

The Odonata of Doña Ana County and the Black Range

Volume Two: Damselflies - A Natural History

Photo Documentation and narrative by James Von Loh
Supplemented by material from Gordon Berman, Bob Barnes, Jonathan Batkin, and Others.
Edition 2, September 2025

A Natural History of
The Odonata of Doña Ana County:
Volume Two - The Damselflies

With Notes on the Black Range

James Von Loh of Las Cruces is the primary author of this work. He is the photographer who took most of the images and the author who wrote most of the text. If a photograph or statement is not attributed to someone else, it is safe to assume that he is the originator and holds the copyright. His photo-documentation occurred entirely within Doña Ana County, New Mexico during the 2019-2025 field seasons.

Some of the material in this work is presented in the first person pronoun because we wished to capture the experience. Unless stated otherwise, the pronoun refers to James Von Loh.

Several other individuals have contributed to this work in significant ways. Primarily Gordon Berman of Las Cruces, Robert Barnes of Hillsboro, and Jonathan Batkin of Tucson. Their contributions, and the contributions of others, are annotated.

Except as noted elsewhere, contributors retain all copyright to the material which they have generously allowed us to use. Generally, narrative specifically referencing the Black Range, and involving data mining of iNaturalist and other sources, was provided by Bob Barnes.

A Natural History of The Odonata of Doña Ana County With Notes on the Black Range is an effort of the Black Range project and is hosted on the *Black Range website*, where it may be downloaded for personal use or read on line, www.blackrange.org. There are two volumes. Volume One covers the dragonflies and Volume Two covers the damselflies.

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This is the second edition of *A Natural History of The Odonata of Doña Ana County With Notes on the Black Range*. As of the date of publication no decision has been made about future versions. However, *The Black Range Naturalist* will continue to publish updates on this topic as contributors submit material. Updates published in The Black Range Naturalist will be noted on the "*Odonata*" page of the Black Range website, where this edition will be available. (Generally the publication date is about a year following the observation date - postings to iNaturalist are encouraged.)

Please help us make this work better. Let me know if you find errors of omission or commission so that future versions (if any) can be corrected. If you have material which would benefit our larger community please share it with us so that it can be included in possible future versions and/or in The Black Range Naturalist updates. And, if you know of someone who might want to access this work please pass the link information on to them so that they can download or read on line.

Bob Barnes, Editor
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THE COVERS

Front Cover: American Rubyspot
by James Von Loh
Back Cover: Mating Mexican Forktails
by James Von Loh

Species Included In This Work

First Page of the Species Account is Indicated

The Order *Odonata* consists of two suborders; *Epiprocta* (which includes *Anisoptera* [dragonflies] and *Anisosygoptera* [a small number of extant species found in China and Japan]) and *Zygoptera* (damselflies). Damselflies are dealt with in this volume.

In this work, species are not presented in strict taxonomic order, they are listed by family, then by genus, and then by species. Within each genus, species are presented in alphabetical order by their Latin binomial.

The *Zygoptera* consists of many species and the taxonomy is not completely fixed. See "Redefining the damselfly families: a comprehensive molecular phylogeny of Zygoptera (Odonata)". Klaas-Douwe B. Dijkstra, Vincent J. Kalkman, Rory A Dow, Frank R. Storkvis, and Jan Van Tol. *Systematic Entomology*. Royal Entomological Society. 26 August 2013 https://doi.org/10.1111/syen.12035. Earlier works, like Kirby's, *A Synonymic Catalogue of Neuroptera Odonata or Dragonflies*, 1890, can also be useful in understanding the taxonomic determinations made within this suborder.

Although there are other differences, the size of the wing connections with the body of the insect is used to distinguish between the Broad-winged (broader connection) and Narrow-winged (a more narrow connection) Damselflies. Members of the Spreadwing family typically hold their wings at an angle away from their body, unlike Broad-winged and Narrow-winged Damselflies which generally hold their wings folded together when they are at rest.

This lineage of animals is at least 225 million years old.

The Damselfly (*Zygoptera*) Species included in this volume.

Broad-winged Damselfly Family *Calopterygidae* (Sélys, 1850)

Rubyspots (Hetaerininae - Tillyard & Fraser, 1939)

9. *Hetaerina americana* (Fabricius, 1798) American Rubyspot

Narrow-winged (or Pond) Damselfly Family *Coenagrionidae* (Kirby, 1890)

Dancers (Argia - Rambur, 1842)

31. *Argia apicalis* (Say, 1840) Blue-fronted Dancer
37. *Argia extranea* (Hagen, 1861) Spine-tipped Dancer
40. *Argia lugens* (Hagen, 1861) Sooty Dancer
42. *Argia moesta* (Hagen, 1861) Powdered Dancer
49. *Argia munda* (Calvert, 1902) Apache Dancer
51. *Argia nahuana* (Calver, 1902) Aztec Dancer
53. *Argia pallens* (Calvert, 1902) Amethyst Dancer
56. *Argia plana* (Calvert, 1902) Springwater Dancer
59. *Argia sedula* (Hagen, 1861) Blue-ringed Dancer

American Bluets (*Enallagma* - Charpentier, 1840)

63. *Enallagma civile* (Hagen, 1861) Familiar Bluet
75. *Enallagma praevarum* (Hagen, 1861) Arroyo Bluet
78. *Enallagma semicirculare* (Sélys, 1876) Claw-tipped Bluet

Painted Damsels (*Hesperagrion* - Calvert, 1902)

82. *Hesperagrion heterodoxum* (Sélys, 1876) Painted Damsel

Forktails (*Ischnura* - Charpentier, 1840)

84. *Ischnura barberi* (Currie, 1903) Desert Forktail
86. *Ischnura damula* (Calvert, 1902) Plains Forktail
88. *Ischnura demorsa (*Hagen*, 1861)* Mexican Forktail
94. *Ischnura denticollis* (Burmeister, 1839) Black-fronted Forktail
96. *Ischnura hastata* (Say, 1839) Citrine Forktail
99. *Ischnura perparva* (McLachlan in Sélys, 1876) Western Forktail (A discussion of Western Forktail vs. Mexican Forktail (Western is absent from our area).
100. *Ischnura ramburii* (Sélys, 1850) Rambur's Forktail

Firetails (*Telebasis* - Sélys, 1865)

101. *Telebasis salva* (Hagen, 1861) Desert Firetail

Spreadwing Family - *Lestidae*

***Archilestes* (Sélys, 1862)**

107. *Archilestes californicus* (McLachlan, 1895) California Spreadwing
122. *Archilestes grandis* (Rambur, 1842) Great Spreadwing

***Lestes* (Leach, 1815)**

130. *Lestes alacer* (Hagen, 1861) Plateau Spreadwing

Reference Material

There is a great deal of material to access if you have an interest in the *Odonata*. We can't cover it all but the following may be useful.

A substantial amount of this material originally appeared in the Black Range Naturalist (BRN). It has been added to and reformatted for this publication. See the BRN index for particulars.

Arizona Dragonflies

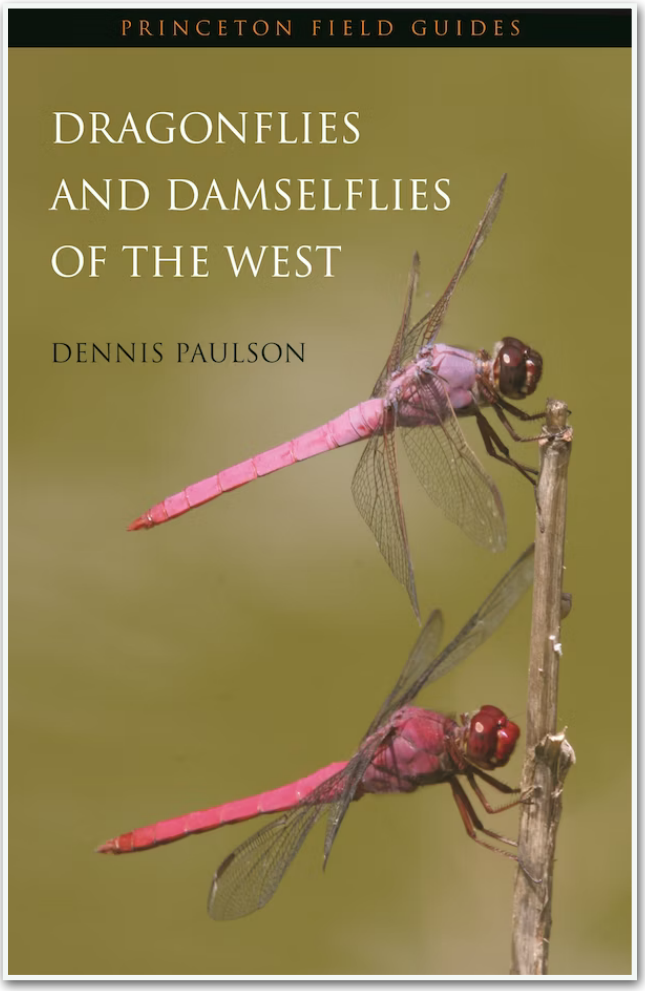
Dragonflies and Damselflies at thehibbits.net - the extensive photographic record of Terry and Diana Hibbitts

A Checklist of North American Odonata 2021 Edition - Paulson and Dunkle

Have an interest in damselflies? If so, the Dragonfly Society of the Americas is a valuable resource.

Dr. Jessica Ware's webinar for the Smithsonian, "Dragonflies From the Arctic to the Tropics" is an interesting overview of the natural history of dragonflies and damselflies.

ODONATA CENTRAL



***Dragonflies and Damselflies of the West*, Dennis Paulson, 2009, Princeton University Press, is a primary reference source used in this survey of the damselflies of Doña Ana County, New Mexico and adjacent areas. The link above will take you to the Princeton University Press site, other websites may offer this reference at a lower price.**

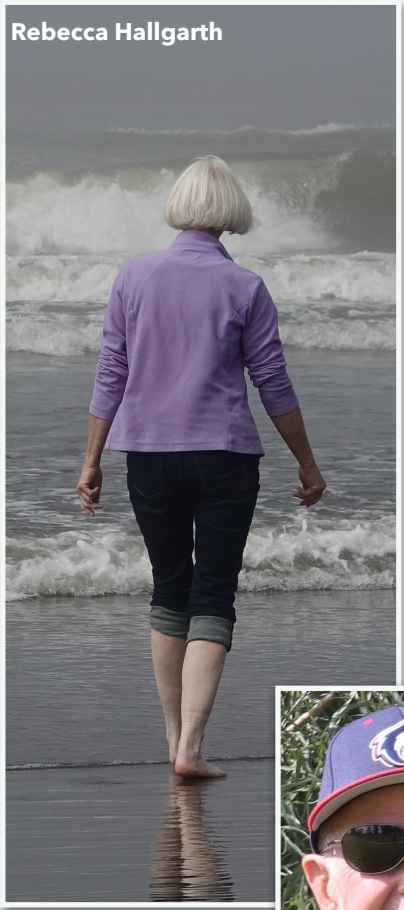
The cite used to refer to this reference is simply "Paulson (2009)". This source is used to explore a wide variety of identification points and behaviors in this work. In particular: Perching; Sleeping; Flight; Vision; Feeding; Predators and Predator Defense; Sexual Patrol; Courtship and Mating; Egg Laying and Hatching; Larval Life History; and Metamorphosis and Emergence.

Some of The Contributors

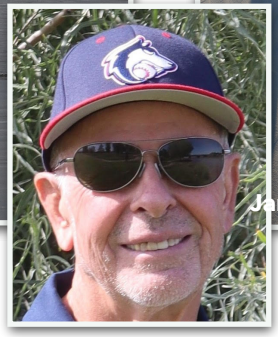
We would really like to include the image of your choice here!


Gordon Berman


Bob Barnes

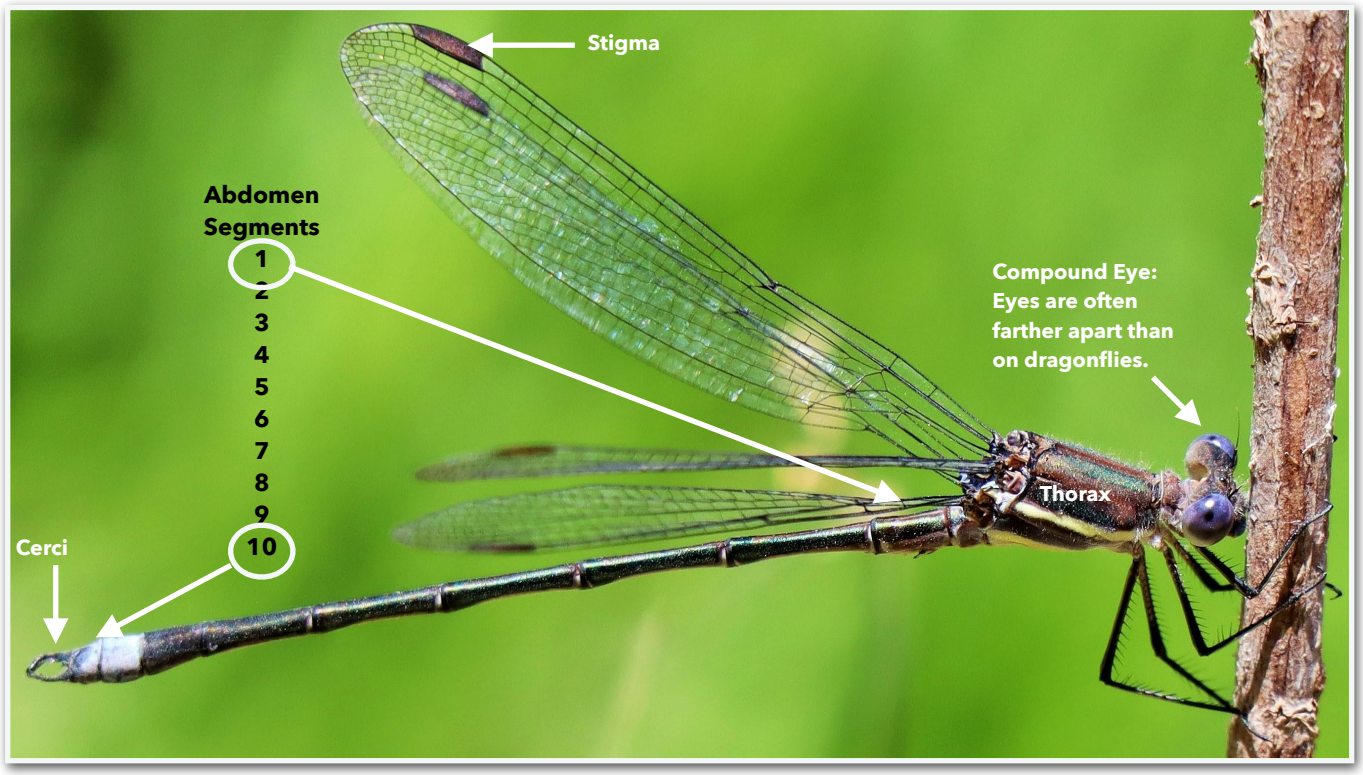

Rebecca Hallgarth

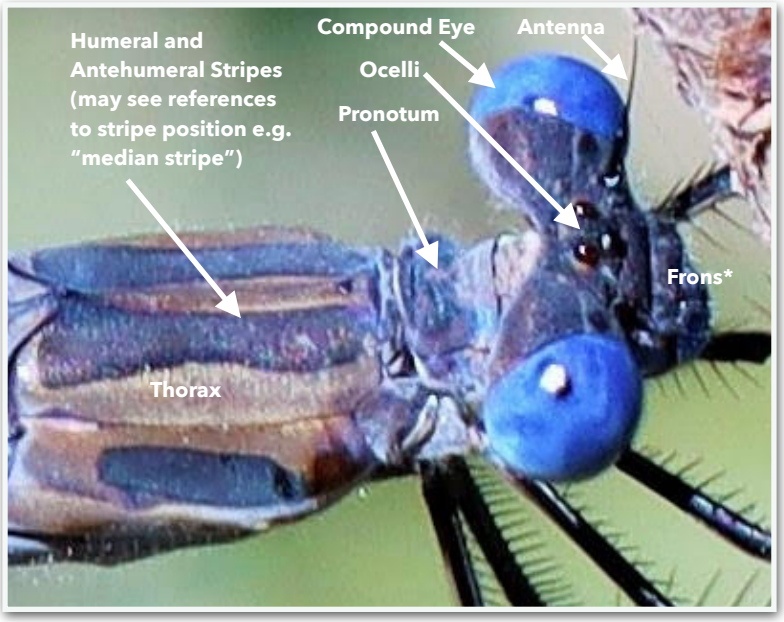

James Von Loh



Damselfly Anatomy

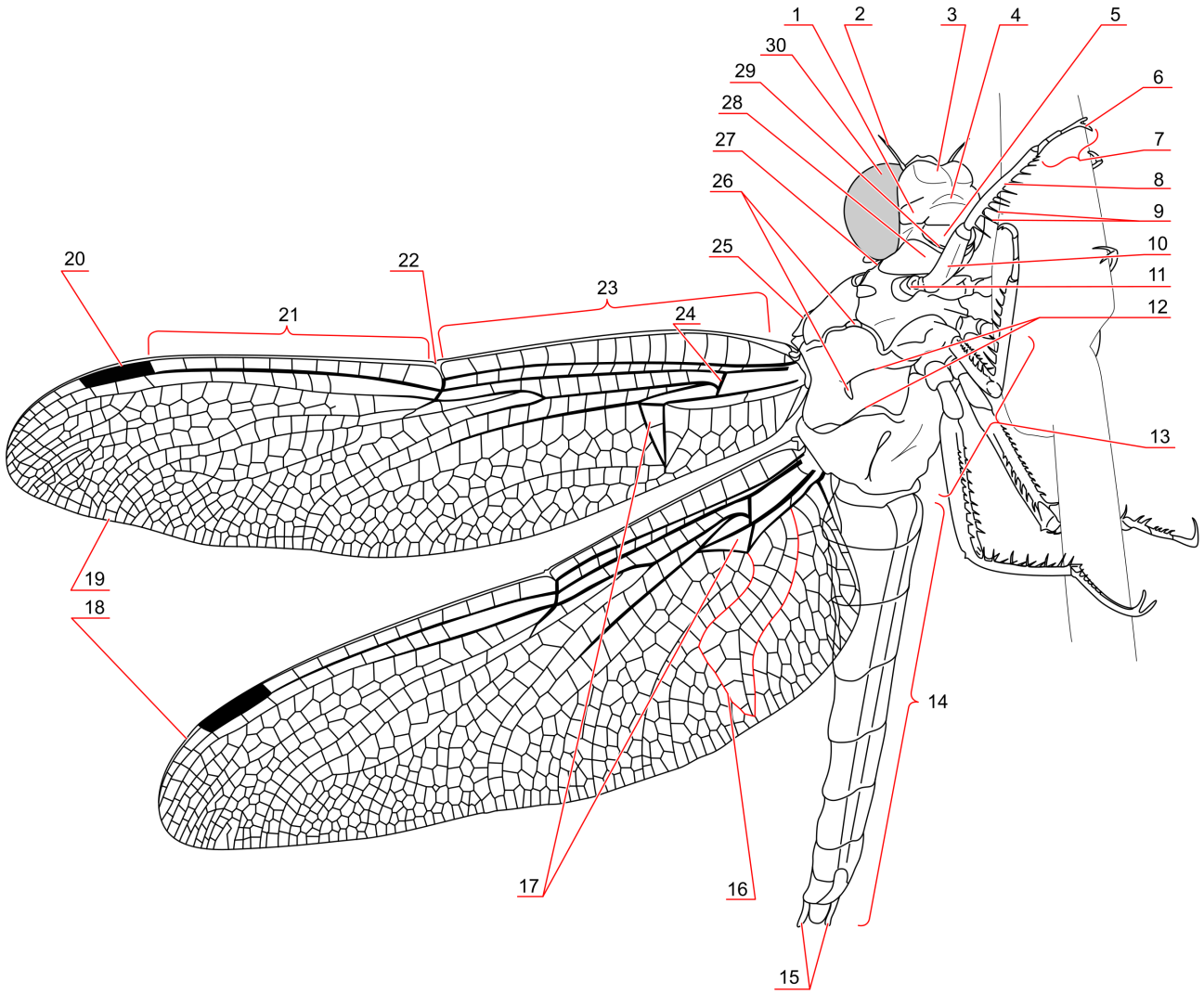
Top: Great Spreadwing, male.
Lower Right: California Spreadwing, male.
Photographs by James Von Loh





***Subdivisions of the frons: from the top of the head to the mouth - Postclypeus, Anticlypeus, and Labrum.**

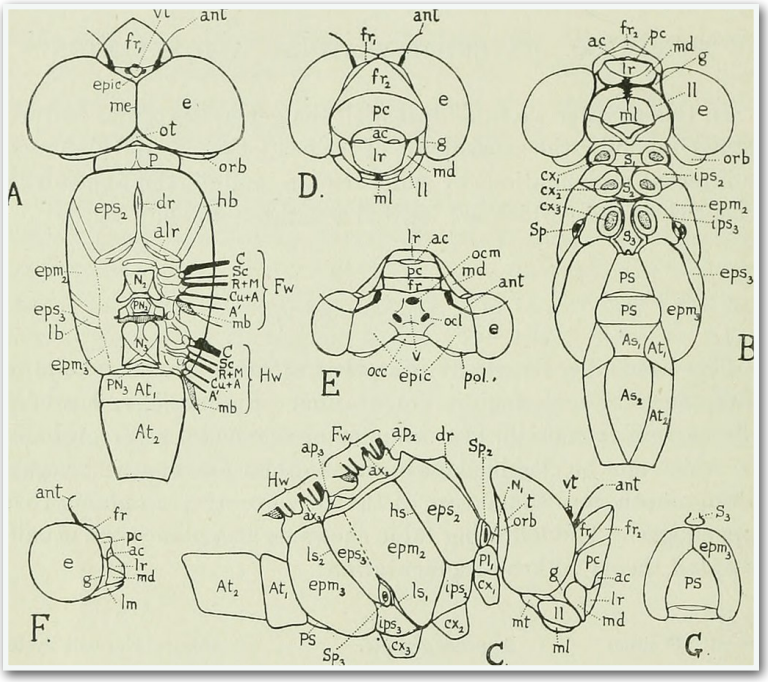
Orthetrum cancellatum



Dragonfly Anatomy (Damselfly "standin")

1: Clypeus
2: Antenna
3,4 Frons
5: Labrum
6: Claw
7: Tarsus
8: Tibia
9: Spines
10: Femur
11: Coxa
12: Sutures
13: Thorax
14: Abdomen (S1-S10),
15: Appendages (claspers)
16: Anal loop
17: Triangles
18: Rear wing
19: Front wing
20: Pterostigma
21: Postnodal cross-veins
22 : Node
23: Antenodal cross-veins
24: Arculus
25: Synthorax
26: Humeral and antehumeral stripes
27: Prothorax
28: Labium
29: Mandibles
30: Compound eye

Diagram and caption released to public domain by the artist, Mouagip.



The two diagrams to the right are from *The biology of dragonflies (Odonata or Paraneuroptera)*, Robin John Tillyard, 1917.

If you wish to explore the anatomy of Odonata in detail this is an excellent work, ignore the fact that it was written a century ago and focus on the substance. Two examples of the detail this work provides are shown here.

Top diagram - caption from original work reads: Exoskeleton of head, thorax, and first two abdominal segments:[3] A. *Austrophlebia costalis* (dragonfly), female; dorsal view. B. The same, ventral view. C. The same, lateral view. D. Head of the same, front view. E. Head of *Lestes* (damselfly), dorsal view. F. The same, lateral view. G. Metathorax of *Orthetrum* (dragonfly), ventral view. An analis (anal vein); A' secondary analis (anal vein); ac anteclypeus; alr ante-alar ridge; ant antenna; ap costal process; As urosternite; At urotergite; ax axillary; C costa (vein); Cu cubitus (vein); cx coxa; dr dorsal carina; e eye; epic epicranium; epm epimerum; eps episternum; fr frons; fr_1 its superior, fr_2 its anterior portion; Fw fore-wing; g gena: hs humeral suture; Hw hind-wing; ips infra-episternum; ll lateral lobe of labium; lm labium; lr labrum; ls_1 first, ls_2 second lateral suture; M media (vein); mb membranule; md mandible; me median eye-line; ml median lobe of labium; mt mentum; N notum; occ occiput; ocl lateral ocellus, ocm median ocellus; orb orbit; ot occipital triangle; P prothorax; pc postclypeus; Pl pleurum; PN postnotum; pol postocular lobe; PS post-sternum ; R radius (vein); S sternum; Sc subcosta (vein); Sp spiracle; t temple; v vertex; vt vertical tubercle.

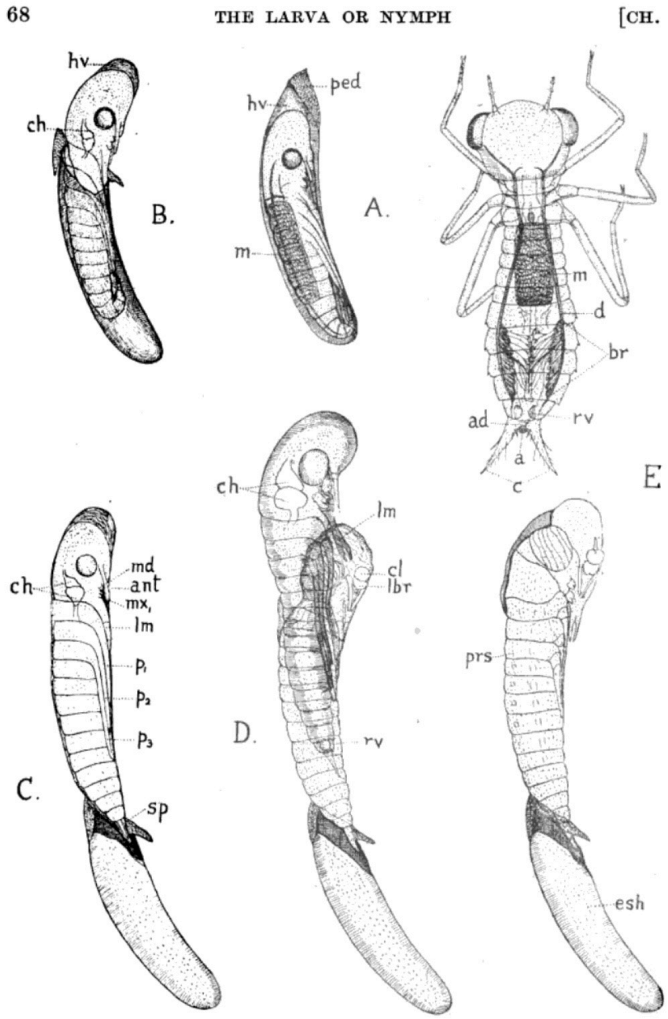


Fig. 24. Hatching of the larva of *Anax papuensis* Burm. A. Embryo in egg, before hatching. B, C. Emergence of pronymph. D, E. Emergence of larva from pronymphal sheath. *a* anus; *ad* appendix dorsalis; *ant* antenna; *br* branchial basket; *c* cerci; *ch* cephalic heart; *cl* clypeus; *d* dorsal tracheal trunk; *esh* egg-shell; *hv* head-vesicle; *lbr* labrum; *lm* labial mask; *m* mid-gut; *md* mandible; mx_1 first maxilla; p_1–p_3 legs; *ped* pedicel of egg; *prs* pronymphal sheath; *rv* rectal valves. (×30.) Original.

Damselflies of Doña Ana County

James Von Loh





Above: There are a variety of habitat elements along the Rio Grande Recreational Trail (walk/run/bike) and within Mesilla Valley Bosque State Park (walk) that support Odonata species through their life cycle.
Below: Habitat supporting Odonata within Leasburg Dam State Park on the Rio Grande at Radium Springs.

Whenever possible we use the first person pronoun when describing observations because the Odonata are about art as much as they are about science.

A Natural History of The Odonata of Doña Ana County With Notes on the Black Range **reflects 6½ seasons (2019 - 2025) of photo-documenting damselflies within Doña Ana County. During this time I focused on diverse habitats in and near Mesilla and Las Cruces (particularly along the Rio Grande and in the Organ Mountains). As a result I have been able to photograph and identify a number of *Odonata* species, including some local variations/forms of widespread populations.**

Images presented herein were primarily collected by the author, with important and welcome contributions from Gordon Berman (a Las Cruces naturalist), Jonathan Batkin (Tucson based subject matter expert), and others. Any errors in text or interpretation are the responsibility of the author and editor. Please contact the editor, Bob Barnes, about suggested changes (rabarnes@blackrange.org).

Damselflies may occur anywhere within Doña Ana County when migrating or hunting, however they require habitat for egg laying and the development of aquatic larval stages to reproduce. Such habitats occur along the Rio Grande drainage (and its associated irrigation, storm runoff, and wastewater canal network), natural springs and seeps along the slopes and within canyons of the Organ Mountains, monsoon season (July-September) temporarily-filled ponds and intermittently-flowing drainages, and water/wetland features used for micro-habitats, livestock management, landscaping, or otherwise occurring in developed areas. Where similar habitat is found in the Black Range, *Odonata* are found.

My goals in presenting damselfly information to *The Black Range Naturalist* at the invitation of editor, incredibly interesting area of potential research, perhaps spark interest in someone to consider entomology as an educational pursuit, preserve representative images and observations within the *Black Range Naturalist* framework, and to provide local information to the regional scientific community. This work grew out of those earlier articles.

Throughout the ensuing discussion I have included locally-collected images of winged immature and/or adult damselflies, behavior types as defined in Paulson (2009), and information to help readers identify damselflies to both sex and species.

Summaries of each species distribution and general natural history were prepared using Paulson (2009) and informed with comments from our local field observations. Distribution maps are from the Global Biodiversity Information Facility.

General damselfly behaviors, identified while evaluating field-collected images are noted and presented and defined in Paulson (2009), are: *Perching; Sleeping; Flight; Vision; Feeding; Predators and Predator Defense; Sexual Patrol; Courtship and Mating; Egg Laying and Hatching; Larval Life History; and Metamorphosis and Emergence*.

So, as you gear-up and run out to photograph damselflies, remember that being quiet, calm, and patient are virtues; but if you feel the need to - sneak up on them in our snap, crackle, pop, and crunch environment (approach from behind those giant eyes); and always remember that damselflies have the finest vision in the insect world. The compound eyes of damselflies have up to 8,000 simple eyes perceiving all around them; the simple eyes are individual receptors creating a mosaic; and damselflies are very good at detecting movement (Paulson 2009).

Damselflies
Suborder *Zygoptera*

The editor notes the following - So what is the difference between a damselfly and a dragonfly? This question, like "what is the difference between a moth and a butterfly?" can cause multiple headaches and moments of frustration. Nevertheless, let's give a try at distinguishing the two.

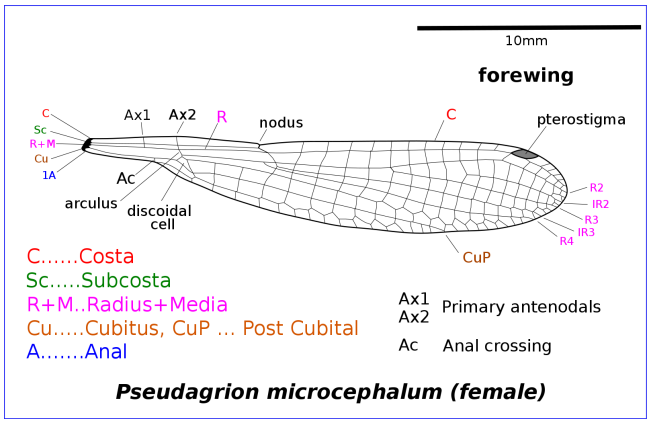
Taxonomically damselflies and dragonflies are in the same Order. But Orders are big things and typically consist of numerous genera and species within each of the suborders which are distinguished within them. That is a convoluted way to say - there are exceptions, remember that as you read the following.

In general:

- **Most damselfly species will fold their wings so that they are parallel to their body when at rest (except the spreadwings), dragonflies typically hold their wings flat and away from their body;**
- **Damselflies are smaller than dragonflies;**
- **Damselflies are slimmer than dragonflies; and as noted below there are some other morphological traits to distinguish between the two.**

Damselflies, like dragonflies, are predators (both as nymphs and as adults). Like dragonflies they are associated with aquatic habitats; like dragonflies their mating displays and mating can be elaborate and like dragonflies involves delayed fertilization, "mating wheels", and indirect insemination. Like dragonflies, damselflies will remain joined while the female lays her eggs, Nymphs go through several moults before climbing out of the water.

In the 1923 *Manual of Entomology*, Maxwell Lefroy provided this diagram (bottom) to show some of the wing differences between dragonflies (top wing) and damselflies (bottom wing). Graham Winterflood provides the labeled diagram of a damselfly wing (directly below) under a Creative Commons license.



Pseudagrion microcephalum (female)

Identification of damselflies and dragonflies in our area is made easier by the limited number of species which have been observed here. It is made more complicated by the fact that new species are observed on a regular basis.

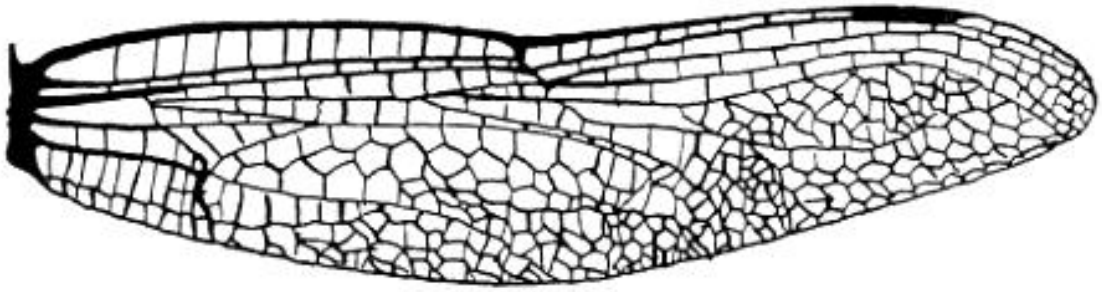


Diagram of Anisopterid Wing.

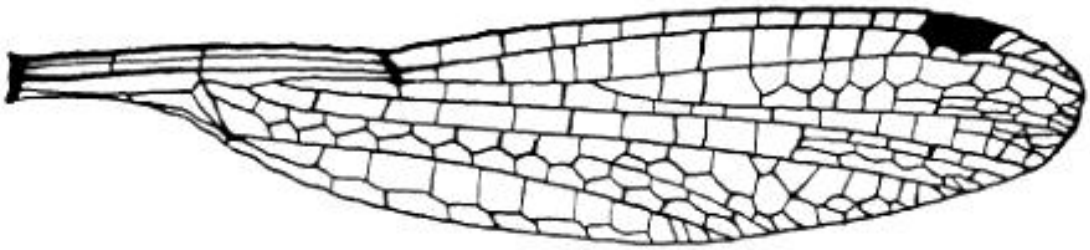
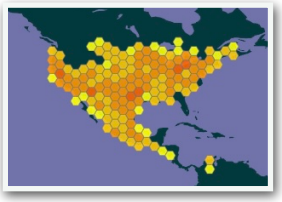


Diagram of Zygopterid Wing.

American Rubyspot
Hetaerina americana
(Fabricius, 1798)

In Doña Ana County, I have observed American Rubyspot damselflies along the Rio Grande west of Las Cruces and Mesilla from July to November (inclusive). This species was abundant during 2019 and 2024, common during 2020 and 2021, and nearly absent during 2022. Only a few American Rubyspots (<10) were observed along the Rio Grande during the summer of 2023; I attribute this, in part, to the regional drought experienced throughout the desert southwest. Their flights were unique in that similar numbers of females and males arrived at roughly the same time and were distributed within the available habitat.

Typically, American Rubyspots use rivers of all sizes and clear, swift-running, sometimes rocky streams (with shore vegetation for perching and submerged vegetation for ovipositing/egg-laying). They were restricted to riparian and wetland habitat established immediately adjacent to the Rio Grande bank and mostly during the time period when the river channel supported bank-to-bank flow (June-September).



Recorded sightings from the Global Biodiversity Information Facility (1/2024).

The flight season for American Rubyspots in New Mexico is year-around (Paulson 2009).

Paulson (2009) states that both sexes of this species rest on stems and leaves over water (sexes are mixed more than in most damselflies). Both sexes are territorial but congregate near dusk to forage on emerging flies such as mayflies. Their flight is low and fast over water and resident males perform horizontal, circling flights when an intruding male arrives (they may fly for several minutes until one of them leaves).

The red wing spots of males increase in size over a period of two weeks in successful male territory holders. The larger red spots may, however, reduce hunting success (Paulson 2009). American Rubyspot males seize approaching females in-flight to mate, but perched females reject inappropriate males by opening wings and curving their abdomen tip upward. Copulation is brief, less than three minutes (I have photographed very few copulation events in six years). Females oviposit on surface vegetation or by entirely submerging in shallow water to 3-to-5 inches, lay eggs in a small area, and emerge from the water as much as an hour later (Paulson 2009).

In my opinion, American Rubyspots are the most colorful, striking, and impossibly cute damselfly species of southern Rio Grande habitats. With patience when approaching them, they are a joy to photograph, e.g., high



contrast of an array of bright colors, small and compact size and shape, selection of open and diverse perches often over water, and tendency to join in small groups.

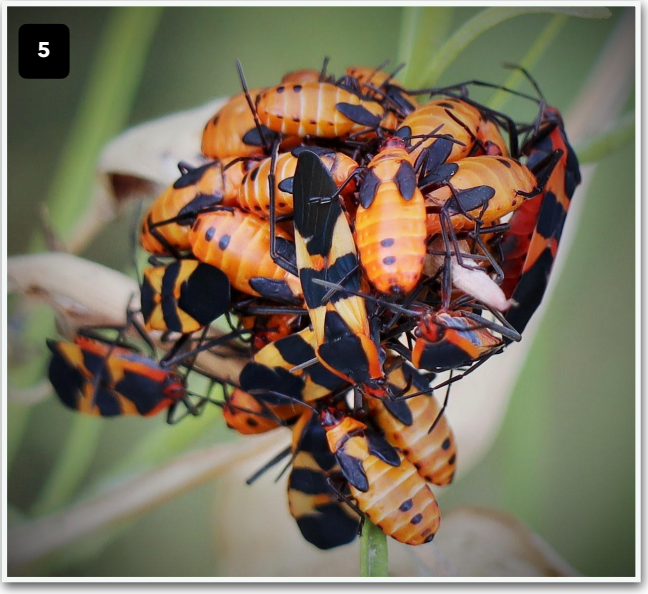
Perching, Sunning, Flight, and Hunting Behaviors

As a biologist, the most interesting aspects of observing/photo-documenting insects and attempting to understand a species, to me, is identifying habitat preference, individual behavior/group dynamics, and regional variation within the population. However, occasionally a species presents that is simply elegant, beautiful, approachable, and a joy to be around - suddenly, science becomes art. So, as you read this entry, please pardon the science as you enjoy the art!

1. **American Rubyspots often appear in mixed-sex groups over the Rio Grande, seen above, nine (6 females and 3 males) are using Three-square Bulrush stems to perch, sun, hunt, and defend territory/seek mates over the bank-full Rio Grande.**
2. **Females perch and hunt from a Barnyard Grass spike, adjacent to the Rio Grande.**



3. **Three American Rubyspots perch on the leaves and follicles of Horsetail Milkweed over the bank-full Rio Grande.**
4. **Two female American Rubyspots use perches on the follicles of Horsetail Milkweed projecting over the bank-full Rio Grande channel.**
5. **A small orange cluster of Large Milkweed Bug larval instars, *Oncopeltus fasciatus* (Dallas, 1852) feeding, through a piercing stylus, from a follicle. Seen also in "3" and "4".**
6. **Female (L) and male (R) American Rubyspots perch and hunt from *Paspalum* spikes, adjacent to the bank-full Rio Grande.**
7. **A female perches on the flower buds and blossoms of Water Smartweed adjacent to the bank-full Rio Grande channel. The nearly vertical elevation of her abdomen is known as "*obelisking*".**













8. **A female perches on the corymb buds of Horsetail Milkweed adjacent to the bank-full Rio Grande channel. Note her brown eyes, boldly striped thorax, metallic green dorsal abdomen color and expanded distal abdomen segments (S8, S9, and S10), and the orangish-to-brownish wing coloration.**
9. **A male perches on a Horsetail Milkweed leaf, adjacent to the Rio Grande, to hunt, defend territory, and to locate a potential mate.**
10. **Males perch on a Horsetail Milkweed leaf, adjacent to the Rio Grande bank-full channel, primarily to hunt for small insects.**





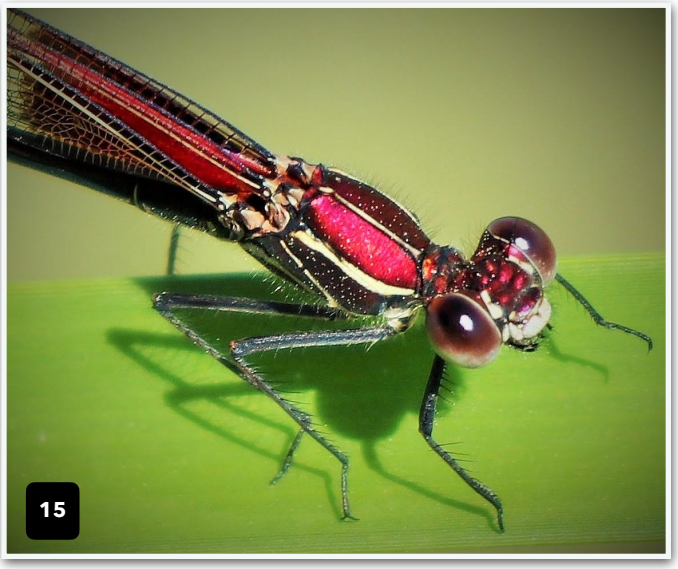




11. Female American Rubyspots have dramatic orange wing spots and brownish-orange coloration throughout their wings. They often perch on dried stems over the bank-full Rio Grande.
12. A brightly-colored female is using an arced Three-square Bulrush stem to perch over the bank-full Rio Grande.
13. Following Page. Leaves of the tall forb, White Sweetclover, growing near the Rio Grande, provide a perching site for a female American Rubyspot.
14. Following Page. Males often select the tip of a Three-square Bulrush stem over the bank-full Rio Grande, to provide a prominent perch for hunting, sexual patrol/ territorial defense, and possibly sexual display.





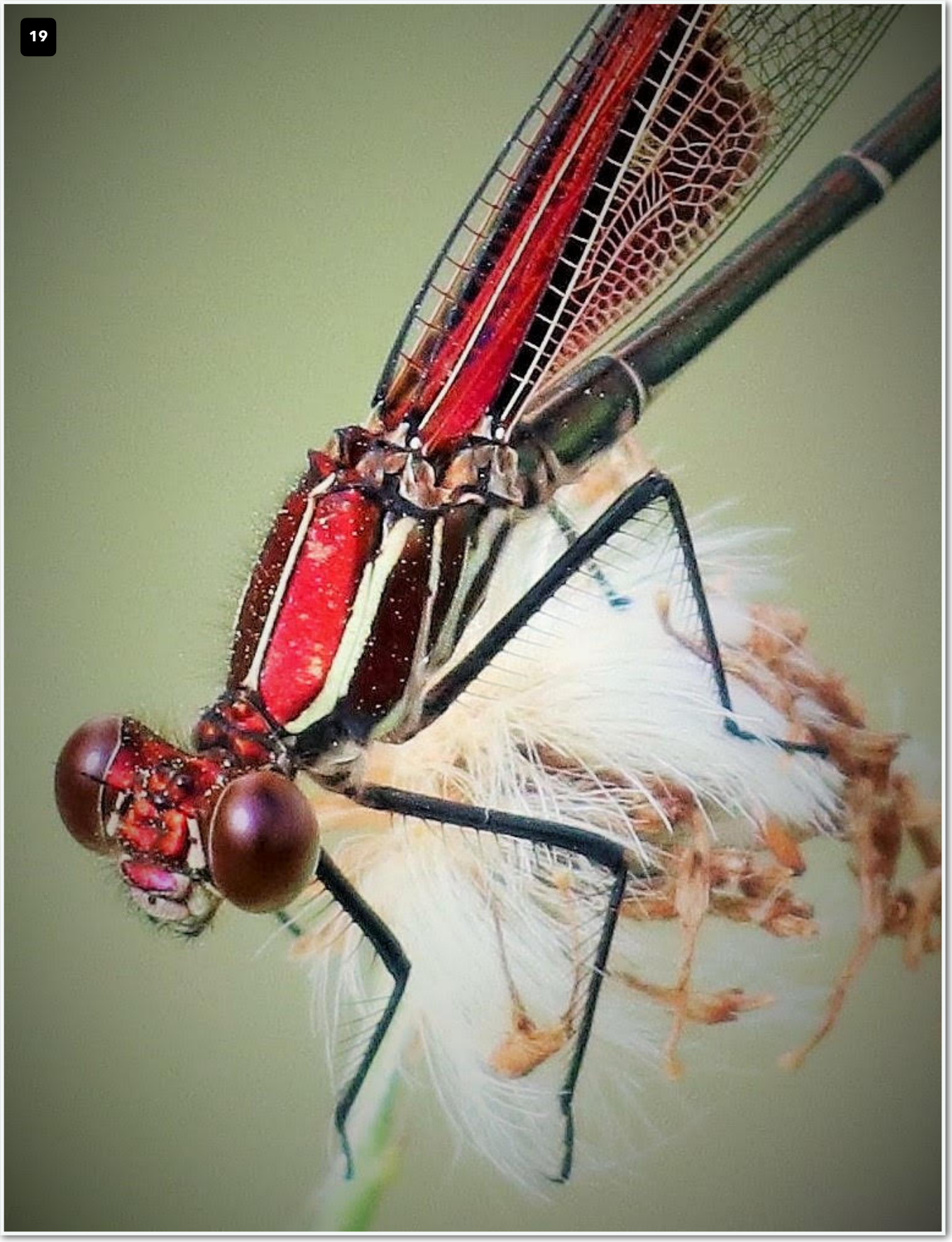








15. Detail of a male American Rubyspot - dorso-lateral view of head and thorax. His eyes are dark reddish-brown, paler below; mostly metallic red head and thorax with cream-to-white lateral lines; anteclypeus, labrum, and mandible (lower facial jutting portion) white.
16. A female American Rubyspot perched on Horsetail Milkweed corymbs (flower buds), adjacent to the Rio Grande, to hunt, perhaps defend territory, and possibly locate a potential mate.
17. Doing the same on a Barnyard Grass panicle.
18. ...and on a Three-square Bulrush bract.
19. Following Page: Detail of a male American Rubyspot - view of head, thorax, wing bases, and abdominal segments S1 and S2. His eyes are dark reddish-brown; mostly metallic red head and thorax, and shiny black abdomen; bright red patches/spots at wing bases marked by white veins; legs are shiny black.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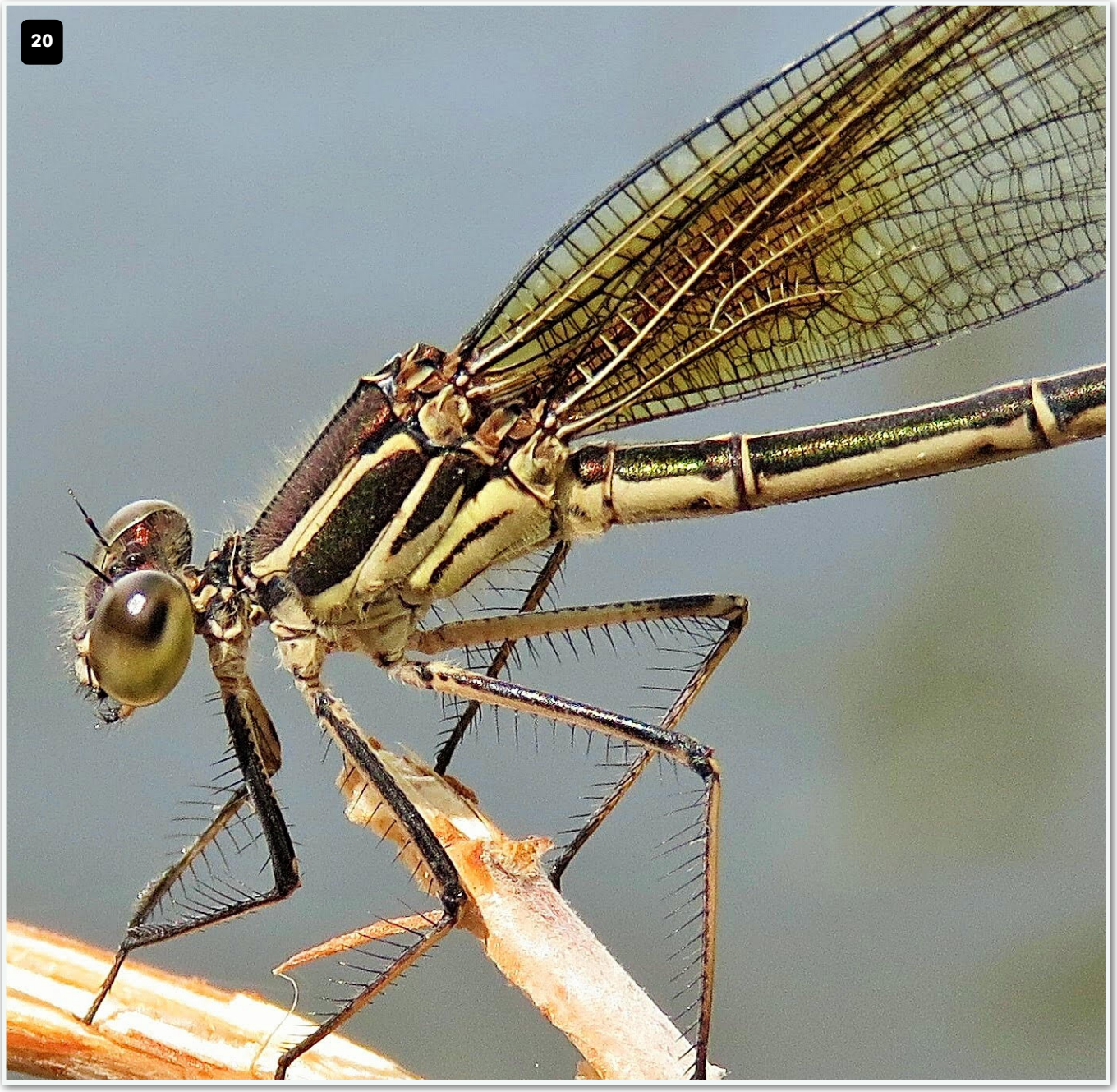


20. Detail of a female American Rubyspot - view of head, thorax, wing bases, and abdominal segments (S1 and S2). Her eyes are the more typical brown-over-tan color; much duller than male, dark body color of matte black (with dull creamy-white stripes), and metallic greenish-black abdomen; wings colored brownish at bases; legs are white with black stripes. This photograph is by Gordon Berman.
21. Following page: A female American Rubyspot perched on a Horsetail adjacent to the Rio Grande, to hunt, perhaps defend territory, and possibly locate a potential mate.
22. Following Page: Same as "21" except on a grass panicle.
23. Following Page: ... and obelisking, something Paulson (2009) reports they often do in the hot sun. Her eyes are dark brown-over-tan; generally duller than male, dark body colors vary from matte black-to-metallic green-to-metallic red (head and thorax only), and dull brown-to-shiny blackish-green abdomen; wings vary from nearly uncolored-to-diffuse orange wash at bases, to dark reddish-orange filling in the same area as does the red in males

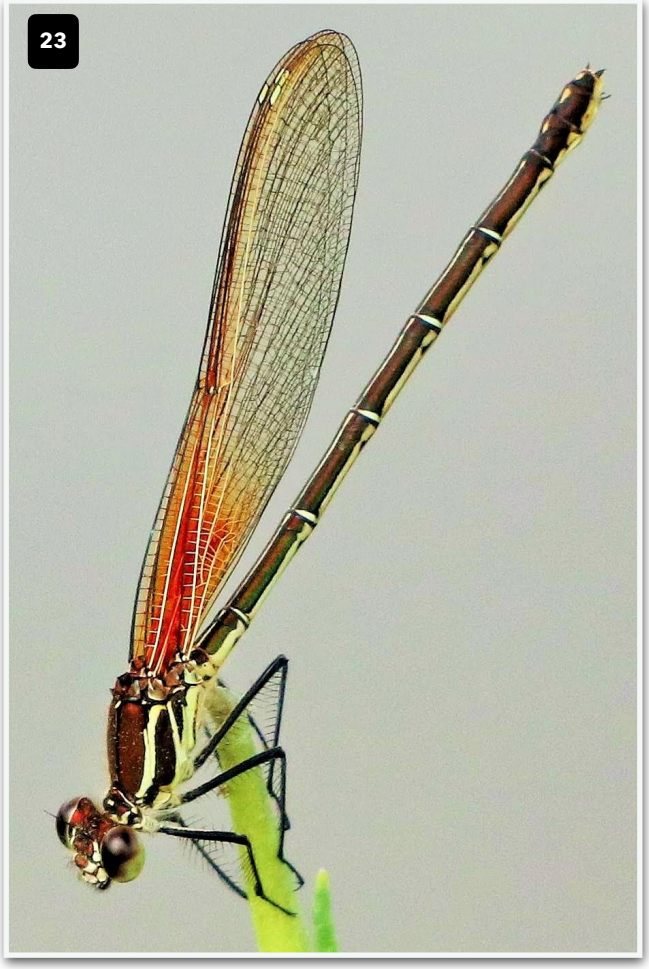
Sexual Display

On a few occasions I observed male American Rubyspots defending territories from open perches and also prominently displaying their bright red wing spots or rapidly flexing their abdomens up-and-down. I interpreted this behavior to be either an attempt to attract females or perhaps to warn other males away from their territory. Paulson (2009) states: "Resident males aggressive to











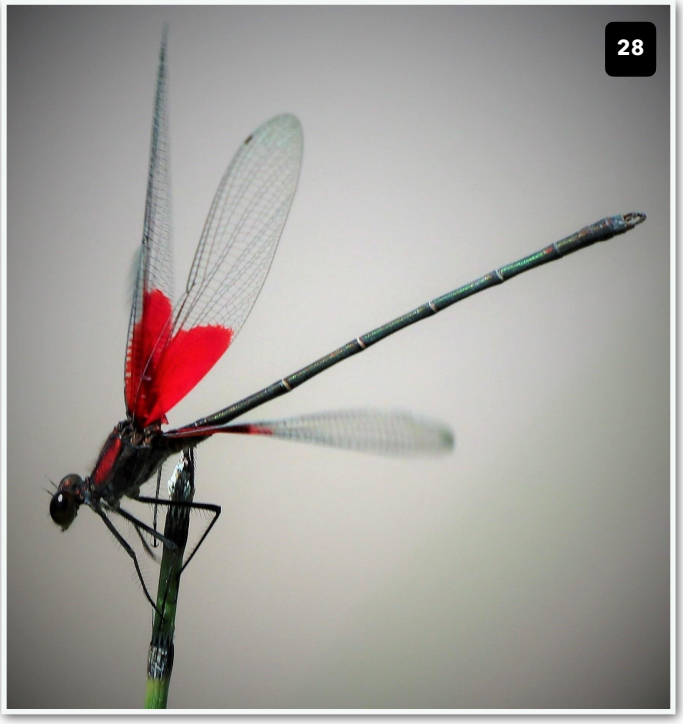
intruders, performing horizontal circling flights until one leaves; display flights may last for minutes. Red wing spots in males increase in size to about 14 days. Larger spots in more successful territory holders but may reduce hunting success. No courtship, males merely seizing approaching females." Paulson (2009) does not mention the raising and lowering of the male abdomen, yet I have observed the motion in a few species of damselflies.

24. Territorial male perched horizontally on the tip of a prominent Three-square Bulrush stem along the Rio Grande. Note his large, bright red wing spots and bright red thorax.

25. The male moves down the stem into an obelisking configuration, within his selected territory.
26. Following Page: A short time later, he spreads his wings to expose bright red wing spots (possibly to attract a female or to dissuade a rival male).

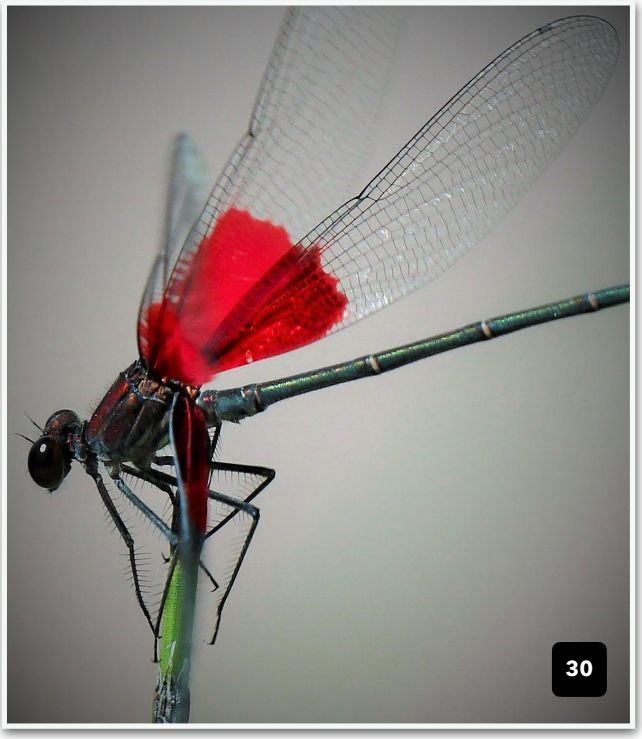




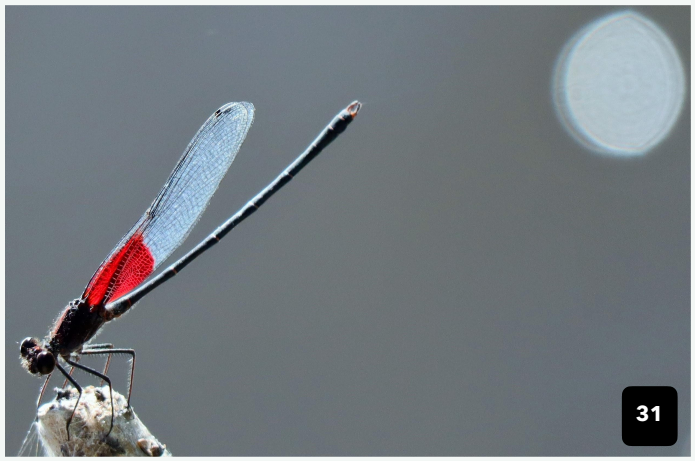


27. He then returns his wings to the original, near horizontal, position.





28. Similarly, a different territorial male displays his wing spots while perched on a prominent Horsetail stem along the Rio Grande.
29. Maintaining his obelisking perch configuration.
30. He then closes his wings and reopens them in the wing spot display.
31. Following Page: At another time and location, a male obelisks on a web-covered stem protruding from the Rio Grande. He begins a display of raising and lowering his abdomen possibly for mate attraction or warding off a competing male.
32. Following Page: He begins lowering his abdomen.
33. Following Page: Then rapidly arcs his abdomen, nearly touching the perch.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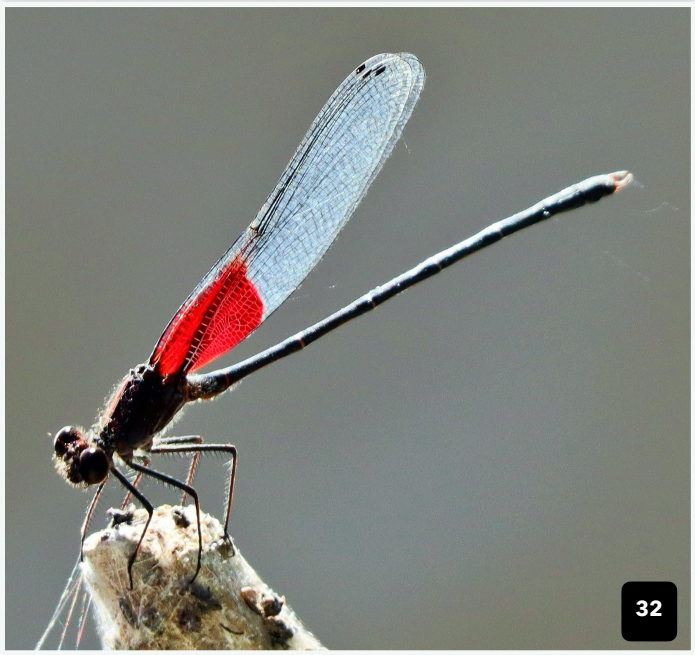
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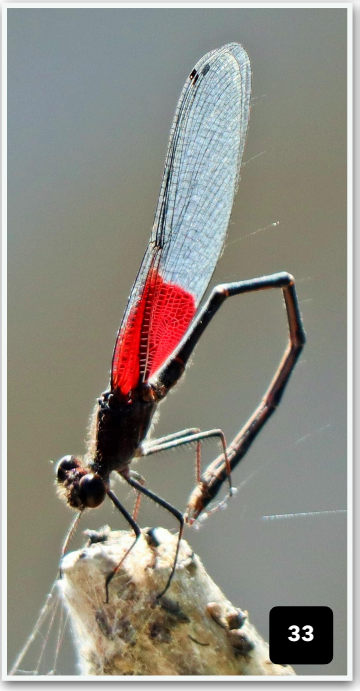
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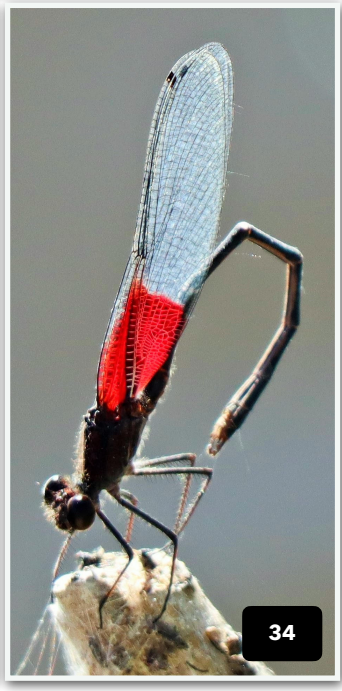
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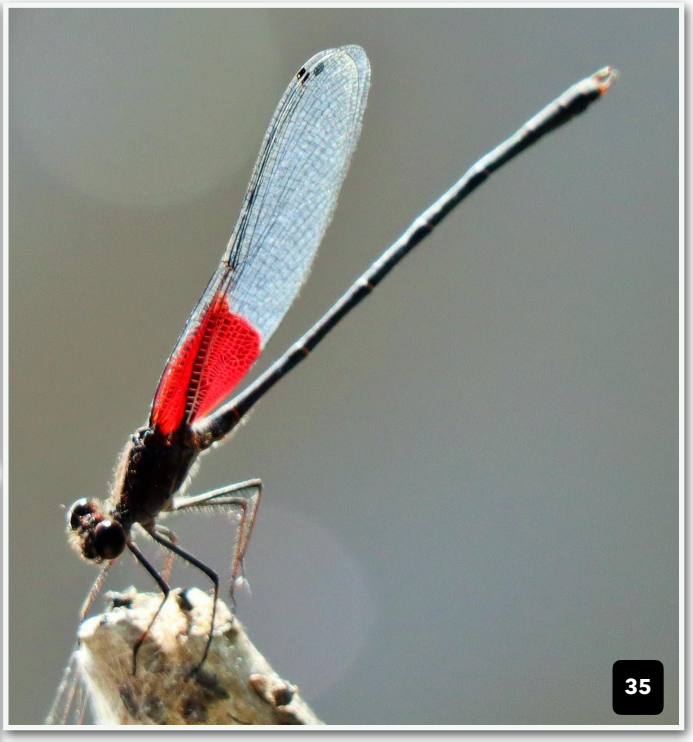
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36





34. Previous Page: Then begins rapidly raising his abdomen to its original position.
35. Previous Page: He raises his abdomen to its original position.
36. Previous Page: Then rapidly arcs his abdomen above his head and thorax area.
37. Thus he completes the full raising and lowering motion of his abdomen and opens his wings somewhat (exposing his wing spots) which I interpret to be a display to attract a female. This male behavior is repeated a few times in succession.
38. A female American Rubyspot obelisks while perching, probably rejecting a nearby, inappropriate male for mating (by curving her abdomen tip upwards).
39. Same female American Rubyspot as "38", returning to her normal perching angle and behavior, above the Rio Grande.
40. Following Page: A female American Rubytspot at right, obelisking and rejecting either the facing female or a nearby inappropriate male as a mate by spreading and displaying her wings/orange patches widely and curving her abdomen tip upwards, per Paulson (2009). The selected perch is a Three-square Bulrush stem, arced over the Rio Grande.
41. Following Page: Female, September 18, 2019. She is ingesting an unknown insect.







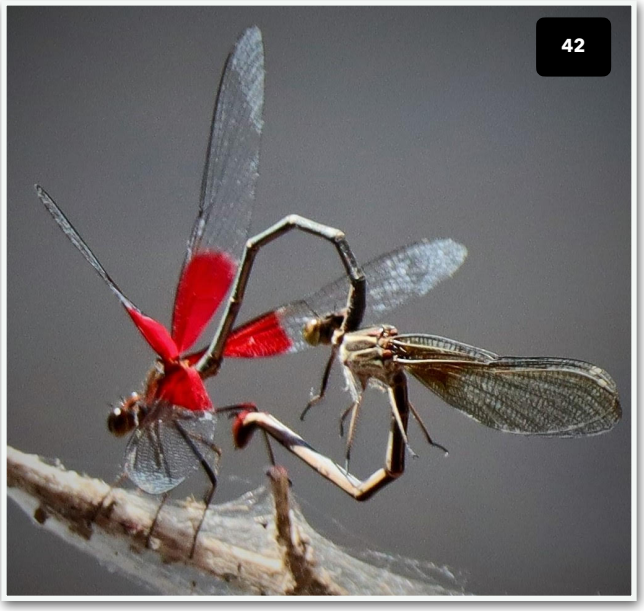
Mating Wheel and Tandem Linkage

Once an American Rubyspot male attracts and captures a suitable female for mating, the copulation process is brief, averaging only 3 minutes in one study (Paulson 2009). Perhaps this short timeframe explains why I have only photographed a few mating encounters by an American Rubyspot pair!

To reach the stage of copulation presented on the following page, required the male to attract, grab/capture, and form a tandem linkage (male firmly clasps the back of the female's prothorax with his two cerci and his two paraprocts to the top of her prothorax) with a receptive female; the male would transfer sperm from his S9 abdominal segment to the seminal vesicle of his S2; he would then swing her abdomen forward to contact and clasp her vagina (located S8) over his penis (located S2); and thus form the "mating wheel" (which is actually heart-shaped); and they would copulate for a short period of time to complete sperm transfer and egg fertilization.

Following Page

42. A pair has successfully mated (transferred his sperm from the seminal vesicle via penis, located at S2, through her genital pore into her vagina, located at S8, and are now uncoupling from the "mating wheel".
43. Further uncoupling occurs.
44. Further uncoupling occurs.
45. Male and female American Rubyspots remain in tandem linkage with the male leading the female to a site suitable for ovipositing/egg-laying. Paulson (2009) states: "Females oviposit on surface vegetation or by submerging entirely (underwater) down to 3"-5", remain in a fairly small area, then emerge after up to an hour".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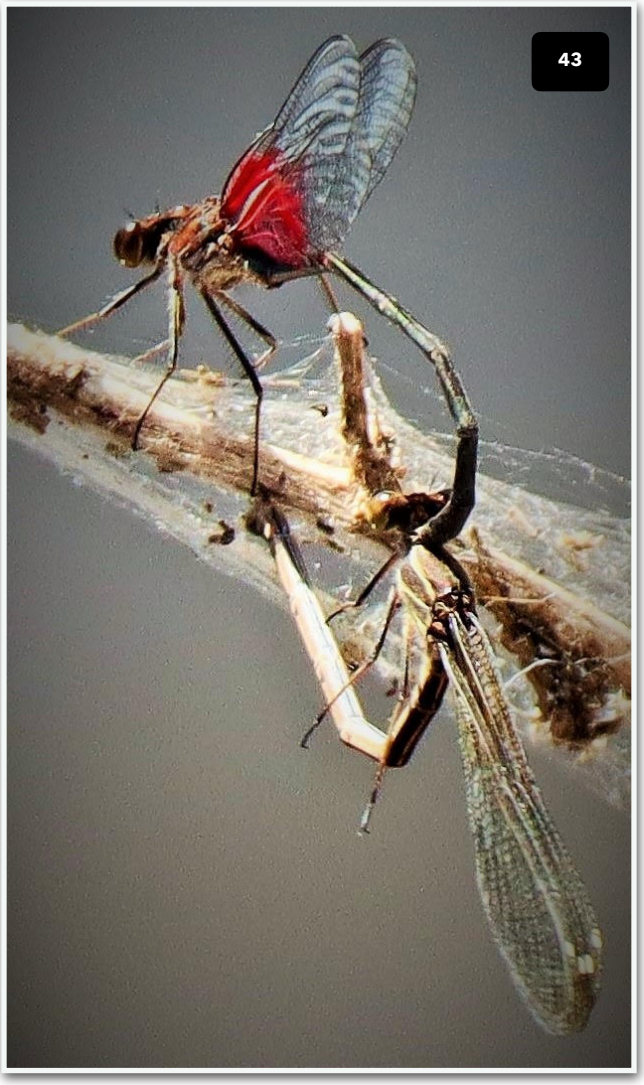
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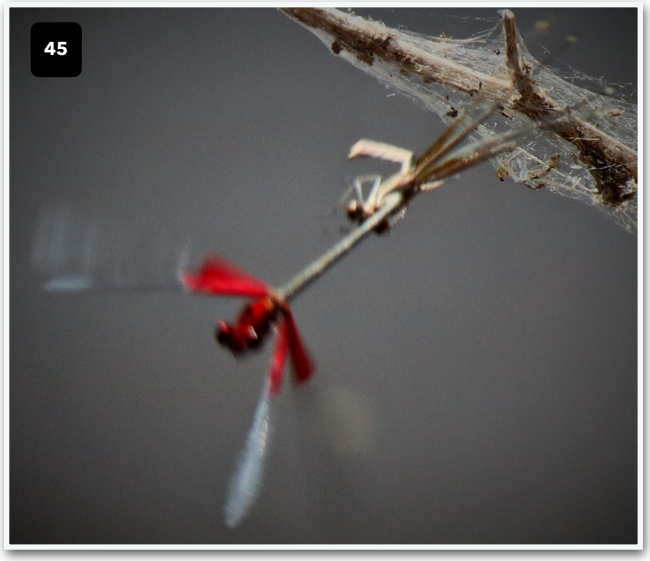
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Color Variation and Possible Immature American Rubyspots

A few, predominantly female American Rubyspots present with greenish-brown wing spots and dull brownish thorax and abdomen colors, which probably represent a range of variation in mature adults or perhaps individuals transitioning from immature to mature life stages. Paulson (2009) states: "Female...Duller than male, dark colors of body varies from matte black to metallic green to metallic red (head and thorax only). Wings vary from almost uncolored to diffuse orange wash at base to dark orange filling same area as red in male."



46. Two color variations in female American Rubyspots. Above with small, greenish wing spots, tan-colored thoracic stripes, and brownish-tan abdomen. Below with brownish wing spots, creamy-white colored thoracic stripes, and blackish-brown abdomen.

47. See "46".

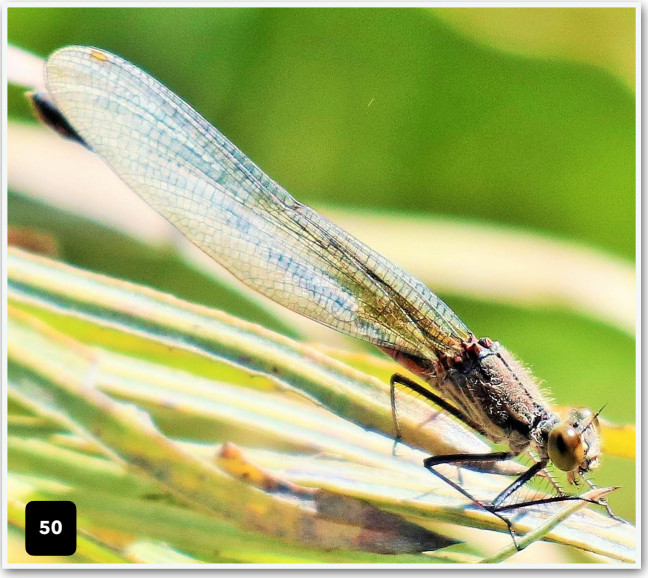


48. A female with greenish-brown wing spots, dull, cream-colored thoracic stripes, and blackish-brown abdomen. Note the white-colored basal wing veins within the wing-spots.

49. A female, possibly an immature individual, with brownish-orange wing spots and somewhat undefined,







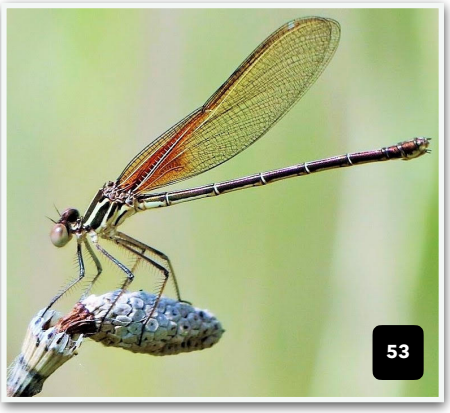
creamy-white thoracic stripes. Note her densely pubescent thorax (a trait shared with the male as shown at bottom right, "50") and large amount of white color on the thorax.

50. Previous Page: A male, possibly an immature individual, with small, brownish-green wing spots and lack of thoracic stripes.

Perch Site Selection

American Rubyspots use a wide variety of perching sites, as long as the perches are open and adjacent to, or overhang water. They typically perch on actively growing vegetation but will also use dead twigs and branches. Both males and females are territorial when using perches near/over the water (Paulson 2009). A variety of commonly used perching sites are presented here.

51. A bract tip and fruits of a Three-square Bulrush bract/stem, projecting over water. (Female)
52. Dried tip of a cut Southern Cattail leaf, protruding over water. (Female)
53. The dried cone of a Horsetail growing on the Rio Grande bank. (Female)
54. Dried flower cluster of Spiny Chloracantha on the Rio Grande bank. (Male)
55. Flowering panicle of Barnyard Grass, adjacent to the Rio Grande. (Male)
56. Long, Southern Cattail leaves, over-arching the Rio Grande, provide desirable perches for this species to hunt, defend territory, and locate mates.
57. Following Page: A dried Southern Cattail leaf, protruding over the water, provides a perch for a female American Rubyspot.



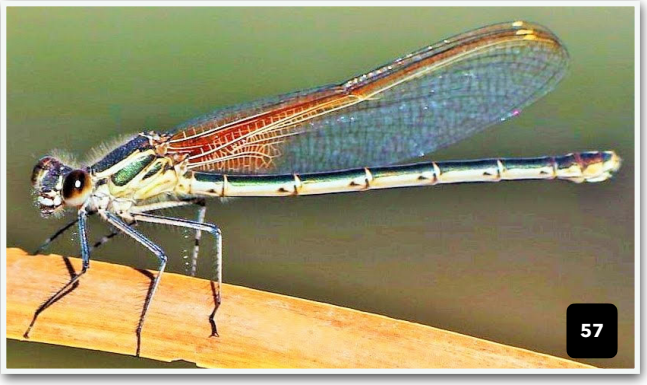










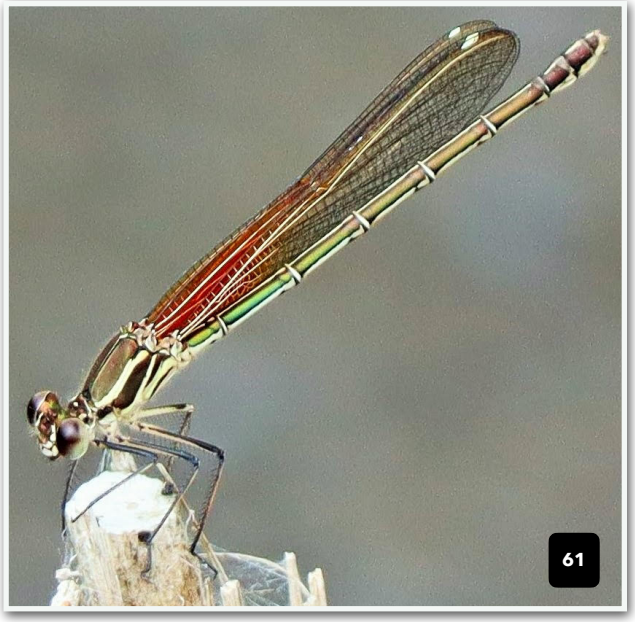








58. A male perches on the dead stem of a Mule's Fat/ Seepwillow tall shrub, the stem overhangs Rio Grande.
59. Dried flower cluster of Spiny Chloracantha, on the Rio Grande bank, provides a perch for a male.
60. A female perches on the prickly fruits of a Curly Dock raceme, the plant is emergent above the Rio Grande flow.
61. A female perches on the cut stem of a Mule's Fat/ Seepwillow tall shrub, the stem is emergent above the Rio Grande flow.





62. A female perches on and hunts from a Three-square Bulrush stem and is perhaps attracted by the many small flies captured by a Long-jawed Orb Weaver (*Tetragnathidae*). I did not observe "poaching" from such caches of *Dipterans*, however.
63. Following Page: A pair of American Rubyspots (female left and male right) perch, hunt, and possibly defend territories from a broken Coyote Willow stem protruding over the Rio Grande. Image collected and provided by Gordon Berman.


63


64



Predation by American Rubyspots

Typical prey for hunting American Rubyspots, observed along the Rio Grande, included small flying insects, particularly species of flies (*Dipterans*).

64. Previous Page: A male perches on and hunts from a Southern Cattail leaf and is perhaps attracted by the mass of small flies captured by an unknown spider species. I did not observe "poaching" from such caches of *Dipterans*.

65. A male perching over Green Lacewing, *Chrysoperla* sp. eggs, attached to a Horsetail Milkweed leaf with long filaments. I did not observe foraging from caches of *Neuropteran* eggs, however.

66. A male American Rubyspot, perches on dried leaves of Horsetail Milkweed, and ingests what appears to be a captured Three-cornered Alfalfa Treehopper, *Spissistilus festivus* (Say, 1830).





67. A female perchsd on a Southern Cattail leaf while ingesting what appears to be a small fly.



68. A female obelisks on a Horsetail Milkweed follicle, while ingesting what appears to be a small fly.



69. A female perches on a Three-square Bulrush stem while ingesting an unknown insect. However, the long white abdominal projections extending from her labrum/mandible suggest the prey may be a Mayfly (Order: *Ephemeroptera* Hyatt and Arms, 1891) or perhaps a Green Lacewing (antennae).

Predation of American Rubyspots

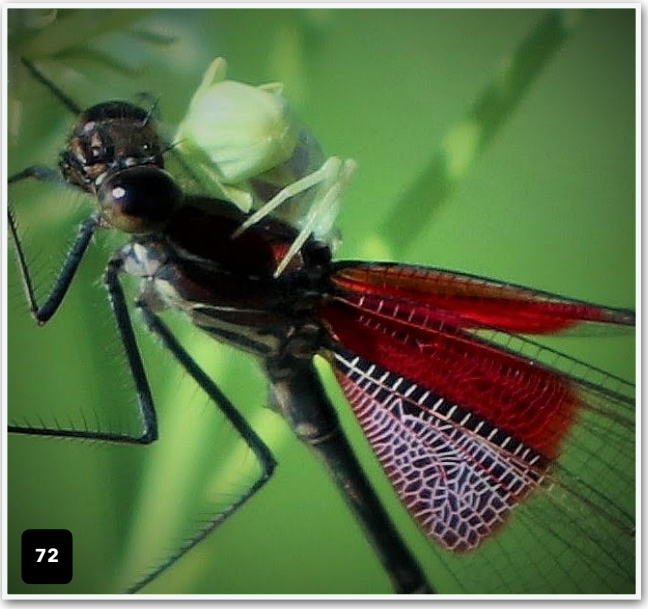
Predators of insects including damselflies are common along the Rio Grande and I believe that an individual insect (probably more) becomes prey for every second of the day. Species of damselflies fulfill both predator and prey roles.



70. A male has been captured, flown to Horsetail Milkweed leaves, and is being ingested by a Robber Fly, *Triorla interrupta* (Macquart, 1834). Robber Fly species are common predators of damselflies, dragonflies, and many other insects along the Rio Grande.



71. A male "perched" unnaturally on Horsetail Milkweed flower buds.



72. Something seems to be holding him firmly on the milkweed.

73. Following Page: A male American Rubyspot has been captured and is being ingested by a small, green-colored, flower crab/crab spider (Order: *Thomisidae*). Note the difference in size of predator versus prey.

74. Following Page: Enlargement of feeding crab spider. Note how much the crab spider resembles the milkweed flower buds, both in color and shape.

Relative Size of American Rubyspots

Paulson (2009) describes the American Rubyspot as a large damselfly; they are smaller, however, than some species of spreadwing damselflies along the Rio Grande. The following images compare the relative sizes of American Rubyspots and other other *Odonata*.









75. Comparison of large-sized, American Rubyspots, female (left) and male (middle), and a small-sized, male Blue-ringed Dancer, *Argia sedula* (Hagen, 1861) (lower right) all perched on a Coyote Willow stem overhanging the bank-full Rio Grande. Image collected and provided by Gordon Berman.

76. Comparison of large-sized, American Rubyspot female (right) and a medium-sized, male Blue-fronted Dancer, *Argia apicalis (*Say, 1840) (left) both perched on a Three-square Bulrush stem overhanging the Rio Grande.

77. Following Page: Comparison of large-sized American Rubyspot male and equally large-sized male Powdered Dancer, *Argia moesta* (Hagen, 1861) both perched on a concrete block adjacent to the Rio Grande.

78. Following Page: Comparison of large-sized, American Rubyspot female and a true bug of average size, Small Milkweed Bug, *Lygaeus kalmii* (Stal, 1874) taking sap from the follicle of Horsetail Milkweed adjacent to the bank-full Rio Grande.

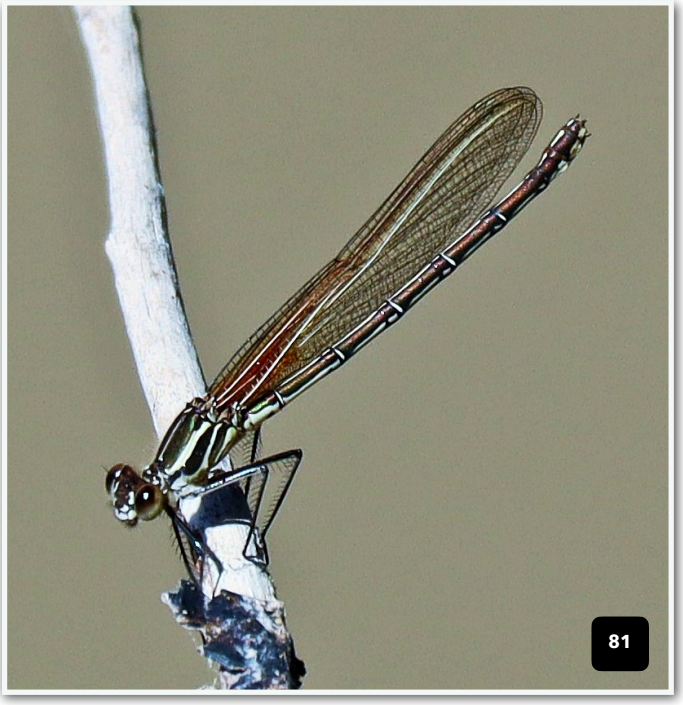
79. Following Page: A male, September 18, 2019.











80. Comparison of large-sized, American Rubyspot female (below) and small-sized male Variegated Meadowhawk, *Sympetrum corruptum* (Hagen, 1861) dragonfly (above), both perched on a Barnyard Grass flowering raceme, adjacent to the Rio Grande.

81. A female perched on a twig over the Rio Grande channel to hunt small flying insects. Summer 2023.







82. Laura Gaudette photographed this American Rubyspot in Bayard, Grant County on August 27, 2015.
83. Greg Lasley photographed this American Rubyspot in northern Luna County on the same day.
84. Susan Elliott photographed this American Rubyspot at Leasburg Dam State Park in Doña Ana County on March 31, 2019.

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Pond Damsel Family
Coenagrionidae

Representing the largest family of damselflies, Pond Damsels are also the second-largest family of *Odonates* (Paulson 2009). An alternative common name for the family is "Narrow-Winged Damselflies." Throughout the world, they typically are the most common damselflies. They are usually found around open ponds and marshes. They tend to be small species with only a few reaching the length of spreadwings. Most of them keep their wings closed when perching.

Dancers
Argia

So named because of their bouncy or jerky flight style (in contrast to the smooth forward motion of other damselfly groups in-flight). Dancers are likely to land flat on rocks, bare ground, litter, or logs (Paulson 2009). Another typical trait is their opening and closing of wings or "wing clapping", along with them always facing towards the stream/water when perched on overhanging twigs and leaves at water's edge (Bluets face towards the shore, for example) (Paulson 2009).

Dancers are well represented in North America with most species occurring in the southwest. The diversity of species increases southward and more than 50 species occur in Mexico, therefore, additional species known from Mexico may occur north of the border (Paulson 2009). We hope to thoroughly investigate mountain seeps and springs for less common Dancer species.

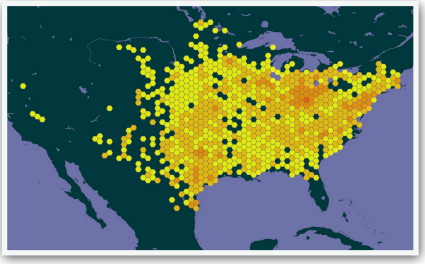
Blue-fronted Dancer
Argia apicalis (Say, 1840)

The Blue-fronted Dancer is a common, widespread eastern dancer with the males exhibiting a distinctive, bright blue, unpatterned thorax. They are more likely to occur along large, muddy rivers than small streams, lakes, and ponds (Paulson 2009).

The New Mexico flight season is March to October; in Doña Ana County I have photo-documented them using low vegetation and open sites on logs, rocks, and ground cover from June to September (inclusive).

1. Male perching on a Climbing Milkweed leaf, illustrates both his small/narrow size and deceptive length. Mature individuals at this site were hunting to capture small flying insects and displaying to attract mates.
2. A male perches low on Bermudagrass at water's edge where he was hunting for small flying insects and displaying to attract a mate; this lateral view exhibits his blue face and eyes, thorax and abdomen tip segments (S8-S9-S10). Note the white color low on the sides of his abdomen for all but S7 through S10, all black color of S7, and blue color of S-8 through S10 segments with a thin black line at the bottom of the blue.
3. Following Page: This male, perching on a Three-square Bulrush stem over the Rio Grande, was warming in the sun while hunting for small flying insects; atypically, he was alone and not among a small group at various stages of development.

Recorded sightings from the Global Biodiversity Information Facility (12/2023).









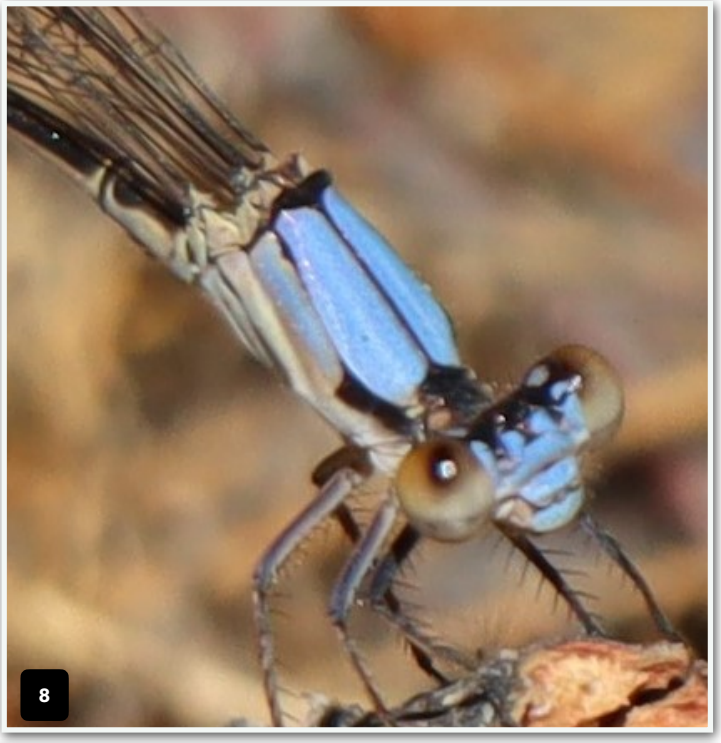




4. An enlarged view of the male head, thorax, and upper abdomen exhibits his remarkable all-blue face when viewed directly from the front; his blue eyes are backed by a brown color and flanged by blue postocular spots; his thorax is blue in front, on top, and on the sides; and his abdomen is black.
5. From an enlarged lateral view, an immature male's lower thorax is a creamy yellow-white color and his abdomen is bicolored with black on top and yellowish-white below. Note the diagnostic dark spot above his second leg at the front of his thorax and the large brown area of the rear of his eye.
6. A blue female (andromorph) perches on rock to warm in the sun, hunt for small flying insects, and display to find a mate. Note how her abdomen shines a golden color in direct sunlight.
7. Females are polymorphic (many forms), this individual is the blue form (andromorph - note lack of blue color in her eyes which helps to distinguish her from males), similar in color to the males described above. Note her stouter abdomen, large S9-S10 segments, and diminished area of black (filled in by brown and some blue colors) as she perches on a Johnsongrass leaf.
8. Following Page: An immature blue female enlargement of face, thorax, and upper abdomen exhibiting her blue facial color; brown eyes; and black dorsal stripe on her abdomen.
9. Following Page: Blue female (andromorph) perched on a Russian-thistle stem while hunting and displaying; this lateral view provides a view of color distribution throughout, including her striking golden-brown abdomen tip (S8-S9-S10).







I sometimes encounter groups of Blue-fronted Dancers intermixed with brown and blue individuals, I believe they represent recently emerged, immature forms as presented below.

10. An immature (brown) male perched on Trailing Snapdragon leaves while hunting for small flying insects.
11. Immature (brown) male head, thorax, and upper abdomen enlarged to exhibit his brown face and eyes, brown thorax, and brown abdomen segments. Note the darkening of the segment, beginning at abdominal S2.
12. Following Page: An immature (brown) female hunting from a perch on a Tamarisk twig, close to ground level. Her abdomen reflects a golden sheen in the sunlight.
13. Following Page: Immature (brown) female perching on a Tamarisk twig to sun and hunt for small flying insects. Note the extent of the black striping on her dorsal abdomen segments (except S9-S10).







14. Wendy McCrady took this photograph in Deming, Luna County on May 28, 2023. It is shown here under a Creative Commons license. Janet Rush Van Eyck's photo of a Blue-fronted Dancer in Truth or Consequences, Sierra County can be viewed at this link.
15. Following Page: Linda Kennedy's image of a Blue-fronted Dancer at the south end of Caballo Reservoir, Sierra County (on July 27, 2022) is shown under a Creative Commons license.
16. Following Page: Blue male and andromorph blue female in tandem linkage (male has clasped her and hooked his cerci/paraprocts to the back of her head) perch on a Sandbur fruit stem, pre-mating.
17. Following Page: Blue male selects a small Coyote Willow branch for perching while the blue andromorph female attempts to attach her S9 segment to his S2 segment (form a mating wheel) for sperm transfer from his S2 to fertilize her eggs at S9.















18. Unfortunately, the perch location he chose made it difficult for her to attach and form the mating wheel and they moved away to complete this necessary stage for successful mating/oviposition.
19. Following Page: Hammertail Robber Fly (*Efferia* sp. Coquillet, 1893) has captured and is sucking liquid nutrients from an immature male Blue-fronted Dancer the site is on the bank of the Rio Grande west of Mesilla. 08/12/24


19

Spine-tipped Dancer
Argia extranea
(Hagen, 1861)

The Spine-tipped Dancer occurs along small rocky and sandy streams (and associated seeps) with much emergent vegetation; males perch on rocks or vegetation near streams (Paulson, 2009). I have observed one male, perching on rocks and a saturated log, along a seep-fed rivulet flowing into Sotol Creek, where it crosses the Pine Tree Recreation Trail, near the Aguirre Springs Campground of the Organ Mountains - Desert Peaks National Monument.

Jonathan Batkin (Pers. Comm. 2025) reported two additional verified sightings within New Mexico, they are:

A. **"Doug Danforth had the first record of Spine-tipped Dancer in New Mexico, at the ranch house in Guadalupe Canyon in 2007 (Peloncillo Mountains, Hidalgo County) (access requires both permission from the landowner and a 10-mile round-trip hike"); and**
B. **Jim Stuart observed at least one, at River Ranch in Luna County, some ten years ago" (~2015) (Von Loh: Jonathan has not observed the species at the River Ranch site over the last several years of personal visits)." (See "6".)**

Batkin further noted that "During April 2019, Kevin Floyd documented one female at the University of Texas - El Paso, perched near a water feature within the Chihuahuan Desert Gardens; it is the only documented observation for Texas (iNaturalist, 2025). (See "5".)

Occurrence in Doña Ana County is well east of its principal southeastern Arizona distribution; they also range south through Mexico to Colombia (Paulson, 2009). The Arizona flight season is from April through November with the Dona Ana County individual observed in July (2025) and the nearby El Paso record during April (2019).

Images "1" through "4" were taken on 24 July 2025 in the Organ Mountains. During the vetting of these images Jonathan Batkin stated: "This is a textbook Spine-tipped Dancer. And it's in very fresh condition" (iNaturalist, 2025). Paulson (2009) describes the male thusly: 'Eyes blue, capped with black; individual entirely blue to purplish-blue with moderate median stripe and narrow humeral stripe (widened in lower half and with large rectangle at lower end);









black irregular polygon on side of S2 (notched at rear); pointed anterior spot or stripe on each side of S2 (notched at rear); pointed anterior spot or stripe on each side and apical ring on S3-S6 (the two joined on S6); S7 almost entirely black; S8-S10 blue with black stripe low on sides of S8 and S9'."

1. **Note one of the key diagnostic markings, a "saddle-shaped" marking highlighted in smaller detail.**
2. **A dorsal view illustrates well the purplish-blue face and post-ocular area, black eye caps and median and humeral stripes, black apical rings with blue in-between, mostly black S7, and blue S8-S10.**
3. **Note how patterns and colors appear when images are collected from the dark side (relative to sun angle) of the dancer.**
4. **One perching session occurred upon a saturated log (the only deviation from all rock perches this midday). Perhaps my moving from one bank of the rivulet to the other caused a curiosity response on this very close proximity perch site.**
5. **Following Page: This photograph is the April 2019 iNaturalist observation by Kevin Floyd, from the UTEP campus in El Paso, noted earlier. Shown here under a creative commons license.**
6. **Following Page: This image is the 19 May 2015 photograph taken by James N. Stuart at Rancho del Rio Mimbres, Luna County referenced earlier. Shown here under the Odonata Central creative commons license.**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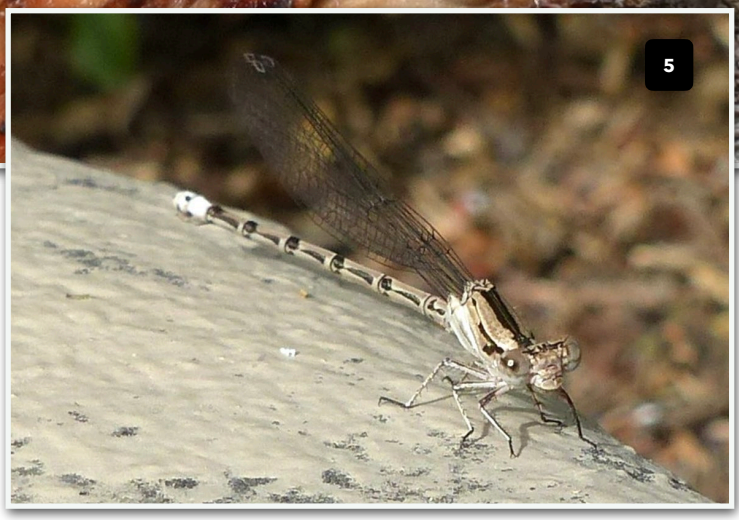
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6

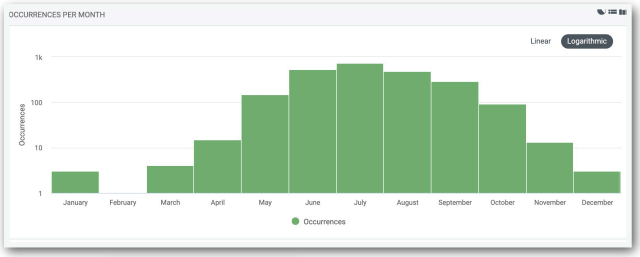
Sooty Dancer
Argia lugens
(Hagen, 1861)

Barnes: Hagen named this species *Hyponeura lugens* in 1861. The genus *Argia* was first described by Rambur in 1842.

The seasonal occurrence distribution shown here is from the Global Biodiversity Information Facility and depicts all sightings in its database. For our purposes, the summer peaking period for its population is apparent.

1. **This mating pair of Sooty Dancers was photographed in Railroad Canyon on the west slope of the Black Range on July 17, 2017, by David Richman. It is used here under a Creative Commons license.**
2. **The Sooty Dancer shown here was photographed by Matt Becker, near the Gallinas Canyon campgrounds along NM-152 in the Black Range, on June 8, 2023. It is used here with his permission.**
3. **Von Loh: One Sooty Dancer record (OC#326224) was located within Dona Ana County, an image collected by Mara Weisenberger (08/28/2009) from San Andres Spring within the San Andres National Wildlife Refuge, White Sands Missile Range. This datum/entry was provided collaboratively by Jonathan Batkin as he researches and analyzes Odonate information for New Mexico. Shown here under Odonata Central's Creative Commons license.**

Von Loh: Paulson (2009) states this is the largest dancer in the region (followed in size by the locally observed





Recorded sightings from the Global Biodiversity Information Facility (12/2023).







Powdered Dancer, a common species). Described habitat is small to medium, open rocky streams, with good current and which may be bordered by riparian vegetation; they mostly perch on large rocks and sand, less so on vegetation (Paulson, 2009). Females are often observed and males frequently fly from perches to touch water, possibly for cooling. The New Mexico flight season is May through October. Sooty Dancer distribution includes the entire western portion of California and adjacent southwestern Oregon, the eastern two-thirds of Arizona, all of New Mexico, a band along the Rio Grande drainage in west Texas, the Texas panhandle, and a narrow band along the southern Colorado border; the species ranges south in Mexico to Chiapas (Paulson, 2009).

4. Barnes: This image (OC# 436959) by James N. Stuart, 23 Sep. 2015, Animas Creek, Sierra County is shown under Odonata Central's Creative Commons license.



Powdered Dancer
Argia moesta
(Hagen, 1861)

The Powdered Dancer is a large dancer that often is quite pruinose in the southwest; they typically are more dull brown to black in eastern populations. Powdered Dancers use many habitats including streams, rivers, and irrigation canals that are muddy to sandy, rocky and wooded streams, and lakes in their northern range (Paulson 2009).

The New Mexico flight season is March to December; in Doña Ana County I have photo-documented them in June, August, September, October, and November using low vegetation and open sites on logs, rocks, and ground cover.

1. **Typically perching low on surfaces near water, this male chooses a large concrete block in the Rio Grande bank to warm in the sun, defend territory, hunt for small flying insects, and to display for a mate. Because of the reflection and texture plus minor backlighting, it is often difficult to collect sharp and in focus images from individuals on rock surfaces.**
2. **A male perches from a Bermuda Grass leaf and displays his densely pruinose (powdery white) face, thorax, upper abdomen and abdomen tip while hunting for small flying insects and displaying for a mate. Note the contrast of this individual against the darker leaf surfaces, however his perching angle and body length still makes collecting images a challenge.**
3. **Nearly completely pruinose, this male perches horizontally from a twig over the flowing water while hunting for small flying insects and displaying to find a mate.**
4. **Perched on a Russian-thistle to hunt and display. This male, although lightly pruinose (except abdominal S8-S9-S10 segments), reveals his thorax antehumeral/humeral white stripe pattern and a few abdomen details.**
5. **Pruinose male perched over the water on a Southern Cattail leaf is approached by an American Rubyspot male (in-flight left). He tips his abdomen down slightly indicating he is not a prospective mate.**
6. **Following Page: After the American Rubyspot male lands, the Powdered Dancer rapidly displays (by bending his abdomen strongly downward, then upward) to attract a female somewhere in his vicinity. Note that strong downward and upward abdominal movements by a male are used by most damselfly species to signal to a female.**
7. **Following Page: Pruinose male perched on a dried leaf holds his wings much like a spreadwing damselfly and exposes his dorso-lateral abdomen surface, color, and patterns. Note the bluish-black dorsal color of his abdomen.**
8. **Following Page. An unstriped blue female perches horizontally on a stem against dense grasses (best angle for collecting in focus images with color contrast). She is hunting for small flying insects and displaying to attract a mate.**

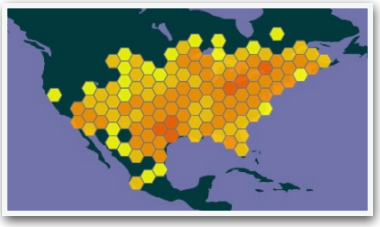












Recorded sightings from the Global Biodiversity Information Facility (12/2023).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9. **A striped blue female perches closely to a branch emerging from the Rio Grande flow; she warms in the sun, hunts for small insects, and displays for a mate. Note her abdominal color pattern of black stripes adjacent to blue and her lack of pruinosity.**
10. **Striped blue male and female in tandem linkage (male clasps her head with his cerci/paraprocts) while perched on a rock adjacent to the Rio Grande; note her abdomen is completely brown in color. It is unknown if they are in pre-mating linkage or if they are resting during post-mating ovipositing.**
11. **Pruinose male and female perch on a twig in tandem linkage (he has clasped the back of her head with his cerci/paraprocts); they are likely preparing to mate and will fly to a more protected site to do so.**



12. **An immature male perches on a Three-square Bulrush stem over the water, while hunting for small flying insects. Note the developmental stages of mature colors and patterns.**
13. **An unstriped blue female perches (slightly obelisking) on a Three-square Bulrush stem and exhibits her blue head and thorax that are mostly unmarked, typical in arid regions (Paulson 2009). Note her abdomen is brown dorsally with thin, black lateral stripes, and is blue ventrally.**




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14. Previous Page: Unstriped blue female perches slightly down-angle on a Southern Cattail leaf to hunt and to display to attract a mate.
15. Previous Page: Lightly pruinose male and brown female, in tandem linkage, perch on a rock along the Rio Grande, likely to rest during oviposition. Ovi-positing may require several minutes up to an hour for mated pairs.
16. Previous Page: Pruinose male and female copulate in a mating wheel (S2/S9 abdominal segments), while perched on a twig over the Rio Grande; a second male seems to act as a guard (he more likely is attracted by the mating activity and ready to pursue her should she release from the tandem linkage).
17. Pruinose male and striped blue female in tandem linkage on a rock along the Rio Grande; it is unknown if they are pre-mating (readying to mate) or post-mating (readying to oviposit). Note the subtle, pastel color contrasts, the near vertical sun angle with underlying shadows, and the linear elements - sometimes images turn out to be artistic!
18. Striped blue male has clasped a brown female and perches on a twig in tandem linkage; they are likely preparing to mate by finding a safe site. Note how many ways the damselflies and twigs have combined to make a clear, in focus image almost impossible to acquire, but always snap that button!
19. Ovipositing pairs of large Powdered Dancers and similar-sized Familiar Bluets choose the same substrate of saturated twigs and stems upon which to deposit (continued on next page)





19. (continued from previous page) eggs in the Rio Grande shallows. Note how both males use vertical positioning behavior as the females deposit their eggs.
20. Lightly pruinose male and brown female, in tandem linkage (he has clasped her head with his cerci/ paraprocts), oviposit along the damp edges of a rock along the Rio Grande (note probable white eggs to their left at water's edge). Note also the vertical positioning behavior typical of many damselfly males and also his strong, white thorax striping.
21. A somewhat rare perched pruinose male (rather than elevated), in tandem linkage with blue female, together oviposit along saturated portions of a small branch in the Rio Grande. Note the female has an exposed egg ready to deposit at her S9 segment and that the male leads her from site-to-site until her eggs are all deposited.
22. Ovipositing pairs of large Powdered Dancers and much smaller Blue-ringed Dancers choose the same substrate of saturated twigs and stems upon which to deposit their eggs in the Rio Grande shallows.
23. Note, three male damselflies perch along an old twig extending over the Rio Grande, the length of the larger Powdered Dancer (right) versus the moderately large Familiar Bluet (far left) and the smaller, slender Blue-ringed Dancer (near left).
24. Following Page: "miguel1958" (iNaturalist) photographed a Powdered Dancer at the south end of Caballo Reservoir, Sierra County on September 22, 2023. Shown below under a Creative Commons license.
25. Following Page: August 2, 2024, Rio Grande.

Other observations from this general area included that of David Tan on October 16, 2022 and Emily Hjalmarson on July 7, 2018.


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Apache Dancer
Argia munda
(Calvert, 1902)

The Apache Dancer is an uncommon, medium-sized and bright blue southwestern dancer of mountain streams (Paulson 2009). Preferred habitat is mountain streams with current early but drying into pools by midsummer; I observed only one at a seep in an arroyo bottom of the middle Organ Mountains. Apache Dancers are rare, occurring in southeastern Arizona, southwestern New Mexico, and a small area in western Texas; they extend south in uplands of Mexico to Durango and San Luis Potosi. The New Mexico flight season is July to October; in Doña Ana county I have photo-documented this one in May, using an active seep and adjacent shrub vegetation for cover.



Recorded sightings from the Global Biodiversity Information Facility (12/2023).





1. **The eyes of this male Apache Dancer are dark blue over light blue and the postocular spots are connected to make a dumbbell shape, his body is bluish-violet (typical of west-Texas area males), and the body color shifts from blue on the thorax to dull purple along the abdomen. Note his abdominal segment, S7 is entirely black while S8-S9-S10 are entirely light blue.**
2. **This male perches low on small rocks and gravel that are located within a moist seep. From this shade dappled position he hunts for small flying insects and defends a small territory. Note his bright white humeral stripe, low on his thorax.**



Barnes: When James Von Loh submitted the images on the previous page, to iNaturalist, one of the commenters (Jonathan Batkin) noted "Important sighting. This is the only record between the western New Mexico counties of Grant and Catron, where there are very few records, and west Texas, where there are equally few. The appendages, clear enough in the photo, are noticeably different than other *Argia* in NM and AZ; the patterns of thorax and abdomen are distinctive, as is the rich purplish blue."

Roughly three months following his initial observation Von Loh revisited the site and found "the seep is dry and no damselflies observed" - personal correspondence with the editor date August 3, 2023.

3. **Other than the Jim Von Loh sighting mentioned above there are few observations of this species in this part of the southwest. There is a report by Matt Becker from June 2023 on the west slope of the Black Range east of Mimbres. His image is shown with permission under a Creative Commons license.**

Note that both of the sightings referenced here occurred at roughly the same time, in the same year (May and June 2023).

On May 22, 2025 Von Loh noted "I made several visits to the Apache Dancer habitat and there was sufficient moist soil and standing water until about two weeks ago - I didn't observe a single damselfly, only a Darner and a Flame Skimmer. Also, the La Mancha habitat visited by Claw-tipped Bluets is super low with none of the emergent shoreline vegetation present a couple of years ago - it will depend on water releases flowing down the Rio to recharge those wetlands and I hope that happens beginning next week or so!"

Misidentifications

Identifying damselflies to species can be difficult and comes with multiple reasons you can get it wrong. Don't feel alone or incompetent. Forget about the arguments about taxonomic placement for a moment and focus on this particular issue: misidentification. If by chance you submit an observation to one of the online databases and have someone question your identification take that as a learning experience, not as the gospel.

When reviewing a draft of this volume Jonathan Batkin provided the following assessment of some records. I have "redacted" identifying institutions because that is not what this is about, it is about "misidentifications happen".

Batkin wrote: "Questionable records, all of which are at (institution): Western Red Damsel, Dusky Dancer, Vivid Dancer, Northern Bluet, and Tule Bluet.

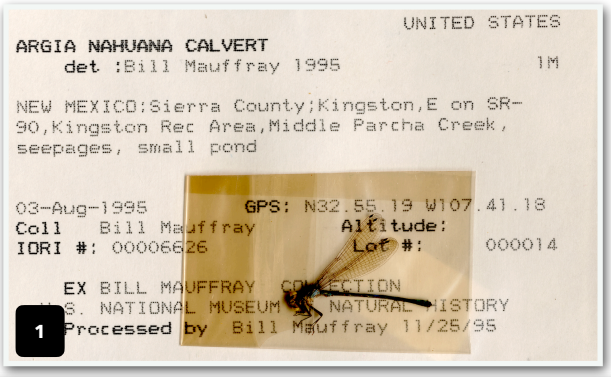
These five species range from possibly incorrect to nearly impossible, and I have spoken with other people who acknowledge the problem with respect to other records in this collection. I hope to make a trip to (institution) to examine the collection. Most NM records of *A. vivida* were declined in the Odonata Central database a few years ago because they were misidentified *A. funebris/ plana*. The species occurs in the Valles Caldera and in the northern counties of the state, but there aren't very many records of it. A similar problem exists for *E. annexum*. It has a northerly range, though there are records from the Sacramento Mountains." (pers. correspondence 29 April 2025)

Aztec Dancer
Argia nahuana
(Calvert, 1902)

Paulson (2009) states this species is a small sky-blue dancer of southwestern weedy streams. Described habitat is small streams with open banks but abundant emergent vegetation (sedges and watercress); usually are at riffles (where they typically perch in vegetation) rather than pools (Paulson, 2009). The New Mexico flight season is March through November. Aztec Dancer distribution includes the entire western and southern portion of California, southern tip of Nevada, and the western third of Arizona; the species ranges south in Mexico to Jalisco (Paulson, 2009).

1. **Barnes: During the draft review of this volume, Jonathan Batkin brought our attention to this specimen. The specimen was collected by Bill Mauffray on August 3, 1995 in the Middle Percha Creek drainage near Kingston. It is now part of the collection of the National Museum of Natural History, Smithsonian Institution.**
2. **Von Loh: I was able to take this photograph on 23 May 2025. Collected over a spring-fed rivulet below Leasburg Dam. Note that this male is light blue rather than the more common, darker 'sky blue' color with characteristics somewhat resembling the Paulson (2009) descriptive note: "Rare lightly marked individuals have median stripe narrower, humeral stripe unforked, and/or S7 all blue".**
3. **GBIF: USNM ENT00365162. Collected by H.E. Evans and M.A. Evans (05/11/1989), at Mesilla Dam along the Rio Grande near Las Cruces. It is now part of the United States National Museum (Smithsonian). This specimen was confirmed by Rosser W. Garrison, Ph. D., the leading authority of the genus Argia. Jonathan Batkin provided the information about this specimen.**
4. **Following Page: Jonathan Batkin photographed this Aztec Dancer (OC#2927684) at the Voiers "Pit" Park in Deming on 11 Jul 2024. Shown under Odonata Central's Creative Commons license.**
5. **Following Page: James N. Stuart photographed this individual (OC#377805) at Rancho del Rio (on the Mimbres River) in Luna County on 18 July 2012. Shown under Odonata Central's Creative Commons license.**
6. **Following Page: Habitat particularly suited to Aztec Dancers occurs below Leasburg Dam where spring-fed rivulets support Rabbitsfoot Grass and Southern Cattail stands (05/30/25). Note that this habitat is seasonal, between about March to May most years, until release of irrigation/water compact flow to the Rio Grande from upriver storage reservoirs inundates the channel.**

There is at least one other record of Aztec Dancer within Doña Ana County; Catalog # UMMZI-00261367 collected by R.B and J.M. Selander (08/28/1952), at San Andres Spring within the San Andres National Wildlife Refuge, White Sands Missile Range.



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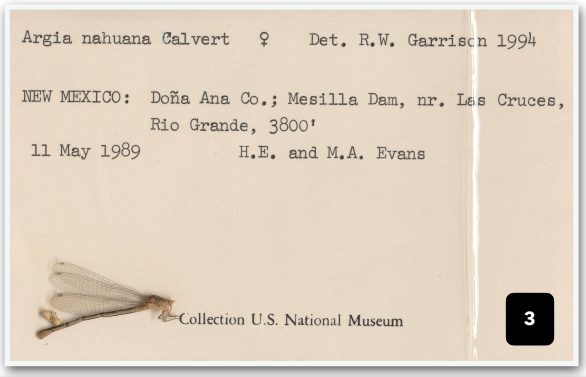

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Amethyst Dancer
Argia pallens
(Calvert, 1902)

The Amethyst Dancer is a slender red-violet dancer of southwestern streams that may spend some time in Doña Ana County. They are more likely to occur on open, rocky areas along shallow streams and rivers (Paulson 2009). Amethyst Dancers occur in south-central/eastern Arizona, far southwestern and southeastern New Mexico, and in western Texas; they extend south in uplands to Guatemala.

The New Mexico flight season is February to October; in Doña Ana County I have photo-documented them in June and July using unvegetated sites on floating stems, branches, logs, rocks, and bare ground.

This species is indescribably beautiful, they have unusual and well-matched color combinations that change with sun angle. However, I have found, in my limited encounters with them, that it is not easy to bring one or a pair into full, clear focus (But it sure is a visual treat when you do!!).

1. **Male obelisking while perching over water on a dried grass stem; he is defending his territory, hunting for small flying insects, and likely displaying to attract a mate. Note the black stripe low on sides of abdominal segments S8-S9, which is diagnostic.**
2. **A mated female, in tandem linkage (his clasped S8-S9-S10 segments are visible to the right) is ovipositing along a floating stem (note the white eggs distributed in a pattern and one just deposited). She exhibits brown eyes, her thorax is patterned much like a male's but with lighter colors, her abdomen has narrow, black, dorsolateral stripes on segments S2-S9.**
3. **A slender, reddish male with purplish abdomen tip perched on a concrete slab near water and warming in the sun, hunting for small flying insects, and displaying to attract a mate. Note that it is typical for both males and females to perch low and often on rocks or bare ground.**

Barnes: J. N. Stuart reported an observation from City of Rocks/Mimbres River in May 2015.

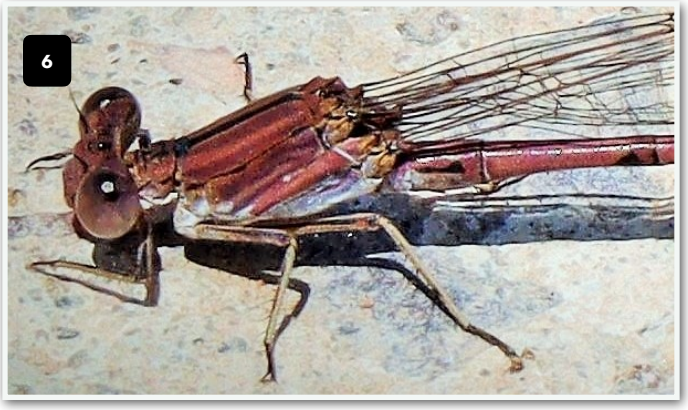












4. An immature male perched on a dry grass blade over open water and hunting for small flying insects is almost entirely blue-violet in color, including his abdomen tip; abdomen segment S7 shows a black lateral stripe and S8-S9 shows a black stripe low on the side. Note on abdomen segments S2-S7 the black lateral spots (fusing into rings on S6-S7).
5. Females are stouter than males and may perch low over water while hunting small flying insects and likely displaying to attract a mate. Perching on an emergent grass stem and obelisking seems to be a common behavior.
6. In a detail from the image at the bottom of the preceding page, the male's eyes are reddish-brown, his thorax is a striped red-violet with bluish-white near the abdomen, and the upper abdomen is reddish-violet. Note narrow, median and unforked antehumeral stripe (becoming pruinose [white] below with age); on abdomen segment (S2), also note the black lateral spot fusing into the ring.
7. Following Page: Two pairs, in tandem linkage (males upper right and females lower left), occupy suitable ovipositing sites along a floating Southern Cattail leaf/ stem. The males have clasped their cerci/paraprocts, located at S10, onto the back of the (continued on next page)



Recorded sightings from the Global Biodiversity Information Facility (12/2023).



7. (continued from previous page) female's heads, they then lead the females to egg-laying sites (and move to new sites several times) typically floating and saturated plant material at the water's surface. Note the extensive egg-deposition occurring with the pair on the right side.



8. As occurs with many damselfly species, the males remain nearly vertical from the tandem linkage point with the ovipositing females. I am unaware of a behavioral/ structural reason for this positioning and surmise it may be a way to better watch for predators while exhibiting dominance.

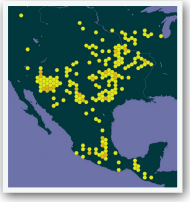


9. The ovipositing pair on the left choose to lay eggs on the horizontal floating cattail leaves while the pair on the right remain vertical with the male grasping a dried grass stem and the female ovipositing on top of the saturated leaves. Note the newly deposited eggs (bright white and circular color/ shape) from both females.
10. The female's thorax color (from the vertical pair ovipositing in "9") is shades of stripy-brown, indicating she is an immature individual. Note her dark/black, extremely narrow, antehumeral stripe (mid-thorax).



Springwater Dancer
Argia plana (funebris)
(Calvert, 1902)
(*A. p. funebris* - Hagen, 1861)

The Springwater Dancer is a common, medium-sized southwestern dancer with blue (occurs east of New Mexico and south into northeastern Mexico) and violet (occurs west of Texas and south to Guatemala) populations; they use small, shallow streams and small springs (Paulson 2009). Their preferred habitat is springs and they are considered indicative of springs in some parts of their range; three were observed on rocks below a waterfall in a creek bottom of the middle Organ Mountains.



Recorded sightings from the Global Biodiversity Information Facility (12/2023).

The New Mexico flight season is April to November; in Doña Ana County they were photo-documented in July and August, perching on rocks below the Fillmore Canyon waterfall (Gordon Berman's images 1-5) and Soledad Canyon (James Von Loh's images) waterfalls.

1. **This violet-colored male perches low on a rock of a dry canyon bottom, near a small headwater seep/waterfall; he is hunting for small flying insects while displaying to attract a mate. Note his light blue-colored abdomen tip (segments S8-S10) when compared to the violet and black colors of his abdomen and thorax.**
2. **A female's eyes are brown and her brown/black thoracic markings are patterned like the male's. Beginning on abdomen segment S2 and continuing to S7, there are short, pointed, narrow dorsolateral stripes.**
3. **The male exhibits blue eyes and violet thorax/abdominal segments (indicative of the western population (Paulson 2009) with postocular spots connected in a dumbbell shape; his thorax has a moderate black median stripe and a narrow, unforked antehumeral stripe that widens at the lower end; and the abdomen (S2) has a narrow black stripe ending in a small triangle.**

Barnes: The currently accepted Latin binomial for this species is *Argia plana* but that is a fairly recent change. Some species reports, like those: by Lauren Leach (of an individual photographed in Hillsboro on October 27, 2019); that by Cathy Pasterczyk of an individual photographed in Kingston on July 26, 2023; and Owen Sinkus' photograph from the San Lorenzo area, on June 19, 2023, were originally posted under the (then current name of *Argia funebris*) which might confuse the recordkeeping but does not diminish the observation.













4. **Brown-colored female perches low on rock and gravel, she is hunting small flying insects and likely displaying to attract a mate. Note her abdomen tip (S8-S9-S10) is entirely pale gray and the dorso-lateral stripe at S7 is fused with the apical ring.**
5. **Another brown-colored female perches low on a rock, as above and is hunting small flying insects and likely displaying for a mate.**
6. **Male perched on and hunting from a sun-warmed volcanic rock, along a small flow drainage, fed by seepage from a livestock pond in Achenbach Canyon (Organ Mountains-Desert Peaks National Monument). Note his violet face and thorax color. Photograph by James Von Loh, 9/5/2021.**
7. **Photograph by James Von Loh, 9/5/2021. The same male as "6". I find it interesting that his terminal abdomen (S8, S9, S10) is colored medium-blue, Paulson (2009) states this is common within violet populations.**







8. **Western populations are violet on the head, upper thorax, and abdomen (except S-2, S-6, and S-7 have black and S-8 to S-10 may be blue); eyes are brown on top over bands of green and white, the thorax humeral stripe is narrow and divides violet above and blue below. 07/28/24**
9. **Enlarged view of the head (violet, eyes are banded brown, green, and white), thorax (violet dorsally and blue laterally with black median and humeral lines), and basal abdomen pattern of white, blue, black, and violet with black rings. 07/28/24**
10. **Three weeks later, a second individual male is present with the entire thorax violet except for the blue ventral surface and there is no white or blue on the basal abdomen, which is violet and black. 08/18/24**
11. **Enlarged lateral view of the head and face (violet), eyes appear black over green due to sun and photograph angle, thorax (this individual is violet dorsally and laterally [only ventral surface is blue] with black median and humeral lines), and basal abdomen pattern of black, and violet with black rings. 08/18/24**

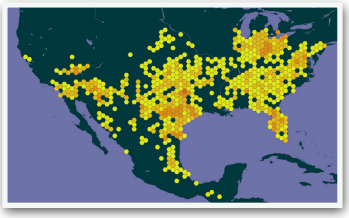




Blue-ringed Dancer
Argia sedula
(Hagen, 1861)

The Blue-ringed Dancer is a common small dancer, mostly black with bright blue rings, and a blue abdomen. Blue-ringed Dancers use many habitats including streams and rivers with dense herbaceous vegetation along the banks; they also tolerate open areas and wooded vegetation contributing to their abundance and large range (Paulson 2009).

Recorded sightings from the Global Biodiversity Information Facility (12/2023).



The New Mexico flight season is March to November; in Doña Ana County I have photo-documented them from May to November, inclusive, using low vegetation along the Rio Grande and at one small pond.

1. **A male perches horizontally over water on a Southern Cattail leaf to defend his territory, hunt for small flying insects, and display to locate a mate. Note along his lower abdomen the semi-circular whitish-blue spots.**
2. **Male perches on a Southern Cattail leaf to defend his territory, hunt for small flying insects, and display to locate a mate. Note his solid black S7 abdominal segment and the blue color of S8-S9-S10 segments. This species carries their wings above the abdomen, like Rubyspots, making images striking in form and with pretty color combinations.**





3. **Male perches at an upward angle from dried Spiny Chloracantha flowers. These slender, long-bodied damselflies are difficult to bring into clear focus and I've found that collecting a few extra images from different angles is recommended.**
4. **Following Page: Male perches horizontally from a Horsetail Milkweed leaf primarily to hunt for small flying insects attracted to the milkweed flowers. It is much easier to collect in focus images when photographing this configuration.**



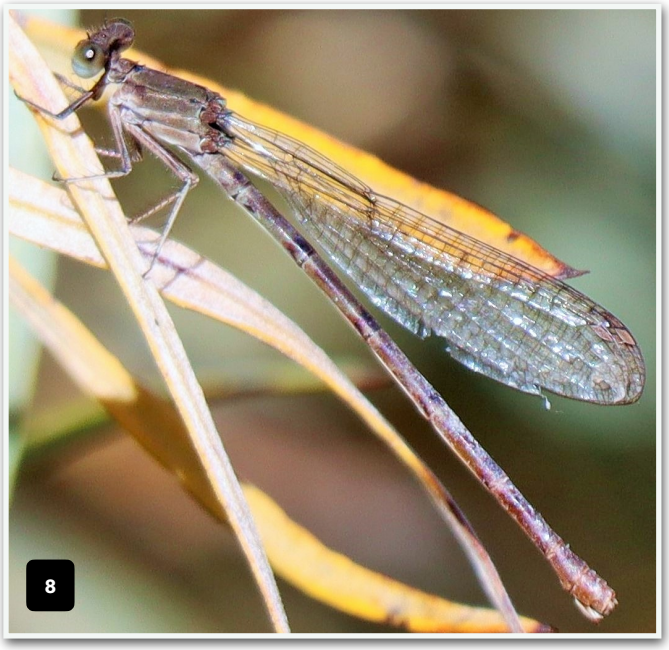


5. This male makes a statement by perching at the sunlit tip of the Climbing Milkweed fruit to hunt small flying insects, defend his territory, and to display for a potential mate. A lucky and somewhat epic image of placement and size comparison.
6. An enlarged image of the male head, thorax, and abdomen exhibits his blue face, darker blue eyes, blue postocular spots, wide black median and antehumeral stripes, and the abdominal S2 exhibits black side stripes, fused dorsally.
7. A mature female with pale bluish-green basal rings and sides evident on her S3-S6 abdominal segments; otherwise the abdominal markings are brown; she is perching on a Climbing Milkweed leaf where her color provides reasonable camouflage from predators.
8. Following Page: This brown female perches on autumn Coyote Willow leaves to avoid wind gusts, warm in the sun, and hunt for small flying insects. Note that her color and features are subtle and some shade of brown, throughout providing effective camouflage.













9. **A premating pair perches together in tandem linkage (female-left/male-right with his cerci/paraprocts clasped behind her head) while hiding low among the leaves of Bermuda Grass. They are likely locating a safe place to form a mating wheel.**
10. **A premating pair perches together in tandem linkage (female-left/male-right) while hiding among the leaves and flowers of Climbing Milkweed. They are likely locating a safe place to mate. When in tandem linkage and later in a mating wheel, all damselflies and dragonflies are a challenge to bring into clear focus because of length, configuration, angle; my advice is to collect many images while changing the lens focal length periodically.**
11. **An enlargement of the female head (also includes a portion of the male abdomen clasped to the back of her head), thorax and upper abdomen. Her eyes are dark brown; head is equally brown, thoracic color is lighter brown and plain with few features; Paulson (2009) states that "mature females show a touch of pale blue-green on tiny plates at wing bases" examine the wing-base just above the abdomen to see this feature; her abdomen is brown with slightly darker apical spots in this image.**
12. **Following Page: A mating/linked male (upper) perches on a Johnsongrass stem and with the linked female (lower) appears to be just completing the wheel position that will allow them to transfer his sperm (located S2) to her eggs (S9) for fertilization.**





13. A postmating pair, released from the mating wheel, remains in tandem linkage while perching on a twig over shallow water to oviposit. Note that this site has been used for egg deposition (see the grass leaf-base and the attached eggs there and elsewhere in the image) but I cannot confirm that this pair deposited any of these eggs.
14. Immature male perches on White Sweetclover leaves and hunts for small flying insects. A tan-to-brown pattern has developed on his thorax and abdomen that is precursor to the blue-and-black colors and patterns of mature individuals.



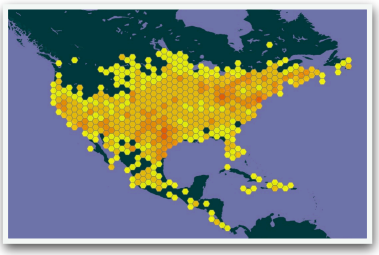


American Bluets *Enallagma*

Small to medium in size, this large genus of bluets primarily occurs in North America with a few species occurring in Eurasia (Paulson 2009). Typical species are predominantly blue in color, as I have photo-documented in Doña Ana County habitats. Females are often polymorphic and are brown, green, or blue in color; I will present examples of female polymorphism below expanding this list of colors.

Familiar Bluet *Enallagma civile* (Hagen, 1861)

During the spring-through-fall months, should you visit almost any wetland or body of water with a fringe of wetland plants, within the contiguous US (except the extreme NW states) and adjacent southern Canada, you will likely see Familiar Bluets. They are pretty, common, slender damselflies that some also call "civil" bluets due to their specific epithet, *Enallagma civile* (Hagen, 1861). However, having observed and photographed many of them and their behavior along the Rio Grande since 2019, I'd describe them in human terms as "singularly-focused free spirits".



Recorded sightings from the Global Biodiversity Information Facility (12/2023).

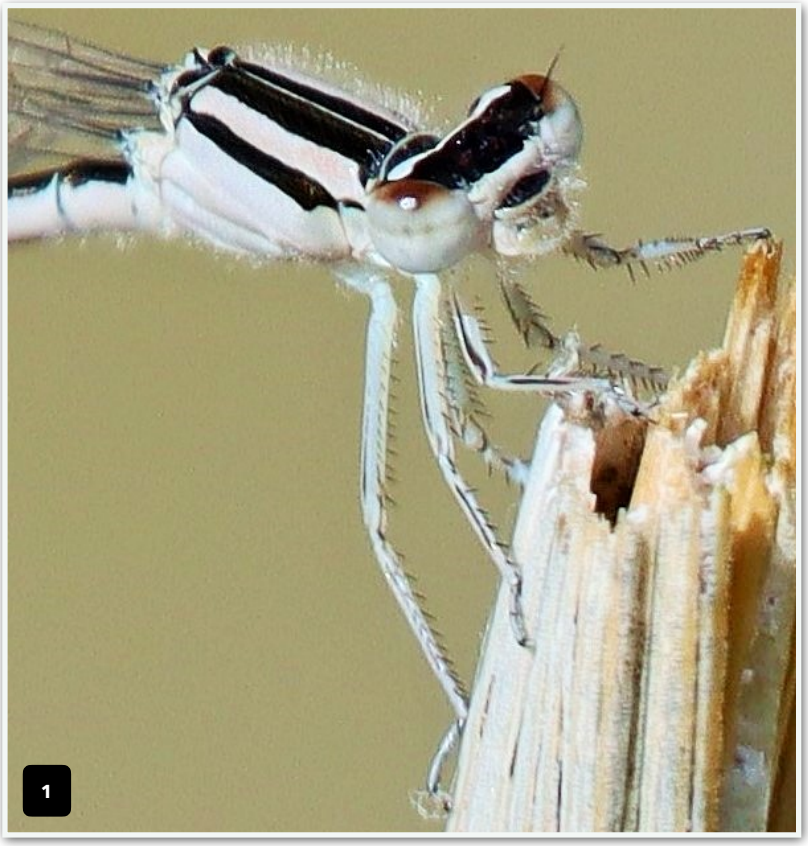
The Familiar Bluet is the most abundant damselfly observed in Doña Ana County. It exhibits broad habitat tolerance; they occupy open marshes, ponds, slow flowing streams, river and lake margins with emergent vegetation (Paulson 2009). The New Mexico flight season is February to November. In this area I have photo-documented them in numbers from April through November, using shallow water habitats of the Rio Grande and associated canals/ditches, small ponds, and seeps and the water sources available in the Organ Mountain, as well as within various urban/homeowner landscaping plans.

Familiar Bluets I encounter locally have amazed me by the number of body colors exhibited, while patterns (dark or black) remained consistent. Perhaps this color palette is related to developing immatures and should be expected, but I decided to photo-document them whenever encountered and present them herein.

Taxonomy among damselfly species can be confusing so errors of identification are always possible. Individual adult bluets don't live all that long, from a few weeks to a few months, which seems to provide them with a very clear and very simple behavioral agenda (emerge/hunt/mate).

From prior egg depositions and hatches, bluet larvae emerge then rapidly enlarge and molt several times, before crawling from the water to dry while clinging to twigs and plants as small but functional individuals. They're soon capable of avoiding capture by predators, searching for/capturing food, mating, and egg deposition. While bluets may mate more than once as adults, they average just over one mating encounter (Paulson 2009).

As occasionally happens, I see something that either confuses or amazes me when photo-documenting insects doing insect things. Usually I see the "thing" when I'm processing the images by cropping and am left to wonder/research about the "why" and "how". For example, when writing this species account I wondered about female Familiar Bluets depositing eggs while still in tandem linkage with only the male's abdomen. The rest of that story is told in the Western Pondhawk dragonfly account in Volume One, where males can be observed with mouthfuls of male Familiar Bluet eyes, head, thorax, and wings, while his abdomen was still attached to the female's head!"

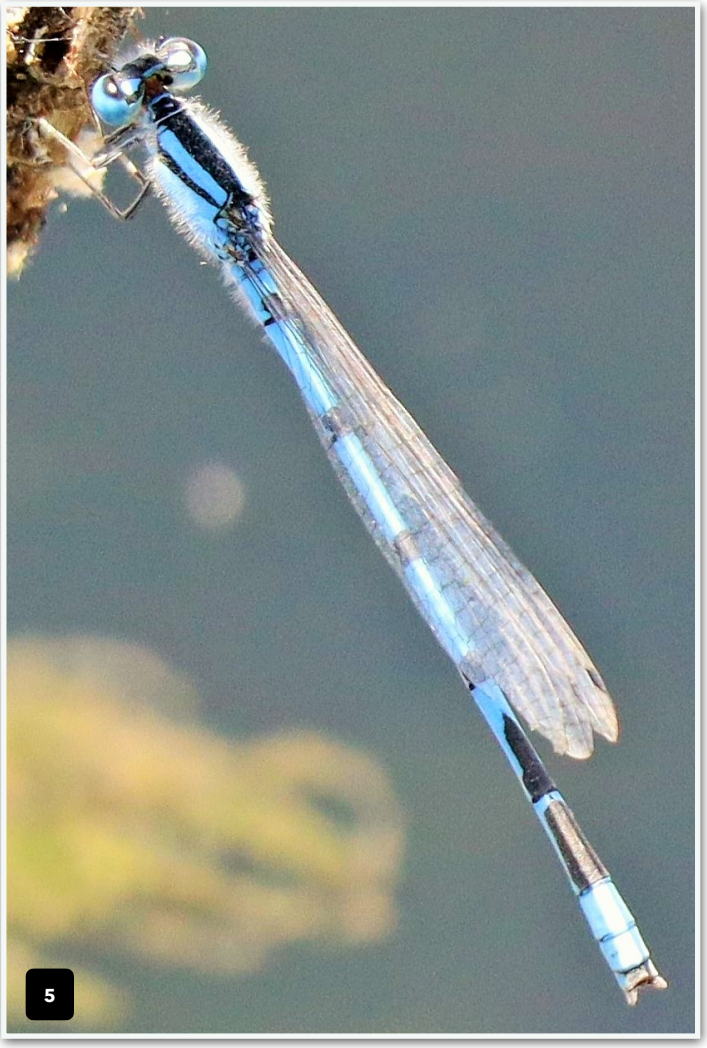


1. Enlargement of the bluet/damselfly head/thorax/legs/abdomen area. I'm always surprised by the number of cilia-like hairs present under magnification, as damselflies appear smooth and shiny when viewed in the sunlight.

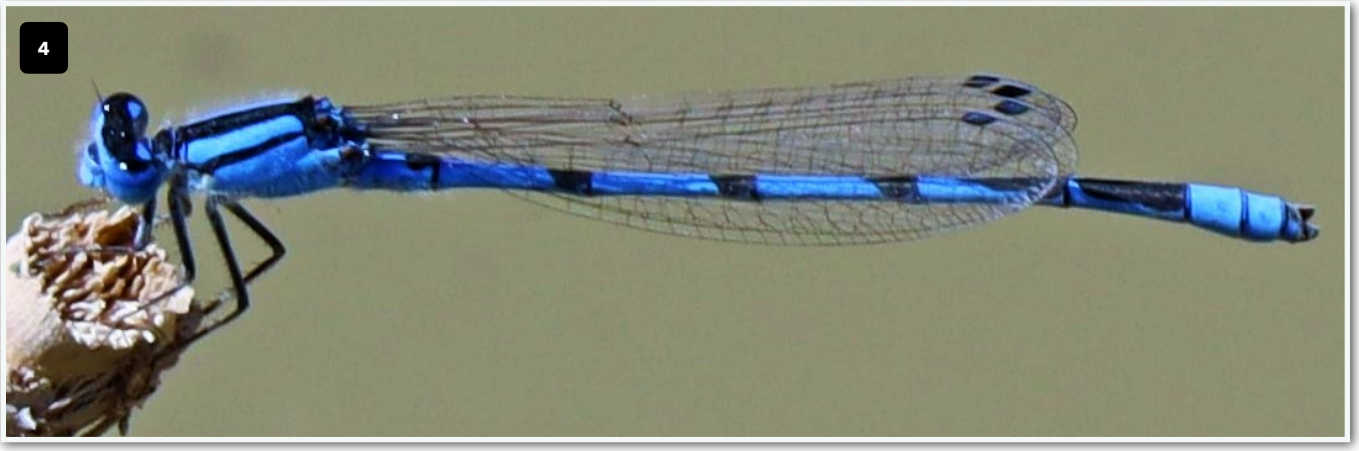
2. **Perching on the tip of a Summer Cypress leaf while hunting for small, attached arthropods, this male is nearly pure white (including post-ocular spots) with perhaps a little light blue tinting where his wings overlap his abdomen.**
3. **A female but with a light bluish tint.**
4. **A typically-colored, medium-blue/black and mature male exhibits the diagnostic pattern of this species while perching horizontally from a stem over water. He is perching to hunt small flying insects, defend his territory, and to display to locate a mate.**
5. **This mature male is pale blue/black, another color often encountered in local populations. Note, though, that his postocular spots are white.**
6. **A female (the same individual as "8") in-flight with no wing shadow, better exhibits her light blue and orangish-tan colors and** **(continued on next page)**

















6. (continued from previous page) diagnostic black pattern. She remains in tandem linkage with the clasped male (note upper right of image) and is being "towed" to a new site for additional ovipositing.
7. A white female perching on a downward angle from a Spiny Chloracantha stem (note her diagnostic pattern, including "torpedoes" of shiny black). She hunts small flying insects along the Rio Grande.
8. A bi-colored female with her diagnostic black pattern, her light blue with brownish-orange colors are striking, including orange eye color. She has mated with a light blue male (note upper right of image) and is ovipositing under Duckweed leaves. There are a large number of eggs within the duckweed mat, deposited by this and several other pairs of damselflies and dragonflies.
9. Hovering within a large Summer Cypress, this orangish-tan/brown-eyed female, with the diagnostic black pattern, is hunting arthropods attached to leaves.
10. Following Page: This orangish-tan over light blue female (advantage of lateral view to obtain ventral color) is eating a small arthropod she picked off a Summer Cypress leaf.
11. Following Page: A striking orange/orange-over-blue-eyed female has a light blue ventral color and diagnostic black pattern. She is hunting for small arthropods from Summer Cypress leaves.
12. Following Page: Dorsal view of the female (#11) showing the effect of the closed wings to color hue and to pattern contrast.









13. A "typical" light blue/black patterned pair, post-mating and in tandem-linkage as she deposits eggs around wet organic matter. When ovipositing, males nearly always remain upright. I have postulated that: 1) this gives them the ability to watch for predators; 2) intimidates other pairs in the vicinity so they access best spots; 3) at this angle, his claspers provide more leverage for her to deposit eggs under obstacles; or 4) since his wings are constantly moving it may enable a quick escape.

14. **A Coyote Willow branch becomes "action central" for mating pairs of Familiar Bluets, and a "wannabe".**
15. **Nearly 100% of the time I include spider images with damselflies, the spider, a super predator, is generally having a great meal. But here a pale blue/black male Familiar Bluet spies a perching spider and rapidly attacks.**
16. **Following page: The spider hangs onto the stem down low and seems to be launching a counter-attack from above with one arced long leg. But Mr. Bluet is determined and tenacious, gains leverage and Gotcha!!! And so goes the 100 degree +, Rio Grande version of "Deadliest Catch".**
17. **See "16".**
18. **See "17".**





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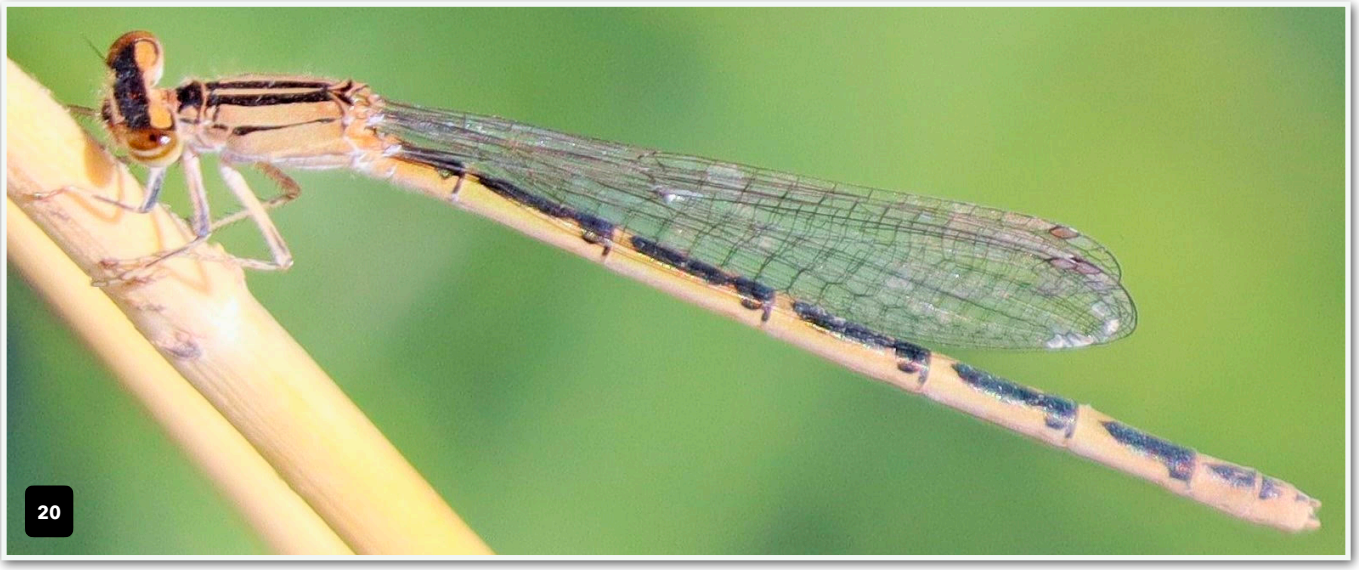
19. Once matured, female bluets along the Rio Grande occur in three fairly distinct color forms (tan, tan and blue, and blue), making their identification a little tricky at times. This is an adult female, tan and light blue color form.
20. This is an adult female, tan color form, but it is difficult to identify her between a Familiar Bluet or an Arroyo Bluet. Paulson (2009) states: "Female (Arroyo Bluet) much like female Familiar, River, and Tule Bluets but smallest of these. Probably indistinguishable except in hand."
21. Adult female, blue color form. She is in tandem linkage to a male's abdomen and is performing post-mating/egg deposition behavior.
22. Adult male pale blue color form. Note narrowing of the abdomen characteristic of males.
23. Following Page: Adult male, bright blue color form.
24. Following Page: This appears to be a juvenile male bluet.
25. Following Page: An immature male exhibits a pinkish-brown color with the diagnostic black pattern, as he perches to dry (harden his wings and body) and perhaps hunt.
26. Following Page: A tan-colored female (Familiar Bluet or Arroyo Bluet) entices males to mate by flipping her abdomen upward then curling it downward (usually male bluets arrive in seconds).







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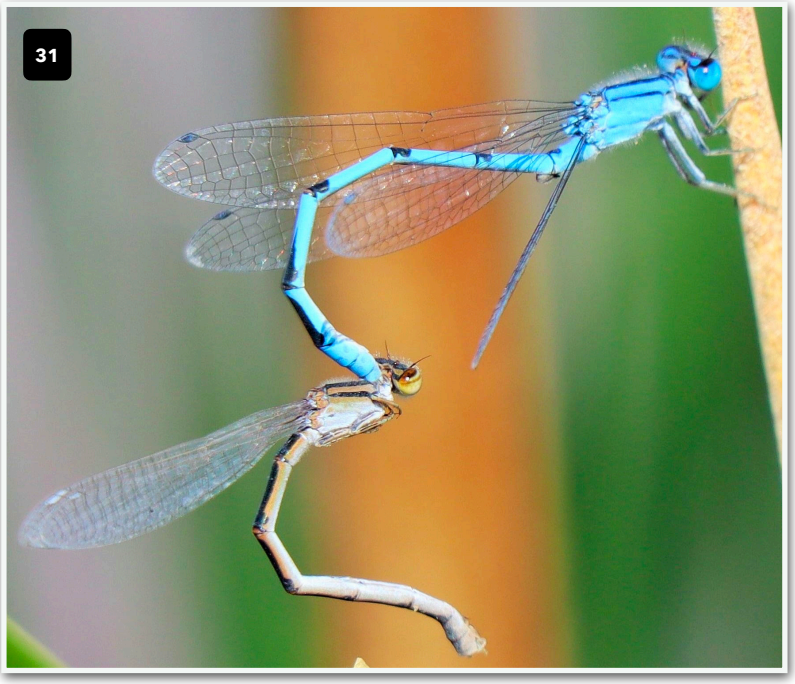
27. Once a suitable mate is accepted, the male connects its abdomen tip (S-10, equipped with paraprocts, cerci, genital pore) to a site on the female's prothorax (top, front of the thorax).
28. The female then maneuvers, sometimes with several attempts, to connect her S-9 segment (vagina) to the male's S-2 segment (penis); note that the basal bulge of the S-2 segment is a way to identify males.
29. Tan-colored female completes the typical "mating wheel" with the blue male. The "mating wheel" in the long-bodied bluets is somewhat heart-shaped rather than a more ovoid shape of other damselfly species.
30. Enlargement showing sites of male penis (S-2) and female genitalia (S-9) plus the "mating wheel" formation as male sperm is transferred to fertilize her eggs.
31. Following Page: The pair uncouples at the abdomen-to-abdomen site to form the "tandem linkage" and begin fertilized egg deposition. The male remains attached with cerci to the female prothorax to provide a "guide and tow service" to egg deposition sites (and to ensure his sperm fertilizes the eggs).

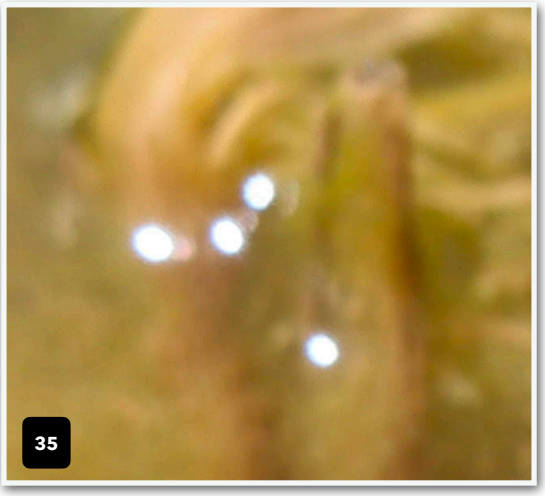








32. The female is guided and delivered to a floating cattail stem and leaves. This popular bluet egg deposition site is visited by more than one egg-depositing pair at a time.
33. A floating branch provides preferred egg deposition habitat for this bluet pair. Note the female (rear bluet) is all blue in color matching the blue color of the male, front bluet. She deposits eggs first to one side, then to the other side of the stem (some eggs are also scattered on top of the stem, appear as white spheroids).
34. A tan and blue female deposits eggs along a floating cattail stem as the male moves them forward along the stem's length. This behavior is repeated as the male flies them to other deposition sites, ensuring eggs are placed in more than one place along this and other stems, and the female ensures that eggs are deposited on both sides of the stem.
35. Four recently deposited bluet eggs shine intensely while underwater under full sunlight.



36. Following Page: Mating and egg-laying bluet pairs are constantly visited by unpaired males, perhaps sensing an opportunity to mate following this pairing. The last male to mate with a female ensures his sperm fertilizes the eggs by scooping out sperm from previous copulating males.
37. Following Page: All the activity of this egg-depositing bluet pair attracts the attention of a male Plateau Dragonlet, *Erithrodiplax basifusca* (Calvert, 1895) defending his territory from other dragonlet males while seeking a mate.
38. Following Page: Perched on the edge of a water-smartweed leaf, the bluet male lowers the female to the waterline where she deposits several bright white eggs.

Barnes: Familiar Bluets have been reported from several sites at or near the Black Range, including: by John and Nancy Crosby on September 29, 2022 at Elephant Butte; by miguel1958 (iNaturalist) near the Elephant Butte

(continued on following page)







(Continued from previous page) dam site on September 19, 2023; by Wendy McCrady at the south end of Caballo Reservoir on May 23, 2023; at City of Rocks State Park by Diana and Terry Hibbitts on August 27, 2015; and by Greg Lasley on October 2, 2013 at Bear Canyon Reservoir.

Following Page

One day I noticed a congregation of bluet tandem-linked pairs depositing eggs along floating southern cattail leaves (while a few single males investigated) and I collected several images:

39. **But some "thing" appeared odd when I looked closer at the tandem-linked pair in the middle of the photograph.**
40. **The Familiar Bluet tandem-linked pair appeared to look horrified to me. What was that "thing" hanging from and dangling in front of the female bluet at the left???**
41. **The female at the left was attached, in tandem linkage, to only a male's abdomen as she continued to deposit eggs.**
42. **See "41". Refer to page 63.**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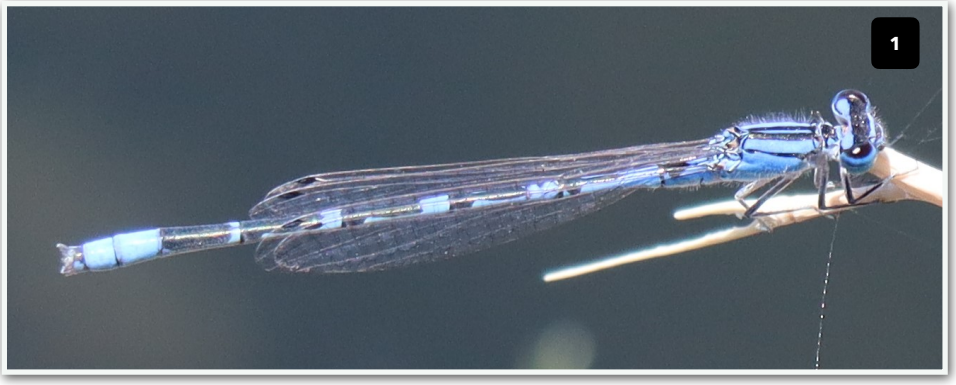
Arroyo Bluet
Enallagma praevarum
(Hagen, 1861)

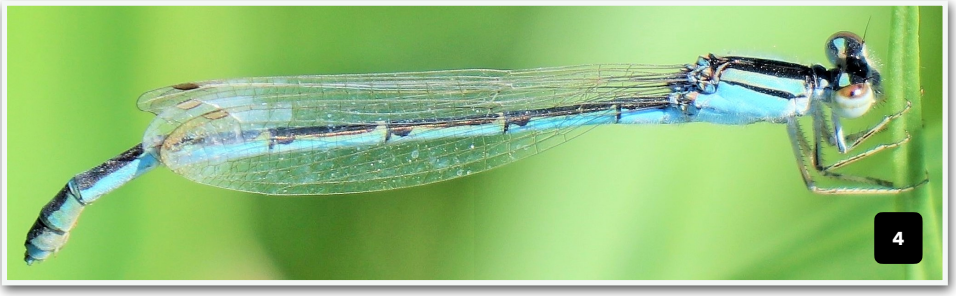
The Arroyo Bluet is a small bluet of the southwest with much black on the abdomen; they occupy slow, flowing streams or lake margins with emergent vegetation (Paulson 2009). The flight season is from February to November in Doña Ana County.

I have only observed (iNaturalist example) a few in June and July, using a canal, with emergent grasses and floating mats of Duckweed delivering treated wastewater to the Rio Grande.









1. **Male perches horizontally from a dried grass stem emerging from a canal; representative blue color patterns are prominently presented, alternating with lines and areas of shiny black. It is easy to bring this perching style into focus but an important need is to obtain clear color patterns through the folded wings.**
2. **An enlargement of the male's head, thorax, and upper abdomen segments exhibits his blue eyes capped by black; light blue postocular spots joined by a thin line to make a "dumbbell" shape; his wide, black median stripe is divided by an incomplete light blue line; narrow black humeral stripe; and the large, black apical spot on abdominal segment S2 (blurred some by his folded wings.**
3. **Females are polymorphic and may present as brown or blue, the brown/brown-eyed form (note, she is very similar to the brown Familiar Bluet female) is presented here perched at a downward angle from a dried grass stem. Because they are shorter than spreadwings, it is less of a challenge to bring her entire body into focus (with her wings held above her body, the better image angle is a lateral view).**
4. **The blue/brown-eyed female form is presented here perched horizontally from a stem. Note her abdomen tip is held in a down-ward position indicating she is rejecting interest in mating with a nearby male of another species (likely Familiar Bluet at this site).**
5. **Following Page: Male selects, clasps (attaches his cerci/ paraprocts to the back of a female's head) in tandem linkage. He perches on a stem, and forms a mating wheel with this brown/ brown-eyed female. (Continued on next page)**



Recorded sightings from the Global Biodiversity Information Facility (12/2023).







5. (Continued from previous page.) At this stage, he is transferring sperm via his penis (located S2) into her vagina (located S9) to fertilize the eggs she carries there. Mating may require several minutes to complete.
6. See "5".
7. Following fertilization of eggs, the pair remains in tandem linkage (note male's S7-S10 blue-and-black abdominal segments clasped to her head) to oviposit; a mated brown/brown-eyed female releases her eggs under the floating aquatic Duckweed leaves. Note the visible, round, pure white dots are previously deposited damselfly or dragonfly eggs.
8. Barnes: Andrew Cannizzaro photographed this individual in Palomas Canyon (east slope of Black Range) on August 23, 2020.

Cameron Eckert observed this species near Sherman on July 17, 2023; Terry and Diana Hibbitts observed one at Katfish Kove (near City of Rocks State Park) in Luna County on August 27, 2015; and Greg Lasley photographed one at Bear Canyon Reservoir on August 30, 2015.





9. **Observed in many ovipositing damselfly species, the male remains vertical while attached to the female in tandem linkage; the brown/brown-eyed female releases her eggs under the floating aquatic Duckweed leaves where several other round, pure white eggs are visible. A few species of bluets, forktails, and dragonflies deposit eggs in the aquatic Duckweed habitat at this site (extensive root and stem masses occur under the floating Duckweed leaves).**
10. **An enlargement of an ovipositing brown/brown-eyed female's head, thorax, and upper abdominal segment (along with her mate's clasped abdominal tip) exhibits her brown-over-tan eyes; brown postocular spots joined by a thin line to make a "dumbbell" shape; wide, black median stripe divided by an incomplete brown line; narrow black humeral stripe; and the large, black spot covering much of abdominal segment S2 (but blurred by folded wings).**



Claw-tipped Bluet
Enallagma semicirculare
(Selys, 1876)

Barely crossing over the border with Mexico (thus, rare within the US), this small purplish-blue to grayish-blue bluet presents a long claw-like cerci (Paulson 2009). The species occurs along the southeastern border of Arizona southward to Chiapas in Mexico. The Arizona flight season is April to November; in Doña Ana County, I have only observed a few in June, using emergent grasses and bulrushes to perch on and oviposit into the plant tissue just above the shallow water surface.



Recorded sightings from the Global Biodiversity Information Facility (12/2023).

1. **A slender blue to purplish-blue male with long claw-like cerci perched from a Southern Cattail leaf (I was immediately attracted to them by their purplish sheen in early-morning sunlight). Note how his post-ocular spots form a pale "dumbbell" shape. Because this species is fairly short, collecting in focus images is relatively easy, however their tightly folded wings are an issue.**
2. **The few individuals I observed often perched by hanging from grass, cattail, or bulrush emergent stems within a foot of the water surface. This downward-angled perching style is reminiscent of somewhat larger spreadwings and provides great photographic opportunities.**
3. **Individual male perched horizontally against a Three-square Bulrush stem, which allows good dorsal abdomen diagnostic detail to appear.**
4. **Following Page: An angled dorso-lateral view allows a better examination of colors and patterns, particularly his bluish-purple middle abdomen segments, black segments S6-S7, and blue (pruinose) tip segments S8-S9-S10. Note that backlighting is not always a good thing for observing detail.**







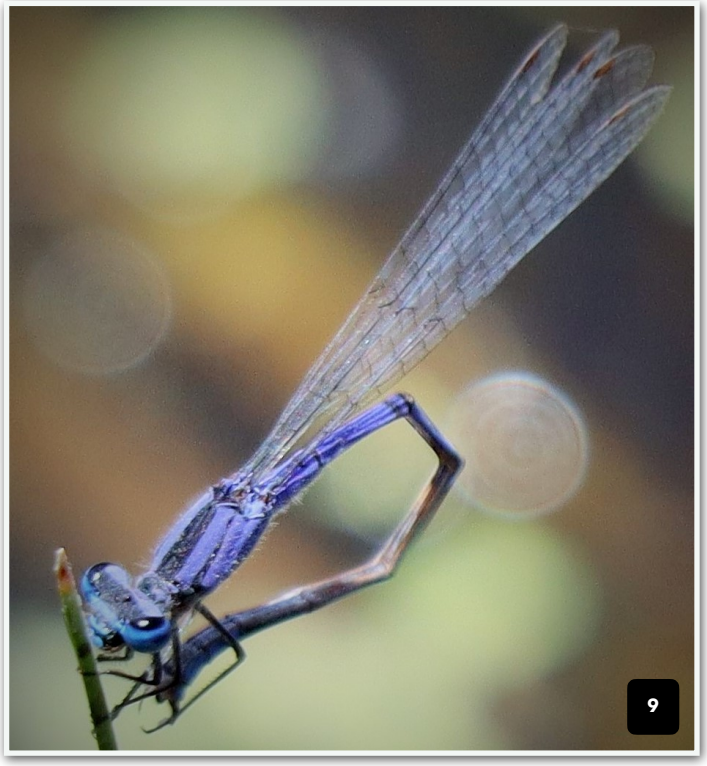


5. **Similar dorso-lateral view in brighter light exhibits his bluish-gray postocular spots ("dumbbell"), thorax, and abdomen tip. His black median stripe, bluish antehumeral stripe, and black humeral stripe are prominent in this view of his thorax. Note his stout, claw-shaped cerci extending from segment S10.**
6. **Enlarged image of a male's head and thorax exhibits his large, blue, dumbbell-shaped postocular spots, black-capped blue eyes, wide, black median stripe (top of thorax), wide blue antehumeral stripe, and narrow, black humeral stripe (side of thorax), generally bluish-purple color (reflects purple in natural sunlight), and the black ring of the S1 (first abdominal segment, a little blurred by his folded wings).**
7. **Following Page: Claw-shaped cerci of a male are stout, noticeably curved, and thick upon inspection. His abdomen is a shiny dark blue and segments S8-S9-S10 are strongly pruinose (white-waxy color).**









Per Paulson (2009), female Claw-tipped Bluets exhibit brown-over-tan eye color and their head and thorax are patterned like males, but with pale blue colors (described from a female photo-documented in San Luis Potosi, Mexico). My observations, presented as images below, of an apparent ovipositing female, suggest that eye color may include black-over-blue and head and thorax are patterned like and may be of the same bluish-purple color as are the males.

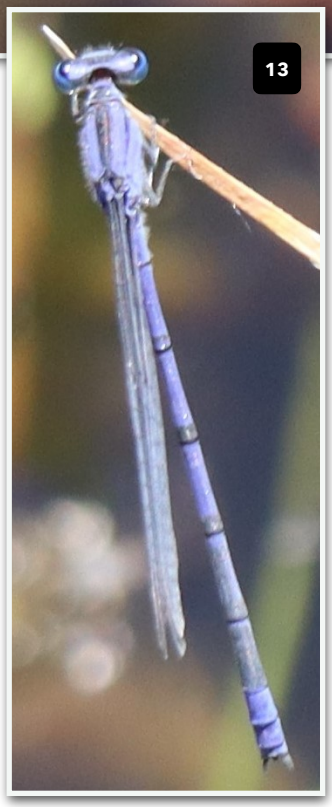
8. **Likely post-mating female oviposits into the tissue of an emergent Three-square Bulrush bract (note a likely white-colored egg top embedded immediately opposite her face), she works up-and-down the bract and lower on the stem to water line while depositing her eggs, then moves to another nearby emergent stem to repeat the process. Perhaps the easiest damselfly image that can be acquired in the field.**
9. **She moves slightly to insert another egg. Note her blue face and her purplish-blue hue in contrast to the black median and humeral stripes, similar to those characteristics exhibited on males.**
10. **Following Page: Enlarged image of a likely female's head, thorax, and upper abdomen exhibits the same color patterns and shapes as those of the male, as previously described.**







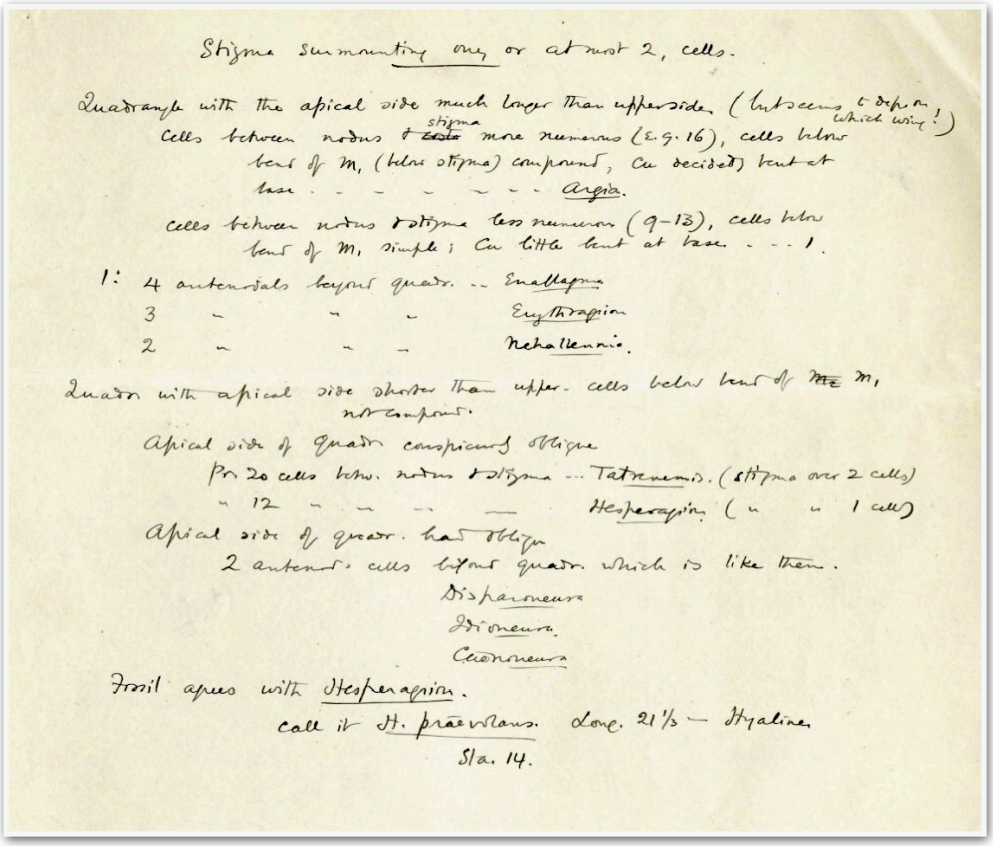




11. **Male distal abdomen from individuals encountered in the field exhibit the stout, pointed, and thick cerci along with pruinose S8-S9-S10 segments.**
12. **Individual perches high at the tip of a Three-square Bulrush bract, displaying to available mates by flipping up-then-down its abdomen tip (flashing the pruinose color) to help it to attract a mate. I believe that holding the wings to the side and slightly separated also contributes to light reflection while displaying.**
13. **Individuals often perch, hunt for small flying insects, and defend a small territory by hanging from emergent cattail, bulrush, and grass stems, typically within a foot of the water surface. This image presents a great view of abdominal segment rings that are not obscured by folded wings. Note that this individual exhibits an overall grayish-blue color due to extended pruinosity. When photographing in the field, always be curious/ alert to differences among individuals and photo-document them to show the range of variability.**

Painted Damsels *Hesperagrion*

Barnes: There are two species in the genus *Hesperagrion, H. heterodoxum* which is discussed here and *H. praevolans* which is extinct. *H. praevolans* is known from the Florissant fossil beds in southern Colorado. It was described by T. D. A. Cockerell (p. 112 of *Early Naturalists of the Black Range*) who did work in this area. His field description of *H. praevolans* is shown to the right, the original is maintained in the University of Colorado Boulder Libraries Rare and Distinctive Collections.



Stigma surmounting only or at most 2, cells.

Quadrangle with the apical side much longer than upperside (but seems to depend on which wing!)
Cells between nodus & ~~costa~~ stigma more numerous (E.g. 16), cells below bend of M_1 (below stigma) compound, Cu decided) bent at base . . . . . Argia.

cells between nodus & stigma less numerous (9–13), cells below bend of M_1 simple; Cu little bent at base . . . 1.

1: 4 antenodals beyond quadr. .. Enallagma
3 " " " Erythragrion
2 " " " Nehalennia.

Quadr. with apical side shorter than upper. cells below bend of ~~Me~~ M_1 not compound.

Apical side of quadr. conspicuously oblique
Pr. 20 cells betw. nodus & stigma ... Tatrenemis. (stigma over 2 cells)
" 12 " " " — Hesperagrion (" " 1 cell)

Apical side of quadr. had oblique
2 antenod. cells beyond quadr. which is like them.
Disparoneura
Idioneura.
Caenoneura

Fossil agrees with Hesperagrion.
call it H. praevolans. Long. 21⅓ — Hyaline
Sta. 14.

Painted Damsel *Hesperagrion heterodoxum* (Selys, 1868)

The Painted Damsel is a pond damsel of small, slow-flowing streams and ditches where heavy herbaceous plant species provide adjacent cover. They are brightly-colored at any age.

The New Mexico flight season is March to November; in Doña Ana County, I have observed a mating pair once in November, using low grasses adjacent to the Rio Grande.

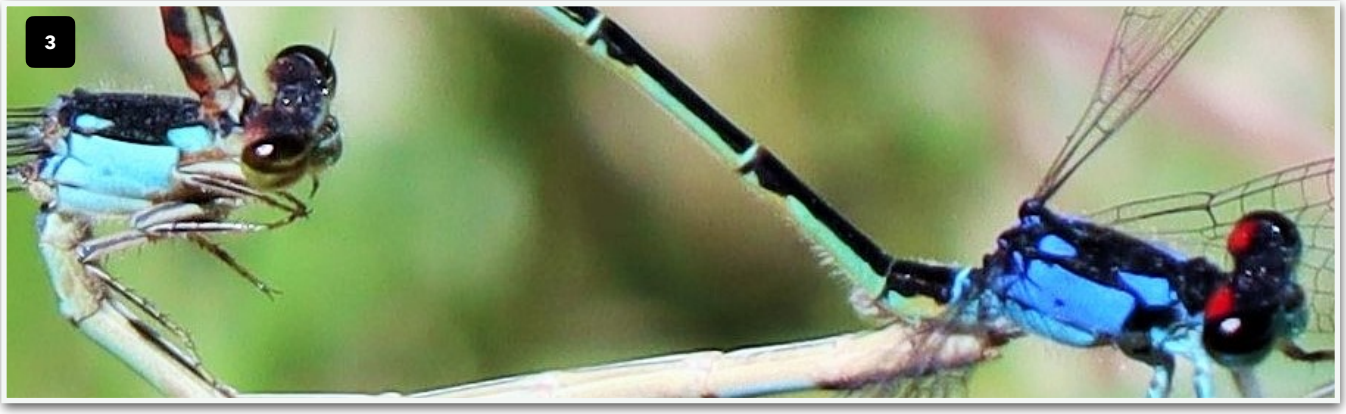
1. **A rare occurrence along the Rio Grande, this pair has joined into a tandem linkage (male clasps a female behind the head with his cerci/paraprocts) then into a mating wheel to transfer his sperm, via penis located at S2 into her vagina, thus fertilizing eggs located in her S9 segment. The male (R) has perched low on a blade of Bermuda Grass.**
2. **An enlargement of the female's head, thorax, and upper abdominal segments (with the male's abdomen tip clasped behind her head) exhibits her black-capped green eyes; her median thorax is black and the sides light blue with two small triangular light blue spots in the antehumeral area.**







Recorded sightings from the Global Biodiversity Information Facility (12/2023).



3. A comparison of the thorax color shades illustrating the light blue female color with the medium-blue male color. Note the male's ventral abdomen color is pale green while the female's is mostly white.
4. An enlargement of the male's head, thorax, and upper abdominal segments (with the female's abdomen tip attached at his S2 segment) exhibits his black-capped green eyes; bright red eyespots; his thorax is black on top and the sides blue with two small triangular blue spots in the antehumeral area; his abdomen is black dorsally and green ventrally.



5. Barnes: Bill Carrell took this photograph at the Nature Conservancy's Mimbres River Preserve on August 12, 2017 shown here under a Creative Commons license.
6. Barnes: Andrew Cannizzaro took the immature male photograph on August 19, 2014 in Palomas Canyon, east slope of the Black Range (used here with permission).



J. N. Stuart observed a Painted Damsel along the Mimbres River near City of Rocks State Park on June 16, 2022.



Forktails - Ischnura

The name "Forktail" refers to the male abdomen tip (segment S10) where a forked projection occurs in most species; these small damselflies are of worldwide distribution (including islands) (Paulson 2009). These species often occur in dense vegetation but some fly over open water; they tend to stay near water, even when immature (Paulson 2009). Identification can be challenging but in males, the combination of green thorax and blue-tipped abdomen is most typical of forktails. In parts of the west, females are difficult to identify with photography and exhibit polymorphism (orange at first, becoming dark or pruinose, then brightly colored like the male) (Paulson 2009).


1


2

Desert Forktail *Ischnura barberi* (Currie, 1903)

Paulson (2009) states it is a large forktail of the arid southwest with much pale coloration (only species of similar size and color is Rambur's Forktail also discussed herein). Described habitats include various lakes, ponds, marshes, canals, and ditches that are alkaline to saline; this forktail typically perches in sedges and grasses along the shoreline (Paulson, 2009). The New Mexico flight season is March through November. Desert Forktail distribution includes southern California, a band along western Utah, western and southern Arizona, southwestern and eastern New Mexico, west Texas and the Texas panhandle, and western Oklahoma jutting into a band into south-central Kansas; the species ranges south in Mexico to northern Baja California and Sonora (Paulson, 2009).

Thanks to the research of Jonathan Batkin we know of several records from this area.

1. James N. Stuart photographed this species "northwest of Radium Springs on State Highway 185" on 29 April 2011 (OC#327816).
2. On 26 August 2015, Marion Dobbs photographed this individual at Mesilla Valley State Park (OC#436257).











3. **Mara Weisenberger photographed this individual (OC#333958 on 01 October 2011 at the Broad Canyon Ranch along the Rio Grande north of Las Cruces.**
4. **Mara Weisenberger photographed this individual OC#333961) on 01 October 2011 at the Broad Canyon Ranch along the Rio Grande north of Las Cruces. Lasley (who vetted the specimen) notes in the specimen record that "Originally submitted as *I. ramburii*. The specimen was collected and determined to be *I. barberi*." Note by Robert Larson: "As I was acetoning the Broad Canyon Ranch specimens last night I found that I had the specimen that Mara photographed and it is the homeochromatic (andromorphic) female of the Desert Forktail (*Ischnura barberi*) with the tear drop shaped loop on the outer edges of the mesostigmal plate."**
5. **Ditto "4"**
6. **Ditto "4"**
7. **Mara Weisenberger photographed this individual (OC#333959) on 01 October 2011 at the Broad Canyon Ranch along the Rio Grande north of Las Cruces.**

The images shown in this species account are done so under Odonata Central's Creative Commons license.

Plains Forktail
Ischnura damula
(Calvert, 1902)

Barnes: Some authorities (BugGuide, for instance) express some concern about the identification of this species in the field versus the *Pacific Forktail, Ischnura cervula* (Selys 1876). Apparently there is the possibility that the two may have ranges which overlap in this area. Arizona Dragonflies has an excellent series of photographs and information about how to identify this species.

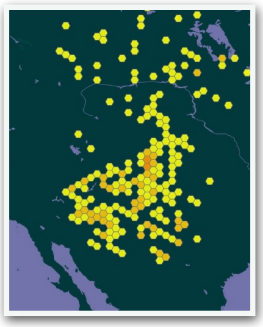
Von Loh: The Plains Forktail is a small, slender forktail with a disjunct population extending from Mexico to Canada (per Paulson 2009, may indicate special habitat needs) with pale dots on the thorax; they occur at lake margins, ponds, slow streams and ditches, and hot springs with abundant vegetation, particularly in beds of tall cattails and bulrushes (Paulson 2009). The New Mexico flight season is from February-October; in Doña Ana County, I have photo-documented them in every month (other than October) between March and December (inclusive), using mixed stands of Bulrush and tall Southern Cattail. This habitat occurs at the La Mancha Wetland Restoration Project Site located along the western levee base of the Rio Grande; site hydrology occurs from groundwater seepage when the Rio Grande is bankfull with interstate irrigation and international water compact flow.

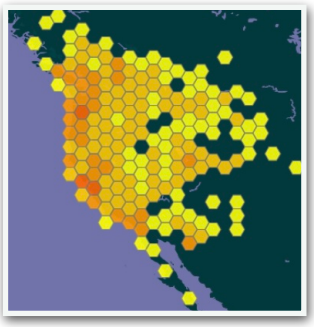
1. **Bill Carrell took this photograph at the Nature Conservancy's Mimbres River Preserve on August 12, 2017 shown here under a Creative Commons license. INaturalist does not have any "research grade" reports of the Pacific Forktail from New Mexico listed (as of July 24, 2025). See also OC#470925.**
2. **La Mancha Wetland Restoration Project Site. May 19, 2024. Male. Photograph by James Von Loh.**
3. **Same as "2".**





Recorded sightings from the Global Biodiversity Information Facility (1/2024). Plains at left and Pacific at right.











4. **A male Plains Forktail with a striking blue/black color contrast; the species occurs throughout New Mexico. I photo-documented 2-5 of them during May 2024; this individual exhibits blue S8-S9 abdominal segments with incomplete black stripes below - a diagnostic trait for identification. It is perched against a Bulrush stem hunting for small arthropods and defending mating territory in a small opening among tall bulrush and 15-foot-tall Southern Cattails; they are a challenge to photograph well in this habitat. Photograph by James Von Loh. May 21, 2024. La Mancha Wetland Restoration site.**
5. **In this enlarged image of (#4) the male's head, thorax, and upper abdominal segments (S1-S3) are visible, his eyes are green with a black cap; the small postocular spots are blue as are the four larger spots on his dorsal thorax; his thorax is blue with a black anterior surface (the paired blue dots represent the ends of the ante-humeral stripes); and his abdomen is black.**
6. **Male eating small bug, La Mancha Wetland Restoration Site. 8/12/2024. James Von Loh**

Jonathan Batkin has photographed this species at the New Mexico Department of Game and Fish's River Ranch (Luna County) on 01 July 2023 (OC#2713679) and at Voiers "Pit" Park in Deming on 11 July 2024 (OC#2927681).



Mexican Forktail
Ischnura demorsa
(Hagen, 1861)

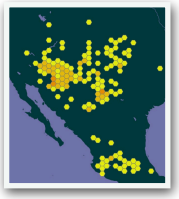
A common to abundant, small forktail of southwestern streams (I have also documented them using canals and ponds in Doña Ana County); they occupy mostly slow-moving streams and ditches and the weedy shores of lakes and ponds (Paulson 2009). The New Mexico flight season is February to November; in Doña Ana County, I have photo-documented them in March, April, June, July, August, September, November, and December, using low herbaceous and floating aquatic vegetation habitats for cover adjacent to the Rio Grande, the La Mancha Wetland Restoration Project site, and a small retention pond near the Dripping Springs Visitor Center of the Organ Mountains.

1. **Diana and Terry Hibbits took this photograph on August 27, 2015 at City of Rocks State Park, used here under a Creative Commons license.**
2. **La Mancha Wetland Restoration Project Site. Immature Female. Photograph by James Von Loh. May 21, 2024.**
3. **Leslie Flint took this photograph on 8/27/2015 at Katfish Cove (northern Luna County, south of City of Rocks State Park), it is used here under a Creative Commons license. Greg Lasley who was with Leslie at the time the photograph was taken commented "Photos don't show the pattern of blue on S8-9 but since I was standing there I can verify it was *I. demorsa*." Diana and Terry Hibbits took a photograph of the same species on the same day, a bit farther north - at City of Rocks State Park.**

All other photos and narrative in this species account are by James Von Loh.

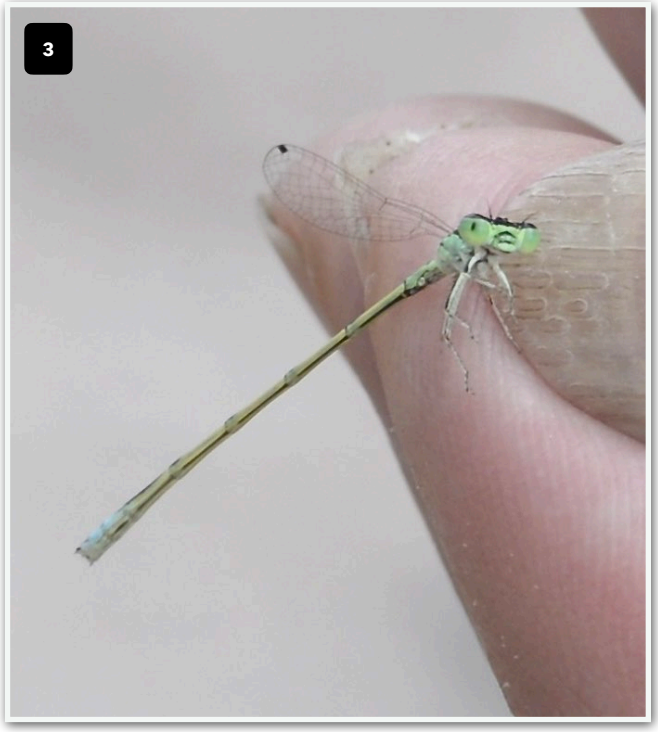
4. **Following Page: Female perching on a twig over the water surface presents the antithesis in pattern and color for this species (with her strongest features being her black-capped green eyes and "bubble"-looking face).**
5. **Following Page: Perched downward while hanging low on an emergent grass leaf, this male is defending a small territory, hunting to capture small insects hiding among leaves, while displaying to attract a mate. Note his bright, green-striped thorax and blue abdomen tip; his size is so small and compact that nearly all images collected at most angles are of good quality.**
6. **Following Page: An enlargement of the male head, thorax, and upper abdomen exhibiting his green eyes with black caps, green postocular spots, green face with black "bubble", green thorax with black median and wide antehumeral stripes, and the shiny, black dorsal surface of his abdomen.**
7. **Following Page: Robber fly (Subfamily *Asilinae*; *Efferia* sp.), a superb and savage predator throughout Doña Ana County, captured this Mexican Forktail male from emergent habitat of the Rio Grande, then perched under a wide, Johnson Grass leaf, to feed from the small damselfly.**





Recorded sightings from the Global Biodiversity Information Facility (1/2024).






4


5


6


7













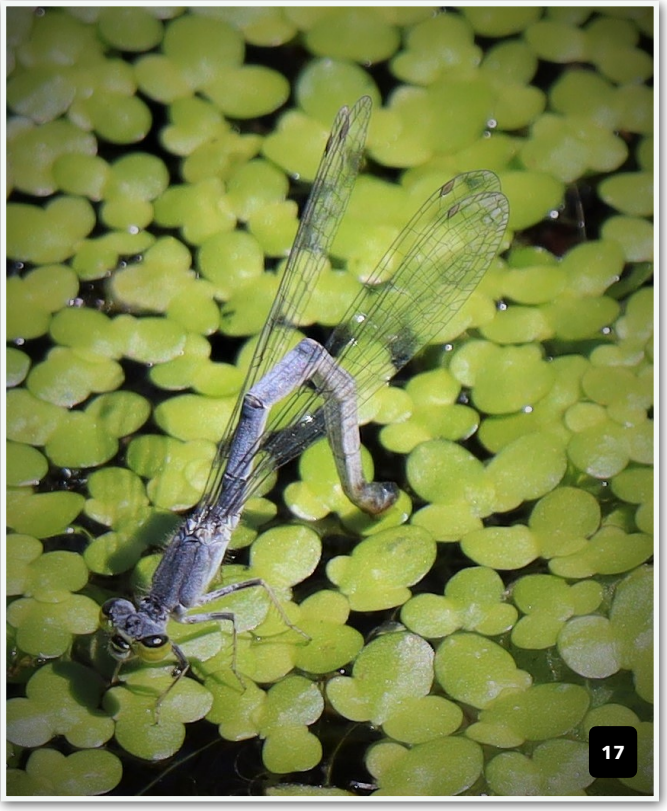
8. Male perched horizontally on a Coyote Willow twig exhibits green eyes with a black cap; green thorax and wide, black antehumeral stripe; and abdominal segment sides of S1-S2 (and part of S3) are green, then tan on S3-S7, while S8-S9 are blue. Note also the top of S10 is black and the narrow, incomplete black stripe on the side of S8 are diagnostic.
9. Male perching on a small rock with his wings open much like a spreadwing, allows an excellent dorsal view; note how strongly patterned and brightly colored this Mexican Forktail male presents.
10. Immature light brown male is beginning to exhibit mature characteristics including his green postocular spots, black dorsal abdomen, and blue abdomen tip.
11. Perched horizontally on a leaf overhanging the water, this female exhibits brown thorax color and stronger bluish-black median and humeral stripes (both are partially covered with pruinose color). Note how her abdomen tip droops or arcs downward, a characteristic feature for mature females; this perching style is perfect for collecting excellent images in the field.
12. Female image, in-flight, enlarged to exhibit her head, thorax, and upper abdomen. Her eyes are green with a black cap, face appears as a "bubble" milky below to black above, her head is dark bluish-gray a color that continues on the (continued on following page)



12. (continued from previous page) thorax and abdomen, except the brown median stripe on her thorax.
13. Previous Page: Heteromorph female; her eyes greenish-tan, brown-capped; orange postocular spots and stripe on face; her thorax is orange with a wide black median and narrow black humeral stripe; and her abdomen is shiny black dorsally.
14. This female had been selected and clasped as a potential mate by a larger, male Familiar Bluet but she rejected him by grabbing this stem and then sharply down-pointing her abdomen tip.
15. Following Page: Male (upper) and female (lower) have formed a mating wheel, connecting their abdomens to transfer his sperm (located S2) to fertilize her eggs (located S9). Note the many contrasting morphological traits between male and female adults. These damselflies are so small that nearly every image collected is an in focus "keeper".









16. **Where Mexican Forktails are most common along the Rio Grande, females nearly always select floating mats of Duckweed for ovipositing. The female at the bottom of the photograph is depositing eggs under a Duckweed leaf while the female in-flight is moving to another spot within this large floating mat to deposit additional eggs.**
17. **An ovipositing female moves across Duckweed leaves to place eggs at additional sites. Note the many eggs already deposited among these plants - they likely represent other damselfly species observed within this habitat (Familiar Bluet, Arroyo Bluet, etc.) and possibly some of many observed dragonfly species.**
18. **An ovipositing female places eggs even under floating leaves that are more scattered from the main Duckweed mat. Note that under the floating leaves are long, many branched root systems and leaf petioles that provide additional attachment points for eggs.**









19. An ovipositing female places eggs well under the floating Duckweed leaves. Note the other eggs already deposited among these plants; it's pleasant to photograph this combination of species/behavior/ habitat knowing that all the images will be good ones.
20. An ovipositing female, when floating aquatic plant leaves are not present, selects a saturated, floating twig and algae upon which to deposit her eggs and systematically moves forward while releasing a few eggs at each stop. Note the shining eggs deposited atop this twig, visible as small white dots.
21. Post-mating, ovipositing female perches low on an emergent bulrush stem and bends her abdomen towards the water surface to deposit eggs. Note that her white antehumeral stripes on her thorax are visible. 6/15/23
22. She places her S9-S10 segments against the bulrush stem at the water interface and begins egg deposition. Note that a few eggs have already been released, appearing as bright white dots alongside her abdomen tip. 6/15/23

Black-fronted Forktail
Ischnura denticollis
(Burmeister, 1839)

Tiny and shiny blue-tipped forktail of western marshes; Black-fronteds occur in dense marshes (sedges or cattails, primarily), still/slow-flowing water, are sometimes observed on open streams or ponds with dense marsh cover, and often associated with hot or cold springs (Paulson 2009). The New Mexico flight season is year-around, in Doña Ana County, I have photo-documented them in August, using flooded Bermuda Grass stands established along the edge of a Southern Cattail marsh. This habitat occurs at the La Mancha Wetland Restoration Project Site located along the western levee base of the Rio Grande; site hydrology occurs from groundwater seepage when the Rio Grande is bankfull with interstate irrigation and international water compact flow. During 2024, seepage rates were elevated because bankfull flow began in mid March, fully 10 weeks before the traditional June 1st bankfull flow.





Recorded sightings from the Global Biodiversity Information Facility (1/2025).



1. A male Black-fronted Forktail with a striking black, green, and the shiny blue-tipped abdomen color contrast occurs in the southern three-fourths of New Mexico. This individual exhibits blue spots on S8-S9 abdominal segments, with black then green stripes below. It is perched against a Bermuda Grass leaf hunting for small arthropods and defending mating territory in a small opening among Bermuda Grass and short Southern Cattail; this species is a challenge to photograph well in this habitat due to their small size, reflective colors, and knack of perching under overhead leaves/flower panicles.
2. In this enlarged image of the male's head, thorax, and upper abdominal segments (S1-S2), his eyes are green with a black cap; the small postocular spots appear bluish-green; his thorax is unmarked and shiny black on top/in front, with blue-green on the sides; and his abdomen is black above with blue-green on the sides of S1-S3.



3. **Previous Page: A female Black-fronted Forktail with a striking black and green color contrast. This individual exhibits a green face, green eyes capped with brown, black median and humeral stripes, and abdomen black above and green below. It is perched against a Bermuda Grass emerging flower panicle hunting for small arthropods and displaying for a possible mating encounter in a small opening among Bermuda Grass and short Southern Cattail. They are a challenge to photograph well in this habitat, as stated previously for the male.**
4. **In this enlarged image of the female's head, thorax, and upper abdominal segments (S1-S2), her eyes are green with a brown cap; the small postocular spots appear blue; her thorax with a wide black median and narrow black humeral stripes, with green on the sides; and her abdomen is black above with green on the sides of S1-S2.**
5. **Justin Jones took this photograph at Katfish Kove south of the City of Rocks State Park on 27 August 2015. Shown here under a creative commons license.**
6. **"dosterhaus" photographed this individual in Las Cruces on 9 April 2025. Shown here under a creative commons license.**









Citrine Forktail
Ischnura hastata
(Say, 1839)

This species is typically found in ponds and along the edges of lakes with significant amounts of grasses and/or sedges. However, wind (of which we have plenty) easily disperses this species to areas where it would not normally be found. (R. A. Barnes paraphrasing Paulson [2009]).

1. **Dennis Paulson (2009) states that the male Citrine Forktail is unmistakeable (p.125). Looking at this photograph of a Citrine Forktail, I think we would all agree. The photograph was taken by James Von Loh on August 12, 2023 at Lat: 32.278684 Lon: -106.82839. La Mancha Wetland.**
2. **Female Citrine Forktail. A photograph by Jonathan Batkin at Mesilla Valley Bosque State Park on August 24, 2023.**
3. **Male Citrine Forktail. A photograph by Jonathan Batkin at Mesilla Valley Bosque State Park on August 24, 2023.**

There is also an earlier observation of this species, by James N. Stuart below Elephant Butte Dam on August 3, 2018.

On May 5, 2024, James Von Loh noted that "These little ones seem to be using habitats here with more frequency, as another male has shown up recently at La Mancha. Prior to these sightings I had not observed or documented this species over many outings beginning in 2018."

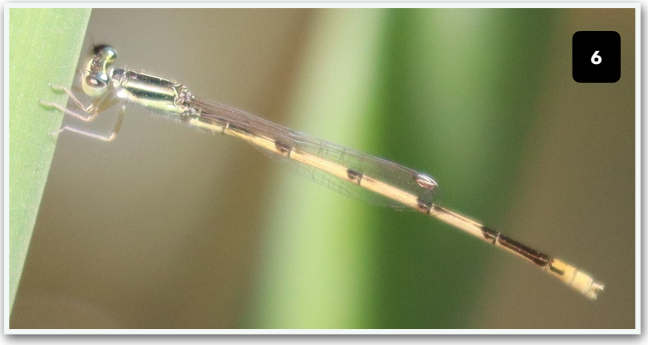
The La Mancha wetland is a saturated site, at the foot of the Rio Grande levee. It apparently had been filled with broken chunks of concrete roadway, curb, and gutter. It was reclaimed by the *Southwest Environmental Center* and volunteers. They reclaimed it by removing/relocating these debris pieces and introducing wetland/riparian plantings. The hydrology is the elevated Rio Grande groundwater table, when it is flowing at capacity during the summer months. A pond, wetland, and riparian habitat has resulted/established, supporting many year-around and migrant species. La Mancha is currently managed by *Nuestra Tierra* staff and volunteers.

















All photographs on this and the following page are by James Von Loh.

4. **The entrance to the La Mancha Wetland Restoration Project Site during the 2024 field season.**
5. **La Mancha. 04/29/24. Male, perched on a Southern Cattail leaf and hunting for small insects.**
6. **La Mancha. 04/29/24. Male, perched on a Southern Cattail leaf and hunting for small insects.**
7. **La Mancha. 04/29/24. Male, perched on a Southern Cattail leaf and hunting for small insects.**
8. **La Mancha. 10/15/23. Male, perched on a Southern Cattail leaf and hunting for small insects.**
9. **La Mancha. 10/15/23. Female, perched on a Southern Cattail leaf and hunting for small insects.**
10. **Following Page: An immature female Citrine Forktail with a striking black and orange color contrast. This individual exhibits green eyes capped with brown, orange postocular spots, black median stripes and nearly absent humeral stripes, and abdomen orange (S1-S5), black above and white below (S6-S9), and white (S10). It is perched against a Bermuda Grass leaf hunting for small arthropods and possibly displaying for a possible mating encounter in a small opening among Bermuda Grass and short Southern Cattail; they are a challenge to photograph well in this habitat given their long length (with mild vertical curving of abdomen) and selection of shaded perches with intervening cover by leaves and stems. 8/10/2024. La Mancha Wetland Restoration Project Site.**







11. **A male Citrine Forktail with a striking black and green thorax (and prominent antehumeral and humeral stripes) and his long yellow abdomen with black bands atop the S1-S2, black basal spearpoints and apical ring at S3-S6 (joined on S6), and S7-S10 are mostly yellow. They are unique in that male forewing stigmas are not at the wing edge (Paulson 2009). They occur in all but the northwestern portion of New Mexico. He is perched against a dried Southern Cattail stem, hunting for small arthropods, and defending mating territory in a small opening among short Bulrush and Southern Cattails; they are a challenge to photograph well in this habitat due to their long length, reflective colors, and typically a slight downward curvature of the abdomen. 8/10/2024. La Mancha Wetland Restoration Project Site.**
12. **In this enlarged image of the male's head, thorax, and upper abdominal segments (S1-S2), his eyes are yellowish in front and greenish behind with a black cap; the postocular spots appear blue; his thorax is striped greenish and black (narrow antehumeral and wide humeral stripe); and his abdomen (S1-S3) is black above with yellow on the side.**

Western vs Mexican Forktail
Ischnura perparva vs *I. demorsa*

One of the identification challenges we face is whether an observed specimen is a Western Forktail, *Ischnura perparva*, or a Mexican Forktail, *Ischnura demorsa*. Here this question should generally be decided by range, in favor of the Mexican Forktail. The three images to the right edify the extent of this problem.

1. **Originally considered an immature Western Forktail, this specimen is now considered a Mexican Forktail. It was photographed at the La Mancha wetland on 21 May 2024.**
2. **Note the significant match between "1" and this immature Western Forktail image taken by Ken-ichi Ueda on 15 September 2015) in California. It is used here under a creative commons license.**
3. **An image by Greg Lasley from Coyote Creek State Park (northern NM) shows a mature Western Forktail. Observed on 18 August 2015. Used here under a creative commons license. See note below.**







These three images define the problem. The following clarifies the identification in our area.

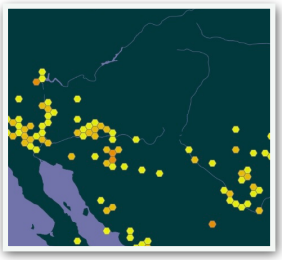
Jonathan Batkin noted the following (05 June 2025):

- **"A specimen purportedly of *Ischnura perparva*, Western Forktail, from Doña Ana County in the NMSU collection was the basis of a Dot Map record. I asked that the specimen be reexamined and just last week it was determined to be *I. demorsa*." (Mexican Forktail). This specimen was the basis for Paulson's range map which extended the range of the Western Forktail into southern New Mexico.**
- **Paulson notes a flight for the Western Forktail in New Mexico from May to July. Paulson notes that females seemingly outnumber males and mating is rarely observed (and that females may mate only once and use the sperm from that encounter to fertilize eggs throughout the season). Females oviposit without male assistance.**
- **In reviewing the original observation "1", Jonathan Batkin noted that "There is basically no chance that the immature female forktail photographed at La Mancha Wetlands is a Western Forktail. Western and Mexican Forktails, male or female, at all ages in their adult state, are visually identical. In Dennis Paulson's words, they are "impossible to distinguish" without examination, under magnification, of male appendages or female mesostigmal plates. The only exception in the field is a photo of a male that clearly shows its appendages, which are about 1/10 of one millimeter long."**
- **"Not only is there no confirmed record of Western Forktail from Doña Ana, there is none from Grant, Hidalgo, Luna, Sierra, Socorro, Otero, Eddy, or Lea County; and none from Texas or Mexico. On the other hand, there are confirmed records of Mexican Forktail from all of those locations. The situation is reversed at the northern end of New Mexico, where there are confirmed records of Western Forktail but apparently, to date, none of Mexican Forktail. Those facts mirror the distribution of the two species in Arizona: Western Forktail does not occur in the southern part of the state; and aside from a satellite population at Bill Williams NWR near Lake Havasu, all records are from north of the Grand Canyon. The two species undoubtedly overlap in parts of northern New Mexico, or at least the latitudes at which they occur do. Note that records from Coyote Creek State Park, including the one from Greg Lasley in 2015 (see "3"), have been questioned for this very reason. See the question from Jim Johnson, a highly regarded odonatologist, and Greg's reply in his record on iNaturalist. It is possible that only Western Forktail occurs at that location, but that has not been confirmed."**

Rambur's Forktail
Ischnura ramburii
(Selys, 1850)

A common, large and brightly marked forktail of the southern United States; they occupy most aquatic habitats of lowlands (lake, pond, marsh, ditch, even brackish water) with some herbaceous shore vegetation (Paulson 2009). Some have been observed in Arizona and Mexico at higher elevations (above 6,000'). The species occurs in south-eastern California, southern Arizona, southeastern New Mexico, Texas (except northern panhandle), southeastern Oklahoma, throughout the southeastern United States to Indiana and Maine, and south to Chile and Paraguay, mostly in lowlands. The New Mexico flight season is April to October; in Doña Ana County, I have only observed an individual male in June, using a large Summer Cypress for cover and to feed adjacent to the Rio Grande.

Recorded sightings from the Global Biodiversity Information Facility (1/2024).



1. **A large, male Rambur's Forktail with striking color contrast is considered very common in the south (Paulson 2009), yet this is the only one I have recorded in nearly 5 seasons along the Rio Grande. Here we are located on the western edge of the US population, this individual exhibits a blue S9 abdominal segment (next to the tip), a characteristic regional trait. It is perched horizontally on the tip of a Summer Cypress leaf, this male was slowly hovering throughout the large plant and capturing/ ingesting small arthropods from its leaves. This perching style and his bright, contrasting colors, ensures great images for each field encounter.**
2. **In this enlarged image of the male's head, thorax, and upper abdominal segments (S1-S3) his eyes are green with a black cap; the small postocular spots are blue; his thorax is green with wide median and humeral stripes while the antehumeral stripe is narrow and light green; additionally, his abdomen is shiny black on top and golden below.**





Firetails - *Telebasis*

Firetails are predominantly red, neotropical damselflies and unlike most other pond damsels in North America, they lack postocular spots (Paulson 2009). They are commonly associated with floating aquatic vegetation. However within Doña Ana County, most are observed perching on a number of substrates and at various heights.



Recorded sightings from the Global Biodiversity Information Facility (12/2023).

Desert Firetail
Telebasis salva
(Hagen, 1861)

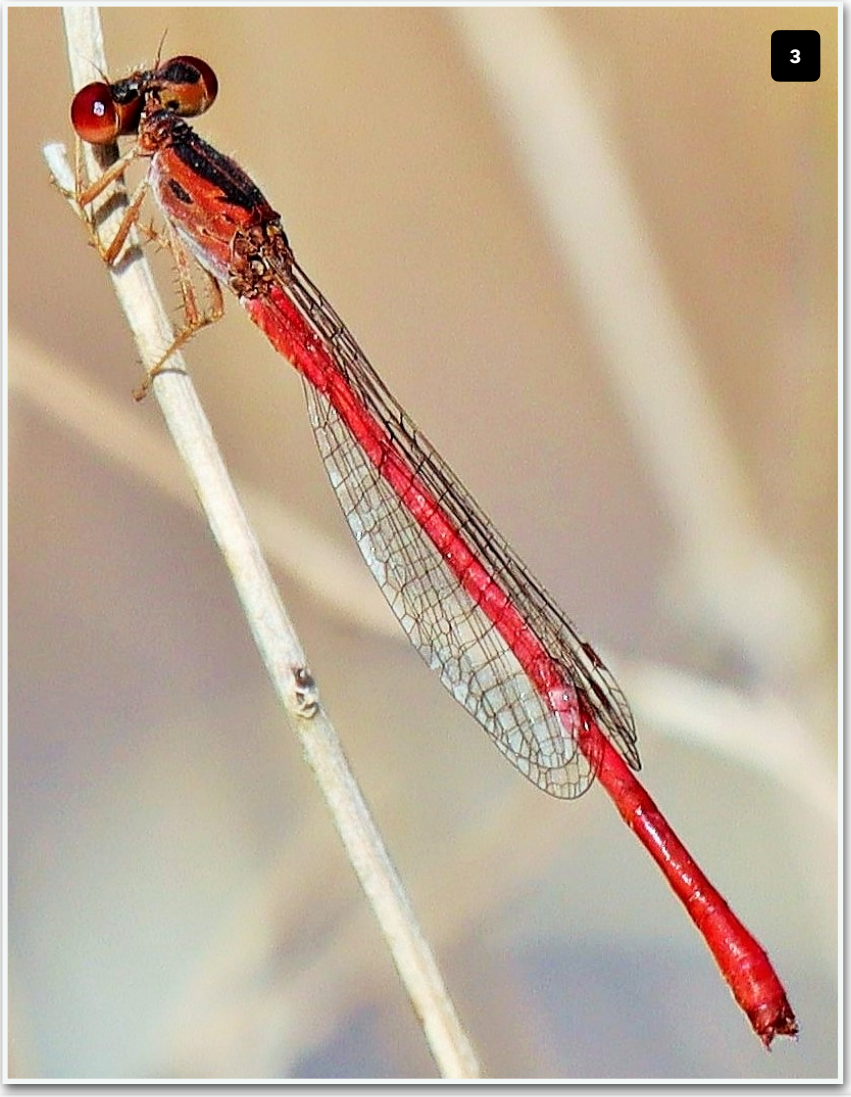
An uncommon to common, small red pond damsel of southwestern wetlands (I have documented them using the Rio Grande, canals, and ponds in Doña Ana County); they occupy mostly ponds and slow-moving streams in open country, including sites where open-canopied trees occur (Paulson 2009).

The New Mexico flight season is reported as May to October. Except for September, I have photo-documented them between April and December (inclusive) in Doña Ana County. They use mostly low vegetation, logs, and rocks to perch, but they may be found perching on twigs to 6' high adjacent to the Rio Grande.

1. **Perching horizontally on a Bermuda Grass flower panicle, this male avoids the wind while hunting for small flying insects along the Rio Grande. In this configuration you are almost assured of collecting great images**
2. **On cool, high-wind days in autumn along the Rio Grande, damselflies like this male Desert Firetail use Coyote Willow stands for a windbreak and perch while warming in the sun and hunting for small flying insects. Although small, they are long and that can make collecting the entire body in focus a challenge.**
3. **Following Page: This unusually bright-colored red damselfly always grabs my attention when flying by or perching in the sun. Male perching on a dried stem, warming in the sun, hunting for small flying insects, and displaying to attract a mate.**
4. **Following Page: Although damselflies are masterful predators, this female Desert Firetail becomes prey for the common and effective Long-jawed Orb Weaver (Family: *Tetragnathidae*, Menge, 1866), perhaps after becoming ensnared in the spider's web.**
5. **Following Page: Male perches at an upward angle on Spiny Chloracantha stem tops that are filled with spider webs underneath, while he warms in the autumn sun, hunts for small flying insects, and displays to attract a mate.**













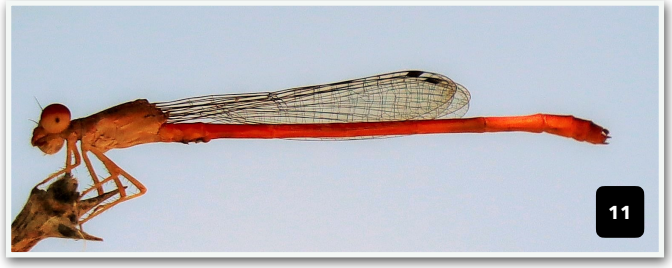
6. **Two males meet in the same territory, one on sexual patrol to find a mate (L) and the other perched to hunt for small flying insects (R). Note the perched male sharply turns down his abdomen tip to let the hovering mate-seeking male know he is not interested.**











7. **Male perching and sunning from a Coyote Willow leaf along the Rio Grande. Note the jagged edges of his median stripe (thorax top).**
8. **Male perching on a twig low over the water to defend a small territory, hunt for small flying insects, and display to attract a mate.**
9. **Enlargement of the male head, thorax, and upper abdomen exhibit his bright red eyes, red face, black head, red-to-brown colored thorax (lighter below) with an irregular, wide, black median stripe, and bright red abdomen.**
10. **Comparison in size between a relatively small dragonfly, a male Variegated Meadowhawk, *Sympetrum corruptum* (Hagen, 1861) (L) and the very small damselfly, a male Desert Firetail (R) as they both perch on a warm rock adjacent to the Rio Grande. Also note the array of morphological differences between dragonflies and damselflies.**
11. **In the early morning light, this male perches horizontally from a Screwbean Mesquite twig (on the tree he used for an overnight roost to sleep).**
12. **He begins to rapidly raise and lower his abdomen tip as part of a display to attract a mate.**
13. **He brings his abdomen tip to near the perch twig moving through lighted and shaded areas under the tree leaves.**
14. **Bringing the tip almost to a full circle, then he repeats this behavior of mate attraction.**
15. **A female perches horizontally from a dried grass stem and raises her abdomen tip up-then-down to signal to a mate.**
16. **Enlarged view of the same female's head, thorax, and upper abdomen, exhibiting her brown eyes, brown thorax (with small, dark markings that are the same as the male's), and a pinkish-brown abdomen.**
17. **In general, the dull-colored female is slightly shorter and slightly thicker than the much more brightly-colored, slender male.**
18. **Female perches on a twig to hunt for small flying insects and to potentially attract a mate.**
19. **A size comparison between the hovering male Blue-ringed Dancer (L) and the perched female Desert Firetail (R). Note that she is indicating, with a sharply downturned abdomen tip, that she is not interested in mating with him.**

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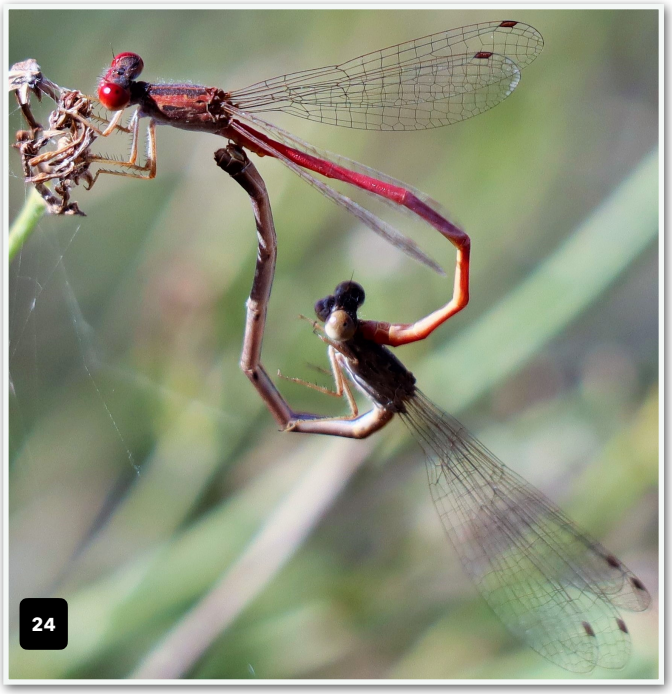
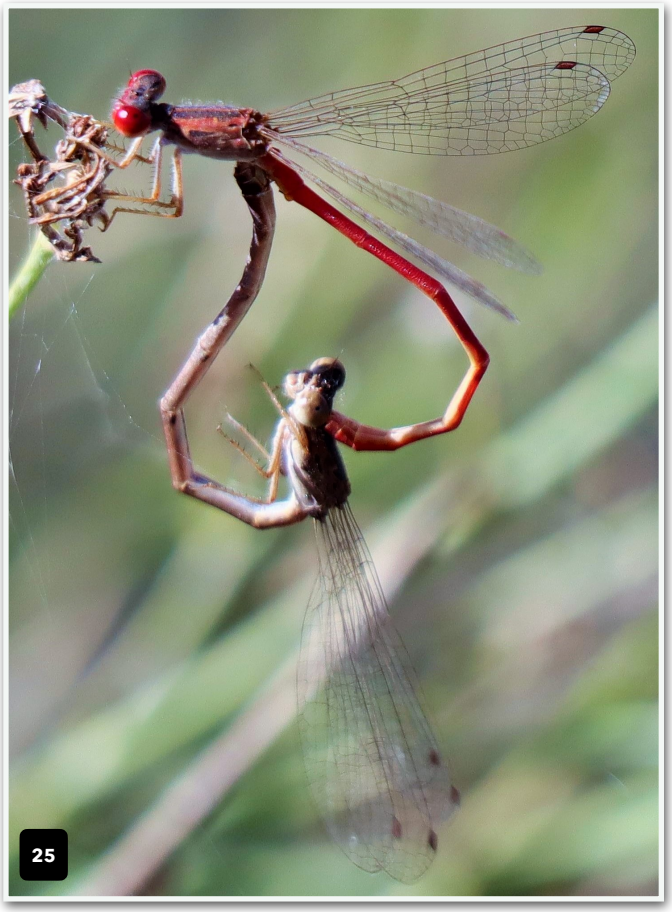
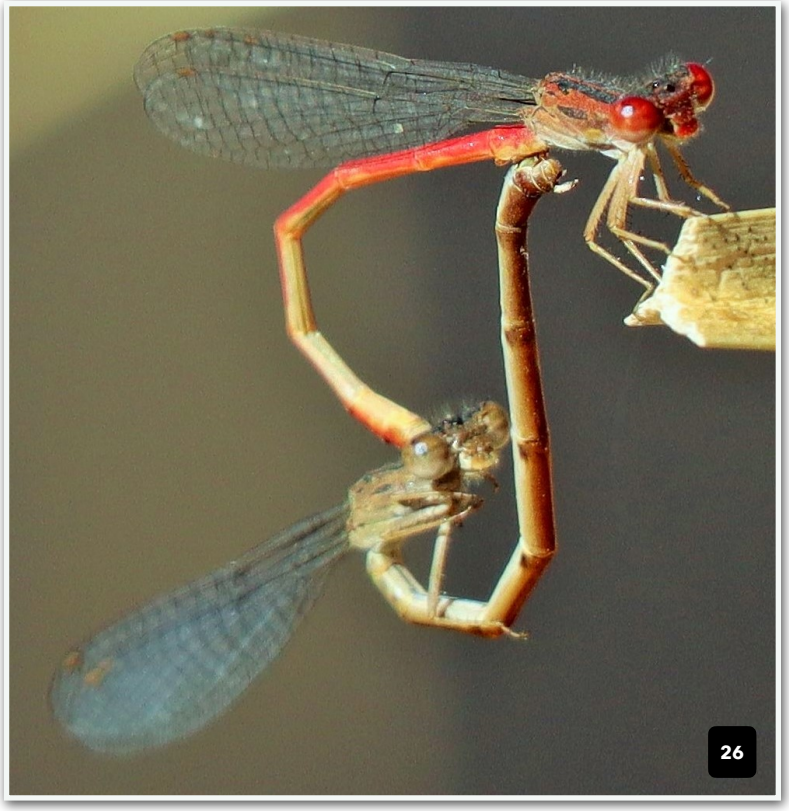




20. **Male finds a female (potential mate) low among Bermuda Grass stems and clasps her behind her head with his cerci/paraprocts (tandem linkage). Females determine whether or not they will mate with a male (Paulson 2009).**
21. **Spiny Chloracantha stem provides the perch as a male has clasped (joined) a female in tandem linkage early in the mating process.**

22. **The male must transfer sperm from his S8 segment to his seminal vesicle located within his S2 segment; to do so he must draw the female, attached in tandem linkage, up and forward.**
23. **Male then lowers the female which begins to swing her abdomen (S9) upward towards his S2 segment.**
24. **Female S9 segment (with vaginal opening and unfertilized eggs) nears attachment with male's S2 segment (with penis and sperm).**
25. **Female has nearly completed the S9-to-S2 attachment to form a mating wheel connecting her with the male.**
26. **Perched on a Three-square Bulrush stem, this mating pair forms into a wheel to transfer sperm (located S2) to her vagina (located S9). Note the striking difference between the male (U) and female (L) patterns, colors, and sizes.**
27. **With sperm successfully transferred, the female releases from the mating wheel to begin the next phase; ovipositing (egg-laying) into an appropriate habitat.**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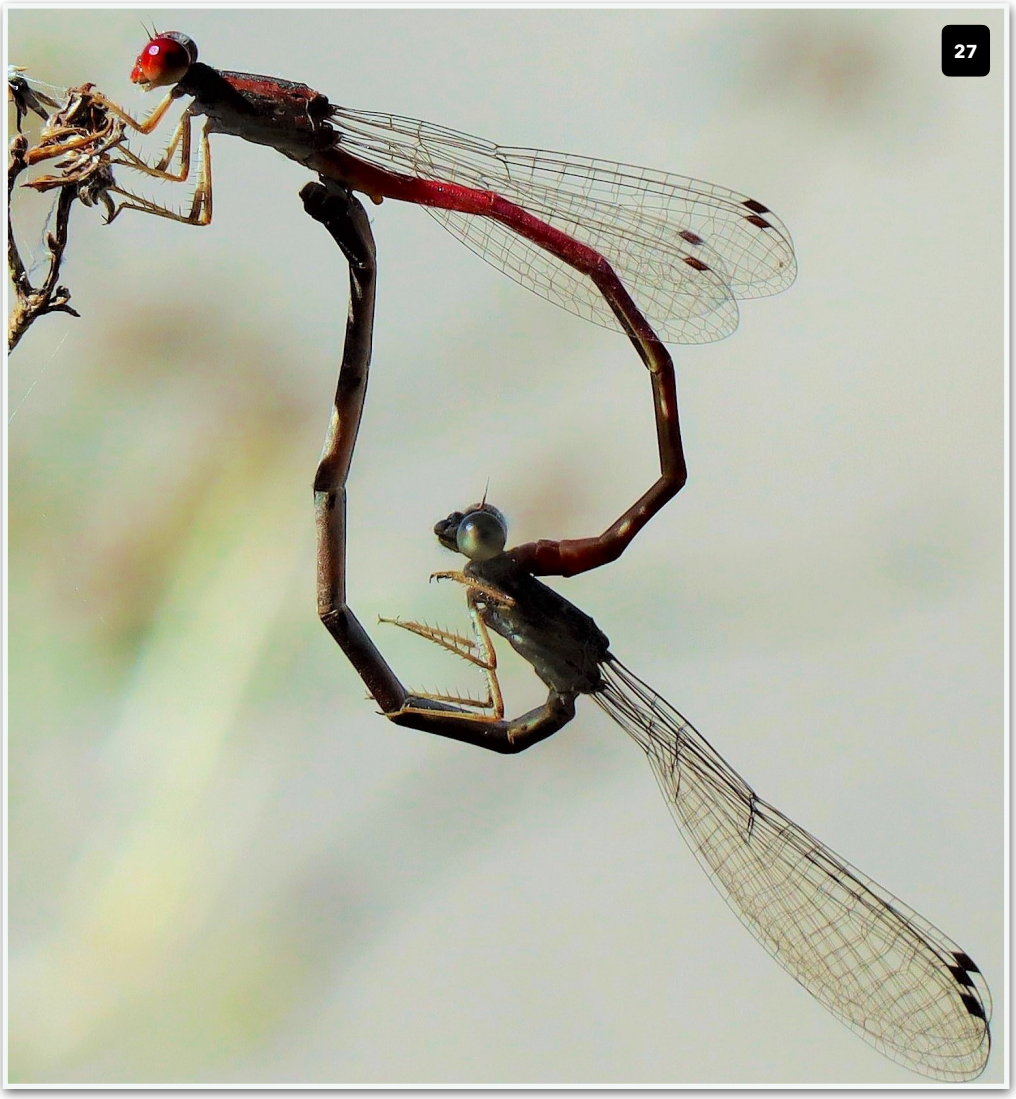
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Spreadwings
Archilestes

Spreadwings include the largest damselfly species within New Mexico, and their morphology presents a challenge to photograph, e.g., bring into focus and photograph in crisp detail due to length, width, depth, color, and behavior elements. Additionally, long wings are often held open at ~75 degrees while the even longer abdomen is typically inclined downward, at an angle.

California Spreadwing
Archilestes californicus
McLachlan, 1895

In Doña Ana County, my encounters with California Spreadwings to date have been in mid and late fall during 2021-2024 (inclusive), while I investigated riparian and wetland habitat supported by perennial flow within the Rio Grande.

California Spreadwings use slow streams and sometimes ponds or lakes associated with those streams. Prior to this synopsis, California Spreadwings had not yet been reported in the south-central New Mexico/Rio Grande corridor (Paulson 2009). However, Jonathan Batkin (pers. comm. 2023) and J. N. Stuart reported that five males were captured in 1974 on the San Simon River in Hidalgo County, New Mexico.

This species is large, and along the Rio Grande, easily equals the size of Great Spreadwings, *Archilestes grandis* (Rambur, 1842), which are considered to be the largest North American damselfly. Locally California Spreadwings use a perennial low-flow reach of the Rio Grande that supports dense, wooded riparian/bank vegetation types/communities.

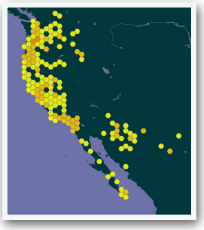
Their flight season ranges from July to November in southeastern Arizona (Paulson 2009), and I have observed them from October to December along the Rio Grande.

The relative size of California Spreadwings when compared to small to average sized damselfly and dragonfly species is illustrated in a series of photographs beginning at the bottom of this page.

In Doña Ana County during the fall seasons in 2021 (21 October to 09 December) and 2022 (20 October to 29 November), I photo-documented California Spreadwings using Rio Grande habitats where there is perennial flow downriver from the outfall of the City of Las Cruces, Jacob H. Hands Wastewater Treatment Facility lined canal. (See the entry on Great Spreadwing for details about this location.) This reliable surface water source supports linear stands of Coyote (Sandbar, Narrowleaf) Willow, tall shrubs, Tamarisk (Salt-cedar), small trees, and reaches characterized by linear, dense, Water Speedwell herbaceous wetland plant communities.

Documented herein, California Spreadwings hunted, sunned, defended territory, displayed to attract mates, paired through tandem linkage and in mating wheels, and oviposited (laid eggs) under woody branches extending over the flowing stream. Common perches were twigs, branches, and graminoids protruding from the embankment adjacent to the water. It is important for California Spreadwings to use branches overarching the water because females deposit eggs into branch





Recorded sightings from the Global Biodiversity Information Facility (1/2024).

1. Protruding Tamarisk branch provides a perch and hunting site for an adult male California Spreadwing (L) and a much smaller adult male Desert Firetail, T*elebasis salva* (Hagen, 1861) (R).







tissue by piercing the bark, and upon hatching, the larvae drop directly into the water (Paulson 2009).

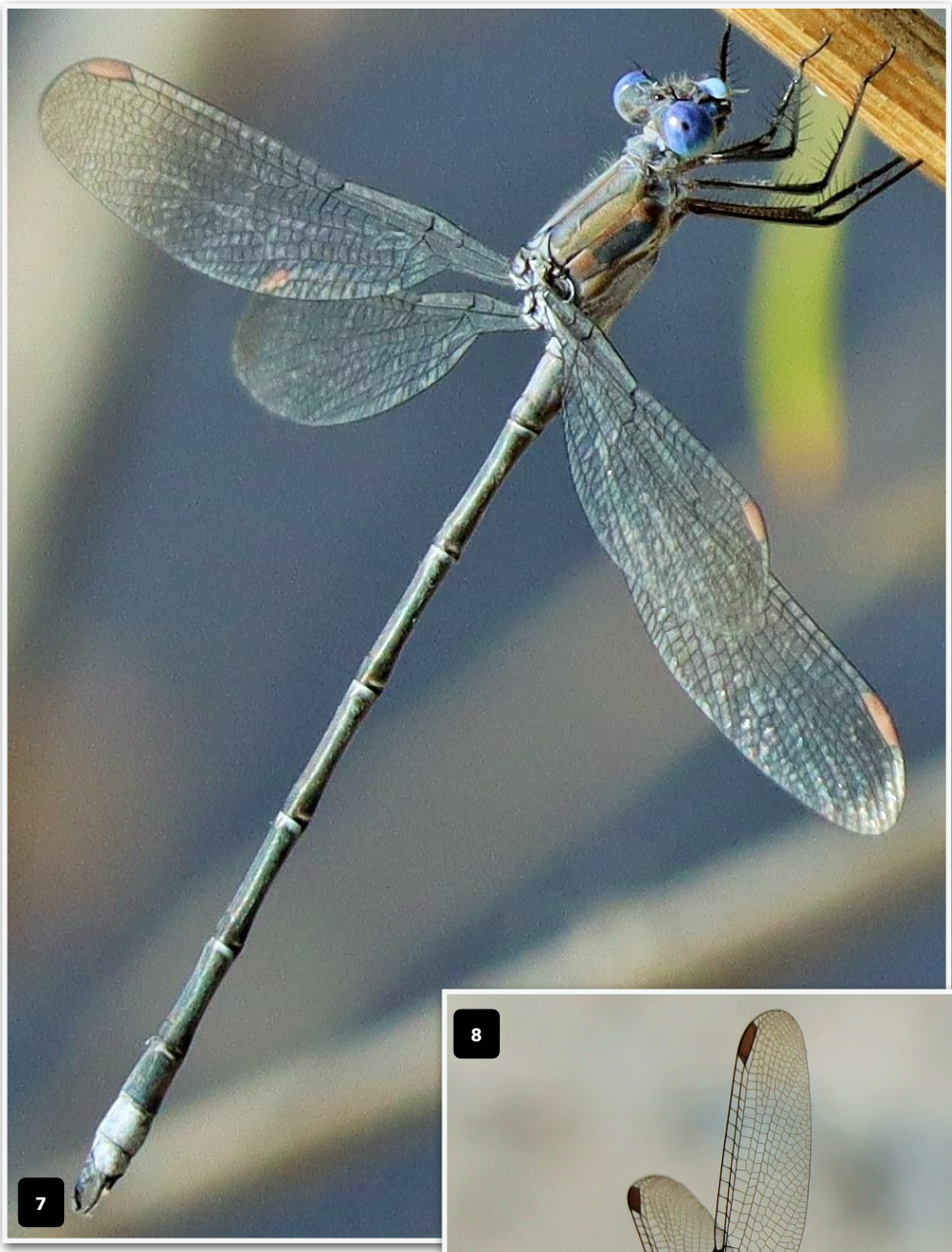
California Spreadwings mate when females are grabbed/ seized by males, joined in tandem linkage, copulate several minutes in a mating wheel configuration, and then spend several hours in tandem linkage while ovipositing. Each oviposition site contains 6 eggs neatly laid. After laying a set of eggs the pair moves down and repeats the process until 70-180 eggs are deposited. Eggs are laid in woody tissue of shrub stems/branches, sometimes up to 10' above water (Paulson 2009).

2. Mule's Fat branch provides a perch and hunting site for an adult male California Spreadwing (left) and a much larger adult male Flame Skimmer, *Libellula saturata* (Uhler, 1857) (right).





3. **Previous Page: Size comparison of the Variegated Meadowhawk (upper and lower), Roseate Skimmer (upper middle), and California Spreadwing (lower middle) as they perch and hunt from a Mule's Fat stem.**
4. **Previous Page: A Tamarisk perch and hunting site for an adult female California Spreadwing (lower) and an average-sized adult male, Blue-ringed Dancer, *Argia sedula* (Hagen, 1861) (upper).**
5. **Tamarisk twig provides a perch and hunting site for an adult male California spreadwing (left side of image), a much larger adult male Roseate Skimmer, *Orthemis ferruginea* (Fabricius, 1775) (right side of image), and an investigating adult male Familiar Bluet, *Enallagma civile* (Hagen, 1861) at the top.**
6. **Coyote Willow twig provides a perch and hunting site for an adult male California Spreadwing (lower part of image) and an adult male Variegated Meadowhawk, *Sympetrum corruptum* (Hagen, 1861) (upper part of image). The spreadwing is longer than the Variegated Meadowhawk but far more slender.**



Characteristics of Adult Male and Female California Spreadwings

7. An adult male California Spreadwing perches by hanging from a Mule's Fat branch. Note the pruinose (white waxy) coloration of the S9 and S10 abdominal segments and the light brown-colored stigma cells near the wing-tips.
8. Young adult male perches from a Coyote Willow twig.
9. Adult male head, thorax, legs, wing bases, and first abdominal segment (S1) detail. Note the blue coloration of its eyes, facial frons and postclypeus (jutting portion); narrow, tan median stripe (top of thorax); blue-green dorsal thorax; tan upper edge of thorax; lateral blue-green patch (oblong); and light blue ventral thorax. The remaining dorsal areas of the abdomen are predominantly a dark, shiny, metallic bluish-brown.









10. **Brighter and darker coloration of a young adult male California Spreadwing.**
11. **California Spreadwing adult female perches by hanging from a grass blade. Note the abdomen width and expanded tip of the distal abdomen (S9, S10), with little pruinosity and the light brown-colored stigma cells near the wing tips.**
12. **Following Page: Adult female perches by hanging from a False Indigobush leaf petiole.**
13. **Following Page: Female head, thorax, legs, wing bases, and first abdominal segment (S1) detail. Note the light blue coloration on top of her predominantly pinkish/grayish colored eyes, blue facial postclypeus (jutting portion); narrow, tan median stripe (top of thorax); blue-green dorsal thorax; tan upper edge of thorax; lateral blue-green patch (oblong); and tan ventral thorax. The remaining dorsal areas are predominantly a shiny, medium-brownish hue.**







14. California Spreadwing female head, thorax, legs, wing bases, and first abdominal segment (S1) detail. As above with a more dorsal/rear thorax perspective.





Displaying Male Attempting to Attract a Female Mate

Males grasp a branch where they are highly visible, move their wings somewhat (flicks/vibration) and orient them to show the light brown stigmatic cell, then arc their abdomen very high, return it to the starting position (or deflect it downward) and repeat in a series, as shown here:

15. **Male perches on exposed Mule's Fat stem to attract a mate by displaying. Note that he keeps his wings at about 30-degrees to his body and fully exposes the colored wing cell (stigma) to reflect the sun's rays.**
16. **He then arcs his abdomen to swing his pruinose (white-waxy colored) S9 and S10 segments upward to attract attention.**
17. **This is his maximum upward extension.**
18. **With wings still presenting the distinctive stigmatic cells, he returns his abdomen to its resting position.**
19. **Then repeats this behavior a few times in succession. Following a successful female approach, the pair forms a tandem linkage.**







Tandem Linkage and Mating/Copulation Wheels

Most pre-mating tandem linkages result when California Spreadwing males grab or capture a female then attach to her upper thorax with hooks (cerci, paraprocts) on their S10 abdominal segment. On one occasion, I observed a male flying over the water when a female flew up behind him (from cover on the shoreline) and attached to him in flight.





20. **Once a female is grabbed/captured, the adult male (top) connects its abdomen tip (S-10, equipped with paraprocts, cerci) to a site on the female's prothorax (bottom) which is the top, front of the thorax.**
21. **A tandem linkage is thus formed which allows the mating process to begin. Here the male transfers sperm from his genital opening under the ninth segment (S9) to be stored in the seminal vesicle in his second segment (S2).**
22. **Following Page: Adult female California Spreadwing completes copulation/mating wheel by attaching her vagina of the S9 abdominal segment to the male's S2 segment where transfer of sperm occurs via his penis during a prolonged mating process.**
23. **Following Page: Adult male (UR) and female (LL) "in copula" as sperm are being transferred from his S2 (through penis) to her S9 (into vagina) where the eggs are fertilized. The pair may remain in the mating wheel formation for up to an hour. Note the difference in size of the male and female abdomens.**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24. Previous Page: This mating pair of California Spreadwings selected a perch on dried Johnson Grass leaves behind a large Tamarisk shrub; the site provided both shelter from gusty wind and direct sunshine.
25. Previous Page: Copulating pairs are often tended/visited by unpaired males (top of image) that perhaps sense an opportunity to mate.
26. Two pairs attached in mating/copulation wheels selected the same small Tamarisk twig to perch, and were blowing in tandem with a light breeze.
27. Following Page: Egg-laying pairs are often tended/visited by unpaired males (upper right) that perhaps sense an opportunity to mate.
28. Following Page: A mated pair selects an oviposition (egg-laying) site on the underside of a Mule's Fat branch. Note the shape of the female's S10 segment (LR) and the sharp points used to pierce the wood.

Ovipositing Pairs and Individual Adult Females

Following mating/copulation, adult females typically remained in tandem linkage with adult males and flew as a pair to Mule's Fat tall shrub branches overhanging flowing water (I rarely observed them using other shrub species). The male would select a landing site and firmly grasp a stem while the female selected an egg deposition site lower on the same stem or on lower stems. As she produced eggs, she would curl her S10 abdomen segment to the stem surface, pierce the wood, and deposit eggs. When a site had been used to place six eggs (Paulson 2009), she would move slightly lower and repeat the process. Often, a single adult male would visit the pair and remain with them for some time, perhaps to attempt to replace the mating male.







29. The female raises her S10 segment to the branch when her eggs emerge and are available to deposit.







30. She will deposit six eggs, neatly arranged, in the wood of the branch (Paulson 2009).
31. The pair then moves to another site and repeats the ovipositing process until 70-180 eggs are laid (Paulson 2009).
32. Two mated pairs arrive at the same branches to select egg laying sites in this Mule's Fat tall shrub.



33. California Spreadwing ovipositing pair (adult male [left] and adult female [right]) using a dead Coyote Willow branch, overhanging the flowing stream, as their egg deposition site.

Rarely, I observed adult females that were not paired with males, ovipositing alone. The series of images on the following page illustrate this process. Note that the female anchors her head against the stem to provide leverage for her abdomen (S10) to pierce the stem surface; when in tandem linkage with a male, he would provide that anchoring effect by clasping the stem and being connected to her thorax with his S10 abdominal segment.



34. Adult female selects a Mule's Fat stem, extended over flowing water, on which to lay eggs (note she anchors her head against the stem).







35. She swings her S10 abdominal segment into place against the woody tissue to pierce the bark.
36. She pierces the wood and deposits up to 6 eggs (Paulson 2009).
37. Following egg deposition she swings her abdomen outward.
38. Her next egg appears to be slightly protruding from her distal (S10) segment.
39. Important California Spreadwing habitat on the Rio Grande bank, where branches overhang the flowing water.



Preferred Spreadwing Habitat Along the Rio Grande

Most of the California Spreadwing population photo-documented during October through December 2021-22 centered around open-crowned Mule's Fat and Coyote Willow tall shrubs and larger Tamarisk trees. Many egg-depositing females oviposited in the woody tissue of branches of the Mule's Fat shrub following mating.

40. Important California Spreadwing habitat on the Rio Grande bank, where branches overhang the flowing water. Images "39" & "40" from 2021 and 2022.





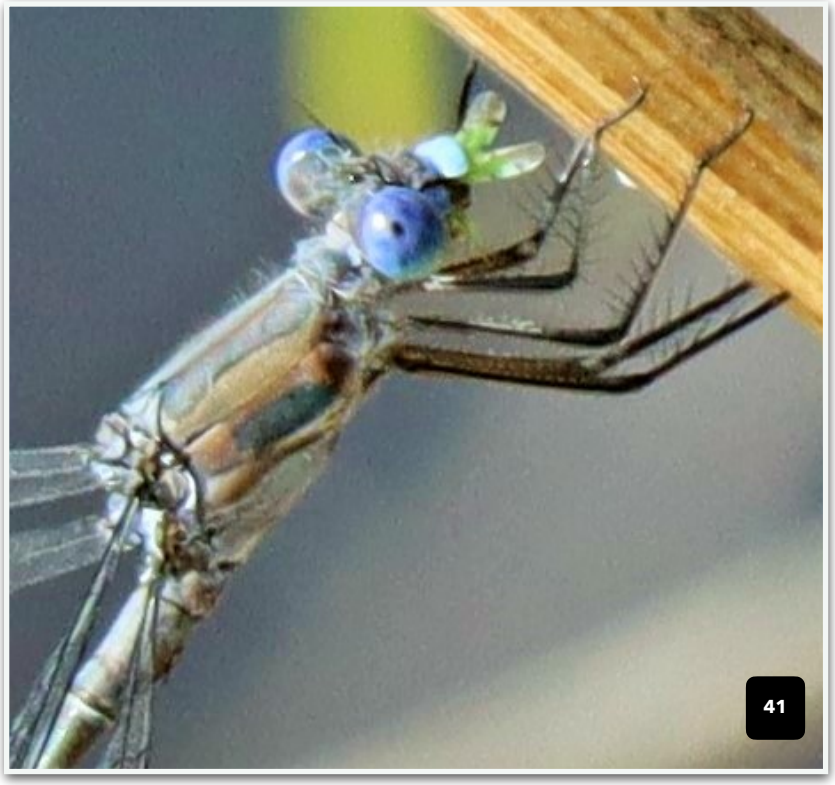
Prey Captured by California Spreadwings

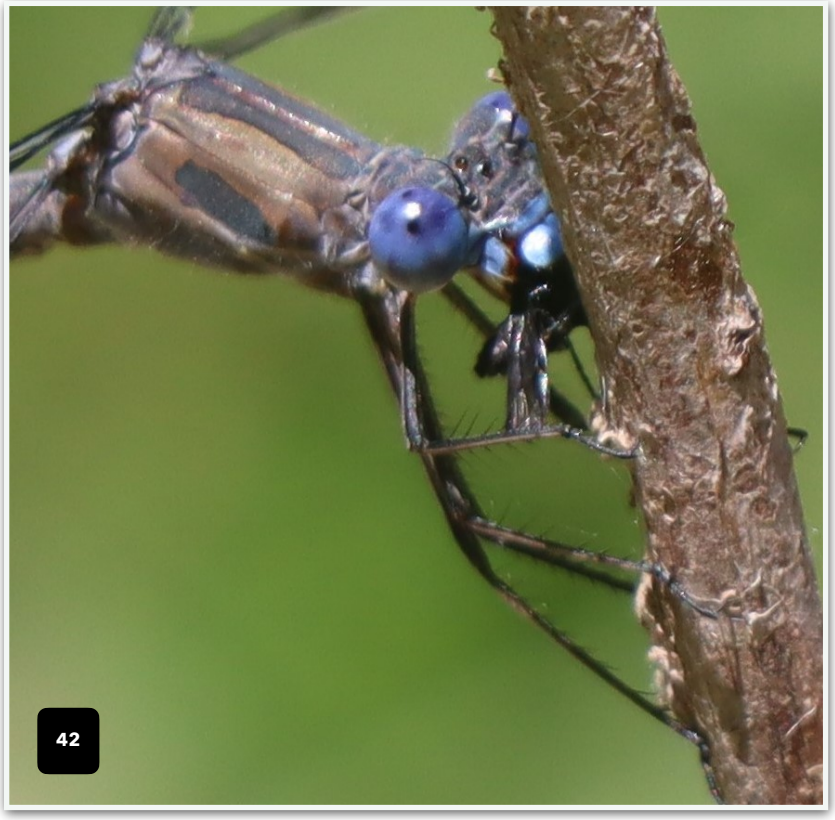
I have photo-documented only the following California Spreadwing prey capture/ consumption images along the Rio Grande.

41. **Adult male ingesting unknown food/prey while perched on a Mule's Fat branch.**

42. **An adult male captured a black-colored fly (Diptera) at streamside and returned to consume it at the perch.**

On 23 October 2022, "cypseloides" posted to iNaturalist, a representative image of California Spreadwings (estimated 10-20 individuals) west of Radium Springs, within Leasburg Dam State Park, along the Lower Mogollon Trail.





Great Spreadwing
Archilestes grandis
Rambur, 1842

In Doña Ana County, my encounters with Great Spreadwings, to date, occurred in mid to late fall, while I investigated riparian and wetland habitat supported by perennial flow within the Rio Grande and during mid summer at the headwall seep of Soledad Canyon of the Organ Mountains.



Recorded sightings from the Global Biodiversity Information Facility (1/2024).







Great Spreadwings use riparian, wetland, and upland habitats. They are considered to be the largest North American damselfly. (I believe their size is equalled by locally-observed California Spreadwings, *Archilestes californicus* (McLachlan, 1895). They typically use streams with wooded riparian/bank vegetation types/communities, their flight season ranges from May to October (Paulson 2009); I have observed a few (<15) along the Rio Grande during late October and early November and individuals near the headwall seep of Soledad Canyon during July and August.

1. **Treated wastewater discharge outlet from the Jacob H. Hands Wastewater Treatment Facility to the Rio Grande channel (22 November 2022). The water-course is a gathering place for several species of resident and migratory waterfowl, other insectivorous birds, and species of aquatic arthropods, fish, amphibians, and turtles along its length. Undoubtedly, a portion of their winter diet includes damselfly larvae.**
2. **Great Spreadwing female's bulbous abdomen tip presenting her stout and sharp ovipositer (used to pierce wood so that eggs can be deposited within the holes); her abdomen is shiny greenish-black dorsally with black rings.**
3. **Great Spreadwing male's distal abdomen presenting his prominent cerci (used to clasp the back of the female's head when in tandem linkage or the mating wheel formations) and his pruinose S9-S10 segments; his abdomen is shiny black dorsally with black or pruinose rings.**

In Doña Ana County during the fall seasons in 2021 (05 November) and 2022 (21 October to 08 November), I observed Great Spreadwings using Rio Grande habitats where there is perennial flow via the City of Las Cruces, Jacob H. Hands Wastewater Treatment Facility lined canal. This reliable surface-water source supports: linear stands of Coyote (Sandbar, Narrow-leaf) Willow tall shrubs; Tamarisk (Saltcedar) small trees, and reaches characterized by linear, dense, Water Speedwell herbaceous wetland plant communities.

Projected release volume of treated, disinfected wastewater from Jacob H. Hands Wastewater Treatment Facility in 2025 (estimated for a population of ~151,000) is ~13.0 million gallons per day or ~4.75 billion gallons per year (Utilities Department; City of Las Cruces, New Mexico: Final Water and Wastewater System Master Plan Update). Discharge into the Rio Grande channel occurs ~150m north of I-10 and surface flow extends south to the Calle del Norte bridge (NM-359).

Documented herein, Great Spreadwings hunted, sunned, and displayed to attract mates from perches on branches extending over the flowing stream and on twigs protruding from the embankment adjacent to the stream. It is important for Great Spreadwings to use branches overarching the water because females deposit eggs into branch tissue by piercing the bark, and upon hatching, the larvae drop directly into the water (Paulson 2009). Great Spreadwings mate when females are grabbed/seized by males, joined in tandem linkage, copulate in a mating wheel configuration, then spend up to 18 hours in tandem linkage while ovipositing in leaf petioles or stems/branches of plants/shrubs, sometimes well above water (Paulson 2009).





4. Western Hackberry, to 2.5m tall, provided Great Spreadwing perching, hunting, and territorial sites at the waterfall of the Soledad Canyon headwall. Gordon Berman first observed this individual and informed me of their location. I then collected these images.
5. Same as "4".





6. Same as "4".
7. Previously, my earliest Great Spreadwing observation along the Rio Grande was on 22 October 2022. This individual male perched on a small twig protruding from the riverbank where it patrolled a small habitat area, defended it from other damselflies and dragonflies, sunned, hunted, and displayed to attract a potential mate (see displaying behavior later in this article).
8. Representative Great Spreadwing female perching on a small branch on the Rio Grande bank (06 November 2022) on a sunny, open site to sleep, warm, attract a mate, and/or to hunt for small flying insects. It is common for Great Spreadwings to hang from the underside of branches while perching, hunting, and/or sleeping.

9. **Male head, thorax, legs, wing bases, and first abdominal segment (S1) detail: Note the blue coloration of its eyes, light blue facial postclypeus (jutting portion), brown median stripe (top of thorax), metallic green humeral stripe (upper edge of thorax), and white lateral stripe (lower edge of thorax) that is bordered by blue stripes, and light blue on the ventral side of the abdomen. The remaining areas are predominantly a dark, metallic green-black, which reflects a sheen in sunshine.**
10. **Following Page: Female head, thorax, legs, wing bases, and first abdominal segment (S1) detail: Note the grayish-blue over brown eye coloration, light blue facial postclypeus (jutting portion), brown median stripe (top of thorax), blackish humeral stripe (upper edge of thorax), and yellowish-white lateral stripe (lower edge of thorax) that is bordered by blue stripes, and light blue on the ventral side of the abdomen. The remaining areas are predominantly a dark, metallic green-black, which reflects a sheen in sunshine.**

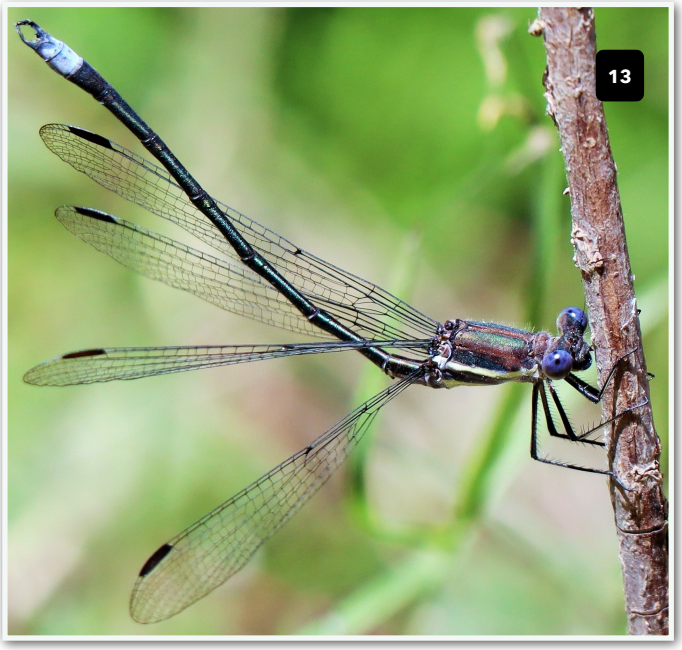

8


9



Although I have observed only a few Great Spreadwings in the field, on at least two occasions they have been males that used courtship displays to attract females (as presented on the following page). The courting males arch their abdomen upward and vibrate their extended wings (creating a soft sound like leaves rustling in a breeze). During image examination, they also appeared to display the black-colored stigma cells near the wingtips upward. Their abdomen angle is then rapidly reversed, flexing the tip dramatically downward (this vertical motion flashes the S9 and S10 terminal segments which are white-to-bluish in color [pruinose]). I have also observed damselflies of different species use rapid, downward flexing of the abdomen to discourage the approach of damselflies of other species.









11. On 04 November 2022 this male Great Spreadwing began a courtship display to attract a female to mate. Its outspread wings vibrated slightly, displayed the black-colored stigma cells upward, and the abdomen was extended in an upward, nearly vertical, arc (note the bluish-colored S9 and S10 abdomen segments).
12. Then the abdomen is rapidly flexed downward as the light-colored tip flashes in the sunlight.
13. Abdomen approaches the horizontal position.
14. Abdomen tip flexes sharply downward from horizontal. This courtship/mate attraction activity may be repeated a few times from the same perch.

Following Page

Following mate capture/selection and mating, pairs of Great Spreadwings oviposit (deposit eggs) into branch-bark or into leaf/petiole tissue (by making a slit in which to insert an egg) over a 15-minute to 3-hour time period (Paulson 2009). Up to 230 eggs may be deposited by a single female. The pair often remains connected in tandem linkage during oviposition, but the female may oviposit on her own (as documented on the following page). Plant material selected for ovipositing must arc/extend over open water so that larvae emerging from the eggs can drop into the water to grow and develop.

15. A female Great Spreadwing (01 November 2022) is preparing to pierce the bark of a Seepwillow (a.k.a. Mule's Fat) tall shrub stem and implant an egg (egg is visible as a white dot at the tip of her abdomen). Note that she seems to provide leverage for the abdomen by positioning her head under a protruding twig.
16. This day (01 November 2022) was very windy and a gust caused her to miss the seepwillow stem on her first attempt at ovipositing. Note the white-colored egg and tucked head position. On her next egg implanting attempt (see "15" and "16"), she uses her back pair of legs for cradle/support while guiding her abdomen for successful oviposition.
17. Same as "16".
18. Same as "16".









Eggs may be implanted a few inches above the water to the highest recorded deposition height for a damselfly of 44 feet (Paulson 2009). The larvae hatch and fall to the stream, tending to forage from and mature in pools (resembling small fish as they swim).

19. An adult male occupied the same Seepwillow branch with a dragonfly, an adult male Roseate Skimmer, *Orthemis ferruginea* (Fabricius 1775). Notable are the differences in size, eye structure, coloration, body morphology/shape, and perching position/style.



Potential Interspecies Mating Event Among Spreadwings

Paulson (2009) states that "courtship behavior in North American damselflies may be exhibited by a few species, but in most species the male just grabs a female (but she still chooses whether or not to mate with him). Further, males of one species will often attempt to mate with females of other species (most females are apparently able to detect, by touch, whether the male that grabs them is their own species)."

On 06 November 2022, I heard wing vibrating/rattling and observed a pair of large, spreadwing damselflies perched on the base of a Southern Cattail plant in tandem linkage (the male's two cerci were applied to the back of the female's prothorax with the two paraprocts holding it firmly). I acquired several images of the linked pair, a male California Spreadwing, *Archilestes californicus*, (McLachlan, 1895). and a Great Spreadwing female. I include a representative adult male California Spreadwing and adult female Great Spreadwing on the following page.



20. Representative male California Spreadwing and typical color pattern for the Rio Grande population (note the brown-colored stigma cells near the wingtips). In general, Great Spreadwing individuals were present in higher numbers along the Rio Grande when compared to California Spreadwings.
21. Representative female Great Spreadwing hanging from a coyote willow twig and typical color pattern for the Rio Grande population (note the black-colored stigma cells near the wingtips).



Following Page

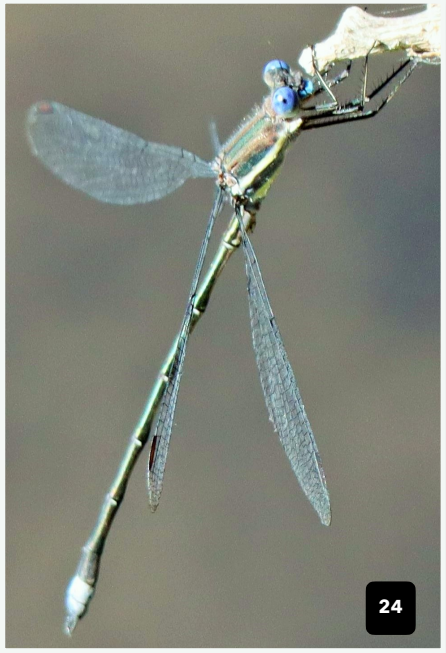
22. Spreadwing pair, with a California Spreadwing adult male (upper left) that has grabbed and tandem-linked with a Great Spreadwing adult female (lower right). Both are perched at the base of a southern cattail plant on the bank of the Rio Grande (06 November 2022).
23. Image enlarged by cropping to enhance thorax and head color pattern examination between these spreadwing species.

This mixed pair of tandem-linked spreadwings flew out of sight together and I cannot confirm if the attempted mating was abandoned. For mating to be completed would require the pair to join into a copulation/mating wheel to transfer sperm and fertilize eggs.

Barnes: Observations within the Black Range include the following: On September 4, 2019 in Palomas Canyon near Hermosa by Lauren Leach and Jane Dixon's observation of February 20, 2018 west of NM-35 along the Mimbres River.











24. Adult male recorded on 08 November 2022. They were perching in sunny, open sites to attract mates and to hunt for small flying insects on this day.
25. Diana and Terry Hibbitts observation of 27 August 2015 at City of Rocks State Park is shown here under a Creative Commons license.
26. "miguel1958's" (iNaturalist) photo from 09 October 2023 is shown here under a Creative Commons license.

Plateau Spreadwing
Lestes (Archilestes) alacer
Hagen, 1861

In Doña Ana County, New Mexico, I observed Plateau Spreadwings beginning in the final week of August 2022 at two sites: 1) an individual at the Nuestra Tierra managed La Mancha Wetland along the Rio Grande; and 2) a population using the retention pond at Dripping Springs Visitor Center in the Organ Mountains. The known Plateau Spreadwing habitat and range include permanent or temporary ponds, springs, and seeps with emergent vegetation from Arizona, New Mexico, Texas, and Oklahoma; south (in uplands) to Costa Rica (Paulson 2009).

Plateau Spreadwing population arrival timing was sudden and apparently in response to monsoon rainfall. Using Las Cruces rainfall data (which I believe to be proportional to the pattern/amounts at Dripping Springs, some seven miles to the east) monthly monsoon rain totals were: June (1.69"); July (1.27"); August (6.97"); September (1.26"); and October (1.80") (http://www.lascruces-weather.com/wxanalraindata.php). Monsoon rainfall, in these amounts, maintained surface water and supported emergent vegetation in the Dripping Springs Visitor Center retention pond bottom throughout summer and autumn seasons.

Paulson (2009) states that Plateau Spreadwing males and linked pairs use shallow-water/marsh vegetation as breeding habitat and oviposit in the stems and leaves of



1. **Mature adult male Plateau Spreadwing (dorsal view) observed perching on a rush (*Juncus* sp.) stem at the Nuestra Tierra, La Mancha Wetland, pond habitat during the last week of August 2022.**



2. Representative mature adult male Plateau Spreadwing of the Dripping Springs Visitor Center retention pond population, perched on emergent Green Sprangletop stem, during early September 2022.

emergent herbaceous vegetation. This habitat is found at the Dripping Springs Visitor Center retention pond, the emergent shoreline graminoid providing this habitat was Green Sprangletop. Also, mature Plateau Spreadwings may roost in woody vegetation up to 0.5 miles from the pond and immatures often use adjacent open, wooded habitat.

Per Paulson (2009) the flight season ranges from January to October in New Mexico. My 2022 observations at the Dripping Springs site suggest this range be extended to November.

During late August and continuing into October, damselfly larvae emerged from the Dripping Springs Visitor Center retention pond. These larvae are also called nymphs or naiads, and those of the Plateau Spreadwing species have three prominent, black, caudal gills that extract oxygen from the water and also are used by larvae to swim by waving them back-and-forth similar to a fish tail. All damselfly larvae are predatory and can be cannibalistic (Paulson 2009).

Further, Paulson (2009) stated that damselfly larvae undergo many molts as they feed and grow, perhaps up to a dozen molts prior to emerging. In the last few molts, adult wings begin forming in wing pads that extend above and back from the larval thorax. At this stage, larvae stop feeding and switch to aerial respiration, then climb onto emergent plant stems/leaves close to the waterline, attaching to the plants with their legs. The larva then expands its thorax until a split appears through which it exits from the now-empty larval skin (exuvia). There, it rests and allows its cuticle to partially harden and muscles

to become stronger, then it reaches upward to pull away from the larval skin.

The newly exposed wings are folded like accordions and begin to fill, from the base (with fluid transferred from the larva's body), until they reach full length/width (Paulson 2009). (See images and discussion starting at page 137.) The wing fluid is then pumped back into the abdomen which also expands and fully extends beyond the wings. Finally, the wings harden, open, and the teneral (pale and soft-bodied) immature Plateau Spreadwing flies to protective cover. The damselflies at Dripping Springs usually emerged during daytime, at the warmer temperatures near midday to late afternoon; the process from larvae exiting the water to tenerals/immatures flying into cover may require one to two hours to complete.

Per Paulson (2009) the male thorax has a wide median black stripe, tan or blue (with maturity) antehumeral stripe with straight edges, and a narrow black humeral stripe. Sides are usually pale brown in males. In image "4" the sides have become pruinose (bluish and obscuring the humeral stripe) indicative of an older individual. The last two abdominal segments (S9 and S10) are pruinose on males and with age, the S8 segment is also pruinose.

Per Paulson (2009) the female thorax is similar to the male. As in males, the oldest females develop blue eyes and a blue antehumeral stripe with straight edges. Their wide black humeral stripe is more prominent because no pruinosity develops on the female. It was difficult to locate individual mature females to photograph, as most were immediately captured by a male, engaged in tandem linkage, then paired in mating wheels.







3. Enlarged image of a mature blue male's head and thorax exhibits his light blue labrum (lower face), blue eyes, wide median black stripe of thorax, relatively wide blue antehumeral stripe (straight edges on this stripe is diagnostic), and pruinose lower thorax that covers his narrow black humeral stripe.
4. Mature older male perching by hanging from a Southern Cattail leaf, exhibits extensive pruinosity on the lower thorax that covers his black antehumeral stripe and also on S8-S9-S10 abdominal segments; his perching angle makes in-focus images easier to collect.
5. Diana and Terry Hibbitts took this photograph of Plateau Spreadwings at the City of Rocks State Park in Grant County on August 27, 2015. Shown here under a Creative Commons license.

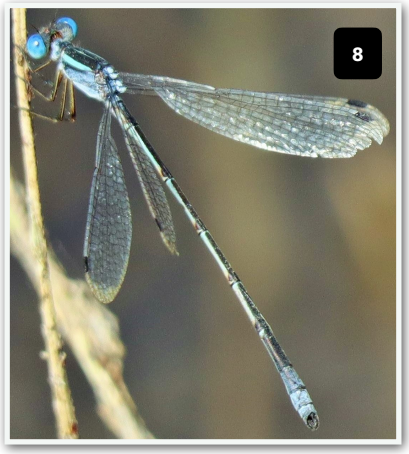
Plateau Spreadwing - Mating

Immediately upon landing on a twig perch, many males begin to display using vertical abdomen movement to attract a mate.

6. **He first rapidly elevates his abdomen tip upward, above his wings, which makes his pruinose S9-S10 segments move and reflect like a small light.**
7. **He reaches full upward extension. Note that his abdomen tip is pruinose on three segments (S8, S9, S10) rather than just two and also the angles of his combined wings reflect light much like a mirror.**
8. **He then rapidly drops his abdomen, again making the pruinose tip flash in the sun.**
9. **Continuing the downward motion he curls his abdomen sharply beneath him towards his perch. Note how reflective his wings become during this behavior.**
10. **His abdomen tip touches his perch (sometimes it extends well beyond the perch) causing him to immediately initiate the upward movement into a curl above his wings.**
11. **When he successfully attracts a mate she will expose her perch to him by moving or leaves her perch and flies to him. He clasps her behind the head with his cerci/paraprocts and they form a tandem linkage. After this, he flies her to a safe, often well hidden, perch.**
12. **At the perch the male manipulates the female forward (swinging motion) and she moves her abdomen upward to connect her S9 segment (with vagina/ unfertilized eggs) to his S2 segment (with penis/sperm).**
13. **She makes contact with his abdomen and slides back her abdomen until they are mated and formed in a mating circle (which typically is heart-shaped.**
14. **Following Page: With the S9/S2 attachment completed, the mating circle is formed; the mature (blue) male is above and the immature (brown) female is below. The pair may stay at this perch, but sometimes the male again flies to a different perch to begin copulation.**











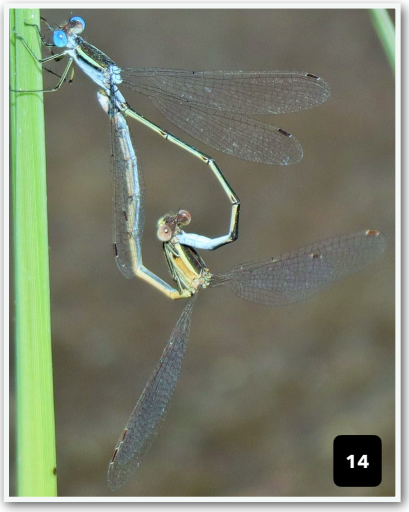
15. **Following Page: This copulating pair selects a perch on dried stems within a large clump of Switchgrass; they may copulate for several minutes to over a half-hour before sperm transfer is completed.**







16. **This mating pair selected leaves of Green Sprangletop as a perch directly over the water. The pair is of a mature blue male (above) and an immature brown female. Note that her eye color is brown, as opposed to the grayish-blue eye color in the female in photograph 15 and she has a tan antehumeral stripe. The male has**
(continued on following page)



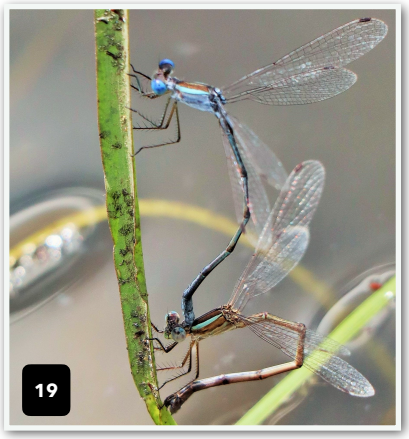


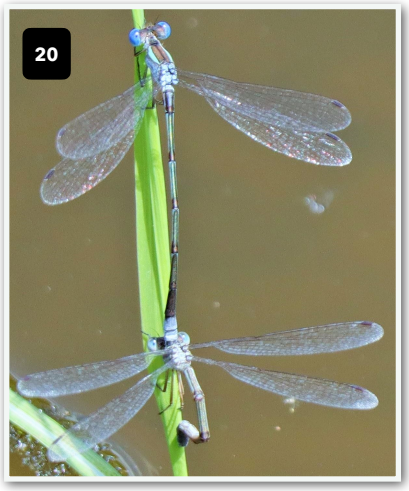


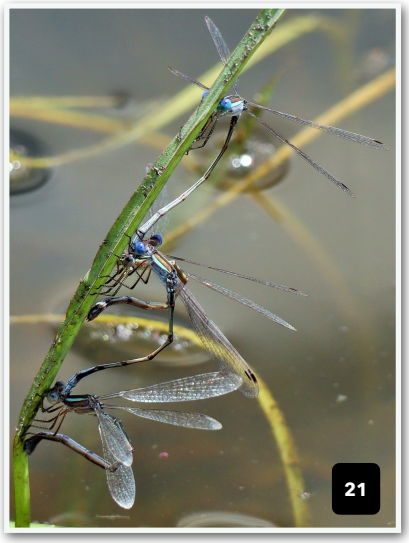
16. (continued from previous page) dark blue eyes and has a high level of pruinosity on his ventral thorax and his S8-S10 abdominal segments.









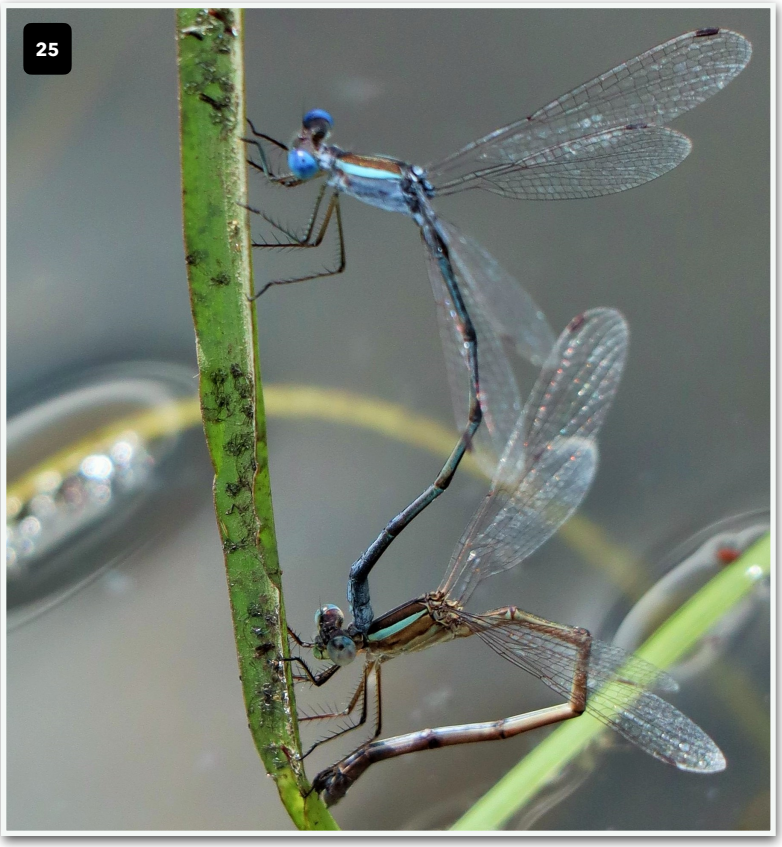




17. Following mating, the female releases from the male, and flying in tandem linkage, the male guides her to emergent vegetation at the water surface for ovipositing.
18. The mated and soon-to-be-ovipositing male and female are both mature blue individuals with similar blue eye color.
19. Mature blue male selects a perch on Green Sprangletop and provides leverage to the mature blue female which begins to perforate the grass leaf/stem with her ovipositor and deposits her fertilized eggs within the tissue.
20. Same as 19.





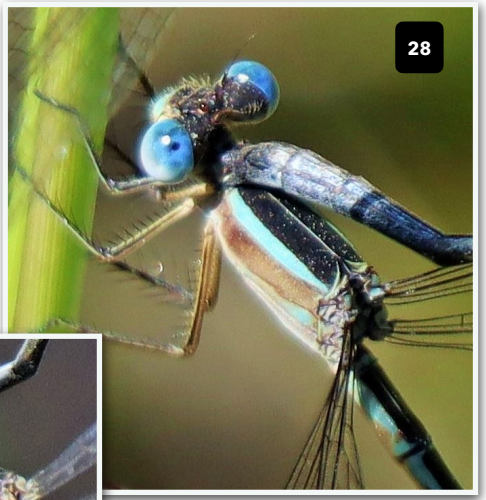


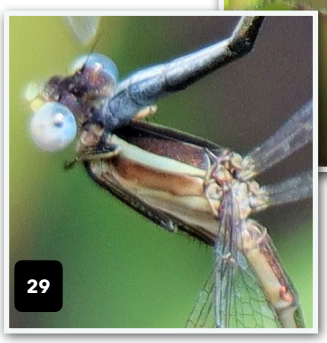


21. Previous Page: Two pairs selected this grass stem for ovipositing and together, several eggs were imbedded at this site.
22. Previous Page: Rarely a female is observed ovipositing alone, as is this brown immature depositing her eggs into Green Sprangletop. It allows me to ponder the mate-fate a little; which ranges from her separating from him on her own, failure of his claspers to hold her in tandem linkage as they navigate within vegetation, interference from a competing male, or perhaps him being taken by a predator.
23. Previous Page: Additional photographs of mating activity are shown here and on following pages.
24. Adult Plateau Spreadwing began to mate in late August 2022. This mature adult male (upper) and mature female (lower) form a mating wheel to transfer the male sperm into the female vagina where eggs may be fertilized prior to ovipositing. The pair is perched on a dried Switchgrass stem.
25. Tandem-linked mature adult male (U) and ovipositing adult female. Eggs are being inserted into a Green Sprangletop leaf. The male guides the female from site to site to oviposit, the pair spending one to five minutes at each site.
26. Immature female, post-mating, inserting fertilized eggs into the stem tissue of Green Sprangletop. Eggs will develop into larvae which drop into the water to forage and grow, molting perhaps a dozen times before emerging. Typically, female Plateau Spreadwings remain in tandem linkage with the male mate during oviposition.
27. Following Page: The same pair (as "25") being joined by a tandem-linked mature adult pair moving between sites to oviposit in Green Sprangletop leaf and stem tissue.



28. Enlarged image of a mature blue female's head, thorax, and upper abdomen exhibits her blue labrum (lower face); blue over gray eyes; wide median black stripe of thorax, light blue antehumeral stripe (straight edges on this stripe is diagnostic), brown humeral stripe; the pale tan ventral thorax; and the dorsal abdomen is black, with blue lateral color below. Note that she is being held in tandem linkage by a male as she oviposits.
29. An immature brown female's head, thorax, and upper abdomen exhibits her light blue over white eyes; wide median dark brown stripe of thorax, relatively wide creamy-white antehumeral stripe (straight edges on this stripe is diagnostic), and brown humeral stripe; and the pale whitish ventral thorax with this color continuing under her upper abdomen (the dorsolateral abdomen is dark green). Note that she is being held in tandem linkage by a male as she oviposits.









30. Mature Plateau Spreadwing larva (nymph, naiad) climbs from the pond onto a Green Sprangletop panicle to begin emergence. The three caudal gills are still underwater but are not taking in oxygen at this late larval stage.
31. The larva climbs higher above the waterline on the grass panicle and clasps it firmly with its legs. Its wing pads are easily observed protruding backward from the thorax.
32. The head and thorax have pulled free from the larval skin and the wings are being pulled from the wing pads. The abdomen begins to be exposed as the teneral (soft-bodied) Plateau Spreadwing emerges from the larval skin.
33. A dorsal view of the Plateau Spreadwing teneral/immature form as it emerged, completing the process by climbing upward from the larval skin.





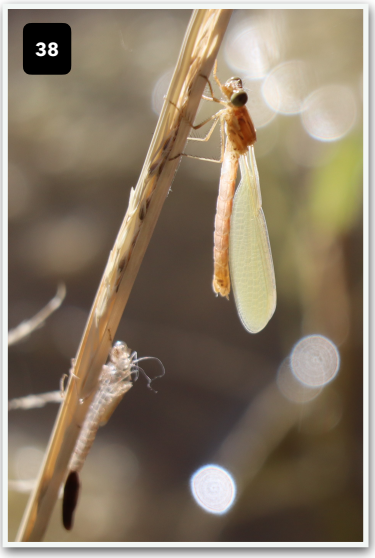


34. A ventral view of the Plateau Spreadwing teneral/ immature form as it emerged, completing the process by climbing upward from the larval skin.
35. Plateau Spreadwing wings, free and folded like accordions, emerging from the teneral/immature damselfly thorax. They have yet to be filled with fluid (to be pumped from the abdomen).
36. Teneral/immature Plateau Spreadwing rests on larval skin to gain strength and begin drying. Note its expanding wings are being filled with fluid pumped from the abdomen.











37. Teneral/immature Plateau Spreadwing rests on larval skin to gain strength to climb upward. Note its wings have filled completely with fluid from the abdomen.
38. Teneral/immature Plateau Spreadwing has climbed up the stem away from the exuvia, its wings have filled with fluid, expanded, and are hardening, while the fluid has been pumped back into its abdomen, which is expanding and lengthening.
39. Emergence nearly complete following fluid transfer to/from wings, abdomen expansion/ extension, and wing/cuticle hardening for this immature female.

Emerging Plateau Spreadwing teneral/ immature forms are particularly susceptible to predation at this vulnerable life cycle stage. A variety of insects including adult dragonflies, amphibians, reptiles, and birds all represent potential predators. The most effective predators I was able to photo-document were species of orb weaver spiders.

40. Long-jawed Orb Weavers (*Tetragnatha* sp.) were predators of Plateau Spreadwings during the emergent life cycle phase at the Dripping Springs Visitor Center retention pond, building webs among the Green Sprangletop stems, leaves, and panicles.

41. Long-jawed Orb Weaver ingesting an immature Plateau Spreadwing, beginning at the eyes/head.





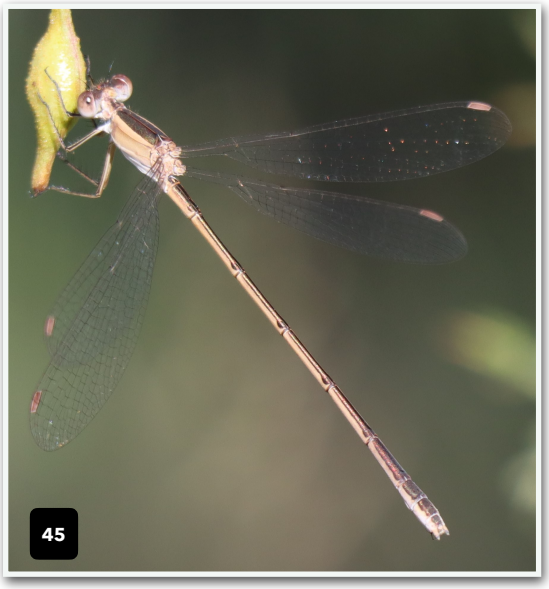


Immature Plateau Spreadwing represented the population during October and November 2022. Paulson (2009) describes the color of both sexes as a wide, black stripe on the front of the thorax contrasting with entirely pale sides.

42. **Immature Plateau Spreadwing with fully expanded/extended abdomen and hardened wings, has just flown to Switchgrass panicles to perch/hide, warm, and allow further hardening of its wings and cuticle.**
43. **Immature male perched among dried Switchgrass panicles in November 2022, prior to migration.**
44. **Immature male perched on Switchgrass leaf on October 26, 2022.**
45. **Immature female perched on Honey Mesquite fruit, overhanging the retention pond-edge, September 27, 2022.**









46. Immature brown male perching by hanging from Switchgrass seed panicles, exhibits tan antehumeral stripes; his perching angle, often used by spreadwing immatures, makes in focus images easier to collect. Note the reflection of late season low-light rays from his outspread wings. October 22, 2022.
47. Older immature brown male perching by hanging from a dried Southern Cattail leaf, exhibits a black medial stripe on top of his thorax and creamy-white antehumeral stripes.
48. Immature brown male perching by hanging from a Softstem Bulrush stem.





Following Page

49. Immature, possibly a soft-bodied teneral male, perching at an angle from a Southern Cattail leaf (July 2023), exhibits unusual thoracic striping and a pinkish ventral abdomen. Note his wings are somewhat opaque and may be recently dried following emergence from the larval stage.
50. Immature male perching horizontally from a Four-wing Saltbush leaf, exhibits light, grayish-blue eyes and a tan antehumeral stripe; his perching angle, like many spreadwing males, makes in focus images relatively easy to collect.
51. Plateau Spreadwing female, Hillsboro, New Mexico. Photograph by Bob Barnes.
52. Plateau Spreadwing female, Hillsboro, New Mexico. Photograph by Bob Barnes.











Habitat - Plateau Spreadwing

53. This retention pond is is about 30'x100' and 12"-16" in depth (pool below outlet culvert elevation) and forms over an impervious liner (otherwise it would rapidly drain into the underlying gravel). Green Sprangletop (emergent) and Switchgrass (embankment top). Switchgrass (above) is hiding cover for Plateau Spreadwing immatures.

54. This photo of post-mating Plateau Spreadwings (in tandem linkage and depositing eggs), was taken by Gordon Berman, at the Dripping Springs Visitor Center retention pond. 01 September 2023.


54

Plant Species Referenced in This Volume

English common names are used for plant species mentioned in this volume. The following list (arranged in alphabetical order of English common name) includes the Latin binomial for these species.

Barnyard Grass, *Echinochloa crus-galli* ([L.] P. Beauv.)
Bermudagrass, *Cynodon dactylon* ([L.] Pers.)
Climbing Milkweed (a.k.a. Twinvine), *Funastrum cynanchoides* ([Decne.] Schltr.)
Common Reed, *Phragmites australis* ([Cav.] Trin. ex Steud.)
Common Sunflower, *Helianthus annuus* (L.)
Coyote (Sandbar, Narrowleaf) Willow, *Salix exigua* (Nutt.)
Curly Dock, *Rumex crispus* (L.)
Duckweed, *Lemna* sp. (L.)
False Indigobush, *Amorpha fruticosa* (L.)
Green Sprangletop, *Disakisperma dubium* ([Kunth] P.M. Peterson & N. Snow)
Honey Mesquite, *Prosopis glandulosa* (Torr.)
Horsetail (a.k.a. Scouring-rush) *Equisetum* sp. (L.)
Horsetail Milkweed, *Asclepias subverticillata* ([Gray] Vail)
Johnsongrass, *Sorghum halepense* ([L.] Pers.)
Kochia (a.k.a. Summer Cypress, Mexican Fireweed), *Bassia scoparia* ([L.] A.J. Scott)
Mule's Fat (a.k.a. Seepwillow), *Baccharis salicifolia* (Ruiz & Pav. [Pers.])
Paspalum, *Paspalum* sp. (L.)
Rush, *Juncus* sp. (L.)
Russian-thistle, *Kali tragus* ([L.] Scop.)
Screwbean Mesquite, *Prosopis pubescens* (Benth.)
Seepwillow (a.k.a. Mule's Fat), *Baccharis salicifolia* (Ruiz & Pav.[Pers.])
Softstem Bulrush, *Schoenoplectus tabernaemontani* ([C.C. Gmel.] Palla)
Southern Cattail, *Typha domingensis* (Pers.)
Spiny Chloracantha, *Chloracantha spinosa* ([Benth.] G.L. Nesom)
Summer Cypress (a.k.a. Kochia, Mexican Fireweed), *Bassia scoparia* ([L.] A.J. Scott)
Switchgrass, *Panicum virgatum* (L.)
Tamarisk (a.k.a. Saltcedar), *Tamarix ramosissima* (Ledeb.)
Three-square Bulrush, *Schoenoplectus pungens* ([Vahl] Palla)
Water Smartweed, *Persicaria* sp. (Mill. 1754)
Water Speedwell, Veronica anagallis-aquatica (L.)
Western Hackberry, Celtis reticulata (Torr.)
White Sweetclover, Melilotus albus (Medic.)



Volume 1: Dragonflies
The Odonata of Doña Ana County and the Black Range

The companion volume to"Damselflies" is available for reading online or download in both compressed and uncompressed versions.

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