to 35 mm.



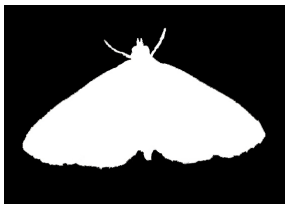
Slug Caterpillar Moths Wingspan from 10 to 35 mm.

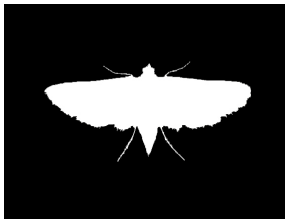


Plume Moths Wingspan from 12 to 40 mm.



Silkworm Moths Wingspan from 32 to 45 mm.

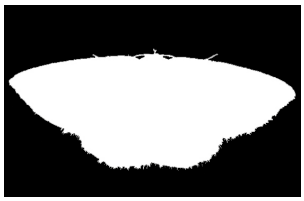




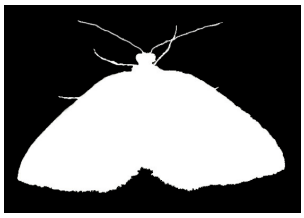
Pyralid Moths Wingspan from 10 to 55 mm.



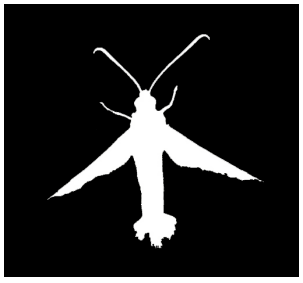
Crambid Snout Moths
Wingspan from 10 to 35 mm.







Geometrid Moths
Wingspan from 8 to 65 mm.





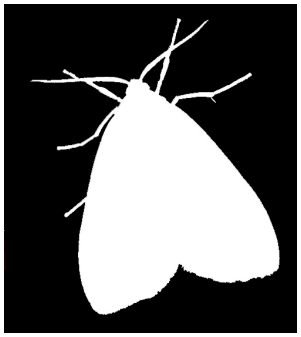
Clearwing Moths
Wingspan from 13 to 60 mm.



Prominent Moths
Wingspan from 25 to 60 mm.



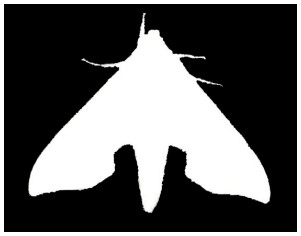
Tussock Moths
Wingspan from 20 to 70 mm.



Tiger Moths
Wingspan from 12 to 80 mm.



Tent Caterpillar Moths
Wingspan from 22 to 105 mm.

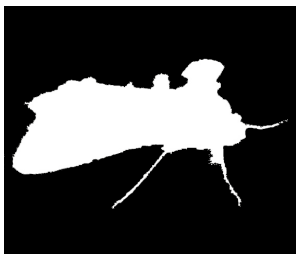




Sphinx Moths
Wingspan from 30 to 150 mm.







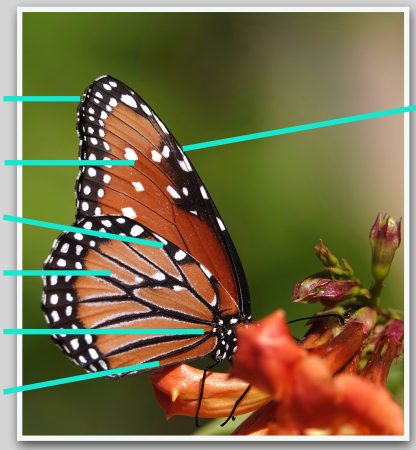
Owlet Moths
Wingspan from 20 to 150 mm.



Giant Silkworm and Royal Moths
Wingspan from 30 to 150 mm.

It takes practice to sort out all of the diagnostic tools which are available.

The best advice, however, is to enjoy. These are exotic creatures brimming with capabilities which we humans lack. Whether they are butterflies, flutterbies, or (insert your favorite latin binomial) they are beautiful and amazing. First of all - Enjoy.



RAB



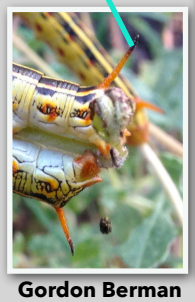
RAB



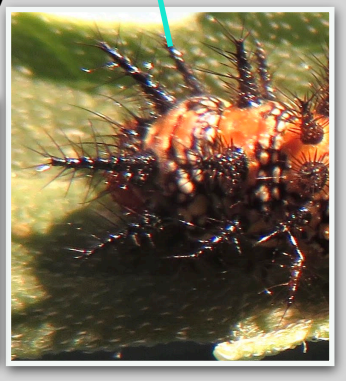
RAB

Growths from body may be called bristles, horns, hairs, or filaments.

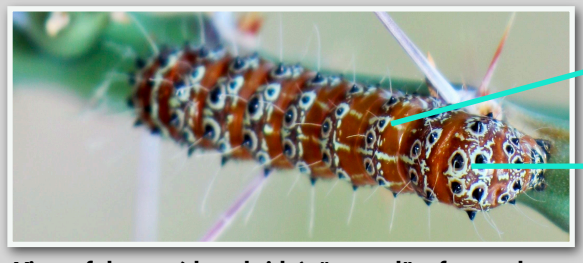
Horns are generally rigid and pointed.



Gordon Berman

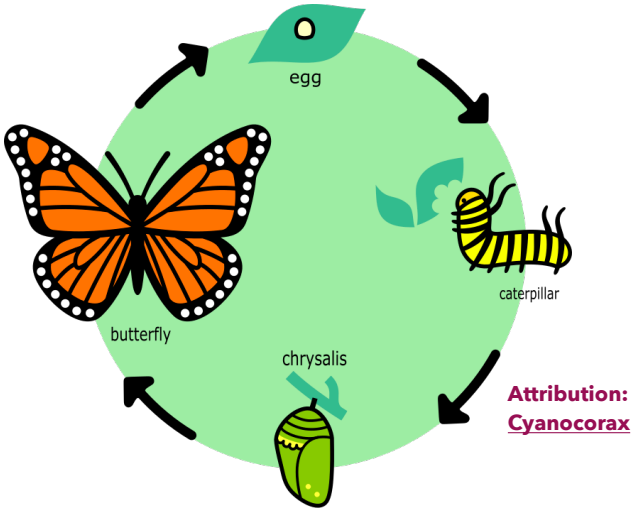


Gordon Berman

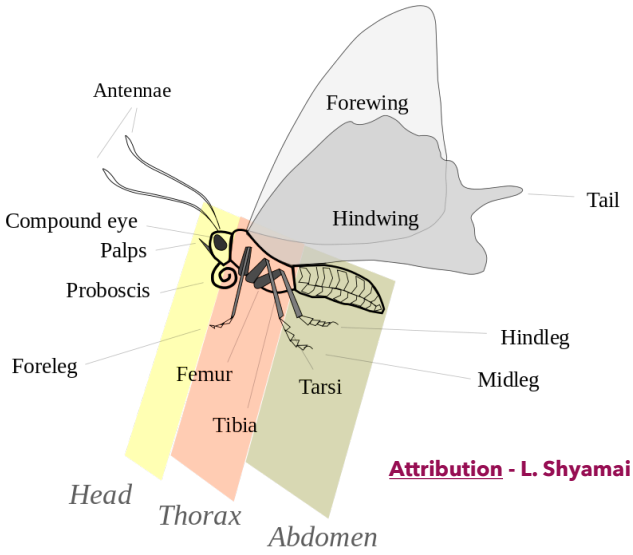


James Von Loh

View of the top (dorsal side); "ventral" refers to the bottom, and "lateral" refers to the sides.



Attribution: Cyanocorax



Attribution - L. Shyamai

A Global Phylogeny of Butterflies Reveals Their Evolutionary History, Ancestral Hosts and Bio-geographic Origins

On May 15, 2023, *Nature Ecology & Evolution*, published an article (title above is link) by Akito Y. Kawahara and a host of others. If you have an unbridled interest in the genetic relationships between the various butterfly species this article, and its supplementary material, is a good place to start. Among the findings of the study are the following:

- **Butterfly species diverged from moths generally about 100 million years ago (101.4 mya in a range of 102.5 to 100.0 mya.);**
- **Butterflies probably originated in what is now the Americas (see graphic on following page). The divergence from moths (probably) occurred in what is now western North America or Central America;**
- **All but one family of butterflies existed prior to the K/Pg extinction event.d (Ed.: The Cretaceous-Palogene extinction event of about 66 million years ago caused [at least in part] by an astroid strike in the Yucatan.) They survived one of the six great mass extensions of earth's history;**
- **Butterfly species may have initially fed on plants in the *Fabaceae* family (legumes, peas, and beans). (Ed.: Note however that some sources date the origin of *Fabaceae* to between 89 and 94 million years ago.) See supplementary tables 10 and 11 and supplementary figure 9 at the above link;**
- **Larva of two-thirds (67.7%) of extant butterfly species feed on one host plant species and those which are "generalists" usually feed on closely related plant species;**
- **Although butterfly dispersal between the world's bioregions (see right) has been active at times and characterized by bi-directional fluidity, it has not been evenly distributed. Some of the world's bioregions (e.g. South America) have significant numbers of species, while others do not; and**
- **The evolutionary relationship between the various butterfly species has not been full mapped (see page 9) but what has been mapped indicates that further research is called for in more than a quarter of all butterfly tribes.**

There is a wealth of information in this article and the supporting material. Delving into it will take time. In the short term, however, relish the thought that our area lies at the edge of two of the major bioregions which characterize butterfly distribution.



105 MYA, Cretaceous Period. The area where the Black Range is now was periodically submerged by water in our geologic history. At this time it is above water. Dinosaurs, mammal, bird, and insect (as in butterflies and moths) lineages were all diversifying at this time. This image is courtesy of Ian Webster. See more of his work at ianww.com.

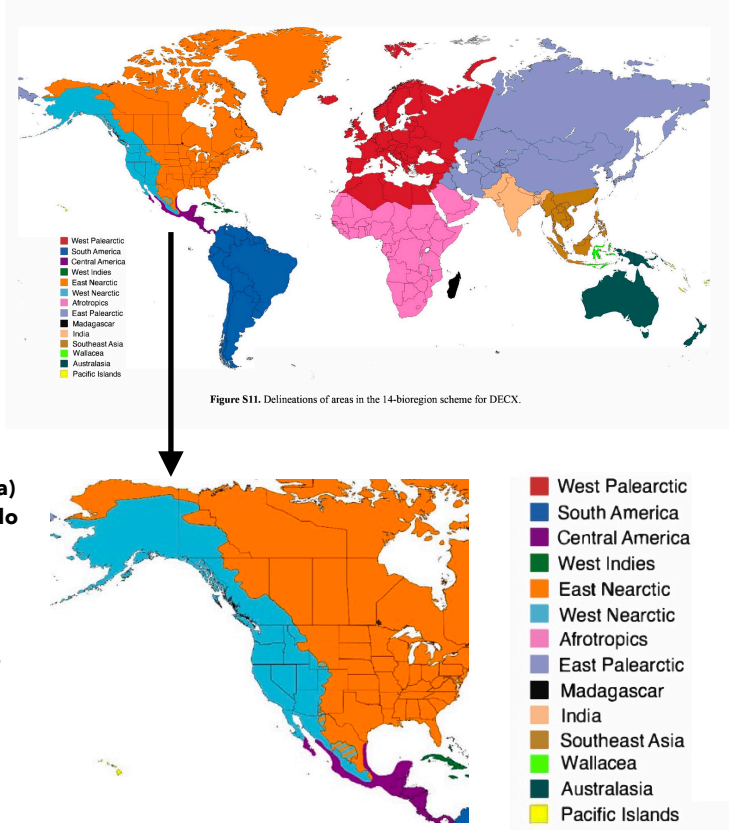
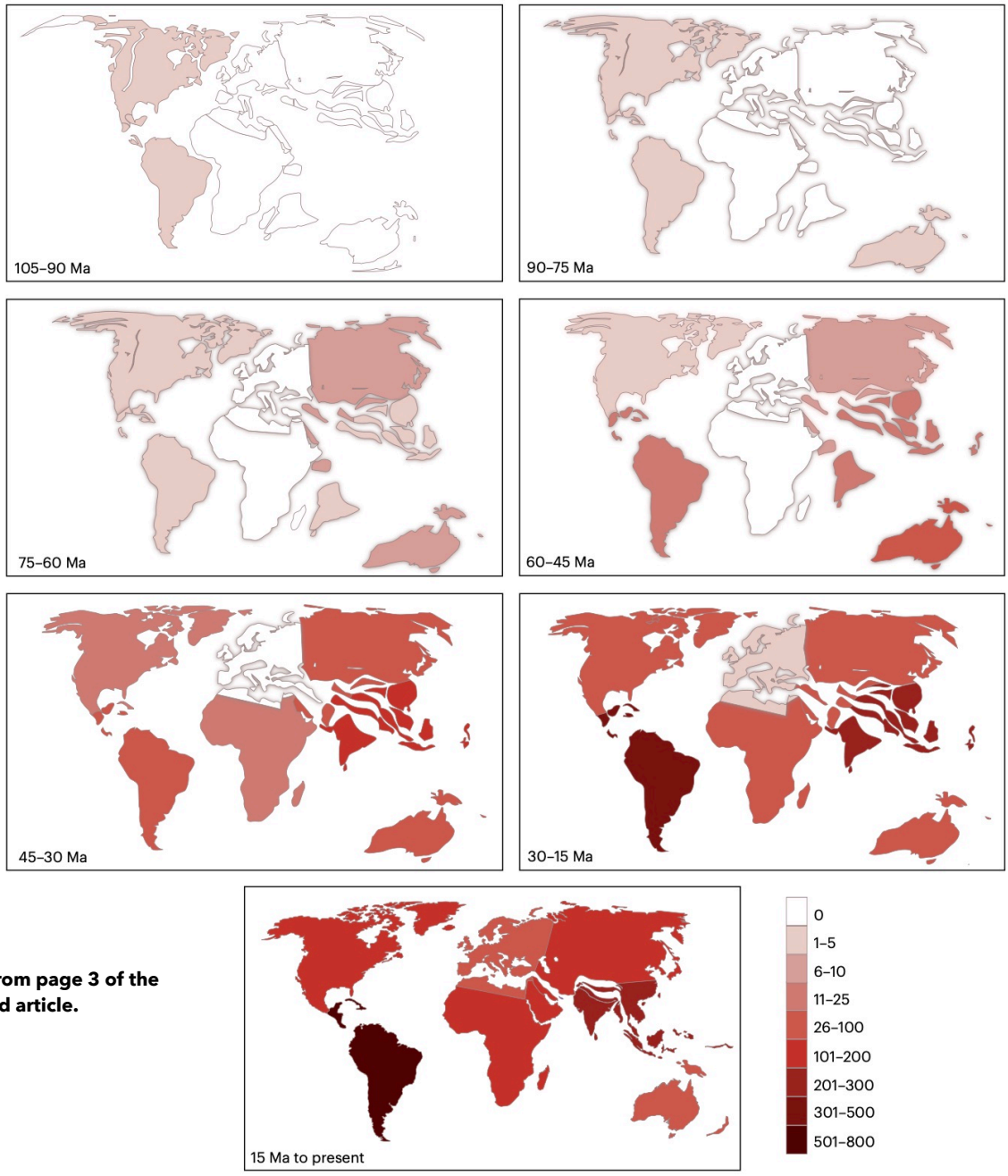


Figure S11. Delineations of areas in the 14-bioregion scheme for DECX.

Graphic from the supplementary material associated with the referenced article.



Graphic from page 3 of the referenced article.

Fig. 2 | Distribution of butterflies over time. Bioregion shading indicates the number of butterfly lineages that were associated with that bioregion during that time period, as determined by BioGeoBEARS ancestral state reconstruction. Each map corresponds to a 15-Ma interval of butterfly evolution. Results are based on data from this study.



The oldest butterfly fossil from America is of a *Prodryas persephone* (shown left). This fossil, which dates from about 34 million years ago was found at the Florissant Fossil Beds in Colorado (see photographs from the Birding Travels in North America website).

Graphic from page 2 of the referenced article.

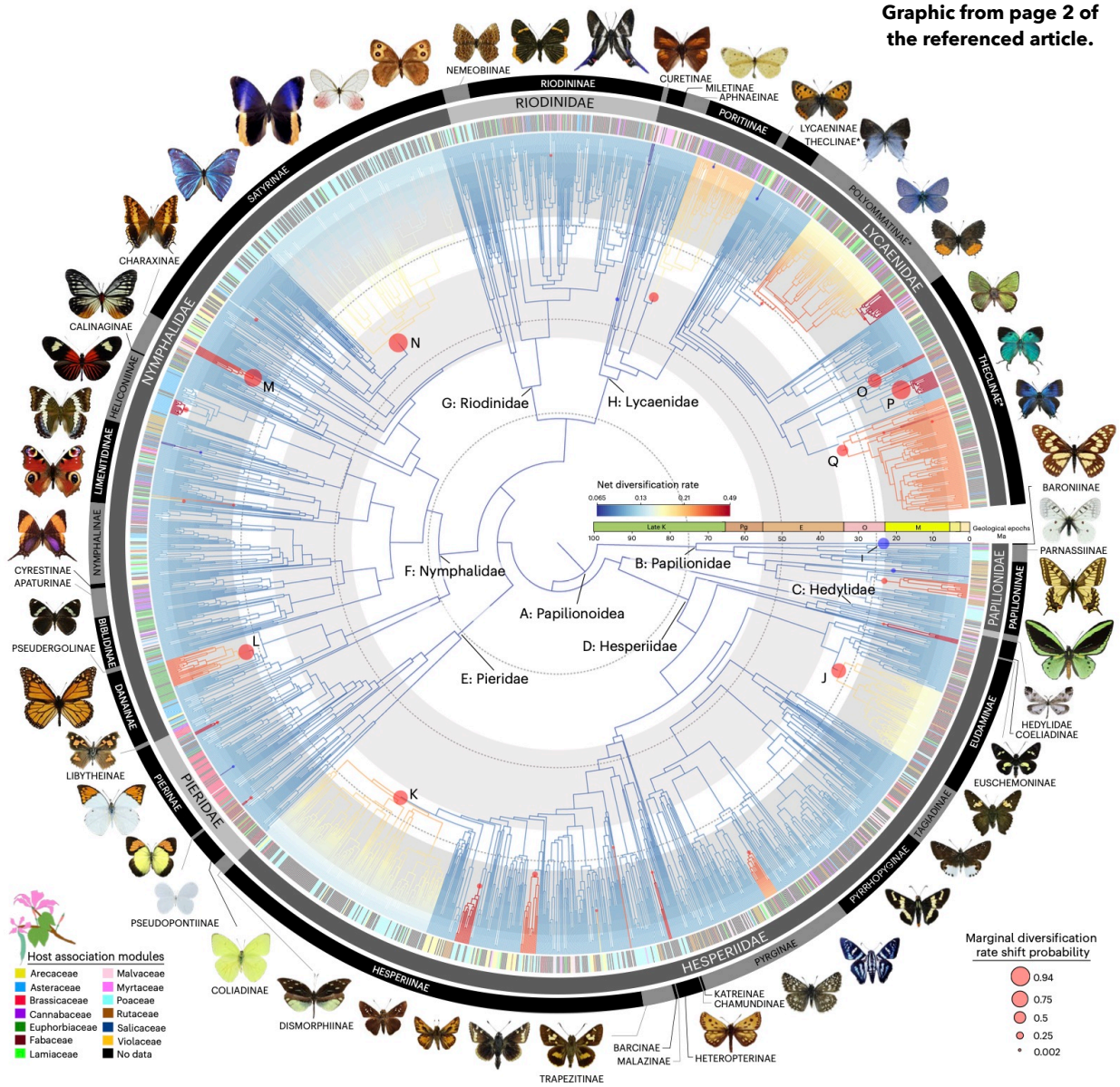
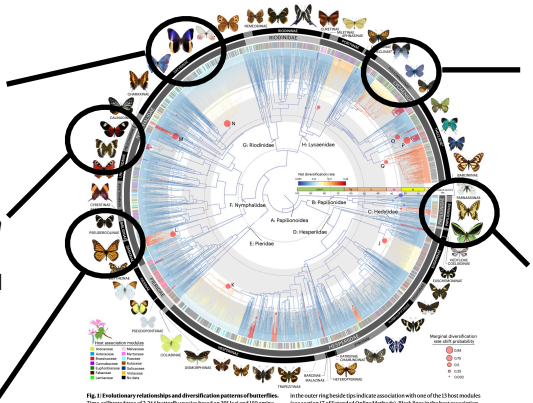


Fig. 1 | Evolutionary relationships and diversification patterns of butterflies. Time-calibrated tree of 2,244 butterfly species based on 391 loci and 150 amino acid partitions. Branches show distinct changes in diversification (circles) as estimated by clade-specific models. Letters at nodes refer to clades with significant rate shifts (see section 6 of Supplementary Results). Coloured lines in the outer ring beside tips indicate association with one of the 13 host modules (see section 17 of Extended Online Methods). Black lines in the host association ring indicate species without data, and asterisks denote non-monophyletic subfamilies. Supplementary Fig. 1 shows this tree with visible species names and ages for all nodes.

Satyrinae **includes the genera *Cissia* and *Cyllopsis*. *Cissia rubricata*** **(Red Satyr) and *Cyllopsis pertepida*** **(Canyonland Satyr) are two examples from our area.**

Limenitidinae **includes the genera *Adelpha* and *Limenitis*. *Adelpha eulalia*** **(Arizona Sister) and *Limenitis arthemis*** **(Red-spotted Admiral) are two examples from our area.**

Danainae **includes the genus *Danaus*. *D. gilippus*** **(Queen) *and D. plexippus*** **(Monarch) are two examples from our area.**



Polyommatinae **includes the genus *Brephidium*. *Brephidium exile*** **(Western Pygmy Blue) is an example from our area.**

Papilioninae **includes the genus *Papilio*. *P. multicaudata*** **(Two-tailed Swallowtail), *P. ornythion*** **(Ornythion Swallowtail), and *P. polyxenes*** **(Black Swallowtail) are some examples from our area.**

Why did we choose to arrange the sampler by placing species in alphabetical order by Latin Binomial? Why didn't we use a taxonomic array typical of most other field guides? Why didn't we list species in alphabetical order by the English common name? These are all good questions, questions from the reviewers of our draft.

The arrangement chosen for the sampler is a compromise and like all compromises has its own set of pros and cons - most referenced or hinted at by the questions above.

We chose not to use the English common name as a matrix for arranging the species in *The Sampler* for the standard reason. In many cases a particular species will have several common names, in many cases those names have no apparent relationship with each other. Use of the common name, we believe, ends up creating confusion for our readers. We note that the Latin binomial naming protocol has not been the most stable of late and have tried to indicate synonyms in the species accounts to address this issue. We assume that we have a diverse readership and that not all readers are familiar with the taxonomic arrangement of species. For readers who do not regularly use material arranged taxonomically the placement of individual species can appear random. For those who regularly use taxonomically arranged material it is easy to move between that and an alphabetical listing by Latin binomial. The only outstanding argument is that the taxonomic arrangement enables users to see the relationship between various species. However, this relationship is most apparent at the genera level and an alphabetical listing addresses this by default in most cases.

All of that said, every protocol has its weaknesses. We hope that our choices do not detract from the value of this work.

Species Depicted In This Sampler

***Abaeis mexicana*, Mexican Yellow**
(Boisduval, 1836)
***Abaeis nicippe*, Sleepy Orange**
(Cramer, 1779)
***Adelpha eulalia*, Arizona Sister**
(E. Doubleday, 1848)
***Agraulis incarnata*, Gulf Fritillary**
(Linnaeus, 1758)
***Agraulis vanillae*, Gulf Fritillary**
See *Agraulis incarnata*
***Amblyscirtes cassus*, Cassus Roadside-Skipper**
(W. H. Edwards 1883)
***Anaea andria*, Goatweed Butterfly**
(Scudder, 1875)
***Ancyloxypha arene*, Tropical Least Skipper**
(W. H. Edwards, 1871)
***Anisota oslari*, Oslar's Oakworm Moth**
(Rothschild, 1907)
***Anteos clorinde*, White Angled-Sulphur**
(Godart, 1824)
***Anthanassa texana,* Texan Crescent**
(W.H. Edwards, 1863)
***Anthocharis thoosa,* Southwestern Orangetip**
(Scudder, 1878)
***Ascalapha ordorata,* Black Witch Moth**
(Linnaeus, 1758)
***Asterocampa celtis,* Hackberry Emperor**
(Boisduval & Leconte, 1835)
***Atalopedes campestris,* Sachem**
(Boisduval, 1852)
***Arachnis zuni,* Zuni Tiger-Moth**
(Neumoegen, 1890)
***Argynnis nausicaa nausicaa,* Southwest Fritillary**
(W. H. Edwards, 1874)
***Atlides halesus,* Great Purple Hairstreak**
(Cramer, 1777)
***Autochton cellus,* Golden-banded Skipper**
(Boisduval & Leconte, 1837)
***Automeric cecrops,* Cecrops-eyed Silkmoth**
(Boisduval, 1875)
***Battus philenor,* Pipevine Swallowtail**
(Linnaeus, 1771)
***Brephidium exile,* Western Pygmy Blue**
(Boisduval, 1852)
Bulia deducta
(Morrison, 1875)
***Burnsius albescens,* White-checkered Skipper**
(Plötz, 1884)
***Burnsius communis,* Common Checked Skipper**
(Grote, 1872)
***Caenurgina erechtea,* Forage Looper**
(Cramer, 1780)
***Calephelis nemsis,* Fatal Metalmark**
(W.H. Edwards, 1871)
***Callophrys gryneus,* Olive Juniper Hairstreak**
(Hübner, 1819)
***Chlosyne fulvia,* Fulvia Checkerspot**
(W.H. Edwards, 1879)
***Chlosyne lacinia,* Bordered Patch**
(Geyer, 1837)
***Chlosyne theona,* Theona Checkerspot**
(Ménétriés, 1855)
Chrysoecia atrolinea
(Barnes & McDunnough, 1912)
***Cissia rubricata,* Red Satyr**
(W.H. Edwards, 1871)
***Colias eurytheme,* Orange Sulphur**
(Boisduval, 1852)
***Colias philodice,* Clouded Sulphur**
(Godart, 1819)
***Copaeodes aurantiaca,* Orange Skipperling**
(Hewitson, 1868)
***Cyllopsis pertepida,* Canyonland Satyr**
(Dyar, 1912)
***Danaus gilippus,* Queen**
(Cramer, 1776)
***Danaus plexippus,* Monarch**
(Linnaeus, 1758)
Datana neomexicana,* Perhaps *Datana perfusa
(Doll, 1911)
***Dione vanillae*, Gulf Fritillary**
See *Agraulis incarnata*
***Dymasia dymas,* Tiny Checkerspot**
(W.H. Edwards, 1877)
***Dysschema howardi,* Great Northern Flag Moth**
(Hy. Edwards, 1886)
***Echinargus isola,* Reakirt's Blue**
(Reakirt, 1867)

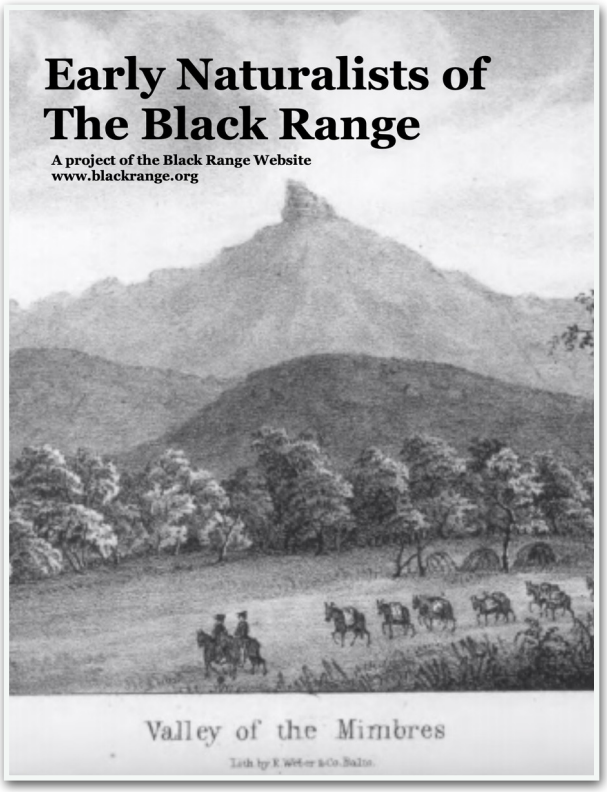
***Epargyreus huachuca*, Huachua Skipper**
(Dixon, 1955)
***Erynnis brizo,* Sleepy Duskywing**
(Boisduval & Leconte, 1837)
***Erynnis funeralis,* Funereal Duskywing**
(Scudder & Burgess, 1870)
***Erynnis telemachus,* Rocky Mountain Duskywing**
(Burns, 1960)
***Erynnis tristis,* Mournful Duskywing**
(Boisduval, 1852)
Euchaetes antica
(Walker, 1856)
***Euphyes vestris,* Dun Skipper**
(Boisduval, 1852)
***Euptoieta claudia,* Variegated Fritillary**
(Cramer, 1776)
Eurema mexicana* - see *Abaeis mexicana
Eurema nicippe* - see *Abaeis nicippe
***Eurema proterpia,* Tailed Orange**
(Fabricius, 1775)
See species discussion, most authorities now place this species in the genus *Pyrisitia*.
***Euscirrhopterus cosyra,* Staghorn Cholla Moth**
(Druce, 1896)
***Euscirrhopterus gloveri,* Purslane Moth**
(Grote & Robinson, 1868)
***Forsebia cinis*, Forsebia Moth**
(Guenée, 1852)
Gesta funeralis* - see *Erynnis funeralis
Gesta telemachus* - see *Erynnis telemachus
Gesta tristis* - see *Erynnis tristis
***Gyrocheilus patrobas,* Red-Rim Satyr**
(Hewitson, 1862)
***Helicoverpa zea,* Corn Earworm Moth**
(Boddie, 1850)
Gesta funeralis* - see *Erynnis funeralis
Gesta telemachus* - see *Erynnis telemachus
Gesta tristis* - see *Erynnis tristis
***Gyrocheilus patrobas,* Red-Rim Satyr**
(Hewitson, 1862)
***Helicoverpa zea,* Corn Earworm Moth**
(Boddie, 1850)
***Hemaris thetis,* Rocky Mountain Clearwing**
(Boisduval, 1855)
The species in our area may be *Hemaris diffinis,* Snowberry Clearwing (Boisduval, 1836)
See species account.
***Hemiargus ceraunus,* Ceraunus Blue**
(Fabricius, 1793)
***Hylephila phyleus,* Fiery Skipper**
(Drury, 1773)
***Hyles lineata,* White-lined Sphinx Moth**
(Fabricius, 1775)
***Hypantria cunea,* Fall Webworm Moth**
(Drury, 1773)
***Icaricia lupini,* Lupine Blue**
See *Plebejus lupini*
***Junonia coenia,* Common Buckeye**
(Hübner, 1822]
***Junonia grisea,* Gray Buckeye**
(Austin & J. Emmel, 1998) ***Leptostales rubromarginaria,***
Dark-ribboned Wave
(Packard, 1871)
***Leptotes marina,* Marine Blue**
(Reakirt, 1868)
***Libytheana carinenta,* American Snout**
(Cramer, 1777)
***Limenitis archippus,* Viceroy**
(Cramer, 1776)
***Limenitis arthemis,* Red-spotted Purple (Admiral)**
(Drury, 1773)
***Limenitis weidemeyerii,* Weidemeyer's Admiral**
(W.H. Edwards, 1861)
***Litocala sexsignata,* Litocala Moth**
(Harvey, 1875)
***Lon taxiles,* Taxiles Skipper**
(W.H. Edwards, 1881)
Some authorities treat this species as *Poanes taxiles*
Loxostege
The species included here is unidentified below genus. There are 25 species in this genus in our area.
***Manduca quinquemaculata,* Five-spotted Hawkmoth**
(Haworth, 1803)
***Megisto rubricata*, Red Satyr**
Currently described as *Cissia rubricata* (since 2018)
***Mestra amymone,* Common Mestra**
(Ménétriés, 1857)
***Nathalis iole,* Dainty Sulphur**
(Boisduval, 1836)
***Nymphalis antiopa,* Mourning Cloak**
(Linnaeus, 1758)
***Pachysphinx occidentalis,* Big Poplar Sphinx**
(Hy. Edwards, 1875)
***Papilio multicaudata,* Two-tailed Swallowtail**
(W.F. Kirby, 1884)
***Papilio ornythion,* Ornythion Swallowtail**
(Boisduval, 1836)
***Papilio polyxenes,* Black Swallowtail**
(Fabricius, 1775)
***Papilio rutulus,* Western Tiger Swallowtail**
(Lucas, 1852)
***Phoebis sennae,* Cloudless Sulphur**
(Linnaeus, 1758)
***Pholisora cattullus,* Common Sootywing**
(Fabricius, 1793)
***Phyciodes picta,* Painted Crescent**
(W.H. Edwards, 1865)
***Phyciodes pulchella,* Field Crescent**
(Boisduval, 1852)
***Phyciodes texana* (see *Athanassa texana*)**
***Phyciodes tharos,* Pearl Crescent**
(Drury, 1773)
***Pieris rapae, (*European) Cabbage White**
(Linnaeus, 1758)
***Plebejus acmon,* Acmon Blue**
(Westwood, 1851)
See species account.
***Plebejus lupini*, Lupine Blue**
(Boisduval, 1869)
See species account.
***Plebejus melissa,* Melissa Blue**
(W.H. Edwards, 1873)
Poanes taxiles
See *Lon taxiles*
***Polites (Yvretta) carus,* Carus Skipper**
(W.H. Edwards, 1883

***Polygonia gracilis,* Hoary Comma**
(Grote & Robinson, 1867)
***Polygonia interrogationis,* Question Mark**
(Fabricius, 1798)
***Polygonia satyrus,* Satyr Comma**
(W.H. Edwards, 1869)
***Pontia protodice,* Checkered White**
(Boisduval & Leconte, 1830)
***Pontia sisymbrii,* Spring White**
(Boisduval, 1852)
***Pyristitia proterpia*, Tailed Orange**
Listed here as *Eurema proterpia*
Pterourus
Species listed in this genus by some sources are listed in the genus Papilio in this Sampler.
***Speyeria hesperis,* Hesperis (Northwest) Fritillary**
See *Argynnis nausicaa nausicaa,* Southwest Fritillary
***Spodoptera ornithogalli,* Yellow-striped Armyworm**
(Guenée, 1852)
***Staphylus ceos,* Golden-headed Scallopwing**
(W. H. Edwards, 1882)
***Strymon melinus,* Gray Hairstreak**
(Hübner, 1818)
Telegonus cellus* - see *Autochton cellus
***Thorybes pylades,* Northern Cloudywing**
(Scudder, 1870)
***Vanessa annabella,* West Coast Lady**
(Field, 1971)
***Vanessa atalanta,* Red Admiral**
(Linnaeus, 1758)
***Vanessa cardui,* Painted Lady**
(Linnaeus, 1758)
***Vanessa virginiensis,* American Lady**
(Drury, 1773)
***Zerene cesonia*, Southern Dogface**
(Stoll, 1790)

Biographical Sketches

Biographical sketches of entomologists who originally described the species covered in this sampler (or did important research in this area), are found throughout the book.

- **Austin: George T. Austin (1943-2009), p. 159**
- **W. Barnes: William Barnes (1860-1930) pp. 226**
- **Benjamin: Foster Hendrickson Benjamin (1895-1936) p. 226**
- **Boisduval: Jean Baptiste Alphonse Déchauffour de Boisduval (1799-1879) p. 50**
- **Cramer: Pieter Cramer (1721-1776) p. 53**
- **Doll: Jacob Doll (1847-1929) p. 106**
- **Doubleday: Edward Doubleday (1810-1849) p. 25**
- **Druce: Herbert Druce (1846-1913) p. 132**
- **Drury: Dru Drury (1724-1803) p. 245**
- **Dyar: Harrison Gray Dyar Jr. (1866-1929) p 93**
- **Hy. Edwards: Henry Edwards (1827-1891) p. 111**
- **W. H. Edwards: William Henry Edwards (1822-1909) p. 73**
- **Emmel: Thomas C. Emmel (1941-2018), p. 159**
- **Fabricius: Johan Christian Fabricius (1745-1808) p. 129**
- **Geyer: Peter Carl Friedrich Geyer (1802-1889) pp. 79, 233**
- **Grote: Augustus Radcliffe Grote (1841-1903), p. 217**
- **Guenée: Achille Guenée (1809-1880) p. 229**
- **Harvey: Leon F. Harvey (1837-1912) p. 174**
- **Haworth: Adrian Hardy Haworth (1767-1833) p. 180**
- **Hewitson: William Chapman Hewitson (1806-1878) p. 136**
- **Hübner: Jacob Hübner (1761-1826) p. 232**
- **Lalonde: Melanie Lalonde, p. 159**
- **Leraut: Patrice J. A. Leraut, p. 178**
- **Merian: Maria Sibylla Merian. p. 28**
- **McDunnough: James Halliday McDunnough (1877 - 1962) p. 84**
- **Marcus: Jeffrey Marcus, p. 159**
- **Ménétries: Édouard Ménétries (1802-1861) p. 82**
- **Nabokov: Vladimir Nabokov (1899-1977) p. 92 and p. 140**
- **Packard: Alpheus S. Packard (1839-1905), p. 162**
- **Reakirt: Tryon Reakirt (1884-1871) p. 112**
- **Scudder: Samuel Hubbard Scudder (1837-1911) p. 119**
- **Snow: Francis H. Snow (1840-1908) p. 93**



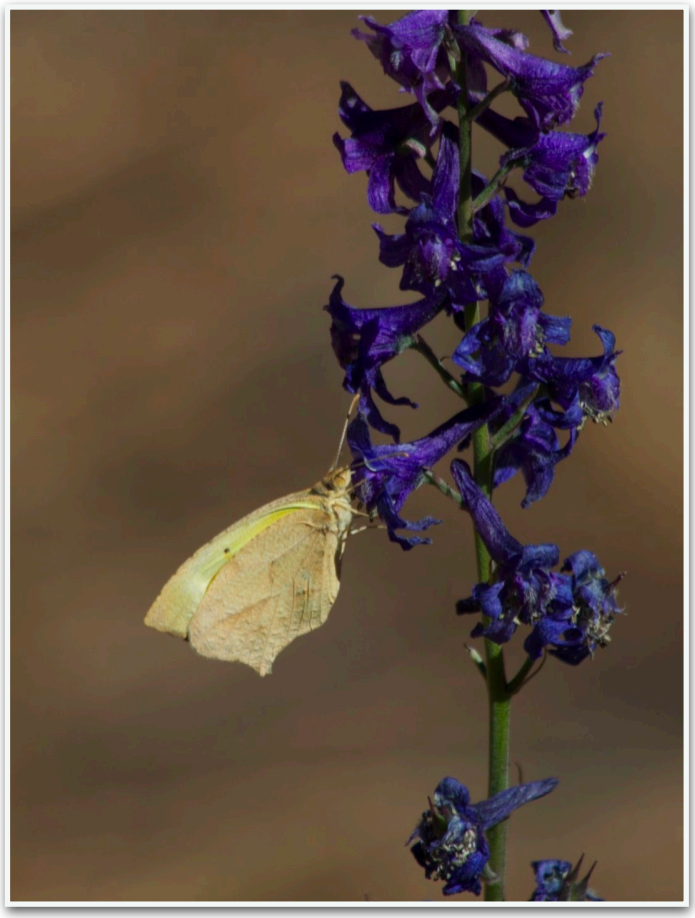
A free download of *Early Naturalists of The Black Range* is available at the Black Range website, www.blackrange.org.

Mexican Yellow

Abaeis (Eurema) mexicana

(Boisduval, 1836)
Hodges #4246

Your field guide may have this species listed as *Eurema mexicana*; the name change (to *Abaeis*) has occurred recently.



Mexican Yellow, photographed in Carbonate Creek Canyon, Black Range. RAB





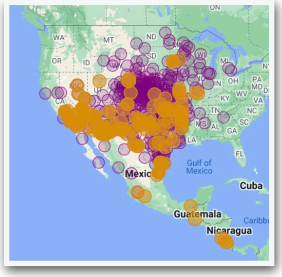
The Mexican Yellow butterflies pictured immediately above were taking nutrients from moist soil near the Soledad Canyon Trailhead. The photograph is by James Von Loh. He was able to take a photograph (below) of this species in flight, at the same location. The lower left image provides a view of the top of the wings (dorsal surface) of the species, something which can be difficult to see in species which consistently keep their wings closed when not flying.



Along the Rio Grande at Las Cruces. Note the short "tail" on the hind wing, a useful diagnostic in separating this species from the Southern Dogface. JVL







Range Map of *Abaeis (Eurema) mexicana* - Mexican Yellow From sightings reported to Butterflies and Moths of North America.

Dogface pattern in Mexican Yellow is visible in flight, when it is visible through the ventral wing. Compare with Southern Dogface, *Zerene cesonia*, shown below with backlit ventral wings.

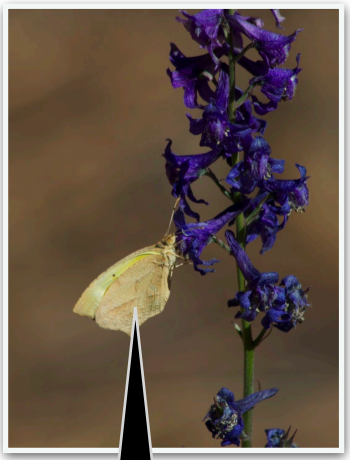
Short tail





Other References (Mexican Yellow)

- Butterflies and Moths of North America
- Pajarito Environmental Education Center
- BugGuide (lists the species as Eurema mexicana)



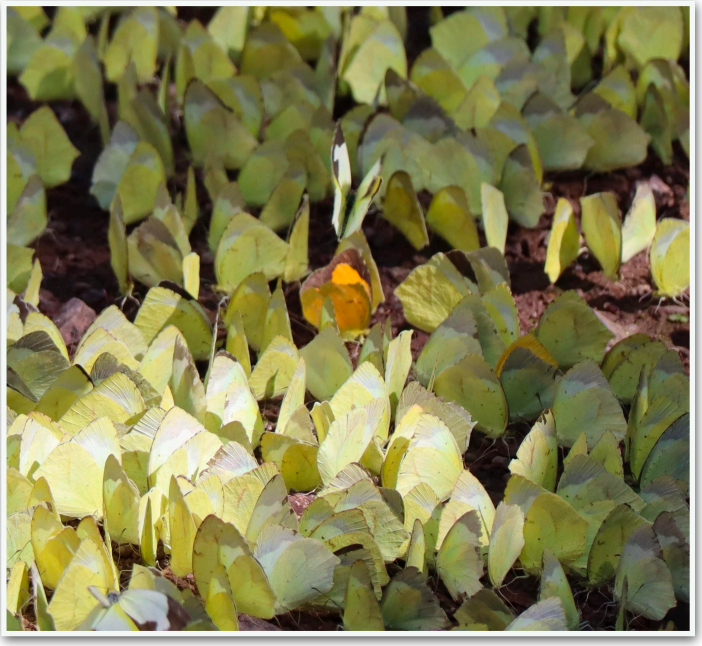
Yellow underside of wings compared with more patterned upper side.



During winter and dry season wings are more orangish

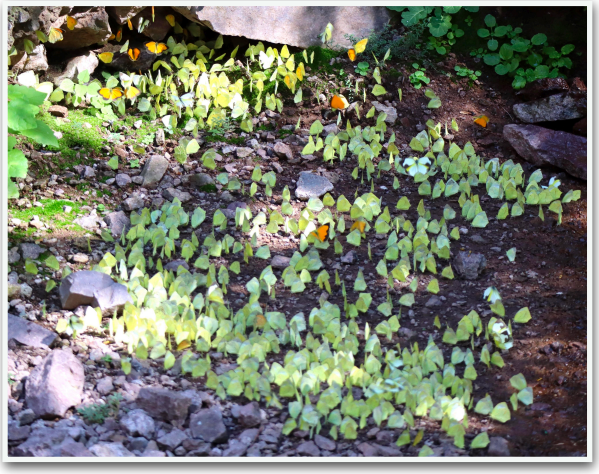


Mexican Yellows in a dense mass which represents approximately 1/3 of this puddle club's occupied area. Dappling results from sunshine filtered through leaves of maple trees established at the Soledad Canyon head. JVL



Mexican Yellows in a detail of the image above, are joined by an individual Sleepy Orange. JVL.

Report from September 2021: In Soledad Canyon this abundant species formed large puddle clubs near the Soledad Spring headwall. Preferred soils were saturated sand with small gravel and occasional larger rocks; shallow pools of water, when present, were avoided by Mexican Yellows. Puddle clubs included numerous individuals ranging from a few hundred to several hundred in number; sometimes a few individuals of other sulphur butterfly species would join the club, usually along the fringe. JVL



Mexican Yellow puddle club that includes several Sleepy Orange individuals. JVL



Mexican Yellow puddlers close-up showing individual butterfly orientation to one another. JVL



Mexican Yellows puddling on rocks of the historic dam constructed along the base of the headwall of Soledad Canyon. JVL



Mexican Yellows, with other sulphur species, formed smaller, less dense puddle clubs on gravel-covered moist soil along La Cueva Trail just north of the Dripping Springs Visitor Center. JVL



Mexican Yellows puddling on moist soil along the La Cueva Trail. JVL

A short video of the Mexican Yellows (and others) described here may be viewed at this link. Video by James Von Loh. Hosted in a Vimeo Portfolio (no ads) by The Black Range Naturalist.









In the photographs to the left, Mexican Yellow butterflies are nectaring on Scarlet Morning-glory flowers, some of which are newly opening. In the bottom photo of this series, a Cloudless Sulphur (left side of image) joins a Mexican Yellow. JVL



In the photo above, a Mexican Yellow is nectaring from a blue morning-glory flower. A Dainty Sulpher, *Nathalis iole* Boisduval (1836), flies just above. JVL

In this Sampler we place this species in the genus *Abaeis* rather than in *Eurema*. This is a "where do you draw the line" question, or alternatively a split vs. lump question. The assignment to *Abaeis* is more common in North America (where it is elevated to a full genus), while *Eurema* is more commonly used in Europe. Pick one designation and someone will think you right, on the other hand, someone will think you wrong.

This species is listed as Hodges 4246.

When identifying this species, note the "dog's head" outline on the forewing and compare it with that of the Southern Dogface, *Colias (Zerene cesonia)*. The outline is more prominent in males and on the dorsal side of the wing, when compared with the ventral (underwing).

MONA or Hodges Number

When researching moths and butterflies you will generally find a Hodges or MONA (Moths of North America) number listed for the species you are considering.

There have been various attempts to distinguish individual *Lepidoptera* species (beyond the standard Linnaean scheme) over time. In 1983, Ronald Hodges published the *Check List of the Lepidoptera of American North of Mexico* establishing the numbering system which is most widely used today. The link will enable you to download a "working paper", May 2016, of the listing.

Such a schema is constantly challenged by changing taxonomic determinations, changes in species name, newly discovered species, lumped species, etc. The number initially assigned to a species stays with the species as it is "moved around" because of changes in the accepted taxonomic hierarchy. When a new species is identified, it is fit into the taxonomic order of that time and assigned a number with a decimal. The listing is in numeric order, except for the changes necessitated by the procedures used to keep the listing current. So, a number may be missing from the listing, or a number may appear out of sequence, or you might encounter something like *Epimartyria bimaculella* - Hodges 1.1, at the very beginning of the listing.

This numbering system has proven reasonably effective in controlling the chaos associated with the taxonomic determinations of more than 12,000 species (North America north of Mexico).

There are currently 89 families and 12,766 species of *Lepidoptera*, north of Mexico, which have been described. There are many undescribed species. Of these roughly 200 are introduced species. This is, however, a small number. There are more than 150,000 described species of *Lepidoptera* in the world.

Sleepy Orange

Abaeis (Eurema) nicippe

(Cramer, 1779)
Hodges # 4242

Report from September 2021: The Sleepy Orange were probably the most abundant medium-sized butterflies visiting habitats of the Organ Mountains' west-facing slopes and into the Rio Grande Valley. They formed puddle clubs where moist soil and seeps occurred, for example, from the Soledad Canyon Trailhead to its terminus at the headwall. Near the trailhead they formed less dense concentrations that included several other species including Mexican Yellows, *Abaeis mexicana* (Boisduval, 1836). At the headwall, they segregated from the Mexican Yellows to form more dense clubs of mostly Sleepy Oranges.

Sulphur species, generally, were the most abundant medium-to-large-sized butterflies visiting habitats of the Organ Mountains west-facing slopes and into the Rio Grande Valley. On these sites, they formed open and often widespread clubs that included several sulphur species and, often, other butterfly species as well. JVL

The photographs on this and on the following page were taken by James Von Loh along the Rio Grande at Las Cruces.



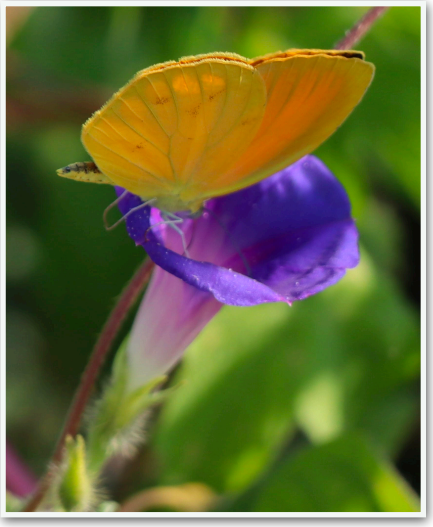
Sleepy Oranges form a high-rise puddle club, attracted by moist soil and moss on the face of the historical Soledad Canyon Dam (constructed along the headwall). They were joined by a few Mexican Yellows. JVL





Report from 2021: Smaller, mostly Sulphur, butterfly species nectared predominantly from Scarlet Morning-glory flowers in large numbers, with some selection observed for nectaring from blue morning-glory flowers. Because of their massive numbers (thousands upon thousands), their friendly nature, and their mechanics of obtaining nectar from the long, tubular, morning-glory flowers, I developed a particular affection towards the Sleepy Oranges. JVL





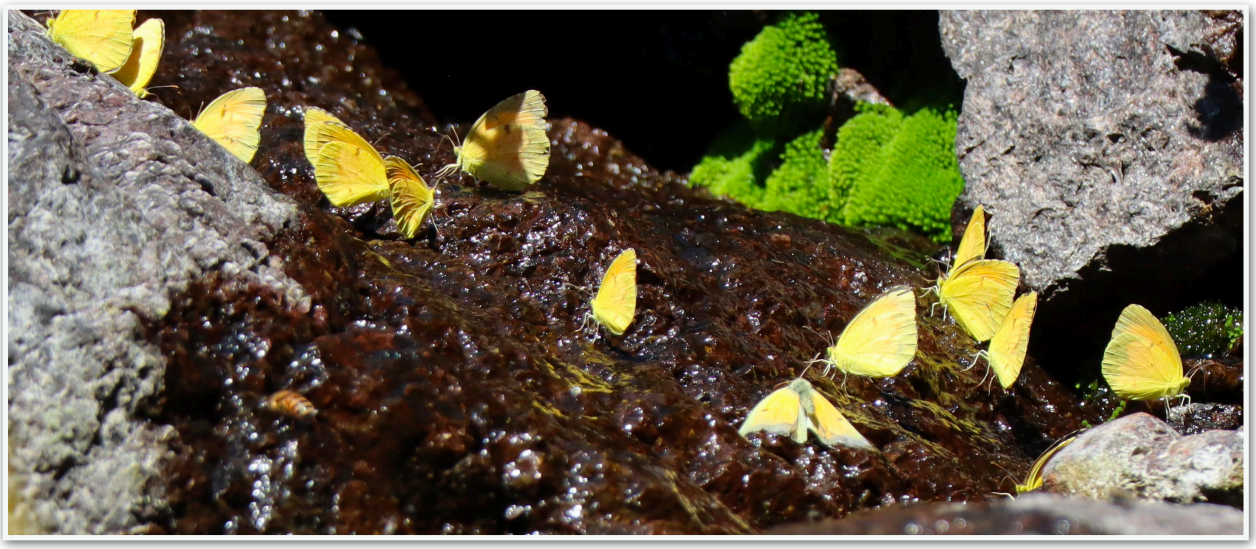




Sleepy Orange butterflies nectaring from Scarlet Morning-glory and from a blue-flowered morning-glory (uncommon observation). JVL

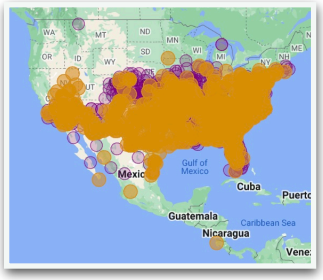






Sleepy Oranges form smaller clubs where water flows over bedrock at the Soledad Canyon Waterfall. JVL





Range Map of *Abaeis (Eurema) nicippe* - Sleepy Orange
From sightings reported to [Butterflies and Moths of North America](#).





Other References (Sleepy Orange)

- [Butterflies and Moths of North America](#)
- [Pajarito Environmental Education Center](#)
- [BugGuide](#)



Sleepy Orange and Mexican Yellow puddlers mix on drier rock and gravelly substrates near the Soledad Canyon Waterfall. GB



***Abaeis nicippe*, Sleepy Orange**
Photographed east of Hillsboro, Black Range. RAB





Sleepy Orange near Soledad Canyon Waterfall, Organ Mountains. GB

The Sleepy Oranges pictured above were taking nutrients from moist soil. Like the Mexican Yellow, this species was recently moved to *Abaeis* from *Eurema*.



Sleepy Orange and Southern Dogface, *Zerene cesonia* (Stoll, 1790), are both present here. As are Marine Blues, *Leptotes marina* (Reakirt, 1868), White Checkered-skippers, and individuals of other butterfly species. JVL



Sleepy Oranges also form smaller clubs where water flows over or splashes onto bedrock at the Soledad Canyon Waterfall. GB



Left: Mixed Sulphurs form the matrix of this puddle club on moist seep soil and gravel adjacent to the Soledad Canyon Trail. JVL

Directly Below: Sleepy Oranges are nectaring on the flowers of Spiny Chloracantha (L) and Spine-aster (R) JVL





Sleepy Orange, above on June 17, were abundant, JVL



Above: Non-sulphur butterfly species occur with the more common sulphurs, puddling together on moist soils with gravel cover.
Below: Mixed Sulphur butterflies, including Sleepy Oranges and Southern Dogface, *Zerene cesonia* (Stoll, 1790), puddling as a club on moist soil with a gravel veneer. JVL

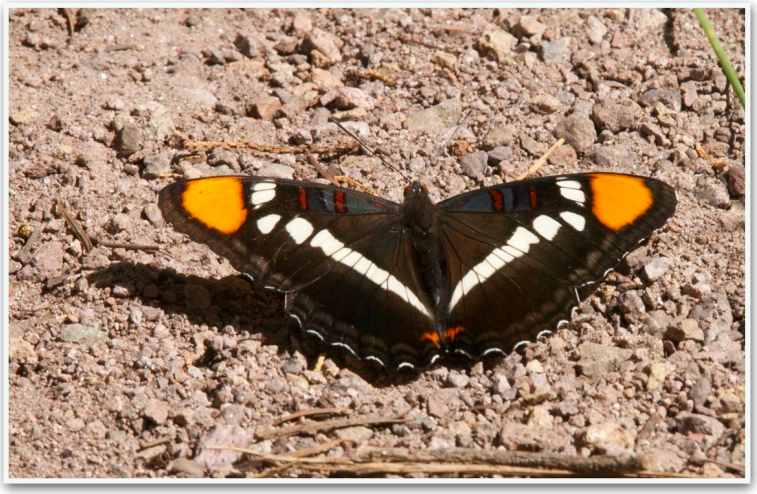




Arizona Sister
Adelpha eulalia
(Doubleday, 1848)
Hodges #4527.1

The Arizona Sister is still considered a subspecies of the California Sister (*Adelpha californica*) by some authorities. There are definitely two geographically separate regions in which the "California Sister" is found. One area is west of the Cascades and Sierra Nevada (if split into two species, this is *Adelpha californica*). The other, separated by the Mojave Desert from *A. californica*, is the species shown here. Its range extends southward through the Great Basin and includes most of Arizona and New Mexico as well as parts of Texas and much of Mexico. The individual shown above was photographed by James Von Loh while it was taking nutrients from bedrock surfaces of the Soledad Canyon Waterfall.

The Arizona Sister is generally associated with oaks and oak habitat, as occurs in upper Soledad Canyon and along the arroyo at the trailhead in the Organ Mountains and in the canyons of the Black Range.



Arizona Sister photographed in Railroad Canyon, Black Range, July 2017. RAB

Butterfly identification must often rely on subtle differences and features are not always apparent on both sides of the wing.

Lilac colored line is distinct, straight, and strongly colored in the Arizona Sister. In the California Sister this line is less distinct.



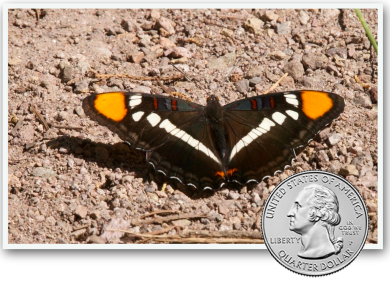
The adult Arizona Sister feeds on rotting fruit, mud, and water. It is seldom found on flowers.

The caterpillar stages are found on various species of oak (Gambel's, Arizona, and Emory - probably others).

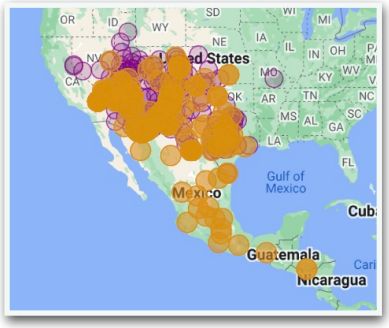
It is distinguished from Bredow's Sister (*Adelpha bredowii),* which is found in Mexico and not the United Staters. At one time, *A. bredowii* was the nominate subspecies of a species which included *A. eulalia* and *A. californica*.

Within Mexico, the Arizona Sister is found well south in the Sierra Madre. It is often found at elevations between 5,000′ and 8,500′ in New Mexico.

There are often three flights a year in our area and the three life cycles may overlap (one is at one stage of the cycle while another is at a different stage.)



The California Sister has an orange line at this location, this Arizona Sister does not.



Range Map of *Adelpha eulalia* - Arizona Sister
From sightings reported to Butterflies and Moths of North America.



Range Map of *Adelpha californica*
California Sister
From sightings reported to Butterflies and Moths of North America.

Edward Doubleday
(1810-1849)

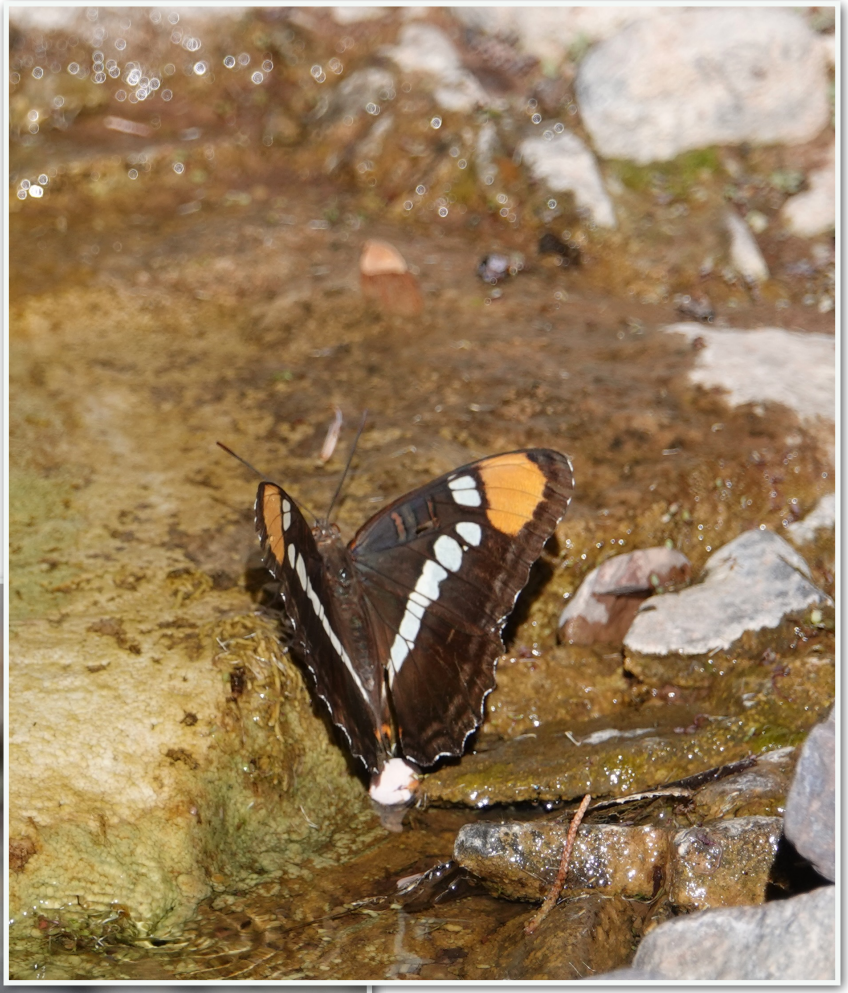
Doubleday probably never saw a live Arizona Sister (or *A. bredowii* either). He was a well known, British entomologist who did research in upstate New York during a short period in the United States. He helped establish the substantial butterfly collection at the British Museum.

Two of his major works are *The Genera of Diurnal Lepidoptera* (2 volumes) and *List of the Specimens of Lepidopterous Insects in the Collection of the British Museum* (35 parts).

Photos in left column and at top right: Arizona Sister, Drummond Canyon, East slope of Black Range, September 29, 2018. RAB









Arizona Sister, July 10. 2017 North Percha Road (FR-157) north of NM-152. RAB

Other References (Arizona Sister)

- Fundamental differences between the California Sister and the Arizona Sister
- Pajarito Environmental Education Center
- BugGide



Above: Gulf Fritillary, photographed at Lake Valley in the Black Range of New Mexico by Debora Nicoll



Gulf Fritillary
Agraulis incarnata
(Linnaeus, 1758)
Hodges #4413

Depending on the reference you have at hand, this species may be listed as *Dione vanillae* or *Agraulis vanillae* (Linnaeus, 1758).

In January 2022, Rayner Núñez, et al published the findings of research they had conducted on *Agraulis* and *Dryas* in "Integrative taxonomy clarifies species limits in the hitherto monotypic passion-vine butterfly genera Agraulis and Dryas"; by Rayner Núñez, Keith R. Willmott, Yosiel Álvarez, Julio A. Genaro, Antonio R. Pérez-Asso, Marina Quejereta, Thomas Turner, Jacqueline Miller, Christian Brévigon, Gerardo Lamas, and Axel Hausmann; *Systematic Entomology,* The Royal Entomological Society, 47:152-178, 2022. Both *Agraulis* and *Dryas* had been treated as monotypic prior to the study. The cited study found seven species of *Agraulis* and four species of *Dryas*.



Gulf Fritillary caterpillar on *Passiflora caerulea*.
Photographed by Margie Gibson in Silver City, Grant County, N.M.

The initial draft of this *Sampler* was well underway when the study by Núñez et al. became better known. (See "DNA Barcoding and Those White-haired Black Caterpillars", *The Black Range Naturalist*, Vol. 6, No. 2, for an extended study of "knowing" when "knowledge" is continually evolving.) From an editor's perspective, it meant a lot of work; substance, the order of pages, page cites, etc. etc. had to be changed because the species had been listed as *Dione vanillae* (with a nod to *Agraulis vanillae*). Reordering of the *Sampler* was in order. I threw up my hands, it was late, I was tired, and decided to give it up for the day. The following morning, I awoke to possibilities, lots of possibilities. An integral part of the initial article on this species dealt with the work of Maria Sibylla Merian, if you read on you will be immersed in sausage making.

Natural History research can be a painstaking undertaking. The study of insects can be tedious, eye straining, and physically demanding. If you were a woman in the 1600's it is not something you did. But Maria Sibylla Merian did; in fact, she was one of the very first naturalists to study insects in the wild. To top it off, she ventured from Amsterdam to what was then Dutch Suriname in 1699 to do some of her most famous field work. The plate to the right shows the complete life cycle of the Gulf Fritillary. Showing the complete life cycle of an insect was a ground breaking concept. The plate is from her book *Metamorphosis Insectorum Surinamensium* about the insects of Suriname, published in 1705.

To understand how hidebound the world was at the time when she was working, she was not allowed to work in oil to create her images, because she was a woman.

Linnaeus named this species *Papilio vanillae* in 1758, based on Merian's painting of the species. It is he, not Merian, who is credited with the original description of the species.

In 1835 Boisduval & Le Conte moved the species to the genus *Agraulis*.



Plate XXV from Merian's *Metamorphosis Insectorum Surinamensium*.



The portrait of Merian, painted by Jacob Marrel, dates from 1679.


METAMORPHOSIS
INSECTORUM SURINAMENSIUM.
OFTE
VERANDERING
DER
SURINAAMSCHE
INSECTEN.
DOOR
MARIA SIBYLLA MERIAN.
TO AMSTERDAM,

In 2019, *Agraulis* was made a sub-genus of *Dione*, based on a phylogenetic study.

Zhang et al, 2020, proposed a split of *Agraulis* and the elevation of *Agraulis incarnata* to a full species after analyzing COI barcodes and nuclear genomes. ("Genomic evidence suggests further changes of butterfly names"; *Taxonomic Report*, 8(7), 1-41.)

The study by Núñez et al. (2022) reordered *Agraulis* completely, the genus went from monotypic (but with eight recognized subspecies) to a genus of seven species. And it was not a case of thoughtless splitting. The new taxonomy explains many a puzzle. *Agraulis vanillae incarnata* was described as a subspecies by Riley in 1926.

Knowledge is never complete. Among the techniques utilized by Núñez et al. were detailed analysis of morphological "landmarks" on the wings. Significant sample sizes of wing markings underwent vigorous statistical analysis (using several different methodologies as cross checks). Findings like "Overall FW (forewing) deformation implies that males have a broader wing compared to females. This is due to the displacement of the wing base and the veins ending at the tornus, landmarks 1-4 (Figs 3, S10). As noted above, in males the origin of the Cu1 vein, landmark 16, is much closer to the end of cell whereas in females it is near the middle (Fig. 3). This trend is also present in each taxon when analysed separately (Figure S11A). On the HW, sexual dimorphism is almost indistinct . . ."

Technological and methodological advancements have extended our umvelten (see the discussion in *BRN 6-2, The Immense World book review*). The utilization of ever increasing precision in the analysis of species morphology (to include genetic attributes) allows us to draw ever more nuanced distinctions. In the case of this study, the distinctions made seem appropriate. Such a conclusion may not apply to all cases using similar techniques, however. Ultimately, the individuals of a species and the actions they take determine speciation. The differences between individuals, identified by our ever more advanced technological and methodological tools, may not be obvious to individuals of the species concerned. Even if they are obvious, they may not cause individuals to make different reproductive choices. (This is not a criticism of current methodologies per se, the same argument can be advanced when assessing the species determinations made throughout the time humans have made such determinations.)

Agraulis Boisduval and Le Conte, [1835]
Agraulis incarnata (Riley)
Agraulis incarnata incarnata (Riley)
Dione vanillae incarnata Riley, 1926: 243
Agraulis incarnata nigrior Michener
Agraulis vanillae nigrior Michener, 1942: 7
Agraulis vanillae (Linnaeus)
Papilio vanillae Linnaeus, 1758: 482
Agraulis forbesi Michener, **new status**
Agraulis vanillae forbesi Michener, 1942: 3
Agraulis insularis Maynard, **reinstated status**
Agraulis insularis Maynard, 1889: 89
Agraulis maculosa (Stichel), **new status**
Dione vanillae maculosa Stichel, [1908]: 18
Agraulis lucina C. Felder & R. Felder, **reinstated status**
Agraulis lucina C. Felder & R. Felder, 1862: 110
Agraulis galapagensis Holland, **new status**
Agraulis vanillae var. *galapagensis* Holland, 1890: 194
Agraulis sp. (undescribed species)

The species taxonomy described by Núñez et al. (2022) found the species shown above (from the cited work).

The original draft of this article contained the following:

Even the Great

Even the great are not infallible. Merian's painting shows the caterpillar on a vanilla plant. It is now known that this species does not use the vanilla plant for nutrition or as a place for its chrysalis. (Ed.: Although it may be an accurate depiction of the natural history of the species, it doesn't necessarily mean that she did not see this in nature at some time.)

The species, however, retains its specific epithet, *vanillae*.

There are two issues tied up in these two paragraphs.

Firstly, the notation on the specific epithet is still correct, but diminished. The species known to Merian, the species found in northern South America, retains the epithet *Agraulis vanillae*. Previously, this species was classified as the nominate subspecies *A. v. vanillae*.

Secondly, others have mismatched the host plant and the butterfly larvas shown on them. For instance, John Abbot in his drawings from 1816-1818, for William Swainson, showed erroneous hostplants in (at least) his depictions of *Papilio palamedes* (the Laurel Swallowtail, found in the south-eastern United States) and *Asterocampa clyton* (the Tawny Emperor found in eastern North America). These errors persisted for decades.

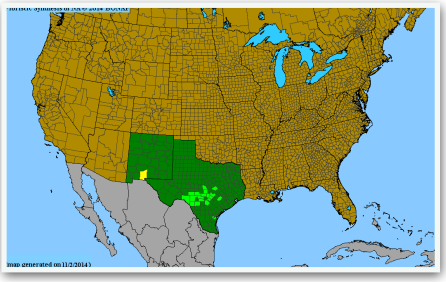
***Agraulis* are *Passifloraceae* (*Passiflora*, passion flower) specialists. The larva of *Agraulis incarnata*, the species found in our area, uses *Passiflora incarnata, P. lutea, P. suberosa, P. foetida,* and possibly other *Passifora* as host (food) plants for its larva. This species also uses Buttonsage, *Lantana involucrata*, as a larva host plant.**



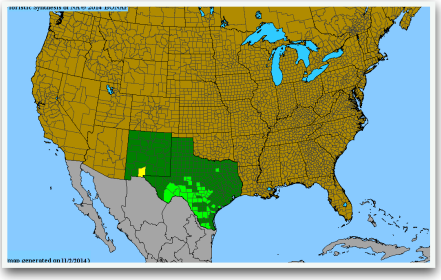
John Abbot's depiction of *Agraulis vanillae* (now *A. incarnata*). From the University of South Carolina Irvine Department of Rare Books and Special Collections (John Abbot Watercolors of Lepidoptera of the South East)



We have gone afield to obtain an image of the chrysalis of this species. The one shown here was photographed by Colton Price in Houston, Texas. The pupa is on a *Passiflora* vine. The image is posted on iNaturalist as *Dione vanillae*. It is shown under a Creative Commons license.



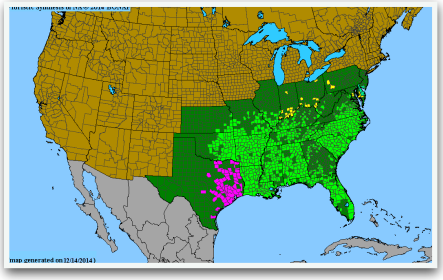
***Passiflora affinis* - BONAP - retrieved 4/7/2023.**



***Passiflora tenuiloba* - BONAP - retrieved 4/7/2023.**

BONAP indicates that *P. affinis* and *P. tenuiloba* are present and native in New Mexico based on specimens from Doña Ana county, where it is listed as rare (yellow color). *Passiflora incarnata* is not found natively in New Mexico.

Steve Cary, at his wonderful site on



***Passiflora incarnata* - BONAP - retrieved 4/7/2023.**

New Mexico Butterflies, lists this species as Dione vanillae (4/7/2023). He notes that the species regularly wanders to the southern counties of New Mexico and that larva have been recorded in Alamogordeo, on *Passiflora*. The site includes photographs of larva on what appear to be non-native *Passiflora (but not P. incarnata.)*

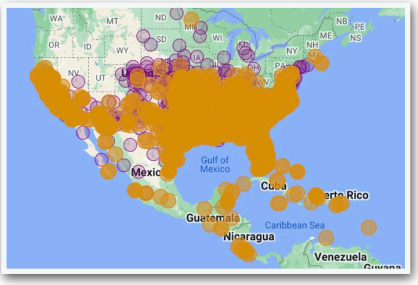
Adults nectar on a variety of species, including; *Lantana*, Shepherd's Needle (*Scandix pecten-veneris*), *Cordias*, composities, and other flowers.

***Lantana* is also used as a larva host plant. Only one species of *Lantana, L. urticoides*, is known natively from New Mexico (Grant County).**

Scientific Name	Collector	Number	Date	Country	State/Province	County	Locality
Passiflora inamoena A.Gray	C. Wright	1084		U.S.A.	New Mexico		
Passiflora tenuiloba Engelm. ex A. Gray	Charles C. Parry	393	1852-09-10	United States	New Mexico		Valley of Rio Grande below Donna Ana
Passiflora tenuiloba Engelm. ex A. Gray	John Milton Bigelow	393	1852-09-00	United States	New Mexico	Doña Ana	Dona Ana Co.
Passiflora tenuiloba Engelm. ex A. Gray	Charles (Carlos) Wright	1383	1852-00-00	United States	New Mexico		
Passiflora tenuiloba Engelm. ex A. Gray	Charles (Carlos) Wright	171		United States	New Mexico		
Passiflora tenuiloba Engelm. ex A. Gray	Charles (Carlos) Wright	1083	1851-00-00	United States	New Mexico		N. Mexico
Passiflora affinis Engelm.	Charles C. Parry	s.n.		United States	New Mexico		Dona Ana County.
Passiflora tenuiloba Engelm.	C. Wright	1383	1852-00-00	United States of America	New Mexico		
Passiflora inamoena A.Gray	C. Wright	1084	1851-00-00	United States of America	New Mexico		
Passiflora caerulea L.	Holmes, Cyndie	1684	1996-08-27	United States	New Mexico	San Juan	Near La Boca, Colorado. Los Pinos River area. One mile south of Colorado border.

***Passiflora* species are not common in New Mexico. See the listing from SEINet above (retrieved 4/7/2023 - *Passiflora* + New Mexico) and the BONAP distribution maps above.**

It is possible that *Agraulis incarnata* uses other plant species as larva hosts and it probably uses species not listed above as nectar sources. The range map shown below is not completely accurate since *A. incarnata* was elevated to a full species.



Range Map of *Dione vanillae*
Gulf Fritillary
From sightings reported to
Butterflies and Moths of North America.

The range depicted, within the United States and Mexico remains quite accurate however.

My first take on the western range of the species, as indicated on the map, was that *A. incarnata* must utilize more larva host plants and nectar sources than is described in the literature. However, Art Shapiro, who has studied the butterflies of California for more than 45 years notes "*This butterfly has no native host plant in California and is entirely dependent on introduced species of the tropical genus Passiflora (Passion Flower, Passion Vine), including the common Maypop (P. incarnata) and P. X alatocaerulea. However, it will not eat all of the Passiflora in cultivation in California.*"

Is this a case where range extension is due entirely to human intervention and the planting of non-native plants? The species was first found in Southern California in the late 1800's and was noted in the San Francisco area by 1908.

Is it possible that *A. vanillae* is found in association with species of vanilla plant? Probably not, but the absence of observation does not mean that it doesn't happen. (Although Merian probably took a bit of artistic license in her depiction of the species it can be difficult to admit that your heroine is human.)

The question of how "hard-wired" individuals are in their preference for "X" is becoming increasingly important given the significant (and swift) changes to the environment which we are experiencing. Species (phenotypic) plasticity will likely be the key to their likelihood of survival. In "From the butterfly's point of view: learned colour association determines differential pollination of two co-occurring mock verbains by Agraulis vanillae", M Eugenia Drewniak, Adriana D Briscoe, Andrea A Cocucci, Hernán M Beccacece, Adriana I Zapata, and Marcela Moré determined that *A. v. maculosa* could be trained to prefer certain plant flower colors. (*Biological Journal of the Linnean Society*, Volume 130, Issue 4, August 2020, pages 715–725). This subspecies has now been elevated to a full species, *A. maculosa*. It is found south of the range of *A. vanillae* (Argentina into Brazil).

Núñez et al. (2022) note the "distribution of most taxa includes contact zones or very closely abutting ranges . . . All named South American taxa and *Agraulis* sp. are in contact or in very close proximity with at least one congener."

Proximity always raises the question of "where do you draw the line"? In a cline of differences where is there a difference? COI barcodes are generally thought to indicate distinct species when the genetic distance is around 2%, but some species distinctions have been made when the genetic difference is as low as 1%, because separate species were found appropriate by the other method-ologies used at the time. Note that "genetic distance" does not translate directly to "genetic difference", a genetic difference of 2%, for instance, could indicate that different "families" are involved - a very significant difference.

Utilizing an analysis of genetic distance the study determined that *A. incarnata* evolved into a separate species at least 2.8 million years ago and perhaps as much as 8.59 mya.

The cited study notes that "*Hypotheses explaining speciation and the present day distribution of Agraulis species require further research, but likely include adaptation to the different habitat types, colonization of new areas followed by periods of isolation and posterior range expansion.*"

When we think about butterflies, smell is not often one of the topics which comes readily to mind. But smell plays an important role in the lives of butterflies. For instance, the Gulf Fritillary will emit foul smelling chemicals when it encounters a predator. Chemical defenses are fairly common in *Lepidoptera*, including the ability of many species to sequester toxic substances contained in the plants the instar eats, making both the caterpillar and adult noxious, if not poisonous, to predators.

A substantive discussion of chemical defenses in this species and others can be found in "Variation of chemical compounds in wild Heliconiini reveals ecological factors involved in the evolution of chemical defenses in mimetic butterflies". (Ombeline Sculfort, Erika C. P. de Castro, Krzysztof M. Kozak, Søren Bak, Marianne Elias, Bastien Nay, and Violaine Llaurens; *Ecology and Evolution*, 13 Feb. 2020). The authors note that "*These neotropical butterflies contain large concentrations of cyanogenic glucosides, cyanide-releasing compounds acting as predator deterrent. These compounds are either de novo synthesized or sequestered from their Passiflora host plant, so that their concentrations may depend on host plant specialization and host plant availability.*"

Passiflora is not simply a (food) host plant for this species. It is integrated into all elements of the natural history of the species. Such a tight association may diminish the phenotypic plasticity of a species.

All of this because of a name change.

If you encounter *Agraulis incarnata*, at any life stage, please document the event, noting the type of plant that you found it on and let us know. Also, if you encountered either of the two native *Passiflora* species please let us know about that. Thanks.

- Bob Barnes
rabarnes@blackrange.org

Cassus Roadside-Skipper

Amblyscirtes cassus

(W. H. Edwards, 1883)

Hodges # 4090

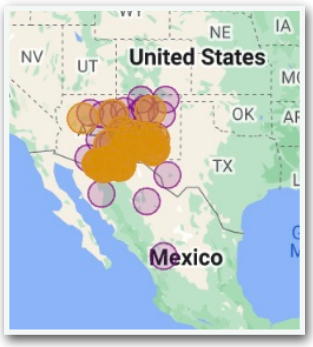
As with many butterflies, the dorsal and ventral view of the wings is very different.

This species is typically found within the 5,400′ to 9,200′ elevation range. The individual shown here was photographed along NM-152 west of Kingston, just above the 7,000′ elevation mark. It is often found in pine woodlands with lots of understory grass.

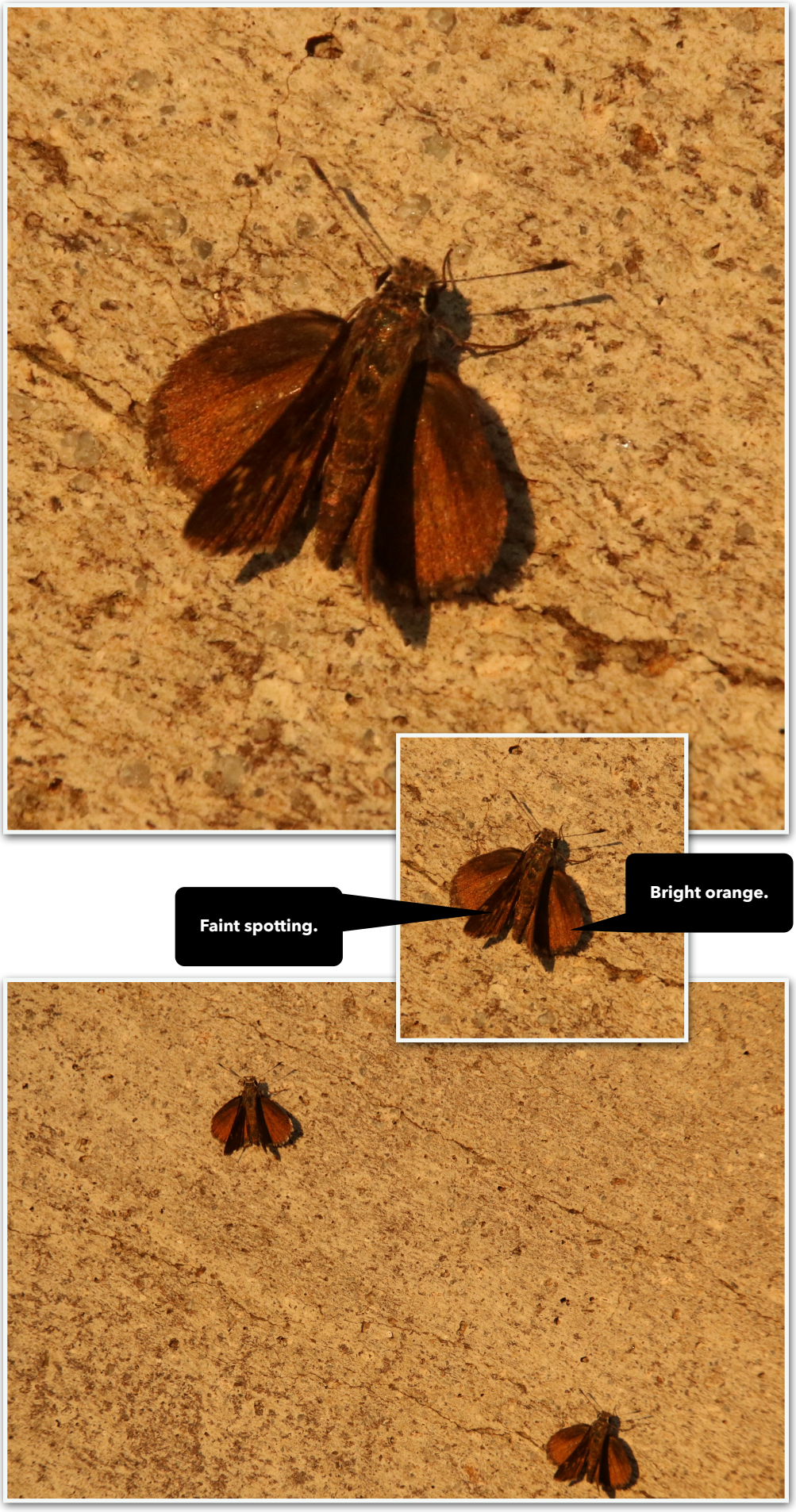
There has only been one annual flight recorded, between late May and late August, peaking in July.

The Cassus Roadside-Skipper is threatened throughout its range of NM-AZ-West Texas south into northern Mexico.





Range Map of *Amblyscirtes cassus* - Cassus Roadside-Skipper from sightings reported to [Butterflies and Moths of North America](#).



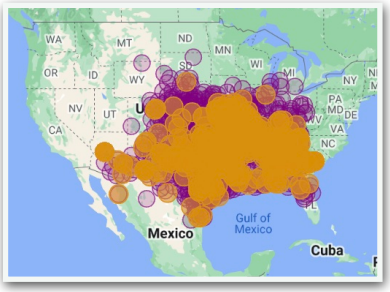


The Goatweed Leafwing, *Anaea andria* (Scudder, 1875) would be an excellent sighting in the Black Range. Many butterfly species are known to wander - keep your eyes out. This individual was taking nutrients from gravel along the creek below the La Cueva parking lot. This individual is a male. GB

Goatweed Leafwing
Anaea andria
(Scudder, 1875)
Hodges # 4554

As with many butterflies, the dorsal and ventral view of the wings is very different. When the ventral side of the wings of this species are displayed they look very much like a dead leaf - thus its common name.

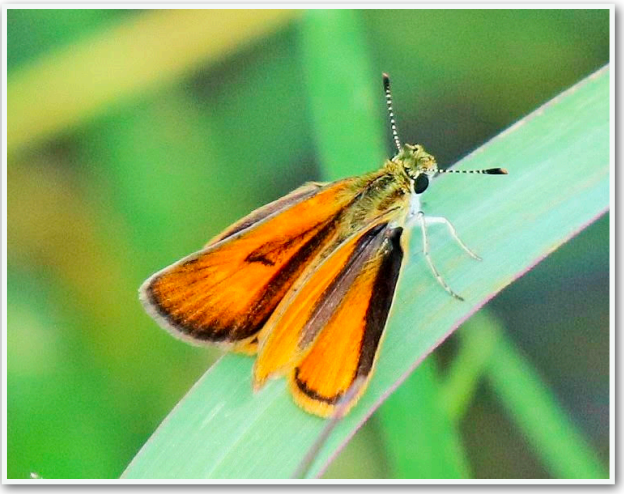




Range Map of *Anaea andria* - Goatweed Leafwing From sightings reported to [Butterflies and Moths of North America](#).

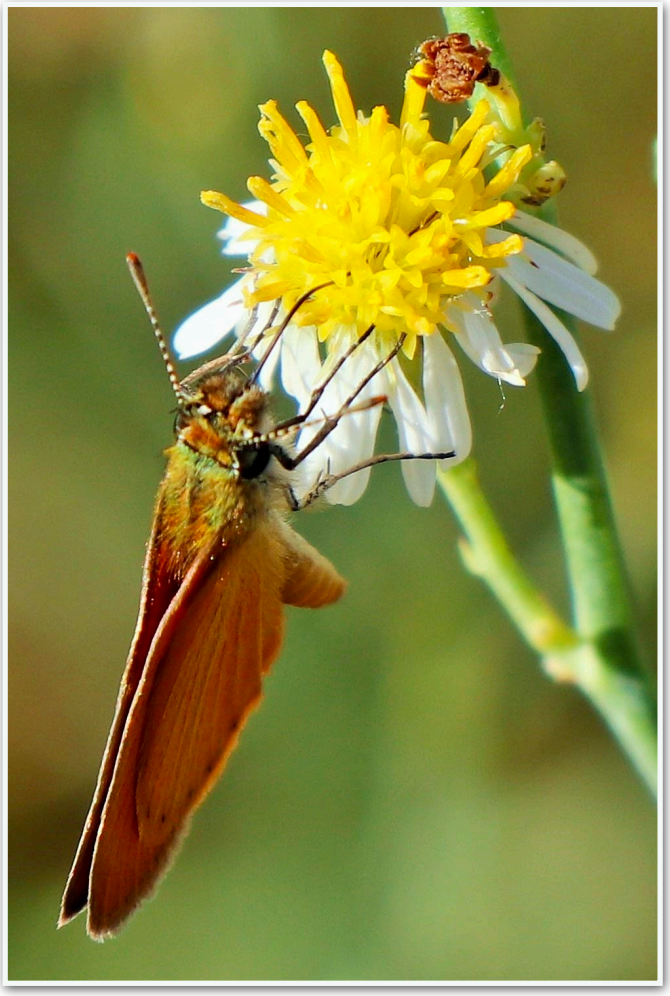
Tropical Least Skipper
Ancyloxpha arene
(W. H. Edwards, 1871)
Hodges #4005

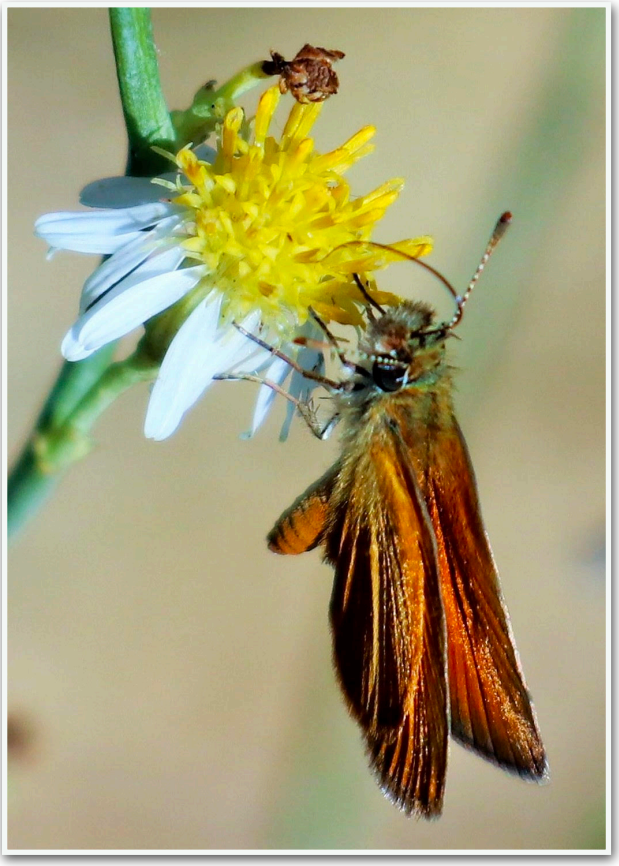






Top: Tropical Least Skipper nectaring from Horsetail Milkweed flowers (left) and perched on Johnson grass in a stand of Horsetail Milkweed (right). This species has rarely been documented, and when seen it is typically at the beginning of the Milkweed flowering period. JVL



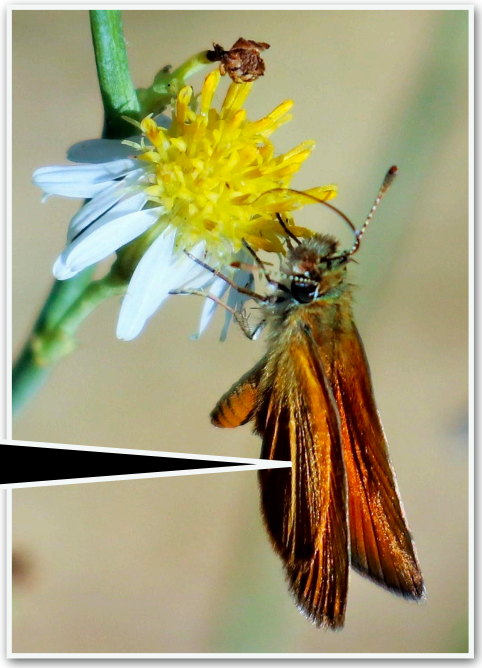


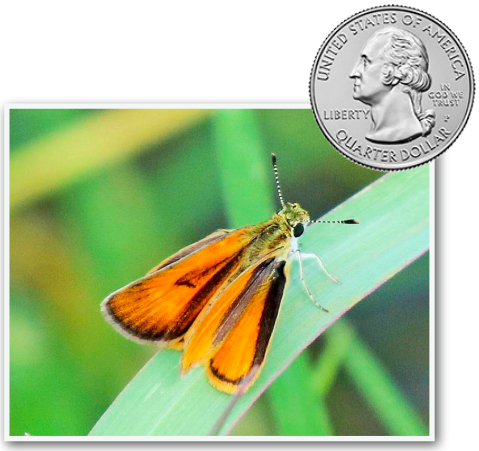
Tropical Least Skipper on June 2 (left and right) and June 14 (center right). JVL





Range Map of *Ancyloxypha arene* - Tropical Least Skipper From sightings reported to [Butterflies and Moths of North America](www.butterfliesandmoths.org).





Skippers have two sets of wings which look like they are set on top of each other, rather than in a forewing and hindwing configuration.

Adults nectar from a variety of low growing plants while the caterpillar use *Echinochloa crusgalli, Polypogon viridis, Polypogon monspeliensis* and *Paspalum distichumas* as food hosts (see *Polypogon virdis* on the Vascular Plants of the Gila Wilderness website).

Skippers have significant muscles at their thorax to enable their rapid flight with quick alterations in trajectory.

Other Resources

Pajarito Environmental Education Center

PEEC - The Pajarito Environmental Education Center
(Los Alamos Nature Center)

The PEEC is a premier natural history resource in New Mexico. They are worthy of your support - take a look at their website, it is impressive. Steve Cary, Michael Toliver, and others have established a phenomenal resource in their "Butterflies of New Mexico" section of the website. As noted in their introduction:

> **New Mexico is home to more than 300 different butterfly species, placing it in the top three states for butterfly species richness, alongside Texas and Arizona. Admittedly, various excellent published field guides (including Glassberg 2017 or Brock and Kaufman 2003) already cover all of New Mexico's species. Comprehensive online resources exist as well, including www.butterfliesandmoths.org (Butterflies and Moths of North America (BAMONA)) and http://butterfliesofamerica.com (Butterflies of America). One consequence of their continental or hemispheric geographic scope, however, is that they compromise on local details. For New Mexico, or any other state, they do not provide all of the hows, whys and wheres, the details one typically needs to actually go out and find, study or photograph many of those butterflies . . . This present work will fill in some of the missing and critically interesting geographic details. When 'Species A' looks different in New Mexico compared to California or Florida, this site/book will illustrate that by using New Mexico images wherever possible; I think that will prove to be more than 90 percent of the time.**

Oslar's Oakworm Moth
Anisota oslari
(Rothschild, 1907)
Hodges #7722

This species is found in southern parts of New Mexico and Arizona, west Texas, and Chihuahua. Larva of the species feed on oak species, including Emory Oak.

Synonyms include: *A. neomexicana* and *A. skinneri*.

The photographs on this page were taken by Véronique De Jaegher in Kingston, N.M.













Caterpillar photographs on this and the following page were taken along the Kingston Cemetery - Emory Pass Trail, Black Range on October 11, 2022. RAB



Other Resources

- Butterflies and Moths of North America
- BugGuide
- North American Moth Photographers Group
- Moths of the Gila National Forest



Range Map of *Anisota oslari* - Oslar's Oakworm Moth From sightings reported to Butterflies and Moths of North America.



Female *Anisota oslari* from Ron Parry's website, Southwestern Moths.



White Angled-Sulphur
Anteos clorinde
(Godart, 1824)
Hodges #4266

Nichole Trushell took the photograph below in Kingston on September 25, 2010. She has not seen it there since that time.

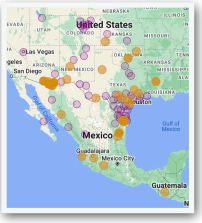
Bob Sivinski took the photograph on the following page at Emory Pass, Black Range, on August 8, 2011.

There are only a handful of sightings of this species in New Mexico. It generally is found in South America (as far south as Argentina), north through Central America and Mexico. It is sometimes seen as a stray in a small bit of southeastern Arizona and the lower Rio Grande valley. There are two subspecies. Based on range this is most likely *A. c. nivifera*.

Note the angle of the antenna in both photographs.

The range map below was generated from sightings reported to Butterflies and Moths of North America (BMNA).

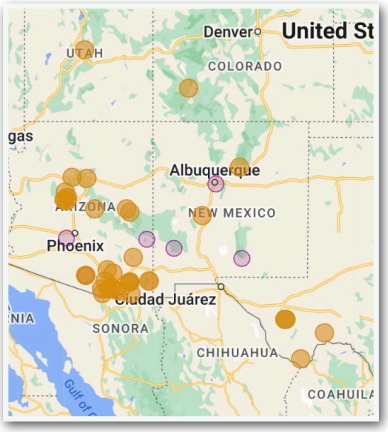




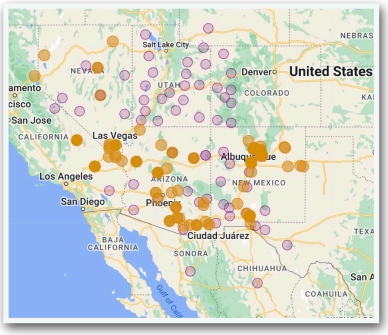




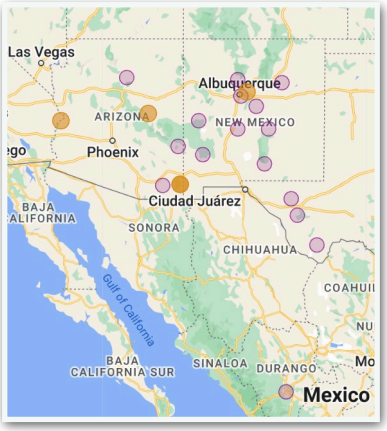
White Angled-Sulphur. Bob Sivinski took this photograph at Emory Pass on August 8, 2011.



Range Map of *Antheraea oculea*
Western Polyphemus
From sightings reported to
Butterflies and Moths of North America.



Range Map of *Anthocharis thoosa*
Southwestern Orangetip
From sightings reported to
Butterflies and Moths of North America.



Range Map of *Arachnis zuni*
Zuni Tiger-Moth
From sightings reported to
Butterflies and Moths of North America.

Range Maps

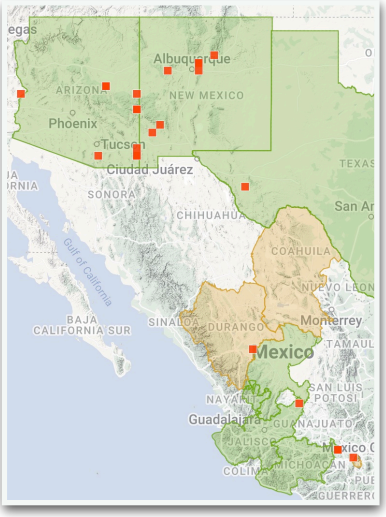
The range maps shown in this Sampler are based on the occurrences recorded in the Butterflies and Moths of North America data base. These sightings may be current or they may be historical (collections, etc.). In all cases they have been verified.

Because the maps depict individual sightings these maps do not always have that nice outline look which is depicted in some range maps, showing the boundary of the range and shading in everything within the boundary. This may lead you to conclude the species is found everywhere within those boundaries. There is utility in these maps but they suffer from a lack of detail. It is not true that a species which is only found above 8,000', for instance, is found everywhere within the boundary depicted - only above 8,000' within the boundary.

Because maps generated from data bases like those of Butterflies and Moths of North America reflect that data base, maps generated by different organizations will sometimes record different sightings. For instance, the following map is from the North American Moth Photographers Group. It documents the sightings within its data base, in this case for *Arachnis zuni*.



Because sightings are often reported to multiple data bases the maps generated by different organizations will often look very similar. The iNaturalist range map (see below), for instance, of *Arachnis zuni* looks similar to that generated by BMNA but is not the same.



These are all excellent maps, predicting which organization will have the most extensive set of sightings for a particular species, in its data base, is not always possible.

U. S. Coinage

The size of butterflies and moths varies within species, sometimes the individual range is significant.

We provide an indication of the size of the individuals shown in these photographs by placing an image of a coin from the United States next to the image. The diameter of American coins is shown below.



17.99 mm (.7")



19 mm (.75")



24.26 mm (.95")



Western Polyphemus or
Oculea Silkworm
Antheraea oculea
(Neumoegen, 1883)
Hodges #7757.1



The photographs of Western Polyphemus shown here were taken by Tom Lander, in Kingston during June 2022. Some consider it a subspecies of *Antheraea polyphemus*.



See range map on page 41.



Southwestern Orangetip
Anthocharis thoosa
(Scudder, 1878)
Hodges #4206.2



The photographs of Southwestern Orangetip shown here were taken by James Von Loh. The top image was taken along the Bar Canyon Trail, the bottom one along Pine Tree Trail above the Aguirre Springs Campground. Both locations are in the Organ Mountains. In both cases the individual is taking nutrients from gravel and most soil.

The top image is of a female; if it were a male there would be more orange and black, and less white, in the wingtips.

This species of butterfly can be found early in the year, perhaps as early as February. Its "flight" may be over by April.

"Flight" is a term often encountered in discussions of butterfly species, as in "its flight may be over by April" or a species may have "three flights". Good luck trying to find a definition; you will be swamped by entries about butterfly flight, the mechanics thereof - a fascinating topic, but it has not much to do with what we are discussing here. A butterfly goes through several life stages (egg, larva, pupa, and imago). The adult, or imago, stage is what we call a butterfly (or moth). Before it dies, a female will probably lay eggs and the process will start over again. Each of these cycles can be said to end with an adult which flies. A "flight" is shorthand for the ending period of this cycle. Some species go through several "flights" in a year, some do not.





In the case of this Orangetip, there are two flights in a year (it is a "bivoltine" species). The first complete life cycle occurs between January and April, the second between May and July. Rarely do they overlap. But note, and this is a big note because natural history is not simple - some pupae of this species have been known to stay in that stage for three years.

Some authorities consider *Anthocharis thoosa* to be a subspecies of Sara Orangetip, *Anthocharis sara thoosa*.

Other Resources

- Butterflies and Moths of North America
- BugGuide
- North American Moth Photographers Group
- Pajarito Environmental Education Center

Zuni Tiger-Moth
Arachnis zuni
(Neumoegen, 1890)
Hodges #8150

The photographs of *Arachnis zuni* shown here were taken by Matilde Holzwarth, in Railroad Canyon, southwest of Hillsboro Peak, on June 8, 2012.

The hand on which the moth sits is that of her husband, Lloyd Barr.

Matilde and Lloyd were professors (pathology), researchers, and naturalists who explored the Black Range during most of the first two decades of the twenty-first century.







Southwest Fritillary
Argynnis n. nausicaa
(W. H. Edwards, 1874)
Hodges #4459.1

This species was, until recently, considered a subspecies of Atlantis Fritillary, *Speyeria atlantis*. Now it is generally placed in *Argynnis,* following a determination by Zhang et al. (2020) that Speyeria was a subgenus of *Argynnis*. At the same time, this butterfly was elevated to a full species *A. nausicaa*.

If you find a Fritillary in our area which looks like this, it is this species. The Pajarito Environmental Education Center website notes that "As a consequence of New Mexico's physiography, suitable habitats are isolated from each other by broad, unsuitable lowlands. As a result of isolation, multiple local regional populations have differentiated and are recognized as distinct subspecies." The subspecies typically found in the Black Range will probably be the nominate form, which apparently intergrades with *A. n. dorothea* in the Magdalena Mountains to the north.

Violets are one host plant for this species. Adults feed on wet sand and nectar from a variety of flowers including rabbitbrush, mint, cinquefoil, and Gaillardia. Single eggs are laid in the leaf litter very near host plants. There is one flight per year, peaking during July and August. Violets are generally found between 7,500' and 10,000' in the Black Range, that helps to define where you are likely to encounter this species.

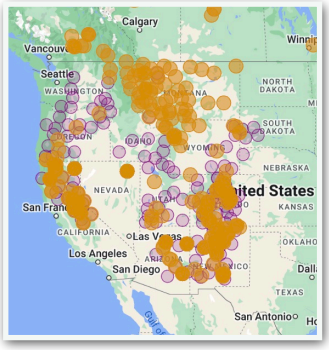


Southwestern Fritillary photographed in Railroad Canyon, Black Range, July 2017. RAB

The Butterflies and Moths of North America website notes that "unfed first-stage caterpillars overwinter, emerging in spring to feed on leaves".

Other Resources
(Southwest Fritillary)

- Butterflies and Moths of North America (lists this species as *Speyeria hesperis* - unsplit)
- North American Moth Photographers Group (lists this species as *Argynnis hesperis* - genus change but unsplit)
- BugGuide (lists this species as *Speyeria hesperis* - unsplit but has an extensive discussion of taxonomic determinations)
- Butterflies of America (photographs limited to *A. n. greyi)*
- Pajarito Environmental Education Center



U. S. Range Map of *Speyeria hesperis* Northwest Fritillary (unsplit - see text) From sightings reported to Butterflies and Moths of North America.



Southwestern Fritillary photographed in Railroad Canyon, Black Range, July 1, 2018. RAB

Compared to the Northwest Fritillary, which is found in the northern part of the state, underwing markings are darker.



Front inside portion of hindwing is a darkish red disk, distinct from the lighter rear wing margin.

Black Witch
Ascalapha odorata
(Linnaeus, 1758)
Hodges #8649

Despite what you might assume from the range map below, this is primarily a tropical species, but one which wanders widely. Therefore, it is more likely to be found in the southern part of its range than in the northerly areas depicted on the map. The Black Witch is found southward into South America. It has been recorded as far north as Juneau, Alaska and Churchill, Manitoba.

Caterpillars feed on Cassia and *Mimosa aculeaticarpa* (Catclaw Mimosa or Wait-A-Minute Bush). Adults feed on tree sap and very ripe fruit.



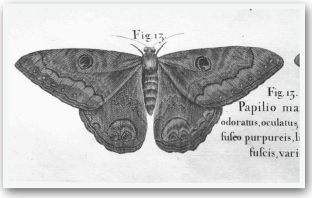
Larva of *Ascalapha odorata* - Image by Forest and Kim Starr, shown here under provisions of a Creative Commons License, Attribution 3.



Southwest Canyon Spring, East side of the Black Range, July 6, 2017. RAB



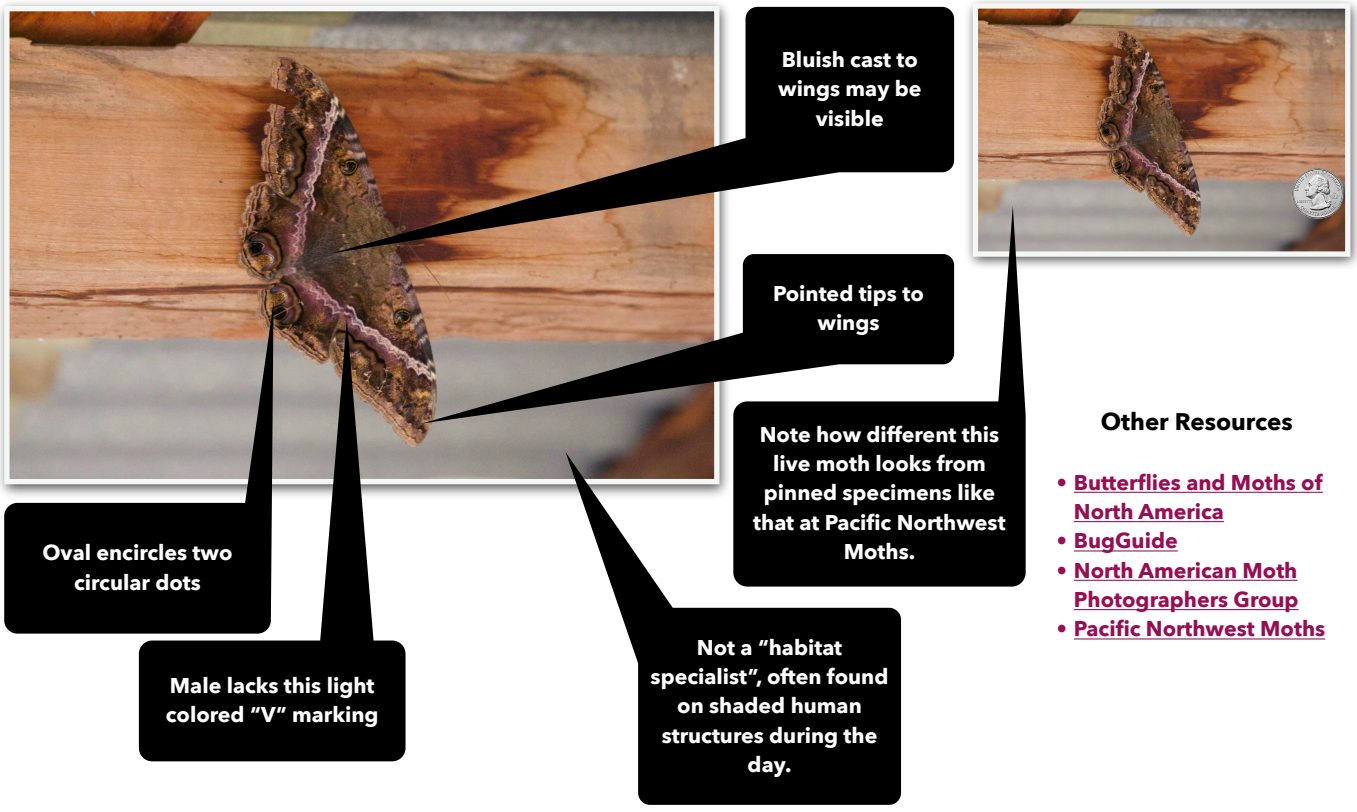
Range Map of *Ascalapha odorata*
Black Witch
From sightings reported to Butterflies and Moths of North America.



The original drawing of *Ascalapha odorata*, from A voyage to the islands Madera, Barbados, Nieves, S. Christophers and Jamaica: *with the natural history of the herbs and trees, four-footed beasts, fishes, birds, insects, reptiles, &c. of the last of those islands; to which is prefix'd, an introduction, wherein is an account of the inhabitants, air, waters, diseases, trade, &c. of that place, with some relations concerning the neighbouring continent, and islands of America. Illustrated with figures of the things described, which have not been heretofore engraved. In large copper-plates as big as the life*, Vol. 2, 1707, Hans Sloane, Table 236.



Female Black Witch photographed in Hillsboro during July 2015. RAB

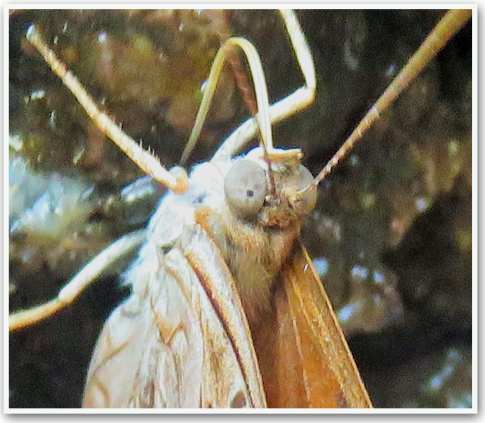


Other Resources

- Butterflies and Moths of North America
- BugGuide
- North American Moth Photographers Group
- Pacific Northwest Moths

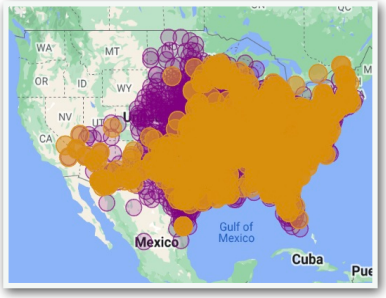
Hackberry Emperor
Asterocampa celtis
(Boisduval & Le Conte, 1835)
Hodges #4557

The Hackberry Emperors pictured directly below were taking nutrients from bedrock seeps in Soledad Canyon in the Organ Mountains. Both photographs are by Gordon Berman.









Range Map of *Asterocampa celtis*
Hackberry Emperor
From sightings reported to
Butterflies and Moths of North America.



Above: Hackberry Emperor, photographed in Lake Valley, Black Range, by Debora Nicoll.



On a site in Fillmore Canyon, the Hackberry Emperor, was documented extracting nutrients from domestic dog scat piles. JVL



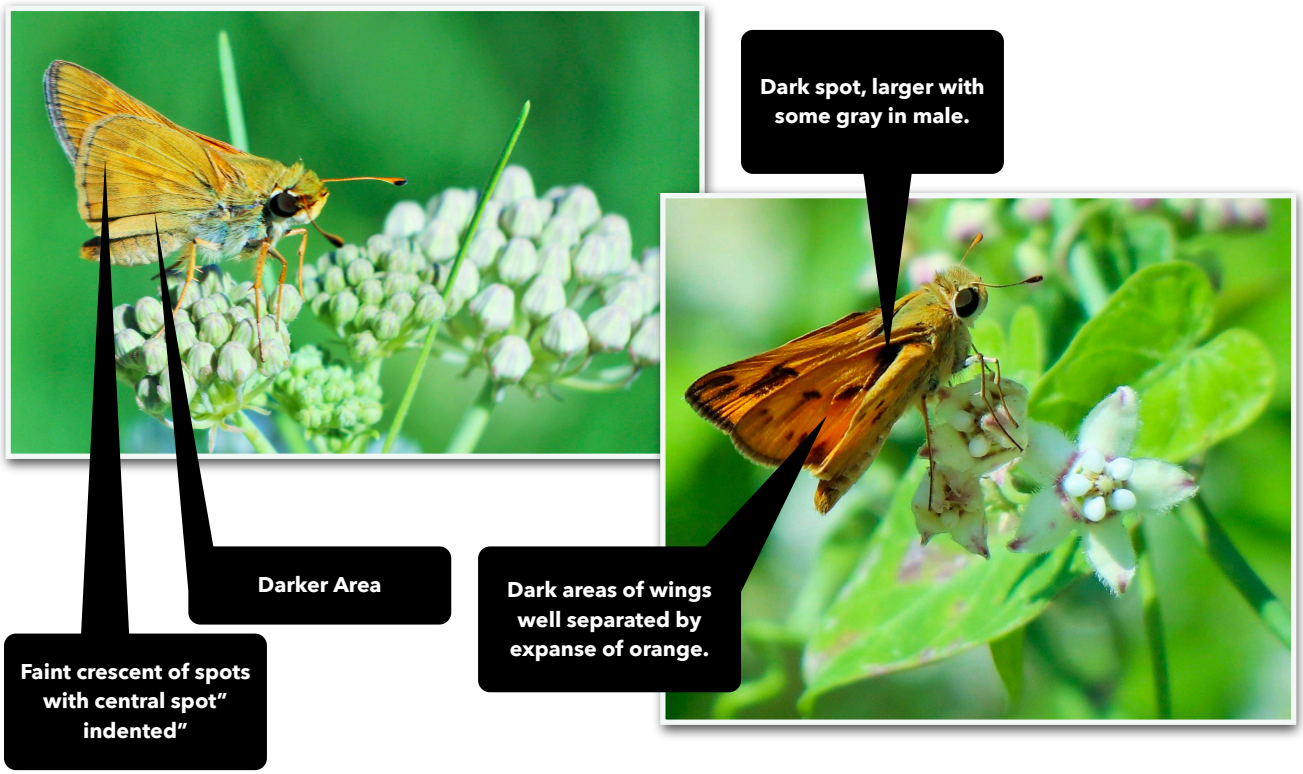
Above: Hackberry Emperor, taking nutrients from bedrock seeps of upper Soledad Canyon. JVL



Other Resources

- Butterflies and Moths of North America
- BugGuide
- Butterflies of America
- North American Moth Photographers Group

Hackberry Emperors will land on humans in search of salts. There is significant geographical variation in this species, some sources argue for multiple species.



Other Resources:

North American Moth Photographers Group
BugGuide
Pajarito Environmental Education Center
Butterflies and Moths of North America

Sachem
Atalopedes campestris
(Boisduval, 1852)
Hodges #4049

The variation in markings in the Sachems below is not just a function of ventral versus dorsal view of the wings. Some males have virtually no markings on their wings.

The Sachem is more common in the southern tier of the United States than in the northern tier. Its range extends southward all the way to Brazil.

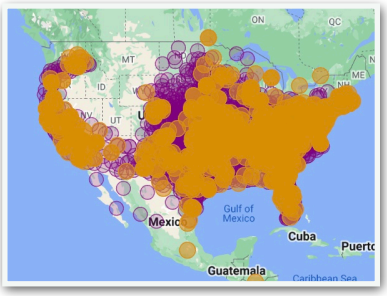
This species is often found on the ground, where the males wait for passing females. Females lay an egg (yes, single) on a grass blade, generally in the afternoon. The female will use multiple egg sites and the larva live at the base of the grass shoots. Bermuda Grass, crabgrass, St. Augustine grass, and goosegrass all serve as caterpillar host plants.

Because of its fondness of grasses, this species is often found in disturbed areas.

Boisduval

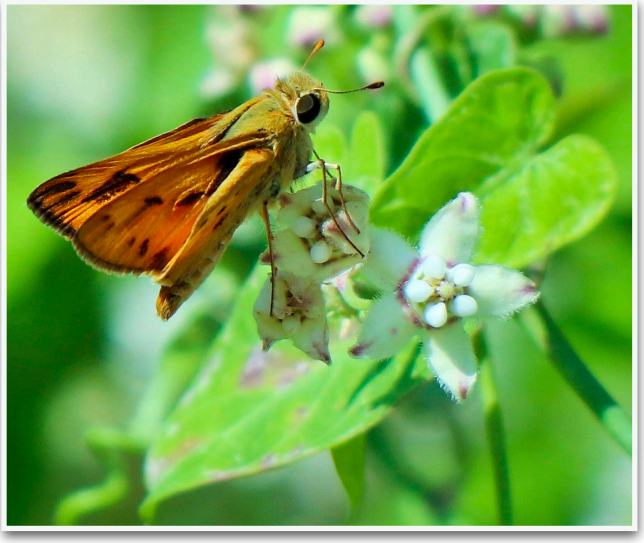
Jean Baptiste Alphonse Déchauffour de Boisduval (1799-1879) is cited as "Boisduval" in many butterfly species descriptions, indicating that he made the initial description of the species. He was a French lepidopterist and botanist. In the field of botany he is cited as "Boisd.".

Biological listings will often follow the common name and Latin binomial with the name of the person who initially described the species. For Sachem, Boisduval is listed, along with the year of the initial description. In the case of the Hackberry Emperor, both Boisduval and Le Conte are listed, indicating a joint effort.



Range Map of *Atalopedes campestris*
Sachem
From sightings reported to [Butterflies and Moths of North America](#).







The Sachem Skipper is rarely observed. At left it is nectaring from Climbing Milkweed flowers, above on Horsetail Milkweed flowers. JVL







Sachem Skipper on Climbing Milkweed flowers. JVL

Texan Crescent
Athanassa (Phyciodes) texana texana
(W. H. Edwards, 1863)
Hodges #4476

Note that the rear of the forewing is indented just inside the tip of the wing.

This species has several broods per year in our area. The caterpillars of this species feed on species in the genus *Ruellia* (called wild petunias by some), *Justicia* (sometimes called Tube-tongues and/or false honeysuckle), and a few other species of the lowlands and desert where this butterfly is often found.

This species ranges as far south as Guatemala.

Synonyms for the species include *Melitaea texana, Tritanassa texana, Phyciodes texana, Eresia smerdis,* and *Eresia texana seminole*. In the realm of common names, it is also called the Texan Crescentspot. There are two subspecies, the nominate form is found in our area.

The original description from Wm. H. Edward's "Description of certain species of Diurnal Lepidoptera found within the limits of the United States and British America. No. 2" at p. 81 of *Proceedings of the Entomological Society of Philadelphia*, Vol. 2, No. 1, March, April, and May 1863, is shown below.

MELITÆA TEXANA, nov. sp.

Male. Expands $1\frac{5}{10}$ inch. Upper side blackish brown, mottled with fulvous at the base of the wings, and sprinkled with small white spots; these form, on primaries, an interrupted sub-marginal line, and an abbreviated line of three spots from the costa, besides five or six others irregularly placed; on secondaries, a bent line across the disk and a sub-marginal row of faint crescents; fringe blackish, except in the emarginations, where it is white.

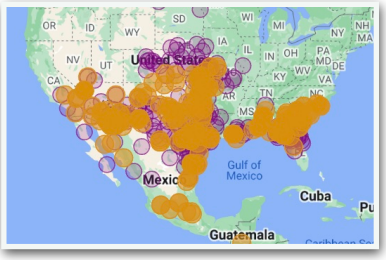
Under side: primaries ochrey-yellow next the base, and beyond, dark brown; the apex and hind margin paler brown; a sub-marginal row of crescents; the white spots re-appear of larger size.

Secondaries buff next the base, reticulated with reddish-brown lines; a white band crosses the disk corresponding to the spots on upper side; beyond to margin clouded with brown, with a row of crescents, the third from the anal angle largest and whitish, all surmounted by blackish spots.

Texas.

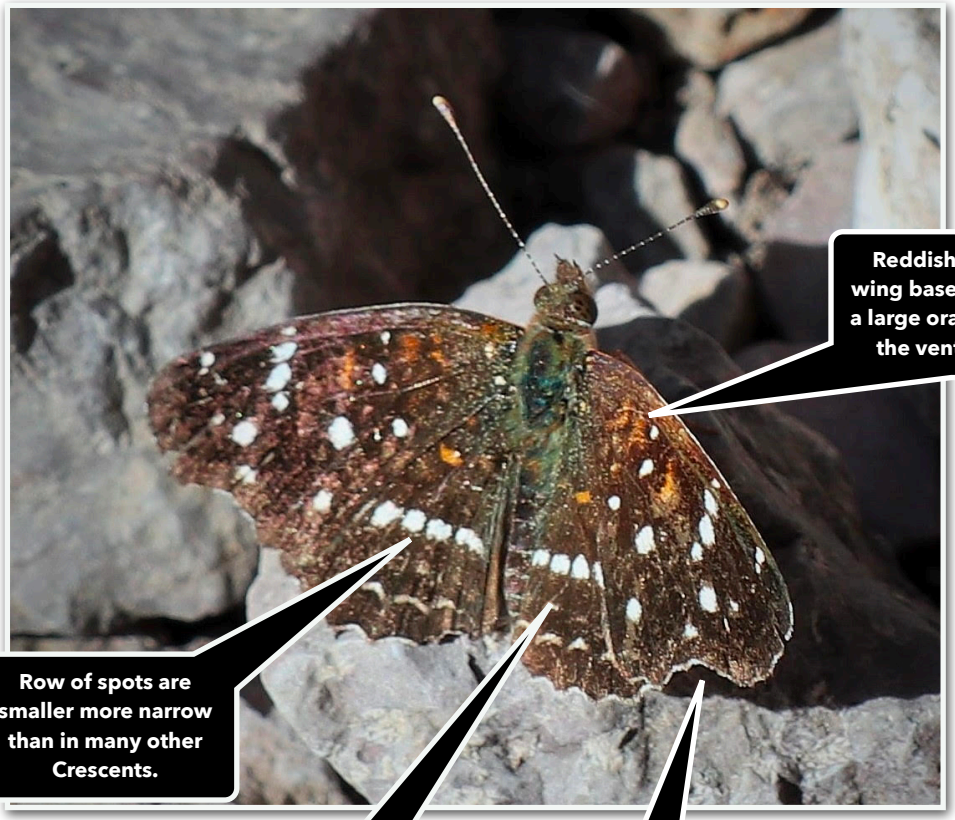


Texan Crescent taking nutrients from cobble-covered moist soil near the Soledad Canyon Waterfall (James Von Loh).



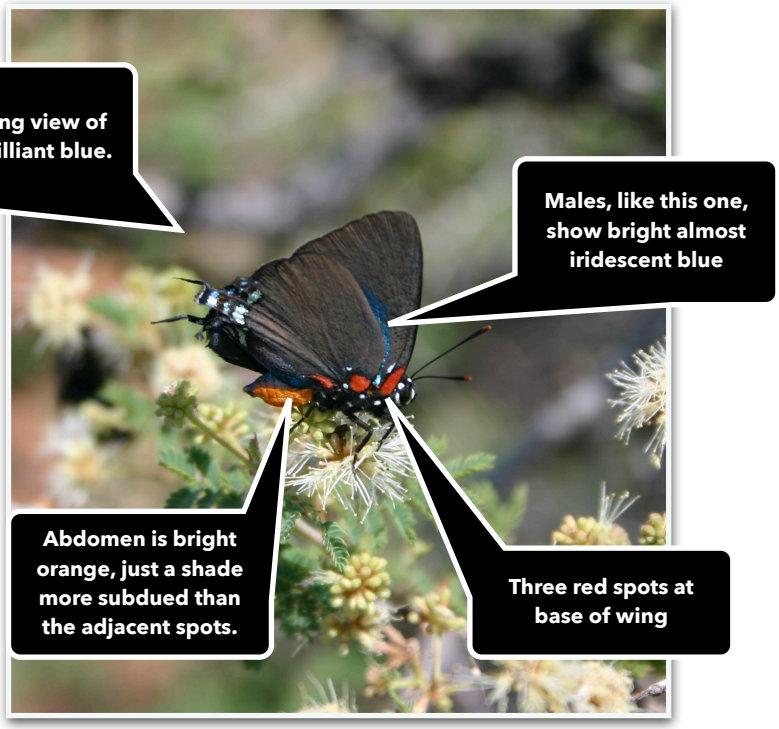
Range Map of *Athanassa texana*
Texan Crescent
From sightings reported to Butterflies and Moths of North America.





Other Resources (Texan Crescent)

- Butterflies and Moths of North America
- BugGuide
- Butterflies of America
- North American Moth Photographers Group



Other Resources (Great Purple Hairstreak)

- Butterflies and Moths of North America
- BugGuide
- Butterflies of America
- North American Moth Photographers Group

Great Purple Hairstreak
Atlides halesus
(Cramer, 1777)
Hodges #4270

Many copper and hairstreak instars look very similar. In the case of the fourth instar of the Great Purple Hairstreak, look for an obvious white diamond on the head (visible in the photo by Todd Stout to the right). Mistletoes on various hardwoods (cottonwood and mesquite, for instance) are the host plants for the instars. See: "The Insect Fauna of Mistletoe…In Southern Texas", by Paul L. Whittaker, *The Southwestern Naturalist* 29(4):435-444, Nov. 14, 1984.

Some sources refer to this species as the Great Blue Hairstreak.

***Atlides halesus* is found across the southern tier of the United States south to the southern part of Mexico. An excellent description of the natural history of this species is found on the University of Florida website.**

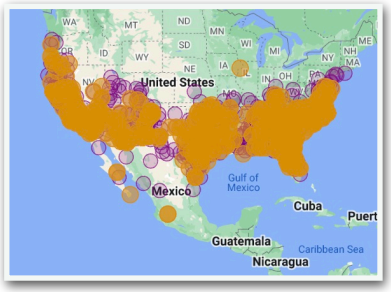
There are typically three flights, between March and December. Various mistletoe species serve as host plants for the caterpillars of this species.

This species is found as far south as Guatemala. It is typically found in wooded areas, especially those with mistletoe. Oak, mesquite, and walnut forests are common habitats.

Pieter Cramer
(1721 - 1776)

Pieter Cramer was a Dutch naturalist who is remembered as a significant entomologist. The documentation of his butterfly collection was printed in *De uitlandsche Kapellen voorkomende in de drie Waereld-Deelen Asia, Africa en America – Papillons exotiques des trois parties du monde l'Asie, l'Afrique et l'Amerique (1775-1782)* both prior to and after his death. Thus, the date of the original description of this species is one year after the original describer had died.

The type specimen of this species was shipped to Cramer from the Americas (apparently from Virginia). The species was depicted in the work cited above on plate XCVIII of Volume Two (see lower right). The painting was made by Gerrit Wartenaar. Caspar Stoll (ca. 1725-1791) completed the publication of the cited work, following the death of Cramer.



Range Map of *Atlides halesus* Great Purple Hairstreak From sightings reported to Butterflies and Moths of North America.



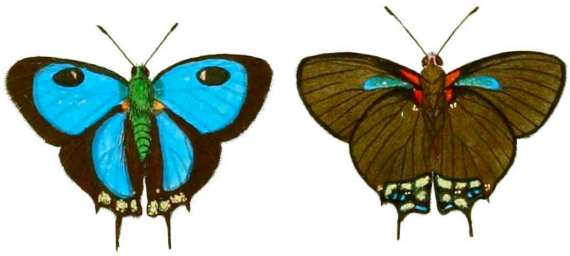
Instar photographs by Todd Stout, 4rth instar, accessed via Creative Commons License.



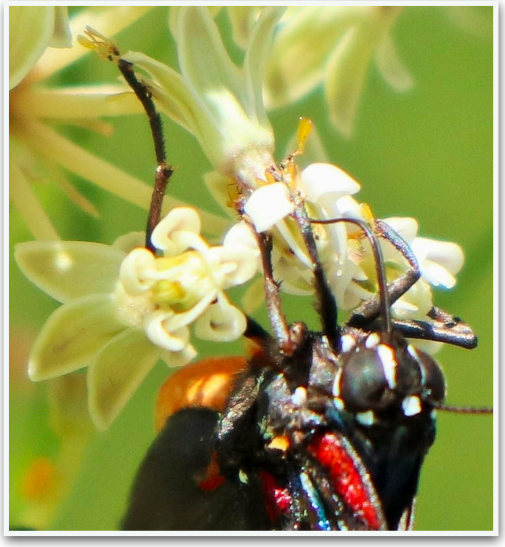




***Atlides halesus*, Great Purple Hairstreak nectaring on *Mimosa biuncifera* by Nichole Trushell, in Kingston, Black Range.**

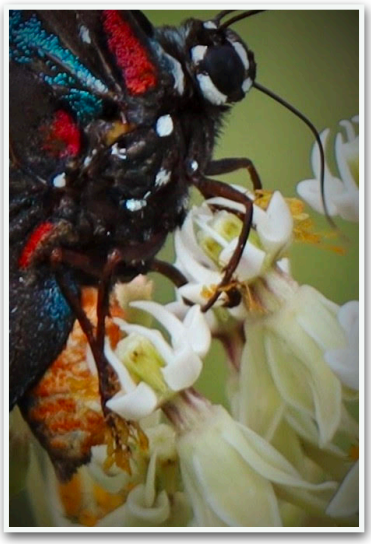






Great Purple Hairstreak nectaring from Horsetail Milkweed flowers. Close-up, to the left, of the several yellow pollinia/ pollen sacs attached to its feet; when present this species is likely an efficient pollinator of Horsetail Milkweed flowers.
Photo Above: Note several dark yellow Oleander Aphids, *Aphis nerii* (Fonscolombe, 1841) in the lower right corner, they are abundant on Horsetail Milkweed plants along the Rio Grande. JVL

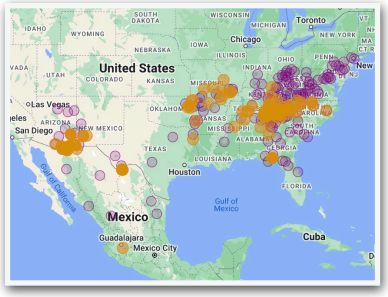




Golden Banded-Skipper
Autochton cellus
(Boisduval & Leconte, 1837)
(Hodges #3902)

This butterfly is known as *Telegonus cellus* in some sources. The Golden Banded-Skippers, shown below were photographed in Railroad Canyon, Black Range, in July (2015, 2016, and 2017) RAB. In southern Arizona there is one brood (flight) from June-September; that is most likely representative of this area.

The New Mexico Locust, *Robinia neomexicana*, is a major host plant for the instars of this species. The number of locust plants in the Black Range increased dramatically after the 2013 Silver Fire, but there was not a noticeable increase in the number of Golden Banded-Skippers.



Range Map of *Autochton cellus* Golden Banded-Skipper From sightings reported to Butterflies and Moths of North America.









Sonoran Banded-Skipper would have a small whitish area near the tip of the antenna.

The lower spot is closer to the wing tip - in the Sonoran Banded-Skipper it is aligned vertically.



Spotted fringe of wing. Sonoran Banded-Skipper has much more distinct, and larger fringe pattern.



Range Map of *Autochton pseudocellus* Sonoran Banded-Skipper From sightings reported to Butterflies and Moths of North America.

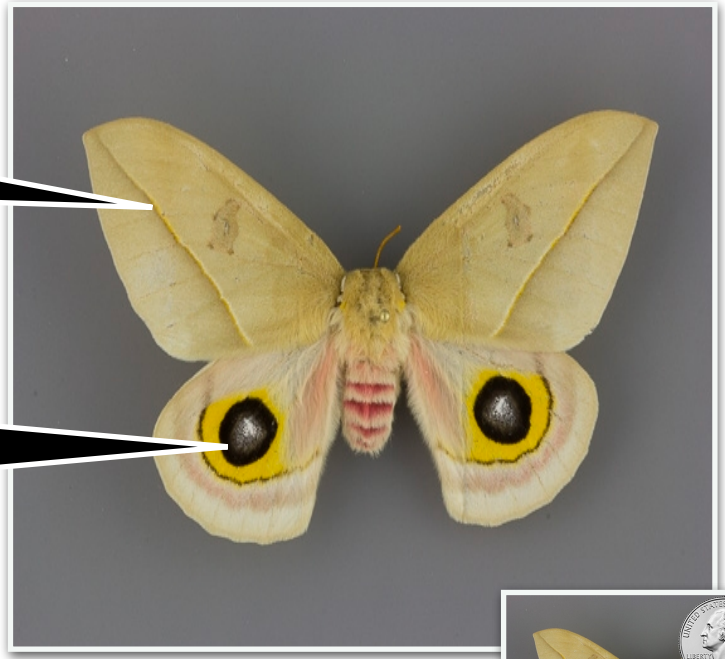
Range map for comparison. Sonoran Banded-Skipper is thought to be extirpated in the United States.

Other Resources (Golden Banded-Skipper)

- Butterflies and Moths of North America
- Butterflies and Moths of North America (Sonoran Banded-Skipper)
- BugGuide
- Butterflies of America (as *Telegonus cellus*)
- North American Moth Photographers Group (as *Telegonus cellus*)

Strong diagonal line.

Black eyespots surrounded by orangish-yellow.





Other Resources (Cecrops-eyed Silkmoth)

- Butterflies and Moths of North America
- BugGuide
- North American Moth Photographers Group
- Southwestern Moths

Cecrops-eyed Silkmoth
Automeris cecrops
(Boisduval, 1875)
(Hodges #7748)

This species is found from the southwestern United States (west of the Rio Grande) south into Mexico. There are three recognized subspecies. Early stage instars will often feed together as a group, but later stage instars are more solitary. Cecrops-eyed Silkmoth instars feed on Fendler Ceanothus, Catclaw Mimosa, Mountain Mahogany, willows (early stage instars), various oaks (later stage instars), and several other species. In this species, the instar is less selective about which host plant it feeds on than are many other species. The imago (adult moth) stage is not known to feed.

Moths versus Butterflies

"What is the difference between a moth and a butterfly?" is a frequently asked question. Sometimes it is clear that a species should be grouped with the moths and sometimes it is clear that it is a butterfly. But sometimes it is not and there is not single filter which you can use to place a flutterby you encounter. Flutterby is a spoonerism, named after W. A. Spooner (1844-1930). A spoonerism is a word/phrase in which the sounds of two or more of the main words are transposed. How would you like something like that to be named after you? Well, I digress, let's get back to determining what is a flutterby and what is a moth.

One myth is that the antenna is a good place to start. Moth antenna are often (not always) "feathery" and lack a ball of some type at the end of the antenna (club) which most butterflies have - some do not. Antenna structure cannot reliably be used to distinguish between a moth and a butterfly.

Another myth, that moths form cocoons (soft) and butterflies form chrysalis (hard). Again there are significant exceptions to the rule.

Moths generally, but not always, fly at night. Butterflies tend to fly during the daylight hours, often after it has warmed up a bit. Again, the simple rule is plagued by exceptions.

Sometimes, the estimated 160,000 moth species are thought of as small and nondescript. Some are. Many are quite large and a good many (small or large) are beautiful.

Sorry to say, there is no hard and fast rule which can be used to separate the two, they are all *Lepidoptera*. Disagreements about the taxonomic relationships between butterflies, skippers, moths, and others continue in the most hallowed halls (see Kawahara AY, Breinholt JW. 2014 "Phylogenomics provides strong evidence for relationships of butterflies and moth", *Proc. R. Soc. B* 281: 20140970. http://dx.doi.org/10.1098/rspb.2014.0970).

Special thanks to Eric Metzler for commenting on this issue.



This caterpillar of the Cecrops-eyed Silkmoth, *Automeris cecrops*, was photographed by Nichole Trushell.

Ron Parry's Website

Our region has many locally grown, comprehensive, and authoritative resources close at hand.

One of those resources is the website created and maintained by Ron Parry. His Southwestern Moths website is a jewel. On his home page he notes:

"I am a retired biochemist with a passion for natural history. I was born and raised in the Southwestern US. After retirement I began to explore the rich moth fauna found in the Gila bioregion. The purpose of this website is to help other folks who wish to do the same. A familiarity with our native fauna and flora not only enriches our lives, it also creates what Utah writer Ellen Meloy called a 'deep map of place.' That deep map should motivate us to stop the destruction of wild Nature in North America, including 'the little things that run the world' (E. O. Wilson). Recent studies indicate that arthropod populations in both temperate and tropical regions are undergoing serious decline, with dire consequences for the animals that feed upon them . . ."

Much of the local resource I referenced above is the product of people who have succeeded in another life/avocation and come home to the study of natural history. Others have made a career of the study of natural history and now continue their study and research in non-institutional settings and/or in other areas of natural history. We are lucky to have many experts in this region who are not content to sit and languish. We also have naturalists in local and regional universities which are engaged in institutional research and nurturing the next generation of naturalists. And we have naturalists from elsewhere in the United States who come to the Black Range and the Gila to further their research and to teach.

Making it more accessible should be the goal of everyone who reads this. Sometimes people draw a distinction between the "creators" and the "consumers". There are distinctions to be made between the two, that is true. What is not true is that the "consumers" do not contribute. I am not making the argument that consumers enable the efforts of creators although that has an element of truth to it. I am talking about what happens when the knowledge of natural history is consumed. Those who consume can be (are not always) transformed into advocates for the natural world. When that happens we all grow, when that happens the chances of a thousand species continuing to survive is enhanced, and I dare say, there is greater joy in the world.

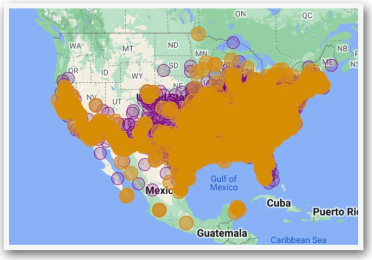


Range Map of *Automeris cecrops*
Cecrops-eyed Silkmoth
From sightings reported to Butterflies and Moths of North America.



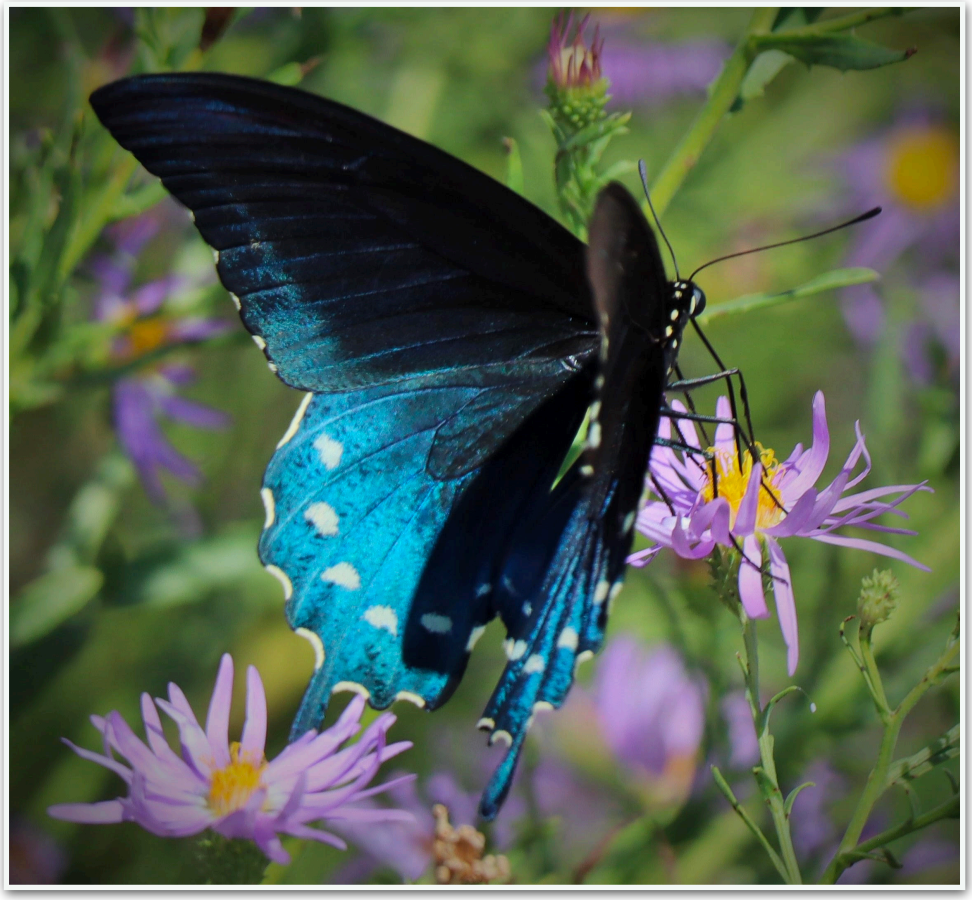
Ron Parry captured this *Automeris cecrops* in the Big Burro Mountains, Grant County, during June 2015.
This image is posted on his website at this link, used with permission.

Pipevine Swallowtail
Battus philenor
(Linnaeus, 1771)
Hodges #4157

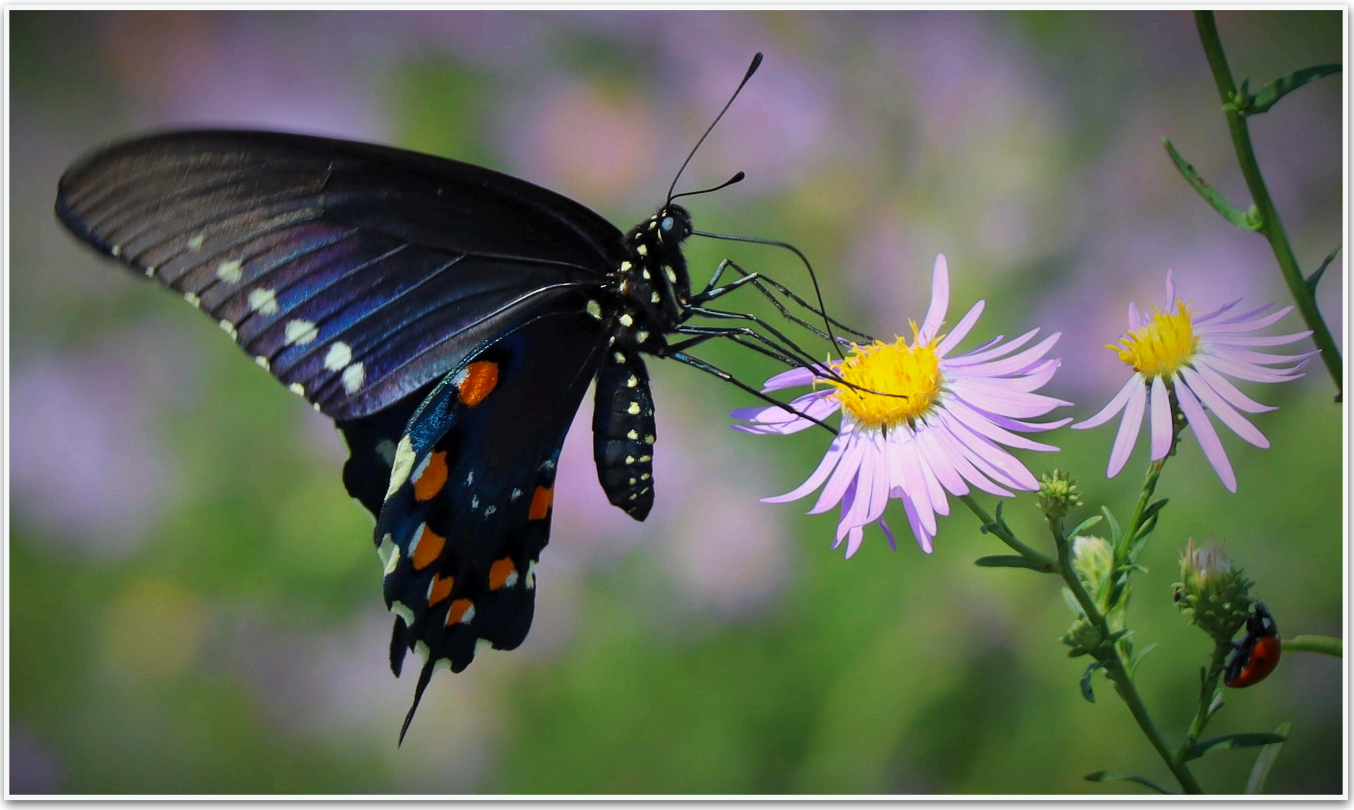


Range Map of *Battus philenor*
Pipevine Swallowtail
From sightings reported to Butterflies and Moths of North America.

The larvae of this species are able to sequester aristolochic acids which are found in some species of *Aristolochia* (Pipevines), its host plants. In doing so, the larvae become poisonous to possible predators. In a sword with two-edges, some species of *Aristolochia* are poisonous to the larvae which eat them.



The Pipevine Swallowtail is occasionally observed nectaring from Spine-aster flowers along the Rio Grande at Las Cruces. Its fluttering style of nectaring makes it a challenge to photograph. Photographs above and below are by James Von Loh.



Other Resources (Pipevine Swallowtail)

- Butterflies and Moths of North America
- BugGuide
- North American Moth Photographers Group



Large shimmering blue area on hindwing of male. Intensity and surface area of blue will vary with angle of light. Blue in the female is more subdued.

Row of spots across hindwing





Blue often apparent in ventral view.

Large orange spots only visible in ventral view.

The story of changing taxonomic determinations is evident in the synonymies for this species:

- *Papilio philenor*, Linnaeus, 1771
- *Papilio astinous*, Drury, 1773
- *Papilio nezahualcoyotl*, Strecker, 1885
- *Papilio obsoleta*, Ehrmann, 1900
- *Papilio wasmuthii*, Weeks, 1901
- *Papilio hirsuta*, Skinner, 1908
- *Papilio inghami*, Gunder, 1927
- *Papilio serpentariae*, Fabricius, 1938

The larvae of this species exhibit the same type of behavior which is often seen in other species. In early instars they will often eat in groups. In later instars they are often more solitary while they eat.

Adults nectar on thistles, bergamot, lupines, and a variety of other species. When nectaring, the Pipevine Swallowtail, flutters its wings, making the blue obvious in the male and more readily apparent in the female.

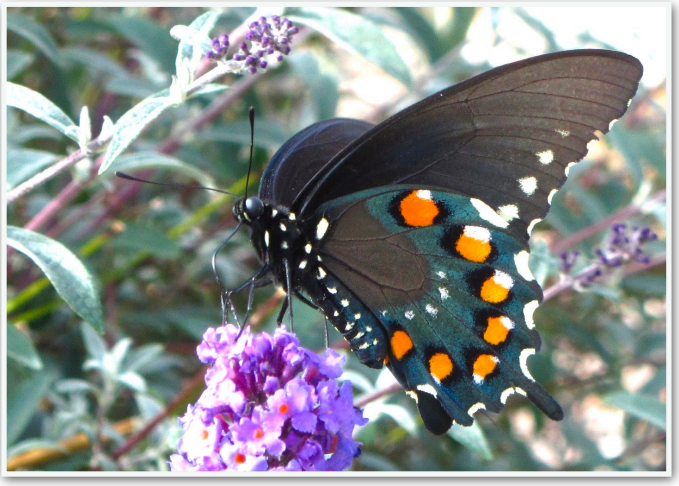
In the early 1900s, this species was known as the Blue Swallowtail by many sources.

There are five subspecies of Pipevine Swallowtail. The nominate form is found here.

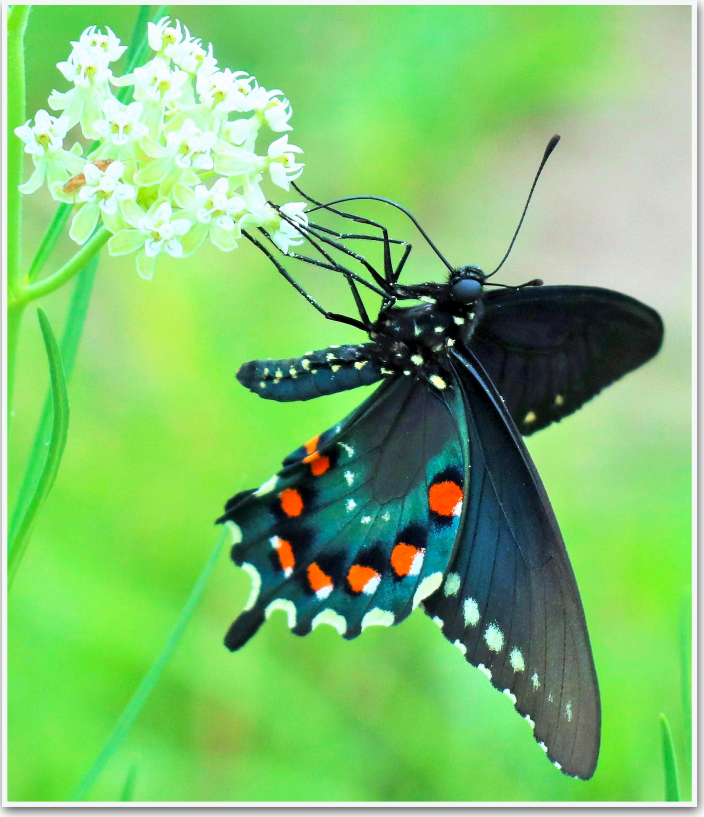
In Mexico, this species flies year around. Flights are more restricted farther north.

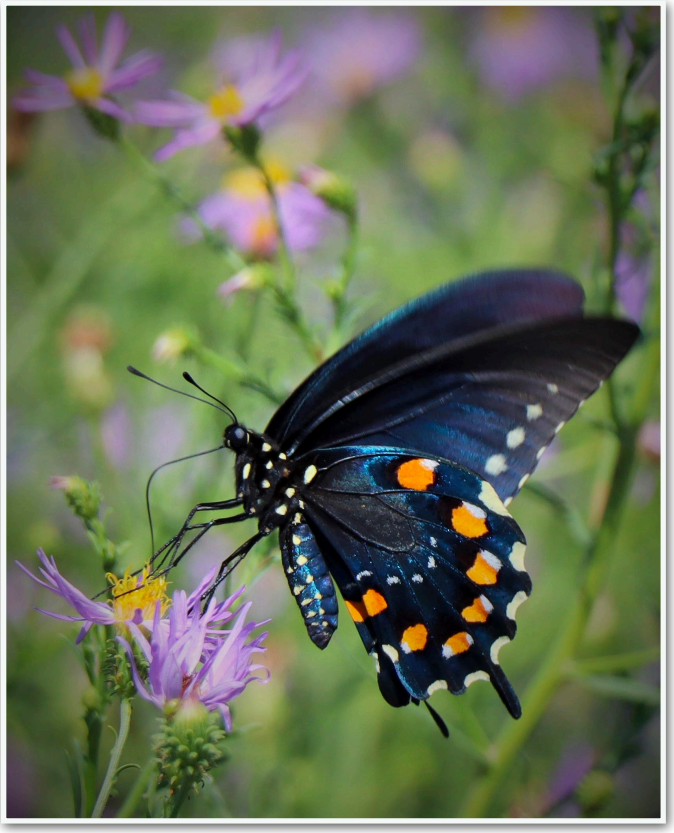
This species is part of a complex of butterflies thought to exhibit Batesian (butterflies which are not distasteful look like associated species which taste bad) or Mullerian (several bad tasting species all look alike) mimicry. Additional research is necessary to sort this out.





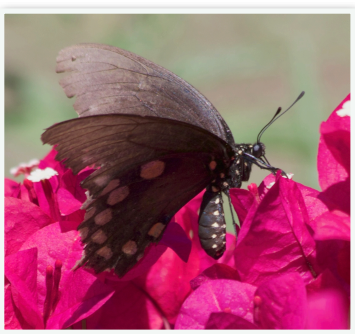
Above: *Battus philenor*, Pipevine Swallowtail
Photographed in Lake Valley, Black Range, by Debora Nicoll.







Left Column: Pipevine Swallowtail nectaring from Horsetail (top two photos) and Climbing (bottom) Milkweed flowers. Immediately Above: Pipevine Swallowtail on Spine-aster flowers along the Rio Grande. JVL





Pipevine Swallowtail photos from August. At Hillsboro to the left and at Rodeo, NM above. RAB

Western Pygmy-Blue
Brephidium exilis
(Boisduval, 1852)
Hodges #4353



Above: Western Pygmy-Blues, photograph by Debora Nicoll, taken in the Black Range. This is the smallest butterfly species in North America.



Above and Below: Western Pygmy-Blue is a common butterfly along the Rio Grande. Here it is perched on Spine-aster flowers. It is sometimes overlooked because of its small size. JVL

The larvae of this species feed on host plants in the *Chenopodium* (the goosefoots), *Atriplex* (*Atriplex canescens* is Four-wing Salt Bush), and related genera. *Chenopodium album* (lamb's quarters, goosefoot, wild spinach, fat hen) is one of its favorite host plants. Adult male Western Pygmy-Blues patrol above these host plants throughout the day looking for mates.

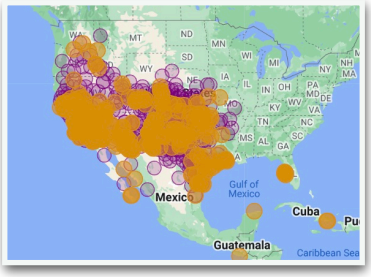
Female Western Pygmy-Blues lay their eggs on all of the surfaces of the host plants but seem to prefer the undersides of leaves. The larvae eat all parts of the host plant.

Pupa hibernate.

Alternatively, Western Pygmy-Blues are also named *Brephidium exile* in some sources. There are four subspecies, the nominate form is found in our area.

The range of the Western Pygmy-Blue extends southward to Venezuela.

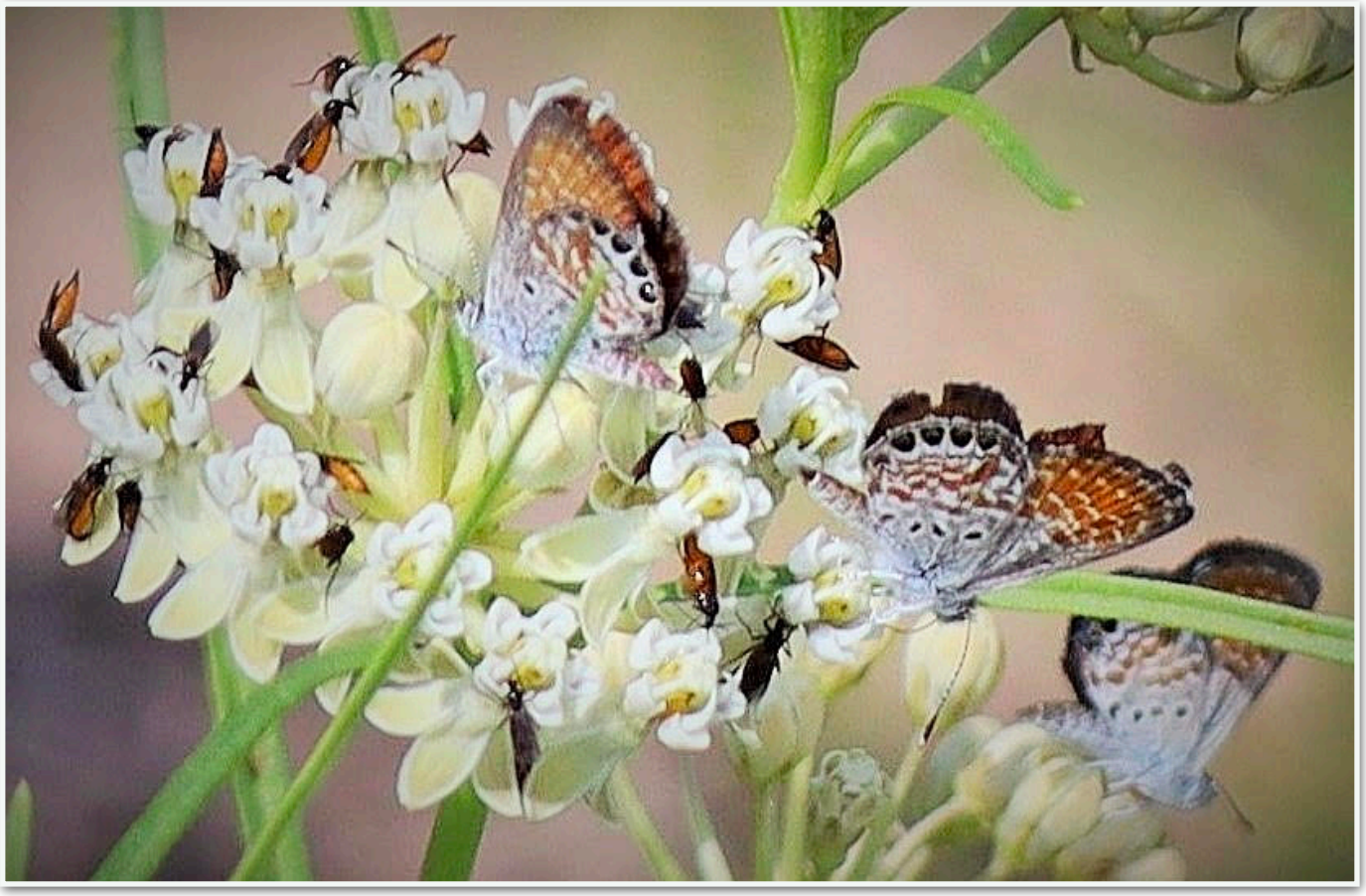




U. S. Range Map of
Brephidium exilis
Western Pygmy-Blue
From sightings reported to
Butterflies and Moths of North America.



Above: *Brephidium exile* instar.
Photograph by Nicky Davis. (CC BY-NC-SA 2.0)



Above: Western Pygmy Blues nectaring from Horsetail Milkweed flowers along with several unidentified beetles - *Coleoptera* (Linnaeus, 1758) - foraging among the flowers.
Below: The Western Pygmy Blue is a resilient species and was present along the Rio Grande at the end of November 2021 and nectared from Water Speedwell, *Veronica anagallis-aquatica*, flowers. JVL



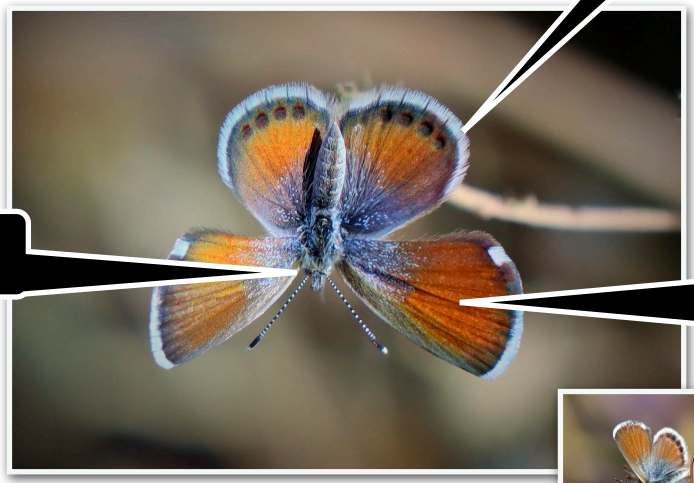


Four of the marginal spots are larger than the others and may show iridescence.

White Fringe

Other Resources (Western Pygmy-Blue)

- Butterflies and Moths of North America
- BugGuide
- Butterflies of America



Grey eyes

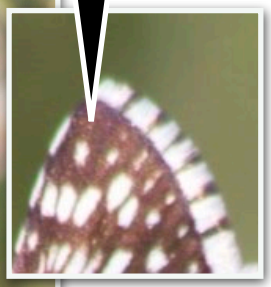
Two-tone wings, grey (described by some as dull blue) near thorax, reddish toward the end.



Markings cited here are more useful in distinguishing the Common Checkered-Skipper and White Checkered-Skipper from other Skippers than from each other.

Usually no spot in extreme corner.





Usually no spot.



Other Resources (Checkered-Skippers)

- Butterflies and Moths of North America (*B. communis*)
- Butterflies and Moths of North America (B. albescens)
- BugGuide
- Butterflies of America

Bulia deducta

(Morrison, 1875) Hodges #8614



There are three species of *Bulia* in the United States. All are limited to the southwestern states with ranges which extend into Mexico. *Bulia similaris* has a range which may overlap that of *Bulia deducta* in our area, although *B. deducta* is much more likely. Adding to the identification problem is the fact that *B. deducta* is quite variable in appearance (per Ron Parry). The third species, *Bulia schausi* is reported only from Arizona. There are two other species in this genus, they are found south of the U.S.-Mexico border.

***B. deducta* and *B. similaris* can not be separated to species without dissection. Mike Pogue (NMSU) has found that almost all of the *Bulia* found in New Mexico are of the species *deducta*. For a detailed assessment of this genus see, A Revision of the Genus Bulia Walker (Lepidoptera: Noctuidae), Michael G. Pogue, *Journal of the Lepidopterists' Society*, Volume 56 p.p. 129-150, 2002. The range maps shown below are from this article, page 141. This photograph was taken in Hillsboro on June 17, 2018.**

Other Resources (*Bulia deducta*)

- Southwestern Moths - Moths of the Gila National Forest
- North America Moth Photographers Group
- Butterflies and Moths of North America
- BugGuide

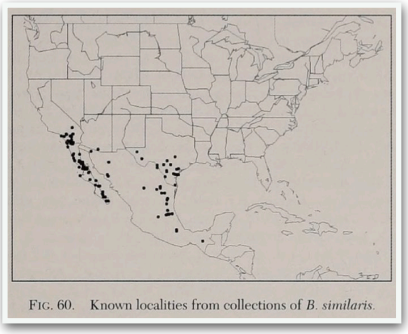


FIG. 60. Known localities from collections of *B. similaris*.

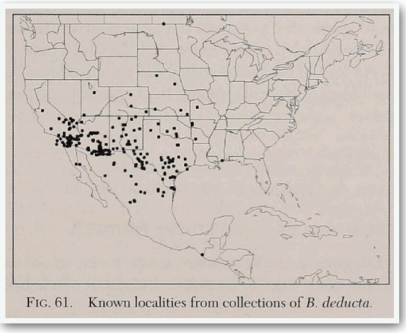


FIG. 61. Known localities from collections of *B. deducta*.



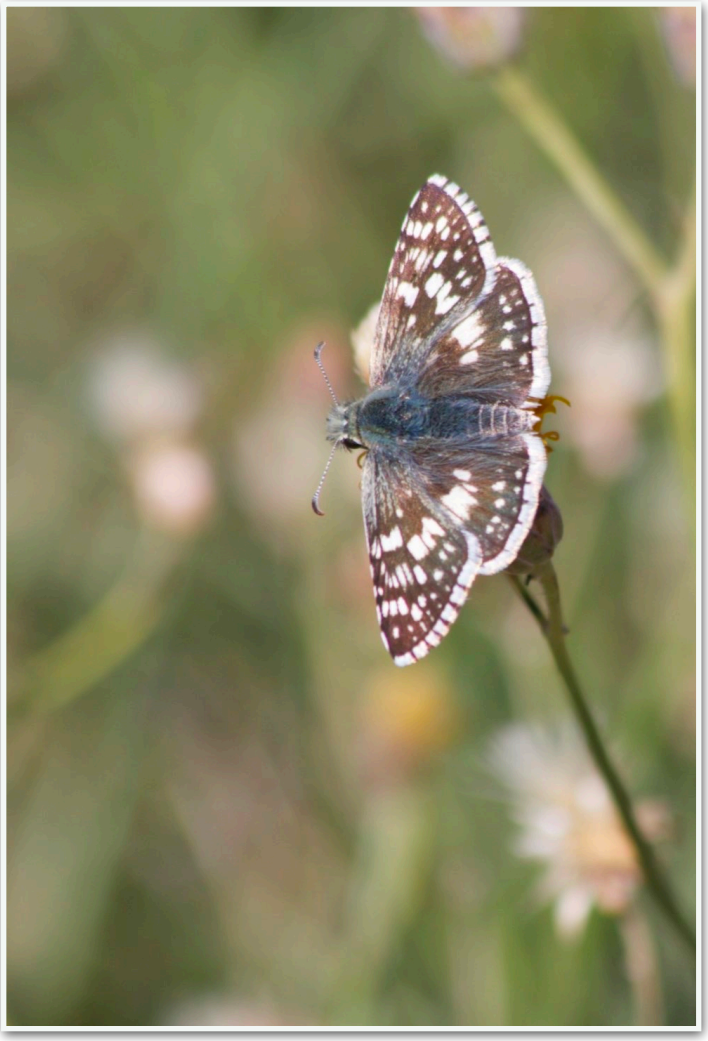
Common Checkered-Skipper
Burnsius (Pyrgus) communis
(Grote, 1872) Hodges #3966
White Checkered-Skipper
Burnsius (Pyrgus) albescens
(Plötz, 1884) Hodges #3967

Identifying any creature to species can be difficult at times. The two species shown above are a great example of the issues involved. They, in fact, may not be separable in the field; the images may be of the same species, or not. For that reason we refer to the images in this section as Checkered-Skipper (Burnsius spp).

James Von Loh took the photographs below, of Checkered-Skipper (Burnsius spp), taking nutrients from moist soil and gravel at the Soledad Canyon Trailhead, Organ Mountains.







Above: Checkered-Skipper (Burnsius spp) photographed in the Florida Mountains. Other gallery images are from Wicks Canyon east of Hillsboro, Black Range. RAB

James Von Loh took the image to the right of a Checkered-Skipper (Burnsius spp) along the Rio Grande. This individual's dorsal wing surface reflected coppery in the sun.



In *Black Range Naturalist*, 5-2, April 2022, James Von Loh noted that:

> ***It didn't take all that much, a four-month monsoon season with consistent 1.5" to 2" monthly rainfall between June and September. A desert transformation from dull shades of dusty green and brown to bright green with multi-colored flowers appeared within weeks. Low "clouds" of white and yellow, blue and orange, and brown and black butterflies simultaneously filled the sky above the rain-revived landscape.***

Where the monsoon rain moistened soil and gravel, it sometimes formed shallow pools and ponds and percolated into the soil and rocks, then emerged from seeps and springs. This is where butterfly puddle clubs were established. Known as puddlers, club butterflies are mostly males and have common needs.

Steve Cary described it thusly:

'Water is life...for desert butterflies...a solvent that contains lots of minerals, particularly electrolytes that are important for butterfly health and for males intending to offer to females a high-value spermatophore. On hot summer afternoons, damp soils...contain lots of electrolytes and attract local butterflies by the scores, hundreds, even thousands' (https://peecnature.org/our-chihuahuan-desert-jungle).



Checkered-Skipper (Burnsius spp) puddle club, near the Soledad Canyon Trailhead. JVL

Thus, male puddle clubbers, in summary: 1) are decoyed into the congregations already landed on the wet soil; 2) suck moisture, salts, and nutrients into their digestive system through a long proboscis; 3) use sodium, in particular, which increases their reproductive success; and 4) their spermatophore, with the additional sodium and other nutrients, are transferred to the female's eggs during mating, enhancing egg survival rate. Meanwhile, humans witnessing the puddlers on the soil and in dense clouds when disturbed to flight, smile, laugh, and say "look at all those butterflies"!! Children, in particular, appear enchanted by the experience.

These small skippers formed puddle clubs, near the Soledad Canyon Trailhead, numbering between 5-10 individuals up to 20-30 individuals. They exhibited a patchy distribution on moist sand covered by pebbles and small rocks. Often a few individuals joined other small puddle clubs with mixed species of sulfurs, marine blues, and lone individuals of other butterfly species.



Checkered-Skippers (Burnsius spp) puddling in/on a typical substrate. JVL

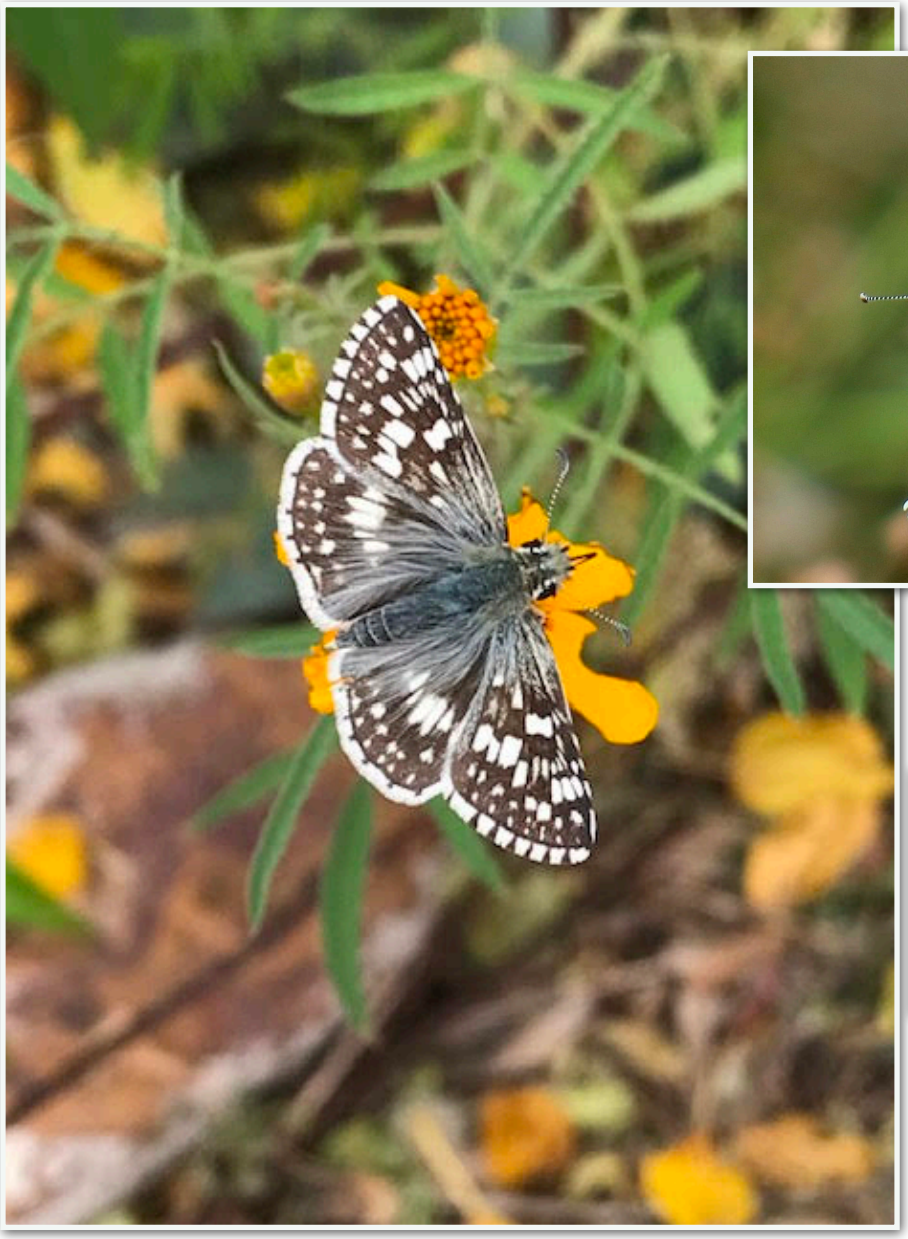
Checkered-Skippers (Burnsius spp) would often join a small puddle club with mixed species of sulphurs (Sleepy Orange, Abaeis nicippe [Cramer, 1779], and Southern Dogface, Zerene cesonia [Stoll, 1790] for instance), Marine Blues, Leptotes marina (Reakirt, 1868), and individuals of other butterfly species.

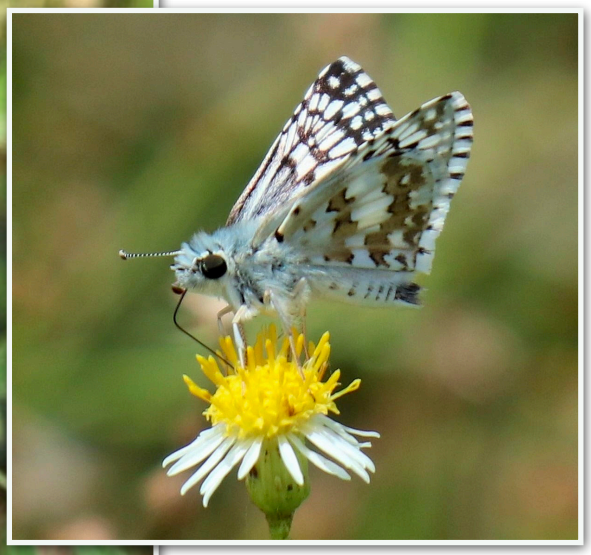


Range Map of *Burnsius albescens*
White Checkered-Skipper
From sightings reported to Butterflies and Moths of North America.

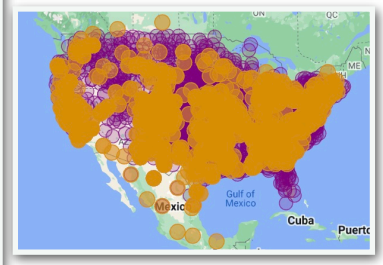


Checkered-Skipper (Burnsius spp) at the Dripping Springs Visitor Center. JVL

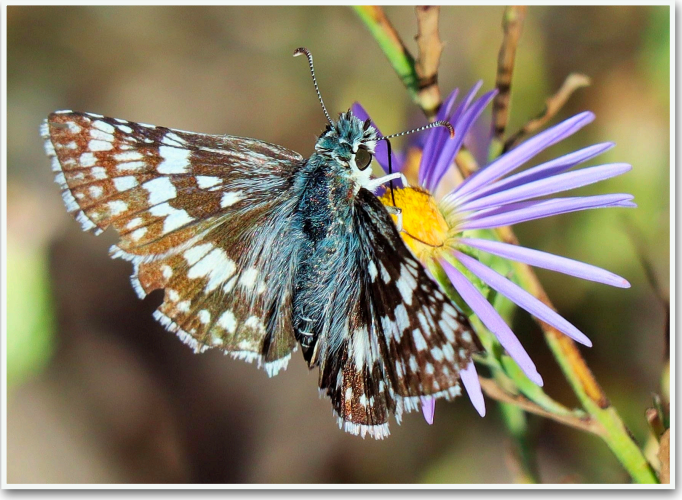




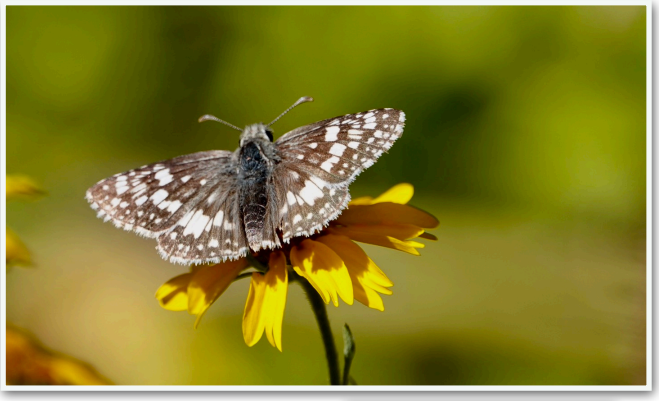
Above and Left: Checkered-Skipper (Burnsius spp) above. From June 15 - July 25 this species can be common. At left on *Tagetes*. JVL



Range Map of *Burnsius communis*
Common Checkered-Skipper
From sightings reported to Butterflies and Moths of North America.



Above: Checkered-Skipper (Burnsius spp), a common butterfly nectaring from Spine-aster flowers. JVL



Above: Checkered-Skipper (Burnsius spp), photographed in Hillsboro, Black Range, October 2021.



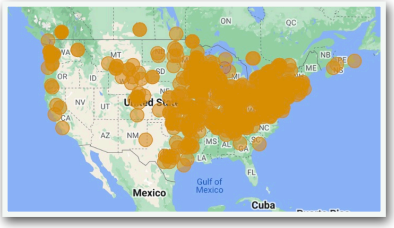


***Caenurgina erechtea*, Forage Looper**
Photographed on Sawyer's Peak, Black Range, June 30, 2019.

Forage Looper
Caenurgina erechtea
(Cramer, 1780)
Hodges #8739

In the past this species has been known under several Latin binomials including *Phalaena erectea, Drasteria agricola,* and *Drasteria mundula*.

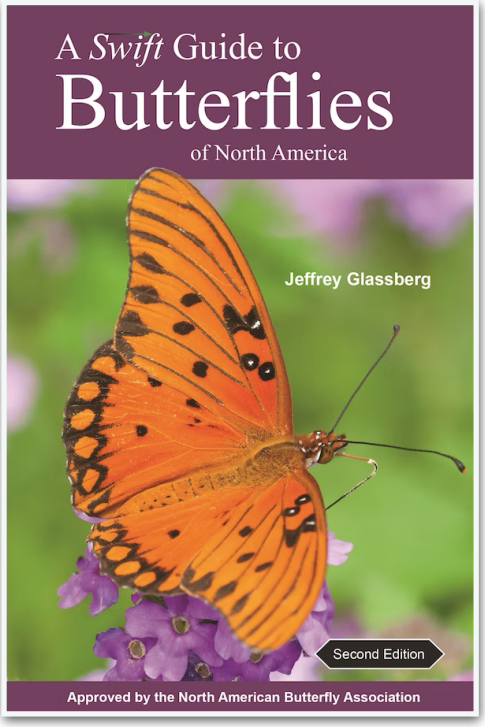
***Ambrosia trifida*; Great Ragweed, Giant Ragweed, Buffaloweed, etc. is a host plant for this species. It also feeds on various legumes and clovers.**

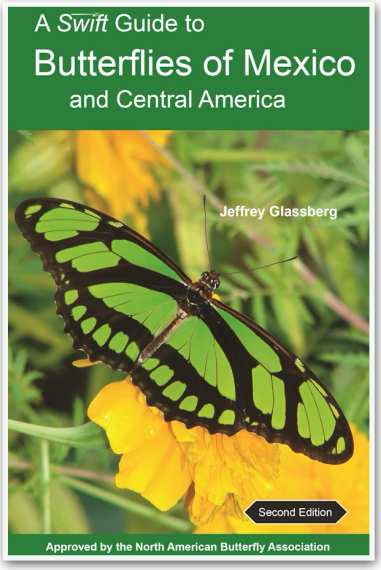


Range Map of *Caenurgina erechtea*
Forage Looper
(aka Common Grass Moth)
From sightings reported to [Butterflies and Moths of North America](#).

This species can be very difficult to separate from *Caenurgina crassiuscula*, requiring inspection under magnification.

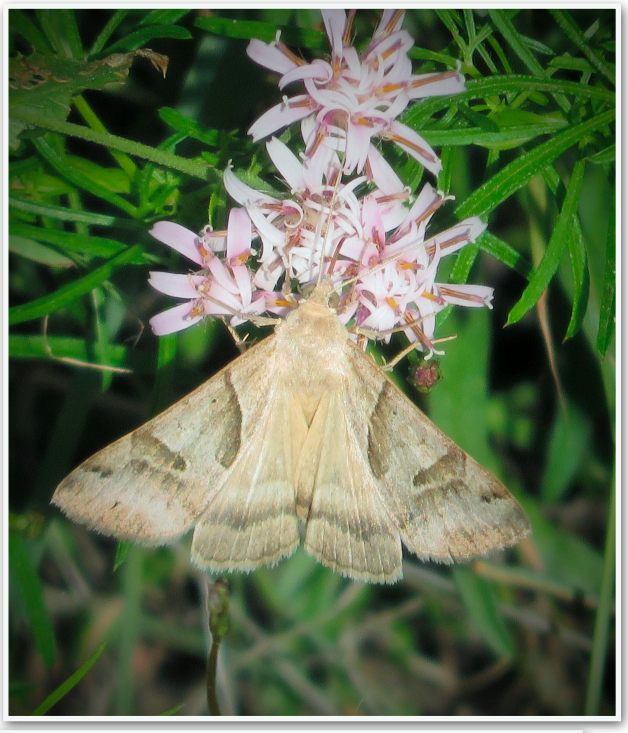






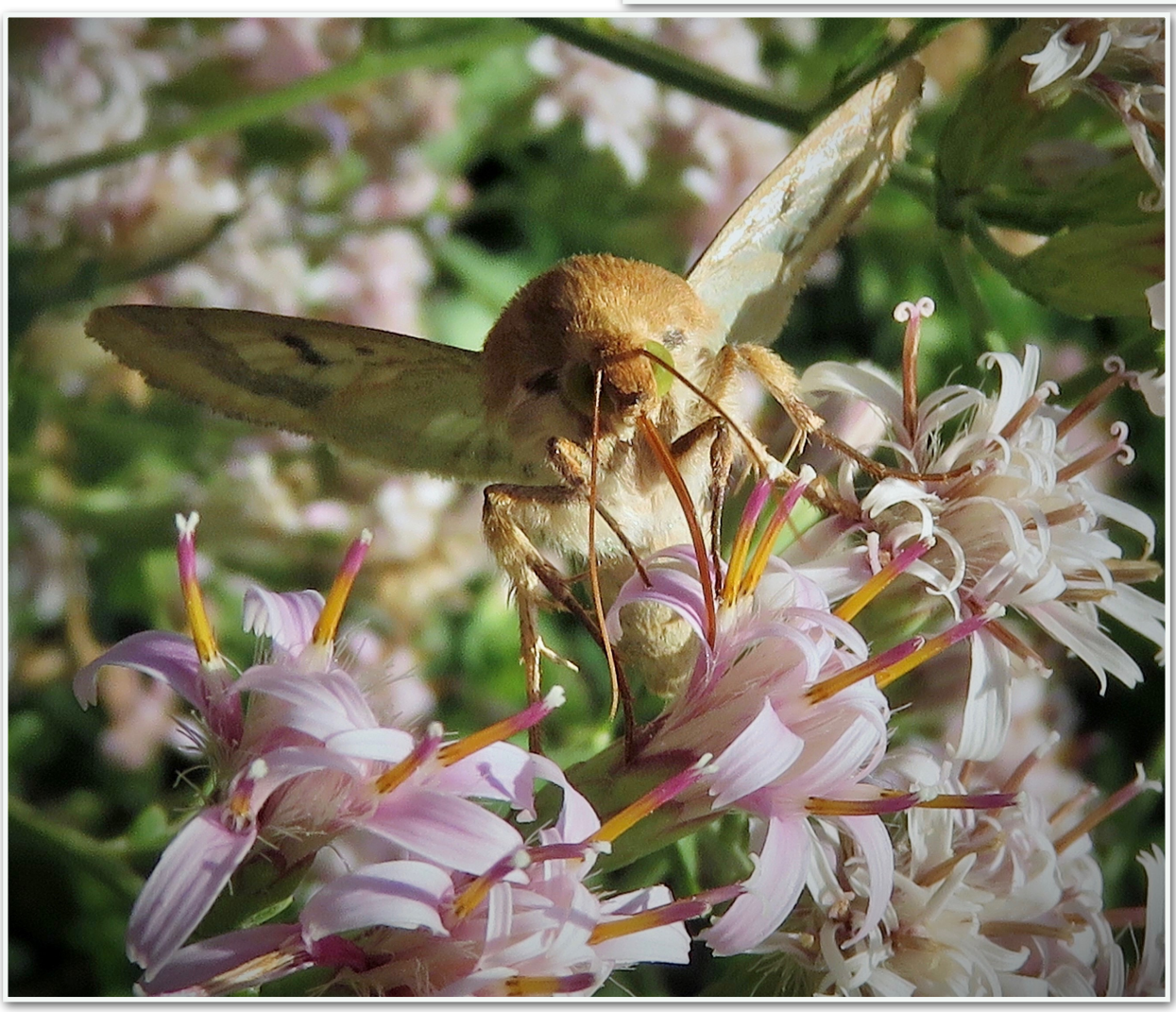
There are many butterfly identification guides, far fewer moth identification guides. Two of the best are the Swift guides which are available at the links.





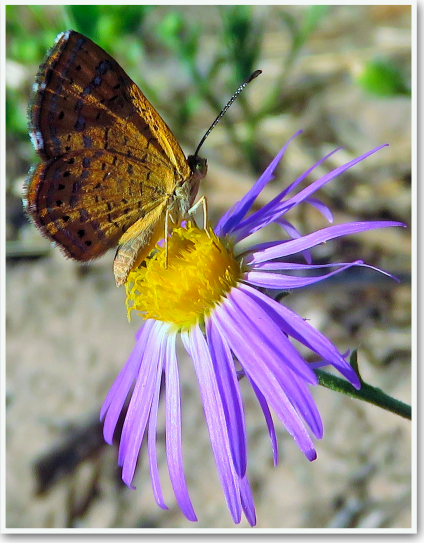
Other Resources (Forage Looper)

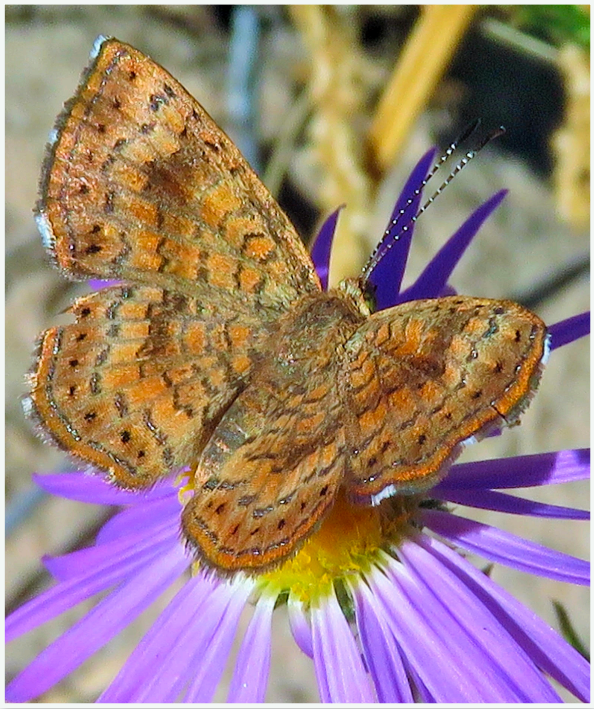
- Butterflies and Moths of North America
- North American Moth Photographers Group
- BugGuide



The Forage Looper shown directly above and upper right was photographed by Gordon Berman, nectaring from Brown-foot flowers.

Fatal Metalmark
Calephelis nemesis
(W. H. Edwards, 1871)
Hodges #4388
Photographs by Gordon Berman



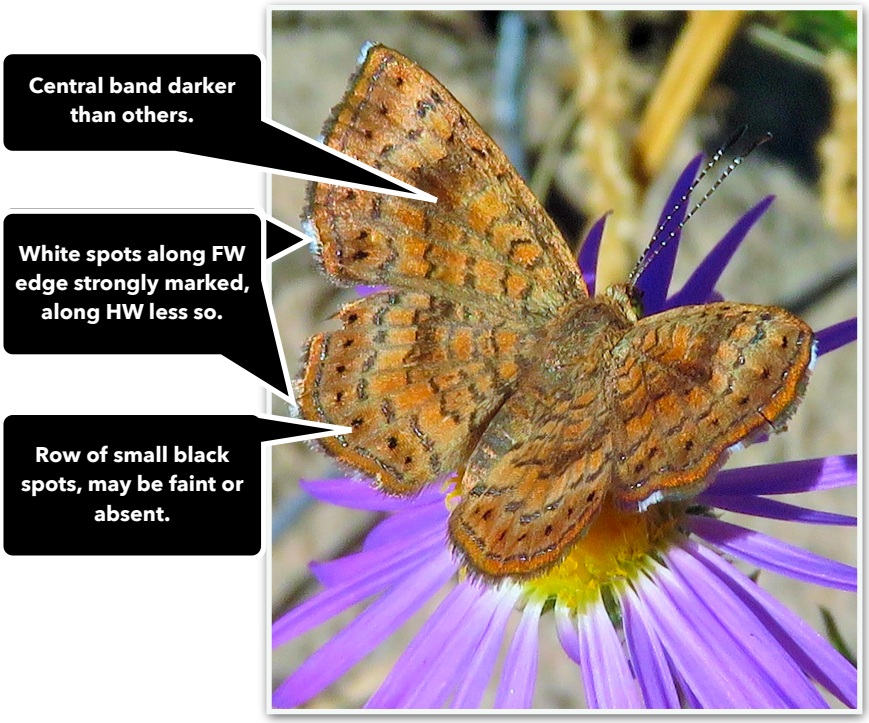




Range Map of *Calephelis nemesis*
Fatal Metalmark
From sightings reported to [Butterflies and Moths of North America](#).







Other Resources (Fatal Metalmark)

- Butterflies and Moths of North America
- North American Moth Photographers Group
- BugGuide
- Butterflies of America
- Pajarito Environmental Education Center



Other Resources (Fulvia Checkerspot)

- Butterflies and Moths of North America
- North American Moth Photographers Group
- BugGuide
- Butterflies of America
- Pajarito Environmental Education Center

Fulvia Checkerspot
Chlosyne fulvia
(W. H. Edwards, 1879)
Hodges #4506

Chlosyne fulvia **is found throughout New Mexico but generally prefers locations at altitudes between 5,000 and 7,000 feet. Among the host plants are several paintbrush species, including Plains (or Downy) Paintbrush, *Castilleja sessiliflora*, and Foothills Paintbrush, *Castilleja integra*.**

As a genus, *Chlosyne* has been sliced and diced by various authorities. And although there are no firmly established structures, *C. fulvia* is generally placed in the subgenus *Thessalia* along with (among others) *C. theona,* which is shown later. *C. lacinia*, which follows, is generally placed in the Lacinia Group of subgenus *Charydryas*. There are 23 species in this genus north of Mexico according to some authorities, 21 according to others.

In the Black Range, we should be observant as the very similar *Chlosyne coronado* is known from adjacent areas in southern Arizona.

W. H. Edwards

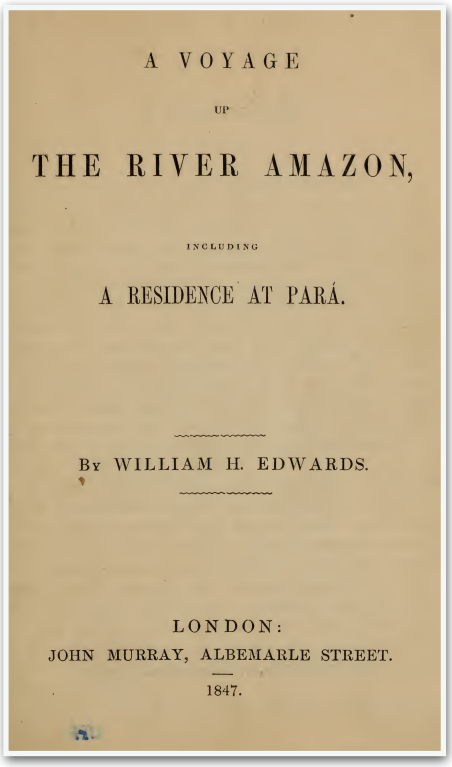
William Henry Edwards (1822 - 1909) was an American entomologist who among other things wrote *The Butterflies of North America* (*Vol. 1*, *Vol. 2*, *Vol. 3*), 1868 - 1897. Many argue this is the best North American butterfly work ever published.

Edwards turned his attention to butterflies in 1856. He soon amassed a large collection, receiving specimens from around the world. He knew both John Weidemeyer and Spencer Baird. His study of polymorphism in butterflies influenced many naturalist.

In 1846, Edwards travelled the northern reaches of the Amazon River and published an account of those travels the next year in *A Voyage Up the River Amazon*. This book inspired both Henry Walter Bates and Alfred Russel Wallace to travel to the Amazon Basin and study its natural history. As such it may be one of the most important books in natural history.



***Chlosyne fulvia*, Fulvia Checkerspot, nectaring from Bladderpod.**
Photographed east of Hillsboro, Black Range, by
Véronique De Jaegher



A VOYAGE

UP

THE RIVER AMAZON,

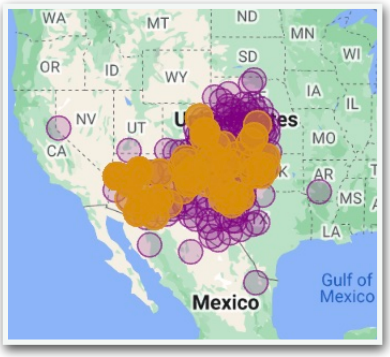
INCLUDING

A RESIDENCE AT PARÁ.

By WILLIAM H. EDWARDS.

LONDON:
JOHN MURRAY, ALBEMARLE STREET.
1847.





Range Map of *Chlosyne fulvia*
Fulvia Checkerspot
From sightings reported to
Butterflies and Moths of North America.





Left: Plains Paintbrush, *Castilleja sessiliflora*, photographed at the same location as the butterfly below.



Photographs from east of Hillsboro on April 7, 2019. RAB



Bordered Patch
Chlosyne lacinia
(Geyer, 1837)
Hodges #4499

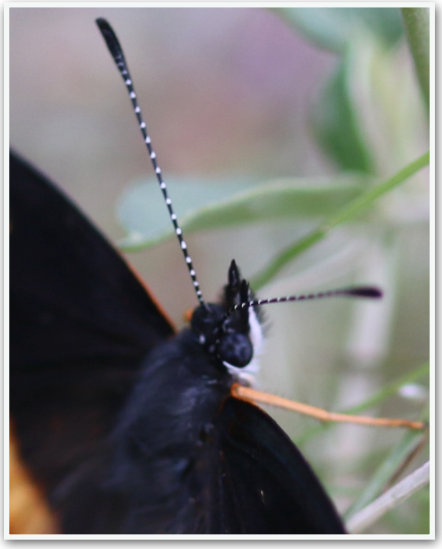


Gordon Berman photographed the Bordered Patch instars shown below and at the right at his home in Las Cruces, just west of the Rio Grande.

The Bordered Patch is variable in appearance, in all phases of its life cycle. Eggs start out yellow-green and later turn reddish. The color of instars ranges from mostly orange with black to mostly black. Pupas (chrysalises) will range from white to nearly all black in color, with intermediates of white with black markings. And lastly, the adult (imago) is also variable, but there is always a red spot near the body on the hindwing.



Among the host plants for this species are sunflowers, ragweed, cockleburs, and crownbeard. In the Black Range, this species is found from the desert foothills up into the Pinyon/Oak forest. Eggs are found on the underside of the leaves of host plants.



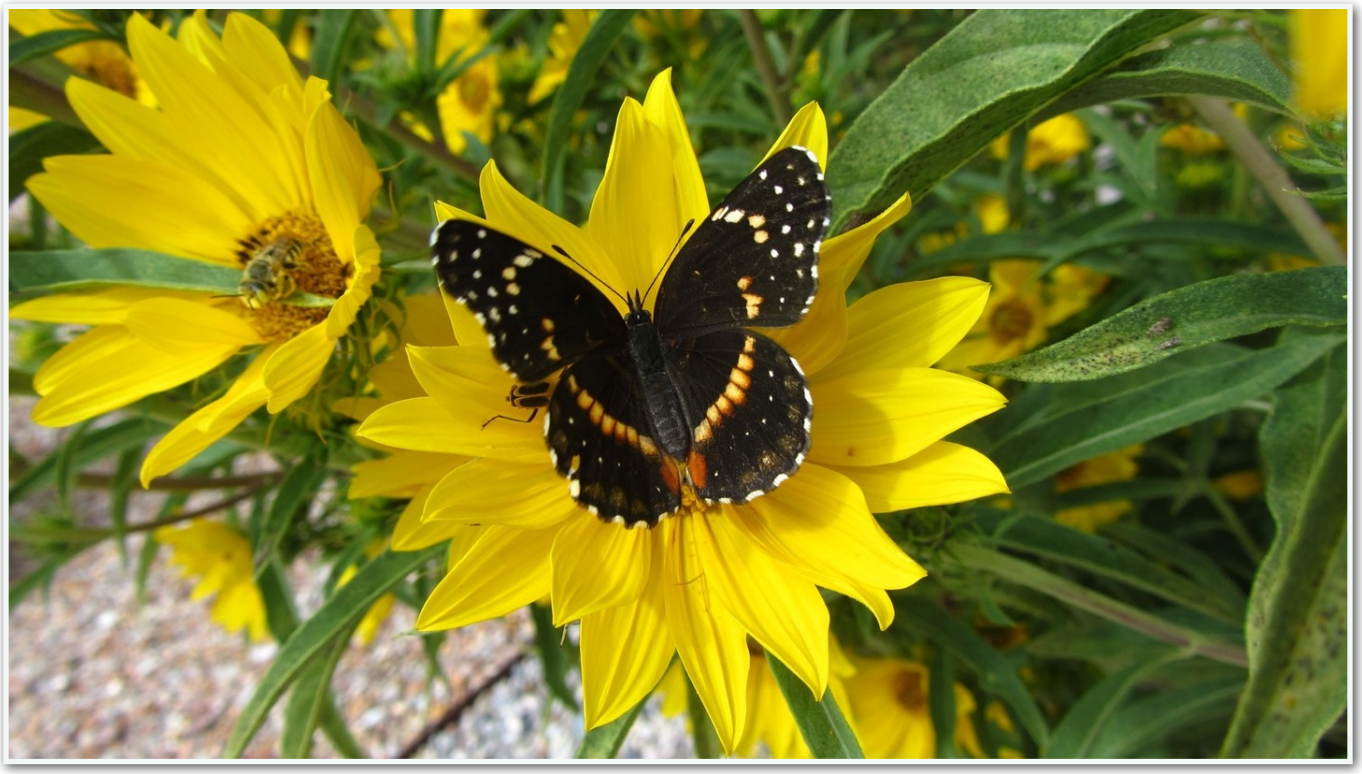
***Chlosyne lacinia*, Bordered Patch**
The photo-graphs shown at the right and on pages 77 and 79 were taken in Hillsboro, NM on October 10, 2022. RAB





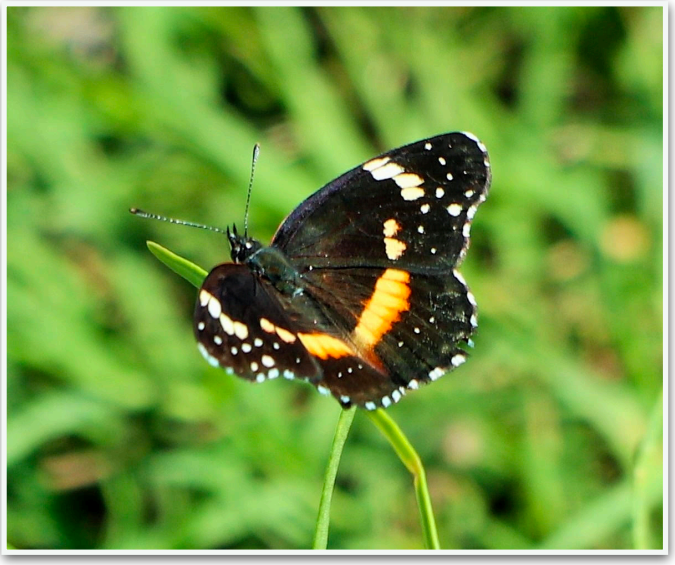


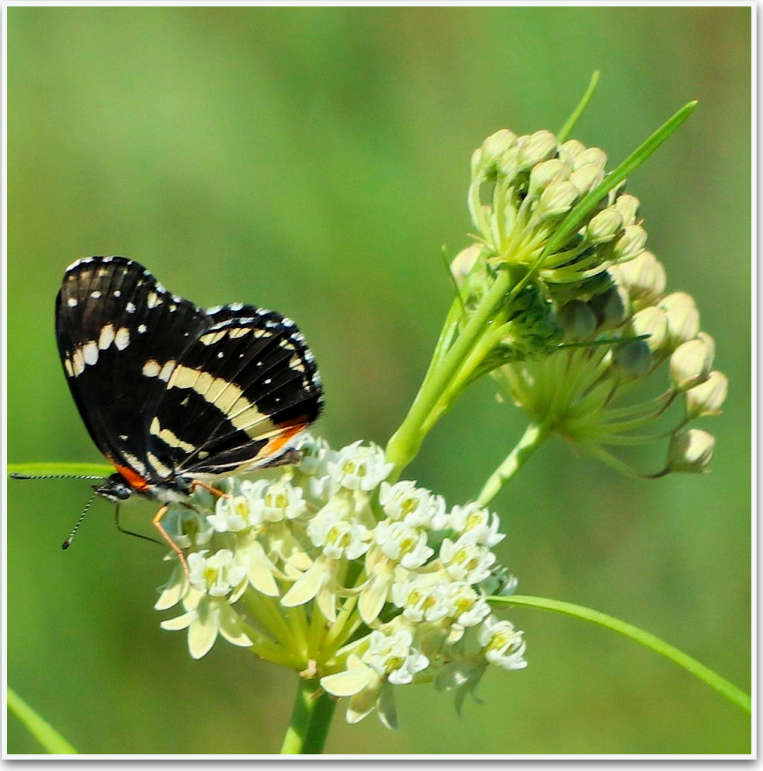
***Chlosyne lacinia*, Bordered Patch**
Above and Below: Photographed in Lake Valley, Black Range, by Debora Nicoll.

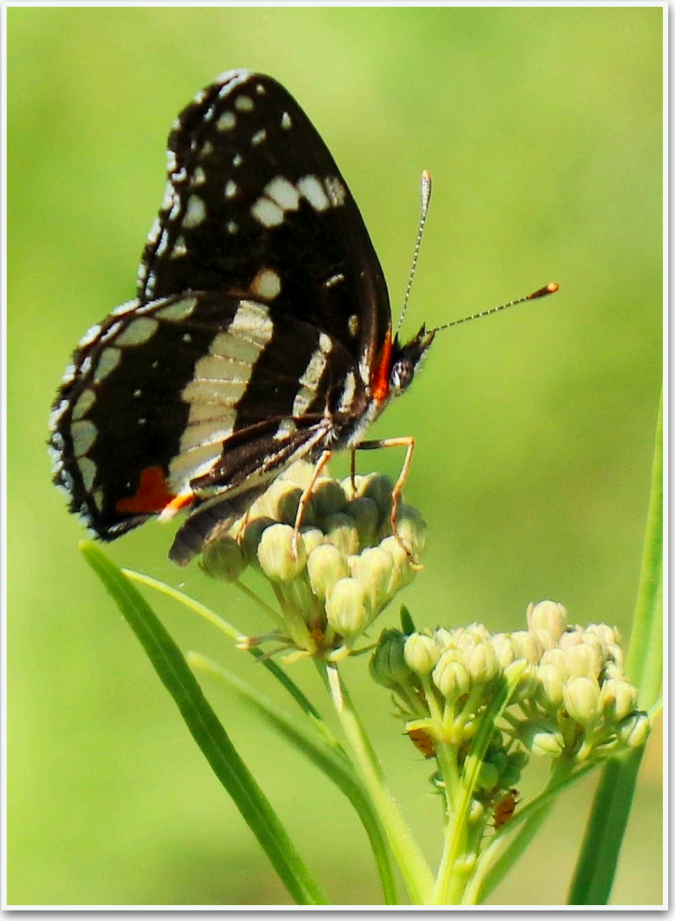
















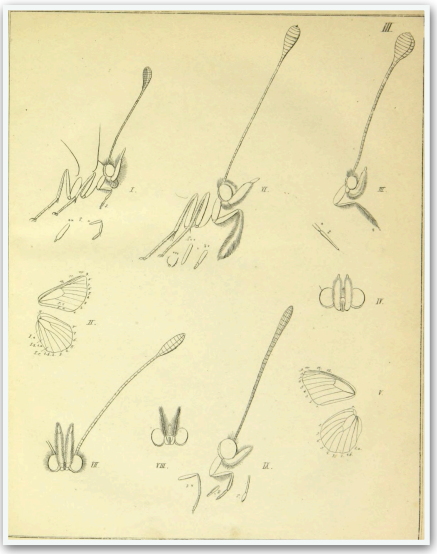
Bordered Patch perched and nectaring from Horsetail Milkweed flowers. Note that in the image to the right a single pollinarium has been extracted via the stigmatic slit and clings to the leg where it could be transferred into another flower, thus achieving pollination. JVL

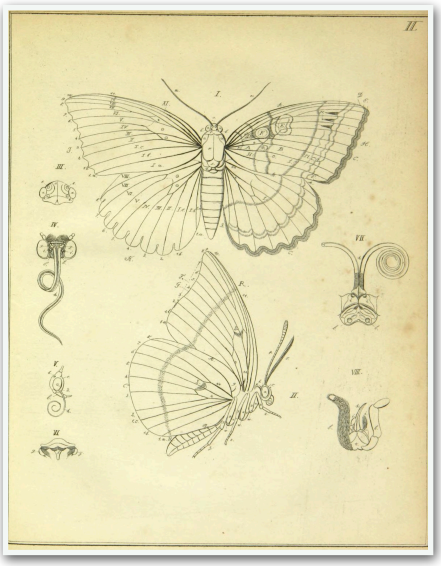




Range Map of *Chlosyne lacinia*
Bordered Patch
From sightings reported to [Butterflies and Moths of North America](#).

One thing to note about the [Bordered Patch](#) is that instars and adult butterflies are variable in appearance. Although the photographs shown in this series represent those that are seen in our area, there is broad of variability in other parts of the range.





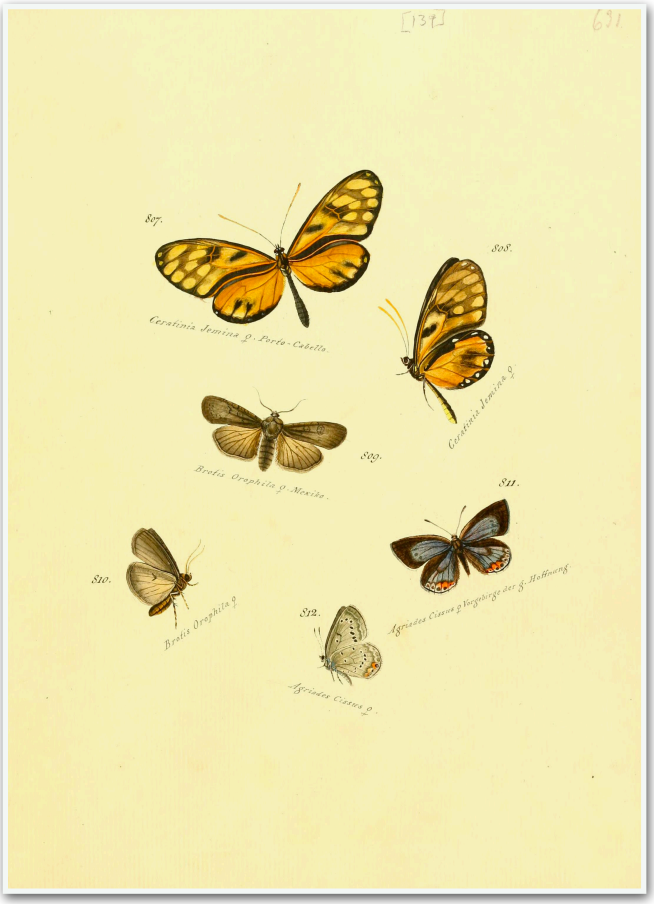
Carl Geyer
(1802-1889)

Peter Carl Friedrich Geyer was a German artist by profession. He worked on Jacob Hüber's works on butterflies, including that published after Hüber's death (primarily *[Systematische Bearbeitung der Schmetterlinge von Europa, zugleich als Text, Revision und Supplement zu Jakob Hübner's Sammlung europäischer Schmetterlinge](#)*). Geyer's diagrams of the parts of a butterfly, especially those useful in identifying a specimen to species is shown above left, from Plate 3 and Plate 2 (above right), Volume 6. His work on that project apparently included his first description of the Bordered Patch.

Other Resources (Bordered Patch)

- Butterflies and Moths of North America
- North American Moth Photographers Group
- BugGuide
- Butterflies of America
- Pajarito Environmental Education Center





Not an illustration of Bordered Patch, but rather an example of Carl Geyer's work, from: *Zuträge zur Sammlung exotischer Schmettlinge [sic] : bestehend in Bekundigung einzelner Fliegmuster neuer oder rarer nichteuropäischer Gattungen*.

Theona Checkerspot
Chlosyne theona thekla
(Ménétriés, 1855)
Subspecies: (W. H. Edwards, 1870)
Hodges #4508

James Von Loh took the photographs of Theona Checkerspot, shown on this and the following page in the Organ Mountains east of Las Cruces. This species is found as far south as Colombia (see range map on the following page).

Among the host plants in our area are various species in the *Castilleja* (paintbrush) genus.

In the American Southwest the flights of this species are between April and October.

Caterpillars in their third or fourth stages are known to hibernate.

There are three subspecies.







Above: Theona Checkerspot with its ventral wing exposed, taking nutrients from moist soil under gravel of the Crawford Trail, Organ Mountains. JVL





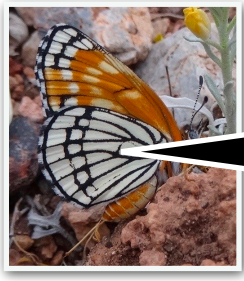
Range Map of *Chlosyne theona*
Theona Checkerspot
From sightings reported to [Butterflies and Moths of North America](#).



Édouard Ménétries

Ménétries was born in Paris, France in 1802 and died in St. Petersburg, Russia in 1861. He served in a Russian expedition to Brazil from 1821-25 and afterwards lived in St. Petersburg. He served as the curator of zoological collections in the Kunstkammer. In that position he received specimens from all over the world. Like many other entomologists, he is the official describer of a number of species which he never saw alive.





Alternating orange and white bands. Compare with *Chlosyne fulvia (left).*

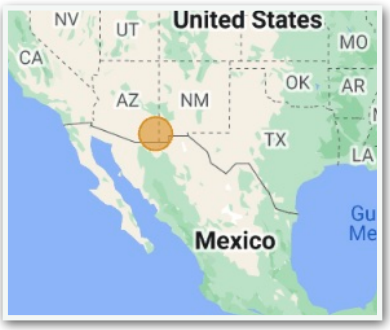


Fairly wide black border.

Other Resources (Theona Checkerspot)

- Butterflies and Moths of North America
- North American Moth Photographers Group
- BugGuide
- Butterflies of America
- Pajarito Environmental Education Center

Theona Checkerspots are extremely variable in appearance even within discrete populations.



Range Map of *Chrysoecia atrolinea*
From sightings reported to Butterflies and Moths of North America.

Other Resources (*Chrysoecia atrolinea*)

- Butterflies and Moths of North America
- North American Moth Photographers Group
- BugGuide





Chrysoecia atrolinea
(Barnes & McDunnough, 1912)
Hodges # 9764

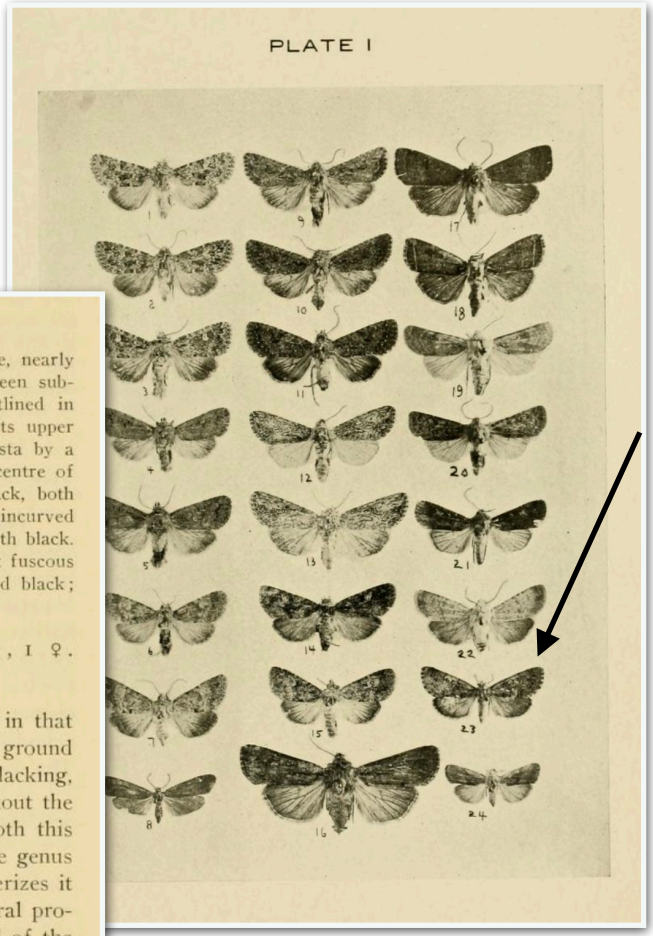
Synonyms of this species include *Antaplaga atrolina* and *Acontia dela*. The original description (and not very helpful image) are shown below right. Text from page 25 of *Contributions to the natural history of the Lepidoptera of North America*; Vol. 1, No. V, Barnes and McDunnough.



Chrysoecia atrolinea
Photographed near Bloodgood Spring (Kingston), Black Range. RAB

James Halliday McDunnough
(1877 - 1962)

After training as a classical violinist, McDunnough received a doctorate in zoology in 1909. From Wikipedia: "He soon learned of an important opportunity: a wealthy surgeon in Decatur, Illinois named William Barnes needed an entomologist to serve as curator and researcher for his private collection of North American Lepidoptera - probably the best in existence at the time." McDunnough and Barnes coauthored numerous professional papers on *Lepidoptera* between 1910 and 1919. In 1919, McDunnough became the manager of the Division of Systematic Entomology in the Canadian Department of Agriculture. He remained in that position until 1946.



ANTAPLAGA ATROLINEA sp. nov. (Plate I, fig. 23.)

Palpi, thorax and primaries orange; t. a. line black, partly double, nearly upright, twice waved, the inner line of the two extending only between subcostal and anal veins, at times broken; orbicular and reniform outlined in black; the former large, open towards costa, touching t. a. line in its upper portion, the latter narrow, well excised outwardly, connected with costa by a black line; below the two spots a waved black line runs through the centre of the median space, incurved in submedian fold; t. p. line double, black, both lines tending to become broken, starting from costa near apex it is incurved slightly opposite cell and strongly below vein Cu_1; fringes checkered with black. Secondaries deep smoky with yellowish fringes. Beneath primaries dark fuscous with costa and outer margin narrowly orange, and fringes orange and black; secondaries smoky with yellow fringes. Expanse, 25 mm.

Habitat:—Chiricahua Mts., Cochise Co., Arizona. 3 ♂♂, 1 ♀. Types, Coll. Barnes.

Related to *dela* Druce which we have before us; differs in that orbicular and reniform are not filled in with paler color than the ground color of the wing, the black suffusion around them is entirely lacking, and the black lines are broken, not so sharply angled and without the slight suffusion seen in *dela*. The frontal protuberance in both this species and *dela* differs from that of *dimidiata*, the type of the genus *Antaplaga*. For this latter species Hampson correctly characterizes it as a "truncate corneous prominence with raised edge and central process and corneous plate below." In *atrolinea* and *dela*, instead of the circular cup-like process, (Hampson's prominence with raised edges) we have a transverse lunate prominence, the front edge of which is drawn out centrally to form a vertical ridge; below this is the infraclypeal plate. This may represent a new genus; we prefer, however, for the present to refer these two species to *Antaplaga*.

Red Satyr
Cissia (Megisto) rubricata
(W. H. Edwards, 1871)
Hodges #4579

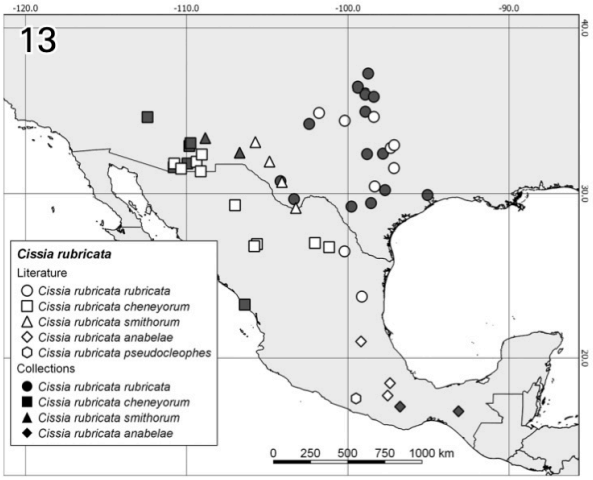




The Red Satyrs pictured to the right, in photos by James Von Loh, were taking nutrients from moist rock surface along Pine Tree Trail above Aguirre Springs Campground and from gravel-covered moist soil along the La Cueva Trail (Organ Mountains).

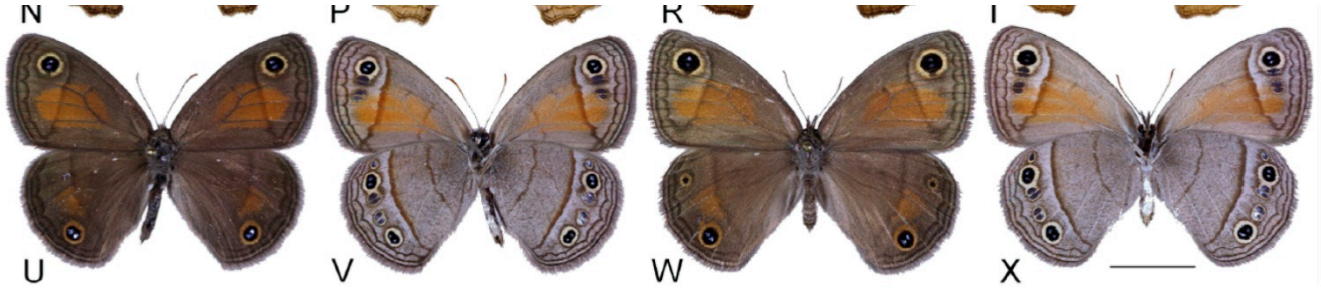
If you have a field guide which is only slightly out-of-date, this species will be called *Megisto rubricata*. In our area it probably has two flights (broods) a year, spanning late April to late August. The individuals shown here are probably of the *C. r. smithorum* subspecies (see distribution map from the study cited below). The subspecies found in the New Mexico boothill and southeastern Arizona is *C. r. cheneyorum;* its coloration is more subdued than the nominate subspecies. The nominate form is found in eastern New Mexico and Texas.

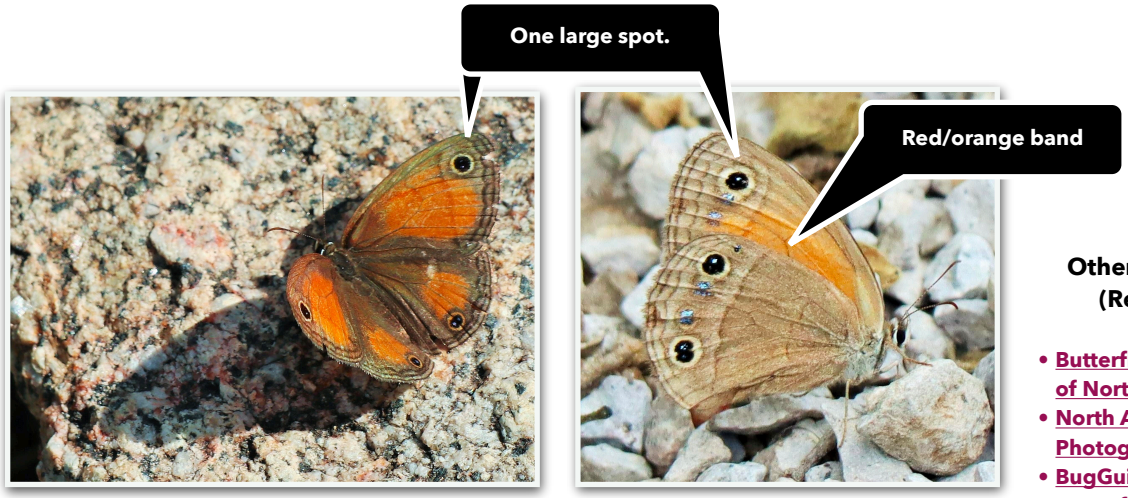
A 2018 study entitled "Systematics of the butterfly genus Cissia Doubleday, 1848 (Lepidoptera: Nymphalidae: Satyrinae) using an integrative approach" by Thamara Zacca, Mirna M. Casagrande, Olaf. H.H. Mielke, Blanca Huertas, Eduardo P. Barbosa, André V.L. Freitas, Luiza M. Magaldi, Marianne Espeland, Shinichi Nakahara, and Keith R. Willmott; in *Arthropod Systematics and Phylogeny* reshaped the genus *Cissia* and moved the Red Satyr to it from *Megisto*. As of the date of this publication (late 2023) some online sources have not adopted the change.



The specimens shown below are from a graphic in the cited study (p. 355). All of the butterflies shown are of the nominate subspecies. "U" is a dorsal view of a male; "V" is the ventral view of a male; "W" is a dorsal view of a female; and "X" is the ventral view of a female.

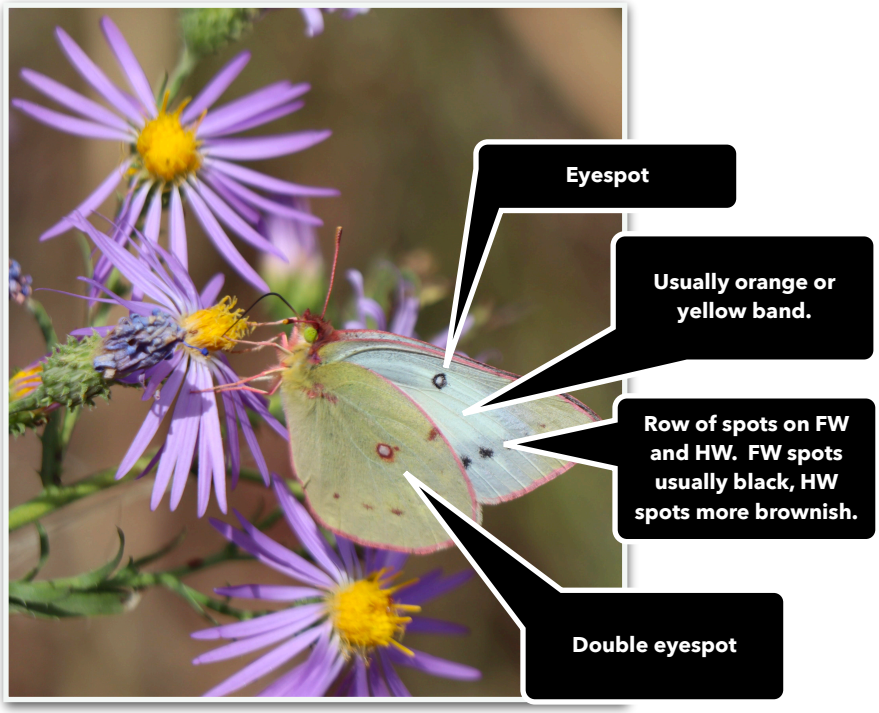






Other Resources (Red Satyr)

- Butterflies and Moths of North America
- North American Moth Photographers Group
- BugGuide
- Butterflies of America
- Pajarito Environmental Education Center



Other Resources (Orange Sulphur)

- Butterflies and Moths of North America
- North American Moth Photographers Group
- BugGuide
- Butterflies of America
- Pajarito Environmental Education Center

Orange Sulphur
Colias eurytheme
(Boisduval, 1852)
Hodges #4210

Sulphurs can be very difficult to identify to species. In the case of an Orange Sulphur look for (among other things) an "underside hindwing spot silver with 2 concentric dark rings, and a spot above it" (Butterflies and Moths of North America).

Host plants for caterpillars are in the pea family (alfalfa and clover). Adult butterflies nectar on a variety of species include asters, milkweeds, goldenrods, and dandelions (at least they have nectared on dandelions since the 1600s).

Flights may number three in our area, generally between March and November.





Above: Orange Sulphur commonly seen nectaring from Spine-aster flowers. Photographs above and to the right are by James Von Loh.

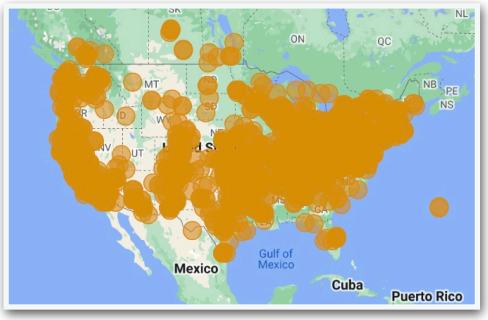


Orange Sulphur JVL



***Colias eurytheme*, Orange Sulphur**
Photographed in Percha Creek, Black Range.





Range Map of *Colias eurytheme*, Orange Sulphur. From sightings reported to Butterflies and Moths of North America.



Above: Variegated Fritillary, *Euptoieta claudia*, and Orange Sulfur on Chamisa in the Black Range. Steve Morgan



Above: Orange Sulphur nectaring from Climbing Milkweed flowers. JVL









This group of images of the life stages of an Orange Sulphur are from Berry Nall's excellent website and are shown here under a Creative Commons Attribution - Non-Commercial 4.0 International License.



Orange Sulphurs nectaring from Spiny Chloracantha flowers on June 18, were common. JVL



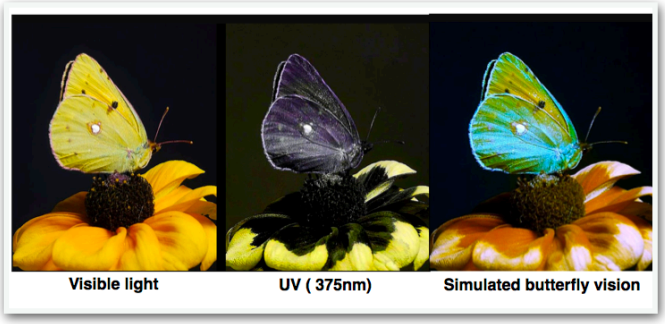


Clouded Sulphur taking nutrients from moist soil near the Soledad Canyon Trailhead in the Organ Mountains. JVL

Clouded Sulphur
Colias philodice
(Godart, 1819)
Hodges #4209

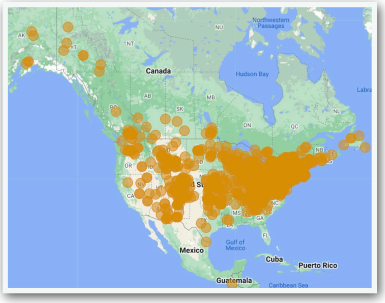
Clouded Sulphur were among the butterflies taking nutrients from moist soil near the Soledad Canyon Trailhead when James Von Loh visited the area in the summer of 2021, taking the two photographs shown here.

Clouded and Orange Sulphurs are closely related species. They use the same host plants and demonstrate some of the same breeding behaviors, like how they go about finding mates. It appears that interspecific breeding is reduced because the two species have wing patterns which reflect ultraviolet (UV) light differently. The dorsal side (top side) of the wings of the Orange Sulphur reflect UV light while the dorsal side of the wings of the Clouded Sulphur absorb UV light. Still, hybrids occur and are often fertile.

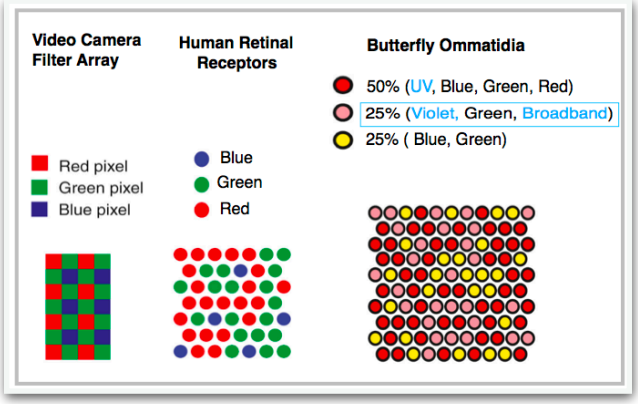


The image, above, is the product of Klaus Schmitt and is from a blog post (August 3, 2020) on the Nectandra Cloud Forest blog. This particular blog is entitled "Blink of an Eye". It describes the eyesight (workings, capabilities, etc.) of butterflies in wonderful detail, and reading it is time well spent. The graph below is from the same blog entry and is adapted from Almut Kelber, *Current Biology* 26:R900-902, 2016.

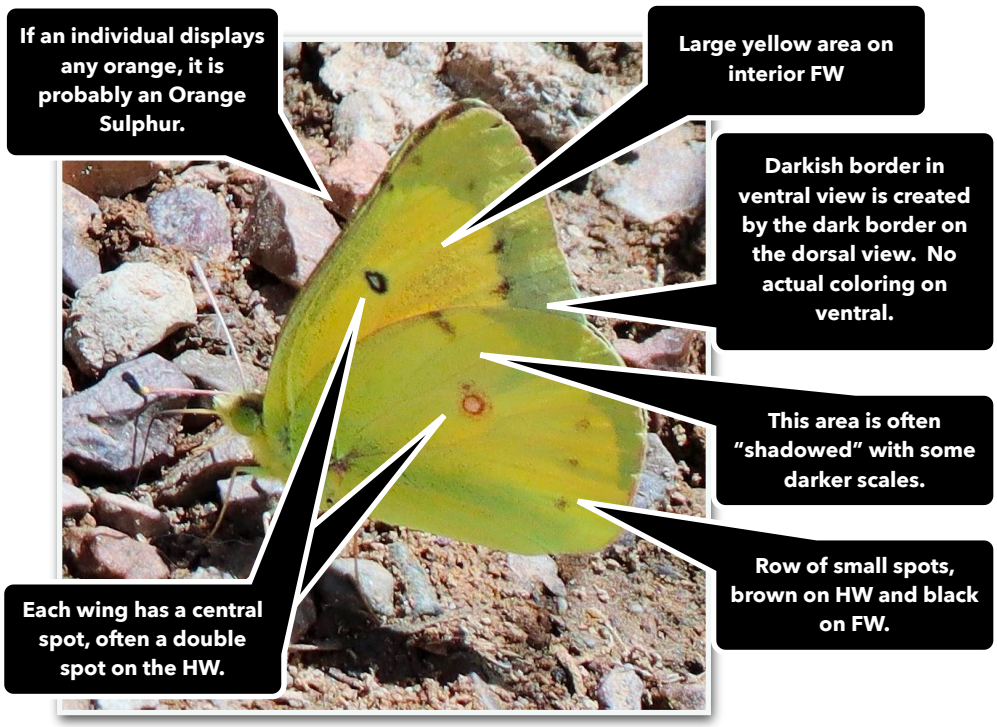




Range Map of *Colias philodice*
Clouded Sulphur
From sightings reported to Butterflies and Moths of North America.



The first record of this species from New Mexico is from June 1961, but its population appears to be expanding. The subspecies found here is *C. p. eriphyle*. There are hints that it may be split and become a full species, *Colias eriphyle* (Western Clouded Sulphur).

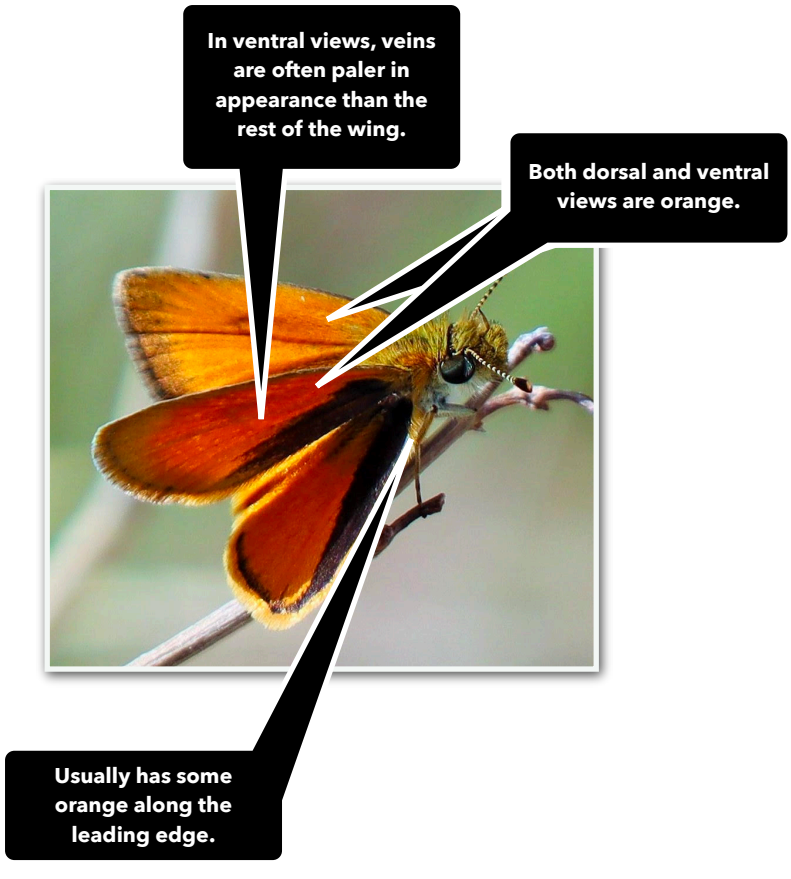


Other Resources (Clouded Sulphur)

- Butterflies and Moths of North America
- North American Moth Photographers Group
- BugGuide
- Butterflies of America
- Pajarito Environmental Education Center

Other Resources (Orange Skipperling)

- Butterflies and Moths of North America
- North American Moth Photographers Group
- BugGuide
- Butterflies of America (Listed as *Oarisma aurantiaca*)
- Pajarito Environmental Education Center



Orange Skipperling
Copaeodes aurantiaca
(Hewitson, 1868)
Hodges #4009

Plants in *Poaceae* (like Bermuda Grass, Sideoats Grama, and Green Spangletop) are hosts for the caterpillar of this species.

The main range of this species covers the southern parts of California, Arizona, and New Mexico, south to Panama. It is also found in west Texas.



Range Map of *Copaeodes aurantiaca,* Orange Skipperling From sightings reported to Butterflies and Moths of North America.





Report from 2021: Orange Skipperling, *Copaeodes aurantiaca* (Hewitson, 1868), arrived late in the Milkweed flowering period and can be confused with the Tropical Least Skipper. It is unknown if they nectar from Milkweeds earlier in the season, but many of these tiny skippers were observed along the Rio Grande during Thanksgiving week in 2021. It is a a resilient species. Night-time temperatures on November 28, 2021 were in the low 30s F when it was observed nectaring from Water Speedwell, *Veronica anagallis-aquatica* L. JVL

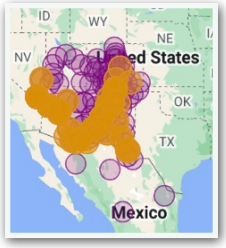
Canyonland Satyr
Cyllopsis pertepida
(Dyar, 1912) - Hodges #4572

The Canyonland Satyr directly below was photographed on November 13, 2021 along Mineral Creek, north of Kingston. There are typically three flights of this species every year, in our part of the world. It is most common during May, July, and October. The earliest an imago has been seen in the state is April 16.





Canyonland Satyr is commonly found at elevations between 4,600′ and 8,900′, meaning that it can be expected in many of the foothill communities and much of the Black Range. Males often patrol dry gulches with enough vegetation to provide shade. The adults of this species rarely feed. Ron Parry notes that we also have Nabokov's Satyr in our area and that it can be differentiated from the Canyonland Satyr when the specimens are fresh, but it can be difficult to separate the two species if the specimens are worn.

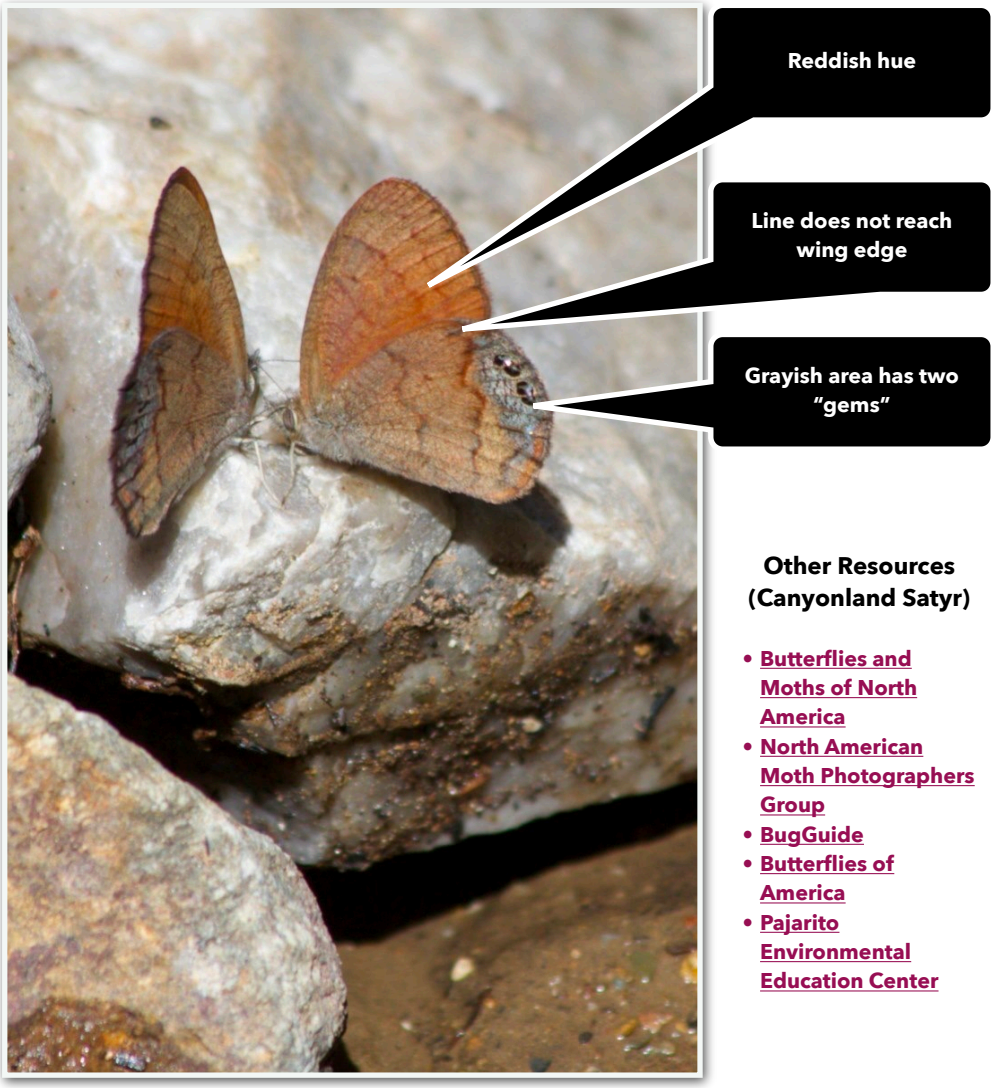


Range: Map from Butterflies and Moths of North America.

This species was first described by Harrison Gray Dyar , Jr. in 1912, but its most famous admirer was Vladimir Nabokov, who studied the species extensively and is the first describer of the three subspecies. Most people know Nabokov as a world-class novelist, but he was also a renowned lepidopterist. Much of his work was not given critical credit during his lifetime, because he was an "amateur". It has, however, stood up well to the most recent genetic testing - something many of the "professionals" can not claim.

The two photographs at the upper right were taken at the fist stream crossing on Middle Percha Road heading west out of Kingston. The photograph immediately to the right is from May 26, 2020, it was taken in Drummond Canyon, off South Percha Creek.





Forewing/Hindwing and Dorsal/Ventral

A butterfly's forewing is the one which is at the front (face end) of the butterfly. The hindwing is the wing to the rear.

When looking at a butterfly from above, and if the wings are open, you are seeing the dorsal wing surface (like that in the top photo on the following page). When the butterfly is sitting and has its wings closed, it exposes the bottom of the wing or the ventral surface. When navigating the features of a butterfly, forewing, hindwing, dorsal surface, and ventral surface are terms of the trade.

The Canyonland Satyr will almost always land with its wings folded, given you a view only of the ventral side of the wings.

Other Resources (Canyonland Satyr)

- Butterflies and Moths of North America
- North American Moth Photographers Group
- BugGuide
- Butterflies of America
- Pajarito Environmental Education Center

Harrison Gray Dyar Jr. (1866-1929)

Dyar's Law, which describes the growth of various insect parts, is named after Dyar. He was an American entomologist.

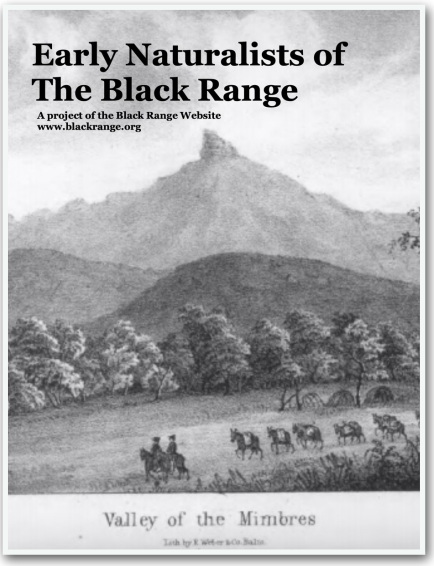
Dyar was the editor of several scientific journals, including; *Journal of the New York Entomological Society* (1904 to 1907), the *Proceedings of the Entomological Society of Washington* (1909 to 1912), and *Insecutor Inscitiae Menstruus* (1913 to 1926).

Dyar collected extensively and during the later part of his life became one of the leading authorities on mosquitoes, with an emphasis on their taxonomy.

There are three subspecies of Canyonland Satyr, all were originally described by Nabokov in 1942. Based on range, the one we find here, and the one shown in these photographs is most likely the nominate form. But check the subspecies images at Butterflies of America (link above) to distinguish the nominate form from *C. p. maniola* which is found in the far southwest of the state.

Francis H. Snow (1840-1908)

The Pajarito Environmental Education Center (link above) website notes that "Snow (1883) collected . . . (Canyonland Satyr) . . . in the Magdalena Mountains (So) in 1881, but misidentified it as *Cyllopsis henshawi*."



See *Early Naturalists of the Black Range*, pp 95-96, for a more complete biography of Snow.

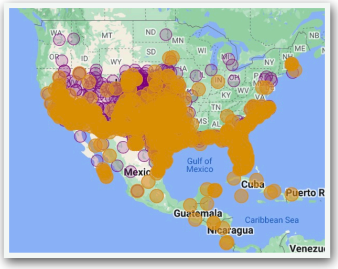
Queen

Danaus gilippus

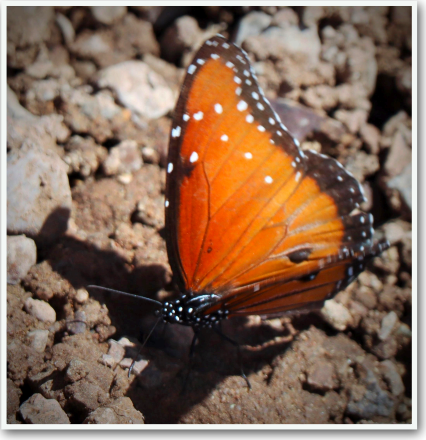
(Cramer, 1776)
Hodges #4615

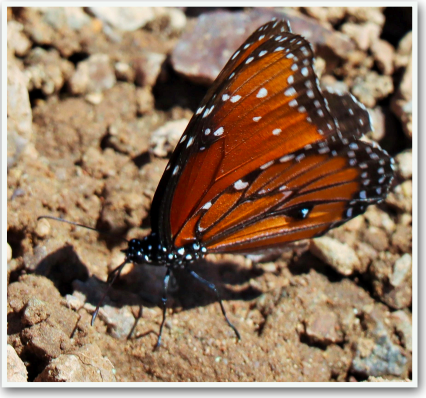
The Queen is the most commonly observed large puddler in our area. James Von Loh, photographed the larvae of the Queen butterfly, foraging on newer leaves and the stem of the inflorescence of *Asclepias subverticillata (*Horsetail Milkweed*)* and the two images of the pupa shown here. The two pupa photographs are of the same individual taken one day apart and were identified with the assistance of Steve Cary.

During both the imago and instar stages of their lives, Queens and Monarchs can be difficult to tell apart. The shades of their coloration, the patterns of color they exhibit, the food (milkweed) they consume, and their ability to sequester toxins from the plants they eat (and thus be distasteful or poisonous) are basically the same. Mullerian mimicry is the term used to describe two species with similar natural defenses and common predators evolve to look alike, "to spread the fear". A more complete description of the differences between the appearance of these two species is found at the end of this species account.



Range Map of *Danaus gilippus* Queen
From sightings reported to Butterflies and Moths of North America.











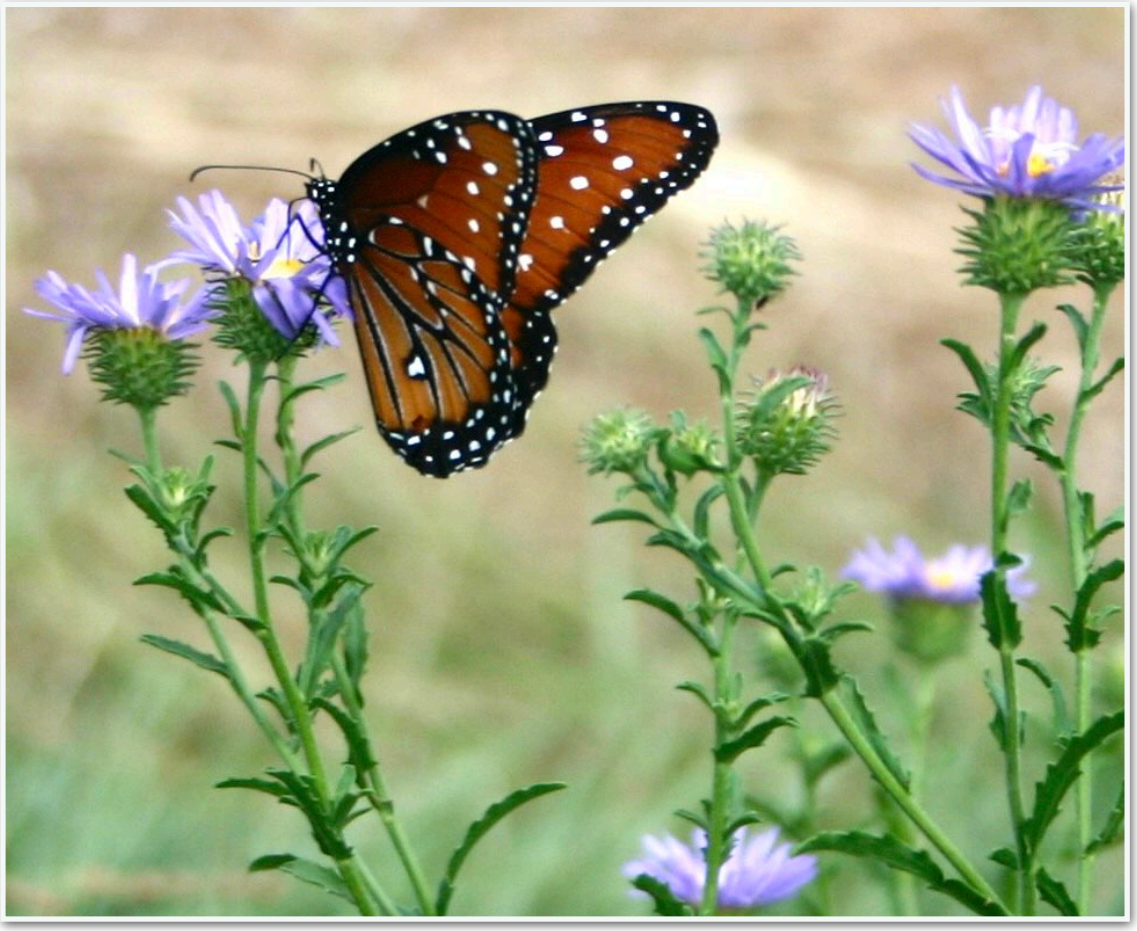




Above: Queen, *Danaus gilippus* (Cramer, 1775). A common large butterfly nectaring from Spine-aster flowers. JVL



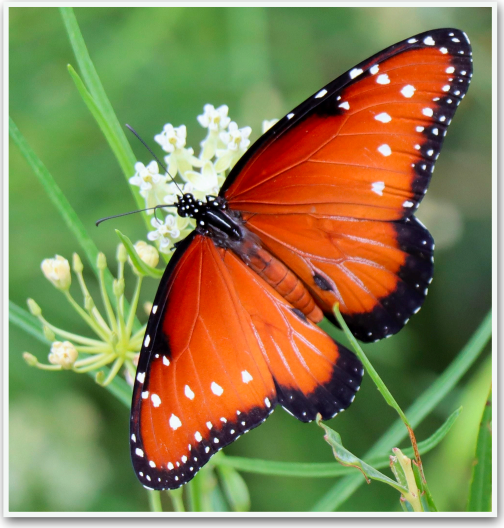
This Queen was photographed in Hillsboro, Black Range (RAB). Video of the butterfly may be viewed here.



Sometimes a photographer will be able to capture a good portion of both wing surfaces, as Nichole Trushell did in the photo to the left. But that can be very difficult. She photographed this Queen at her home in Kingston, Black Range.



Desert Queen, *Danaus gilippus* (Cramer, 1775) *thersippus* (H. Bates, 1863), butterflies nectared from both Horsetail and Climbing Milkweed flowers consistently over three growing seasons per my observations/photographs. JVL



Desert Queen, shown here nectaring from Horsetail Milkweed flowers, exhibits brownish-colored dorsal wing surface (above) and brownish-colored ventral wing surfaces. JVL

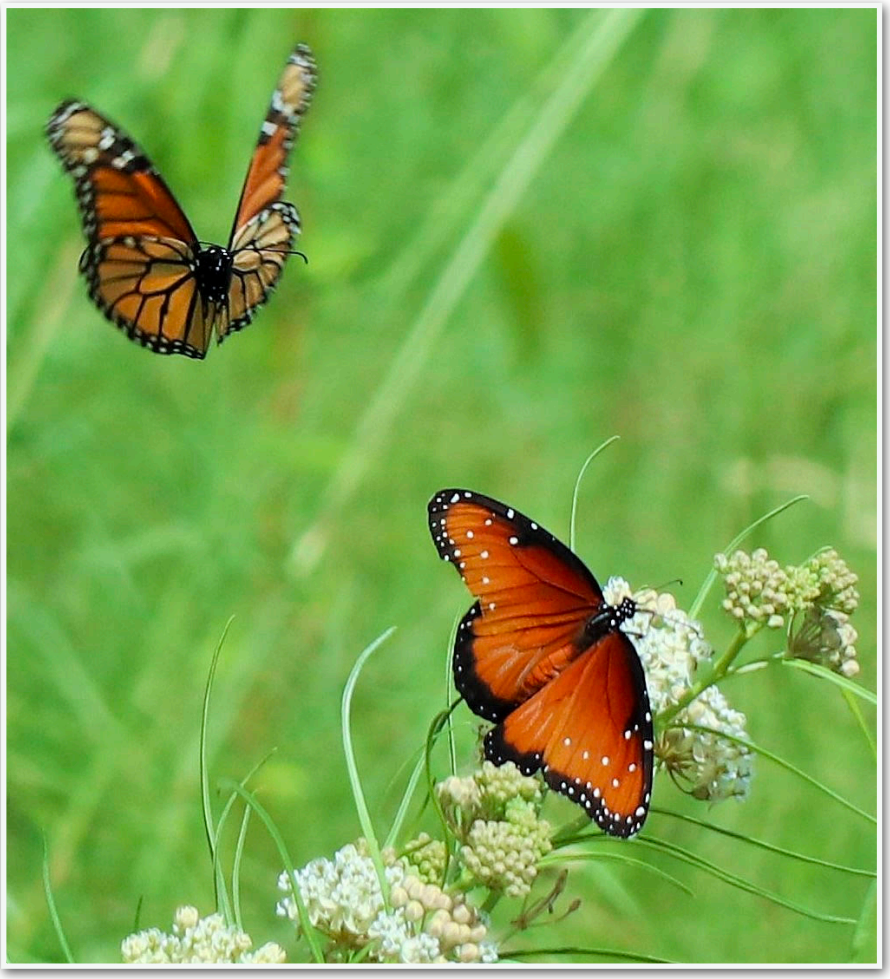




A short video by James Von Loh, of Desert Queens on Horsetail Milkweed at this site is hosted here.

Desert Queens nectar from both Horsetail and Climbing Milkweed flowers, while Monarchs appear to exclusively nectar from Horsetail Milkweed flowers. (I observed only a single Monarch nectaring from Climbing Milkweed flowers, in 2019).

Below: Queen with frayed wings on June 27, it was uncommon at that time and nectaring from Spiny Chloracantha flowers. JVL







Above: Queen is nectaring from Brown-foot, *Acourtia wrightii* ((A. Gray) Reveal & King) flowers. JVL



Above: Queen nectaring from Scarlet Morning-glory in Fillmore Canyon. JVL





Above Right: Horsetail Milkweed plant illustrating typical progression of leaf distribution, flower development, and nectaring opportunities available to migrating butterflies such as this Queen. JVL



**Queen (*Danaus gilippus*) on Chamisa.
Nichole Trushell**



**Above: Queen on June 22, were uncommon.
Here it is is nectaring from Spiny Chloracantha flowers. JVL**

Other Resources (Queen)

- Butterflies and Moths of North America
- North American Moth Photographers Group
- BugGuide
- Butterflies of America
- Pajarito Environmental Education Center





Telling them apart: Forewing and hindwing of Queen (left) are same color; they are different colors in the Monarch (right). Monarchs do not have white spots within the orange of the forewing; Queens do.

Monarch
Danaus plexippus
(Linnaeus, 1758)
Hodges #4616

There are several species of butterfly in the genus *Danaus* in our area; the Monarch is probably the best known. This species is a milkweed specialist, and there are milkweed planting campaigns you can "join" in an effort to mitigate the decline in its population.





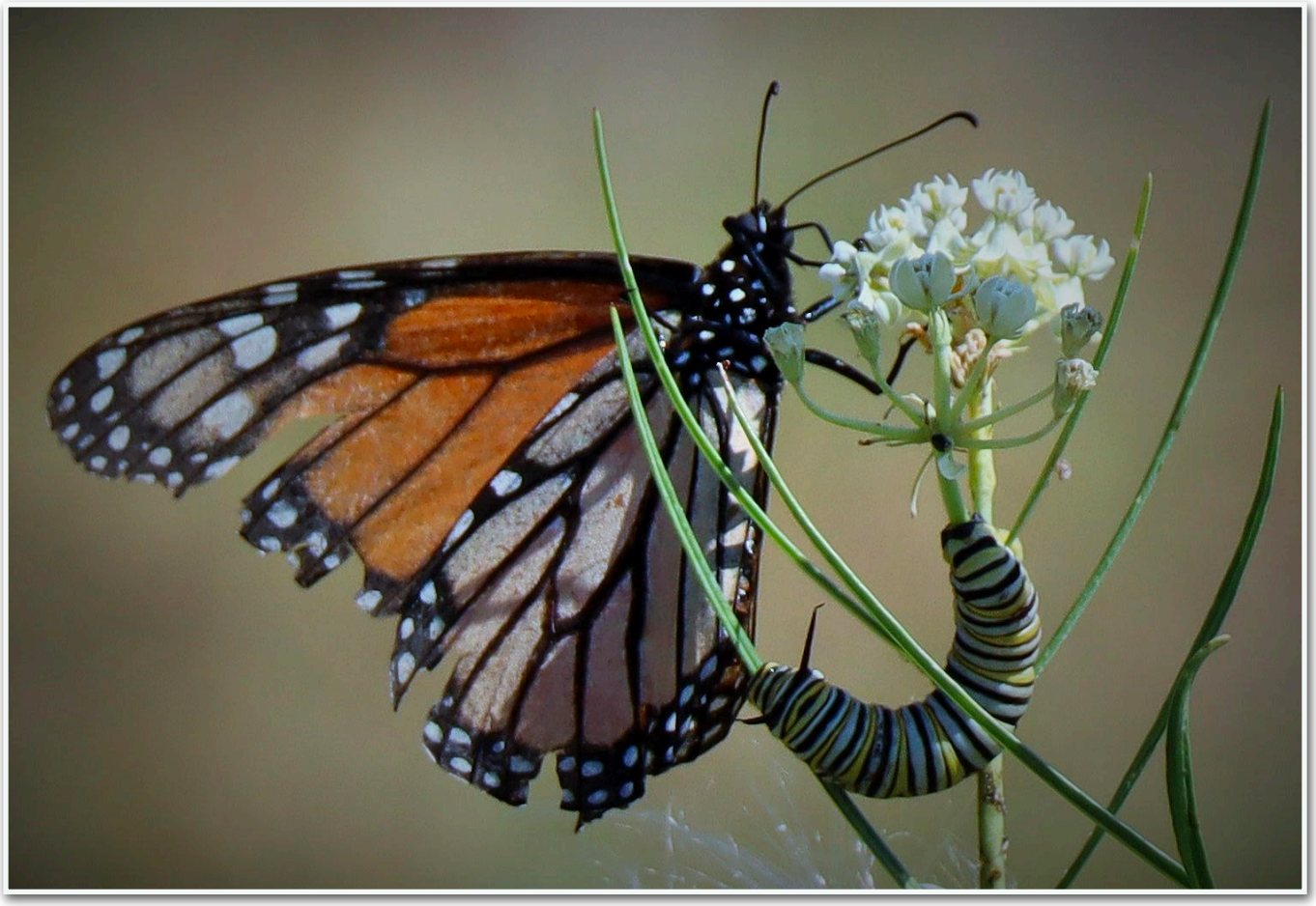


Upper Right: The photograph of a Monarch at the upper right was taken by Debora Nicoll in Lake Valley, Black Range.

In both photographs of Monarch larvae, the insects are foraging on newer *Asclepias subverticillata* (Horsetail Milkweed) leaves among fruits. Photograph above by Nichole Trushell (photographed in Kingston, Black Range) and by James Von Loh, to the right.

Below Right: Monarch nectaring from Brown-foot flowers. JVL





Monarch adult nectaring from flowers and larva foraging on younger *Asclepias subverticillata* leaves near inflorescence. Photograph by James Von Loh.



Monarch larvae often forage on *Asclepias subverticillata* fruits or on the youngest leaves of the stem. There are probably high concentrations of nutrients available at those locations. Instars can often look quite different. Photographs by James Von Loh.



Telling them apart: Monarch (left) has bands which are roughly the same width; Queen (right) has broader white bands, and filaments emerge from yellow bands boarded by black. Monarchs will have two sets of filaments (those "antenna" look a likes), front and back, while Queens have three (two front sets with filaments longer than those of the back - see page 94).



Monarch, above, at Fillmore Falls, Organ Mountains (photo by Gordon Berman)

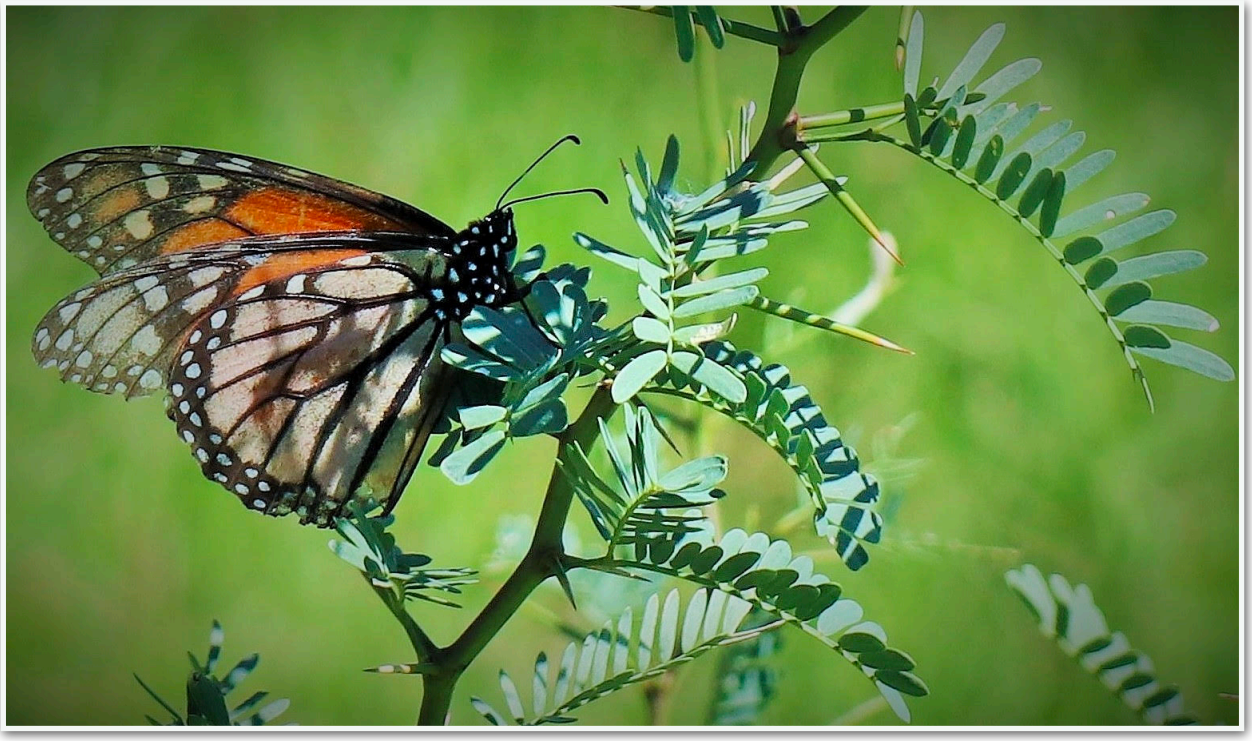


The Bordered Mantis, *Stagmomantis limbata* (Hahn, 1835), is the color of Horsetail/Whorled Milkweed leaves and stems. In this image a Bordered Mantis captures and ingests a Monarch which was seeking nectar from the Milkweed flowers. JVL

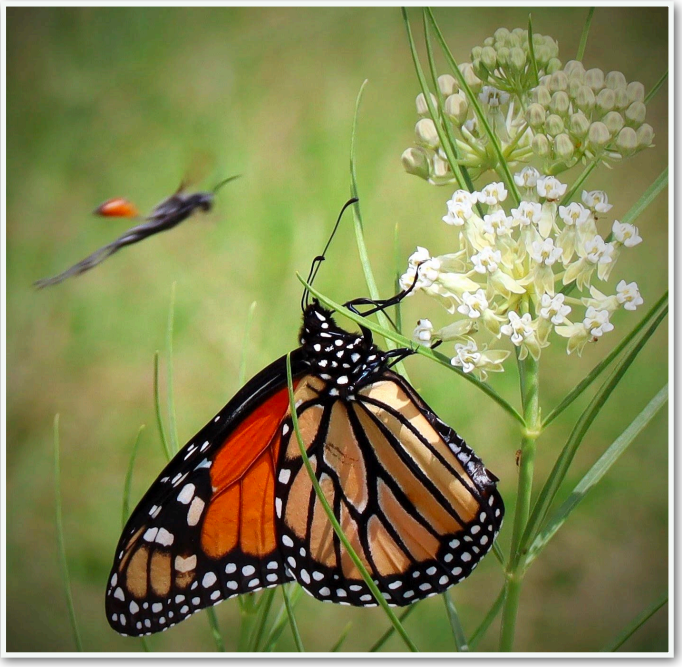


Monarchs are well known for laying eggs on milkweed species, as is shown below. Above, a Monarch nectars on Horsetail Milkweed, while a larva of the species munches on the same plant - the plant is in flower and seed. JVL





This Monarch is depositing eggs on a Honey Mesquite, *Prosopis glandulosa* (Torr.), which was within a Horsetail Milkweed stand. JVL





Monarchs nectaring on Horsetail Milkweed flowers are sometimes harassed by Ashmead's Digger Wasp, *Sphex ashmeadi* (Fernald, 1906) - at left - and Hymenoptera (Linnaeus, 1758) wasps - above.

This is the only Monarch (dorsal wing view below center and ventral wing view below left) I have observed nectaring from Climbing Milkweed flowers, during three seasons of observation/photography.

Bottom Right: Horsetail Milkweed fruits, provide an egg deposition site for this Monarch. The fruits are also preferred forage for Monarch caterpillars. JVL

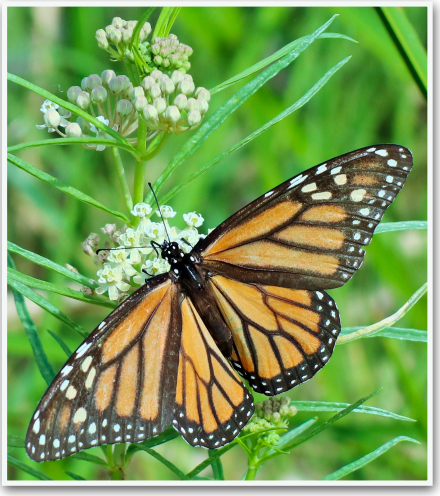






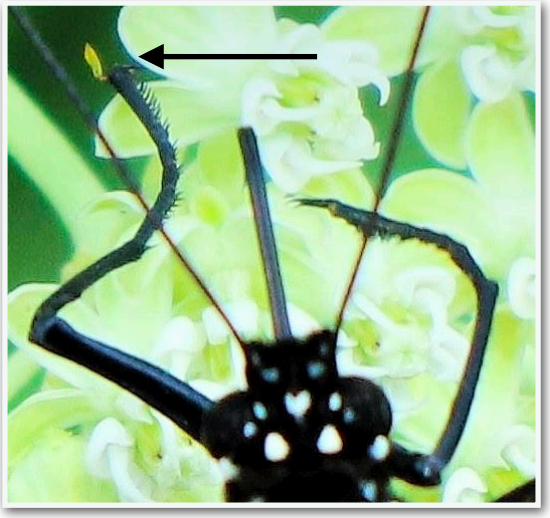






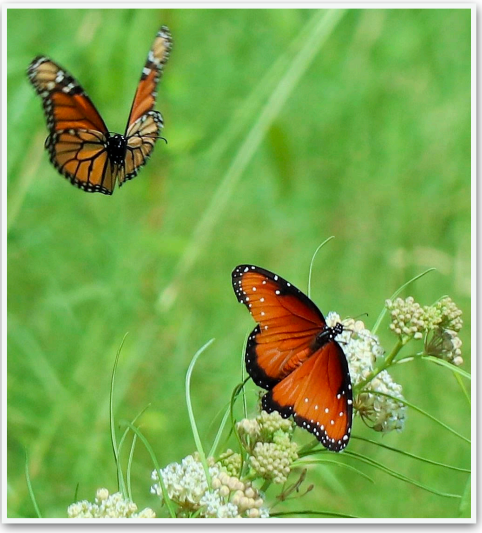
When photographing many butterfly species, like this Monarch, back-lighting will often enhance the wing colors. However, their wings will exhibit dull orange color under a cloudy sky (second photo from top, at right).

The pair of Monarchs pictured at the bottom right were mating in Bermuda Grass, *Cynodon dactylon* under Horsetail Milkweeds. The butterfly in the foreground exhibits the large beige color patches on the ventral wings which are one of the keys to the identification of the species. JVL

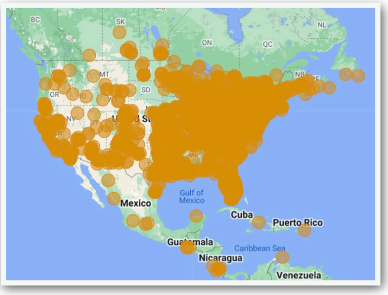




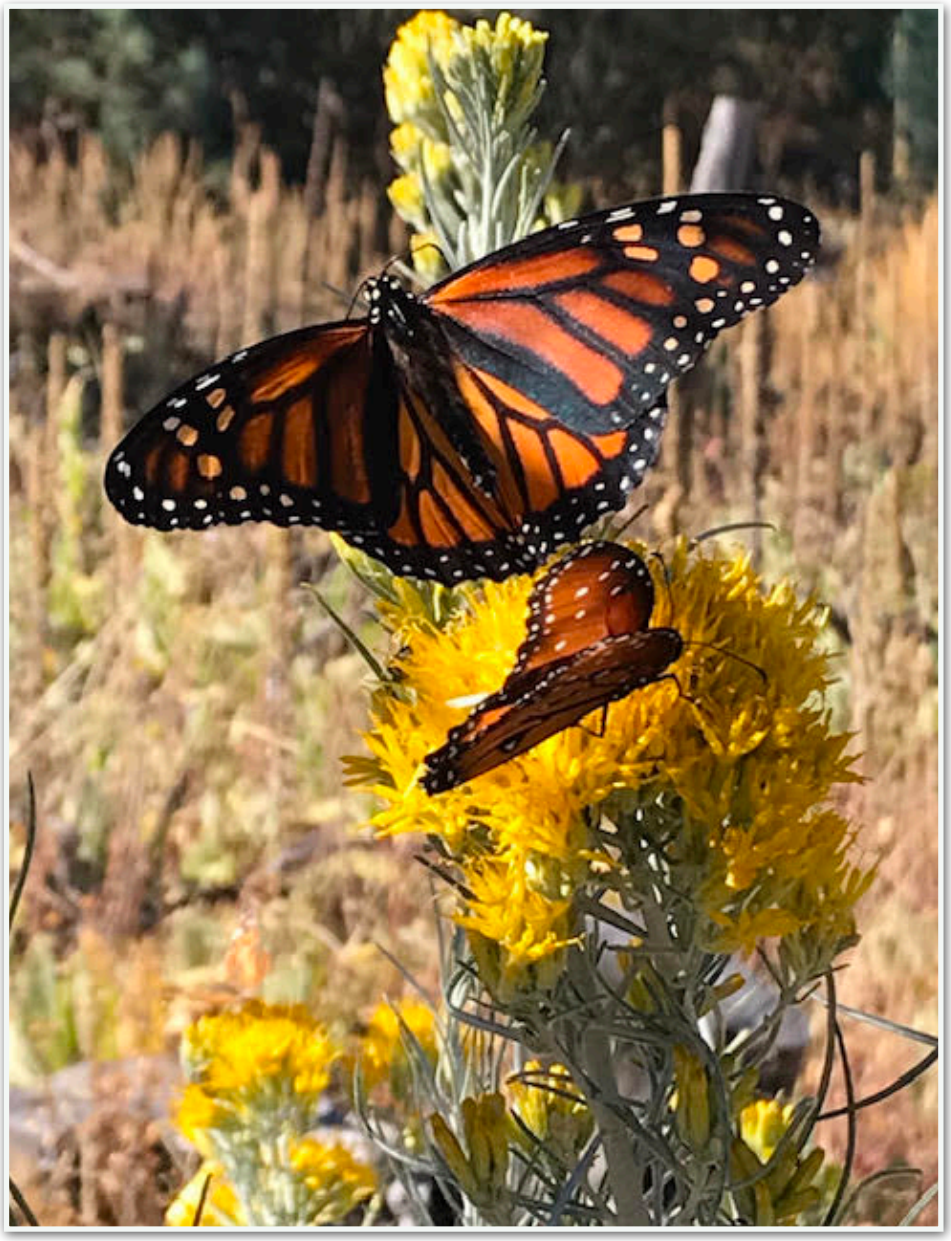
Above: Monarchs have legs that are long and strong enough to extract pollinia (see pollen sac on left front leg) however, I would consider them a rare pollinator of Milkweed flowers and an uncommon flower visitor along this Rio Grande reach. JVL



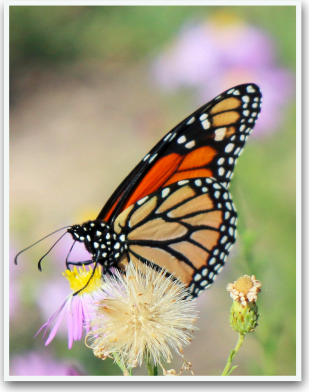
Left: Monarch (in-flight) investigates Desert Queen nectaring from Horsetail Milkweed flowers. Generally, Monarch wings are orange-colored dorsally with orange and beige colors ventrally while Desert Queen wings are shades of brown-to-brownish orange in color, both dorsally and ventrally. Desert Queens nectar from both Horsetail and Climbing Milkweed flowers, while Monarchs appear to exclusively nectar from Horsetail Milkweed flowers. (I observed only a single Monarch nectaring from Climbing Milkweed flowers, in 2019). JVL



Range Map of *Danaus plexippus*
Monarch
From sightings reported to
Butterflies and Moths of North America.



Top: Monarch and Queen on Chamisa. JVL

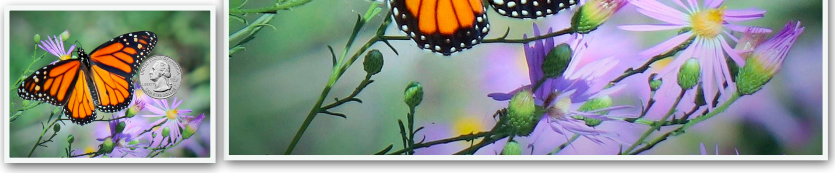








The Monarch images directly above have been entered on the Journey North page on this species. JVL



Monarchs are uncommon on Spine-aster flowers. JVL

Datana neomexicana
(Doll, 1911)
Hodges #7913

The caterpillars shown here are most likely the instars of *Datana neomexicana* which has a range which extends from Arizona to western Texas, to include New Mexico and parts of Colorado. This determination, however, is made exclusively on range (at this point). *Datana neomexicana* can not be separated from *D. perfusa* using DNA barcoding techniques.

The April 2023 issue of the Black Range Naturalist has a more extended discussion of these issues.

The two photographs on this page were taken by Véronique De Jaegher of Kingston in late summer, 2022.

Photographs on the following page were taken along the trail from the Kingston Cemetery to Emory Pass on October 11, 2022 - RAB.







Range Map of *Datana neomexicana*
From sightings reported to Butterflies and Moths of North America.

Jacob Doll
(1847-1929)

Doll is known primarily as a collector but from 1898 to 1927 he served as the Curator of Lepidoptera at the Brooklyn Museum.

The *Bulletin of the Brooklyn Entomological Society*, p. 105, Volume 24, Number 2, April 1929, noted that *"To Mr. Doll's credit there is a long list of moths all bearing the specific name of 'dolli' in his honor as the first discoverer of the species. Many of these were collected by him during pioneer days out west. Of his exploits and the incidents connected with the capture of these insects, his is wont to talk freely . . ."*

From the early 1870's to 1896 he collected for, and maintained the collection of, Neumoegen, who at that time owned one of the largest *Lepidoptera* collections in the country. Following Neumoegen's death, his collection became the core of the Brooklyn Entomological Society's collection and remained under Doll's care.











Photographed along the trail from the Kingston Cemetery to Emory Pass, Black Range, New Mexico on October 16, 2022 - RAB.

