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J. BARRY LOMBARDINI: EDITOR

PHOTOS AND COMMENT
BY
STEVE MIX

Zebra Longwings (*Heliconius charithonia*) were numerous in southern South Carolina this year

DONORS

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Tailed Cecropian (*Historis acheronta*); Photos by Sara Shane taken on September13 and 14, 2021, at fruit and with wings closed and spread. Location: Garden City, Kansas. The butterfly was first observed on a day with a southerly wind approximately 20 mph; the butterfly was also seen by Tom Shane.

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"Cover illustration: First known drawing of a North American butterfly from the Modern Age: Eastern Tiger Swallowtail (*Papilio glaucus*) by John White, North Carolina, 1587 (original dsign by J. V. Calhoun, 1996)."

CENOPIS VABROUI POWELL & BROWN, 2012 (LEPIDOPTERA: TORTRICIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR. AND CHARLOTTE DOZAR BROU

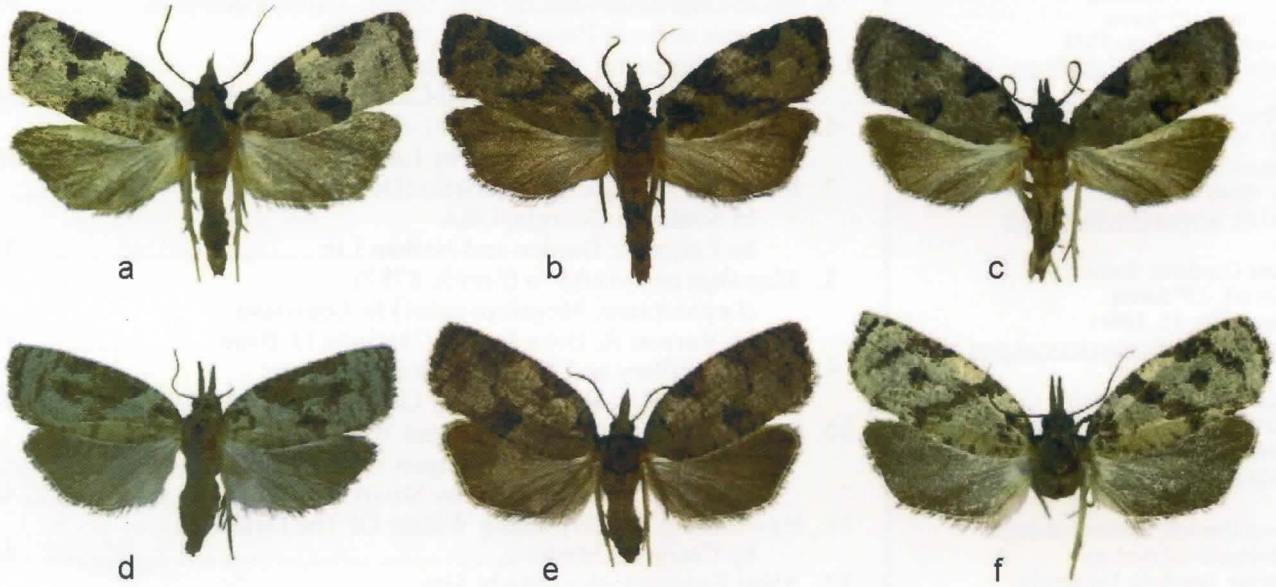

Fig. 1. ***Cenopis vabroui*** Paratypes: a-c. males, d-f. females. All from Type locality.
a. 1997-May 13, **b.** 1997-May 15, **c.** 1998 May 2, **d.** 1988 May 15, **e.** 2001 May 11, **f.** 1997 June 7.

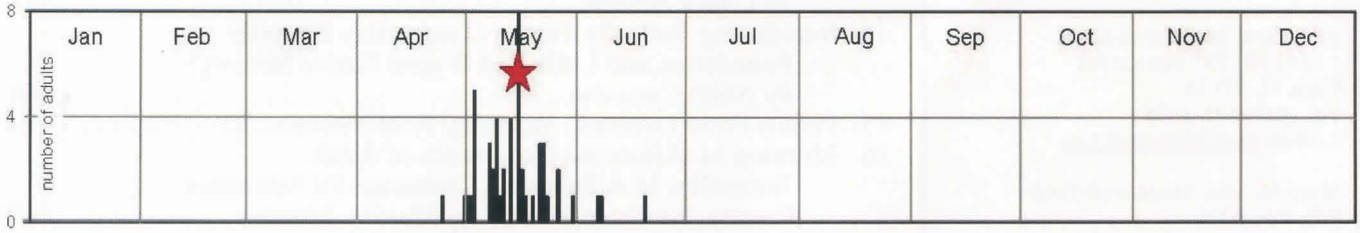

Fig. 2. Adult ***Cenopis vabroui*** captured in Louisiana. n = 52

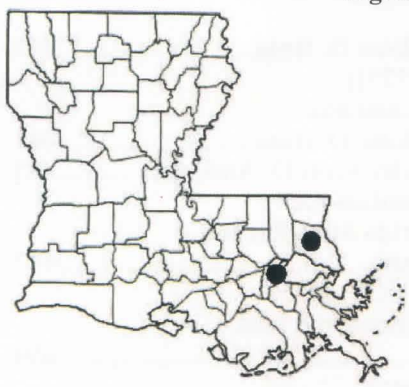

Fig. 3. Parish locations for ***Cenopis vabroui***.

The small in size (forewing length 7.0-8.7 mm) moth ***Cenopis vabroui*** Powell & Brown (Fig. 1) so far has only been captured at two locations in North America (Fig. 3). Nearly all of the existing adults were captured in high-wattage UV light traps at the Type locality *AESS. Adults of this species resembles the larger in size (forewing length 8.5-9.0 mm) species ***Cenopis cana*** Robinson, 1869, which also occurs at the type locality of ***C. vabroui***. The genitalia of both of these species are nearly indistinguishable, and Cytochrome c oxidase I, also does not distinguish ***C. vabroui*** from ***C. cana***. Unlike ***C. cana***, sexual dimorphism is virtually unnoticeable in ***vabroui***. The Paratype series of ***C. vabroui*** consists of 22 males and 26 females.

C. vabroui is univoltine, the annual brood peaking mid-May (Fig. 2). The parish locations are illustrated in Fig. 3.

**Abita Entomological Study Site*: sec.24,T6S,R12E, 4.2 miles northeast of Abita Springs, St. Tammany Parish, Louisiana USA.

Literature Cited

Powell, J.A. and **J.W. Brown,** 2012. Tortricoidea, Tortricidae (part) Tortricinae part): Sparganothini and Atteriini in Hodges, R.W. et al., *The Moths of North America*, fasc. 8.1

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A SPECIMEN OF *POLYGRAMMODES ELEVATA* (F.) FROM VACA KEY, FLORIDA

BY

LAWRENCE J. HRIBAR

Polygrammodes elevata (F.) (Crambidae) is a very attractive moth, orange with red spots on the wings, abdomen, and thorax. It has been referred to as the red-spotted sweetpotato moth (https://mothphotographersgroup.msstate.edu/pinned.php?plate=51.3&page=2&state=FL). The specific epithet appears in the literature spelled two ways, as "*elevata*" and "*eleuata*". Cock (2017a) and Malley et al. (2019) use "*eleuata*" which is Fabricius' original spelling according to Cock (2017a). "*Elevata*" is used here because that is the name under which this species is recorded in the Globales Informationssystem Zünslerfalter (http://globiz.pyraloidea.org/Pages/Reports/TaxonReport.aspx). Larval host plants are *Ipomoea* sp., Convolvulaceae (Heppner 2003), the Morning Glory family, which includes sweet potato, *I. batatas* (Austin 1997). In Florida there are 29 species of *Ipomoea* recorded. The following 15 species occur in the Florida Keys and there are vouchered specimens in herbaria: *I. alba, I. batatas, I. cairica, I. carnea* subsp. *fistulosa, I. cordatotriloba, I. corymbosa, I. hederifolia, I. imperati, I. indica, I. pes-caprae* subsp. *brasiliensis, I. sagittata, I. tenuissima, I. tiliifolia, I. triloba, I. violacea* (Wunderlin et al. 2021).

On 24 April 2022 a single specimen of *P. elevata* was collected on Vaca Key in a light trap placed near Crane Hammock. This moth has been collected previously from Bahia Honda Key (FDEP 2002), Key Largo (Fine & Gresham 2011), and No Name Key (Keysmoths undated). Fabricius (1777) wrote only, "Habitat in America meridionali" (She lives in southern America).

Red-spotted sweetpotato moth (*Polygrammodes elevata*)

Besides Florida, it also occurs in nearby Caribbean islands of Cuba (Núñez Águila 2004), Trinidad and Tobago (Cock 2017b), Barbados (Gibbs 1992), Saba (Wit 2011), Jamaica, St. Martin, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada, and Bequia in the Grenadines (Barnes 2002a, b; Touroult et al. 2015, 2021), and Haiti and Puerto Rico (see Pessoa (1985) for references). Its range extends south to Brazil (Leitão-Lima 2002). Schaus (1923) and Linsley and Usinger (1966) reported this species from the Galapagos Islands. [Their reports are from the same island that is known by different names, viz., James Island, Santiago Island, and San Salvador Island.] Landry (2016) states that this moth does not occur in the Galapagos Islands.

This moth is apparently rare in the Florida Keys; there do not seem to be many literature records reporting the moth in the islands. Does this moth have an established population in the Florida Keys? If so, what is the larval host plant? Given the fact that it is a pest of sweet potato in other countries (e.g., Gibbs 1992), and there is no cultivation of sweet potato in the islands, might the larval host plant be some other species of *Ipomoea*? Or might there be wild sweet potato available for the moth to exploit? Relevant to the latter possibility, Bennett (2015) recounts the following: years ago, sweet potato was an important crop in southern Florida, where soil conditions made growing maize difficult; sweet potato was introduced to Florida by the Spanish; Native-Americans, African-Americans, and European-Americans all grew the plant; and sweet potato is known to have been cultivated by settlers on Long Key and Upper Matecumbe Key. Gentry (1974) mentions settlers growing sweet potato on Upper Matecumbe Key. Dickson et al. (1953) reported sweet potato on Big Pine Key. Perrine (1951) mentioned people on Vaca Key maintaining a communal sweet potato patch [this is a reprint of an article published in 1840]. Perrine (1979) wrote to a Dr. Ralph Glover of New York to suggest that he invest in sweet potato farming on Long Key. [This reprinted 1840 letter is more interesting in that the names given on navigational charts for present day Long Key are "Cayo Viboras or Viper's Key" and Vaca Key was then known as "Key Vacas." Perrine also mentions a "West Metacumbie" (apparently Lower Matecumbe Key) and a "Lignurd Vetoz" which might be a phonetic attempt to write Lignumvitae Key. Neither of the latter two island names appears in the online Key Names Gazetteer (http://keys.fiu.edu/gazetteer/index.htm).] Munroe (1981) mentions that the Seminoles grew sweet potatoes. Sweet potatoes also were grown in Crane

Hammock; George and Olivia Adderley grew sweet potatoes in their garden (Albritton and Wilkinson 2018).

Why is *P. elevata* rare in the Florida Keys? The answer might have something to do with host plant availability. Are there sufficient host plants to support more insects? It appears that *P. elevata* is most commonly collected from sweet potato. Pessoa (1985) states that sweet potato is the only known host for this moth. It also appears that the present-day range of sweet potato in the Florida Keys is not known. Are there any plants remaining from the sweet potato patch that the Adderleys and their neighbors cultivated? If so, how many? Even if the plants are numerous, herbivorous insect abundance does not always correlate with host plant abundance; it is possible for a host plant to be abundant but the insect to be rare (Hopkins 2002). Apparently, a habitat analysis was done at Crane Hammock years ago. Unfortunately, this document has proven impossible to track down. Although it has been cited in Federal government correspondence and referenced in local newspaper articles, a copy could not be located. It would seem that both a botanical survey and an entomological survey may need to be conducted.

Literature Cited

Albritton, L. and J. Wilkinson, 2018. Hidden History of the Florida Keys. History Press, Charleston, SC. 143 pp.

Austin, D.F., 1997. Convolvulaceae (Morning Glory Family). Published on WWW at http://www.fau.edu/divdept/biology/people/convolv.htm

Barnes, M.J.C., 2002a. A preliminary illustrated catalogue of the larger moths of Jamaica. http://www.mbarnes.force9.co.uk/jamaicamoths/jamaicahome.htm

Barnes, M.J.C., 2002b. A preliminary illustrated catalogue of the larger moths (Macrolepidoptera) of the Grenadines. http://www.mbarnes.force9.co.uk/grenadinesmoths/grenadineshome.htm

Bennett, B.C., 2015. Subsistence farming in southern Florida (1840–1940): The importance of sweet potato—In Memory of Daniel F. Austin. *Economic Botany*. 69(2): 185-198.

Cock, M.J.W., 2017a. A preliminary catalogue of the moths (Lepidoptera except Papilionoidea) of Tobago, West Indies. *Insecta Mundi*. 0585: 1-58.

Cock, M.J.W., 2017b. Moths (Lepidoptera) from the Five Islands, Trinidad and Tobago, including new country records. *Living World, Journal of the Trinidad and Tobago Field Naturalists' Club*. 2017: 21-25.

Dickson, J.D., R.O. Woodbury, and T.R. Alexander, 1953. Check list of flora of Big Pine Key, Florida and surrounding keys. *Quarterly Journal of the Florida Academy of Sciences*. 16: 181–197.

Fabricius, J.C., 1777. *Genera insectorum eorumque characteres naturales secundum numerum, figuram, situm et proportionem omnium partium oris adiecta mantissa specierum nuper detectarum*. Mich. Friedr. Bartschii, Chilonii (=Kiell), Germany. xiv + 310 pp. 16 plates.

FDEP [Florida Department of Environmental Protection], 2003. *Bahia Honda State Park Unit Management Plan*. iii + 28 pp. 6 addenda.

Fine, D. and H. Gresham, 2011. Crocodile Lake National Wildlife Refuge a gold mine for moths and history. *Southern Lepidopterists' News*. 33(Special Issue): 1-61.

Gentry, R.E., 1974. Early families of Upper Matecumbe. *Tequesta.* 34: 57–64.

Gibbs, I.H., 1992. *Polygrammodes elevata a 'new' pest of sweet potato in Barbados.* Proceedings of the Tenth Annual Conference, Grand Barbados Beach Resort, Barbados West Indies, Nov 11-13 1992, Barbados Society of Technologists in Agriculture, St. Michael, Barbados. Pp. 40-42..

Heppner, J.B., 2003. *Lepidoptera of Florida. Part 1. Introduction and Catalog. Arthropods of Florida and Neighboring Land Areas*. Volume 17. Florida Department of Agriculture and Consumer Services. 670 pp.

Hopkins, G.W., J.I. Thacker, A.F.G. Dixon, P. Waring, and M.G. Telfer, 2002. Identifying rarity in insects: the importance of host plant range. *Biological Conservation*. 105: 293-307.

Keysmoths, Undated. 5230 – *Polygrammodes elevata, Redspotted Sweatpotato [sic] Moth.* https://www.keysmoths.com/5230-polygrammodes-elevata

King, A.B.S., 1978. *The pests of sweet potato (Ipomoea batatas) at Turrialba, Costa Rica, with special reference to Polygrammodes elevata F. (Lep., Pyralidae) and its effect on yield.* Centro Agronómico Tropical de Investigación y Enseñanza (CATIE). Turrialba, Costa Rica. 17 pp.

Landry, B., 2016. Taxonomic revision of the Spilomelinae (Lepidoptera, Pyralidae s. l.) of the Galápagos Islands, Ecuador. *Revue suisse de Zoologie.* 123(2): 315-399.

Leitão-Lima, P. Da S., 2002. *Levantamento da entomofauna em sítios florestais em recuperação e em um fragmento de floresta natural em Botucatu, SP.* M.S. thesis, Universidade Estadual Paulista "Julio de Mesquita Filho". Botucatu. 106 pp.

Linsley, E.G. and R.L. Usinger, 1966. Insects of the Galápagos Islands. *Proceedings of the California Academy of Sciences, 4th series.* 33(7): 113-196.

Malley, R., J.E. Hayden, C. Neinhuis, B.H. Jordal, and M. Nuss, 2019. The phylogenetic systematics of Spilomelinae and Pyraustinae (Lepidoptera: Pyraloidea: Crambidae) inferred from DNA and morphology. *Arthropod Systematics & Phylogeny.* 77: 141-204.

Munroe, M.B., 1981. The Seminole women of Florida. *Tequesta.* 41: 23-32.

Núñez Águila, R., 2004. Lepidoptera (Insecta) de Topes de Collantes, Sancti Spíritus, Cuba. *Boletín de la Sociedad Entomológica Aragonesa.* 34: 151-159.

Perrine, H., 1951. Random records of tropical Florida. *Tequesta.* 11: 51-62.

Perrine, H., 1979. A letter by Dr. Henry Perrine, 1840. *Tequesta.* 39: 29–33.

Pessoa, S.C., 1985. *Taxonomy of the larvae and pupae of economically important Pyralidae in Honduras.* M.S. thesis, University of Florida. Gainesville. 486 pp.

Schaus, W., 1923. Galapagos Heterocera with descriptions of new species. *Zoologica.* 5(2): 22–48, 2 plates.

Touroult J., E. Poirier, J. Braud, F. Deknuydt, E. Dumbardon-Martial, N. Moulin, T. Ramage, and D. Romé, 2015. *Inventaire entomologique des ZNIEFF de Martinique et de la réserve de la Caravelle. Mission 2014 pour le compte de la DEAL Martinique.* Rapport de la Société Entomologique Antilles-Guyane (SEAG), No. 2015-1, 66 pp. + 3 annexes.

Touroult, J., E. Poirier, and T. Jourdan, 2021. *Inventaire entomologique de la Réserve Biologique Dirigée Nord Grande Terre, Guadeloupe, 2020.* Rapport de la Société Entomologique Antilles-Guyane (SEAG), No. 2021-02, 34 pp.

Wit, B., 2011. Nieuwe Nederlandse vlinders op Saba. *Vlinders.* 26(2): 19–22.

Wunderlin, R.P., B.F. Hansen, A.R. Franck, and F.B. Essig, 2021. *Atlas of Florida Plants* (http://florida.plantatlas.usf.edu/). [S. M. Landry and K. N. Campbell (application development), USF Water Institute.] Institute for Systematic Botany, University of South Florida, Tampa.

(Lawrence J. Hribar, sphaeromias@lycos.com)

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INVASIVE *PROMALACTIS SUZUKIELLA* (OECOPHORIDAE) IN SOUTHERN GEORGIA, USA

BY

LANCE A. DURDEN AND NATHAN LIN

The oecophorid moth, *Promalactis suzukiella* (Matsumura, 1931) is native to southeast Asia (Korea, Japan and Taiwan) and was first recorded in North America as an invasive introduced species in the early 2000's in some northeastern and mid-Atlantic U.S. states (Adamski et al., 2009). The importance of "backyard collecting" and biophotography were emphasized as being instrumental in documenting the early records of this species in the USA by Adamski et al. (2009) and we report this moth from southern Georgia, USA under similar circumstances. As part of a summer Research Experience for Undergraduates (REU) program at Georgia Southern University (GSU), two light sheets were set up behind the main Department of Biology building in Statesboro, Georgia on the night of 18 July 2022. A 15 W battery operated UV blacklight was suspended in front of one sheet and a 40 W battery operated UV light was positioned in front of the other sheet. In addition to several native moth species, at least one specimen of *P. suzukiella* was recorded (Fig. 1). The Moth Photographers Group website shows several records of this moth from the northeastern U.S., and some from the southeastern U.S., including northern Georgia, but none from southern Georgia, or from Florida. However, there are records of *P. suzukiella* in *iNaturalist* from southern Georgia (Seminole, Tift and Worth counties) and also from northern Florida (St. Johns county). This moth therefore appears to be expanding its range in the southeastern U.S. The larva – illustrated by Adamski et al. (2009) – is stated to feed under the bark of rotting logs of *Prunus virginiana* (chokecherry), *Prunus persica* (peach), and *Quercus* (oak) species, all of which occur on and around the GSU campus. It will be interesting to follow the expansion of this moth in the U.S, and to determine if it poses any future economic or ecological threats.

Fig. 1. Adult *Promalactis suzukiella*, on light sheet, Statesboro, GA, 18 July 2022 (Photograph by Nathan Lin).

Literature Cited

Adamski, D., G. E. Hevel, and A. Pultyniewicz, 2009. Redescription and immature stages of *Promalactis suzukiella* (Matsumura) (Gelechioidea: Oecophoridae), a new introduction into the United States. *Proceedings of the Entomological Society of Washington* 111: 204-214.

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MEGALOPYGE PYXIDIFERA (SMITH, 1797) (LEPIDOPTERA: MEGALOPYGIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR. AND CHARLOTTE DOZAR BROU

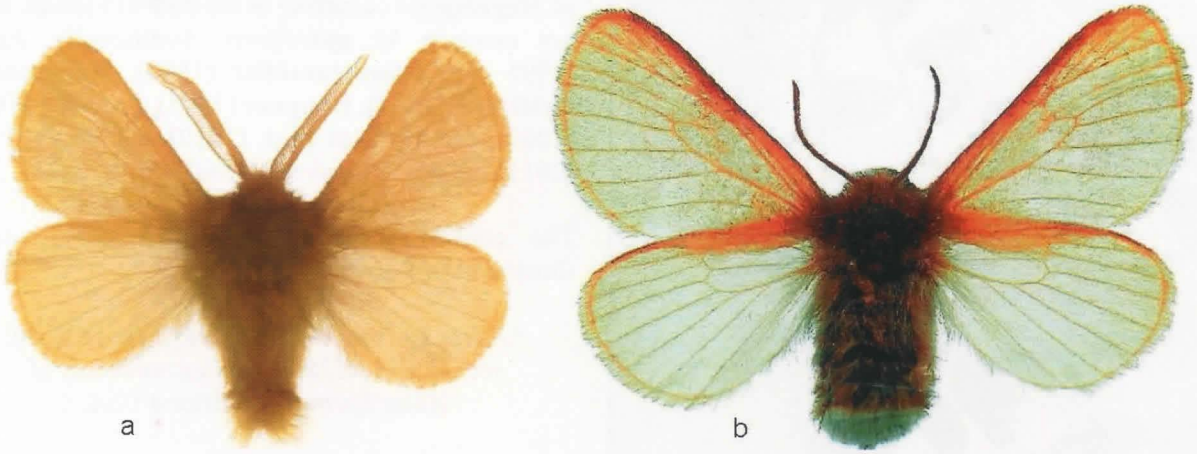

Fig. 1. ***Megalopyge pyxidifera*** phenotypes:
a. male, Apr 13-2004. **b.** female, Aug 15-1983. Both captured at the ***Abita Entomological Study Site.**

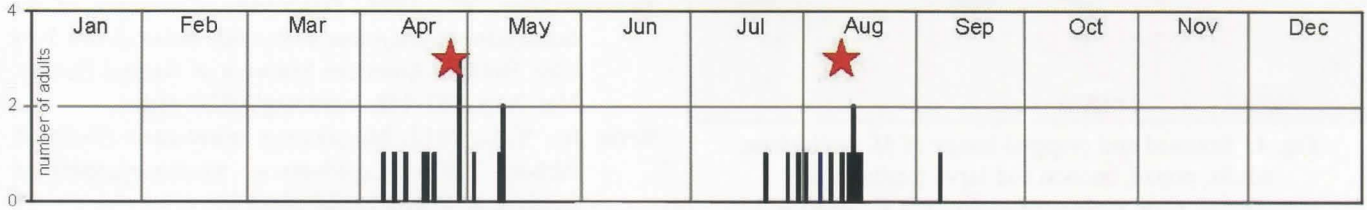

Fig. 2. Adult ***Megalopyge pyxidifera*** captured in Louisiana. n = 26.

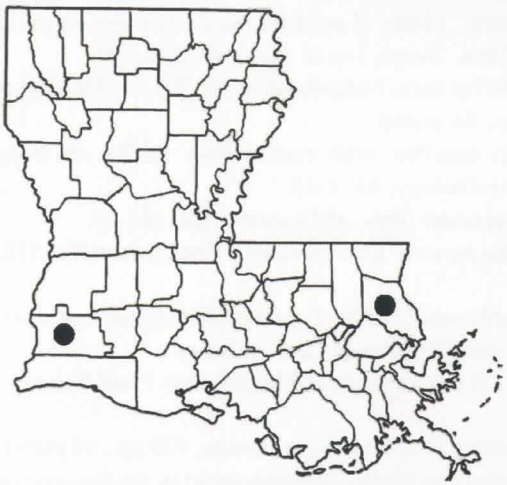

Fig. 3. Parish records in Louisiana for ***Megalopyge pyxidifera.***

The moth ***Megalopyge pyxidifera*** (Smith, 1797) (Fig. 1) belongs to the family ***Megalopygidae*** Herrich-Schäffer, 1855, and occurs in the southeast coastal states of the United States. This species was originally described as ***Phalaena pyxidifera*** Smith from the state of Georgia. We have placed a scan of the original plate illustrating this species published in 1797 (Fig. 4). This is one of three species of this genus known to occur in Louisiana. Previously, Brou (2017) and Brou and Brou (2022) published species accounts on both ***Megalopyge opercularis*** (Smith & Abbot) and ***Megalopyge crispata*** (Packard).

M. pyxidifera is one of more than two dozen species of Lepidoptera with stinging larvae we have documented in the state of Louisiana. This species is not commonly encountered in Louisiana; only a few records existing from two distant southern parishes. Unlike ***M. opercularis*** and ***M. crispata*** in Louisiana which are both univoltine, ***M. pyxidifera*** has two annual broods peaking late April and early-mid August (Fig. 2).

N.B. *Records of Louisiana insects found in all of our numerous hundreds of species accounts and other entomological publications over the past half century (1969-2022) were derived only from our personal research, unless specifically noted otherwise, or properly cited from past published scientific literature.*

Holland (1903) stated ***M. pyxidifera*** is rare in collections and its home is on the seaboard of the Southern States. **Covell** (1984) stated the range of ***M. pyxidifera*** includes Pennsylvania to Florida and west to Mississippi, occurring throughout the year and common southwards.

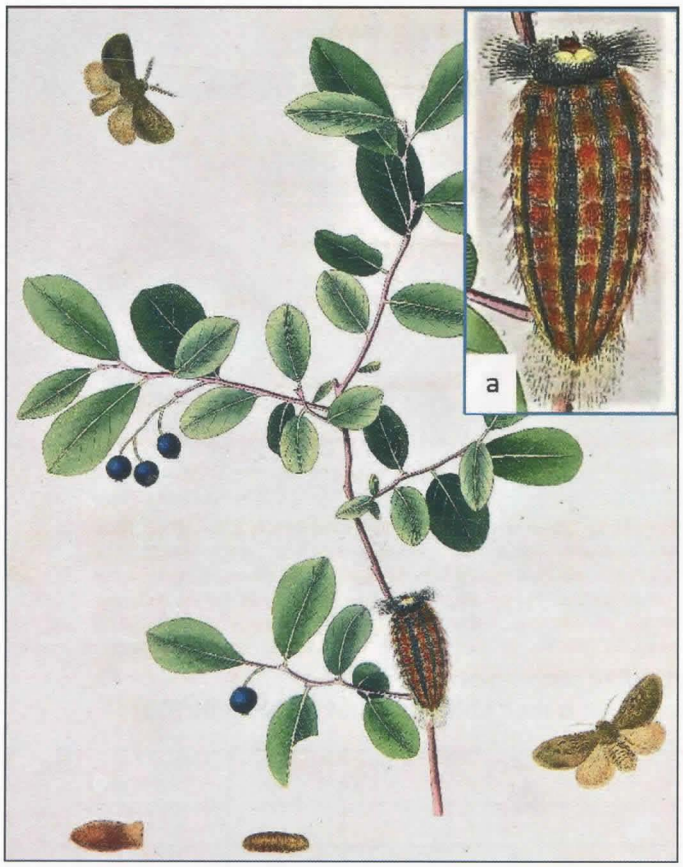

Fig. 4. Scanned and cropped image of ***M. pyxidifera***, adults, pupae, cocoon and larva feeding upon *Vaccinium*, plate illustrated in Smith, J.E., -Abbot, J., 1797, a. insert of enlarged image of larva.

Heppner (2003) stated the range of ***M. pyxidifera*** includes Pennsylvania to Florida and Missouri to Texas, January to December, and larvae feeding upon blueberry, cherry and oak.

Heppner (1997) illustrated and discussed a few species of ***Megalopyge*** occurring in the state of Florida, but did not mention ***M. pyxidifera***. Additionally, **Epstein** (1995-1997), **Beutenmüller** (1898), **Heitzman** and **Heitzman** (1987), **Heppner** (1995), **Powell** and **Opler** (2009), and **Profant** et al. (2010) and **Murphy** et al. (2011) did not address ***M. pyxidifera.***

The confirmed parish records in Louisiana are illustrated in Fig. 3.

***Abita Entomological Study Site (AESS):**
sec.24,T6S,R12E, 4.2 miles northeast of Abita Springs, Louisiana USA.

Literature Cited

Beutenmüller, W., 1898. *Descriptive Catalogue of the bombycine moths found within fifty miles of New York City*. Bulletin American Museum of Natural History. Vol. X. p. 353-448, including XXIII plates.

Brou Jr., V.A., 2017. Megalopyge opercularis (Smith & Abbot, 1797) (Lepidoptera: Megalopygidae) in Louisiana. *South. Lepid. News* 39: 211.

Brou Jr., V.A. and **C.D. Brou,** 2022. Megalopyge crispata (Packard, 1864) (Lepidoptera: Megalopygidae) in Louisiana. *South. Lepid. News* 44: 209-210.

Covell, Jr., C.V., 1984. *A field guide to the moths of eastern North America.* The Peterson Field Guide Series No. 30. Houghton Mifflin Co., Series No. 30. Houghton Mifflin Co., Boston. xv + 496pp., 64 plates.

Epstein, M., 1995(1997). Revision and phylogeny of the Limacodid-Group families, with evolutionary studies on Slug Caterpillars (Lepidoptera: Zygaenoidea). *Smithsonian Contributions to Zoology*, 34: 1-13.

Heitzman, J.R. & **J.E. Heitzman,** 1987. *Butterflies and Moths of Missouri.* Missouri Dept. of Conservation, 385 pp.

Heppner, J.B., 1995. *Urticating caterpillars in Florida: 2. Slug caterpillars (Lepidoptera: Limacodidae).* Ent. circular No. 372, Div. Plant Industry, Fla. Dept. Agr. & Consum. Serv. 4 pp.

Heppner, J.B., 1997. *Urticating Caterpillars in Florida: 3. Puss Caterpillar and Flannel Moths (Lepidoptera: Megalopygidae).* Entomology Circular No. 381, Florida Dept. Agric. & Consumer Services Division of Plant Industry.

Heppner, J.B., 2003. Arthropods of Florida and neighboring land areas, vol. 17: Lepidoptera of Florida, Div. Plant Industry, Fla. Dept. Agr. & Consum. Serv., Gainesville. x + 670 pp., 55 plates.

Holland, W.J., 1903. *The Moth book.* New York, Doubleday, Page & Co. reprinted 1968 New York: Dover, 479 pp., 48 plates.

Murphy, S. M., Lill, J.T., and **Epstein, M.E.,** 2011. Natural History of Limacodidae Moths (Zygaenoidea) in the Environ of Washington D.C., *Journal of the Lepidopterists' Society* 65(3), 2011, 137–152.

Powell, J.A. and **P.A. Opler,** 2009. *Moths of Western North America*, Univ. Calif. Press xiii + 369 pp + 64 plates.

Profant, D., E.H. Metzler, and **S. Passoa,** 2010, The Slug Caterpillar Moths (Lepidoptera: Limacodidae), and Other Zygaenoidea of Ohio, *Bulletin of the Ohio Biological Survey*, **16** (3): 1-66.

Smith, James Edward, -Abbot, John, 1797. *The natural history of the rarer lepidopterous insects of Georgia: including their systematic characters, the particulars of their several metamorphoses, and the plants on which they feed.* Collected from the observations of Mr. John Abbot, many years resident in that country. London, T. Bensley. 208 pp.

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DIANA FRITILLARY AND MT. MAGAZINE, ARKANSAS: A HISTORICAL PERSPECTIVE

BY

GARY NOEL ROSS

INTRODUCTION

I graduated from a high school in New Orleans on Tuesday June 3, 1958. Two weeks earlier, my parents asked what I would enjoy as a graduation present. With a deep-rooted propensity for butterflies, I didn't think twice: "A trip to Mt. Magazine, Arkansas."

My response was not random. To the contrary. An AAA Road Atlas indicated that the nearest mountains to the soggy lowlands of New Orleans was northwest Arkansas. At an elevation of 2,753 feet, Mt. Magazine was touted as "the highest peak between the Rockies and Appalachian mountains, accessible by paved road from Paris, Arkansas."

Furthermore, my two "Butterfly Bibles"—*A FIELD GUIDE TO THE BUTTERFLIES OF NORTH AMERICA, EAST OF THE GREAT PLAINS* by Alexander B. Klots (1951) and *THE BUTTERFY BOOK* by W.J. Holland (1931)—indicated that one of the more eye-popping butterflies in the East, the Diana—currently, Diana fritillary or *Speyeria diana* (Cramer, 1777)—could be found primarily in the southern Appalachian Mountains, but also in the highlands of Arkansas. The references described the butterfly as medium-sized and sexually dimorphic (wings of males and females differ): males dark brown with broad orange borders, females black with patches of powder blue. In my way of thinking, Mt. Magazine fit the bill for a Diana habitat. And so, a vacation there would be the quintessential graduation gift for an eighteen-year-old New Orleanian enamored with butterflies. Right?

And there was more. Turns out close friends of our family had vacationed on Mt. Magazine the summer before. They assured us that the cool fresh mountain air and vistas were well worth the two-day drive of 550 miles. The vacationers had even retained an advertisement distributed by the tourist lodge atop the mountain. And although extended out-of-state road travel in 1958 was no simple matter (remember, no interstate highway network, no big chain motels, and few fast food eateries), my parents were piqued. (After all, summers in New Orleans were noted to be extremely unpleasant.) So, just before daybreak on Saturday June 7, my father, mother, younger brother (Grant), and I embarked upon an adventure to "The Natural State."

By sunset on the second day, we were standing before the registration desk of the Mount Magazine Lodge. Constructed of tan colored sandstone, the retreat was perched on what appeared to be a flat-topped mountain rimmed by craggy bluffs that plunged precipitously through heavy mixed forest to a verdant valley and a large blue lake below. The setting was impressive, idyllic. Our reservation had procured for the next six nights one of the 13 rustic cabins associated with the lodge.

Fig. 1. View of Mt. Magazine from a northern approach following a winter ice/snow storm. The mountain has a tableland appearance because of its upper broad plateau at 2,500 feet in elevation. The actual summit, "Signal Hill" (2,753 feet and the highest point in Arkansas), is a knoll/hillock atop the plateau. In 1997, 2,234 acres of the upper mountain were dedicated as "Mt. Magazine State Park." On May 1, 2006, the park officially opened to visitors.
January 13, 1997.

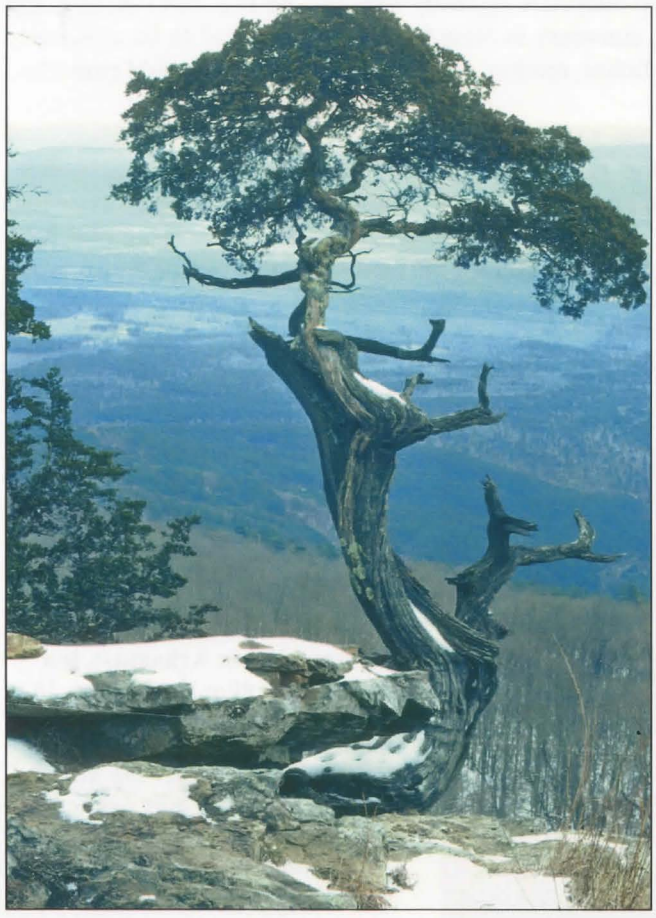
But then, misfortune. On our first morning, we awoke to a world that was shrouded in a gray, cool mist. That did not bode well, of course, for butterfly collecting. With little to do, we walked to the lodge where we could wile away the hours sitting before the log fire and socializing with other guests and lodge staff. The latter were cheery and pragmatic: "The mist is due to a low-hanging cloud that will lift at any minute." I put on a brave face, but inside, I was deflated—even I dare say, skeptical.

On Day Three, however, our travail was over. SUN! We now had an unobstructed view of the valley below dominated by farmland, pastures, and a large irregularly shaped lake. My psyche was re-energized. As lagniappe, our cabin was positioned perfectly for a nature-lover. First, the cabin was at the end of a long drive through a swath of semi-dwarf hardwood trees — excellent habitat for shade-loving butterflies. And second, the cabin backed onto a grassy opening carpeted with brightly colored wildflowers — a banquet for sun-loving butterflies.

Suddenly, a "eureka moment." With the azure sky beaming sunshine and warmth on the land, the glade was soon punctuated by kaleidoscopic butterflies fluttering and reeling about; most were unrecognizable because of my south Louisiana background. Each evening I poured over my field guide to identify the novel specimens I had netted earlier. But my ultimate reward was not to be. After nearly a week of unbridled romping, I had spotted nary a single Diana.

Fast forward 32 years to 1990. My interest in the Diana remained undaunted. So, after an early retirement from teaching, I decided to return to Mt. Magazine to search for the elusive butterfly. And for the subsequent 12 years, the mystical Roman "Goddess of the Hunt" smiled on me!

My research on Mt. Magazine consisted of a large number of personally funded excursions between 1990 and 2002—including annual "Fourth of July Butterfly Counts" administered by the Xerces Society and North American Butterfly Association (NABA) between 1992 and 2002, and a National Geographic Society Research Grant for the entire year of 1996. Because the lodge and cabins had been destroyed by the early 1970s, the plateau had returned to a quasi wild state—a checkerboard of hardwood forest mixed with some evergreen pine and redcedar, grassy/wildflower roadsides, and wildflower meadows; in short, a crucible for butterfly diversity. Most nights I camped in the back of my covered pick-up that I parked at "my" old cabin site from 1958. When a hot shower was "mandatory," or when air temperatures dropped into the uncomfortable range, I drove into Paris to secure a room in the modern Blakely Inn.



In summary, by 2002, I had amassed (and published) considerable data—some validating work previously recorded, some new. My general butterfly surveys tallied 91 species out of a total of 152 (residents and migrants) for the entire state. Of these, 90 are considered breeding residents out of the state's recorded 127. Put another way, Mt. Magazine is home to at least 71 percent of Arkansas' resident butterflies and 60 percent of its total species (residents and migrants).

Fig. 2. Eastern redcedar (*Juniperus virginiana*) in aftermath of ice/snow storm (January 8, 1997) atop bluff near the Old Lodge. The stalwart is estimated to be 200+ years old and is the acknowledged signature image for Mt. Magazine. January 13, 1997.

That said, this historical perspective on *S. diana* and Mt. Magazine is an effort to codify data and to compile a comprehensive bibliography to benefit future researchers who might be inspired to inaugurate research in the new state park. Fresh empirical research would be particularly relevant. Consider: In the mid 1990s, a substantial permanent water conduit and pumping station were installed between a large lake at the base of the mountain and the plateau—obviating a future water crisis on the plateau (a critical problem in the past). Then, on April 9, 2004, development of modern guest facilities began in earnest on the plateau. Two years later, May 1, 2006, 2,234 acres of the plateau were christened as the state's newest recreational destination: *Mount Magazine State Park.* Advertised as the "crown jewel of the Arkansas state park system, showcase facilities include a multi-unit/multi-storied lodge (60 guest rooms, restaurant, conference room, indoor pool), furnished cabins (13), campsites (18), and improved roads. For certain, the development has wrought permutations since the era when I endearingly and metaphorically referred to Mt. Magazine as the "Garden of Eden." Politics aside, documentation of those changes and comparing them with what was predicted by the initial "Environmental Impact Statement" promulgated by the U.S. Forest Service in 1993 should provide a treasure trove of data for modern conservation biologists.

Fig. 3. Male Diana fritillary (DF) (*Speyeria diana*) nectaring on butterfly milkweed *Asclepias tuberosa*), south face of the plateau. The plant provides nectar for most butterflies and is the reproductive host for the monarch (*Danaus plexippus*). July 1996.

Fig. 4. Female Diana fritillary (DF) (*Speyeria diana*) on rough blazing star (*Liatris aspera*), a common summer wildflower that is a popular source of nectar. September 1992.

FACTS AND THEORIES

Below are details salient to the Mt. Magazine-Diana fritillary relationship:

1. Data on Mount (Mt.) Magazine. Location: 35° 10' 0.75" N latitude and -93° 38' 24.60" W longitude in southeast Logan County Arkansas 45 miles east of the AR-OK border. The closest community is Paris, just under 20 miles to the north northwest; Fort Smith is 60 miles to the west northwest; and Little Rock, the state's capital, is 100 miles to the southeast. Mt. Magazine is a monolith that rises from the broad Arkansas River Valley (and to a lesser degree, the Petit Jean River Valley); both run in an east-west direction between the Boston Mountain range to the north and the Fourche Mountain range (subdivision of the Ouachita Mountains) to the south. The actual summit is named "Signal Hill." At 2,753 feet above sea level, it is the official high point for the state. This pinnacle, however, is a knoll (hillock) atop a broad tableland, aka plateau/mesa 2,500 feet in elevation, seven miles in length (east-west) and barely one mile in width. As such, the monolith appears "flattened" but rimmed by sheer rock bluffs, Mt. Magazine represents an eroded landform created when bedrock in the Arkoma Basin uplifted and disintegrated, revealing thick sequences of sandstones and shales. These formations date back on the Geologic Scale to the ancient Pennsylvanian Period (323.2-298.9 million years ago) of the Paleozoic Era, and are analogous to many outcrops within the Appalachian Mountains in the East. There is limited permanent water on the upper mountain — only a few weak springs. Precipitation averages 54 inches per year, and is well distributed. Heavy fogs occur on an average of 8.5 days/month. Summer temperatures can be 10-15 degrees cooler than those in the valley below. Winters can be severe: snow, ice, and wind can create

frequent wind chills below zero F. Much of the mountain is forested, but openings occur in disturbed areas; there are no Rhododendrons as in the Appalachians. The forest is of recent origin, having developed via old field succession. Eleven distinct plant communities are represented: "mesic oak-hickory hickory" is dominant (especially on the northern slope) followed by "xeric oak-hickory forest" (especially on the southern slope). "Xeric sandstone glades" flanked by evergreen redcedar on the southern rim of the plateau generate seasonal displays of wildflowers. Since the mid 1880s, various levels of human habitation and development have been prominent. In 1900, for example, the Town of Mt. Magazine was organized and the Skycrest Hotel was constructed. Later, the Buckman Inn (including a swimming pool) was constructed so that the plateau became a popular recreational site. In 1934, the federal government acquired the mountain but soon ceded it to the U.S. Forest Service. Between 1938 and 1941, the Civilian Conservation Corps (CCC) developed a sizable lodge with restaurant and 13 individual cabins (south rim), primitive campsites, and picnic areas. In 1971 the lodge burned; cabins were vandalized and burned shortly thereafter. For the next two or so decades, the mountain remained low key—a primitive recreational venue patronized by hikers, bikers, rock climbers (best locale in entire Mid West), hang gliders, nature watchers, campers, photographers, and painters). The mountain is home to a large number of species that are considered of concern, that is, listed under either a federal or state PETS program (Proposed, Endangered, Threatened, Sensitive). Of these, 19 are plants, 4 are vertebrates, and 11 are invertebrates (the latter includes *Speyeria diana*);

Fig. 5. Male and female DFs (ventral) feeding on eastern purple coneflower (*Echinacea purpurea*). Extreme sexual dimorphism is attractive to collectors. (Rare bilateral gynandromorphs have been reported, too.) Composite flower head provides abundant nectar at a single feeding station. July 1997.

Fig. 6. Original two-toned leaflet advertising Mt. Magazine Lodge and Cabins. Front side. June 1958.

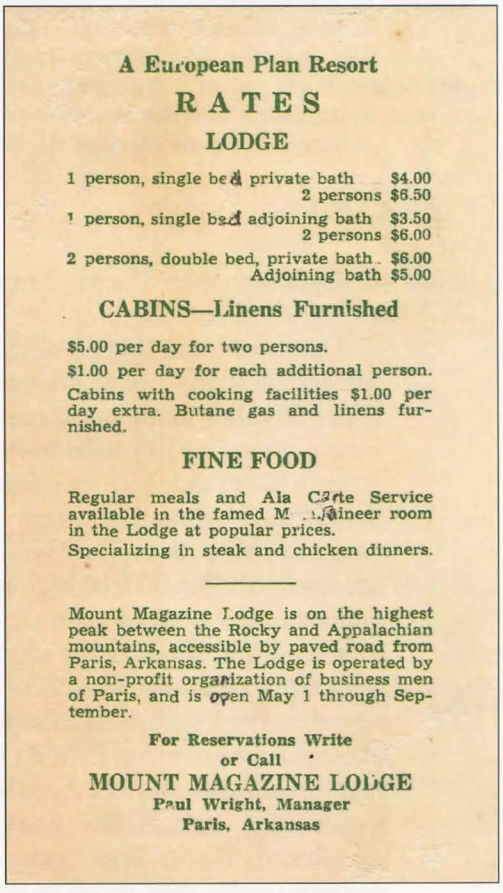


Fig. 7. Original two-toned leaflet advertising Mt. Magazine Lodge and Cabins. Back side. [NB: Mt. Magazine is not "the highest peak between the Rocky and Appalachian mountains." Elevations in North and South Dakota, Nebraska, Oklahoma, and Texas exceed 3,500 feet.] June 1958. ➜

2. In Roman mythology, *Diana* is the goddess who symbolizes the hunt, wild animals, fertility, childbirth, and the moon. The deity is the counterpart of the Greek goddess *Artemis*;

3. The historic range of *Speyeria diana* is recorded to be native to the southern Appalachian Mountains of eastern North America, westward through Ohio and Indiana, and terminating in the Interior Highlands of the Ouachita-Ozark mountains of Arkansas, Missouri, and Oklahoma. However, throughout the decades, the smaller cohorts of the Midwest — and probably those in Missouri and Oklahoma as well — have been extirpated. Since the early 1990s, the epicenter for the extant western population has been the uplands of northwest Arkansas, especially, Mt. Magazine. Consequently, the current cohorts in Arkansas are isolated from those in the East;

Fig. 8. Original lodge (26 guest rooms) and rustic cabins (13) skirting south-facing rim of the plateau. Second-most-eastern cabin was rented for a week by author's family to celebrate his high school graduation. Individual photos beginning top far left and moving clockwise: Old Lodge (front view); interior of Lodge with father (Cecil), author, and brother (Grant) kneeling beside mounted deer; the "Ross Cabin" (front view) east of lodge; the "Ross Cabin" (back view with father and brother). Photos by Shirley Ross. June 11, 1958.

Fig. 9. Interior of the "Ross Cabin" in 1958. Author's mother (Shirley) and father (Cecil) standing with younger brother (Grant) tending fireplace. Photo by author, mother's camera. June 11, 1958.

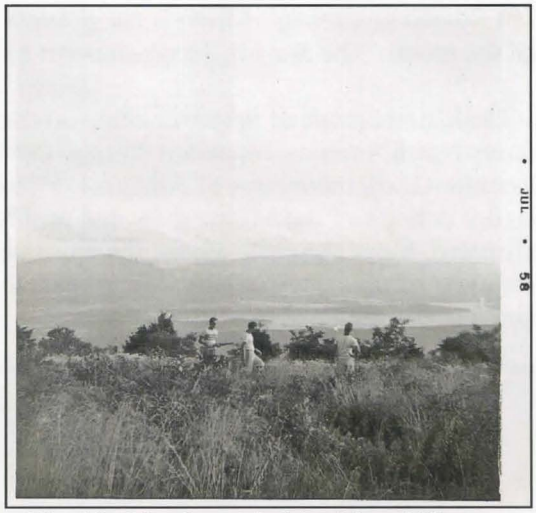


Fig. 10. Meadow (glade) with wildflowers behind the "Ross Cabin" in 1958. Father in lead, followed by author, and then brother (carrying BB gun). Photo by Shirley Ross. June 12, 1958.

4. The species has but one generation each year (univoltine), a characteristic shared by all species within the genus *Speyeria*. Males eclose usually between late May/early June through early July, and remain on the wing until early August; females don't take to the wing until early July, and fly through October or until the first killing freeze;

5. S. diana was (at least until 2002) common on the plateau; the congeneric, great spangled fritillary (*S. cybele*), was consistently more common and more widespread. The population size of *S. diana* based on "capture-recapture" experiments was estimated to be approximately 200 with little fluctuation during the years of study. Individuals could also be found along forest roads on the lower slopes of the mountain (particularly the unpaved Spring Lake Road);

6. Both male and female Diana fritillaries will visit cultivated flower gardens in nearby residential communities (Corley, Havana, Magazine, Paris, Subiaco, and Waveland, for examples) if suitable nectar sources (primarily tall zinnias, eastern purple coneflowers, and butterfly milkweed) are being cultivated;

Fig. 11. Author seated on a section of the original rock foundation for the 1958 "Ross Cabin." Common blue violet (*Viola sororia*), a reproductive plant (host) for *S. diana*, was common in cracks of the shaded asphalt driveway. Photographs by author's mother (see Fig. 8) helped identify venue after 38 years. June 1996.

Fig. 12. Old Lodge site on edge of plateau (2,500 feet). Below, Petit Jean River Valley is partially obscured by low clouds. July 1995.

7. Adults are voracious nectar feeders. Males are particularly addicted to the flowers of native butterfly milkweed (*Asclepias tuberosa*) and eastern purple coneflower (*Echinacea purpurea*) growing in sunny to partially shaded arenas. On the other hand, females have a propensity for the following (listed in chronological order of flowering): butterfly weed, eastern purple coneflower, wild bergamot (*Monarda fisulosa*), mountain mint (*Pycnanthemum tenuifolium*), rough blazing star (*Liatris aspera*), tall thistle (*Cirsium altissimum*) and field thistle (*Cirsium discolor*). All are relatively common in sunny to partially shaded habitats, and most produce an inflorescence that is commonly referred to as "composite" (currently classified within the family Asteraceae). The multitude of floral nectaries compressed within a single flower head accommodates a pollinator for an extended period of time, thus conserving energy.

Fig. 13. Service road to USFS fire lookout tower at west end of plateau. Fires from frequent lightning strikes perpetuate a limited landscape of scrubby post oak (*Quercus stellata*) and grass intermingled with wildflowers. July 1992.

Fig. 14. Cabin of forest ranger at west end of plateau enshrouded by fog. Eastern purple coneflower and yellow daylilies (*Hemerocallils fulva*) in foreground. Summer fogs help nurture wildflowers and butterflies. June 1993.

8. Adult nectar plants engage in pharmacophagy, that is, synthesize metabolically active phytonutrients, aka phytochemicals, secondary plant substances, that have nothing to do with inherent nutrition but rather are directly used for defenses against predators and parasitoids, and in addition, serve as potent anti-microbial and anti-inflammatory "drugs" for insects. These unique chemicals theoretically contribute to a female's inordinate fecundity and longevity by boosting metabolism;

9. Males visit scat or urine to extract salts and minerals. At this time, the butterflies can be easily approached;

10. On cool autumn days, a female may spend one to two hours on a single sunlit inflorescence before returning to a shaded venue where she will rest for another two to three hours. In late autumn, females may remain on a single inflorescence for the entire day, thereby maximizing energy conservation;

Fig. 15. Aerial view of Mt. Magazine following ice/snow storm (January 8, 1997). Old Lodge site (center left) is atop the south-facing plateau rimmed by steep bluffs. "Signal Hill" is the knoll (right of center, towards top of photo) visible through the leafless hardwood trees. Dark patches near bluffs are evergreen eastern redcedar trees. January 12, 1997.

11. As with all *Speyeria*, *S. diana* is confined to various species of violets (*Viola*) for reproductive (host) plants. On Mt. Magazine, the common blue violet (*Viola sororia*), the most common violet within the mountain's hardwood forests, serves as the butterfly's major host. Arrowleaf violet (*V. sagittata*), and birdfoot violet (*V. pedata*) are also common in shaded areas, and may serve as alternate hosts.

12. Females exhibit reproductive diapause, that is, they delay depositing their bounty of ova (1,300-1,500), until the cool period of autumn (September-October). At such time, a female remains at her nocturnal perch until approximately 10:30-11:00 am. She then flies to a nearby thistle head and spends the next 2-3 hours walking about the head probing each floral nectary—often oblivious to all activity nearby. By 1:00 pm, she flies into the canopy of the adjacent forest and then descends immediately to the ground where she will begin walking slowly and probing detritus with the tip of her abdomen. To lay, she curls her abdomen under dead plant material (often the desiccated leaves of the host violet as well as detritus in the vicinity) to deposit a single egg. Within 4-5 seconds, she moves a few inches, repeating the probing and depositing. Usually, a maximum of 6-12 eggs will be dropped before she flies to a sun-dappled leaf in the forest where she rests with wings outstretched for maximum heat absorption. After 20 to 30 minutes, she resumes egg-laying. The alternate behaviors continue until approximately 3:00 pm at which time she will have deposited 30-45 eggs. After, the female abandons the forest to resume nectaring on a thistle head—often the same specimen that was appropriated earlier in the day. At approximately 4:45 pm, the butterfly seeks shelter for the impending cool night. This same routine occurs each day until all eggs are deposited or until disease or predators exact their toll;

Fig. 16. Sign identifying actual summit atop the 2,500 foot plateau of Mt. Magazine. Forest canopy during summer prevents panoramic vistas, but creates shade for comfortable hiking. July 1995.

Fig. 17. Hiking trail to "Signal Hill" from plateau. Naturalized daylily and blackeyed Susan (*Rudbeckia hirta*) in full bloom. July 1997.
➜

13. Eggs hatch within 3-5 weeks in the cool autumn. First instar larvae nibble their evacuated shell, but do not search out violets, which at this time are desiccated. Instead, larvae enter diapause (hibernate) within the ground litter until the warmth of spring renews plant growth;

14. First instar larvae possess long, translucent, bulbous setae (reported also in some species of satyrs (family Satyridae) that are theorized to retard desiccation and buffer against predators;

15. Larvae break diapause in late April or early May. Feeding is nocturnal—presumably an adaptation to lessen predation. Development races through the next two weeks. If a host becomes defoliated, the larva crawls to another, which is usually in close proximity;

16. A post first instar larvae is endowed with a single, small, globous, fleshy, and eversible gland beneath and between its head and first thoracic segment (prosternal). The gland emits a faint unpleasant odor that is theorized to be a defense mechanism, essentially analogous to the dorsal and more conspicuous double osmeteria of swallowtail larvae;

17. Pupation is on a low stem or leaf near ground level where dark coloration imports camouflage. Adults eclose as described previously;

18. Males and females spend the night beneath the leaves of trees in nearby forest cover. Females rest higher (9-12 feet above the ground) than males (usually within 2-4 feet of the ground). The coloration of the ventral wings mimics dead leaves, and is as such, provides valuable camouflage from potential predators;

Fig. 18. Sign identifying site of Old Lodge on southern face of the plateau (2,500 feet) following an ice/snow storm (January 8, 1997). Winter cold and wind are responsible for stunted appearance of trees. January 13, 1997.

Fig. 19. Sign along highway from Paris identifying the upper mountain as an official recreational area. July 1992.

19. Violet plants (several species) are usually common within both disturbed and non-disturbed habitats throughout the general range of *S. diana*. Therefore, the dramatic reduction of the geographical range of the species over the years seems to be governed not so much by the extirpation of host plants due to human settlement (as is so often the over-riding paradigm for most lepidopterans) but rather by the reduction or elimination of a female's specific sources of nectar for energy and phytonutrients that are required in a specific blooming sequence. Of course, reduction in natural habitats by whatever means reduces flower resources, and so human encroachment likely does indirectly impact the butterfly's well-being. Fortunately, between 1990 and 2002, Mt. Magazine fulfilled all stringent requirements for a healthy population of *S. diana*;

20. Periodic small controlled burns during calm weather between October and April encourage pioneer plants such as violets, eastern purple coneflower, butterfly milkweed, rough blazing star, wild bergamot, mountain mint, and fall thistle—all critically important in the reproductive cycle of *S. diana*. In addition, because the burns are small, adjacent woodlands remain untouched. Thus the hibernating immature stages of the butterfly escape incineration;

21. Although *S. diana* is noted to be a denizen of hardwood forests in upland elevations, there is an isolated extant population in southwest Arkansas (Hempstead County near the town of Columbus). Known as Rick Evans Grandview Prairie Wildlife Management Area, the conservation/recreational site consists of 4,885 acres with the nation's largest contiguous tract of "blackland prairie"—an ecosystem of low, gently rolling topography with moist, organically rich soils carpeted in grassland vegetation punctuated with hardwood forest. At an elevation of barely 370 feet and approximately 60 miles north of the Louisiana/Arkansas border, the locality seems improbable for *S. diana. S. cybele,* or **any** species of *Speyeria*. Nevertheless, the site is the established home of both species, at least since monitoring began in 2003 and 2004 (mainly by Craig Marks of LA). The *S. diana* population consists of only a hundred or so individuals, but remains relatively stable; the population of *S. cybele* is consistently lower (surprisingly so!). Therefore, this disjunct cohort of both species is effectively the most southern and most lowland in the United States. How can this be explained? While the southern locale is warmer than those farther north, southeast Arkansas does experience winters with at least one snow/ice event. In addition, the compliment of plants in the two disparate geographies is similar; butterfly milkweed, eastern purple coneflower, wild bergamot, mountain mint, blazing star, thistles, and several species of violets. Therefore, the Hempstead County locality appears to be ecologically appropriate for the butterfly.

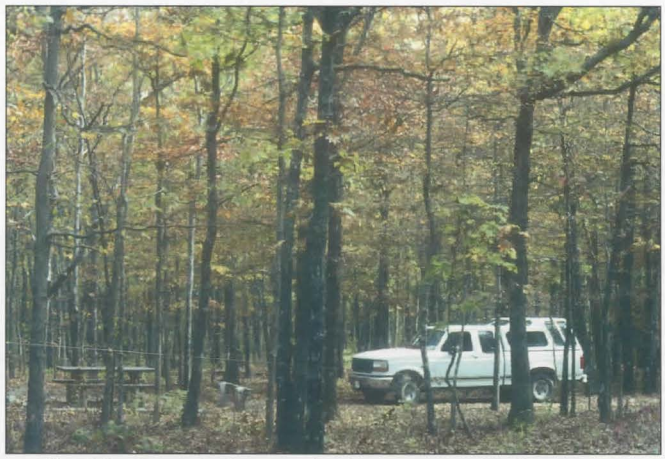


Fig. 20. Deserted campsite in autumn. Fallen leaves from the deciduous oak and hickory trees provide winter cover for first instar larvae of both *S. diana* and *S. cybele* from eggs deposited in September/October. October 1996.

Fig. 21. Deserted campsite during a winter ice/snow storm (January 8, 1997). Annual snow fall provides insulation for hibernating first instar larvae of both *S diana* and *S. cybele.* January 10, 1997.

Fig . 22. Aftermath of ice/snow storm (January 8, 1997). Spur to Old Lodge site from main road on plateau. January 13, 1997.

Fig. 23. Hang glider paused to launch from a pre-1971 cabin site. July 1996.

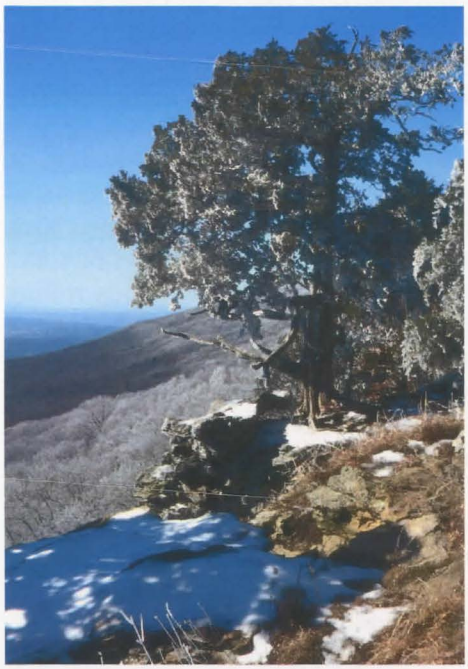


Fig. 24. Eastern redcedar on bluff near Old Lodge site following an ice/snow storm. Winds rising from the valley below have stunted the tree with an estimated age of 200+ years. January 13, 1997.

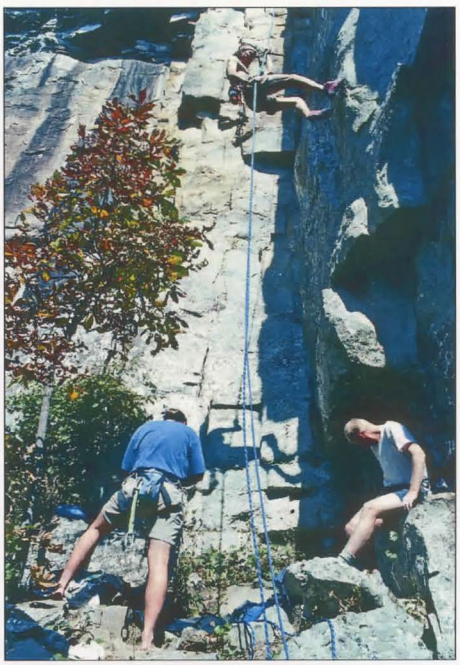


Fig. 25. Rock climbers ascending a south-facing bluff of the plateau — regarded as the best climbing site in the entire Midwest. Jagged/sheer sandstone formations are ancient, dating back to the geologic Pennsylvanian Period (323.2-298.9 million years ago). July 1992.

22. The presence of both *S. diana* and *S. cybele* at the southern limit of their geographical range and in a different ratio to each other offers a glimpse into the population dynamics of the two species. Consider: According to an ecological dictum known as "competitive exclusion principle," aka "Gause's Law/Principle" proposed in 1934, "no two species can occupy the same niche." Conclusion? Patently, there is a biological nexus between *S. diana* and S. *cybele*, Simply put, the two cogenerics are competitors. *S. cybele* has a strategic advantage on Mt. Magazine (and virtually all locales throughout the eastern U.S.), whereas *S. diana* outcompetes *S. cybele* in an extreme southern habitat, or so it seems. But the specific factors that are determining the differences in reproductive success of each species remain a mystery. The dilemma seems rife for future research by future ecologists.

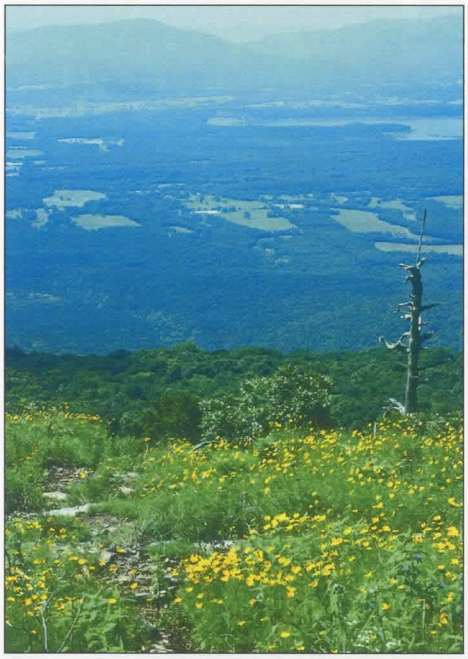


Fig. 26. Xeric sandstone glade behind an old cabin site used as launch site by recreational hang gliders. Pole atop dead tree is the remains of a wind sock. A private pasture in the agricultural Petit Jean River Valley below provides flat ground for landings. July 1996.

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Fig. 27. Author netting a female DF on butterfly milkweed in the xeric sandstone glade behind the old cabin originally rented by the Ross family in June 1958. July 1997.

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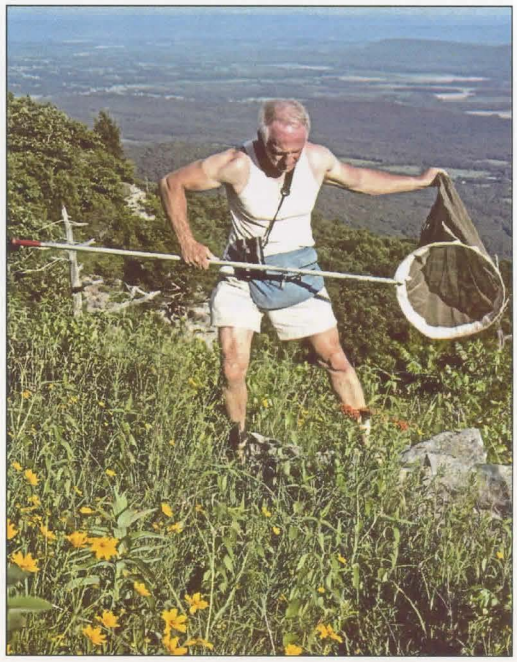

SPIN OFFS FROM RESEARCH

The following were inspired by my research on Mt. Magazine and other locations throughout northwest Arkansas.

1. The plateau of Mt. Magazine has become internationally acknowledged and advertised as a "Butterfly Eden" and "Home of the Rare Diana Fritillary Butterfly";

2. The "First Annual Mt. Magazine International Butterfly Festival" (sponsored by the Paris Area Chamber of Commerce (formerly, North Logan County Chamber of Commerce) was spawned by the authors' several years of research). The festival premiered August 1-3, 1997. Approximately 10,000 visitors, the highest number for any similar event anywhere, attended. Places of origin included 35 U.S. states, three Canadian provinces, and five distant countries (Australia, Germany, Japan, Saudi Arabia, and Uganda). The event involved most schools and commercial establishments in Paris. Activities were offered in both downtown Paris and atop the mountain's plateau. Major events included the premiere of the author's multimedia sight/sound theatrical "Mt. Magazine, Arkansas: Fantasia" in the recently renovated *Paris Cinema* (including a special VIP event for representatives from state government). On Saturday morning, the festival was officially inaugurated with a costumed parade that involved loca l school children and their parents. Vendors from around the state set up booths on south side of the plateau to market their nature-oriented wares. The festival continued for the next several years. And with the untimely death of the internationally venerated Princess Diana of Wales on August 31, 1997, the name "Diana" took on an even more luminary status for the new state park. To this day, the mountain, the butterfly, and the deceased Princess of Wales are inextricably linked. But when the mountain became an official state park (May 1, 2006), festival offerings were pared down;

3. A 36" x 24" poster showcasing Mt. Magazine's butterflies was produced by the author and *Carma Graphix* (a silk-screen enterprise in Paris). The poster features 29 species in 34 images with a male and female Diana fritillary as center format. The initial run was 10,000 copies. Of these, 150 were signed

by the state's Lieutenant Governor Winthrop P. Rockefeller and yours truly for special gifts. Other copies were distributed (free) to most schools and *Welcome Stations* bordering the state prior to the 1997 festival. Remaining copies were marketed at the 1997 festival and beyond.

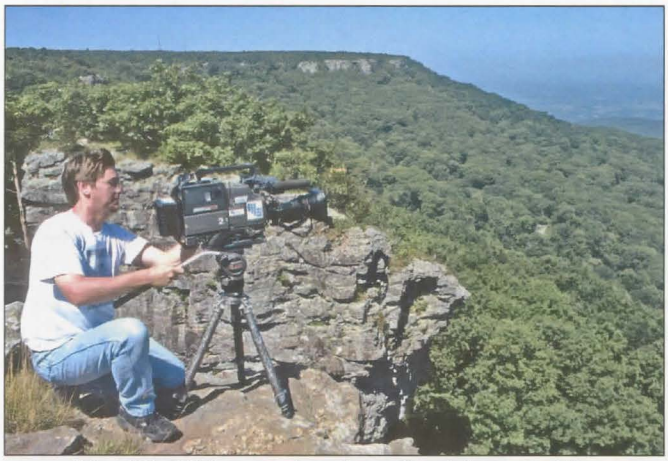

Fig. 28. Videographer from Louisiana Public Broadcasting (LPB) on northern slope of plateau filming for a new documentary featuring author. "*An Enchantment of Butterflies*" was released by LPB on August 24, 1997. June 1997.

Fig. 29. Author in back of camper-truck waiting for morning fog to lift. Open box of recently printed butterfly posters is partially visible in far right interior. April 1997.

PHOTO GALLERY

All images in color were taken originally with a Canon AE-1, 35 mm SLR camera loaded with Kodachrome 64 film (slide). The images were recently digitized with a Nikon Super Coolscan 5000 ED. Minor adjustments (cropping, lighting) were facilitated with Adobe Photoshop Elements 15 Editor. Black and white images from 1958 were taken with an Argus Argoflex Seventy-Five camera loaded with 620 film (2.25 x 2.25 inch format). Unless stated otherwise, all images are credited to the author.

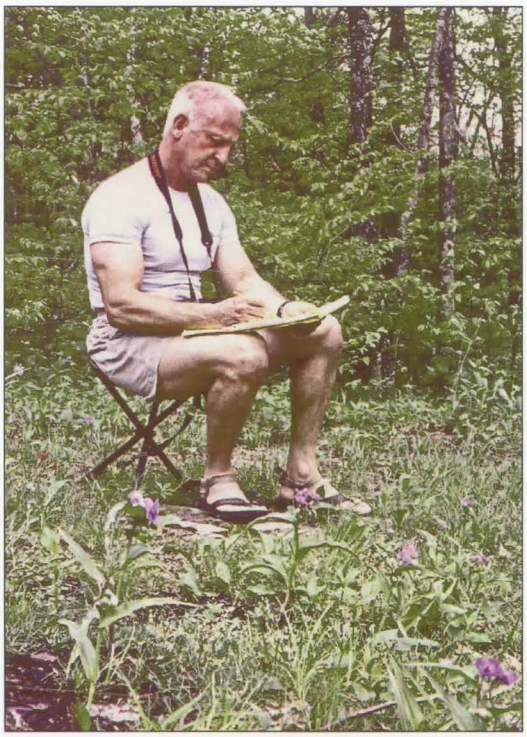

Fig. 30. Author taking notes in sunny location surrounded by spiderwort (*Tradescantia*). Scraggy hardwood forest in background is response to excessive winter cold and wind. May 1996.

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Fig. 31. Male DF basking on a boulder in a south-facing glade. Lanceleaf tickseed in full bloom. Flowers were attractive to many small pollinators such as bees, wasps, and flies, but not butterflies. July 1992.

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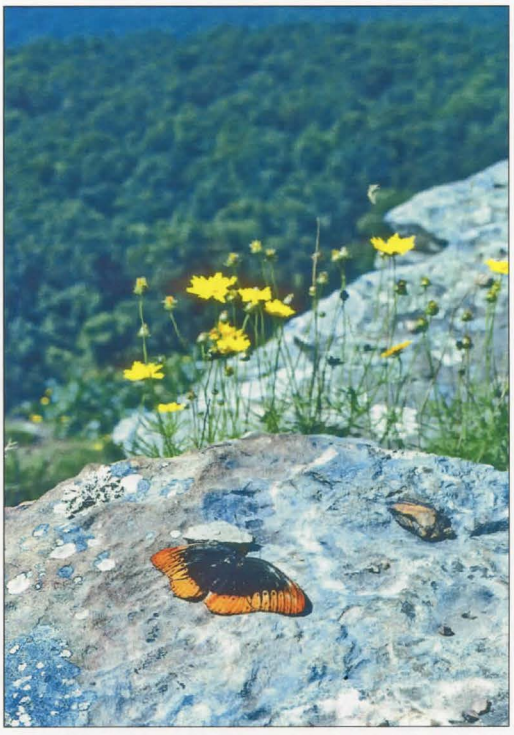

Fig. 32. Male DF feeding on human urine along roadside. Male butterflies frequently sample urine and feces for minerals and salts. July 1992.

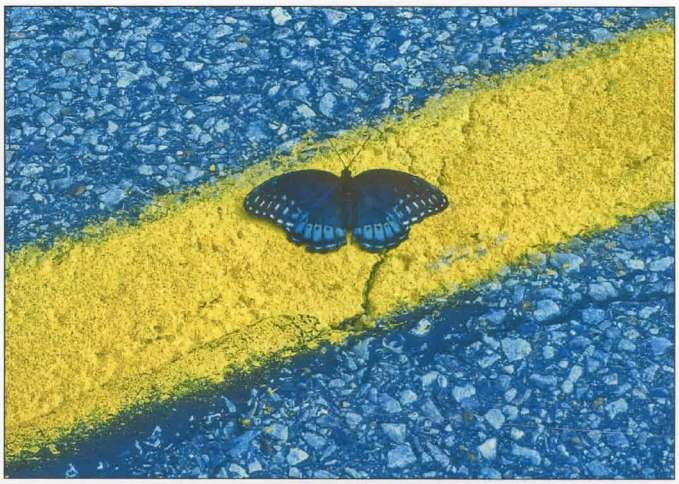

Fig. 33. Geriatric female DF basking on asphalt roadway on a cool autumn morning. Female may or may not have deposited her entire load of eggs. October 1995.

Fig. 34. Female DF settled in for the night 10 feet above the ground in a small hickory tree (*Carya* sp.). Underwings mimic tree bark and dead leaves. A clump of eastern coneflowers beneath the tree had been a feeding station until 8:10 pm. After, the butterfly flew up into the tree where it remained until 10:30 the following sunny morning when she then fluttered back to the coneflowers to resume feeding. August 1992.

Fig. 35. Male DF sheltered during a rain shower beneath eastern purple coneflower. Males typically spend the night inverted beneath leaves of shrubbery or lower branches of hardwood trees. Underwings mimic dead leaves. July 1997.

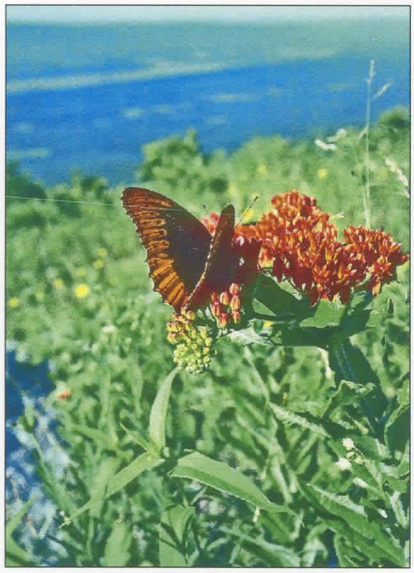

Fig. 36. Late season male DF nectaring on native butterfly milkweed, a showy and common summer wildflower that is visited by multiple pollinators. August 1992.

Fig. 37. Butterfly milkweed with male DF fritillary, zebra swallowtail (*Eurytides marcellus*), and pipe-vine swallowtail (*Battus philenor*). The flowers are favored by virtually all species of butterflies. July 1995.

Fig. 38. Two female DFs on tall thistle (*Cirsium altissimum*), a common fall wildflower with nectar critical for most pollinators still on the wing. July 1996.

Fig. 39. Female DF on autumn-flowering tall thistle. The branching habit creates multiple flower heads/nectaries. Adjacent woodlands provide a cool respite for satiated females. October 1994.

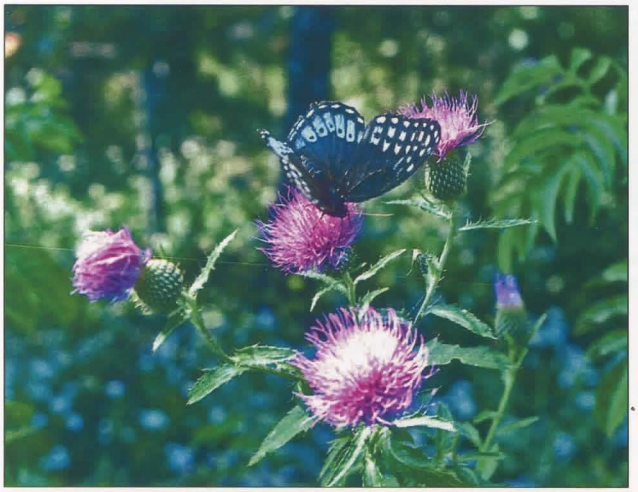

Fig. 41. Close-up of female DF on fall blooming tall thistle. Dense flower head accommodates extended periods of feeding, thus conserving energy. October 1994.

Fig. 40. Female DF and two painted ladies (*Vanessa cardui*) on rough blazing star (*Liatris aspera*). The abundant nectaries provide critical fuel for late season butterflies. September 1992.

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Fig. 43. Close-up, female DF nectaring on eastern purple coneflower, a summer wildflower that synthesizes phytochemicals. These chemicals are deemed important to the butterflies' metabolism. September 1996.

Fig. 42. Close-up, female DF on rough blazing star, a preferred nectar source. September 1992.

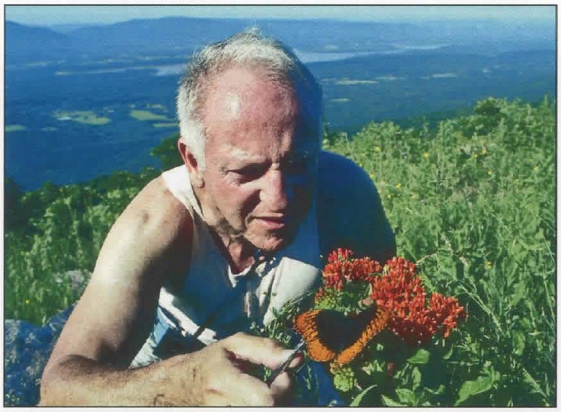


Fig. 44. Author with a male DF on butterfly milkweed in a sandstone glade, south-facing plateau. Petit Jean River Valley and Blue Mountain Lake in background. Photo first appeared in *National Geographic* magazine, November 2001 issue. May 1996.

Fig. 45. Author netting a male DF basking on a boulder in a glade dominated by spiderwort. Petit Jean River Valley and Blue Mountain Lake in background. Photo first appeared in *National Geographic* magazine, January 1997 issue. May 1996.

Fig. 46. Author marking a male Diana fritillary for capture/recapture study as part of his National Geographic Society research grant. Population was estimated to be approximately 200 individuals, but stable. July 1996.

Fig. 47. Female DF nectaring in a zinnia flower garden at a residence in Corley — a small community between Paris and Mt. Magazine. Both males and females were frequent summer visitors. Photo appeared on the front cover of *Butterfly Gardener* magazine, Fall 2019 issue. July 19, 1997.

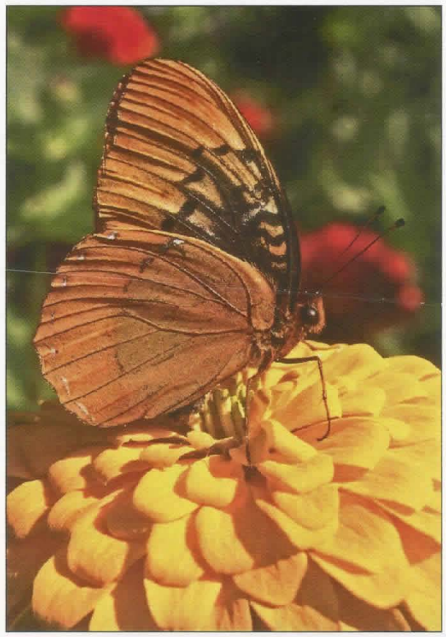


Fig. 48. Male DF on a tall garden zinnia growing in a Paris school-ground garden. July 1997.

Fig. 49. Sanddune wallflower (*Erysimum capitatum*), a rare western species that is stimulated by fire. Thirty-nine species of plants and animals are noted to be "of concern," a designation by the U.S. Forrest Service that indicates endemic, rare, threatened, or sensitive. *Speyeria diana* is the only butterfly listed. May 1997.

Fig. 50. Butterfly milkweed thriving along roadside due to infrequent mowing and low traffic. The showy species was a favorite of most butterflies. July 1996.

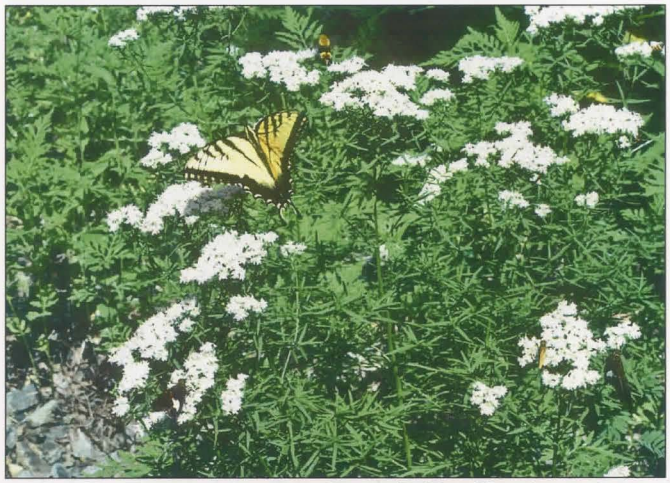


Fig. 51. Eastern tiger swallowtail (*Papilio glaucus*) on narrowleaf mountainmint (*Pycnanthemum tenuifolium*). Inherent phytochemicals in the nectar are considered vital for the reproductive success of both *S. diana* and *S. cybele*. June 1996.

Fig. 52. A controlled burn to reduce ground clutter in order to lesson chances for lightening-triggered infernos and to stimulate wildflower seeds. Small burn sizes rotate every 2-3 years. March 28, 1997.

Fig. 53. Woodland in spring after small controlled burn in early February. Fire stimulates new growth of violets, the exclusive hosts for all species of *Speyeria*. Birdfoot violet (*Viola pedata*) flowering. May 12, 1997.

Fig. 54. Author inspecting birdfoot violet for young larvae of DF. None was observed. Swath of dwarfed hardwood trees are in background. May 1996.

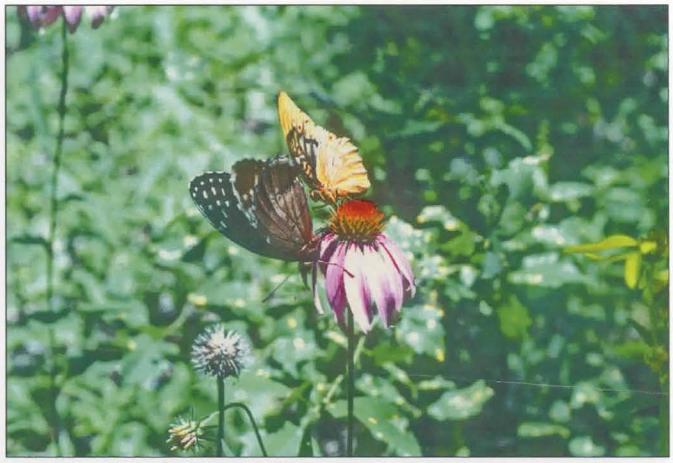


Fig. 55. A pair of DFs courting on eastern purple coneflower along forest edge atop plateau. Sexual dimorphism is striking. July 1993.

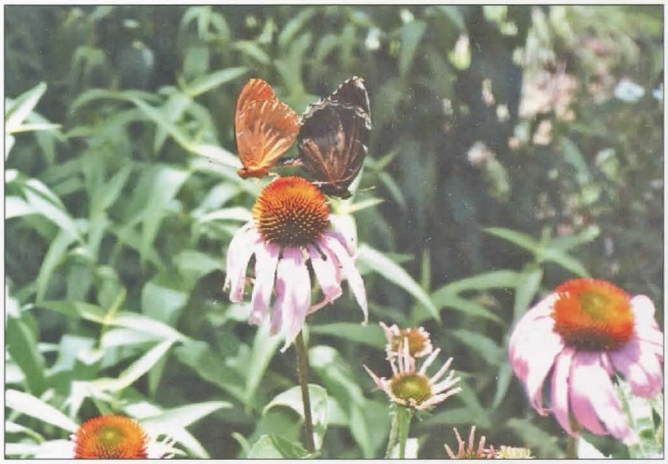


Fig. 56. Mating pair of Diana fritillaries on an eastern purple coneflower. Residential garden at the base of Mt. Magazine. June 20, 1997, 5:00 pm. Photo by the late Myra Lee Horn, Corley, AR.

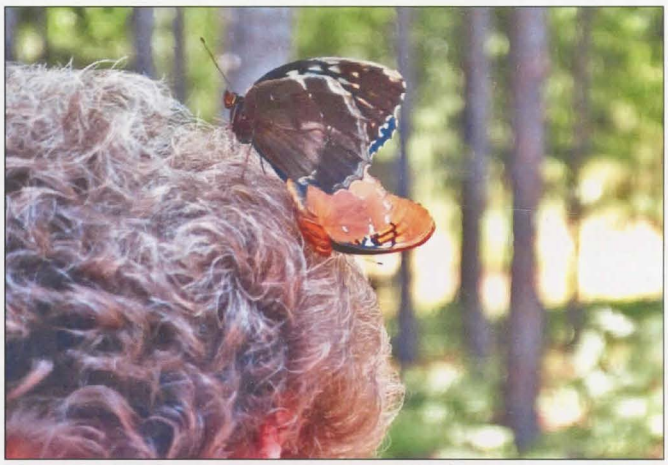


Fig. 57. Mating pair of Diana fritillaries resting on head of Mrs. Myra L. Horn watering her residential flower garden. June 20, 1997, 5:00 pm. Photo by the late JT. Horn, Corley, AR.

Fig. 58. Pregnant female DF near a common blue violet growing on the forest floor. Females oviposit in miscellaneous ground litter rather than violet plants that usually are desiccated at this time. September 1994.

Fig. 59. Close-up of female DF laying an egg in forest litter near dried violet plants. Females typically produce 1,300-1,500 ova, usually deposited between September and October. September 1996.

Fig. 60. Close-up of two three-day old eggs on a fallen dead leaf. Eggs are yellow at first, but then turn pink after a day or two, and steel gray on days 4-5. November 1996.

Fig. 61. Close-up of first instar larva. Dense translucent setae may prevent desiccation and protect against ground predators during the 5--6 months of hibernation. November 1996.

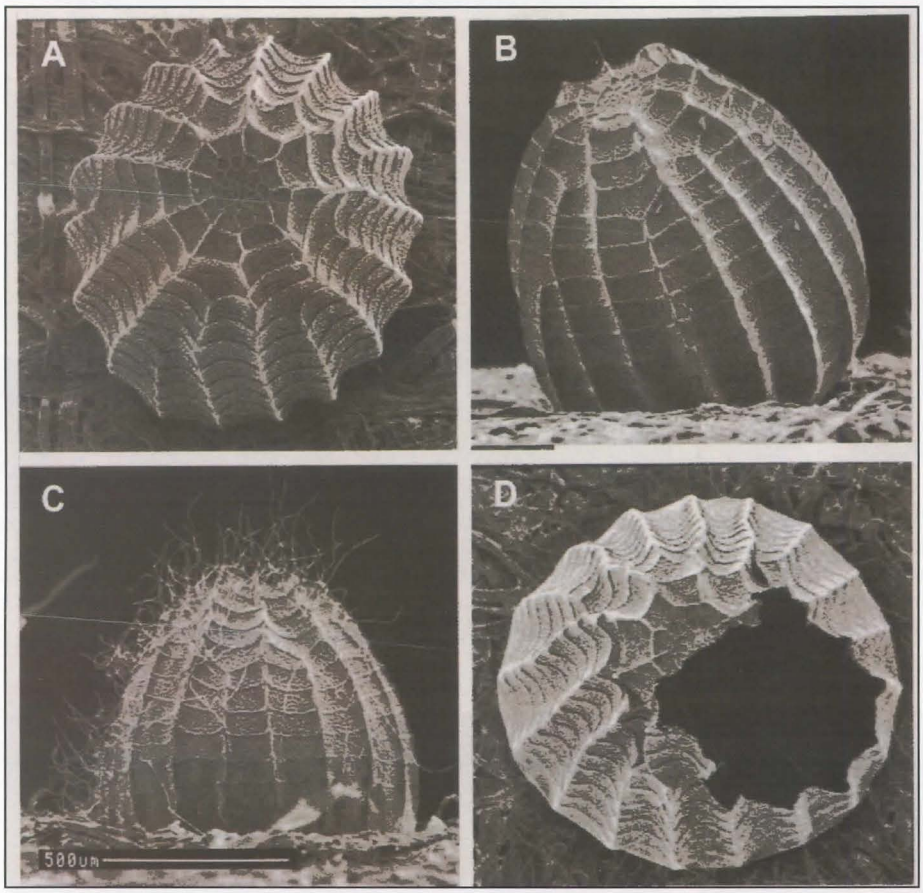


Fig. 62. Eggs. Scanning electron microscope (SEM). A, B, and D. are of *S. diana*; C is of *S. idalia* (regal fritillary) with fungal contamination. Photo from Ross and Henk (2004). November 1996.

Fig. 63. Tiny (2.0 mm) first instar larva in hibernation beneath a fallen, dead leaf. Young larvae do not feed during cold season (5-6 months). November 1996.

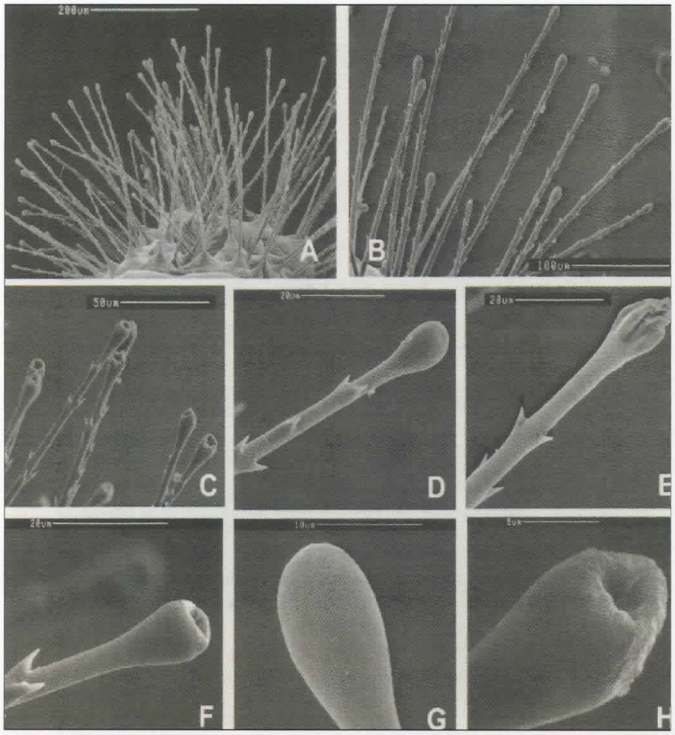


Fig. 64. Setae of first instar larvae of DF. A. thorax and abdomen; B and C. detail of thorax and abdomen; D-H details of abdominal setae (E, F, H with partial collapsed terminal bulbs likely due to fluid loss during preparation; D and G show normal inflated appearance. Photo from Ross and Henk (2004). November 1996.

Fig. 66. Author hand-feeding a captive female DF with sugar-water for sustenance and to coax egg laying. Deserted campground served as a private "laboratory." October 1996.

Fig. 65. Great spangled fritillary (*Speyeria cybele*) on eastern purple coneflower. The species is a close relative of *S. diana*, but exhibits no sexual dimorphism, is more common, and has a wider distribution. July 1997.

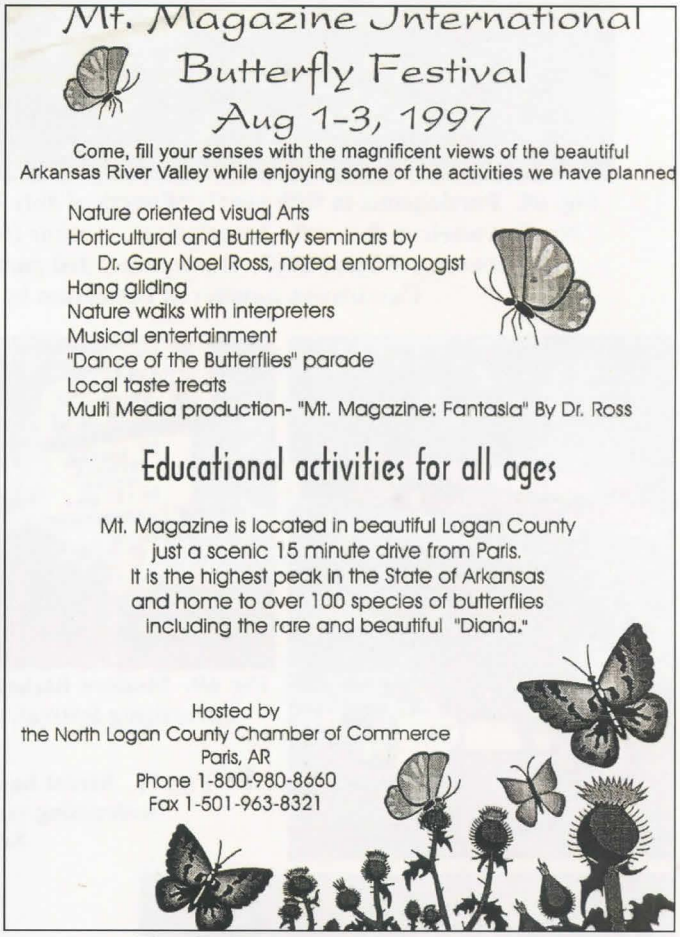


Fig. 67. Flyer advertising activities of the first "Mt. Magazine International Butterfly Festival." North Logan County Chamber of Commerce (revised to Paris Area Chamber of Commerce). July 1997.

Fig. 68. Participants in fifth year's "Fourth of July Butterfly Count" (administered by Xerces Society and North American Butterfly Association). Author (far right with net) conducted similar one-day surveys between 1992 and 2002. Roster recorded participants from Arkansas, Louisiana, and Texas. Cumulative number of butterflies by 2002: 91. Old Lodge site. June 1996.

Fig. 69. Modern Blakely Motel in Paris advertising festival. August 1998.

Fig. 70. Downtown Paris business decorated for festival. August 1998.

← Fig. 71. Street banner in downtown Paris spanning state highway 22 welcoming visitors to the "Gateway to Mt Magazine." Second festival. August 1998.

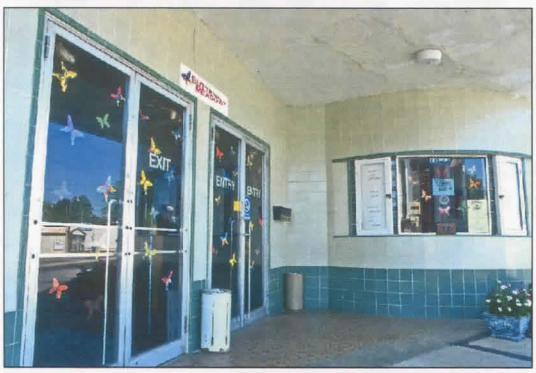


Fig. 72. The recently renovated *Paris Cinema* in downtown Paris was the site of the premier of the author's multimedia show titled "Mount Magazine, Arkansas: Fantasia" during the inaugural festival. August 1998.

Fig. 73. Festival grounds atop plateau at Old Lodge site. Commercial vendors and conservation groups set up booths. August 1997.

Fig. 74. Festival grounds atop plateau. Vendors and conservation groups from around the state participated. Petit Jean River Valley is in background. August 1997.

Fig. 75. Festival grounds atop plateau. Conservationist prepared to interact with visitors at second "Mt. Magazine International Butterfly Festival." August 1, 1998.

Fig. 76. Caterpillar "Crawl Tunnel" for kids at festival grounds atop plateau. August 1997.

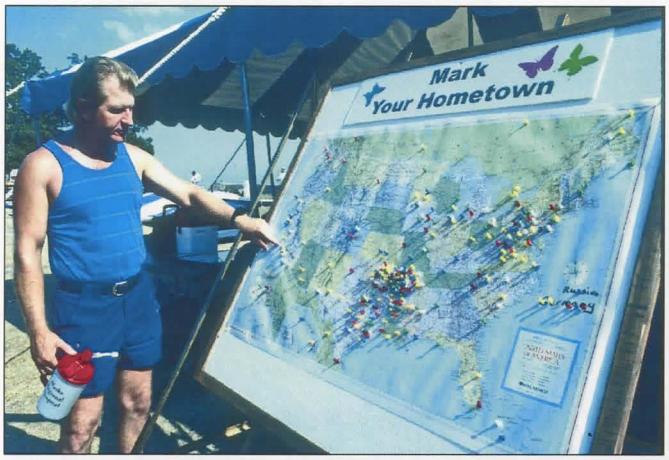


Fig. 77. Map pinpointing visitors' origin. Tally: 35 U.S. states, three Canadian provinces, and five distant countries (Australia, Germany, Japan, Saudi Arabia, and Uganda). August 1997.

Fig. 78. Local school children perform as "Butterfly Dancers" as part of the festival's entertainment atop plateau. August 2, 1997.

Fig. 79. Tractor tram for transporting adventurous visitors from Paris to plateau. August 2, 1997.

Fig. 80. Morning parade in downtown Paris to launch the first (and free) "Mt. Magazine International Butterfly Festival" (August 1-3, 1997). Sponsored by the Paris Area Chamber of Commerce. The author's research inspired the event. Tally: 10,000 visitors. August 2, 1997.

Fig. 81. Golf cart decorated with image of a female DF for parade in downtown Paris. August 2, 1997.

Fig. 82. Golf cart decorated for second festival. August 1, 1998.

Fig. 83. Parade in downtown Paris. Second "Mt. Magazine International Butterfly Festival." All schools in Paris participated; prizes awarded for the most whimsical costumes. August 1998.

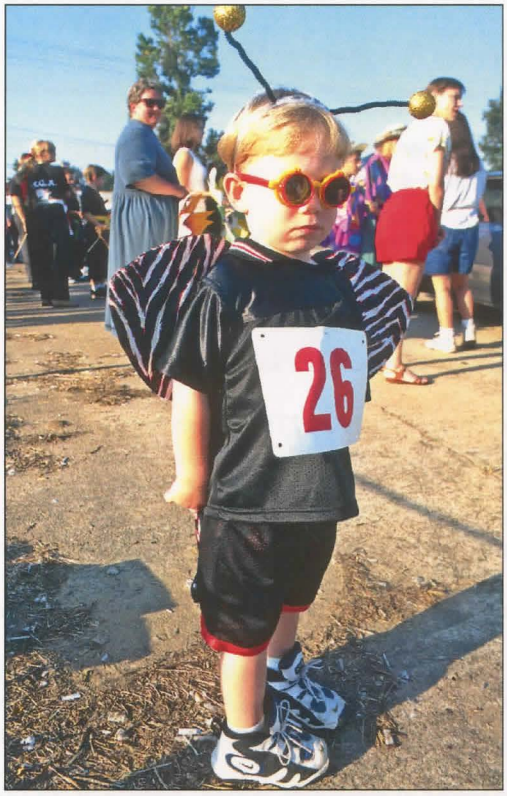
Fig. 84. Parade in downtown Paris. August 2, 1997.

Fig. 85. Horse and rider participating in parade. Downtown Paris. August 2, 1997.

Fig. 86. Junior Miss Mt. Magazine participating in first year's festival. Downtown Paris. Photo first appeared as the front cover of *American Butterflies* magazine, 1998 Summer Issue. August 2, 1997.

Fig. 87. Local family in kick-off parade in downtown Paris. Young boy is dressed as a young scientist to portray/honor author: "The Young Dr. Ross." August 2, 1997.

The following are Miscellaneous photographs of participants in kick-off parade in first and second "Mt. Magazine International Butterfly Festival." August 1997, 1998. (No legends are included.)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BIBLIOGRAPHY

Adams, J.K. and I.L. Finkelstein, 2006. Late season observations on female Diana fritillary (*Speyeria diana*) aggregating behavior. *News of the Lepidopterists' Society*, Winter (Vol. 48:4), pages 106-107.

Allen, T.J., 1997. *The Butterflies of West Virginia and Their Caterpillars*. University of Pittsburgh Press. Pittsburgh, PA. 388 pages.

Blum, M.S., 1981. *Chemical Defenses of Arthropods*. Academic Press. Cambridge, MA. 562 pages.

Boppré, M., 1984. Redefining "pharmacophagy." IN Letter to the Editor. *Journal of Clinical Ecology*, Vol. 10:7, pages 1151-1154.

Brock, J.P, and K. Kaufman, 2003. *Kaufman Field Guide to Butterflies of North America.* Houghton Mifflin Company. New York, NY. 392 pages.

Butler, C.A., 2017. Gynandromorphism. *Natural History* mag., May (Vol. 125:5), pages 20-25.

Carlton, C.D. and L.S. Nobles, 1996. Distribution of *Speyeria diana* (Lepidoptera): Nymphalidae) in the highlands of Arkansas, Missouri and Oklahoma, with comments on conservation. *Entomological News*. (Vol. 107:4), pages 213-219.

Carma Graphix, 1997. *Mt. Magazine, Arkansas Butterflies.* Poster, 36" X 24". North Logan County Chamber of Commerce. Designed by Carma Graphix, photographs and consultations provided by Gary Noel Ross. Thirty-four photographs with captions.

Cech, R. and G. Tudor, 2005. *Butterflies of the East Coast: An Observer's Guide*. Princeton University Press. Princeton, NJ. 345 pages.

Green, G., 1990. *Mount Magazine: A History*. Garvin Green. The Paris Express-Progress. Paris, AR. 31 pages.

Glassberg. J., 1999. *Butterflies through Binoculars: The East. A Field Guide to the Butterflies of Eastern North America.* Oxford University Press. New York, NY. 242 pages.

Hammond, P.C. and D.V. McCorkle, 1983(84). The decline and extinction of *Speyeria* populations resulting from human environmental disturbances (Nymphalidae): Argynninae). *Journal of Research on the Lepidoptera* (Vol. 22:4), pages 217-224.

Harris, L., Jr., 1972. *Butterflies of Georgia*. University of Oklahoma Press. Norman, OK. 326 pages.

Heitzman, J.R. and J.E. Heitzman, 1987, 1996. *Butterflies and Moths of Missouri*. Missouri Department of Conservation. Jefferson City, MO. 385 pages.

Hill, R.I., C.E. Rush and J. Mayberry, 2018. Larval food limitation in a *Speyeria* butterfly (Nymphaliade): How many butterflies can be supported? *National Center for Biotechnology Information. PubMedCentral. Insects.* December (Vol. 9:4): 179.l

Holland, W.J., 1931. *The Butterfly Book*. Doubleday & Company, Inc. Garden City, NY. 424 pages, plates I-LXXVII.

Hovanitz, W., 1963. Geographical distribution and variation of the genus *Argynnis*. III. *Argynnis diana*. *Journal of Research on the Lepidoptera* (Vol.1:3), pages 201-208.

Howe, W.H., 1975. *The Butterflies of North America*. Doubleday & Co. Garden City, NY. 633 pages.

Hunter, C.G., 1988. *Wildflowers of Arkansas*. The Ozark Society Foundation. Little Rock, AR. 296 pages.

James, D.G., 2008. Comparative studies n the immature stages and developmental biology of five *Aragynnis* spp. (Nymphalidae) from Washington. Journal *of the Lepidopterists' Society* (62:2), pages 61-70.

Klots, A.B., 1951. *A Field Guide to the Butterflies of North America, East of the Great Plains.* The Peterson Field Guide Series. Houghton Mifflin Company. Boston, MA. 349 pages.

Lawson, N., 2022. "Drug Stores" for monarchs. *Butterfly Gardener* mag., Fall (Vol. 27:3), pages 8-10.

Louisiana Public Broadcasting, 1997. *An Enchantment of Butterflies*. Video and DVD. Donna Lafleur producer. Louisiana Public Broadcasting. Baton Rouge, LA. www.lpb.org.

Marks, C.W., 2005. Rick Evans Grandview Prairie WMA, Hempstead Co., AR. Second Year. IN: *NABA Butterfly Counts: 2005 Report.* Region 10: Southeast, page 29. Edited by Sharon Wander. North American Butterfly Association, Inc., Morristown, NJ.

Marks, C.W., 2008. Dianas in southwest Arkansas at Rick Evans/Grandview Prairie WMA. *Southern Lepidopterists' News*, December (Vol. 30:4): pages 136-140.

Marks, C.W., 2015. Stone Road Glade Natural Area, Howard Co., AR. First year. IN: *NABA Butterfly Counts: 2014 Report.* Region 10: Southeast, page 27. Edited by Sharon Wander. North American Butterfly Association, Inc., Morristown, NJ.

Mattoon, S.O., R.D. Davis, and O.D. Spencer, 1971. Rearing techniques for species of *Speyeria* (Nymphalidae). *Journal of the Lepidopterists' Society,* (Vol. 25:4), pages 247-256.

McFarland, D., 1964. Notes on collecting, rearing, and preserving larvae of macrolepidoptera. *Journal of the Lepidopterists' Society*, (Vol. 18:4), pages 201-210.

Mohenbrock, R.H., 1985. Mount Magazine, Arkansas. IN: This Land. *Natural History* mag., October (Vol. 94:10), pages 82-85.

Moran, M.D. and C.D. Baldridge, 2002. Distribution of the Diana Fritillary, *Speyeria diana* (Nymphalidae) in Arkansas, with notes on nectar plant and habitat preference. *Journal of the Lepidopterists' Society* (Vol. 56:3), pages 162-165.

Mozian, L.D., 2000. *Foods That Fight Disease: A Simple Guide to Using and Understanding Phytonutrients to Protect and Enhance Your Health.* Avery (Penguin Putnam, Inc.). New York, NY. 240 pages.

Murray, M.T., 1995. *The Healing Power of Herbs.* Prima Publishing. Rocklin, CA. 410 pages.

National Geographic Society, 1997. Butterflies are free. IN: Field Notes: Committee for Research and Exploration (Gary Noel Ross), *National Geographic* mag., January (Vol. 191:1), page 107.

National Geographic Society, 2001. Butterflies losing habitat. IN: Geographica Section (Gary Noel Ross) NGS Research Grant. *National Geographic* mag., November (Vol. 200:5), page GEOGRAPHICA.

NABA, 2001. *North American Butterfly Association (NABA) Checklist & English Names of North American Butterflies.* Second Edition. Morristown, NJ. 60 pages.

Odum, E.P., 1959. *Fundamentals of Ecology.* W.B. Saunders Co. Philadelphia, PA. 546 pages.

Ogard, P.H. and S. Bright, 2021. Posternal glands in great spangled and Diana fritillary caterpillars. *Southern Lepidopterists' News*, December (Vol. 43:4), pages 367-368.

Opler, P.A. and G.O. Krizek, 1984. *Butterflies East of the Great Plains: An Illustrated Natural History.* The Johns Hopkins University Press. Baltimore, MD. 294 pages.

Opler, P.A. and V. Malikul, 1992. *A Field Guide to Eastern Butterflies.* The Peterson Field Guide Series. Houghton Mifflin Company. Boston, MA. 396 pages.

Paulissen, L.J., 1975. Arkansas butterflies and skippers. *Proceedings of the Arkansas Academy of Science* (Vol. 29), pages 57-61.

Price, L., 2011. Notes on the Diana fritillary. *Southern Lepidopterists' News,* September 30 (Vol. 33:3), page 99.

Ross, G.N., 1993. Mt. Magazine, AR. IN: *Fourth of July Butterfly Counts: 1992 Report.* Edited by A.B. Swengel and P.A. Opler. Xerces Society, Portland, OR. Page 41.

Ross, G.N., 1994. Mt. Magazine, AR. IN: *NABA-XERCES Fourth of July Butterfly Counts: 1993 Report.* Region 10: Southeast, pages 17-18. Edited by A.B. Swengel and P.A. Opler. North American Butterfly Association, Inc., Morristown, NJ.

Ross, G.N., 1995. Mt. Magazine, AR. IN: *NABA-XERCES Fourth of July Butterfly Counts: 1994 Report.* Region 10: Southeast, page 22. Edited by A.B. Swengel and P.A. Opler. North American Butterfly Association, Inc., Morristown, NJ.

Ross, G.N., 1996. Mt. Magazine, AR. IN: *NABA-XERCES Fourth of July Butterfly Counts: 1995 Report.* Region 10: Southeast, pages 22-23. Edited by A.B. Swengel and P.A. Opler. North American Butterfly Association, Inc., Morristown, NJ.

Ross, G.N., 1997a. Mt. Magazine, AR. IN: *NABA Fourth of July Butterfly Counts: 1996 Report.* Region 10: Southeast, pages 21-22. Edited by A.B. Swengel and P.A. Opler. North American Butterfly Association, Inc., Morristown, NJ.

Ross, G.N., 1997b. Preliminary inventory of the butterflies of Coweeta Hydrologic Laboratory, Nantahala National Forest, North Carolina. *News of the Lepidopterists' Society* (Vol, 39:4), pages 70-71, 88, front cover.

Ross, G.N., 1998a. Butterfly festivals: Fun and education for all! *American Butterflies* mag., Summer (Vol. 6:2), pages 16-23.

Ross, G.N., 1998b. Definitive destination: Mount Magazine State Park, Arkansas. *America Butterflies* mag., Summer (Vol. 6:2), pages 24-33.

Ross, G.N., 1998c. Mt. Magazine, AR. IN: *NABA Fourth of July Butterfly Counts: 1997 Report.* Region 10: Southeast, page 18. Edited by A.B. Swengel and P.A. Opler. North American Butterfly Association, Inc., Morristown, NJ.

Ross, G.N., 1999. Mt. Magazine, AR. IN*: NABA Fourth of July Butterfly Counts: 1998 Report.* Region 10: Southeast, page 21. Edited by A.B. Swengel and P.A. Opler. North American Butterfly Association, Inc., Morristown, NJ.

Ross, G.N., 2000. Mt. Magazine, AR. IN: *NABA Fourth of July Butterfly Counts: 1999 Report.* Region 10: Southeast, pages 24-25. Edited by A.B. Swengel and P.A. Opler. North American Butterfly Association, Inc., Morristown, NJ.

Ross, G.N., 2001a. Mt. Magazine, AR. IN*: NABA Butterfly Counts: 2000 Report.* Region 10: Southeast, pages 26-27. Edited by A.B. Swengel and P.A. Opler. North American Butterfly Association, Inc., Morristown, NJ.

Ross, G.N., 2001b. IN: *Butterflies of Mount Magazine State Park.* Brochure containing checklist. Arkansas State Parks, Little Rock, AR.

Ross, G.N., 2002a. Mt. Magazine, AR. IN*: NABA Butterfly Counts: 2001 Report.* Region 10: Southeast, page 34. Edited by A.B. Swengel. North American Butterfly Association, Inc., Morristown, NJ.

Ross, G.N., 2002b. Social butterflies. IN: The lives of butterflies: Tails & Tales. *News of the Lepidopterists' Society*, Summer (Vol. 44:2), pages 55, 63, 68.

Ross, G.N., 2002c. Social butterflies. *American Butterflies* mag., Winter (Vol. 10:4), pages 34-37.

Ross, G.N., 2003a. Mt. Magazine, AR. IN: *NABA Butterfly Counts: 2002 Report.* Region 10: Southeast, page 33. Edited by A.B. Swengel and S.R. Swengel. North American Butterfly Association, Inc., Morristown, NJ.

Ross, G.N., 2003b. What's for dinner? A new look at the role of phytochemicals in butterfly diets. *News of the Lepidopterists' Society*, Autumn (Vol. 45:3), pages 83-89, 100, outside back cover.

Ross, G.N., 2004a. Rick Evans Grandview Prairie WMA, Hempstead Co., AR. First year. IN: *NABA Butterfly Counts: 2003 Report.* Region 10: Southeast, page 28. Edited by A.B. Swengel and S.R. Swengel. North American Butterfly Association, Inc., Morristown, NJ.

Ross, G.N., 2004b. Social butterflies. IN: Conservation Hotline. *Wildlife Conservation* mag., May/June (Vol. 107:3), pages 24-25.

Ross, G.N., 2005. A time to drink. *News of the Lepidopterists' Society*, Winter (Vol. 47:4), pages 107, 111.

Ross, G.N., 2008. Diana's Mountain Retreat. IN: Naturalist at Large. *Natural History* mag., March (Vol. 117:2), pages 24-26, 28, 72.

Ross, G.N., 2009. Herbs and spices for man and butterflies. *News of the Lepidopterists' Society*, Fall (Vol. 51:3), pages 95-100.

Ross, G.N., 2011. Diana still reigns in Arkansas: a natural history essay. *News of the Lepidopterists' Society*, Winter (Vol. 53:4), pages 116-123, front cover photograph.

Ross, G.N., 2012. Mt. Magazine and Diana fritillaries: A photo essay. *Southern Lepidopterists' News*, June 30 (Vol. 34:2), pages 88-104.

Ross, G.N., 2019. Zinnias for butterflies—and the kitchen table. *Butterfly Gardener* magazine, Fall (Vol. 24:3), pages 4-7, cover.

Ross, G.N. and M.C. Henk, 2004. Notes on eggs and first instar larvae of three species of *Speyeria* (Nymphalidae). *News of the Lepidopterists' Society*, Summer (Vol. 46:2), pages 53-57, 62-63.

Rudolph, D.C., C.A. Ely, R.R. Schaefer, J.H. Williamson, and R.E. Thrill, 2006. The Diana fritillary (*Speyeria diana*) and great spangled fritillary (*S. cybele*): Dependence on fire in the Ouachita Mountains of Arkansas. *Journal of the Lepidopterists' Society* (Vol. 60:4), pages 218-226.

Scott, J.A., 1986. *The Butterflies of North America: A Natural History and Field Guide*. Stanford University Press. Stanford, CA. 583 pages.

Shull, E.M., 1987. *The Butterflies of Indiana*. University of Indiana Press. Bloomington, IN. 262 pages.

Sims, S.R., 1984. Reproductive diapause in *Speyeria* (Lepidoptera: Nymphalidae). *Journal of Research on the Lepidoptera,* Autumn (Vol. 23:3), pages 211-216.

Sims, S.R., 2017. *Speyeria* (Lepidoptera: Nymphalidae) Conservation. *National Center for Biotechnology Information. PubMedCentral. Insects.* (Vol. 8:2): 45.

Skillman, F.W. Jr. and J.B. Heppner, 1992. Gynandromorph *Speyeria diana* from Georgia. *Tropical Lepidoptera*. May (Vol. 3:1), page 34.

Sourakov, A., 1995. Systematics, evolutionary biology and population genetics of the *Cercyonis pegala* group (Nymphalidae: Satyrinae). *Holarctic Lepidoptera*, (Vol. 2), pages 1-21.

Sourakov, A., 1996a. Notes on the genus *Calisto*, with descriptions of the immature stages (Part 1) (Lepidoptera: Nymphalidae: Satyrinae). *Tropical Lepidoptera*, (Vol. 7), pages 91-112.

Sourakov, A., 1996b. Notes on the genus *Calisto*, with descriptions of the immature stages (Part 2) (Lepidoptera: Nymphalidae: Satyrinae). *Tropical Lepidoptera*, (Vol. 10), pages 73-79.

Sourakov, A. and T.C. Emmel, 1997a. *Bicyclus* and *Hallelesis*: their immature stages and taxonomic relationships (Nymphalidae: Satyrinae). *Tropical Lepidoptera,* (Vol.8, Supplement 3), pages 14-22.

Sourakov, A. and T.C. Emmel, 1997b. *Ypthima* and *Ypthimomorpha*: their immature stages and taxonomic relationships (Nymphalidae: Satyrinae). *Tropical Lepidoptera,* (Vol. 8, Supplement 3), pages 23-28.

Spencer L.A., 2006. *Arkansas Butterflies and Moths*. Ozark Society Foundation. Little Rock, AR. 314 pages.

USDA Forest Service, 1993. *Final Environmental Impact Statement for Mount Magazine State Park.* Ozark-St. Francis National Forests. Russellville, Arkansas. Pages 1.0-9.0, Appendix A-H, Tables 1.1-4.4, Figures 1.1-4.1.

Wagner, D.L., 2006. *Caterpillars of Eastern North America*. Princeton University Press, Princeton, NJ. 512 pages.

Wells, C.N., L. Spencer, and D. Simons, 2011a. Reproductive behavior of *Speyeria diana* (Nymphalidae) in Arkansas. *Journal of the Lepidopterists' Society*, April 20 (Vol. 65:1), pages 51-53.

Wells, C.N., L. Spencer, and D. Simons, 2011b Reproductive behavior of *Speyeria diana* (Nymphalidae) in Arkansas. (in Literature Cited). *Journal of the Lepidopterists' Society*, August 17 (Vol. 65:2), page 136.

INTERNET

USDA Plants Database
www.Mount Magazine State Park
en.wikipedia.org/wiki/Magazine_Mountain_middle-toothed_snail

(Gary Noel Ross, 6095 Stratford Ave., Baton Rouge, LA 70808:
E-Mail: GNRoss40@yahoo.com)

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MOTHS FOR TRINITY RIVER NATIONAL WILDLIFE REFUGE, LIBERTY COUNTY, TEXAS (August 1, 2022, through October 31, 2022)

BY
STUART J. MARCUS

Cosmopterigidae: *Teladoma* sp.

Pyralidae: *Melitara prodenialis*, Eastern Cactus-boring Moth

Pyralidae: *Moodna pallidostrinella*, Paler Moodna Moth

Crambidae: *Stegea salutalis*. According to both Drs. Richard L. Brown and Brian Scholtens, this is the most likely species, but it should not be found in Southeast Texas.

Erebidae: *Heteranassa mima*

Gracillariidae: *Leucospilapteryx venustella*

Pyralidae: *Atascosa glareosella*, Rosy Atascosa Moth

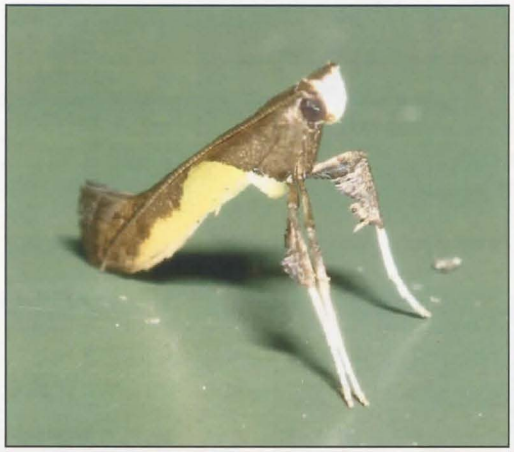
Elachisridae: *Elachista brachyelytrifoliella*

Erebidae: *Hypocala andremona*, Hypocala Moth

Geometridae: *Archirhoe neomexicana*, New Mexico Carpet Moth

Gracillariidae: *Acrocercops quinquistrigella*

Noctuidae: *Ponometia phecolisca*, One-spotted Bird-dropping Moth



Gracillariidae: *Caloptilia belfragella*, Dogwood Caloptilia Moth

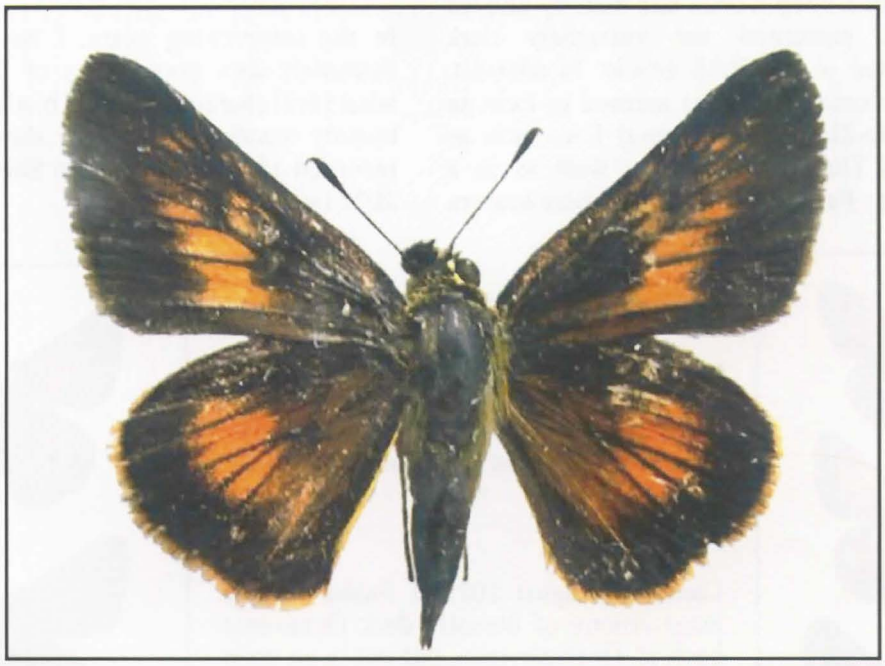
(Stuart.marcus13@gmail.com)

RE-CROSSING THE PERPLEXING WATERS OF THE DELAWARE

BY

CRAIG W. MARKS

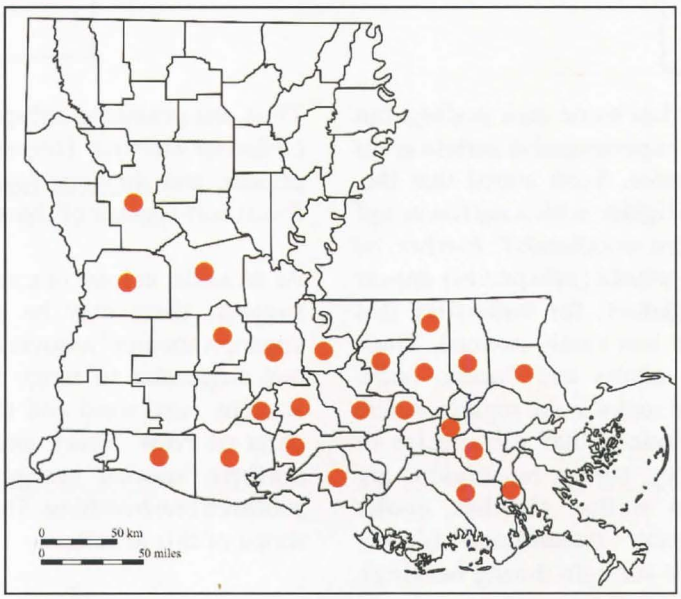
Back in 2010, I wrote an article for this Newsletter (Vol. 32 No. 1) about finding Delaware Skippers (*Anatrytone logan*) in deep woods along a slough at Thistlethwaite WMA in St. Landry Parish. In hindsight, one might ask why that event served as reason for writing an article, but at the time I initially didn't know what I had found as the specimen (and subsequent specimens found there) were extremely dark dorsally (see below).



Female

Delaware Skipper, dorsal, 8/30/2009

As I was putting together my book on Louisiana's Butterflies, I came upon some research on this species generated by the late Gayle Strickland. Specifically, in an unpublished manuscript (1971), Strickland reported this skipper was first recorded in LA between 1968 and 1971 in varied habitats, commenting that, "Specimens are generally larger and darker than those examined from more northern localities in the U.S." Like Strickland's specimens, those I found at Thistlethwaite were much darker than those shown in the field guides available for reference.

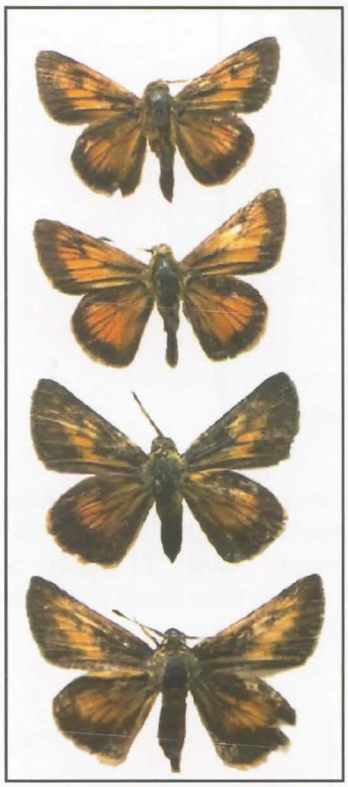


Recorded Delaware Skipper sightings

Since those initial sightings at Thistlethwaite, I have found this skipper across the State as well as in southwestern Mississippi. The species' distribution map reflects numerous sightings along the Mississippi River corridor where the associated habitat is primarily deciduous woods. Several of the sightings were in habitat that was virtually identical to the initial habitat described at Thistlethwaite.

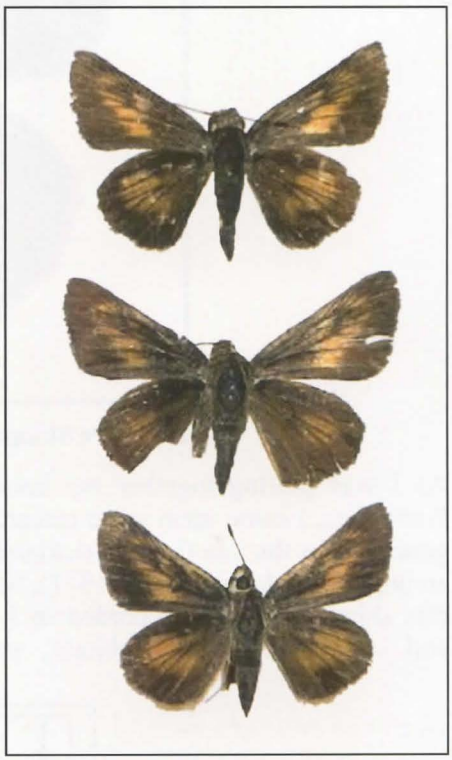
Over this time frame, the impression I developed was that those found in a deep woods and heavily shaded type of habitat presented the extremely dark characteristics noted in my 2010 article. In contrast, dorsally lighter-colored specimens seemed to exist in more open, prairie-like habitat around LA, such as Avery Island and Duralde Prairie, as well as in a powerline cut at Pass Christian in southwestern Mississippi. I also found three of the dorsally lighter form in Cameron Parish in July, September and October. One exception was at Abita Creek where the habitat was more open, with scattered deciduous and pine woods, yet the females there were extremely dark. Beyond the Gulf Coast region, Delaware Skippers I found in southwestern Arkansas, southeastern Oklahoma and mid-Wisconsin were much smaller and lighter colored with minimal dark dorsal wing borders, reflective of the type typically shown in field guides.

In the intervening years, I have continued to find extremely dark populations of Delaware Skippers in what I will characterize as "Thistlethwaite-like" habitat, heavily wooded and deeply shaded. Most recently, I recorded 10+ at a location in Sherburne WMA in May 2022 (see below).



Sherburne WMA specimens, 5/01/22
←

Thistlethwaite WMA specimens 8/16/2022
→



Later, in August 2022, I found another large colony of dorsally dark Delawares back at Thistlethwaite, but out in an open pipeline cut, several miles away from the slough where they had been seen back in 2009. I have never stopped wondering what dynamics were occurring to generate these differing, and sometimes inconsistent, findings.

Scott pictured a female that has some dark scaling, but not nearly as much as I have experienced in certain areas of LA, particularly on females. Scott stated that the, "ssp *lagus* (Great Plains) is lighter with a narrower upf border than ssp *logan* (eastern woodlands)" Further, he stated, "Many geographic variants (subspecies) appear to owe their origin to predators, for butterflies that match their background are less easily noticed. Thus, California *Oeneis chryxus* adults and *Papilio indra* pupae match the background rocks in the regions where they occur. W. Hovanitz noticed that sub-species or populations that occur in dry, sunny, hot regions are lighter than populations in wetter, cloudier, cooler regions, evidently for better camouflage (darker coloration also absorbs more sunlight during basking). Thus, the grassland subspecies of *Coenonympha tullia, Chlosyne harrisii, Hesperia leonardus, H. comma, H. attalus*, and *Atrytone logan* are much lighter than the forest sub-species of these species."

As an aside, at least one source (Nature Serve Explorer) suggests there may be two "rather easily separable apparent species" associate with the name *A. logan*, with one suggested to range from, "the New Jersey Pine Barrens northward and the other from more southern parts of New Jersey and Missouri to Florida." The northern "species" is suggested to be univoltine, and the southern one bivoltine. Those issues are well beyond the scope of this article.

Based on studies of several western species spread along the west coast, Hovanitz made several generalizations regarding the potential reason for darker scaling vs lighter scaling. He referred to that darker scaling as melanie suffusion due to melanin pigment. The variation of that pigment was, he proposed, correlated with certain geographic regions and conditions, and therefore genetic.

He regarded it as "possible" to correlate, among other factors, increased humidity, increased precipitation, decreased solar radiation with increased melanie suffusion in area and intensity on the wings. He then concluded that those factors played a role in butterfly color variation which then made that color variation "adaptive". Hovanitz also recognized as "highly probable" the hypothesis that a color variety better adapted or fitted to a given environment "has a better survival value or reproductive advantage over other types under the same conditions." He further concluded this adaptiveness of coloration may be more than protective but also a "secondary product of some physiological change in development, metabolism or hardiness which are of primary adaptive value".

With regard to areas with dense vegetative cover, he referenced both direct and indirect effects caused by that vegetation. Dense vegetation usually is a product of high temps, humidity and precipitation. One effect of greater vegetative cover is reduced solar radiation reaching the ground surface. Soils in this habitat are usually dark which absorbs more solar radiation, "and an object between the sky and the earth will therefore receive less light" than lighter colored soil which is more reflective. Therefore, he proposed that wing coloration will be darker in areas of greater vegetative cover and dark soil/ground cover.

A year later Hovanitz generated a case study on the arctic, *Oeneis chryxus*, in the Sierra Nevada of California and the mountains of western Nevada. That butterfly was represented by two "races", a "very pale" race (*ivallda*) and a "very dark" race (*stanislaus*), reflected primarily by the dorsal wing color. The northern and southern sections of this range were where the light races were found while in the intervening area, about 80 miles in length, the dark race was found. In determining the origin of these color races, Hovanitz suggested the color of the landscape was the determinative factor. The ground cover where the dark race lived was dominated by dark red rocks while a "very light-colored Jurassic granite" predominated where the light race was found.

Hovanitz described these "races" as examples of "protective coloration". He proffered two possible causes of this "selective effect". The first is selection by predators. While he referenced some studies which he described as establishing that "cryptic coloration gives a selective advantage," he was unable to point to any evidence of what predators might actually be applying selective pressure on *O. chryxus*. The second possible cause he identified was "selection by physiological fitness for the environment." He felt the color differences were "almost certainly genetic" and "may" give the impacted butterfly "greater suitability for living" in the applicable habitat. He suggested this cause to be the "most probable hypothesis".

In addressing the color differences between male and female Diana Fritillaries, Ross proposed that the female's dark coloration, compared to the male's orange coloration, enables her to absorb enough heat from less-direct sunlight and be active during cooler parts of the day. That advantage continues to serve her when the cooler weather of autumn approaches. The dark color also provides camouflage in forest shade, likely reducing the risk of predation by birds.

Based on over 30 years of field observations, I am not inclined to accept predator pressure as the predominant explanation for the darkened dorsal wing surface on some colonies of Delaware Skippers in LA. Adult male Delawares typically perch on tall stalks of grass. The females are seen most often feeding at flowers. Both sexes do this in the classic skipper "jet-fighter" position, quick to dash away at the first indication of a possible threat. In that position, the bright orange lower ventral wings are much more conspicuous than the upper dorsal wings. My impression is that speed on the wing, rather than protective coloration, is their greatest protection against typical predators such as dragonflies (which are movement-based hunters), robber flies, ambush bugs, crab spiders and lizards. Again, per my observations, the main predator added in a deep woods setting would be web spiders, particularly Banana Spiders. Again, I don't see darkened dorsal wings as protection against those kinds of spiders (or, for that matter, any spiders).

While I do not doubt the darkened dorsal scaling facilitates some increased heat absorption, I suspect that increased capacity is ancillary, at least here in LA. Composite LA records indicated several broods, from late April into early October. During that timeframe, typical daytime temperatures range from the mid-70's into the high 90's. For example, temperatures were in the mid to high 80's when I found the colony at Sherburne in May 2022. Temperatures were in the 90's at Thistlethwaite in August 2022. No increased heat absorption was required in those instances. In fact, during the intense heat and humidity that occurs here in July, August and September, many species hide in the shade to reduce their heat exposure.

In deep wooded habitat such as is found at Thistlethwaite, Sherburne, Indian Bayou and Bayou Teche, the males can typically be found perched on a stalk of grass in a patch of sunlight. Unlike the female Diana, which spends most of the day perched back in the heavy shade, those males spend their day racing from one patch of sunlight to another. At the existing temperatures, my suspicion is that those males do not require added temperature absorption.

The females are typically less active than the males, found most often at flowers such as thistle and buttonbush, moving in and out of the sunshine from flower to flower. At Sherburne, in a large patch of blue clover, the females were found feeding at flowers in the sun or at the edge of the shade. As such, I don't see that added heat absorption plays a significant role in order to facilitate flight activity during this skipper's extended flight period.

Across the board, those locations where I have found the dark scaled specimens involve very dense vegetative ground cover and extremely dark soil. If not for hunter's trails, much of the area at those locations is impenetrable. Given these conditions, Hovanitz' theory that wing coloration will be darker in areas of greater vegetative cover and dark soil appears applicable.

Actually, even in the areas where I have found the lighter scaled specimens (such as Duraldi Prairie and Avery Island), the soil is dark. The difference is the nature of the ground cover, open, grassy, prairie-like habitat vs deep woods with dense cover dominated by palms and sedge. My belief is that no one particular factor is dictating the occurrence of darker dorsally scaled Delaware Skippers across LA; rather, a combination of conditions and factors have caused the prevalence of dark scaled specimens.

Specifically, I suspect the dark dorsal scaling could provide some protective coloration in the context of birds hunting from the trees/vegetation above. I further suspect the melanistic scaling does provide some heat absorption benefits in certain circumstances such as on cool mornings or overcast days. And, finally, referencing Horwitz concept of "selection by physiological fitness for the environment," the color differences may give dark scaled Delaware Skippers "greater suitability for living" in the applicable habitat.

References

Douglas, M. M., 1989. *The Lives of Butterflies*. The University of Michigan Press, Ann Arbor, MI. 241 pp.

Hovanitz, W., 1940. Ecology Color Variation in a Butterfly and the Problem of "Protective Coloration." *Ecology*, 21(3), 371–380.

Hovanitz, W., 1941. Parallel Ecogenotypical Color Variation in Butterflies. *Ecology*, 22: 259-284.

Marks, C.W., 2008. "Dianas in Southwest Arkansas at Rick Evans/Grandview Prairie WMA," *Southern Lepidopterists' News* 30(4): 136-140.

Marks, C.W., 2010. "Crossing the Perplexing Waters of the Delaware," *Southern Lepidopterists' News* 32(1): 25-8.

Marks, C.W., 2010. "Thistlethwaite WMA, St. Landry Parish, Louisiana, May 2, 2010." *Southern Lepidopterists' News* 32(2): 60-1.

Ross, G.N., 2008. Diana's mountain retreat. IN: Naturalist at Large. *Natural History Magazine* March 117 (2):24-26, 28, 72.

Scott, J.A., 1986. *The Butterflies of North America: A Natural History and Field Guide.* Stanford University Press, Stanford CA. 583 pp.

Strickland, G.T., 1972. *Recent studies of Louisiana rhopalocera.* Unpublished manuscript, 20 pages. Presented verbally at the annual meeting of the Lepidopterists' Society, June 22-25, Trinity University, San Antonio, Texas.

https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.119507/Anatrytone_logan

(Craig W. Marks: cmarks@landcoast.com)

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ABITA ENTOMOLOGICAL STUDY SITE

BY

VERNON ANTOINE BROU JR. AND CHARLOTTE DOZAR BROU

Fig. 1. Entrance to the *Abita Entmological Study Site* (*AESS*) est. 1981 sec. 24, T6S, R12E, 4.2 miles northeast of Abita Springs, Louisiana USA.

Fig. 2. Aerial view of the *Abita Entomological Study Site*. Yellow arrow indicate entrance, red line is site boundary.

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Pages:

Historical description of the areas near Abita Springs, Louisiana

The current town of Abita Springs previously was an old Choctaw Indian village centered around a natural spring, adjacent to what is now known as the Abita River. Louisiana became a state in 1812 and the first Louisiana pioneers documented to have settled near Abita Springs occurred around 1820 near a Choctaw settlement of about 25 families. This area in southeastern Louisiana was the home of Native Americans as far back as 2,200 years ago. A succession of different tribes continued to live there until the repressive government policies forced the Native Americans into Oklahoma; a few remained or later returned. The town register contains names from many nationalities. A few of the early settlers were African, many Germans, some English, Scot-Irish, and French names are evident, including many claiming Choctaw heritage. Interestingly, later during the mid-nineteenth century (Civil War Era), the population of New Orleans (on the south shore of Lake Pontchartrain) was around 50% of German heritage (Brou, 2010). According to historical census records, in 1840, there were at least five families in Louisiana having the surname 'Brou', though in the 182 subsequent years dozens of individuals can be can be found in the census records with the surname Brou in Louisiana. In the census of 1724 in Louisiana the name Pierre Antoine Brou appears in a local census as a landowner in (German coast area) of Louisiana, and also Antoine Pierre Brou IV (1754-1802).

The first documented major hotel to open in Abita Springs was the *Long Branch*, built around 1880. Numerous epidemics during the nineteenth century: yellow fever, cholera and malaria which greatly affected the residents of the city of New Orleans caused people to migrate to other surrounding areas, e.g. the north shore of Lake Pontchartrain where Abita Springs is located. These deadly epidemics were discussed by Brou (2010).

Abita Entomological Study Site (AESS)

(Figs. 1, 2) is recognized and considered by entomologists worldwide as the most intensely studied entomological location in North America (USA, Canada, and Mexico). This 10 acre location, 74320 Jack Loyd Road, Abita Springs, St. Tammany Parish, Louisiana 70420 USA, is the home of *Vernon Antoine Brou Jr. & Charlotte D. Brou* for the past 41 years (1981-2022), and is located approximately 4.2 miles northeast of the town of Abita Springs, St. Tammany Parish, sec.24,T6S,R12E. This property has been legally classified as a tree farm since 1981. Numerous hundreds of the 450-500 self-designed, automatic-capture insect traps operated at this forested rural location continuously 24-hours daily/nightly, every day of every year 1981 to present day 2022 (41 years), regardless of temperatures, rains, snow, hail, tropical storms, tornados, hurricanes, or other adverse weather conditions. Before and since relocating to the AESS, this region was severely impacted by dozens of tropical storms and hurricanes e.g., the most destructive ones affecting us occurred on September 29-2005 by Hurricane Katrina (Fig. 31 and 31.1) and later on September 29, 2021 by Hurricane Ida, and many others over decades before and after. Far more than 100 mature, very large trees and hundreds of smaller trees were completely destroyed because of these many storms over the past four decades. The AESS is in an area receiving the second most average annual precipitation +/-62" in the continental United States, though in 1991 the AESS received a record of nearly 120" of rainfall. At the beginning of our collecting activities at the AESS, we self-installed ~3,000' of perimeter boundary chain-link fencing and galvanized steel posts, and steel wire fencing and non-galvanized steel posts, and numerous posted/safety/warning signs. We self-installed above ground and mostly underground 220-volt electrical wiring throughout the 10 acre property along with waterproof breaker panels and post mounted waterproof electrical access boxes in order to provide voltage-adequate electricity to seven planned high-wattage light trap locations throughout the site. Initial minimal, selective site clearing of trails and selective perimeter tree removal involved initial bulldozer work over 26 days, and continuing sporadically to 2022. The guiding and primary intended purpose in finding and creating the AESS from the beginning was to allow for the continual surveillance of the insect fauna (especially lepidoptera) occurring in the state of Louisiana. We were only limited in our daily activities and accomplishments by the fact that our lifelong work was entirely self-funded. As a result, Vernon and Charlotte were lifetime caretakers and administrators of this forested private research site.

Our more than half century of self-funded non-stop insect collecting and documentation officially began in 1969 at a different location, Edgard, St. John the Baptist Parish, Louisiana, (originally a French/German settlement and home to many past generations of the Brou family) and the senior author sporadically collected insects there as early as 1962, and as late as 1984. In 1981 most of our entomological research efforts and collecting activities began migrating to the ***Abita Entomological Study Site*** (***AESS***), including trapping activities overlapping at both locations for around two to three years. The average insect collector occasionally using a hand net or an illuminated sheet for collecting will doubtfully understand or comprehend the true impact of collecting 24 hours of every day continuously for over a half century using hundreds of automatic-capture insect traps. We truly have captured numerous hundreds of billions of insects over the past half century

just as the AESS. The greatest volume of insects captured in a single 24 hour period at the AESS amounted to approximately 124 million specimens in the 1990s, confirmed by statistical sampling methods in accordance with the U.S. Department of Defense Military Standard 105D.

Occasional and sporadic collecting occurred in dozens of the Louisiana's 64 parishes (=counties) over the decades, though 99.9% of our collecting effort and activities (defined as trap-hours) occurred non-stop for 41 years at the AESS. To better understand the unusual nature of our self-funded novel collecting methods and groundbreaking procedures we provide a brief explanation. Much of what we list here could be considered minutia, but the sheer volume and effort utilized over 53 years of our research cannot be discounted. Only after documenting these prodigalities can the true effort and magnitude of our lifelong research be realized.

Entomological Buildings/equipment, capital expenditures and consumables at the AESS

One stand alone 520 sq. feet master research collection storage building, with continuous environmental controls (pests, temperature and humidity).

Three (fabrication/repair shop and equipment storage buildings).

One stand alone 120 sq. ft. chemical storage building with environmental controls, for drums of Sodium Cyanide (more than 2,000 pounds), 55 gallon drums and 5 gallon cans of ethyl acetate (several hundreds of gallons), also lesser amounts of mineral spirits, benzene, toluene, carbon tetrachloride, chloroform, acetone, xylene, sodium hydroxide, potassium hydroxide, 10 pounds of chlorocresol, 4 quarts of phenol, hundreds of gallons of both 70% and 90% Isopropyl alcohols, and ethanol, more than 300 pounds paradichlorobenzene, 20 pounds of naphthalene, 41 years of annual fumigation fogging chemicals and supplies, 25 gallons of ethylene glycol (used in some coleoptera traps). 500+ pounds of mice/rat poisons and 400+ pounds of ant poisons were utilized for control of pests. More than 1,000 plastic pans, bowls, containers with lids, etc., were used to design and fabricate a variety of hundreds of insect traps for many purposes and also to create numerous hundreds of relaxing containers used daily. Hundreds of pest and humidity-resistant plastic containers were also used for long term storage of hundreds of thousands papered and field pinned materials.

Physical storage for two rooms of entomological reference library with temperature and humidity controls.

Five large window air conditioners, three dehumidifiers, six vacuum cleaners, and other household items etc.

One self-designed 3' x 4' specimen processing-preparation desk with (4) 40 watt daylight fluorescent lamps.

Two large refrigerator/freezers for bait storage, semiochemical lure storage and occasional relaxing chamber storage.

Storage for two half-size refrigerator/freezers for use on field trips and occasionally at the AESS.

Vehicles used at the AESS

Six trucks and vans, and five tractors (used daily to run trap lines and for continual trail and site maintenance), numerous dozens of spare tires, numerous dozens of cases of engine oil and many thousands of gallons of gasoline to operate tractors, vehicles and other equipment over many decades. Four tractor carts used daily to carry tools, traps, chemicals and granular cyanide, buckets of prepared fruit baits and collecting equipment. Trap lines were run every day of every year to pick up freshly captured specimens in order to chronicle our ever amassing record daily captures and produce thousands of species phenograms for use in our publications and to process (pin, spread, label and store) and retain the highest quality fresh specimens.

Alternating current Electricity usage at the AESS

Numerous megawatts consumed over 41 years to operate the high-wattage light traps, and to operate lighting, temperature and humidity controls in various shops, and specimen and equipment storage buildings.

Gasoline powered electrical alternating current generators used at the AESS

Six were used: one 1200 watts, one 1800 watts, one 2400 watts, one 2800 watts, two 6,000 watts. Because the location of the AESS has been ravaged by numerous tropical storms and hurricanes over the many decades, generators were required to provide electricity, a result of the damage to our electrical system when we were without alternating electrical current, and also for occasional use during field trips statewide.

Tools used at the AESS

One commercial grade 4' *box and pan* sheet metal brake (Fig. 32), and dozens of associated electric and manual sheet metal shears, hand tools, nibblers, riveting tools, numerous dozens of steel files (flat, half-round, round). Two (manual and electric) miter wood saws, two 10"

electric table saws (Fig, 32), three electric scroll saws, two skill wood saws, three electric belt sanders with hundreds of sanding belts, hundreds of 8" X 12" sheets of sanding paper, 12 electric drills with many hundreds of drill bits, one electric shop drill press, eight kitchen duty and commercial duty food blenders, dozens of 10" dia. electrical saw blades, and assorted electrical and hand tools. We obtained and used 12 gasoline powered chainsaws at the AESS. The AESS was subject to constant cleanup and removal of downed dead limbs and trees, as well as those downed during tropical storms and hurricanes. Two sewing machines and related supplies to fabricate nets, rearing bags and malaise traps were used. One self-designed electric tester for MV lamps, fluorescent tubes, ballasts, starters, etc. was used.

Lamps/bulbs/cords/wires/office consumables/trap accoutrements used at the AESS

Various items were used over the decades to design, fabricate and service the many types of experimental traps and equipment needed in the scientific investigations, as well as the purchase of more than 4,000 ultraviolet blacklight lamps/bulbs (15-watt and 25-watt fluorescent blacklights), (15-watt, and 48" fluorescent daylights), many hundreds of blacklight lamps, ballasts and fluorescent lamp starters (15-watt, 25-watt, 40-watt, 175-watt, 400-watt, 1000-watt), 500+ photoelectric cells, numerous hundreds each of smaller high-quality water resistant electrical components of many descriptions: bipin lamp holders, starter holders, many hundreds of flush mounted male and female plugs and receptacles, and male and female cord plugs and receptacles, many hundreds of rechargeable, high milliamp hours DC current batteries (sizes: AAA, AA, C and D) of all types and descriptions, 30,000 lineal feet of various small gauge and heavy-gauge diameter bare steel guy-wires and PVC-covered electrical wires, hundreds of sq. ft. of ⅛" mesh fiberglass screening, ⅛" mesh aluminum screening and canvas cloth, more than 6,000 lineal feet of 10-3, 12-3, 14-3 & 16-3 gauge electrical outdoor cords, 1,000+ lineal feet 16-gauge single strand PVC-covered electric wire. More that 2,000 square feet of galvanized sheet metal of various gauges (12-28), hundreds of pounds of stainless steel and galvanized steel screws, nails, rivets, and other assorted fasteners, 200+ gallons of galvalume primer and epoxy paints and primers (for sheet metal traps), 50+ gallons of wood paints and primers, etc., hundreds of gallons of black, white, brown, green, red, and yellow epoxy paint, two custom designed specimen drying ovens (Fig. 32), 1000+ lineal feet of self-designed balsa wood spreading boards (Brou, 1993), 1,450,000 insect pins bulk purchases directly from the manufacturers, and usual office equipment and consumable supplies over a half century timespan, one copy machine, four large office steel file cabinets. Chemically pressure-treated lumber of all descriptions (hundreds of 4' x 8' sheets of plywood of all thicknesses (⅛"-1¼"), hundreds each of wooden (8' x 2" x 4") and (10' x 4" x 6"), and numerous hundreds of wooden boards of numerous other descriptions. 1" x 4", 1"x 6", 1" x 10", 1" x 12"...), 30+ gallons of wood glues, epoxy glues, carpentry and sheet metal hand tools of numerous descriptions. 200+ rolls of electrical tape, 50 rolls of duct tape, thousands of electrical wire nuts, 40+ rolls of packaging tape, 500 lineal feet of 4" diameter pvc pipe, 100+ lineal feet of ½" diameter copper pipe, copper sleeves and copper elbows, 200 lineal feet of ¾" diameter copper pipe, six containers of solder, flux, brushes, 350 steel wool pads, 10" x 500' aluminum roof flashing, five pounds of rope caulking, 200+ tubes of silicon-latex caulking, 75 fiberglass tarpaulins, several cases of various contact adhesives glues in metal cans, >500 ounces of contact adhesive/sealant in tubes, 40,000 sq. ft. of 45-mil EDPM rubber sheeting, and 160 sq. ft. thin vinyl sheeting, on and on....

Light traps, bait traps, lure traps, malaise traps, bucket traps, pan traps used at the AESS (Figs. 4-13)

Over the many decades we newly designed, fabricated and accumulated a trap inventory of about 450-500 traps of all types, contrivances and purposes. A single light trap and ballast box required in excess of 550 individual components, hundreds more for each attached collection chamber. Because our insect traps were exposed to the ravages of sunlight (UV degradation) and extremes of heat and cold, hurricane strength winds, heavy rains, freezing temperatures, and constant damage due to wind and falling branches and trees, we found ourselves constantly repairing traps, or sometimes discarding traps and replacing them with newly fabricated ones. Our light traps and associated galvanized sheet metal ballast boxes (electrical light fixtures), heavy and more stationary in nature, were designed and fitted with high-wattage ultraviolet lamps and bulbs. Typically light traps each contained four, and

occasionally eight, or twelve (18" long) vertically mounted 15-watt fluorescent blacklight tubes with added (one to five) 275-watt reflector sunlamps, and/or one or two clear borosilicate glass (resistant to thermal shock) mercury vapor lamps, either 175 watts, 400 watts or 1,000 watts, and all light traps had attached automatic collection chambers constructed of wood and each had one to four drawers, each drawer having size separating galvanized hardware cloth and aluminum screened bottoms (1", ½", ¼", ⅛" intermesh). The light traps operated continuously in the same (differing micro-habitat locations) due to heavy forestation, and our decision to not cut down more trees than necessary to navigate the site and to conduct our surveillance and research as much as possible under wild natural conditions. We designed our high-wattage light traps to operate automatically and continuously dusk to dawn using on-off photoelectric controls wired into the design of both traps and ballast boxes. 58,000 sq. ft. of polypropylene garden quilt fabric was used to rear larvae directly upon living foodplants in the wild. More than 120 plastic outdoor chairs used, (one positioned permanently at each light trap, and other traps over a half century). Due to the effects of ultraviolet degradation on most commonly manufactured low cost plastic items, e.g. plastic chairs always remained out in the direct sunlight and weather elements for over a half century and were continuously replaced every few years because of ultraviolet degradation. Several dozens of fruit bait traps were designed, fabricated and operated, and these too, were more stationary in nature, especially those attached to automatic collection killing chambers constructed of wood, plastic, galvanized sheet metal and clear glass. The light traps were operated at elevations of (two feet to 53 feet) above ground level, these larger and heavier sheet metal traps were attached to wooden collection chambers using 4" diameter pvc pipe (Figs 4-9). Many hundreds of smaller plastic automatic-capture lure traps were also designed and fabricated using plastic food containers, plastic plates, 2-liter plastic bottles, and these most often used semiochemical lures especially for attracting and capturing clearwing moths to larger moths and other insects. While these smaller lightweight lure traps are easily handled, moved and transported, and because we were limited in placement location at our 10 acre site, these operated in essentially the same locations as well, for four decades. Live collected and automatic captured cyanide dispatched specimens were retrieved in pristine and fresh condition on a daily basis placed into custom designed chlorocresol charged humid relaxing containers directly from the traps, and usually were processed (pinned, spread, and labeled) within 24-48 hours, and subsequently oven dried for two days or more while on spreading boards (Fig. 33). One (20' x 8' x 8') malaise trap was operated at the AESS for two years.180 five-gallon plastic buckets with lids, and more than 3,000 one-gallon plastic jugs with lids were used for handling and storage of prepared fermenting fruit bait. 10 plastic and steel 55-gallon drums were used for chemical storage and trap development projects. All insect traps suffered damage to varying degrees due to: white-tailed deer, opossums, nine-banded armadillos, grey squirrels, red squirrels, grey foxes, flying squirrels, rabbits, bobcats, several species each of lizards, snakes, birds, even hummingbirds, ants, wasps and hornets, crayfish, blue crabs, fiddler crabs, and numerous other orders of insects. On several occasions each year our light traps and collection chambers were filled to overflowing due to massive numbers of different species of adult mayflies.

Fruit baits and related supplies used at the AESS

In the early 1980s, we planted eight dozen varieties (160 trees) of European and Asian pear and apple tree seedlings, hundreds of peach and nectarine seedlings, quince seedlings and others fruit trees, including 24 varieties of banana plants, more than 100 blueberry plants, dozens each of paw paw trees, mandarin trees, kumquat trees, and fig trees, in order to obtain thousands of pounds of fruit used in operating our fermenting fruit bait traps year-round. We also used fruit from on-site wild native plants and trees at the AESS (hawthorns, crabapples, blackberries, blueberries, grapes, elderberries, currants, etc.). Typically our fermenting bait consisted of store-bought apples, bananas, figs, peaches, pears and others blended with white granulated cane sugar and regular beer and onsite potable well water. We used about three gallons of liquid bait in each trap and topped off the containers with fresh bait every day or two during all 12 months of every year. We used over 2,000 pounds of granulated cane sugar and brown sugar, 50+ gallons of molasses and cane syrups, more than 1,200 gallons of standard 5% alcohol beer, many hundreds of gallons of wines and ethanol, numerous thousands of gallons of non-chlorinated, naturally occurring on site potable well-water, and others.

Collection storage and accoutrements, and reference library used at the AESS

Storage of these collected biological materials involved obtaining an all electric separate building which housed (5) wood (Brou, 1993) and (9) steel cabinets for more than 860 Cornell-size specimen glass top storage drawers, and additional shelving units for an additional 50 Cornell-size specimen glass top storage drawers, more than 220 wood Schmidt boxes and more than 600 similar fiber board specimen storage boxes, all requiring round-the-clock, continuous temperature and humidity controls, as well as yearly chemical pest fumigation (Fig. 3). Various tweezers, scissors, dissecting and laboratory supplies were utilized. Over these many decades, much of our research and accomplishments has been documented in scientific journals, newsletters, and other print venues, which resulted in more than 446 published articles so far. Ninety percent of our lifetime of entomological related publications are listed in the 'Literature cited' portion of this publication. As a result of these investigations, over 400 new to science undescribed insects (mostly moths) were discovered. Between 1971-2022, around 700,000 of our duplicate wild collected specimens were routinely and permanently deposited at the Louisiana State Arthropod Museum, Louisiana Wildlife and Fisheries Museum, Audubon Institute Butterflies in Flight exhibit (New Orleans), Audubon Insectarium (New Orleans), McGuire Center for Lepidoptera and Biodiversity, Florida State Collection of Arthropods, United States National Museum (Smithsonian), American Museum Natural History, Carnegie Museum, Los Angeles County Museum, Natural History Museum London, Prague Museum, and various other university collections, as well as hundreds of major private entomological research collections worldwide. Thousands of invaluable taxonomical and rare entomological reference books needed for research purposes are located onsite at the AESS. One highway ready and fully-equipped field trip cargo trailer filled with collecting equipment storage was used for over 30 years and stored at the AESS.

Photographic equipment and related items, paper, card stock, envelopes used at the AESS

Two Pentax brand manual 35mm film cameras, and numerous dozens of macro lenses, bellows, filters and other photographic accoutrements were used. 10 Fujifilm brand and one Nikon brand digital cameras (3 MP-16MP), one Pentax brand (36.5 MP) digital camera, and numerous dozens of digital data-storage cards up to 64 GB, and numerous dozens of USB flash drives were used almost daily. An illuminated photographic light (fixture) box was self-designed and fabricated using sheet metal, and was used for nearly 40 years to obtain far more than 100,000 film and digital images of our captured and processed specimens, many appearing in hundreds of our entomological publications. 500,000 paper specimen envelopes, five reams of (8 ½" X 11") laser and ink jet printing paper, three reams of (8 ½" X 11") medium and heavy 'card stock', 1,000+ sheets (8 ½" X 11") of photographic paper, 100+ sheets (8 ½" X 11") of adhesive printer paper. Dozens of liquid ink printer refills, and dozens of dry ink printer refills were used. (4,000' x 12") Reynolds 910 clear plastic PVC film, and 350 pcs (2' X2') heavy cardboard stock, and 85 pcs (2' x 2') medium weight white and black poster boards, and over 2,000 manila file folders were used.

Computers, word processors, printers, laboratory equipment and digital storage used at the AESS

Two word processors, two stereo microscopes, four (Pc) personal desktop computers (two were custom designed), six laser and ink-jet printers, two dry ink printers (Xerox and Lexmark), two Xerox copy/printer machines, 12 external hard drives totaling near 50 terabytes of digital data-storage capacity and numerous dozens of flash drives, and two DVD and four CD creators.

Insect traps usage over the decades, (reported as trap hours) **99% occurred mostly at the AESS**

Over 53 years (1969-2022) numerous dozens of self-designed automatic-capture high-wattage light traps were operated for 1,390,000 light-trap hours, hundreds of semiochemical lure traps were operated for 32,400,000 trap-hours, dozens of fermenting fruit bait traps were operated for 1,270,000 trap-hours, more than 100 dung beetle traps were operated 15,341,000 trap-hours, and malaise traps were operated 10,800 trap-hours, on and on. For 41 years (1981-2022)all of these various traps were operated continuously 24 hours every day, 365-366 days every year at the AESS and were similarly and continuously operated elsewhere across Louisiana over 53 years. Images of a few of these traps are illustrated (Figs. 4-13).

Fig. 3. Image of some of the master reference collection of nearly 500,000 Louisiana insects (best of the best, pinned, spread, labeled and determined) accumulated by Vernon Antoine Brou Jr. and Charlotte Dozar Brou over the past half century housed at the *AESS*. The majority of these biological materials are Lepidoptera, and a much lesser quantity are coleoptera, diptera, hemiptera, hymenoptera, orthoptera and various other insect families. Two additional rooms not illustrated here house the processing and work stations, huge amounts of stored additional dried papered specimens inventory, and an extensive entomological library mostly on lepidoptera going back to the mid 19th century and worldwide in origin.

Fig. 4. Collage illustrating a few of the 500 or so self-designed insect traps operated and used at the *AESS* and across Louisiana over the past half century. We developed and operated numerous additional specialized insect traps not highlighted here, e.g., tiger beetle traps, and dung beetle traps for both diurnally active and nocturnally active species. And our semiochemical lure traps even captured saturnidae species. We sometimes captured butterfly and hawkmoth species in some of our dung beetle traps using human feces.

Fig. 5. Examples of light traps operated above secondary lower growth vegetation at the AESS in the 1980s. a. 175-watt mercury vapor lamp with (4) 15-watt blacklight fluorescent tubes, trap 8-meters above ground, b. 1000-watt mercury vapor lamp, trap 16-meters above ground, c. 400-watt mercury vapor lamp, trap 8-meters above ground, d. upper trap 16-meters above ground 175-watt mercury vapor lamp with (4) 15-watt blacklight fluorescent tubes, lower trap 2-meters above ground 175-watt mercury vapor lamp with (4) 15-watt blacklight fluorescent tubes, all traps fitted with NaCn dispatching wooden automatic-capture collection chambers.

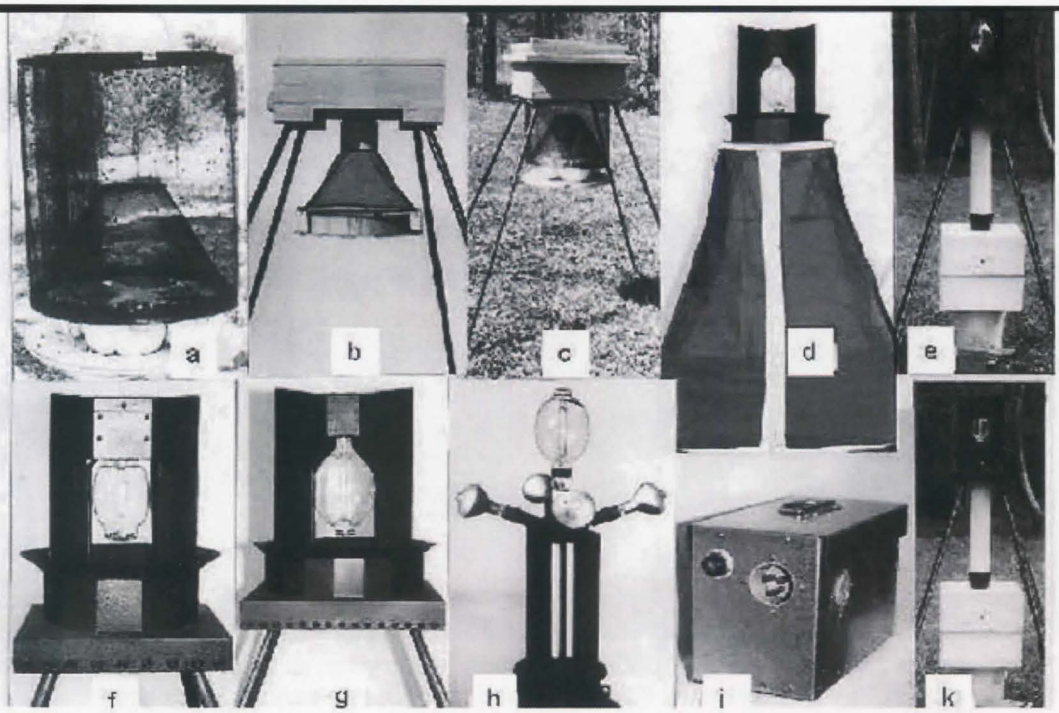
Fig. 6. Examples of light traps with multi-drawer automatic-capture collection chambers used at the *AESS*.

Fig. 7. Examples of light and bait traps with automatic-capture collection chambers used at the *AESS*.

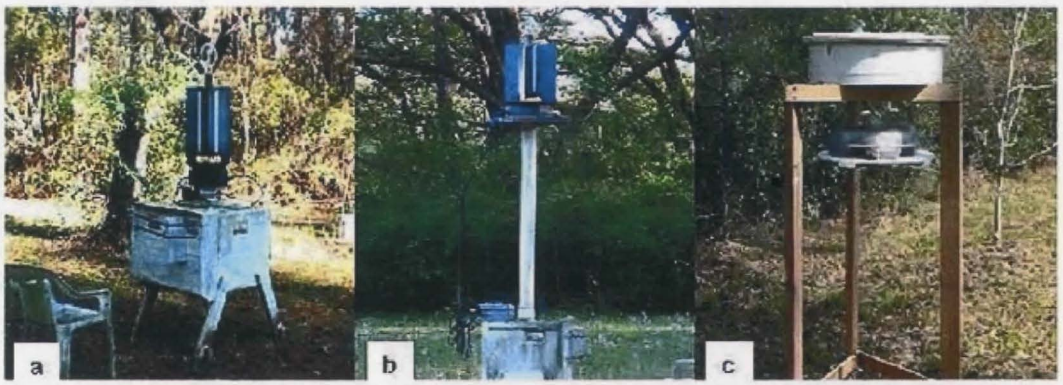
AESS, live-capture **Light trap #8**. (1) 1000-watt mercury vapor lamp, and (2) 275-watt RS sunlamps, and (8) 15-watt fluorescent blacklights, and (1) 160-watt mercury vapor lamp

AESS Left: **Light trap #9**. (4) 15-watt fluorescent blacklights, and (1) 160-watt mercury vapor lamp with collection chamber, right: **Fermenting fruit bait trap #4** with automatic capture collection chamber.

Fig. 8. Examples of light and bait traps with automatic-capture collection chambers used at the *AESS*



a. Live-capture fruit bait trap, **b**. bait trap/lure trap with collection chamber, **c**. bait trap/lure trap with collection chamber, **d**. light trap with inverted 1000-wat mercury vapor lamp and fiberglass screen skirt, **e**. light trap with 1000 watt mercury vapor lamp and automatic capture collection chamber, **f**. light trap with inverted 175-watt mercury vapor lamp, **g**. light trap with inverted 1000-watt mercury vapor lamp, **h**. light trap with 1000-watt mercury vapor lamp, (4) 275-watt reflector sunlamps, and (8) 15-watt fluorescent blacklights, **j**. mercury vapor ballast box, **k**. light trap with inverted 175-watt mercury vapor lamp with automatic capture collection chamber.



a. light trap with (1) 400-watt mercury vapor lamp and (4) 15 watt fluorescent blacklights with collection chamber, **b**. light trap with (1) 175-watt mercury vapor lamp and (4) 15 watt fluorescent blacklights with collection chamber, **c**. **fruit-bait trap #5** with automatic capture collection chamber.

Fig. 9. Examples of insect traps, components and devices, some with automatic-capture collection chambers designed and used at the *AESS*.

Fig. 10. Examples of insect traps and devices designed and used at the *AESS*.

Fig. 11. 30 examples of semiochemical lure type insect traps designed and used at the *AESS*.

Fig. 12. 30 examples of semiochemical lure type insect traps designed and used at the *AESS*.

Fig. 13. a. Light trap (1) 400 watt mercury vapor lamp and (4) 15-watt fluorescent blacklights and collection chamber, one sesiid lure trap at the *AESS*, b. Light trap (1) 1000-watt mercury vapor lamp, and (5) 275-watt RS sunlamps, and (8) 15-watt fluorescent blacklights, used for fieldwork and occasionally at the *AESS*.

As with the thousands of other newly reported species over the past half century we have documented in scientific literature for Louisiana, these best of the best (~500,000 specimens of the master research collection) (Fig. 3), and other captures are part of the master entomological research collections of the authors. It is our intention that this research collection will eventually be deposited in the Louisiana State Arthropod Museum for the benefit of future entomological researchers in Louisiana. We have previously placed approximately one quarter of a million insect specimens in the LSAM between 1971 and 2022.

1988 The first new species we reported on and described at the AESS location (Type locality) was 164 adults captured in UV light traps of ***Catocala charlottae*** Brou 1988, the senior author (Vernon A. Brou Jr.) naming a species in honor of his wife the junior author (Charlotte Dozar Brou). (Fig. 14a, b)

1991 Chapin and Brou (1991) reported on a lady beetle ***Harmonia axyridis*** (Pallas), not previously known to be established in the United States. More than 1,000 wild adults were captured at the AESS using ultraviolet light traps. This publication was the first to be published confirming this species to be established in the United States.

1993 Brou (1993) reported capturing a female ***Anticarsia irrorata*** Fabricius (Fig. 14c) in a light trap at the AESS on February 7, 1990. Good quality color images of that specimen were sent to several noted lepidoptera (Noctuidae specialist) researchers at the United States National Museum (USNM), U.S. Department of Agriculture, and elsewhere. All respondents agreed that this specimen appeared to be '***Anticarsia irrorata***', a new species record for North America. So, we proceeded, publishing that brief note. Years later, we were made aware that the true identity of this species actually was ***Epitausa prona*** (Moschler) (Fig. 14c). The first known report of adult ***Epitausa prona*** in the United States was made by Andre Blanchard (1973) who captured one male in Welder Wildlife Refuge, San Patricio County, near Sinton, Texas on November 14, 1968. Brou (2007) published a correction concerning the true identity of this adult Louisiana female moth. Twenty-four years later on December 29, 2014, a male ***Epitausa prona*** (Moschler) (Fig. 14d) was captured in a UV light trap also at the *AESS*. ***E. prona*** is sexually dimorphic in appearance and shape, and this fact also contributed to the misdeterminations of this tropical species. At that time the persons involved had never seen a female ***E. prona***. Brou (1993) reported the capture on February 23, 1991 at the AESS of the first confirmed adult Louisiana record of the global pest bean-pod borer moth ***Maruca testulatis*** (Geyer), subsequently reclassified as ***Maruca vitrata*** (Fabricius, 1787) (Fig. 14e.), the name ***testulatis*** is now synonymized under ***vitrata***. Newly reported for Louisiana, adults of two introduced new invasive moth

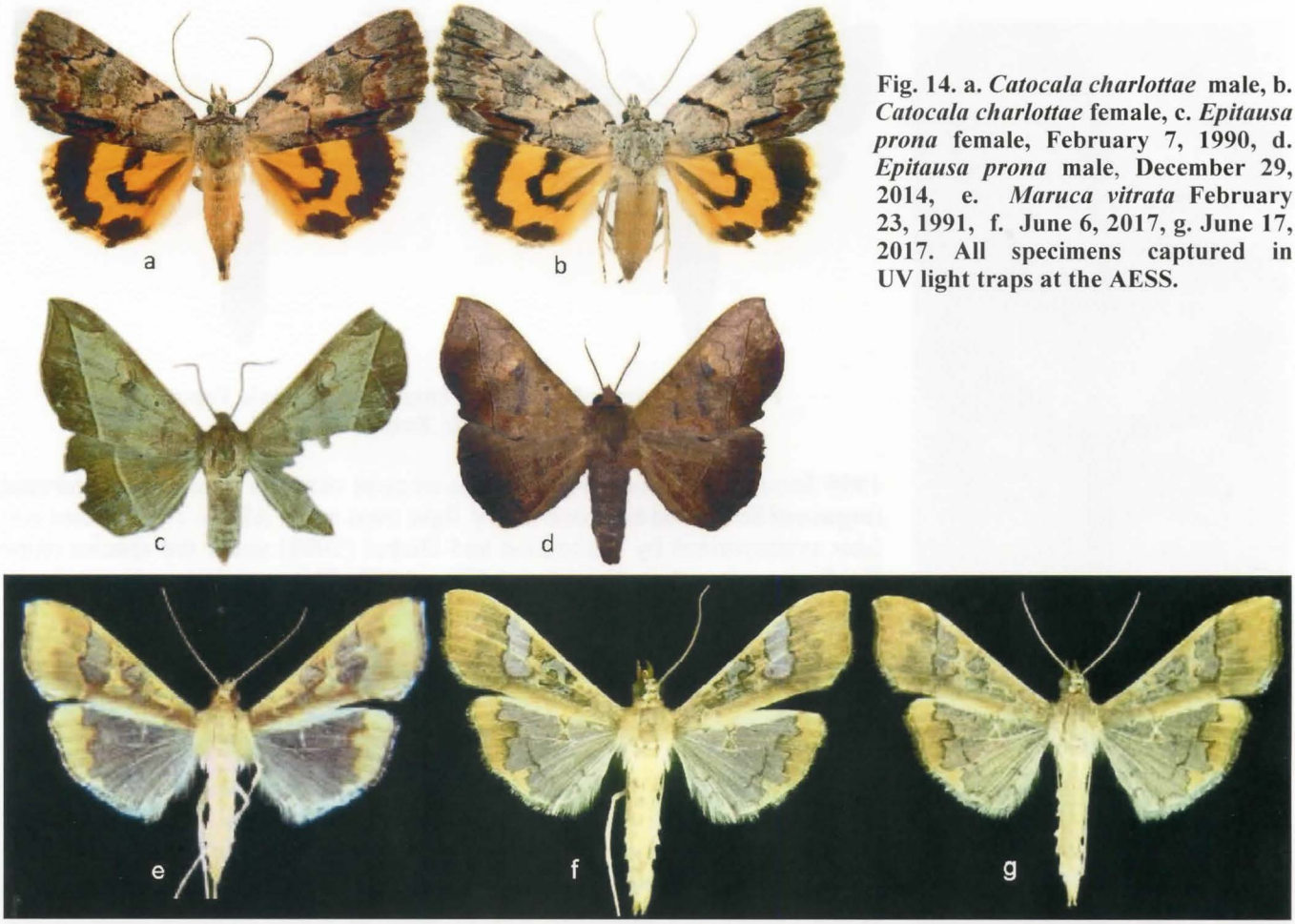


Fig. 14. a. *Catocala charlottae* male, b. *Catocala charlottae* female, c. *Epitausa prona* female, February 7, 1990, d. *Epitausa prona* male, December 29, 2014, e. *Maruca vitrata* February 23, 1991, f. June 6, 2017, g. June 17, 2017. All specimens captured in UV light traps at the AESS.

species, both occurring at the AESS, captured in ultraviolet light traps: one ***Sameodes albiguttalis*** (Warren) (Fig.15a,b) was captured in all 12 months. Brou (1993) captured ***Sameodes albiguttalis*** at the AESS, a larval host upon water hyacinths ***Eichhornia crassipes*** (Mart.). ***S. albiguttalis*** was subsequently moved to a different genus ***Niphograpta albiguttalis*** (Warren). Adults of the second species ***Parapoynx diminutalis*** Snellen (Fig. 15c,d) suspected host upon ***Hydrilla*** species (Baloch & Ullah, 1975), were captured in UV light traps spring and fall in at least two annual broods at the AESS, Brou (1993).

1994 In 1994, the hawkmoth ***Lapara phaeobrachycerous*** Brou (Fig. 16a,b topotypes) was described based upon many thousands of wild adults captured in ultraviolet light traps at the AESS (Type locality). Additionally, specimens of a second, larger undescribed hawkmoth species also in the genus ***Lapara*** from the AESS remains undescribed all these decades waiting for a larger series of adults to base the formal description upon (Fig. 28e). Brou (1994) reported on the Geometridae genus ***Nematocampa*** Guenée at the AESS including adding one recently described new species ***Nematocampa baggettaria*** Ferguson for the state of Louisiana. Brou (1994) added two species of ***Callosamia*** from the AESS as new for Louisiana, capturing numerous hundreds of wild specimens using ultraviolet light traps of both ***Callosamia angulifera*** (Walker) and ***Callosamia securifera*** (Maassen). A third species ***Callosamia promethea*** (Drury) was first reported in Louisiana by von Reizenstein (1863), also occurs at the AESS. Brou (1994) captured and reported 21 wild adults of the tropical moth ***Agrotis repleta*** Walker, new for Louisiana and occurring at the AESS. Brou (1994) reported the pyralids ***Omiodes martyralis*** (Lederer) and ***Omiodes indicata*** (Fabricus) both new state records, and ***O. martyralis*** is a new US record, both species captured in UV light traps occurring at the AESS. Brou (1994) reported two fruit piercing moth species ***Gonodonta pyrgo*** (Cramer), and ***Eudocima materna*** (Linnaeus), both new state record wild captures in UV light traps at the AESS. Later, Brou (2006) addressed the Old World species ***E. materna*** and removed that one species long existing on multiple century old and newer checklists for North American Lepidoptera, and replaced it with three new species names: ***Eudocima apta*** (Walker) replacing ***E. materna***, and ***Eudocima serpentifera*** (Walker,·[1858]) both new United States and Louisiana state records captured at the AESS, and also included a third species of ***Eudocima*** for the US, the Palearctic species ***Eudocima tyrannus*** (Guenée,1852) recently reported from the Aleutian Islands.

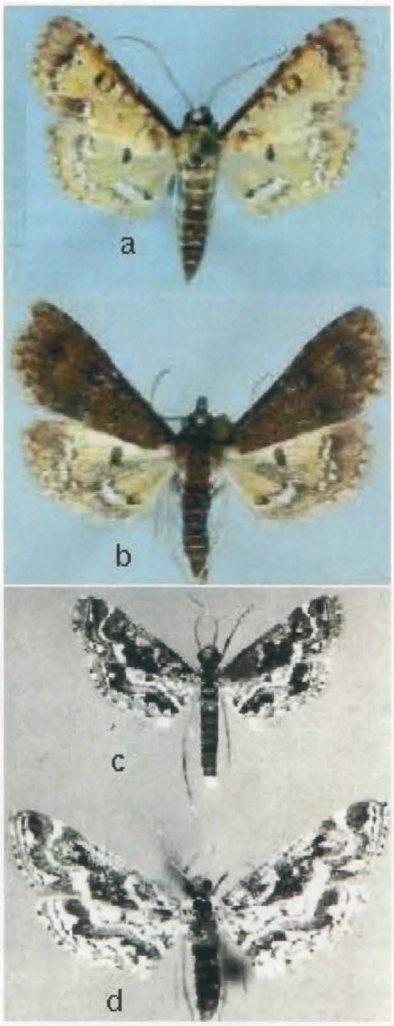


Fig. 15. ***Niphograpta albiguttalis*****, a. male, b. female, AESS** ***Parapoynx diminutalis*****, c. male, d. female, AESS.**

Fig. 16. ***Lapara phaeobrachycerous*** **Brou, a. male Topotype, b. female Paratype. Both from AESS.**

1995 Brou (1995) newly reported the tropical moth for Louisiana ***Epidroma fergusoni*** Solis wild captured in UV light traps at the AESS. This species was later synonymized by Lafontaine and Dickel (2008) under the species name ***Epidroma rotundata*** Herrich-Schäffer, 1869. This species continues to be abundant and well established at the AESS.

1996 Brou (1996) reported a new state record from the AESS, wild captured adults of ***Franclemontia interrogans*** (Walker) captured in UV light traps; the larvae is a borer in ***Arundinaria*** bamboo.

1997 Brou (1997) reported the invasive European moth species ***Noctua pronuba*** (Linnaeus), wild captured in UV light traps at the AESS, and the first published record in both the USA and Louisiana. Brou (1997) reported three new for Louisiana species of ***Chaetaglaea***, all wild captured in UV light traps at the AESS, and described one of them as a new species: ***Chaetaglaea fergusoni*** Brou (Fig. 18), TYPE locality AESS. Brou and Brou (1997) reported a 26-year portion of their continuous 30-year study of the hawkmoths of Louisiana, capturing 71,839 wild adults in UV light traps, fermenting fruit bait traps and dung beetle traps, reviewed past and current records totaling 55 species for the state, and specifically reported on 44 species taken in this study, of which 40 species were captured at the AESS (all new St. Tammany Parish records).

Phenograms for most of the reported species were provided based on actual dates of all captured wild adults for the first time in scientific literature. The numbers of annual broods for most hawkmoth species in North America were historically (~150 years) reported as having only one, or at most two annual broods by earlier workers. Of the species we addressed in Louisiana, we proved only one species is univoltine, a few have two annual broods, but the rest of the species we reported upon actually have 3, 4, 5, 6, 7, 8, 9 or more annual broods. A review of the major and minor scientific literature going back to the Civil War era reveals that earlier workers stated numbers of annual broods in North America for many of these species of hawkmoths were based upon nothing but unsubstantiated conjecture and baseless opinions. Upon reviewing both old and newer literature, it is evident that each of these subsequent publications for over a century simply parroted what the previous authors stated and published, over and over from the 1800s to present day. Brou (1997) reported ***Citheronia sepulcralis*** Grote & Robinson, a new state record from the AESS. In past scientific literature this species is reported to have one or two annual broods, but we captured 1,295 wild adults using UV light traps over 25 years which proved this species has a least four annual broods. Brou (1997) published species accounts on five clearwing moth species captured in UV light traps, fermenting fruit bait traps and semiochemical lure traps at the AESS: Synanthedon acerni (Clemens), ***Podosesia syringae*** (Harris), ***Podosesia aureocincta*** Purrington & Nielsen, ***Synanthedon exitiosa*** (Say), and ***Synanthedon rubrofascia*** (Hy. Edw.), providing capture dates creating 366-day phenograms for all of them based upon decades of wild-captured adults for the first time in scientific literature.

1999 Brou (1999) reported on the univoltine phenology of ***Anisota stigma*** (Fabricius), newly reported for Louisiana and wild captured in UV light traps at the AESS.

2000 Brou (2000) captured 259 wild adults of ***Parrhasius m-album*** Boisduval & LeConte mostly in UV light traps at the AESS. Prior publications anecdotally stated this species has three or four annual broods without proof. We proved this species has six or more annual broods at the AESS. Brou (2000) captured thousands of adult ***Catocala muliercula*** Guenée; there were population explosions during three early years at the AESS, e.g. in 1986 approximately 4,000 wild adults of ***C. muliercula*** were collected each and every day during the entire month of June using five to six UV light traps and eight fermenting fruit bait traps.

2001 Brou (2001) captured 461 wild adult ***Xanthopastis timais*** (Cramer) in UV light traps mostly from the AESS proving this species has five annual brood in Louisiana. Subsequently, this species name was revised to ***Xanthopastis regnatrix*** (Grote, 1863).

2002 Brou (2002) newly reported for Louisiana 149 adults of ***Sphacelodes vulneraria*** (Hbn.) in UV light traps mostly from the AESS. Brou (2002) reported upon the voltinism of ***Antheraea polyphemus*** in Louisiana, previously reported by various authors as having one or two annual broods. Our publication documented 1,509 wild captured adults at the AESS, proving there are five annual brood in Louisiana. Brou (2002) newly reported ***Nepytia semiclusaria*** (Walker) in Louisiana, reporting 2,216 wild adults from the AESS, indicating one annual brood peaking late May. Brou (2002) newly reported 721 wild captured adults at the AESS of ***Syngamia florella*** (Stoll) peaking in one annual brood during September/October in Louisiana. Brou (2002) provided chronographic analysis in 'Brief observations of Sphingidae flight time' illustrating nocturnal capture times of some species hawkmoths also found at the AESS and elsewhere in Louisiana. Brou (2002) illustrated in color some variations in appearance for adults of the Arctiidae species: ***Utetheisa bella*** (Linnaeus), ***Utetheisa ornatrix*** (Linnaeus) and ***Holomelina laeta*** (Gr.-Men.) all captured at the AESS. Brou (2002) illustrated in color some variations in appearance for adults found at the AESS for the species ***Atteva aurea*** (Fitch) and ***Hyparpax aurora*** (Smith). Brou and Brou (2002) published a four year addendum (1996-99), a compendium to the earlier 26-year portion of the Sphingidae of Louisiana (1997), documenting an additional 12,053 wild-captured adults, cumulatively representing 36 species of hawkmoths totaling 83,889 wild-captured adults over 30 consecutive years (1969-1999). The vast majority of specimens in this 30-year study were captured at the AESS. During the 30-year investigation, in excess of 2.42 million trap-hours, representing 1,160,000 ultraviolet light trap-hours and 1,262,000 fermenting bait trap-hours were expended. Brou (2002) reported six species of ***Dioryctria*** at the AESS, (five species were new state records). Brou (2002) reported three ***Euzophera*** species, all new state records captured at the AESS in UV light traps. Brou (2002) documented 377 wild adults of ***Hemileuca maia*** (Drury) captured in ultraviolet light traps at the AESS. Brou (2002) placed representative images for 3,033 adult wild-captured adults of ***Catocala ilia*** (Cramer) and form ***umbrosa*** captured in UV light traps at the AESS in Louisiana, along with genitalia comparisons proving ***C. umbrosa*** is a valid distinct species from ***C. ilia***. Brou (2002) illustrated some variations of ***Catocala ilia*** and ***Catocala umbrosa*** mostly captured in UV light traps at the AESS. Brou (2002) published the species description of ***Catocala umbrosa*** Brou, Holotype, Allotype and 422 Paratype males and females were wild-captured in UV light traps and fermenting fruit bait traps at the (type locality AESS) (Fig. 25). Brou (2002) newly reported 2,383 wild adults of ***Catocala grynea*** (Cramer) captured in UV light traps at the AESS. Brou (2002) newly reported ***Catocala ultronia*** (Hbn.), reporting 977 wild adults captured in UV light traps at the AESS. Brou (2002) reported 881 wild adults of ***Synanthedon pictipes*** (Grote & Robinson) captured in UV light traps and mostly using semiochemical lure traps at the AESS. Many of these documented adults actually represent around a half dozen different species of ***Synanthedon*** misdetermined as ***S. pictipes*** by T.D. Eichlin during the 1980s-1990s for Brou. Unfortunately, one of these misdetermined adults of a new undescribed species was pictured in this one-page (2002) species account as ***S. pictipes.***

2003 Brou (2003) newly reported for Louisiana 942 wild adult captured ***Epimecis hortaria*** Fabricius taken in all 12 months using UV light traps at the AESS. Brou (2003) newly reported for Louisiana mostly from the AESS 44 wild-captured adults (late August to mid-October) of the univoltine, rare white flower moth ***Schinia bimatris*** (Harvey). Shortly afterwards all of these irreplaceable specimens were destroyed and this matter was subsequently documented by Brou (2003). Brou (2003) updated the current status of ***Bagisara brouana*** Ferguson (Fig. 26) capturing 656 adults in UV light traps over the past 25 years since its discovery at the AESS, and subsequent description by Ferguson (1997). Brou (2003) newly reported four species (2,946 wild adults) of the genus ***Metaxaglaea*** in Louisiana, captured in UV light traps at the AESS. Brou (2003) reported 3,604 wild-captured adults of ***Automeris io lilith*** (Strecker) from the AESS via UV light traps. All prior literature records stated there were only two or three annual broods for this species in the Southern US. Our data eclipsed centuries of prior unsubstantiated anecdotal statements, and proved without a doubt there are always four annual broods in Louisiana. Brou

(2003) newly reported 1,682 wild adults of ***Cosmosoma myrodora*** Dyar captured in UV light traps mostly at the AESS. Brou (2003) reported 544 wild-captured adults of ***Schinia trifascia*** Hübner in UV light traps at the AESS. Brou (2003) reported 1,054 wild-captured adults of ***Catocala charlottae*** Brou (Type locality AESS) in UV light traps in Louisiana. Brou (2003) newly reported 2,317 wild-captured adults of ***Holomelina laeta*** (Guérin-Méneville) using UV light traps at the AESS. Brou (2003) reported 1,421 wild-captured adults of ***Euagrotis lubricans*** (Guenée) captured in UV light traps, at the AESS. In 2004, the genus ***Euagrotis*** was synonymized with ***Anicla*** Grote, and also the newly recognized species ***Anicla sullivani*** Lafontaine also found at the AESS was described. The Louisiana sample population at the AESS, reported as ***E. lubricans***, was collected prior to 2003 actually composed of both of these species. Brou (2003) provided records for some wild-captured ***Ascalapha odorata*** (Linnaeus), at the AESS, and newly reported for Louisiana three adults of **Thysania zenobia** (Cramer). Brou (2003) newly reported 55 wild-captured adults of ***Catocala messalina*** in Louisiana, using UV light traps, including some adults at the AESS. Brou (2003) in 'Let this be a lesson – a real sad dilemma....' documented the blatant disregard for the safety of 2,399 pinned, and spread, labeled and determined Heliothinae specimens loaned to a careless researcher at the National Museum of Natural History, aka Smithsonian. The vast majority of those destroyed specimens were captured at the AESS. The resulting tally were that 702 of these specimens were destroyed, lost or missing, and even the remaining portion which were weeks and months later returned, all were damaged as well, being exposed to the ambient humidity conditions traveling in a broken open parcel through the 'junk mail system' for three weeks or more. Brou (2003) newly reported for Louisiana 1,039 wild adults of ***Schinia arcigera*** (Guenée), captured at the AESS. Brou (2003) newly reported for Louisiana 1,137 wild adults of ***Eacles imperialis*** (Drury), captured in UV light traps at the AESS, and newly reported ***Eacles imperialis nobilis*** Neumoegen for Louisiana in Natchitoches Parish.

2004 Brou (2004) reported 1,757 wild-captured adults of ***Actias luna***, at the AESS, proving this species has five annual broods in Louisiana. Brou (2004) newly reported for Louisiana three species of the Notodontidae genus ***Peridea*** reporting 2,086 wild-captured adults of ***Peridea angulosa*** (J.E.Smith), using UV light traps at the AESS, proving ***P. angulosa*** has four annual broods in Louisiana. Brou (2004) newly reported for Louisiana ***Cisthene plumbea*** Stretch, 1,016 wild-captured adults in UV light traps at the AESS, proving this species has three annual broods in Louisiana. Brou (2004) newly reported for Louisiana 3,301 wild-captured adults of **Prochoerodes transversata** (Drury) in UV light traps at the AESS, proving that the second of five or six annual broods composes ~90% of the entire annual population. Brou (2004) on Color insert A, illustrated 16 images of several wild-captured noctuidae species from UV light traps at the AESS. Brou (2004) newly reported for Louisiana ***Feralia major*** J.B. Smith, capturing 832 wild adults in UV light traps at AESS. Brou (2004) reviewed four species of the noctuidae genus ***Mocis*** Hübner in Louisiana, capturing 5,668 wild adults in UV light traps at the AESS. This publication proved that two species are residents in Louisiana and two are annual migrants. Brou (2004) reported ***Ecpantheria scribonia*** (Stoll), capturing 1,130 wild adults in UV light traps at the AESS proving this species has two annual brood in Louisiana. Brou (2004) illustrated ***Phoberia atomaris*** Hübner, capturing 1,294 wild adults in UV light traps at the AESS. Brou (2004) revised the genus ***Baileya*** Grote, and also described two new species from the southeastern United States. Both new species ***Baileya acadiana*** Brou (Fig. 20) and ***Baileya ellessyoo*** Brou (Fig. 27) and all of the five earlier described species also have been captured at the AESS. Brou (2004) newly reported a long known and still undescribed ***Catocala*** species capturing 2,527 wild adults at the AESS. Brou (2004) newly reported for Louisiana 1,118 wild adults of ***Eutrapela clemataria*** (J.E.Smith) in UV light traps at the AESS, proving this species has four to five annual broods in the state. Brou (2004) newly reported for Louisiana 2,753 wild adults of ***Thysanopyga intractata*** (Walker) captured in UV light traps at the AESS, proving this species has six or more annual broods in Louisiana. Brou (2004) newly reported for Louisiana 3,627 ***Artace cribraria*** (Ljungh) adults taken in UV light traps at the AESS, proving this species has three or more broods in Louisiana. Brou (2004) newly reported for Louisiana two distinctly western U.S. species: ***Schinia grandimedia*** Hardwick and ***Schinia tertia*** (Grote), both taken at the AESS. Brou (2004) newly reported for Louisiana 991 wild adults of ***Cymatophora approximaria*** Hübner captured in UV light traps at the AESS. Brou (2004) newly reported for Louisiana three species of the genus ***Pyreferra***, two of which occur at the AESS. Brou (2004) newly reported for Louisiana 2,246 adults of ***Symmerista albifrons*** (J.E. Smith), at the AESS. Brou (2004) newly reported for Louisiana ***Basilodes pepita*** Guenée, a rarely encountered Louisiana noctuid moth at the AESS.

2005 Brou (2005) reported 689 adult ***Calycopis cecrops*** (Fabricius) in four annual broods, all wild-captured using UV light traps, at the AESS. Brou (2005) newly reported for Louisiana three species of the genus ***Lytrosis*** Hulst, all wild-captured in UV light traps at the AESS. Brou (2005) newly reported for Louisiana 253 wild-captured adults of an undescribed ***Lithophane***

species in UV light traps, at the AESS. Brou (2005) newly reported for Louisiana 254 adults of the univoltine species ***Papaipema appasionata*** Harvey captured in UV light traps at AESS. The larvae of this species is a borer in the yellow flowered pitcher plant ***Sarracenia alata*** Wood, which also occurs at the AESS. Brou (2005) newly reported for Louisiana 45 adults of ***Meskea dyspteraria*** Grote in UV light traps at the AESS. Brou (2005) newly reported for Louisiana ***Catocala lincolnana*** Brower at the AESS and ***Catocala texarkana*** in Louisiana. Brou (2005) newly reported 332 adults of the winter Geometridae moth ***Ceratonyx satanaria*** Guenée captured in UV light traps at the AESS. Brou (2005) documented 87 adults ***Hypocala andremona*** (Cramer) captured in UV light traps at the AESS. Brou (2005) newly reported for Louisiana 21 adults of ***Neocataclysta magnificalis*** (Hübner) captured at the AESS. Brou (2005) newly reported for Louisiana 887 adults of ***Macrurocampa marthesia*** (Cramer) captured at the AESS. Brou (2005) newly recorded for Louisiana two new undescribed species of ***Notodontidae*** found at the AESS. Brou (2005) newly reported for Louisiana 504 wild adults of ***Parasa chloris*** (Herrich-Schäffer) captured in UV light traps at the AESS. Brou (2005) illustrated the various larval instars of the most abundant species of hawkmoth found at the AESS, ***Amphion floridensis*** B.P. Clark. Brou (2005) newly reported for Louisiana 3,026 wild adults of ***Iridopsis defectaria*** (Guenée) captured at the AESS. Brou (2005) newly reported ***Acrapex relicta*** Ferguson for Louisiana at the AESS. Brou (2005) documented capturing 52 adults of ***Acronicta perblanda*** Ferguson found at the AESS. Brou and Brou (2005) chronicled the devastating effects of Hurricane Katrina and Tropical Storm Bill at the AESS (Fig. 31 and 31.1). Brou (2005) documented the capture of 162 adults of ***Acronicta sinescripta*** Ferguson at the AESS. Ferguson (1988) described ***Acronicta sinescripta*** Ferguson and designated the holotype, allotype and some paratypes from the AESS (Type locality). Brou (2005) illustrated rearing ***Automeris louisiana*** Ferguson & Brou which has been captured at least once at the AESS. This species was first discovered and recognized as a new undescribed species in 1975 at Golden Meadow, Lafourche Parish, Louisiana.

2006 Brou (2006) documented 1,041 wild adults of ***Harrisimemna trisignata*** (Walker) captured at the AESS. Brou (2006) illustrated rearing ***Darapsa myron*** (Cramer), a very abundant species at the AESS. Brou (2006) reported capturing 1,318 wild adults of ***Catocala micronympha*** Guenée at the AESS. Brou (2006) newly reported for Louisiana 518 wild adults of ***Metarranthis obfirmaria*** (Hübner) captured in UV light traps at the AESS. Brou (2006) newly reported for Louisiana 243 wild-captured adults of ***Schinia tuberculum*** (Hübner) mostly at the AESS. Brou (2006) newly reported for Louisiana 176 wild adults of ***Lithacodia bellicula*** Hübner captured in UV light traps at the AESS. Brou (2006) newly reported 145 wild adults of ***Melipotis indomita*** Walker for Louisiana at the AESS. Brou (2006) newly reported for Louisiana capturing 16 wild adults of ***Melipotis perpendicularis*** Guenée at the AESS. Brou (2006) newly reported for Louisiana 172 wild adults of ***Epidroma fergusoni*** (Solis) captured in UV light traps at the AESS. Brou (2006) newly reported for Louisiana ***Panula inconstans*** Guenée, the first confirmed US record at the AESS. Brou (2006) newly reported for Louisiana 71 wild adults of ***Catocala alabamae*** Grote captured using UV light traps and fermenting fruit bait traps at the AESS. Brou (2006) reported 4,077 wild adults of ***Hyphantria cunea*** (Drury) captured at the AESS. Brou (2006) captured a new US species of the large in size tropical fruit-piercing moth ***Eudocima serpentifera*** (Walker) (Fig. 28j) taken in a UV light trap at the AESS. Brou (2006) newly reported for Louisiana 24 wild adults of ***Melipotis fasciolaris*** (Hübner) taken in UV light traps at the AESS. Brou (2006) newly reported for Louisiana 4,414 wild adults of ***Holomelina opella*** (Grote) taken in UV light traps at the AESS. Brou (2006) newly reported for Louisiana ***Grammia virgo*** (Linnaeus) capturing 32 wild adults in UV light traps at the AESS.

2007 Brou (2007) newly reported ***Catocala orba*** Kusnezov for Louisiana taking 71 wild adults in UV light traps at the AESS. Brou (2007) reported 1,045 wild adult ***Papilio palamedes*** Drury captured at the AESS. Brou (2007) reported 309 wild adults of ***Fixsenia ontario*** (W.H. Edwards) captured in UV light traps at the AESS. Brou (2007) reported 76 wild adults of ***Satyrium liparops*** (LeConte) captured in UV light traps at the AESS. Brou (2007) illustrated ***Eudocima serpentifera*** (Walker), a new US record for a tropical fruit-piercing moth captured at the AESS. Brou (2007) again illustrated ***Eudocima serpentifera*** (Walker) a new US record moth captured at the AESS on October 25, 2006 (Fig. 28j). Brou (2007) illustrated wild adults and wild larvae of ***Phoebis sennae eubule*** Linnaeus found at the AESS. Brou (2007) illustrated and newly reported for Louisiana ***Catocala miranda*** Hy. Edwards capturing five wild adults at the AESS. Brou (2007) illustrated larvae and wild adults of ***Automeris io lilith*** (Strecker) found at the AESS. Brou (2007) newly reported for Louisiana the tropical pyralid ***Portentomorpha xanthialis*** (Guenée) captured in UV light traps at the AESS. Brou (2007) reported 335 wild adults of ***Alypia octomaculata*** (Fabricius) captured in UV light traps at the AESS. Brou (2007) illustrated larvae, pupae and adults of the hawkmoth ***Isoparce cupressi*** (Boisduval) captured and reared at the AESS. Brou (2007) newly reported for Louisiana ***Catocala clintoni*** Grote,

capturing 416 wild adults in UV light traps at the AESS. Brou (2007) newly reported for Louisiana the pyralid moth ***Undulambia striatalis*** (Dyar) captured in UV light traps at the AESS. Brou (2007) reported 322 wild adults of the moth ***Azenia obtusa*** (H. S.) captured in UV light traps mostly at the AESS. Brou (2007) newly reported for Louisiana the geometrid moth ***Glenoides texanaria*** (Hulst) capturing 4,484 wild adults at the AESS. Brou (2007) reported 162 wild adults of ***Schinia gracilenta*** Hübner mostly captured in UV light traps at the AESS. Brou (2007) reported the tropical moth ***Epitausa prona*** (Moschler) captured in a UV light trap at the AESS. Brou (2007) newly reported for Louisiana ***Cossula magnifica*** (Strecker) capturing 517 wild adults in UV light traps at the AESS.

2008 Brou (2008) reported 294 wild adults of ***Catocala carissima*** Hulst in Louisiana mostly captured at the AESS. Brou (2008) reported 33 wild adults of ***Chaetaglaea fergusoni*** Brou captured in UV light traps at the AESS. Brou (2008) reported 81 wild adults of ***Satyrium kingi*** (Klots & Clench) captured in UV light traps at the AESS. Brou (2008) captured 752 wild adults of ***Exyra semicrocea*** (Guenée) in UV light traps at the AESS. Brou (2008) captured 1,001 wild adults of ***Apantesis nais*** (Drury) in UV light traps at the AESS. Brou (2008) newly reported for Louisiana ***Fania nana*** (Strecker) capturing 62 wild adults in UV light traps at the AESS. Brou (2008) captured 2,367 wild adults of ***Oreta rosea*** (Walker) in UV light traps at the AESS. Brou (2008) captured 4,946 wild adults of ***Dryocampa rubicunda*** (Fabricus) in UV light traps at the AESS. Brou (2008) illustrated 16 phenotype variations of ***Phoberia atomaris*** Hübner wild-captured in UV light traps at the AESS. Brou (2008) captured 69 wild adults of ***Acrolophus mycetophagus*** Davis in UV light traps mostly at the AESS. Brou (2008) reported 1,665 wild adults of two species of ***Phytometra*** Haworth, most all captured in UV light traps at the AESS. Brou (2008) newly reported for Louisiana ***Holomelina rubicundaria*** (Hübner) capturing 380 wild adults in UV light traps at the AESS. Brou and Brou (2008) reported on the effects of Hurricane Gustav (August 31, 2008) at the AESS. Brou (2008) captured 755 wild adults of ***Apatelodes torrefacta*** (J.E. Smith) in UV light traps at the AESS. Brou (2008) captured 2,044 wild adults of Zale horrida Hübner in UV light traps at the AESS. Brou (2008) reported 218 wild adults of ***Stiria rugifrons*** Grote in UV light traps, a common species at the AESS. Brou (2008) captured 1,392 wild adults of ***Diphthera festiva*** (Fabricius) in UV light traps at the AESS. Brou (2008) newly reported for Louisiana 71 wild adult males of ***Basicladus tracyi*** (Jones) in UV light traps at the AESS. Brou (2008) newly reported for Louisiana 36 wild adults of ***Terastia meticulosalis*** Guenée captured in UV light traps mostly at the AESS.

2009 Brou (2009) reported capturing 110 adults of ***Satyrium calanus falacer*** (Godart) in UV light traps at the AESS. Brou (2009) newly reported capturing adult ***Cucullia convexipennis*** Grote & Robinson in UV light traps at the AESS. Brou (2009) reported 123 wild adults of ***Dasychira dominickaria*** Ferguson in UV light traps mostly captured at the AESS. Brou (2009) newly reported for Louisiana ***Schizura badia*** (Packard) capturing 730 wild adults in UV light traps at the AESS, proving this species has four annual broods in Louisiana. Brou and Lafontaine (2009) newly described a species of ***Lithophane*** (Hübner) captured in UV light traps at the AESS (Type locality). This species existed in collections and remained unnamed for a century (Fig. 17). Brou (2009) newly reported for Louisiana 819 wild adults in Louisiana of ***Nacophora quernaria*** (J.E. Smith) captured in UV light traps at the AESS. Brou (2009) newly reported for Louisiana ***Epiglaea apiata*** (Grote) capturing 165 wild adults in UV light traps at the AESS. Brou (2009) newly reported for Louisiana ***Dichorda iridaria*** (Guenée) capturing 422 wild adults in UV light traps at the AESS. Brou (2009) reported 506 wild adults of both ***Utetheisa ornatrix*** (Linnaeus), and ***Utetheisa bella*** (Linnaeus) mostly captured in UV light traps at the AESS. Brou (2009) newly reported for Louisiana ***Nadata gibbosa*** (J.E. Smith) capturing 1,643 wild adults in UV light traps at the AESS. Brou (2009) captured 26,277 wild adults of ***Polygrammate hebraeicum*** Hübner in UV light traps at the AESS. Brou (2009) reported on some entomological visitors to the AESS during 2009. Brou (2009) captured 421 wild adults of ***Prionoxystus robiniae*** (Peck) in UV light traps at the AESS. Brou (2009) newly reported for Louisiana ***Agriopodes fallax*** (Herrich-Schaffer) capturing 753 wild adults in UV light traps at the AESS. Brou (2009) reported recent entomological visitors to the AESS: Paul W. Schaefer on June 19, 2009, Christopher C. Grinter on July 20, 2009, and J. Bolling Sullivan on August 12, 2009. Brou (2009) captured 249 wild adults of ***Acherdoa ferraria*** Walker in UV light traps mostly at the AESS. Brou (2009) newly reported for Louisiana ***Magusa divaricata*** (Grote) capturing 514 wild adults in UV light traps at the AESS.

2010 Brou (2010) newly reported for Louisiana ***Phrygionis privignaria*** Guenée at the AESS. Brou (2010) illustrated 25 wild adult phenotypes of ***Epimecis hortaria*** (Fabricius) captured at the AESS. Brou (2010) reported entomological visitors Eric and Pat Metzler visiting the AESS. Brou (2010) newly reported for Louisiana ***Acronicta americana*** (Harris) capturing 711 wild adults in UV light traps at the AESS. Brou (2010) newly reported for Louisiana ***Fagitana littera*** (Guenée) capturing 127 wild adults in UV light traps the AESS. Brou (2010) reported for Louisiana ***Catocala andromedae*** Guenée capturing 2,153 wild adults in UV light traps at the AESS. Brou (2010) reported capturing

216 wild adults of two species of the genus ***Dargida*** Walker, in UV light traps at the AESS. Brou (2010) newly reported for Louisiana 177 wild adults of ***Loxa flavicollis*** (Drury) a large invasive green stink bug first captured in UV light traps at the AESS. Dickel, Brou, and Heppner (2010) reported new records of the invasive species ***Simplicia cornicalis*** (Fabricius) including 16 wild adults captured in UV light traps at the AESS. Brou (2010) newly reported for Louisiana 110 wild-captured adults of ***Omiodes indicata*** (Fabricius) and one adult also a new US record of ***Omiodes martyralis*** (Lederer) (Fig. 28), both captured in UV light traps at the AESS. Brou (2010) newly reported for Louisiana ***Dyspteris abortivaria*** (Herrich-Schäffer) capturing 431 wild adults in UV light traps mostly at the AESS. Brou (2010) using an aerial pictorial, illustrated the placement of various insect traps operating during 2010 at the AESS (Fig. 29). Brou (2010) reported for Louisiana ***Chaetaglaea sericea*** (Morrison) capturing 479 wild adults mostly in UV light traps at the AESS. Brou (2010) reported ***Allotria elonympha*** (Hübner) capturing 1,488 wild adults in UV light traps and fermenting fruit bait traps at the AESS.

2011 Brou (2011) reported for Louisiana 336 wild adults of ***Chaetaglaea tremula*** (Harvey) captured in UV light traps mostly at the AESS. Brou (2011) captured 3,077 wild adults of ***Nemoria lixaria*** (Guenée) in UV light traps mostly at the AESS. Brou (2011) illustrated Entomology Humor at the AESS - Frogs in ***Sesiidae*** traps. Brou (2011) newly reported for Louisiana ***Heterocampa astarte*** Doubleday capturing 600 wild adults in UV light traps at the AESS. Brou (2011) reported 126 wild adults of ***Leuconycta diphteroides*** (Guenée) and 160 wild adults of ***Leuconycta lepidula*** (Grote) both species captured in UV light traps mostly at the AESS. Brou (2011) captured 912 wild adults of ***Pyrausta bicoloralis*** (Guenée) in UV light traps at the AESS. Brou (2011) added two newly recorded species to the ***Sphingidae*** for Louisiana, also illustrating other species found at the AESS. Brou (2011) newly reported for Louisiana three species of the genus ***Eubaphe*** Hübner (Geometridae) capturing 1,153 wild adults in UV light traps at the AESS. Brou (2011) newly reported for Louisiana ***Condica claufacta*** (Walker) capturing 352 wild adults in UV light traps at the AESS. Brou (2011) captured 127 wild adults of ***Estigmene acrea*** (Drury) in UV light traps at the AESS. Brou (2011) reported ***Acronicta oblinita*** (J.E. Smith) capturing 430 wild adults in UV light traps, mostly at the AESS.

2012 Brou (2012) reported for Louisiana ***Hyparpax aurora*** (J.E. Smith) capturing 108 wild adults in UV light traps mostly at the AESS proving this species has three annual broods in Louisiana. Brou (2012) reported ***Panthea furcilla australis*** Anweiler capturing 1,462 wild adults in UV light traps mostly at the AESS proving this species has 10 annual broods at approximately 35-day intervals in Louisiana. Brou (2012) reported capturing 1,043 wild adult clearwing moths in 2011 in Orleans Parish, all of which except one, also occur at the AESS. Brou (2012) captured 219 wild adults of ***Properigea tapeta*** (J.B. Smith) in UV light traps at the AESS proving this species has four annual broods in Louisiana. Brou (2012) captured 2,196 wild adults of ***Charadra deridens*** (Guenée) in UV light traps at the AESS proving this species has six annual broods in Louisiana. Brou (2012) captured 390 wild adults of ***Catocala maestosa*** Hulst in UV light traps and fruit bait traps, mostly at the AESS in the months June through December. Brou (2012) reported for Louisiana ***Carmenta pyralidiformis*** (Walker) capturing 102 wild adults using UV light traps, semiochemical lure traps, and taking newly emerged adults hanging on grass stems at dusk at the AESS. Brou (2012) newly reported for Louisiana 1,842 wild adults of three species of the genus ***Morrisonia*** Grote including one recently described species in UV light traps at the AESS. Brou (2012) captured 313 wild adults of ***Baileya ophthalmica*** (Guenée) mostly in UV light traps at the AESS proving this species has three annual broods. Brou (2012) newly reported for Louisiana 133 wild adults of ***Colomychus talis*** (Grote) captured in UV light traps at the AESS proving this species has six annual broods. Brou (2012) newly reported for Louisiana 1,544 wild adults of ***Lochmaeus manteo*** Doubleday and 401 wild adults of ***Lochmaeus bilineata*** (Packard) both captured in UV light traps at the AESS, each species has four annual broods. Brou (2012) newly reported 526 wild adults of ***Cicinnus melsheimeri*** (Harris) captured in UV light traps at the AESS proving this species has two annual broods. Brou (2012) newly reported for Louisiana the univoltine species ***Metarranthis lateritiaria*** (Guenée) capturing 133 wild adults in UV light traps at the AESS. Brou (2012) newly reported for Louisiana the univoltine species ***Haploa clymene*** (Brown) capturing 184 wild adults in UV light traps at the AESS. Brou (2012) newly reported for Louisiana the genus ***Balsa*** (Walker) capturing 1,365 wild adults of three species in UV light traps, mostly at the AESS. Brou (2012) reported five new species for Louisiana in the genus ***Argyrostrotis*** Hübner capturing 3,236 wild adults in UV light traps at the AESS. Brou (2012) captured 1,620 wild adults of ***Panopoda rufimargo*** Hübner in UV light traps, mostly at the AESS, proving this species has five annual broods in Louisiana. Brou (2012) newly reported for Louisiana the univoltine species ***Pyrrhia aurantiago*** (Guenée, 1852) capturing 36 wild adults in UV light traps mostly at the AESS.

2013 Brou (2013) reported the new invasive moth from Asia, ***Simplicia cornicalis*** (Fabricius) capturing 107 wild adults in UV light traps at the AESS. Brou (2013) reported the genus ***Enodia*** Hübner in Louisiana capturing 972 wild adults of ***Enodia portlandia missarkae*** (Heitz. & dos Passos) at the AESS. Brou (2013) reported ***Vitacea scepsiformis*** (Henry Edwards) taking 141 wild adults at the AESS. Brou (2013) newly reported for Louisiana 54 wild adults of ***Synanthedon rileyana*** (Henry Edwards) captured at the AESS. Brou (2013) newly reported for Louisiana 23 wild adults of ***Pennisetia marginata*** (Harris) captured at the AESS. Brou (2013) newly reported for Louisiana ***Lychnosea intermicata*** (Walker) capturing 759 wild adults in UV light traps at the AESS. Brou, et al. (2013) reported on a tropical fruit-piercing moth ***Eudocima apta*** (Walker), a species recorded three times previously at the AESS. Brou (2013) reported capturing 265 wild adults of ***Citheronia regalis*** (Fabricius, 1793) a species found at the AESS. Brou (2013) newly reported the genera ***Euthyatira*** and ***Pseudothyatira*** capturing 270 wild adults of two species in UV light traps and fermenting fruit bait traps at the AESS. Brou (2013) reported ***Samia cecropia*** (Linnaeus) capturing 415 wild adults in UV light traps mostly at the AESS. Brou (2013) newly reported for Louisiana the clearwing moth ***Vitacea polistiformis*** Harris capturing 31 wild adults, mostly at the AESS. Brou (2013) reported on ***Anaea andria*** Scudder capturing 249 wild adults, mostly at the AESS in fruit bait traps. Brou (2013) reported the earliest known captures of ***Leptotes cassius*** (Cramer, 1775) (Lepidoptera: Lycaenidae) in Louisiana. Brou (2013) newly reported for Louisiana ***Metallata absumens*** (Walker) capturing 298 wild adults in UV light traps mostly at the AESS. Brou (2013) reported ***Melanolophia canadaria choctawae*** Rindge capturing 1,854 wild adults in UV light traps mostly at the AESS. Brou (2013) newly reported two species of the genus ***Erastria*** Hübner for Louisiana capturing 396 wild adults of ***Erastria cruentaria*** (Hübner) at the AESS. Brou (2013) reported on Texas lepidopterists' Ed Knudson and Charles Bordelon visiting the AESS June 23, 2013. Brou (2013) reported ***Gondysia consobrina*** (Guenée) capturing 183 wild adults in UV light traps mostly at the AESS. Brou (2013) reported entomologist Jim Miller visiting the AESS on October 23, 2012. Brou (2013) reported ***Metria amella*** (Guenée) capturing 2,255 wild adults in UV light traps at the AESS. Brou (2013) reported entomological visitors on October 13, 2013 at the AESS. Brou (2013) reported the highly destructive cotton pest ***Alabama argillacea*** (Hübner) capturing 48 wild adults in UV light traps including at the AESS. Brou (2013) reported ***Acronicta lobeliae*** Guenée capturing 712 wild adults in UV light traps mostly at the AESS. Brou (2013) reported ***Raphia abrupta*** Grote capturing 149 wild adults in UV light traps mostly at the AESS.

2014 Brou (2014) newly reported for Louisiana ***Heterocampa guttivitta*** (Walker) capturing 2,854 wild adults in UV light traps mostly at the AESS. Brou (2014) newly reported for Louisiana ***Clostera albosigma*** Fitch capturing 33 wild adults in UV light traps at the AESS. Brou (2014) newly reported for Louisiana ***Furcula borealis*** (Guérin-Méneville) capturing 840 wild adults in UV light traps mostly at the AESS. Brou (2014) newly reported for Louisiana 349 wild adults of ***Datana perspicua*** (Grote & Robinson) in UV light traps mostly at the AESS. Brou (2014) newly reported for Louisiana 50 wild adults of ***Datana robusta*** Strecker in UV light traps mostly at the AESS. Brou (2014) newly reported for Louisiana 613 wild adults of ***Schizura ipomoeae*** Doubleday in UV light traps, mostly at the AESS. Brou (2014) newly reported for Louisiana 1,116 wild adults of ***Hyperaeschra georgica*** (Herrich-Schäffer) in UV light traps mostly at the AESS. Brou (2014) reported entomologist Craig Marks visiting the AESS on January 19, 2014. Brou (2014) newly reported both ***Datana major*** Grote & Robinson capturing 400 wild adults, and ***Datana drexelii*** H. Edwards capturing 147 wild adults taken in UV light traps mostly at the AESS. Brou (2014) newly reported for Louisiana both ***Dasylophia thyatiroides*** (Walker) capturing 127 wild adults in UV light traps mostly at theAESS, and adults of ***Dasylophia anguina*** (J.E. Smith) captured in UV light traps in Louisiana. Brou (2014) reported entomological visitors to the AESS: J. Donald Lafontaine Jr. on February 27, 2014, and on March 8, 2014 Shane Dixon, Linda Barber Auld, and Dorothea Munchow. Brou (2014) newly reported for Louisiana ***Datana contracta*** Walker capturing 191 wild adults in UV light traps mostly at the AESS. Brou (2014) newly reported for Louisiana ***Lithophane laceyi*** (Barnes & McDunnough) capturing 160 wild adults mostly at the AESS. Brou (2014) reported on entomologist Brooke Bullock visiting the AESS on January 11, 2014. Brou (2014) newly reported for Louisiana ***Nerice bidentata*** Walker capturing 72 wild adults in UV light traps mostly at the AESS. Brou (2014) reported ***Citheronia sepulchralis*** Grote and Robinson capturing 2,588 wild adults in UV light traps at the AESS. Brou (2014) newly reported for Louisiana ***Pyrrharctia isabella*** (J. E. Smith) capturing 565 wild adults in UV light traps mostly at the AESS. Brou (2014) reported the genus ***Oligocentria*** Herrich-Schäffer in Louisiana capturing 103 wild adults of ***Oligocentria semirufescens*** (Walker) and 1,072 wild adults of ***Oligocentria lignicolor*** (Walker) both in UV light traps mostly at the AESS. Brou (2014) newly reported for Louisiana ***Lithophane patefacta*** (Walker) capturing 53 wild adults in UV light traps at the AESS. Brou (2014) illustrated the phenotype variations of ***Hypercompe scribonia*** (Stoll) found at the AESS.

2015 Brou (2015) newly reported for Louisiana ***Duponchelia fovealis*** Zeller another US exotic introduction captured in a UV light trap at the AESS. Brou (2015) reported ***Polygonia comma*** (Harris) capturing 44 wild adults mostly in fruit bait traps at the AESS. Brou (2015) reported how to fabricate a stationary fruit-bait insect trap with automatic collecting chamber used for decades at the AESS. Hayden et al. (2015) reported ***"Diaphania" costata*** (Fabricius) a new US invasive pest occurring at the AESS and new Louisiana record. Brou (2015) reported a new Louisiana state record for a distinctly western U.S. moth ***Anarta mutata*** (Dod) captured in UV light traps at the AESS. Brou (2015) newly reported for Louisiana ***Heterocampa obliqua*** Packard capturing 1,240 wild adults in UV light traps at the AESS. Brou (2015) reported entomologist Jeffrey R. Slotten visiting the AESS during May 2015. Brou (2015) reported New York City Radio Station phenom and entomologist Paul Cavalconte visiting the AESS on April 27, 2009. Brou (2015) newly reported for Louisiana 2,552 wild adults of ***Pero ancetaria*** (Hübner) captured in UV light traps mostly at the AESS. Brou (2015) reported ***Wallengrenia otho*** (J.E. Smith) capturing 291 wild adults mostly in UV light traps at the AESS. Brou (2015) reported 101 wild adults of ***Incisalia henrici turneri*** Clench captured mostly in UV light traps at the AESS. Brou (2015) reported entomologist Howard Grisham visiting the AESS on October 2, 2015.

2016 Brou (2016) newly reported for Louisiana ***Acronicta noctivaga*** Grote capturing 338 wild adults in UV light traps mostly at the AESS. Brou (2016) newly reported for Louisiana ***Acronicta hamamelis*** Guenée capturing 190 wild adults in UV light traps mostly at the AESS. Brou (2016) newly reported for Louisiana ***Phyllodesma occidentis*** (Walker) capturing 197 wild adults at the AESS. Brou (2016) newly reported for Louisiana ***Lithophane viridipallens*** Grote capturing 16 wild adults at the AESS. Brou (2016) reported entomologist Ricky Patterson visiting the AESS on November 17, 2015. Brou (2016) reported a rare capture of the moth ***Photedes enervata*** (Guenée) a new state record at the AESS. Brou (2016) reported entomologists Zack Lemann visiting the AESS on Jan 12, 2016 and Jim Vargo visiting on February 29, 2016. Brou (2016) newly reported for Louisiana ***Lycia ypsilon*** (S.A. Forbes) capturing 767 wild adult males in UV light traps mostly at the AESS. Brou (2016) reported a new Louisiana record for an invasive Asian pyralid species, ***Nacoleia charesalis*** (Walker) at the AESS. Brou (2016) newly reported for Louisiana ***Acronicta afflicta*** Grote capturing 1,880 wild adults in UV light traps at the AESS. Brou (2016) newly reported ***Acronicta hasta*** Guenée for Louisiana capturing 2,902 wild adults in UV light traps mostly at the AESS. Brou (2016) newly reported ***Palpita quadristigmalis*** (Guenée) for Louisiana capturing 2,493 wild adults in UV light traps mostly at the AESS. Brou (2016) reported entomological visitors Bill Mauffray, Kenneth Bosso, Jeffrey Slotten, and Dave Wagner at the AESS. Brou (2016) reported ***Nedra ramosula*** Guenée capturing 170 wild adults in UV light traps at the AESS. Brou (2016) reported ***Acronicta brumosa*** Guenée capturing 358 wild adults in UV light traps mostly at the AESS. Brou (2016) reported ***Panopoda repanda*** Walker capturing 1,992 wild adults in UV light traps mostly at the AESS. Brou (2016) newly reported for Louisiana ***Diaphania hyalinata*** (Linnaeus) capturing 496 wild adults in UV light traps at the AESS. Brou (2016) newly reported for Louisiana ***Palpita flegia*** (Cramer) capturing 23 wild adults in UV light traps especially at the AESS. Brou (2016) newly reported for Louisiana ***Argillophora furcilla*** Grote capturing 25 wild adults in UV light traps mostly at the AESS. Brou (2016) reported ***Metaponpneumata rogenhoferi*** Möschler capturing 223 wild adults in UV light traps mostly at the AESS. Brou (2016) newly reported for Louisiana ***Horama panthalon texana*** (Grote) capturing 31 wild adults in UV light traps especially at the AESS. Brou (2016) newly reported ***Trotorhombia metachromata*** (Walker) at the AESS, the first species of the Lepidoptera family Epiplemidae captured in Louisiana. Brou (2016) reported on entomological visitors Jennifer M. Zaspel and Crystal Klem on Aug 15, 2016 at the AESS. Brou (2016) newly reported for Louisiana ***Salbia haemorroidales*** Guenée capturing 61 wild adults in UV light traps mostly at the AESS. Brou (2016) newly reported for Louisiana ***Ategumia ebulealis*** (Guenée) capturing 1,440 wild adults mostly at the AESS.

2017 Hayden, et al. (2017) reported ***Diaphania costata*** (Fabricius), an ornamental invasive pest first discovered in the US at the AESS. Brou (2017) newly reported for Louisiana ***Acronicta laetifica*** Smith capturing 557 wild adults in UV light traps at the AESS. Brou (2017) reported ***Acronicta longa*** Guenée capturing 973 wild adults in UV light traps mostly at the AESS. Brou (2017) newly reported for Louisiana ***Euchlaena marginaria*** (Minot) capturing 334 wild adults in UV light traps mostly at the AESS. Brou (2017) newly reported for Louisiana three species of the genus ***Apocheima*** Hübner capturing 390 wild adults mostly at the AESS. Brou (2017) newly reported for Louisiana ***Condylorrhiza vestigialis*** (Guenée) capturing 678 wild adults mostly at the AESS. Brou (2017) newly reported for Louisiana ***Givira arbeloides*** (Dyar) capturing 36 wild adults in UV light traps mostly at the AESS. Brou (2017) reported ***Simyra insularis*** (Herrich-Schäffer) capturing 513 wild adults in UV light traps mostly at the AESS. Brou (2017) newly reported for Louisiana ***Givira anna*** (Dyar) capturing 446 wild adults in UV light traps mostly at the AESS. Brou (2017) newly reported for Louisiana ***Givira francesca*** (Dyar)

capturing 1,121 wild adults in UV light traps mostly at the AESS. Brou (2017) newly reported ***Inguromorpha basalis*** (Walker) capturing 327 wild adults in UV light traps mostly at the AESS. Brou (2017) reported ***Thyridopteryx ephemeraeformis*** (Haworth) capturing 966 wild adults in UV light traps mostly at the AESS. Brou (2017) newly recorded for Louisiana ***Micrathetis triplex*** (Walker) capturing 107 wild adults in UV light traps mostly at the AESS. Brou (2017) reported ***Iodopepla u-album*** (Guenée) capturing 4,882 wild adults in UV light traps at the AESS. Brou (2017) newly reported for Louisiana ***Diaphania infimalis*** (Guenée) capturing 63 wild adults in UV light traps mostly at the AESS. Brou (2017) reported ***Anicla infecta*** Ochsenheimer, capturing 8,968 wild adults in UV light traps mostly at the AESS. Brou (2017) reported entomological visitors to the AESS: on January 27, 2017 Diane Lafferty, on June 1, 2017 Charles M. Allen and Susan Allen, and on July 6, 2017 James E. Hayden. Brou (2017) reported the univoltine species ***Megalopyge opercularis*** (Smith & Abbot) capturing 2,110 wild adults in UV light traps at the AESS. Brou (2017) illustrated phenotype variations of ***Atteva aurea*** (Fitch) captured in UV light traps mostly at the AESS. Brou (2017) reported ***Prolimacodes badia*** (Hübner) capturing 985 wild adults in UV light traps at the AESS. Brou (2017) illustrated phenotype variations of adult ***Nepytia semiclusaria*** (Walker) captured in UV light traps at the AESS. Brou (2017) reported entomological visitors to the AESS: on August 6, 2017 – Katherine Givіden and Curt Auzenne, on October 12, 2017 – Junsuk Kim, on October 21, 2017 – Alex and Victoria Bic. Brou (2017) newly reported for Louisiana ***Misogada unicolor*** (Packard) capturing 140 adults in UV light traps mostly at the AESS. Brou (2017) newly reported for Louisiana ***Lacosoma chiridota*** Grote capturing 652 wild adults in UV light traps mostly at the AESS.

2018 Brou (2018) reported ***Phosphila miselioides*** (Guenée) capturing 996 wild adults mostly in UV light traps at the AESS. Brou (2018) newly reported for Louisiana ***Psaphida resumens*** Walker capturing 610 wild adults mostly in UV light traps at the AESS. Brou (2018) reported ***Condica videns*** (Guenée) capturing 4,027 wild adults mostly in UV light traps at the AESS. Brou and Brown (2018) newly reported for Louisiana ***Hemieuxoa rudens*** (Harvey) capturing 64 wild adults in UV light traps mostly at the AESS. Brou (2018) reported ***Homophoberia apicosa*** (Haworth) capturing 319 wild adults in UV light traps and fruit bait traps mostly at the AESS. Brou (2018) reported ***Choephora fungorum*** (Grote & Robinson) capturing 648 wild adults in UV light traps mostly at the AESS. Brou (2018) newly reported for Louisiana ***Phosphila turbulenta*** Hübner capturing 1,461 wild adults in UV light traps and fruit bait traps mostly at the AESS. Brou (2018) newly reported for Louisiana ***Abagrotis alternata*** (Grote) capturing 176 wild adults in UV light traps mostly at the AESS. Brou (2018) newly reported for Louisiana ***Catocala pretiosa*** Lintner capturing 71 wild adults in UV light traps and fruit bait traps mostly at the AESS, and also discussing ***Catocala texarkana*** Brower in Louisiana. Brou (2018) reported ***Oiketicus abbotii*** Grote capturing 517 wild adults in UV light traps mostly at the AESS. Kim and Brou (2018) reviewed the coleoptera Genus ***Strategus*** Kirby in Louisiana reported 686 wild adult specimens of four species, two of which occur at the AESS captured using UV light traps. Brou (2018) reported an entomological visitor to the AESS on February 7, 2018, Tom Emmel. Matthews, et al. (2018) reported the Plume moths of Louisiana capturing 477 wild adults in UV light traps mostly at the AESS. Brou (2018) newly reported for Louisiana ***Egira alternans*** (Walker) capturing 5,395 wild adults in UV light traps at the AESS. Brou and Brou (2018) newly reported for Louisiana ***Cirrhophanus triangulifer*** Grote capturing 120 wild adults in UV light traps mostly at the AESS.

2019 Brou and Brou (2019) reported ***Drasteria grandirena*** (Haworth) capturing 275 wild adults in UV light traps at the AESS. Brou and Brou (2019) illustrated the placement of various insect traps operating during 2018 at the AESS (Fig. 30). Brou and Brou (2019) newly reported for Louisiana ***Psaphida styracis*** (Guenée) capturing 568 wild adults in UV light traps mostly at the AESS. Brou and Brou 2019 newly reported for Louisiana **Synanthedon fatifera** Hodges capturing 612 wild adults in UV light traps and using various semiochemical lure traps at the AESS. Brou and Brou (2019) newly reported for Louisiana ***Schizura unicornis*** (J.E. Smith) capturing 1,418 wild adults in UV light traps mostly at the AESS. Brou and Brou (2019) reported ***Phyprosopus callitrichoides*** Grote capturing 1,153 wild adults in UV light traps mostly at the AESS. Brou and Brou (2019) newly reported for Louisiana ***Synanthedon scitula*** (Harris) capturing 385 wild adults mostly in UV light traps at the AESS. Brou and Brou (2019) reported ***Cissusa spadix*** (Cramer) capturing 870 wild adults in UV light traps mostly at the AESS. Brou and Brou (2019) reported the genus ***Glena*** capturing 1,573 wild adults of three species, two of which are newly reported for Louisiana, the majority were captured in UV light traps at the AESS. Brou and Brou (2019) reported the genus ***Callosamia*** Packard in Louisiana capturing 4,080 wild adults over 49 years, mostly at the AESS. Kim and Brou (2019) reported the coleoptera species ***Dynastes tityus*** (Linnaeus) capturing 229 wild adults in Louisiana, the majority taken in UV light traps at the AESS. Brou and Brou (2019) reviewed the genus ***Callopistria*** Hübner capturing 1,680 wild adults of four species taken in UV light traps mostly at the AESS. Brou and Brou (2019) reported the genus ***Lesmone*** Hübner capturing 1,972 wild adults

representing three species in Louisiana, mostly from the AESS.

2020 Brou and Brou (2020) reported on the Southern Lepidopterists' Society – Member locations in its 42nd year of existence. Brou and Matthews (2020) reported a new US record ***Stenoma exarata*** (Zeller) an adult captured in a UV light trap at the AESS, the first species of the Lepidoptera family Depressariidae to be reported from Louisiana. Brou and Brou (2020) reported ***Parallelia bistriaris*** Hübner capturing 1,052 wild adults in UV light traps mostly at the AESS. Brou and Brou (2020) reported ***Mythimna unipuncta*** (Haworth) capturing 17,823 wild adults in UV light traps and fermenting fruit bait traps at the AESS. Brou and Brou (2020) reported ***Zale lunata*** (Drury) capturing 3,014 wild adults in UV light traps mostly at the AESS proving this species has eight annual broods in Louisiana. Brou and Brou (2020) newly reported for Louisiana ***Iscadia aperta*** Walker capturing one wild specimen in a UV light trap at the AESS. Brou et al. (2020) reported 102 wild adults of ***Pseudothyris sepulchralis*** (Boisduval), captured mostly at the AESS in UV light traps, and one adult of ***Thyris maculata*** Harris new state record, also captured at the AESS in a malaise trap. Brou and Brou (2020) reported ***Parapamea buffaloensis*** (Grote) capturing 61 wild adults in UV light traps mostly at the AESS. Brou and Brou (2020) reported the invasive species European species, ***Noctua pronuba*** (Linnaeus) capturing 15 wild adults at the AESS in UV light traps. Brou and Brou (2020) reported ***Enigmogramma basigera*** (Walker) capturing 3,498 wild adults in UV light traps mostly at the AESS proving this species has six or more annual broods in Louisiana. Brou and Brou (2020) reviewed the genus ***Doryodes*** Guenée capturing 361 wild adults in Louisiana, reporting on four species captured using UV light traps, including three newly described species. Three of the four species were captured at the AESS.

2021 Brou and Brou (2021) newly reported for Louisiana ***Dichagyris acclivis*** (Morrison) capturing nine wild adults in UV light traps at the AESS. Brou et al. (2021) newly reported for Louisiana ***Dichagyris grotei*** (Franclemont and Todd) captured in UV light traps at the AESS. Brou and Brou (2021) reported ***Macaria bicolorata*** (Fabricius) capturing 2,919 wild adults mostly in UV light traps at the AESS. Brou and Brou (2021) reported ***Macaria transitaria*** Walker capturing 5,880 wild adults in UV light traps at the AESS. Brou and Brou (2021) reported ***Macaria distribuaria*** Hübner capturing 1,326 wild adults in UV light traps at the AESS. Brou and Brou (2021) reported ***Feltia subterranea*** (Fabricius) capturing 1,483 wild adults and 22 wild adults of ***Feltia repleta*** (Walker) in UV light traps, both occurring at the AESS. Brou et al. (2021) reported three species of the genus ***Euxoa*** for Louisiana, two species new for the state: ***Euxoa auxiliaris*** (Grote) and ***Euxoa inconcinna*** (Harvey) both captured in UV light traps at the AESS. Brou and Brou (2021) reported ***Agrotis malefida*** Guenée capturing 58 wild adults in UV light traps mostly at the AESS. Brou and Brou (2021) reviewed the genus ***Paectes*** Hübner in Louisiana capturing 8,531 wild adults of five different species in UV light traps all occurring at the AESS, including several species newly recorded in the state. Brou and Brou (2021) newly reported for Louisiana ***Anavitrinella pampinaria*** Guenée capturing 6,615 wild adults in UV light traps mostly from the AESS. Brou and Brou (2021) reported ***Dichagyris broui*** Lafontaine captured in UV light traps in Louisiana, including the AESS. Brou and Brou (2021) reported the genus ***Meropleon*** Dyar in Louisiana, on two species captured in UV light traps at the AESS. Brou and Brou (2021) reported ***Psaphida rolandi*** Grote capturing 1,706 adults in UV light traps especially at the AESS. Brou and Brou (2021) reported ***Alcathoe caudata*** (Harris) capturing 37 wild adults mostly at the AESS. Kim and Brou (2021) reviewed the coleoptera Family Lucanidae Latreille capturing 345 wild adult specimens occurring in Louisiana, two of which occur at the AESS using UV light traps.

2022 Brou and Brou (2022) newly reported 23 wild adults for Louisiana of the pantropical Teak pest moth ***Hyblaea puera*** (Cramer), mostly captured in UV light traps at the AESS. Brou and Brou (2002) reported capturing 34 wild adults of the newly described species ***Schizura matheri*** Miller and Franclemont, in Louisiana, mostly at the AESS in UV light traps. Brou and Brou (2022) reported 206 wild adults of the newly described species ***Baltodonta broui*** Miller and Franclemont, mostly captured at (Type locality: AESS) in Louisiana using UV light traps. Brou and Brou (2022) newly reported for Louisiana capturing 4,181 wild adults of ***Isa textula*** Herrich-Schäffer in UV light traps captured in UV light traps at the AESS. Brou and Brou (2022) newly reported for Louisiana 3,162 wild adults of ***Heterocampa pulverea*** Grote and Robinson captured in UV light traps at the AESS. Brou and Brou (2022) newly reported capturing 492 wild adults of ***Lithacodes fasciola*** Herrich-Schäfferin Louisiana mostly captured in UV light traps at the AESS. Brou and Brou (2022) newly reported for Louisiana the univoltine moth ***Megalopyge crispata*** (Packard) capturing 223 wild adults in UV light traps mostly at the AESS. Brou and Brou (2022) newly reported for Louisiana 4,273 wild adults of ***Euclea delphinii*** (Boisduval) captured in UV light traps mostly at the AESS. Brou and Brou (2022) reported capturing 1,092 adult ***Tarache aprica*** (Hübner) in Louisiana mostly at the AESS. Brou and Brou (2022) reported 65 specimens of ***Atlides halesus*** (Cramer) captured using UV light traps and

fermenting fruit bait traps, a species captured dozens of times at the AESS. Brou and Brou (2022) newly reported 26 adults of ***Megalopyge pyxidifera*** (Smith) for Louisiana, most all captured at the AESS. Brou and Brou (2022) newly reported 52 adults of ***Cenopis vabroui*** Powell & Brown for Louisiana, most all captured at the AESS.

The following are species of Lepidoptera which have the ***Abita Entomological Study Site (AESS)*** designated as the 'TYPE locality' in scientific literature.

Dichrorampha broui E.C. Knudson 1986 Jour. Lepid. Soc. 40(4). – 'Tortricidae' (Fig. 22)
Acronicta sinescripta Ferguson 1988 Jour. of Res. on the Lepid. 26:201-218. – 'Noctuidae' (Fig. 24)
Catocala charlottae Brou 1988 Jour. Lepid. Soc. – 'Noctuidae' (Fig. 14a,b)
Lapara phaeobrachycerous Brou 1994 Jour. Lepid. Soc. 48:51-57. – 'Sphingidae' (Fig. 16a,b)
Bagisara brouana Ferguson 1997 Jour. Lepid. Soc. 51(4).– 'Noctuidae' (Fig. 26)
Chaetaglaea fergusoni Brou 1997 Jour. Lepid. Soc.– 'Noctuidae' (Fig. 18)
Catocala umbrosa Brou 2002 South. Lepid. News 24: 48-50.– Noctuidae' (Fig. 25)
Baileya acadiana Brou 2004 Jour. Lepid. Soc. 58(2) 94-99. – 'Nolidae' (Fig. 20)
Lithophane abita Brou and Lafontaine 2009 Zoo Keys 10: 11-20. – 'Noctuidae' (Fig. 17)
Cenops vabroui Powell & Brown 2012 The Moths of America north of Mexico. Fasc. 8.1, p 112.– 'Tortricidae' (Fig. 23)
Doryodes broui Lafontaine and Sullivan 2015 ZooKeys 527: 127–147.– 'Erebidae' (Fig. 21)
Baltodonta broui Miller and Franclemont 2021 The Moths of North America. Fasc. 22.1B, p 46-47.– 'Notodontidae' (Fig. 19)

One plate is provided illustrating a few selected species of lepidoptera which are first time recorded for the USA (*) and/or new for the state of Louisiana records (**) (Fig. 28).

a. ***Omiodes martyralis*** (Lederer) ♀ (AESS), first USA record
b. ***Panula inconstans*** Guenée ♀ (AESS) first confirmed USA record
c. ***Acontia species*** unknown, 5-13-1995 (AESS), only known USA record
d. ***Ogdoconta fergusoni*** Metzler & Lafontaine ♂, a Paratype
e. ***Lapara*** new species ♂ (AESS) (currently undescribed)
f. ***Noctua pronuba*** (Linnaeus) ♀ (AESS) first published USA record
g. ****Enodia anthedon*** Clark ♂
h. ****Eudocima apta*** (Walker, [1858] ♂ (AESS)
j. ***Eudocima serpentifera*** (Walker) ♀ (AESS) first Louisiana record, and first USA record.
k. ****Simplicia cornicalis*** Fabricius ♀ (AESS)
m.****Phrygionis privignaria*** Guenée ♀ (AESS)
n. ****Leptotes cassius striata*** (Edwards) ♂
o. ****Duponchelia fovealis*** Zeller ♂ (AESS)
p. ***Tripudia paraplesia*** Pogue ♂ first USA record
q. ***Diaphania costata*** (Fabricius) ♂ (AESS) first USA record
r. ***Stenoma exarata*** (Zeller) ♂ (AESS) first USA record
s. ****Catocala messalina*** Guenée ♂ (AESS)

Over the past 53 years we have made 70 individual donations of mostly Louisiana insects from the AESS to museums here in the USA, that were independently appraised. Though, we have lost our records for 17 of these USA donations, for the 53 donations which we do currently have appraisals, these amounted to 348,829 pinned spread, labeled and mostly determined adult specimens with an appraised value exceeding $600,000.00. Additionally, our currently held master collection of ~500,000 specimens will be added to our future museum donations. Also, we have placed ~700,000 specimens of mostly Louisiana insects (mostly lepidoptera and coleoptera) in museums and private research collections in many dozens of countries out of the USA and across the world. These often large bulk quantities were either donated, exchanged or sold to museums, universities, and major private researchers. Additionally along our lifelong entomological journey we accumulated a collection of world Sphingidae (approximately 40,000 adult hawkmoth specimens) 800+ species from 120 countries of the world which was sold in 1987, and is now located at the McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, Gainesville, Florida. Also a research collection of world Eudocima (approximately 10,000+ adult specimens) 42 species from 42 countries of the world and many island locations is presently housed at the AESS.

Concerning employment, Vernon has worked much of the early years of his adult life in the field of Quality Control/Quality Assurance and Engineering for the large-scale construction industry, steel manufacturing, chemical manufacturing, petroleum industry, food manufacturing, nuclear plant fabrication, and engineering consultant fields. During the later 20 years, Vernon worked as a RN Certified Professional in Utilization Review, and Registered Nurse Certified Case Manager for two major Louisiana hospitals and two medical insurance companies. Vernon has degrees in Industrial Engineering (1974), and also in Nursing (1989) from Louisiana State University Medical Center, New Orleans, Louisiana, USA. Charlotte and Vernon have been married for 47 years and together have one daughter, April Rose Brou Hart, age 45.

Fig. 17. *Lithophane abita* Brou and Lafontaine 2009 Paratype captured at the AESS, Type locality near Abita Springs, St. Tammany Parish, Louisiana.

Fig. 18. *Chaetaglaea fergusoni* Brou 1997 male Holotype captured at the AESS, Type locality near Abita Springs, St. Tammany Parish, Louisiana.

Fig. 19. *Baltodonta broui* Miller and Franclemont 2021. Paratypes, a. male, b. female, both captured at the AESS, Type locality near Abita Springs, St. Tammany Parish, Louisiana.

Fig. 20. *Baileya acadiana* Brou 2004. a. Holotype male, b. Allotype female, both captured at the AESS, Type locality near Abita Springs, St. Tammany Parish, Louisiana.

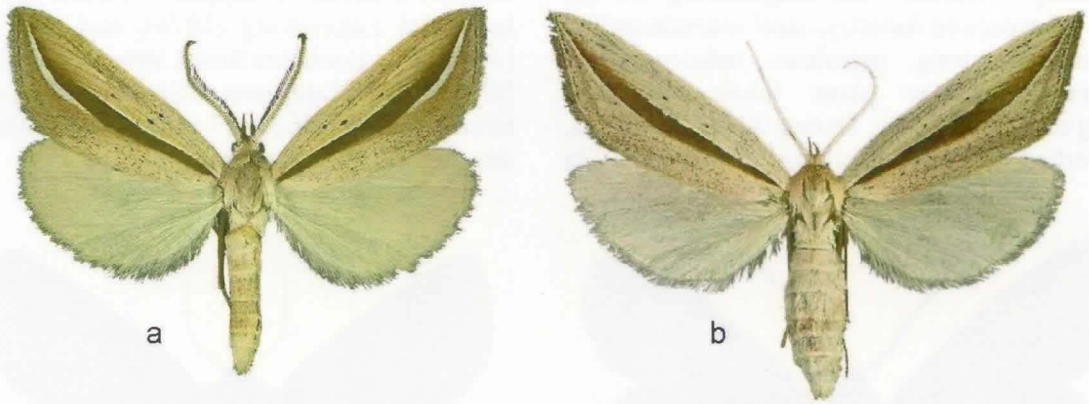


Fig. 21. ***Doryodes broui*** **Lafontaine and Sullivan 2015. Paratypes a. male, b. female, both captured at the AESS, Type locality near Abita Springs, St. Tammany Parish, Louisiana.**

Fig. 22. ***Dichrorampha broui*** **E.C. Knudson 1986 male captured at the AESS, Type locality near Abita Springs, St. Tammany Parish, Louisiana.**

Fig. 23. ***Cenopis vabroui*** **Powell & Brown 2012 male captured at the AESS, Type locality near Abita Springs, St. Tammany Parish, Louisiana.**

Fig. 24. ***Acronicta sinescripta*** **Ferguson 1988. a. male, b. female, both captured at the AESS, Type locality near Abita Springs, St. Tammany Parish, Louisiana.**

Fig. 25. ***Catocala umbrosa*** **Brou 2002. a. Holotype male, b. Allotype female, both captured at the AESS, Type locality near Abita Springs, St. Tammany Parish, Louisiana.**

Fig. 26. ***Bagisara brouana*** **Ferguson 1997. a. male, b. female, Topotypes both captured at the AESS, Type locality near Abita Springs, St. Tammany Parish, Louisiana.**

Fig. 27. ***Baileya ellessyoo*** **Brou, 2004. a. male, b. female, Paratypes, a species captured at the AESS. This species was named after a rhyme of the acronym LSU, The Louisiana State University, alma mater of the author.**

Fig. 28. Selected images of a few of the thousands of new (first captured) USA records (*) and new (first captured) Louisiana records (**):

a. ***Omiodes martyralis*** **(Lederer) ♀,**
b. ***Panula inconstans*** **Guenée ♀,**
c. **unknown *Acontia species 5-13-1995 (AESS),**
d. ***Ogdoconta fergusoni*** **Metzler & Lafontaine ♂,**
e. ***Lapara*** **new species captured at the AESS (currently undescribed) ♂,**
f. ***Noctua pronuba*** **(Linnaeus) ♀,**
g. ****Enodia anthedon*** **Clark, ♂,**
h. ***Eudocima apta*** **(Walker, [1858] ♂,**
j. ***Eudocima serpentifera*** **(Walker) ♀,**
k. ****Simplicia cornicalis*** **Fabricius,**
m. ****Phrygionis privignaria*** **Guenée ♀,**
n. ****Leptotes cassius striata*** **(Edwards) ♂,**
o. ****Duponchelia fovealis*** **Zeller ♂,**
p. ***Tripudia paraplesia*** **Pogue ♂,**
q. ***Diaphania costata*** **(Fabricius) ♂,**
r. ***Stenoma exarata*** **(Zeller) ♂,**
s. ****Catocala messalina*** **Guenée ♂.**

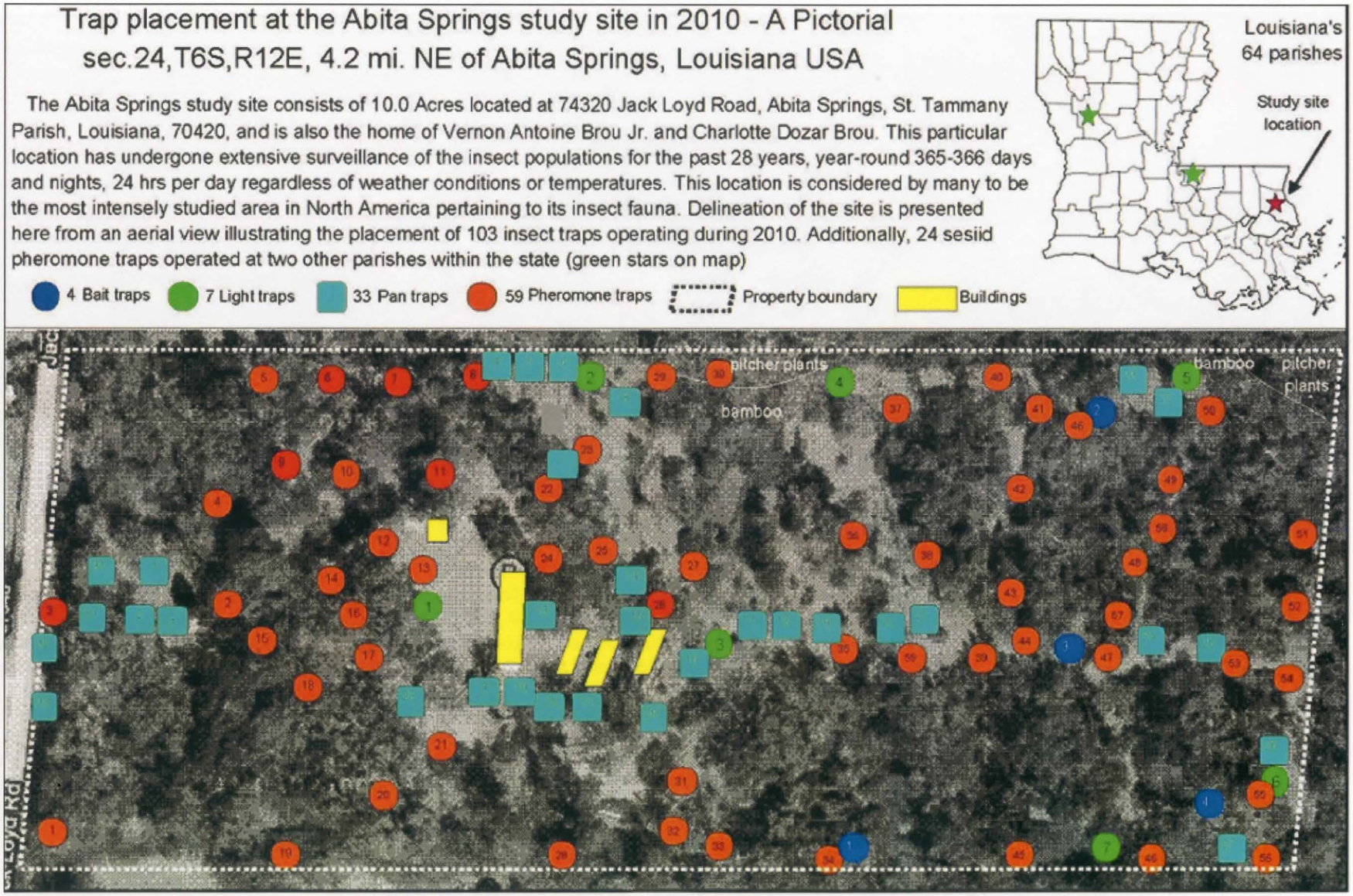
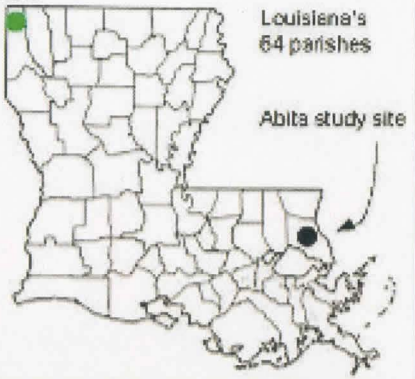


Fig. 29. Trap Placements at the AESS in 2010

Trap placement at the Abita Springs study site in 2018 - A Pictorial
sec.24,T6S,R12E, 4.2 mi. NE of Abita Springs, Louisiana USA

by
Vernon Antoine Brou Jr. and Charlotte D. Brou, 74320 Jack Loyd Road, Abita Springs, Louisiana, 70420 USA

The Abita Springs entomological study site (Fig.1) consists of 10.0 acres located at 74320 Jack Loyd Road, Abita Springs, St. Tammany Parish, Louisiana, 70420, and is also the home of the authors (black dot on map). This location has undergone extensive surveillance of the populations of many insect orders, using several hundreds of self designed insect traps of many types and purposes. Traps operated continuously at this site for the past 36 years, year-round 365-366 days and nights, 24 hours every day, regardless of weather conditions or temperatures, and also at numerous other locations in the state since 1969. This location is recognized worldwide by amateur and professional entomologists to be the most intensely studied area in North America pertaining to its insect fauna. Hundreds of insect species of all orders and new to science have been discovered at this location. Delineation of the trap placements at this site is presented here from an aerial view illustrating the placement of 51 insect traps operated during 2018. Additionally, 65 sesiid pheromone traps operated in Caddo Parish (green dot on map).



property boundaries — · — 44 pheromone traps 7 light traps BC - Base Camp

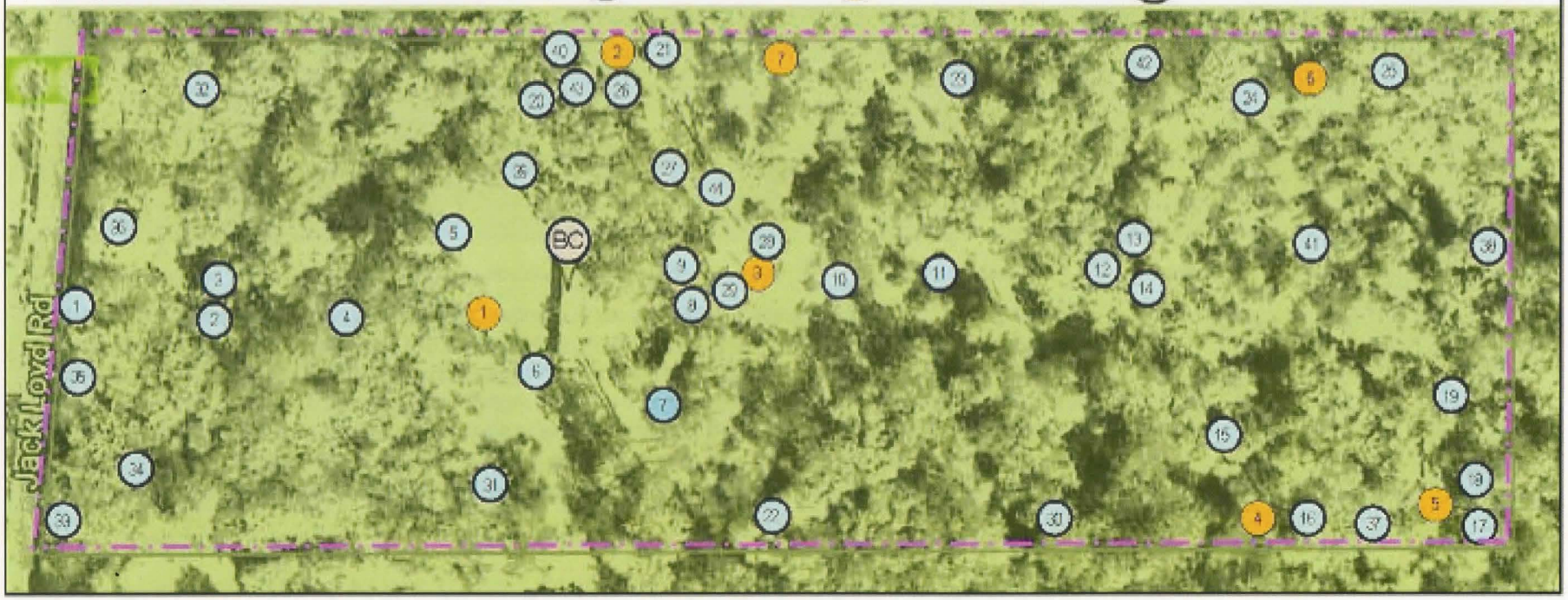


Fig. 30. Trap Placements at the AESS in 2018

Fig. 31. We must mention the massive devastation that occurred at the AESS due to Hurricane Katrina on September 29, 2005, though this same type of destruction occurred in all of the Gulf States from Florida to Texas. We earlier documented the effects of Hurricane Katrina at the AESS (Brou and Brou, 2005). It was necessary to not only remove the above ground parts of the downed trees, but also to remove the remaining root balls of these trees that were blown over. Some of these root balls were partially or completely pulled out of the ground and the result was that there were many dozens of holes 20' wide and 12' -15' or more in depth throughout the property. Even now 17 years later we have yet to remove all of the downed trees due to Hurricane Katrina. It was necessary to hire many persons and heavy equipment and many trucks to clean the AESS site daily for eight straight months following the hurricane. We took over 1100 digital images following Katrina, though we show only these six illustrated here. The majority of clean up work was performed by us.

Fig. 31.1. Even huge trees were blown over (Red oak illustrated here) in lower velocity non-hurricane winds of tropical storms as occurred at the AESS, TS Bill on July 1, 2003.

Fig. 32. a. 4' box and pan sheet metal brake, and b. 10" electric table saw, both used at the AESS. These and numerous hundreds of other electric and manual hand tools were necessary to construct around 65 light traps and 65 ballast boxes using galvanized sheet metal, and many other specialized necessary collecting, processing and storage devices. The table saws were used to fabricates dozens of unique self-designed wooden light trap collection chambers and over 450 wooden Cornell-size specimen storage drawers and cabinets to hold them, and numerous specimen large display cases for use in public museums, nature and science centers, zoological gardens, and the Audubon Insectarium (New Orleans), c. and d. self-designed low temperature specimen drying oven, 100% of pinned, spread, and papered specimens were placed in this unique oven over the past 40 years at the AESS. Other ovens were earlier used for this same purpose for over 10 years. Using these drying ovens not only accelerated specimen drying times and improved and increased productivity, but as a beneficial consequence also completely eliminated all museum pest e.g. dermestids and psocids by desiccating adults, their ova and pupae. In order to accomplish our work, it was necessary from the beginning to develop our unique self-designed, automatic-capture rapid dispatching traps, unique processing procedures including self-designed large volume specimen holding relaxing containers to facilitate successful high-quality daily pinning/spreading. Also, more than 1,000 lineal feet of self-designed balsa wood spreading and pinning boards were first fabricated in the early 1970s and these same boards remain in use today (2022) (Brou, 1993). It was also necessary to develop our unique procedures and methods to pin/spread and process the high volumes of daily captures which were subject to accelerated oven drying and subsequent long term storage in areas devoid of light.

Why did we spend an inordinate amount of our lives engaged in these activities involving new discoveries of insects (especially moths) in the state of Louisiana?

1. During the 1960s there were very few published researchers anywhere in North America who were using actual traps to collect insects, and there were only a few rudimentary commercial versions of insect light traps for lepidoptera which more often involved only one 15-watt fluorescent blacklight tube or circular fluorescent blacklight tube. Notable published light trap researchers back then included Stuart Ward Frost (December 4, 1891-January 23, 1980) who taught entomology at Pennsylvania State University and was responsible for

developing the Pennsylvania Insect Light Trap (1957). And Perry A. Glick (1895–1983) a lifelong entomologist who experimented with various tubes, lamps and bulbs in the state of Texas for the USDA Agricultural Research Service at College Station and Brownsville, Texas during 1950-1965.

2. No one was documenting bulk phenology information based upon real captures under wild natural conditions and certainly not on a grand and continual basis. When specifics were documented in print, nearly all information was simply baseless personal speculation, or plagiarized from earlier baseless speculations in previous publications, ad infinitum for more than a century earlier. Some more recent authors used biological statistical formulas to prove their conclusions, and these are often invalid and meaningless, not to mention few readers are familiar with, or understand the validity of these statistical arguments.

What gave us solace and provided a unique sense of accomplishments to press on through the severest adversities of life decade after decade?

1. We compiled never ending lists of discovering new facts concerning natural wild population movements.

2. Inventing and designing different novel insect traps that actually work was stimulating and invigorated our efforts to collect more insects and document more of our discoveries in print over the decades.

What was the most surprising epiphany now that we have logged more than 50,420,000 trap-hours of round the clock non-stop insect trapping in Louisiana, every day of every year despite temperature or other issues?

1. The vast majority of these hundreds of new species discoveries and billions of insect captures occurred non-stop on a small 10-acre fenced in dedicated site, the AESS.

What were we surprised by recording these many millions of daily capture dates over many decades?

1. Who could have predicted that these activities would have occurred at such a tiny geographical location every minute of every day for 41 continuous years and we are still logging new state record lepidoptera species at the AESS, even in year 41 of never discontinuing our traps or turning them off.

2. Who could have predicted that the operation of ~500 insect traps in the same exact locations for 41 years and yet we have not decimated the populations of insects there, as so many persons accused us of over the past half century?

3. Who would have predicted that we would record capturing numerous billions of insects throughout the state of Louisiana over 53 consecutive years, the vast majority were captured at the AESS over 41 years.

4. Who could have predicted that we would add over 3,000 new species of lepidoptera alone to the list of existing insect species previously documented to occur in the state, the majority at the AESS.

5. Who could have predicted that we would eventually discover over 400 species of Lepidoptera new to science, the majority of which were taken at the AESS.

6. We discovered that the vast majority of minimally published phenology information concerning lepidoptera species in North America are baseless assumptions and plagiarized over and over by subsequent authors often over centuries.

7. The amount of taxonomical errors in our scientific literature is considerable, some often repeatedly plagiarized from centuries past, even to current literature in 2022; some author's published findings are simply personal opinions and assumptions, simply pulled out of thin air for prestige and notoriety.

8. Determining species based solely upon genitalia dissections, or solely upon DNA or CO1 analysis is folly as in some cases any or all of these methods can fail to prove anything one way or the other.

9. Phenology analysis under total wild natural conditions can be an extremely helpful in distinguishing similar looking species that aren't clearly defined by various other methods. More importantly phenology analysis can be most helpful in proving, bolstering or discounting species validity when there is only minimal or questionable other proofs.

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Literature Cited

Baloch, G.M. & S. Ullah, 1975. Proceedings International Symposium Biological Control of Weeds, *Montpellier*, 1973. 3: 17-26.

Blanchard, A., 1973. Record and illustration of some interesting moths flying in Texas (Sphingidae, Ctenuchidae, Noctuidae, Notodontidae, Geometridae, Pyralidae, Cossidae). *J. Lepid. Soc.* 27: 103-109.

Chapin, J.B. and V.A. Brou Jr., 1991. Harmonia axyridis (Pallas), the third species of the genus to be found in the United States (Coleoptera: Coccinellidae). *Proc. Entomol. Soc. Wash.* 93: 630-635.

Brou Jr., V.A., 1993. A new continental record of an eastern hemisphere agricultural pest collected at ultraviolet light. *South. Lepid. News* 15:9-10.

Brou Jr., V.A., 1993. Build it yourself 12 & 25 drawer (cornel-size) specimen cabinets. *South. Lepid. News* 15: 13-16.

Brou Jr., V.A., 1993. A new US mainland record of a global agricultural pest collected at light. *South. Lepid. News* 15:17.

Brou Jr., V.A., 1993. Constructing non-adjustable insect spreading boards. *South. Lepid. News* 15: 25-27.

Brou Jr., V.A., 1993. Status in Louisiana of the introduced moth Sameodes albiguttalis (Warren) (Lepidoptera: Pyralidae). *South. Lepid. News* 15: 31-33.

Brou Jr., V.A., 1993. Range extension of the moth Parapoynx diminutalis Snellen (Lepidoptera: Pyralidae). *South. Lepid. News* 15:33-34.

Brou Jr., V.A., 1994. New species of Lapara (Sphingidae) from southeastern United States. *Jour. Lepid. Soc.* 48: 51-57.

Brou Jr., V.A., 1994. Additional information on the geometrid genus Nematocampa in Louisiana. *South. Lepid. News* 16: 1-2.

Brou Jr., V.A., 1994. The genus Callosamia Packard (Saturnidae) in Louisiana. *South. Lepid. News* 16: 2-4.

Brou Jr., V.A., 1994. The occurrence of the noctuid Agrotis repleta Walker in Louisiana. *South. Lepid. News* 16: 26.

Brou Jr., V.A., 1994. A new U.S. Pyraloid species record. *South. Lepid. News* 16: 26.

Brou Jr., V.A., 1994. New records of two fruit-piercing moths encountered in Louisiana and other southern states. *South Lepid. News* 16:39-40.

Brou Jr., V.A., 1997. A new Chaetaglaea from the southeastern United States. (Noctuidae: Cuculliinae). *Jour. Lepid. Soc.* 51: 135-138.

Brou Jr., V.A. and C.D. Brou, 1997. Distribution and phenologies of Louisiana Sphingidae. *Jour. Lepid. Soc.* 51: 156-175

Brou Jr., V.A., 1997. Voltinism of Citheronia sepulcralis Grote & Robinson in Louisiana. *South. Lepid. News* 19: 25.

Brou Jr., V.A., 1997. The flight period of Synanthedon acerni (Clemens) in southeastern Louisiana. *South. Lepid. News* 19: 25-26.

Brou Jr., V.A., 1997. The flight periods of Podosesia syringae (Harris) and Podosesia aureocincta Purrington & Nielsen in Louisiana. *South. Lepid. News* 19: 35-36.

Brou Jr., V.A., 1997. The flight period of Synanthedon exitiosa (Say) in southeastern Louisiana. *South. Lepid. News* 19: 36-37.

Brou Jr., V.A., 1997. The flight period of Synanthedon rubrofascia (Hy. Edw.) in Louisiana. *South. Lepid. News* 19: 49.

Brou Jr., V.A., 1999. Voltinism of Anisota stigma (Fabricius) in Louisiana. *South. Lepid. News* 21: 29.

Brou Jr., V.A., 2000. Parrhasius m-album (Lycaenidae) in Louisiana. *South. Lepid. News* 22: 31.

Brou Jr., V.A., 2000. Catocala muliercula Guenée in Louisiana. *South. Lepid. News* 22: 49.

Brou Jr., V.A., 2001. Xanthopastis timais (Cramer) in Louisiana. *South. Lepid. News* 22: 71.

Brou Jr., V.A., 2001. The genus Heliothis Ochsenheimer (Noctuidae) in Louisiana. *South. Lepid. News* 23: 15 -17.

Brou Jr., V.A., 2001. Nemoria extremaria in Louisiana. *South. Lepid. News* 23: 8.

Brou Jr., V.A., 2001. Portrait of Sphingidae Flight in Louisiana. *South. Lepid. News* 23: 9.

Brou Jr., V.A., 2001. Sannina uroceriformis Walker (Sesiidae) in Louisiana. *South. Lepid. News* 23: 43.

Brou Jr., V.A., 2001. Sibling species Synanthedon kathyae Duckworth & Eichlin and Synanthedon alleri (Enge lhardt) in southeast Louisiana. *South. Lepid. News* 23: 62-64.

Brou Jr., V.A., 2002. Sphacelodes vulneraria (Hbn.) (Geometridae) in Louisiana. *South. Lepid. News* 24: 7.

Brou Jr., V.A., 2002. Voltinism of Antheraea polyphemus (Cramer) (Saturnidae) in Louisiana. *South. Lepid. News* 24: 6.

Brou Jr., V.A., 2002. The occurrence of Nepytia semiclusaria (Walker) in Louisiana. *South. Lepid. News* 24: 8.

Brou Jr., V.A., 2002. Syngamia florella (Stoll) (Pyralidae) in Louisiana. *South. Lepid. News* 24: 24.

Brou Jr., V.A., 2002. Brief observations of Sphingidae flight time. *South. Lepid. News* 24: 26-27.

Brou Jr., V.A., 2002. Variations in Utetheisa bella (L.), Utetheisa ornatrix (L.), and Holomelina laeta (Gr.-Men.). *South. Lepid. News* 24: 1, insert A.

Brou Jr., V.A., 2002. Variations in Atteva aurea and Hyparpax aurora in Louisiana. *South. Lepid. News* 24: 2, insert C.

Brou Jr., V.A. and C.D. Brou, 2002. Addendum to Sphingidae of Louisiana *Jour. Lepid. Soc.* 56: 178-179.

Brou Jr., V.A., 2002. The Dioryctria (Pyralidae) species of Louisiana. *South. Lepid News* 24: 58-59.

Brou Jr., V.A., 2002. The Euzophera (Pyralidae: Phycitinae) species of Louisiana. *South. Lepid. News* 24: 51-52.

Brou Jr., V.A., 2002. Hemileuca maia (Drury) in Louisiana. *South. Lepid. News* 24: 56.

Brou Jr., V.A., 2002. Catocala ilia (Cramer) and form umbrosa in Louisiana. *South. Lepid. News* 24: 48-50.

Brou Jr., V.A., 2002. Variations in Catocala ilia (a-g) and Catocala umbrosa (h-r) in Louisiana. *South. Lepid. News* 24: 3, insert C.

Brou Jr., V.A., 2002. Type designation of Catocala umbrosa Brou. *South. Lepid. News* 24: 85-86.

Brou Jr., V.A., 2002. Catocala grynea (Cramer) in Louisiana. *South. Lepid News* 24: 93.

Brou Jr., V.A., 2002. Catocala ultronia (Hbn.) in Louisiana. *South. Lepid. News* 24: 94.

Brou Jr., V.A., 2002. The occurrence of Synanthedon pictipes (Grote & Robinson) in Louisiana. *South. Lepid. News* 25: 5.
Brou Jr., V.A., 2003. The many faces of the Tulip Tree Moth Epimecis hortaria Fabricius. *South. Lepid. News* 25: 6.
Brou Jr., V.A., 2003. Schinia bimatris (Harvey) in Louisiana. *South. Lepid. News* 25: 7.
Brou Jr., V.A., 2003. The occurrence of Bagisara brouana Ferguson in southeast Louisiana. *South. Lepid. News* 25: 8.
Brou Jr., V.A., 2003. Metaxaglaea of Louisiana. *South. Lepid. News* 25: 41-42.
Brou Jr., V.A., 2003. Automeris io lilith (Strecker) in Louisiana. *South. Lepid. News* 25: 44-45.
Brou Jr., V.A., 2003. Cosmosoma myrodora Dyar in Louisiana. *South. Lepid News*. 25: 46.
Brou Jr., V.A., 2003. Schinia trifascia in Louisiana. *South. Lepid News* 25:48.
Brou Jr., V.A., 2003. Catocala charlottae Brou in Louisiana. *South. Lepid. News* 25: 80.
Brou Jr., V.A., 2003. Holomelina laeta (Gr.-Men.) in Louisiana. *South. Lepid. News* 25: 81.
Brou Jr., V.A., 2003. Euagrotis lubricans (Guenée) in Louisiana. *South. Lepid. News* 25: 89-90.
Brou Jr., V.A., 2003. Ascalapha odorata (L.) and Thysania zenobia (Cram.) in Louisiana. *South. Lepid. News* 25: 91.
Brou Jr., V.A., 2003. Catocala messalina in Louisiana. *South. Lepid. News* 25: 107.
Brou Jr., V.A., 2003. Let this be a lesson - a real sad dilemma. Careless destruction of a lifetimes work. *South. Lepid. News* 25: 118-120.
Brou Jr., V.A., 2003. Schinia arcigera in Louisiana. *South. Lepid. News* 25: 120.
Brou Jr., V.A., 2003. Eacles imperialis (Drury) and E. i. nobilis Neumoegen in Louisiana. *South. Lepid. News* 25: 128.
Brou Jr., V.A., 2004. The occurrence of Actias luna (L.) in Louisiana. *South. Lepid. News* 26: 4.
Brou Jr., V.A., 2004. The Genus Peridea (Notodontidae) in Louisiana. *South. Lepid. News* 26: 5-6.
Brou Jr., V.A., 2004. Cisthene plumbea in Louisiana. *South. Lepid. News* 26: 7.
Brou Jr., V.A., 2004. Prochoerodes transversata (Drury) in Louisiana. *South. Lepid. News* 26: 9.
Brou Jr., V.A., 2004. Color insert A, *South. Lepid News* 26: Vol. 26, No. 1.
Brou Jr., V.A., 2004. Feralia major J.B. Smith in Southeast Louisiana. *South. Lepid. News* 26: 31-32.
Brou Jr., V.A., 2004. The Noctuidae genus Mocis Hubner in Louisiana. *South. Lepid. News* 26: 35-37.
Brou Jr., V.A., 2004. The Leopard Moth, Ecpantheria scribonia (Stoll), (Arctiidae) in Louisiana. *South. Lepid. News* 26: 43.
Brou Jr., V.A., 2004. Phoberia atomaris Hubner in Louisiana. *South. Lepid. News* 26: 44.
Brou Jr., V.A., 2004. Two new species of Baileya Grote (Nolidae: Risobinae) from the southeastern United States. *Jour. Lepid. Soc.* 58:94-99.
Brou Jr., V.A., 2004. A long known and undescribed Catocala in Louisiana. *South. Lepid. News* 26: 74.
Brou Jr., V.A., 2004. Eutrapela clemataria (J.E.Smith) in Louisiana. *South. Lepid. News* 26: 75.
Brou Jr., V.A., 2004. Thysanopyga intractata (Wlk.) in Louisiana. *South. Lepid. News* 26: 79.
Brou Jr., V.A., 2004. Artace cribraria (Ljungh) in Louisiana. *South. Lepid. News* 26: 80.
Brou Jr., V.A., 2004. NEW STATE RECORDS. *South. Lepid. News* 26: 94.
Brou Jr., V.A., 2004. Cymatophora approximaria Hubner in Louisiana. *South. Lepid. News* 26: 103.
Brou Jr., V.A., 2004. The Pyreferra of Louisiana. *South. Lepid. News* 26: 104.
Brou Jr., V.A., 2004. Symmerista albifrons (J.E.Smith) in southeast Louisiana. *South. Lepid. News* 26: 111.
Brou Jr., V.A., 2004. Basilodes pepita Gn., a rarely encountered Louisiana noctuid moth. *South. Lepid. News* 26: 112.
Brou Jr., V.A., 2005. Calycopis cecrops (F.) in Louisiana. *South. Lepid. News* 27: 5.
Brou Jr., V.A., 2005. Lytrosis Hulst of Louisiana. *South. Lepid. News* 27: 7.
Brou Jr., V.A., 2005. An undescribed Lithophane from Louisiana. *South. Lepid. News* 27: 9.
Brou Jr., V.A., 2005. Papaipema appasionata Harvey in Louisiana. *South. Lepid. News* 27: 10.
Brou Jr., V.A., 2005. Meskea dyspteraria Grote in Louisiana. *South. Lepid. News* 27: 25
Brou Jr., V.A., 2005. Catocala lincolnana Brower and Catocala texarkana Brower in Louisiana. *South. Lepid. News* 27:28.
Brou Jr., V.A., 2005. Ceratonyx satanaria in Louisiana. *South. Lepid. News* 27:29.
Brou Jr., V.A., 2005. Hypocala andremona (Cramer) in Louisiana. *South. Lepid. News* 27:36.
Brou Jr., V.A., 2005. Neocataclysta magnificalis (Hbn.) in Louisiana. *South. Lepid. News* 27:68.
Brou Jr., V.A., 2005. Macrurocampa marthesia (Cram.) in Louisiana. *South. Lepid. News* 27:70
Brou Jr., V.A., 2005. Two undescribed species of Notodontidae from Louisiana. *South. Lepid. News* 27:82.
Brou Jr., V.A., 2005. Parasa chloris (H.-S.) in Louisiana. *South. Lepid. News* 27:83
Brou Jr., V.A., 2005. Spotlight on rearing: Amphion floridensis B. P. Clark 27: *South. Lepid. News* Plate 1.
Brou Jr., V.A., 2005. Iridopsis defectaria (Gn.) in Louisiana. *South. Lepid. News* 27: 103.
Brou Jr., V.A., 2005. Acrapex relicta Ferguson in Louisiana. *South. Lepid. News* 27: 105.
Brou Jr., V.A., 2005. Acronicta perblanda Ferguson in Louisiana. *South. Lepid. News* 27: 109.
Brou Jr., V.A. and C.D. Brou, 2005. The effects of a hurricane named Katrina. *South. Lepid. News* 27: 110-113.
Brou Jr., V.A., 2005. Acronicta sinescripta Ferguson in Louisiana. *South. Lepid. News* 27: 121.
Brou Jr., V.A., 2005. Spotlight on rearing: Automeris louisiana Ferguson & Brou. *South. Lepid. News* 27: No. 4, plate 2.
Brou Jr., V.A., 2006. Harrisimemna trisignata (Walker) in Louisiana. *South. Lepid. News* 28: 7.

Brou Jr., V.A., 2006. Spotlight on rearing: Darapsa myron (Cramer). *South. Lepid. News* 28 No. 1, Plate 1.
Brou Jr., V.A., 2006. Catocala micronympha Guenée in Louisiana. *South. Lepid. News* 28: 26.
Brou Jr., V.A., 2006. Metarranthis obfirmaria (Hbn.) in southeast Louisiana. *South. Lepid. News* 28: 32.
Brou Jr., V.A., 2006. Schinia tuberculum (Hubner) in Louisiana. *South. Lepid. News* 28: 33-34.
Brou Jr., V.A., 2006. Lithacodia bellicula Hubner in Louisiana. *South. Lepid. News* 28: 51.
Brou Jr., V.A., 2006. Melipotis indomita Walker in Louisiana. *South. Lepid. News* 28: 57-58.
Brou Jr., V.A., 2006. Melipotis perpendicularis Guenée in Louisiana. *South. Lepid. News* 28: 59-60.
Brou Jr., V.A., 2006. Epidroma fergusoni (Solis) in Louisiana. *South. Lepid. News* 28: 81.
Brou Jr., V.A., 2006. Panula inconstans Guenée, a new state record for Louisiana. *South. Lepid. News* 28: 82.
Brou Jr., V.A., 2006. Catocala alabamae Grote in Louisiana. *South. Lepid. News* 28: 83-84.
Brou Jr., V.A,. 2006. Hyphantria cunea (Drury) in Louisiana. *South. Lepid. News* 28: 85-86.
Brou Jr., V.A., 2006. A New US Record for the tropical fruit-piercing moth Eudocima serpentifera (Walker, 1858). *South. Lepid. News* 28:105-108.
Brou Jr., V.A., 2006. Melipotis fasciolaris (Hubner) in Louisiana. *South. Lepid. News* 28: 116.
Brou Jr., V.A., 2006. Holomelina opella (Grote) in Louisiana. *South. Lepid. News* 28: 119-120.
Brou Jr., V.A., 2006. Grammia virgo (L.) in Louisiana. *South. Lepid. News* 28: 136.
Brou Jr., V.A., 2007. Catocala orba Kusnezov, 1903 in Louisiana. *South. Lepid. News* 29: 12.45
Brou Jr., V.A., 2007. Spotlight on rearing: Papilio palamedes Drury in Louisiana. *South. Lepid.* News 29: 13-15.
Brou Jr., V.A., 2007. Fixsenia ontario (W.H. Edwards) in Louisiana. *South. Lepid. News* 29: 17-18.
Brou Jr., V.A., 2007. Satyrium liparops (LeConte, 1833) in Louisiana. *South. Lepid. News* 29: 19-20.
Brou Jr., V.A., 2007. A New US Record for a tropical fruit-piercing moth. *News Lepid. Soc.* 49: (1), 35-37.
Brou Jr., V.A., 2007. A New US Record for a tropical fruit-piercing moth. *News Lepid. Soc.* 49: (Supplement S1), in 2006 Season Summary Cover.
Brou Jr., V.A., 2007. Phoebis sennae eubule Linnaeus in Louisiana. *South. Lepid. News* 29: 33-35.
Brou Jr., V.A., 2007. Catocala miranda Hy. Edwards 1881 in Louisiana. *South. Lepid. News* 29: 66.
Brou Jr., V.A., 2007. Spotlight on rearing Automeris io lilith (Strecker). *South. Lepid. News* 29: 71.
Brou Jr., V.A., 2007. Portentomorpha xanthialis (Gn.) in Louisiana. *South. Lepid. News* 29: 72.
Brou Jr., V.A., 2007. Alypia octomaculata (Fabricius, 1775) in Louisiana. *South. Lepid. News* 29: 80-81.
Brou Jr., V.A., 2007. Catocala judith Strecker 1874 in Louisiana. *South. Lepid. News* 29: 89.
Brou Jr., V.A., 2007. Spotlight on rearing: Isoparce cupressi in Louisiana. *South. Lepid. News* 29: 90-91.
Brou Jr., V.A., 2007. Catocala clintoni Grote 1864 in Louisiana. *South. Lepid. News* 29: 97.
Brou Jr., V.A., 2007. Undulambia striatalis (Dyar) in Louisiana. *South. Lepid. News* 29: 120.
Brou Jr., V.A., 2007. Helvibotys subcostalis (Dyar, 1912) and Helvibotys pucilla (Druce, 1895) in Louisiana. *South. Lepid. News*
Brou Jr., V.A., 2007. Azenia obtusa (H. S., 1854) in Louisiana. *South. Lepid. News* 29: 147.
Brou Jr., V.A., 2007. Glenoides texanaria (Hulst) in Louisiana. *South. Lepid. News* 29: 148.
Brou Jr., V.A., 2007. Schinia gracilenta Hubner in Louisiana. *South. Lepid. News* 29: 149.
Brou Jr., V.A., 2007. Epitausa prona (Moschler, 1880) in Louisiana. *South. Lepid. News* 29: 153-155.
Brou Jr., V.A., 2007. Cossula magnifica (Strecker, 1876) in Louisiana. *South. Lepid. News* 29: 164.
Brou Jr., V.A., 2008. Catocala carissima Hulst, (Lepidoptera: Noctuidae) 1880 in Louisiana. *South. Lepid. News* 30: 15-16.
Brou Jr., V.A., 2008. Update on Chaetaglaea fergusoni Brou, 1997 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid.News* 30: 17.
Brou Jr., V.A., 2008. Satyrium kingi (Klots & Clench, 1952) in Louisiana. *South. Lepid. News* 30: 18-19.
Brou Jr., V.A., 2008. Exyra semicrocea (Guenée) in Louisiana. *South. Lepid. News* 30: 19-20.
Brou Jr., V.A., 2008. Spotlight on rearing: Apantesis nais (Drury) (Lepidoptera: Arctiidae) in Louisiana. *South. Lepid. News* 30: 21-23.
Brou Jr., V.A., 2008. Fania nana (Strecker, 1876) (Lepidoptera: Cossidae) in Louisiana. *South. Lepid. News* 30: 40.
Brou Jr., V.A., 2008. Oreta rosea (Walker,1855) (Lepidoptera: Drepanidae) in Louisiana. *South. Lepid. News* 30: 41-42.
Brou Jr., V.A., 2008. Dryocampa rubicunda (F.) in Louisiana. South. Lepid. News 30: 51-52.
Brou Jr., V.A., 2008. Variations of Phoberia atomaris Hübner (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 30: 57-58.
Brou Jr., V.A., 2008. Acrolophus mycetophagus Davis 1990 (Lepidoptera : Acrolophidae) in Louisiana. *South. Lepid. News* 30: 59.
Brou Jr., V.A., 2008. The genus Phytometra Haworth, 1809, (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 30: 60-61.
Brou Jr., V.A., 2008. Holomelina rubicundaria (Hübner) (Lepidoptera: Arctiidae) in Louisiana. *South. Lepid. News* 30: 61-63.

Brou Jr., V.A., 2008. Cartoon: Lepidoptera humor. Vern's clearwing moth pheromone trap. *South. Lepid. News* 30: 99.

Brou Jr., V.A., 2008. Anarta jatrophae guantanamo Munroe in Louisiana. *South. Lepid. News* 30: 100-101.

Brou Jr., V.A. and C.D. Brou, 2008. Status of Hurricane Gustav (2008) upon collecting in southeast Louisiana. *South. Lepid. News* 30:105-107.

Brou Jr., V.A., 2008. Apatelodes torrefacta (J.E. Smith, 1797) (Lepidoptera: Apatelodidae) in Louisiana. *South. Lepid. News* 30: 108-109.

Brou Jr., V.A., 2008. Nymphalis milberti (Godart) (Lepidoptera: Nymphalidae) captured in Louisiana. *South. Lepid. News* 30: 109-110.

Brou Jr., V.A., 2008. Agathodes designalis Guenée, 1854 (Lepidoptera, Pyralidae) in Louisiana. *South. Lepid. News* 30: 124.

Brou Jr., V.A., 2008. Stiria rugifrons Grote,1874 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 30: 141-142.

Brou Jr., V.A., 2008. Zale horrida Hübner (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 30: 142-143.

Brou Jr., V.A., 2008. Diphthera festiva (Fabricius, 1775) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 30: 147-148.

Brou Jr., V.A., 2008. Basicladus tracyi (Jones, 1911) (Lepidoptera: Psychidae) in Louisiana. *South. Lepid. News* 30: 149-150.

Brou Jr., V.A., 2008. Cartoon: Lepidoptera humor. Vern's clearwing moth pheromone trap #2. *South. Lepid. News* 30: 151.

Brou Jr., V.A., 2008. Terastia meticulosalis Guenée (Lepidoptera: Pyralidae) in Louisiana. *South. Lepid. News* 30: 164.

Brou Jr., V.A., 2009. Satyrium calanus falacer (Godart, [1824]) (Lepidoptera: Lycaenidae) in Louisiana. *South. Lepid. News* 31: 1-2.

Brou Jr., V.A., 2009. A 2008 report of illegal insect collecting by visitors in India. *South. Lepid. News* 31: 7-8.

Brou Jr., V.A., 2009. Lepidoptera Humor: Vern's Bait Trap #1, Frog with thought. *South. Lepid. News* 31: 14.

Brou Jr., V.A., 2009. Cucullia convexipennis Grote & Robinson, 1868 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 31: 20-21.

Brou Jr., V.A., 2009. Dasychira dominickaria Ferguson, 1978 (Lepidoptera: Lymantriidae) in Louisiana. *South. Lepid. News* 31: 21-22.

Brou Jr., V.A., 2009. Schizura badia (Packard, 1864) (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 31: 40.

Brou Jr., V.A. and J.D. Lafontaine, 2009. A new species of Lithophane Hbn. (Lepidoptera: Noctuidae: Xyleninae) from southeastern United States. In Schmidt SBC, Lafontaine JD (Eds) Contributions to the Systematics of New World Noctuidae. *ZooKeys* 9: 11-20 .doi: 10.3897/*zookeys.* 9.158.

Brou Jr., V.A., 2009. Two US citizens arrested in Australia for beetle smuggling. *South. Lepid. News* 31: 60.

Brou Jr., V.A., 2009. Nacophora quernaria (J.E. Smith, 1797) (Lepidoptera: Geometridae) in Louisiana. *South. Lepid . News* 31: 61-62.

Brou Jr., V.A., 2009. Berks County Pennsylvania man fined $5,000 for illegally importing beetles. *South . Lepid. News* 31: 62-63.

Brou Jr., V.A., 2009. Epiglaea apiata (Grote, 1874) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 31: 70-71.

Brou Jr., V.A., 2009. Dichorda iridaria (Guenée, 1857) (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 31: 126.

Brou Jr., V.A., 2009 . Utetheisa ornatrix (L., 1758) and Utetheisa bella (L., 1758) (Lepidoptera: Arctiidae) in Louisiana. *South. Lepid.News* 31: 119-123.

Brou Jr., V.A., 2009. Picture from our past - 1990 Catocala Workshop. *South. Lepid. News* 31: 125.

Brou Jr., V.A., 2009. Nadata gibbosa (J.E. Smith, 1797) (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 31: 112.

Brou Jr., V.A., 2009. Polygrammate hebraeicum Hübner, 1818, (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 31: 92.

Brou Jr., V.A., 2009. Some visitors of Vernon Antoine Brou Jr. & Charlotte Dozar Brou in Abita Springs, Louisiana during 2009. *South. Lepid. News* 31: 118.

Brou Jr., V.A., 2009. Prionoxystus robiniae (Peck, 1818) (Lepidoptera: Cossidae) in Louisiana. *South. Lepid. News* 31: 124-125.

Brou Jr., V.A., 2009. Agriopodes fallax (Herrich-Schaffer, 1854) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 31: 169-170.

Brou Jr., V.A., 2009. Recent visitors to Vernon Antoine Brou Jr & Charlotte Dozar Brou in Abita Springs, Louisiana during 2009. *South. Lepid. News* 31:149-150.

Brou Jr., V.A., 2009. Acherdoa ferraria Walker, 1865 (Lèpidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 31: 165.

Brou Jr., V.A., 2009. Magusa divaricata (Grote, 1874) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 31: 172-173.

Brou Jr., V.A., 2010. Phrygionis privignaria Guenée 1857 (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 32: 35-39.

Brou Jr., V.A., 2010. Adult phenotypes of Epimecis hortaria (Fabricius, 1794) (Lepidoptera: Geometridae) from St. Tammany Parish, Louisiana. *South. Lepid. News* 32: 56-57.

Brou Jr., V.A., 2010. 12-14-2009 Eric & Pat Metzler visiting Vernon & Charlotte Brou. *South. Lepid. News* 32: 32.

Brou Jr., V.A., 2010. Acronicta americana (Harris, 1841) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 32: 33-34.

Brou Jr., V.A., 2010. Fagitana littera (Guenée, 1852) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 32: 1-2.

Brou Jr., V.A., 2010. Catocala andromedae Guenée, 1852 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 32: 80-81.

Brou Jr., V.A., 2010. The genus Dargida Walker, 1856 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 32: 71-72.

Brou Jr., V.A., 2010. Baron Ludwig von Reizenstein (1826-1885) Father of Louisiana Lepidopterists. *South. Lepid. News* 32: 120-126.

Brou Jr., V.A., 2010. Loxa flavicollis (Drury, 1773) (Hemiptera: Pentatomidae) a new invasive stink bug in Louisiana. *South. Lepid. News* 32: 166-167.

Brou Jr., V.A., 2010. Omiodes indicata (Fabricius) and Omiodes martyralis (Lederer) (Lepidoptera: Pyralidae) in Louisiana. *South. Lepid. News* 32: 165-166.

Brou Jr., V.A., 2010. Dyspteris abortivaria (Herrich-Schaffer, 1855) (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 32: 151-152.

Brou Jr., V.A., 2010. Trap placement at the Abita Springs study site in 2010 - A Pictorial, sec.24,T6S,R12E, 4.2 mi. NE of Abita Springs, Louisiana USA. *South. Lepid. News* 32: 171.

Brou Jr., V.A., 2010. Chaetaglaea sericea (Morrison, 1874) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 32: 180-181.

Brou Jr., V.A., 2010. Allotria elonympha (Hübner, 1818) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 33: 13-14.

Brou Jr., V.A., 2011. Chaetaglaea tremula (Harvey, 1875) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 33: 15-16.

Brou Jr., V.A., 2011. Nemoria lixaria (Guenée, [1858]) Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 33: 25-26.

Brou Jr., V.A., 2011. Revisiting the noncommercial collection of fauna by U.S. National Forest visitors in 2011. *South. Lepid. News* 33: 56-57.

Brou Jr., V.A., 2011. Heterocampa astarte Doubleday, 1841 (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 33: 74-75.

Brou Jr., V.A., 2011. New IRS Reporting Rules affect eBay and PayPal in the U.S. *South. Lepid. News* 33: 95.

Brou Jr., V.A.,2011. Leuconycta diphteroides (Guenée 1852) and Leuconycta lepidula (Grote 1874) in Louisiana. *South. Lepid. News* 33: 102-103.

Brou Jr., V.A., 2011. Pyrausta bicoloralis (Guenée) in Louisiana. *South. Lepid. News* 33: 137-138.

Brou Jr., V.A., 2011. Second addendum to the Sphingidae of Louisiana. *South. Lepid. News* 33: 140-144.

Brou Jr., V.A., 2011. The Eubaphe Hübner, 1823 (Geometridae) of Louisiana. *South. Lepid. News* 33: 147-148.

Brou Jr., V.A., 2011. Condica claufacta (Walker, 1857) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 33: 151.

Brou Jr., V.A., 2011. Estigmene acrea (Drury, 1773) (Lepidoptera: Arctiidae) in Louisiana. *South. Lepid. News* 33: 171-172.

Brou Jr., V.A., 2011. Acronicta oblinita (J.E. Smith, 1797) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 33:173-174.

Brou Jr., V.A., 2012. Hyparpax aurora (J.E. Smith, 1797) (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 34: 18-19.

Brou Jr., V.A., 2012. Panthea furcilla australis Anweiler (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 34: 20-21.

Brou Jr., V.A. and Z. Lemann, 2012. Survey of the Lepidoptera family Sesiidae (Clearwing moths) in Orleans Parish, Louisiana. *South. Lepid. News* 34: 26-33.

Brou Jr., V.A., 2012. Properigea tapeta (J.B. Smith, 1900) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 34: 34.

Brou Jr., V.A., 2012. The genus Charadra Walker, 1865 (Lepidoptera: Noctuidae) of Louisiana. *South. Lepid. News* 34: 39-40.

Brou Jr., V.A., 2012. Catocala maestosa Hulst, 1884 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 34: 41-42.

Brou Jr., V.A.,2012. Carmenta pyralidiformis (Walker, 1856) (Lepidoptera: Sesiidae) in Louisiana. *South. Lepid. News* 34: 46-47.

Brou Jr., V.A., 2012. The genus Morrisonia Grote (1874) (Lepidoptera, Noctuidae) in Louisiana. *South. Lepid. News* 34: 61-62.

Brou Jr., V.A., 2012. Baileya ophthalmica (Guenée, 1852) (Lepidoptera, Nolidae) in Louisiana. *South. Lepid. News* 34: 82.

Brou Jr., V.A., 2012. Colomychus talis (Grote, 1878) (Lepidoptera, Pyralidae) in Louisiana. *South. Lepid. News* 34: 87.

Brou Jr., V.A., 2012. Lochmaeus manteo Doubleday and Lochmaeus bilineata (Packard) in Louisiana. *South. Lepid. News* 34: 105-106.

Brou Jr., V.A., 2012. Cicinnus melsheimeri (Harris, 1841) (Lepidoptera, Mimallonidae) in Louisiana. *South. Lepid. News* 34: 109-110.

Brou Jr., V.A., 2012. Metarranthis lateritiaria (Guenée, 1857) (Lepidoptera, Geometridae) in Louisiana. *South. Lepid. News* 34: 114.

Brou Jr., V.A., 2012. Haploa clymene (Brown, 1776) (Lepidoptera: Erebidae) in Louisiana. *South. Lepid. News* 34: 122-123.

Brou Jr., V.A., 2012. The genus Balsa (Walker, 1860) (Lepidoptera, Noctuidae) in Louisiana. *South. Lepid. News* 34: 126-127.

Brou Jr., V.A., 2012. The genus Argyrostrotis Hübner (1821) (Lepidoptera: Erebidae) in Louisiana. *South. Lepid. News* 34: 134-138.

Brou Jr., V.A., 2012. Panopoda rufimargo Hübner (Lepidoptera: Erebidae) in Louisiana. *South. Lepid. News* 34: 154-155.

Brou Jr., V.A., 2012. Pyrrhia aurantiago (Guenée, 1852) (Lepidoptera, Noctuidae) in Louisiana. *South. Lepid. News* 34: 186.

Brou Jr., V.A., 2012. I fought the bugs and the bugs nearly won. *South. Lepid. News* 34: 187-188.

Brou Jr., V.A., 2012. Simple method for protecting antennae when papering lepidoptera specimens. *South. Lepid. News* 34: 215-216.

Brou Jr., V.A., 2013. Simplicia cornicalis (Fabricius, 1794) (Lepidoptera, Noctuidae) in Louisiana. *South. Lepid. News* 35: 22.

Brou Jr., V.A., 2013. The Enodia Hübner (Lepidoptera: Nymphalidae) of Louisiana. *South. Lepid. News* 35: 29-30.

Brou Jr., V.A., 2013. Vitacea scepsiformis (Hy. Edw.) (Lepidoptera: Sesiidae) in Louisiana. *South. Lepid. News* 35: 18.

Brou Jr., V.A., 2013. Synanthedon rileyana (Hy. Edw.) (Lepidoptera: Sesiidae) in Louisiana. *South. Lepid. News* 35: 17.

Brou Jr., V.A., 2013. Pennisetia marginata (Harris, 1837) (Lepidoptera: Sesiidae) in Louisiana. *South. Lepid. News* 35: 1-2.

Brou Jr., V.A., 2013. Lychnosea intermicata (Walker, 1862) (Lepidoptera: Geometridae) in Louisiana. *South . Lepid. News* 35: 4.

Brou Jr., V.A., A.R. Giese, and D.H. Miller, 2013. A new U.S. state record for a tropical fruit-piercing moth in the family Erebidae Leach. *South. Lepid. News* 35: 27-28.

Brou Jr., V.A., 2013. Citheronia regalis (Fabricius, 1793) (Lepidoptera: Saturnidae) in Louisiana. *South. Lepid. News* 35: 73.

Brou Jr., V.A., 2013. The Euthyatira and Pseudothyatira of Louisiana (Lepidoptera, Thyatiridae). *South. Lepid. News* 35: 75-76.

Brou Jr., V.A., 2013. Samia cecropia (Linnaeus,1758) (Lepidoptera: Saturnidae) in Louisiana. *South. Lepid. News* 35: 81-82.

Brou Jr., V.A., 2013. Vitacea polistiformis Harris, 1854 (Lepidoptera: Sesiidae) in Louisiana, *South. Lepid. News* 35: 82-83.

Brou Jr., V.A., 2013. Anaea andria Scudder (1875) (Lepidoptera: Nymphalidae) in Louisiana. *South. Lepid. News* 35: 86-87.

Brou Jr., V.A. and R. Núñez Águila, 2013. Eudocima toddi (Zayas, 1965) (Lepidoptera: Erebidae), a rare and endemic species of Cuba. *South. Lepid. News* 35: 92-93.

Brou Jr., V.A., 2013. Earliest records for Leptotes cassius (Cramer, 1775) (Lepidoptera: Lycaenidae) in Louisiana. *South. Lepid. News* 35: 123.

Brou Jr., V.A., 2013. Metallata absumens (Walker, 1862) (Lepidoptera: Erebidae) in Louisiana. *South. Lepid. News* 35: 130-131.

Brou Jr., V.A., 2013. Melanolophia canadaria choctawae Rindge, 1964 (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 35: 132-134.

Brou Jr., V.A., 2013. Eusarca packardaria (McDonnough, 1940) (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 35: 135.

Brou Jr., V.A.,2013. The genus Erastria Hübner, 1813 (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 35: 143-144.

Brou Jr., V.A., 2013. Visitors to Vernon Antoine Brou Jr. and Charlotte D. Brou in Abita Springs, Louisiana, June 23, 2013, *South. Lepid. News* 35: 144.

Brou Jr., V.A., 2013. Gondysia consobrina (Guenée, 1852) (Lepidoptera, Erebidae, Erebinae) in Louisiana. *South. Lepid. News* 35: 147-148.

Brou Jr., V.A., 2013. Jim Miller visiting Vernon & Charlotte Brou in Abita Springs, Louisiana, October 23, 2012. *South. Lepid. News* 35: 165.

Brou Jr., V.A., 2013. Metria amella (Guenée, 1852) (Lepidoptera: Erebidae) in Louisiana. *South. Lepid. News* 35: 180-181.

Brou Jr., V.A., 2013. Fascinated lepidoptera visitors to Vernon and Charlotte Brou at Abita Springs, Louisiana. *South. Lepid. News* 35:189.

Brou Jr., V.A.,2013. Alabama argillacea (Hübner, 1823) (Lepidoptera: Erebidae) in Louisiana. *South. Lepid. News* 35: 190-191.

Brou Jr., V.A., 2013. Acronicta lobeliae Guenée, 1852 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 35: 194-195.

Brou Jr., V.A., 2013. Raphia abrupta Grote (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 35: 196-197.

Brou Jr., V.A., 2014. Heterocampa guttivitta (Walker, 1855) (Lepidoptera, Notodontidae) in Louisiana. *South. Lepid. News* 36: 5-7.

Brou Jr., V.A., 2014. Clostera albosigma Fitch,1856 (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 36: 8.

Brou Jr., V.A., 2014. Furcula borealis (Guérin-Méneville, 1844) (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 36: 13-15.

Brou Jr., V.A., 2014. Datana perspicua (Grote & Robinson, 1865) (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 36: 16.

Brou Jr., V.A., 2014. Datana robusta Strecker, 1878 (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 36: 20.

Brou Jr., V.A., 2014. Schizura ipomoeae Doubleday, 1841 (Lepidoptera, Notodontidae) in Louisiana. *South. Lepid. News* 36: 24.

Brou Jr., V.A., 2014. Hyperaeschra georgica (Herrich-Schäffer, 1855) (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 36:29-30.

Brou Jr., V.A., 2014. Visiting Vernon & Charlotte Brou at Abita Springs, Louisiana. *South. Lepid. News* 36: 42.

Brou Jr., V.A., 2014. Datana major Grote & Robinson, 1866 and Datana drexelii H. Edwards, 1884 (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 36: 43-44.

Brou Jr., V.A., 2014. Dasylophia thyatiroides (Walker, 1862) and Dasylophia anguina (J.E. Smith, 1797) (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 36: 57-58.

Brou Jr., V.A., 2014. Visitors to Vernon A. Brou's research collection in Abita Springs, Louisiana. *South. Lepid. News* 36: 64.

Brou Jr., V.A., 2014. Datana contracta Walker, 1855 (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 36: 72.

Brou Jr., V.A., 2014. Lithophane laceyi (Barnes & McDunnough, 1913) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 36:77-79.

Brou Jr., V.A., 2014. Visiting Vernon & Charlotte Brou at Abita Springs, Louisiana. *South. Lepid. News* 36: 90.

Brou Jr., V.A., 2014. Nerice bidentata Walker, 1855 (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 36: 113-114.

Brou Jr., V.A., 2014. Citheronia sepulchralis Grote and Robinson, 1865 (Lepidoptera: Saturnidae) in Louisiana. *South. Lepid. News* 36:143-144.

Brou Jr., V.A., 2014. Pyrrharctia isabella (J. E. Smith, 1797) (Lepidoptera: Arctiidae) in Louisiana. *South. Lepid. News* 36: 178-179.

Brou Jr., V.A., 2014. How to eliminate drying in delayed processing and spreading of lepidoptera specimens. *South. Lepid. News* 36: 180-181.

Brou Jr., V.A., 2014. The genus Oligocentria Herrich-Schäffer,1856 (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 36:184-185.

Brou Jr., V.A., 2014. Lithophane patefacta (Walker, 1858) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 36: 186-187.

Brou Jr., V.A., 2014. Phenotype variations of Hypercompe scribonia (Stoll, [1790]) (Lepidoptera, Erebidae) in St. Tammany Parish, Louisiana. *South. Lepid. News* 36: 190-191.

Brou Jr., V.A., 2015. The small pyralid Duponchelia fovealis Zeller, 1847, another US exotic introduction. *South. Lepid. News* 37: 1-2.

Brou Jr., V.A., 2015. Tripudia paraplesia Pogue, 2009, (Lepidoptera: Noctuidae) in Louisiana, another new United States record. *South. Lepid. News* 37: 17.

Brou Jr., V.A., 2015. Cartoon, Eastern tailed blue my as... *South. Lepid. News* 37: 18.

Brou Jr., V.A., 2015. Polygonia comma (Harris, 1842) (Lepidoptera, Nymphalidae) in Louisiana. *South. Lepid. News* 37: 19-20.

Brou Jr., V.A., 2015. Protographium marcellus (Cramer) (Lepidoptera: Papilionidae) in Louisiana. *South. Lepid. News* 37: 25-26.

Brou Jr., V.A., 2015. Fabricating a stationary fruit-bait insect trap with automatic collecting chamber. *South. Lepid. News* 37: 27-30.

Brou Jr., V.A., 2015. New Louisiana state records for a distinctly western U.S. moth. *South. Lepid. News* 37: 66.

Brou Jr., V.A., 2015. Heterocampa obliqua Packard, 1864 (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 37: 80.

Brou Jr., V.A., 2015. May 17-2015 field trip to Kisatchie National Forest in Louisiana. *South. Lepid. News* 37: 88-89.

Brou Jr., V.A., 2015. May 2015 lepidopterist visitor to Vernon A. Brou Jr. and Charlotte Brou. *South. Lepid. News* 37: 89.

Brou Jr., V.A., 2015. Recent visitor to Vernon & Charlotte Brou at the Abita Entomological Study Site. *South. Lepid. News* 37: 127.

Brou Jr., V.A., 2015. Dasychira matheri Ferguson, 1977 (Lepidoptera: Erebidae: Lymantriinae) in Louisiana. *South. Lepid. News* 37:157-158.

Brou Jr., V.A., 2015. Pero ancetaria (Hübner, 1806) (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 37: 177-178.

Brou Jr., V.A., 2015. Wallengrenia otho (J. E. Smith, 1797) (Lepidoptera: Hesperidae) in Louisiana. *South. Lepid. News* 37: 181-182.

Brou Jr., V.A., 2015. Incisalia henrici turneri Clench (Lepidoptera: Lycaenidae) in Louisiana. *South. Lepid. News* 37: 183.

Brou Jr., V.A., 2015. A personal commentary on the subject of Plagiarism. *South. Lepid. News* 37: 184.

Brou Jr., V.A., 2015. Visitors to Vernon and Charlotte Brou at the Abita Entomological Study Site. *South. Lepid. News* 37: 200.

Brou Jr., V.A., 2016. Paranthrene asilipennis (Guérin-Méneville, 1829) in Louisiana. *South. Lepid. News* 38: 6.

Brou Jr., V.A., 2016. Acronicta noctivaga Grote, 1864 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 38: 12.

Brou Jr., V.A., 2016. Acronicta hamamelis Guenée, 1852 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 38: 16.

Brou Jr., V.A., 2016. Phyllodesma occidentis (Walker, 1855) (Lepidoptera: Lasiocampidae) in Louisiana. *South. Lepid. News* 38: 35-36.

Brou Jr., V.A., 2016. Lithophane viridipallens Grote, 1877 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 38: 51-52.

Brou Jr., V.A., 2016. November 17-2015 Ricky Patterson visiting Vernon A. Brou Jr. and Charlotte Dozar Brou. *South. Lepid. News* 38:52.

Brou Jr., V.A. and A. Zilli, 2016. An overlooked sibling of the fruit-piercing moth Eudocima phalonia (Linnaeus, 1763) from Africa (Lepidoptera, Erebidae, Calpinae) *Zootaxa* 4109 (3): 391–399.

Brou Jr., V.A., 2016. A rare capture of the moth Photedes enervata (Guenée, 1852) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 38: 81.

Brou Jr., V.A., 2016. Visitors to Vernon and Charlotte Brou at the Abita Entomological Study Site. *South. Lepid. News* 38: 87.

Brou Jr., V.A., 2016. Lycia ypsilon (S.A. Forbes, 1885) (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 38: 88-89.

Brou Jr., V.A., 2016. A new Louisiana record for an Asian pyralid species, Nacoleia charesalis (Walker, 1859). *South. Lepid. News* 38:90-91.

Brou Jr., V.A., 2016. Acronicta afflicta Grote 1864) Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 38: 110-111.

Brou Jr., V.A., 2016. Acronicta hasta Guenée, 1852 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 38: 126.

Brou Jr., V.A., 2016. Palpita quadristigmalis (Guenée, 1854) (Lepidoptera: Crambidae) in Louisiana. *South. Lepid. News* 38: 160.

Brou Jr., V.A., 2016. Entomological visitors to Vernon and Charlotte Brou at the Abita Entomological Study Site - 2016 - 2. *South. Lepid. News* 38: 172.

Brou Jr., V.A., 2016. Nedra ramosula Guenée (Lepidoptera: Noctuidae) 1852 in Louisiana. South. Lepid. News 38: 173-174.

Brou Jr., V.A., 2016. Acronicta brumosa Guenée (1852) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 38: 175-176.

Brou Jr., V.A., 2016. Panopoda repanda Walker (Lepidoptera: Erebidae) in Louisiana. South. Lepid. News 38: 225-226.

Brou Jr., V.A., 2016. Diaphania hyalinata (Linnaeus) (Lepidoptera: Crambidae) in Louisiana. *South. Lepid. News* 38: 227-228.

Brou Jr., V.A., 2016. Palpita flegia (Cramer, 1777) (Lepidoptera: Crambidae) in Louisiana. *South. Lepid. News* 38: 233.

Brou Jr., V.A., 2016. Junsuk Kim of Alexandria, Louisiana at Kisatchie National Forest light trapping on July 4-6-2016, *South. Lepid.News* 38: 234.

Brou Jr., V.A., 2016. Argillophora furcilla Grote, 1873 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 38: 253.

Brou Jr., V.A., 2016. Metaponpneumata rogenhoferi Möschler, 1890 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 38: 256-257.

Brou Jr., V.A., 2016. Horama panthalon texana (Grote, 1868) (Lepidoptera: Erebidae) in Louisiana. *South. Lepid. News* 38: 259-260.

Brou Jr., V.A., 2016. Trotorhombia metachromata (Walker, 1861) (Lepidoptera: Epiplemidae) in Louisiana. *South. Lepid. News* 38: 261.

Brou Jr., V.A., 2016. Entomological visitors to Vernon and Charlotte Brou at the Abita Entomological Study Site. *South. Lepid. News* 38:262.

Brou Jr., V.A., 2016. Field trip to Kisatchie National Forest, Natchitoches Parish, Louisiana. *South. Lepid. News* 38: 263.

Brou Jr., V.A., 2016. Salbia haemorroidales Guenée (Lepidoptera: Crambidae) in Louisiana. South. Lepid. News 38: 264- 265.

Brou Jr., V.A., 2016. Ategumia ebulealis (Guenée,1854) (Lepidoptera: Crambidae) in Louisiana. *South. Lepid. News* 38: 276- 277.

Brou Jr., V.A., 2017. Hayden, J.E,. E.R. Hoebeke, M.A. Bertone, and V.A. Brou, Jr. 2017. Diaphania costata (F.) (Lepidoptera: Crambidae: Spilomelinae), a commonly misidentified pest of ornamental apocynaceae in the southern United states. *Proc. Entomol. Soc. Wash.* 119 (2): 173-190.

Brou Jr., V.A., 2017. Acronicta laetifica Smith, 1897 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 39: 31-32.
Brou Jr., V.A., 2017. Acronicta longa Guenée, 1852 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 39: 33-34.
Brou Jr., V.A., 2017. Euchlaena marginaria (Minot, 1869) (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 39: 35-36.
Brou Jr., V.A., 2017. Apocheima Hübner, [1825] of Louisiana (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 39: 37-39.
Brou Jr., V.A., 2017. Condylorrhiza vestigialis (Guenée, 1854) (Lepidoptera: Pyralidae) in Louisiana. *South. Lepid. News* 39: 40.
Brou Jr., V.A., 2017. Givira arbeloides (Dyar, 1899) (Lepidoptera: Cossidae) in Louisiana. *South. Lepid. News* 39: 46.
Brou Jr., V.A., 2017. Simyra insularis (Herrich-Schäffer, 1868) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 39: 67-68.
Brou Jr., V.A., 2017. Givira anna (Dyar, 1898) (Lepidoptera: Cossidae) in Louisiana. *South. Lepid. News* 39: 69.
Brou Jr., V.A., 2017. Givira francesca (Dyar, 1909) (Lepidoptera: Cossidae) in Louisiana. *South. Lepid. News* 39: 70.
Brou Jr., V.A., 2017. Inguromorpha basalis (Walker,1856) (Lepidoptera: Cossidae) in Louisiana. *South. Lepid. News* 39: 71.
Brou Jr., V.A., 2017. Thyridopteryx ephemeraeformis (Haworth, 1803) (Lepidoptera: Psychidae) in Louisiana. *South. Lepid. News* 39: 72-73.
Brou Jr., V.A., 2017. Micrathetis triplex (Walker, 1857) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 39: 89-90.
Brou Jr., V.A., 2017. Iodopepla u-album (Guenée, 1852) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 39: 155-156.
Brou Jr., V.A., 2017. Diaphania infimalis (Guenée, 1854) (Lepidoptera: Crambidae) in Louisiana. *South. Lepid. News* 39: 157-158.
Brou Jr., V.A., 2017. Anicla infecta Ochsenheimer 1816 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 39: 159-160.
Brou Jr., V.A., 2017. Visitors to Vernon and Charlotte Brou at Abita Entomological Study Site -2017. *South. Lepid. News* 39: 205.
Brou Jr., V.A., 2017. Megalopyge opercularis (Smith & Abbot, 1797) (Lepidoptera: Megalopygidae) in Louisiana. *South. Lepid. News* 39: 211.
Brou Jr., V.A., 2017. Phenotype variations of Atteva aurea (Fitch, 1856) (Lepidoptera , Yponomeutidae) captured in Louisiana. *South. Lepid. News* 39: 212.
Brou Jr., V.A., 2017. Prolimacodes badia (Hübner, 1822) (Lepidoptera: Limacodidae in Louisiana. *South. Lepid. News* 39: 222-223.
Brou Jr., V.A., 2017. Phenotype variations of adult Nepytia semiclusaria (Walker, 1863) (Lepidoptera: Geometridae) from St. TammanyParish, Louisiana. *South. Lepid. News* 39: 229.
Brou Jr., V.A., 2017. Late season visitors to the Abita Entomological Study Site - 2017. *South. Lepid. News* 39: 293-296.
Brou Jr., V.A., 2017. Misogada unicolor (Packard, 1864) (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 39: 297-298.
Brou Jr., V.A., 2017. Lacosoma chiridota Grote, 1864 (Lepidoptera: Mimallonidae) in Louisiana. *South. Lepid. News* 39: 341-342.
Brou Jr., V.A., 2018. Phosphila miselioides (Guenée, 1852) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 40:5.
Brou Jr., V.A., 2018. Psaphida resumens Walker, 1865 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 40: 7-8.
Brou Jr., V.A., 2018. Condica videns (Guenée, 1852) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 40: 21.
Brou Jr., V.A., 2018. Hemieuxoa rudens (Harvey, 1875) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 40: 23.
Brou Jr., V.A., 2018. Homophoberia apicosa (Haworth, 1809) (Lepidoptera: Noctuidae) in Louisiana. South. Lepid. News 40: 25-26.
Brou Jr., V.A., 2018. Choephora fungorum (Grote & Robinson, 1868) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 40: 27-28.
Brou Jr., V.A., 2018. Phosphila turbulenta Hübner,1818 (Lepidoptera: Noctuidae) in Louisiana. *South . Lepid. News* 40: 33-34.
Brou Jr., V.A., 2018. Abagrotis alternata (Grote, 1864) (Lepidoptera: Noctuidae) in Louisiana. *South . Lepid. News* 40: 45-46.
Brou Jr., V.A., 2018. Catocala pretiosa Lintner, 1876 and Catocala texarkana Brower 1976 in Louisiana. *South. Lepid. News* 40: 53-56.
Brou Jr., V.A., 2018. Oiketicus abbotii Grote, 1880 (Lepidoptera: Psychidae) in Louisiana. *South. Lepid. News* 40: 98-99.

Brou Jr., V.A., 2018. Visitor to Vernon and Charlotte Brou at the Abita Entomological Study Site -2018. *South. Lepid. News* 40: 137.

Brou Jr., V.A., 2018. Egira alternans (Walker, [1857]) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 40: 269 - 270.

Brou Jr., V.A. and C.D. Brou, 2018. Cirrhophanus triangulifer Grote (Lepidoptera: Noctuidae) in *Louisiana. South. Lepid. News* 40: 287-288.

Brou Jr., V.A. and C.D. Brou, 2019. Drasteria grandirena (Haworth, 1809) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 41: 39-40.

Brou Jr., V.A. and C.D. Brou, 2019. Schizura unicornis (J.E. Smith, 1797) (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 41: 54.

Brou Jr., V.A. and C.D. Brou, 2019. Trap placement at the Abita Springs study site in 2018 - A Pictorial.sec.24,T6S,R12E, 4.2 mi. NE of Abita Springs, Louisiana USA *South. Lepid. News* 41: 41-42.

Brou Jr., V.A. and C.D. Brou, 2019. Psaphida styracis (Guenée, 1852) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 41: 43-44.

Brou Jr., V.A. and C.D. Brou, 2019. Synanthedon fatifera Hodges, 1962 (Lepidoptera: Sesiidae) in Louisiana. *South. Lepid. News* 41: 51-53.

Brou Jr., V.A. and C.D. Brou, 2019. Phyprosopus callitrichoides Grote, 1872 (Lepidoptera: Erebidae) in Louisiana. *South. Lepid. News* 41: 55-56.

Brou Jr., V.A. and C.D. Brou, 2019. Synanthedon scitula (Harris), 1839 (Lepidoptera, Sesiidae) in Louisiana. *South. Lepid. News* 41: 61-64.

Brou Jr., V.A. and C.D. Brou, 2019. Cissusa spadix (Cramer, 1780) (Lepidoptera: Erebidae) in Louisiana. *South. Lepid. News* 41: 65-66.

Brou Jr., V.A. and C.D. Brou, 2019. Moths of the genus Glena Hulst 1896, (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 41: 77-79.

Brou Jr., V.A. and C.D. Brou, 2019. Recent award presented to Vernon Antoine Brou Jr. in recognition of more than a half century of entomological research concerning the insects of Louisiana. *South. Lepid. News* 41: 105.

Brou Jr., V.A. and C.D. Brou, 2019. The genus Callosamia Packard (Lepidoptera: Saturnidae) in Louisiana. South. *Lepid. News* 41: 06-111.

Brou Jr., V.A. and C.D. Brou, 2019. The genus Callopistria Hübner (1821) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 41: 289-291.

Brou Jr., V.A. and C.D. Brou, 2019. The genus Lesmone Hübner, 1818 (Lepidoptera: Erebidae) in Louisiana. *South. Lepid. News* 41:325-327.

Brou Jr., V.A. and C.D. Brou, 2020. Southern Lepidopterists' Society - Member locations in our 42nd year 2020. *South. Lepid New* 42: 4.

Brou Jr., V.A. and D.L. Matthews, 2020. Stenoma exarata (Zeller, 1854) (Lepidoptera: Depressariidae) in Louisiana. *South. Lepid. News* 42: 7-8.

Brou Jr., V.A. and C.D. Brou, 2020. Parallelia bistriaris Hübner,1818 (Lepidoptera: Erebidae) in Louisiana. *South. Lepid. News* 42: 9-10.

Brou Jr., V.A. and C.D. Brou, 2020. Mythimna unipuncta (Haworth, 1809) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 42:31-33.

Brou Jr., V.A. and C.D. Brou, 2020. Zale lunata (Drury, 1773) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 42: 51-53.

Brou Jr., V.A. and C.D. Brou, 2020. Iscadia aperta Walker, 1857 (Lepidoptera: Nolidae) in Louisiana. *South. Lepid. News* 42: 59-60.

Brou Jr., V.A., R. Patterson, and R. Tyler, 2020. Pseudothyris sepulchralis (Boisduval, 1832) (Lepidoptera: Thyrididae) in Louisiana. *South. Lepid. News* 42: 245-247.

Brou Jr., V.A. and C.D. Brou, 2020. Parapamea buffaloensis (Grote, 1877) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 42: 319-320.

Brou Jr., V.A. and C.D. Brou, 2020. Noctua pronuba (Linnaeus) (Lepidoptera: Noctuidae in Louisiana. *South. Lepid. News* 42: 329-330.

Brou Jr., V.A. and C.D. Brou, 2020. Enigmogramma basigera (Walker, 1865) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 42: 341-342.

Brou Jr., V.A. and C.D. Brou, 2020. The genus Doryodes Guenée, 1857 (Lepidoptera: Erebidae) in Louisiana. 42:345-350.

Brou Jr., V.A. and C.D. Brou, 2021. Dichagyris acclivis (Morrison, 1875) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 43: 5-6.

Brou Jr., V.A., C.D. Brou, R. Brown, and R. Patterson, 2021. Dichagyris grotei (Franclemont and Todd, 1983) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 43: 7-8.

Brou Jr., V.A. and C.D. Brou, 2021. Macaria bicolorata (Fabricius, 1798) (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 43: 21-22.

Brou Jr., V.A. and C.D. Brou, 2021. Macaria transitaria Walker, 1861 (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 43:23-24.

Brou Jr., V.A. and C.D. Brou, 2021. Macaria distribuaria Hübner, 1825 [1831] (Lepidoptera: Geometridae) in Louisiana. *South. Lepid.News* 43: 25-26.

Brou Jr., V.A. and C.D. Brou, 2021. Feltia subterranea (Fabricius, 1794) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 43: 47-49.

Brou Jr., V.A., C.D. Brou. R. Patterson, and R. Tyler, 2021. Euxoa auxiliaris (Grote, 1873) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 43: 51-52.

Brou Jr., V.A. and C.D. Brou, 2021. Agrotis malefida Guenée, 1852 (Lepidoptera: Noctuidae. *South. Lepid. News* 43: 101-102.

Brou Jr., V.A. and C.D. Brou, 2021. The genus Paectes Hübner (1818) (Lepidoptera: Euteliidae) in Louisiana. *South. Lepid. News* 43:103-106.

Brou Jr., V.A. and C.D. Brou, 2021. Anavitrinella pampinaria Guenée, 1857 (Lepidoptera: Geometridae) in Louisiana. *South. Lepid. News* 43: 113-114.

Brou Jr., V.A. and C.D. Brou, 2021. Feltia austrina Lafontaine, 1986 (Lepidoptera: Noctuidae) in Louisiana. 43:115-116.

Brou Jr., V.A. and C.D. Brou, 2021. Dichagyris broui Lafontaine (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 43: 121-122.

Brou Jr., V.A. and C.D. Brou, 2021. The genus Merople on Dyar, 1924 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 43:151-152.

Brou Jr., V.A. and C.D. Brou, 2021. Psaphida rolandi Grote, 1874 (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 43: 155-157.

Brou Jr., V.A. and C.D. Brou, 2021. Alcathoe caudata (Harris, 1839) (Lepidoptera: Sesiidae) in Louisiana. *South . Lepid. News* 43: 212-214.

Brou Jr., V.A. and C.D. Brou, 2022. Hyblaea puera (Cramer, 1777) (Lepidoptera: Hyblaeidae) in Louisiana. 44: 11-13.

Brou Jr., V.A. and C.D. Brou, 2022. Schizura matheri Miller and Franclemont 2021 (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 44: 115-117.

Brou Jr., V.A. and C.D. Brou, 2022. Baltodonta broui Miller and Franclemont 2021 (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 44: 127-128.

Brou Jr., V.A. and C.D. Brou, 2022. Isa textula (Herrich-Schäffer 1854) Lepidoptera, Limacodidae in Louisiana. *South. Lepid. News* 44: 129-130.

Brou Jr., V.A. and C.D. Brou, 2022. Heterocampa pulverea Grote and Robinson, 1867 (Lepidoptera: Notodontidae) in Louisiana. *South. Lepid. News* 44: 131-132.

Brou Jr., V.A. and C.D. Brou, 2022. Lithacodes fasciola (H.-S., 1854) (Lepidoptera, Limacodidae) in Louisiana. *South. Lepid. News* 44: 167-168.

Brou Jr., V.A. and C.D. Brou, 2022. Megalopyge crispata (Packard, 1864) (Lepidoptera: Megalopygidae) in Louisiana. *South. Lepid. News* 44: 209-210.

Brou Jr., V.A. and C.D. Brou, 2022. Euclea delphinii (Boisduval, 1832) (Lepidoptera: Limacodidae) in Louisiana. *South. Lepid. News* 44: 263-264.

Brou Jr., V.A. and C.D. Brou, 2022. Tarache aprica (Hübner, 1808) (Lepidoptera: Noctuidae) in Louisiana. *South. Lepid. News* 44: 273-275.

Brou Jr., V.A. and C.D. Brou, 2022. Atlides halesus (Cramer, 1777) (Lepidoptera: Lycaenidae) in Louisiana. *South. Lepid. News* 44: 317-319.

Brou Jr., V.A. and C.D. Brou, 2022. Megalopyge pyxidifera (Smith, 1797) (Lepidoptera: Megalopygidae) in Louisiana. *South. Lepid. News* 44.

Brou Jr., V.A. and C.D. Brou, 2022. Cenopis vabroui Powell & Brown, 2012 (Lepidoptera: Tortricidae) in Louisiana. *South. Lepid. News* 44.

Dickel, T.S., V.A. Brou Jr., and J.B. Heppner, 2010. New North American records of the Asian species, Simplicia cornicalis in Florida and Louisiana (Lepidoptera: Noctuidae: Herminiinae). *Lepidoptera Novae* 3(1): 53-56.

Ferguson, Douglas C., 1997. Review of the new world Bagisarinae with description of two new species from the southern United States (Noctuidae). *Jour. Lepid. Soc.* 51:344-357.

Frost, S.W., 1957. The Pennsylvania Insect Light Trap, *Journal of Economic Entomology*, Volume 50: 3, 287–292.

Hayden, J.E., E.R. Hoebeke, M. Bertone and V.A. Brou Jr., 2015. "Diaphania" costata (F.), a misidentified pest of Apocynaceae in the Southeastern United States Soc. Europ. Lepid. Congress in Dresden Sept. 28 – Oct. 2.

Kim, J. and V.A. Brou Jr., 2018. The Genus Strategus Kirby (Coleoptera: Scarabaeidae: Dynastinae) in Louisiana. *South. Lepid. News* 40: 100-105.

Kim, J. and V.A. Brou Jr., 2019. Dynastes tityus (Linnaeus, 1763) (Coleoptera, Scarabaeidae, Dynastinae) in Louisiana. *South. Lepid. News*. 41: 250-254.

Kim, J. and V.A. Brou Jr., 2021. The Family Lucanidae Latreille, 1804 (Coleoptera) in Louisiana. *South Lepid. News* 43: 371- 374.

Lafontaine J.D. and Dickel T.S., 2008. Review of the genus Epidroma in North America (Lepidoptera: Noctuidae: Catocalinae). *Lepidoptera Novae* 1: 109–115.

Matthews, D.L., V.A. Brou Jr., R. Tyler, and C.M. Allen, 2018. Plume moths (Lepidoptera: Pterophoridae) in Louisiana. *South. Lepid. News* 40: 197-203.

(Vernon Antoine Brou Jr. and Charlotte Dozar Brou, E-Mail: vabrou@bellsouth.net)

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Photos taken on October 8, 2022, in front of Texas State Aquarium in Corpus Christi, Texas
(by Richard Lombardini)

Any suggestions as to the identification?

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THE COMPLEX HISTORY OF TWO LICHEN MOTH GENERA

BY
CHUCK SEXTON

Over the past few months, I have been doing a deep dive into the early literature regarding a couple of lichen moth genera, *Cisthene* and *Illice* (Erebidae: Arctiinae: Lithosiini). They may be synonyms, or they may not be. Let's just say they have a "complicated relationship". Here I offer a glimpse into this quagmire. Nothing in this note should be taken as a formal taxonomic treatment. As an ecologist and biogeographer, I see a need to point out some current problems in the taxonomy as it stands today. Genus-level uncertainty isn't the only instability these taxa have endured. The ever-shifting suprageneric classification of tiger and lichen moths has kept "Arctiidologists" busy for a couple of centuries. Even fairly recently Weller et al. (2009) stated that a "consensus is lacking" on a full and proper classification of the tiger and lichen moths. I'll make no attempt to jump into that fracas.

The two primary generic actors in this taxonomic opera, *Cisthene* and *Illice*, were both erected by Francis Walker in his massive *List of the Specimens of Lepidopterous Insects in the Collection of the British Museum*, published in the 1850s and 1860s. Modern species in these two genera have at various times been named in, moved to, or moved out of at least 27 other genera including *Brycea, Byssophaga, Clemensia, Eudesmia, Gerba, Hypoprepia, Lamprostola, Lithosia, Maepha, Nodozana, Ozodania, Prepiella, Pyralidia, Ruscino, Talara, Vianania,* and *Zonoda*, among others. I compiled a bibliography of original descriptions, generic revisions, comprehensive lists, and catalogues (both regional and worldwide) which now numbers over 90 titles wherein there are nearly 800 mentions of 125 different specific, varietal, and form names of taxa that have at one time or another been ascribed to *Cisthene* or *Illice*.

A portion of this convoluted pathway revolves around the well-documented difficulties and tension in communication between European and North American Lepidopterists in the late 19th and early 20th centuries as well as disagreements among North American researchers (Sorensen 1995, Epstein 2016).

Into the Weeds

In Walker's 1854 *List* (Part II), we run into complexity from the outset because he listed three lichen moth species in three different genera which we now recognize to be closely related and perhaps belonging in one genus (*Eudesmia*): *Cisthene trisigna, Ruscino menea*, and *Eudesmia ruficollis* (Figs. 1, 3-4). On the other hand, the two species he placed in his newly erected *Cisthene* are quite different, the second of which is *Cisthene subjecta* (Fig. 2), a model for a diverse set of species in North, Central, and South America which we can recognize as sharing several basic pattern elements (Sexton & McGuinness 2017). So Walker started us out with three similar species in different genera and two very different species in the same genus.

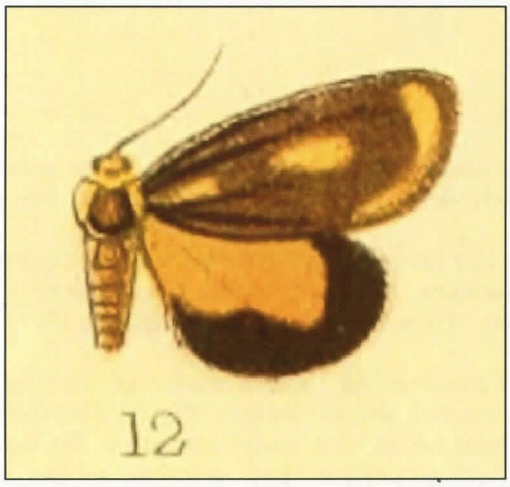


Fig. 1. *Cisthene trisigna* Walker, 1854 [now *Eudesmia trisigna*].
From Hampson 1900, pl. 25, Fig. 12.

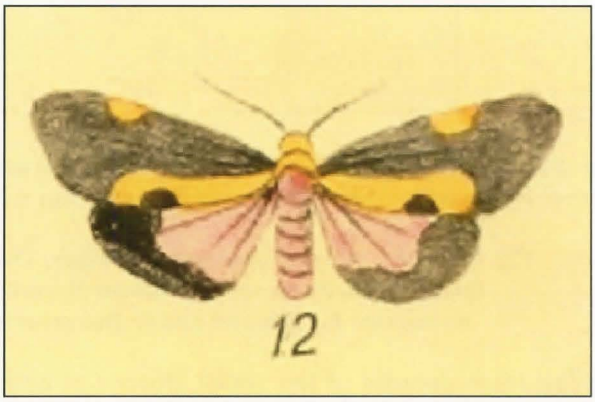


Fig. 2. *Cisthene subjecta* Walker, 1854 [probably referable to the modern *Cisthene packardii* but let's not open that can of worms].
From Stretch 1872, pl. 7, Fig. 12.
Most later authors agree that these belong in separate genera.

Fig. 3. *Ruscino menea Drury*, 1782 [now *Eudesmea menea*]. A widespread but highly variable member of the genus. From Drury, 1837, pl. 3, Fig. 2.

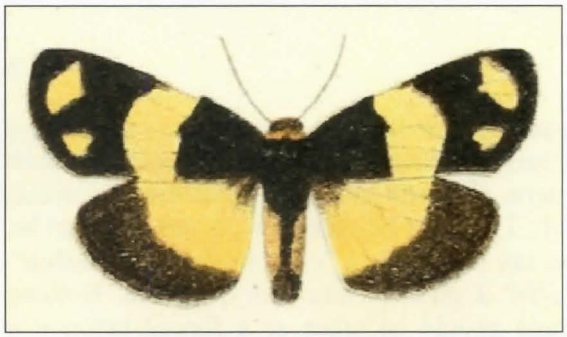


Fig. 4. *Eudesmia ruficollis* Donovan, 1798. General pattern of at least 4 species in southern South America. From Draudt, 1918, pl. 35, row k.

In 1859, Walker erected the genus *Illice* to house the species *Illice batialis* from Brazilian specimens. Yet *batialis* is quite different from a host of other species which would later join that genus (Fig. 5). *Illice batialis* almost certainly doesn't belong in the modern *subjecta*-like concept of *Cisthene* and, remarkably, it may not be a Lithosiine or Arctiid moth at all. Only a careful modern examination of Walker's original types in the British Museum will resolve this small but pertinent question. Another pawn in this saga is *Maepha opulentana* which Walker described from Amazonian Brazil in 1864, placing it in the family Tineidae (Fig. 6).

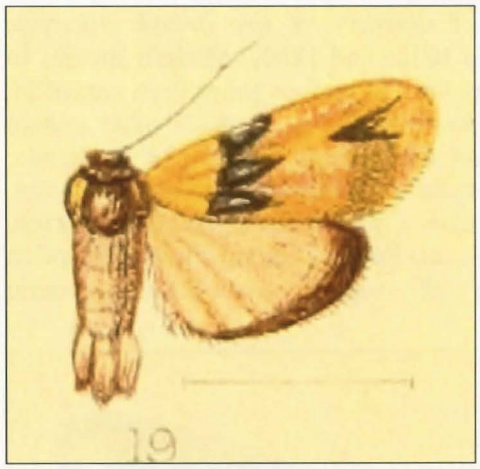


Fig. 5 (left). *Illice batialis* Walker, 1859. This is the earliest illustration of the type species for the genus *Illice*. It shares very little with other members of the genus nor with members of *Cisthene*. From Hampson, 1900, pl. 29, Fig. 2.

Fig. 6 (right). *Maepha opulentana* Walker, 1864. Later lumped into the burgeoning *Illice* genus, then summarily moved to *Cisthene* in recent literature. *Maepha* probably deserves to be re-instated for this and one or two other species. From Hampson, 1900, pl. 28, Fig. 19.

In the last three decades of the 1800s, dozens of new species were added to *Cisthene* from North, Central, and South America. Because of a lack of clarity in the definitions of the genera, still more species were added to related genera like *Gerba* and *Ruscino* and still more genera were erected (unnecessarily) for similar species. American researchers were inclined to place a host of new *subjecta*-like species in *Cisthene* while at the same time European authors were describing the larger *Eudesmia*-like lichen moths of Central and South America also as *Cisthene* (Fig. 7). This dichotomy arose because of that early conflation Walker created by putting *trisigna* and *subjecta* in the same genus. Augustus R. Grote (1874) tried to resolve the issue by selecting *subjecta* as the type species for the genus, but European authors basically overlooked or ignored that American pronouncement.

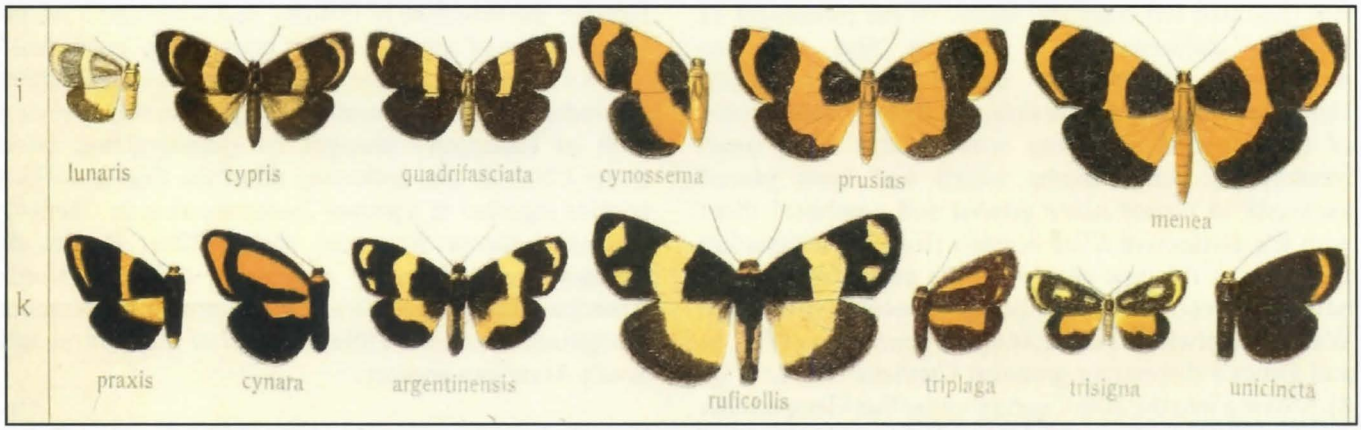
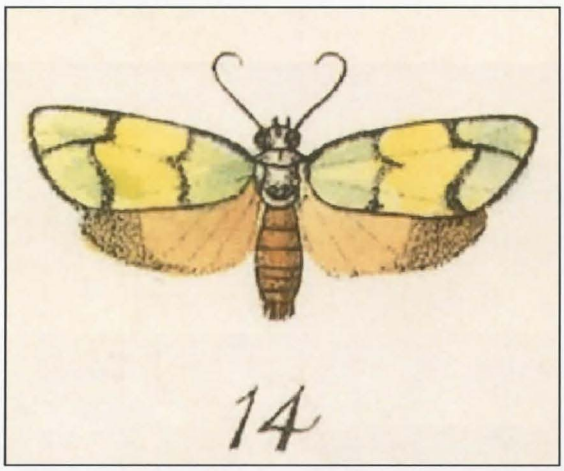


Fig. 7. Draudt's 1918 plate of an array of "*Cisthene*" species. Most of these were moved into that genus by Hampson in 1900 in his shake-up of lichen moth genera. Most now reside in the genus *Eudesmia*...but it's complicated. From Draudt, 1918, pl. 35, rows i, k.

In Godman and Salvin's massive *Biologia Centrali-Americana*, published between 1881 and 1900, Herbert Druce stuck to prevailing usage of *Cisthene* for a mixed set of species but also brought forward *Brycea, Gerba*, and *Ruscino* as receptacles for several *Eudesmia* -like moths. Druce added a new twist by describing two small distinctive Lithosiine moths, the greenish *Cisthene citrina* from Panama (Fig. 8), and the black and blue *Cisthene criton* from Guatemala (Fig. 9). From a phenotypic standpoint, neither of Druce's new *Cisthene's* shared any common pattern elements with either the *Eudesmia*-like pattern nor with the many *subjecta*-like members of the genus.



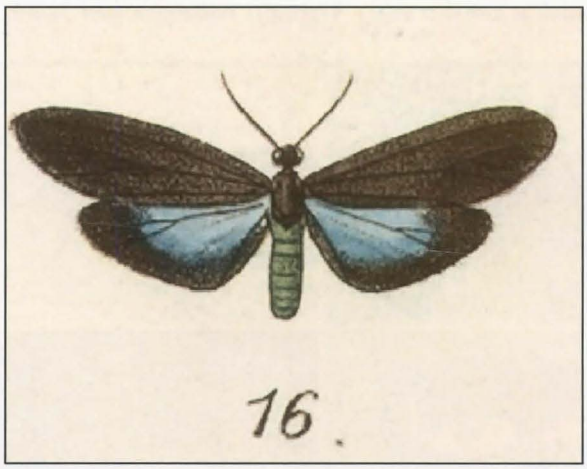


Fig. 8 (left). *Cisthene citrina* Druce, 1885. A beautiful and distinctive lichen moth from Central America, but does it belong in this genus? From Druce, 1885, pl. 12, Fig. 14.

Fig. 9 (right). *Cisthene criton* Druce, 1885. Described by Druce on the same page with *C. citrina*, but even Druce doubted the generic placement. Now assigned to the genus *Propyria*. From Druce, 1885, pl. 12, Fig. 16.

Turn of the 20th Century and Hampson's Shake-up

The biggest detour in this long complicated pathway comes from the taxonomic work of Sir George F. Hampson. Hampson authored an updated *Catalogue of the Lepidoptera Phalaenae* [moths] *in the British Museum* (Hampson, 1898-1920). His hundreds of color plates are invaluable. Unfortunately, Hampson apparently had his own ideas on the classification of moths, ignoring much of the work of American authors and running contrary to naming conventions which were being established by a series of International Congresses of Zoology (1889 - 1898) and which would eventually lead to the International Code of Zoological Nomenclature (see ICZN 2022 for a detailed history). To his credit, he pulled together the various *Eudesmia*-like lichen moths which had previously been described among several genera (*Brycea, Cisthene, Eudesmia, Gerba, Ruscino*, and others)(Fig. 7). Unfortunately, he chose to place all of these in a revised and aberrant concept of *Cisthene* Walker, contrary to Grote's earlier designation and the general American usage.

But that also left open the matter of the placement of *Cisthene subjecta*. In a decision that still has modern-day taxonomists scratching their heads, Hampson collected all the *subjecta*-like *Cisthene* moths of the America's together with several other small Neotropical lichen moths which had been placed variously in *eleven other genera* and combined them with the distinctive *Illice batialis* (Fig. 5), designating the latter as the type species of the genus. Among the new members of this hodge-podge concept of *Illice* were Walker's erstwhile Tineid *Maepha opulentana* (Fig. 6) and Druce's distinctive greenish *Cisthene citrina* (Fig. 8). Moving into the 20th Century under that Hampsonian concept, *Illice* had morphed into a heterogeneous set of species with diverse wing shapes and patterns, posture, and geography. And so it would be for the next two or three decades as dozens more species were described under Hampson's framework.

An ICZN Frame of Mind

By 1917, some American authors were openly pointing out the discrepancy of Hampson's taxonomic framework with the rules being formulated by the ICZN to stabilize zoological taxonomy worldwide. This should bring in a long sidebar on the early German entomologist Jacob Hübner, the Principle of Priority, and when and how the formal name of some animal is considered "published" – but I'm not going there. Suffice it to say that Barnes & Lindsey (1922) and Strand (1922) effectively reversed both of Hampson's changes by synonymizing *Illice* under *Cisthene* and collecting all of the *Eudesmia*-like species together in a proper *Eudesmia* akin to Hübner's original concept from the early 1800s. Barnes & Lindsey were explicitly addressing only the North American fauna, but Strand's taxonomic placements recognized *Eudesmia* Hübner for all of the Central and South American species.

Nonetheless, there remained the difficulty of verifying which species truly belonged in the revised concept of *Cisthene* with *subjecta* as type species (see Fig. 10 for a sampling). Barnes & Benjamin (1927) bemoaned the difficulty of verifying many species placements by European authors since many of the type specimens were housed in the far-away British Museum. Even today, identification of the hugely diverse lichen moths of Central and South America is a difficult task because the descriptions remain scattered in the early literature and many of the type specimens (and paratype series, etc.) are housed on distant continents.

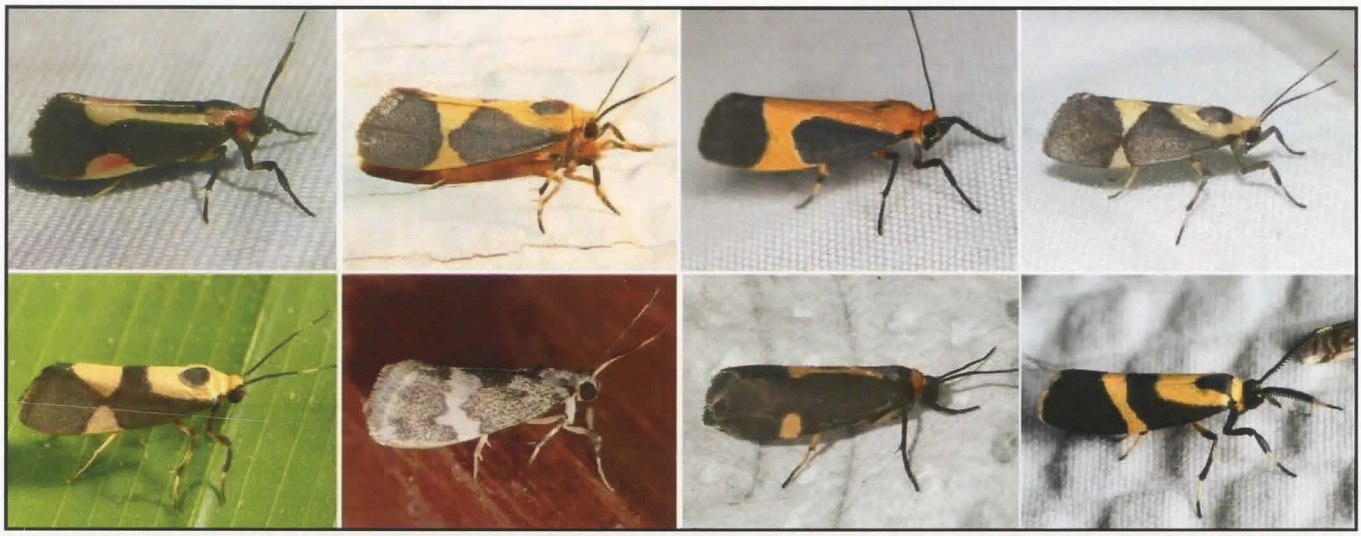


Fig. 10. A sample of recent images of *Cisthene*. Upper row: North American taxa (L to R), *C. packardii* (Texas), *C. unifascia* (Texas), *C. picta* (Oklahoma), *C. subrufa* (Texas). Bottom row (L to R): *C. polyzona* (Costa Rica), *Cisthene* sp. (El Salvador), *Cisthene* sp. (Brazil), *Cisthene* ? (Colombia).

Recent Check Lists and Twenty-first Century Advances

Hodges' *Check List of Lepidoptera of America North of Mexico* (Franclemont 1983) employed the newer Barnes-Lindsey framework, placing *Illice, Pyralidia, Byssophaga*, and *Ozodania* as synonyms under *Cisthene*, and placing *Ruscino* and *Gerba* as synonyms of *Eudesmia*. Franclemont's structure for North American taxa influenced decisions in a wider realm. The North American checklists of Schmidt & Opler (2008), Lafontaine & Schmidt (2010), and Pohl et al. (2016) follow the genus-level Barnes-Lindsey-Franclemont classification while updating the ever-shifting supra-generic structure of this group of lichen moths.

But a new schism has arisen: Various researchers working independently on ecological, morphological, and/or molecular aspects of the Lithosiine classification

seem to be of two camps regarding application of the genera *Cisthene, Eudesmia*, and *Illice*. Some follow the Barnes-Lindsey-Franclemont framework while others, including many South American researchers, retain the Hampsonian framework (e.g., Ferro 2007, Rodriguez-Ramirez et al. 2020). A number of recent morphological studies and incipient phylgenomic studies have begun to shed some light on the phylogenetic relationships within and among various lichen moth genera. However, the sampling of taxa to date has been very limited with respect to the genera of concern here (e.g. Bendib & Minet 1999, Scott et al. 2014, Palting & Moore 2022).

Summary

The long story of *Cisthene* and *Illice* is complex in time, place, and concept. They and related genera started out in a confused way in the early and mid-19th Century literature and have taken circuitous pathways, sometimes diverging, sometimes combining in poorly-explained or ill-conceived taxonomic revisions. All the while, additional species have been added to the mix, their generic placement depending largely on the era in which they arose and the taxonomic bent (and often the geography) of their author. Even with the gift of hindsight and, one would hope, a global perspective, many of the taxonomic decisions evinced in this nearly two centuries of work remain perplexing, not unlike the diverse relationships of the moths themselves.

The themes covered in this essay are almost certainly not unique to the Lithosiine lichen moths. For instance, Walker's minimal generic and species descriptions have given researchers headaches across the full spectrum of moths. And Hampsonian taxonomy may still be the source of vexation among some systematists. The early-diverging and sometimes clashing research efforts on either side of the Atlantic I'm sure have also played out in most other moth taxa, including the remainder of the Noctuoidea, the Geometroidea, etc. Much of this is noted in the literature, but other conflicts probably yet lay in the shadows.

Fig. 11. Three related and distinctive Neotropical Cisthene's.
L to R: *C. citrina* (Costa Rica), *C. intacta* (French Guiana), *C. tessellata* (Colombia).

Acknowledgments

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Future Studies

– The familial and generic placement of *Illice batialis* Walker 1859 (Fig. 5), and its would-be synonym *Scoparia stupidalis* Walker, 1862, needs re-examination.

– The relationship of *Cisthene citrina* Druce 1885 (Fig. 11, left), the closely related *Illice intacta* Rothschild 1913 (Fig. 11, center), and the distinctive *Illice tessellata* Dognin 1912 (Fig. 11, right), to all other *Cisthine* needs to be clarified. These may deserve their own genus.

– There is a need to clarify the identities of *Maepha opulentana* Walker 1864 (Fig. 12), and *Illice croesus* Hampson 1914 (Fig. 13). The two are closely related, probably congeneric, and probably do not belong in *Cisthene* Walker (*sensu lato*). If it is determined that these taxa are not congeneric with other *Cisthene*, then the genus *Maepha* Walker, 1864, would be available, but that would also entail looking at a few additional species which have subsequently been added to the latter genus. And there may be other potential members of a revised concept of *Maepha*.

– Much work needs to be done on the current set of species placed in *Eudesmia* Hübner, particularly the handful of taxa in Mexico and Central America erected

by Dyar and Druce in various publications (Fig. 14). They were taxonomic splitters who did not recognize, or have at their disposal a sufficient number of specimens to appreciate the sexual and populational variation in members of the genus. Presently, there are also differing opinions as to the generic limits of *Eudesmia* Hübner and whether Orfila's *Vianania*, erected for three species of southern South America, is distinct.

Fig. 12 (left). *"Cisthene" opulentana* (Walker, 1864) [originally *Maepha opulentana*]. Brazil. Very distinctive lichen moth from South America.

Fig. 13 (right). *"Cisthene" croesus* (Hampson, 1914) [originally *Illice croesus*]. Costa Rica. Very similar size, wing shape, and posture to *C. opulentana* and probably congeneric. The placement of these two species in *Cisthene* might need to be reconsidered.

Fig. 14. Array of recent images of *Eudesmia*. ID challenges still follow these moths. There may be anywhere from 5 to 8 different species here. Top row (L to R): *Eudesmia arida* (Texas); *Eudesmia* sp.1 (Mexico); *Eudesmia* sp. 2 (Mexico); *Eudesmia* sp. 3 (Honduras). Bottom row (L to R): *E. argentinensis* (Argentina); *E. australis* (Brazil); *E. lunaris* (Colombia); *E. menea* (Panama).

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Figure 10: *Cisthene packardi* (Sam Kieschnick); *C. unifascia* (Chuck Sexton); *C. picta* (Zach DuFran); *C. subrufa* (Chuck Sexton); *C. polyzona* (Heiner Ziegler); *Cisthene* sp. (El Salvador; joeles); *Cisthene* sp. (Brazil; Miranda85); *Cisthene* ? (Colombia; Josh Vandermeulen).

Figure 11: *Cisthene citrina* (Chrissy McClarren and Andy Reago); *C. intacta* (vanilendil); *C. tessellata* (Oscar Enciso).

Figure 12: *"Cisthene" opulentana* (Copyright, Paul Davis).

Figure 13: *"Cisthene" croesus* (Samuel Messner).

Figure 14: *Eudesmia arida* (Chuck Sexton); *Eudesmia* sp. 1 (Mexico; Copyright, Hugo van Vliet); *Eudesmia* sp. 2 (Mexico; nuria); *Eudesmia* sp. 3 (Honduras; Josue Ramos Galdamez); *E. argentinensis* (Gastón García); *E. australis* (Kahio T. Mazon); *E. lunaris* (Wilson Lombana Riaño); *E. menea* (Josh Vandermeulen).

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Further Reading

Barnes, M. D., and F. H. Benjamin, 1927. Check List of the Lepidoptera of Boreal America, Superfamilies Sphingoidea, Saturnioidea, and Bombycoidea, of the Families Synotomidae and Arctiidae. *Bull. So. Calif. Acad. Sci.* 26(2):35-50.

Barnes, M. D., and A. W. Lindsey, 1922. A review of some generic names in the order Lepidoptera. *Ann. Entomol. Soc. Amer.* 15:89-99.

Bendib, A. and J. Minet, 1999. Lithosiine main lineages and their possible interrelationships. I. Definition of new or resurrected tribes (Lepidoptera: Arctiidae). *Ann. Soc. Entomol. Fr. (N.S.)* 35 (3-4):241-263.

Draudt, M., 1913 [1918-19]. 4. *Family: Arctiidae, Tiger Moths.* Pp. 231-497, In: A. Seitz, *The Macrolepidoptera of the world: a systematic account of all the known Macrolepidoptera.* Division II: The Macrolepidoptera of the American Region, Vol. 6. The American Bombyces and Sphinges. Plus "Additions" (1925).

Druce, H., 1881-1900. *Biologia Centrali-Americana. Insecta. Lepidoptera-Heterocera,* Vol. I., Vol. II (1891-1900), Vol. III (Plates; 1891-1900). Edited by F. D. Godman and O. Salvin.`

Drury, D., 1770 [1837]. *Illustrations of Exotic Entomology.* Vol. I. New edition by J. O. Westwood. London. xxvi + 123 p., 50 plates.

Epstein, M. E., 2016. *Moths, Myths, and Mosquitoes. The Eccentric Life of Harrison G. Dyar, Jr.* Oxford Univ. Press. 325 p.

Ferro, V. G., 2007. *Diversidade de Mariposas Arctiidae (Lepidoptera) do Cerrado.* Unpubl. Ph.D. thesis. Univ. de Brasília. (And subsequent research papers derived from her work.)

Franclemont, J. G., 1983. *Arctiidae.* In: R. W. Hodges et al. (eds). *Check List of the Lepidoptera of America North of Mexico.* The Wedge Entomol. Res. Found., Washington, D.C. pp. 114-119.

Grote, A. R., 1874. Notes on American Lepidoptera with Descriptions of Twenty-one New Species. *Bull. Buffalo Soc. Nat. Sci. 2:145-163.*

Hampson, G. F., 1898-1920. *Catalogue of the Lepidoptera Phalaenae in the British Museum.* London. 13 vols. + supplements.

International Commission on Zoological Nomenclature (ICZN), 1999. *International Code of Zoological Nomenclature.* 4th edition. International Trust for Zoological Nomenclature, London, xxix + 306 pp.

ICZN, 2022. *Online website,* at: https://www.iczn.org/about-the-iczn/ Last accessed 10 November 2022.

Lafontaine, J. D., and B. C. Schmidt, 2010. Annotated check list of the Noctuoidea (Insecta, Lepidoptera) of North America north of Mexico. *ZooKeys* 40:1-239.

Palting, J. D., and W. Moore, 2022. Molecular phylogeny of Lichen Tiger Moths (Lepidoptera, Erebidae, Arctiinae, Lithosiini): a contribution toward classifying Western Hemisphere genera. *ZooKeys* 1108:119-139.

Pohl, G., R., B. Patterson, and J. P. Pelham, 2016. *Annotated taxonomic checklist of the Lepidoptera of North America.* Working paper publ. online by the authors at ResearchGate.net. 766 p.

Rodriguez-Ramirez, J., H. M. Beccacece, L. Rodrigues P., J. Grados, and M. L. Morono-Brizuela, 2020. Type material of Arctiinae (Lepidoptera: Erebidae) in the collection of the Museo Argentino de Ciencias Naturales Bernardino Rivadavia (Buenos Aires, Argentina). *Zootaxa* 4742(3):442-466.

Savela, M., 2022. *Arctiidae Leach 1815. Online taxonomic compilation,* at: https://www.nic.funet.fi/ Version 23.9.2020 (189728). Accessed 10 November 2022.

Schmidt, B. C., and P. A. Opler, 2008. Revised checklist of the tiger moths of the continental United States and Canada. *Zootaxa* 1677:1-23.

Scott, C. H., J. M. Zaspel, P. Chialvo, and S. J. Weller, 2014. A preliminary molecular phylogenetic assessment of the lichen moths (Lepidoptera: Erebidae: Arctiinae: Lithosiini) with comments on palatability and chemical sequestration. *Syst. Entomol.* 39:286-303.

Sexton, C., and H. McGuinness, 2017. Identification of lichen moths in the genus *Cisthene* Walker 1854 (Erebidae: Arctiinae) in the Central and Eastern United States. *So. Lep. News* 39(4):309-322.

Sorensen, W. C., 1995. *Brethren of the Net, American Entomology,* 1840-1880. Univ. of Alabama Press, Tuscaloosa. 357 p.

Strand, E., 1922. *Lepidopterorum Catalogus, Part 26: Arctiidae: Subfam. Lithosiinae.* H. Wagner (ed.). Junk, Berlin. pp. 501-899.

Stretch, R. H., 1872-1873. *Illustrations of the Zygaenidae & Bombycidae of North America.* Vol. I, Part 1 to 9. 242 p. + 10 pl.

Walker, F., 1854-64. *List of the Specimens of Lepidopterous Insects in the Collection of the British Museum.* Parts II, XIX, XXIX, XXX. Printed by order of the Trustees, London.

Watson, A., D. S. Fletcher, and I. W. B. Nye, 1980. *The Generic Names of Moths of the World. I. W. B. Nye (ed.). Vol. 2, Noctuoidea (part): Arctiidae, Cocytiidae, Ctenuchidae, Dilobidae, Dioptidae, Lymantriidae, Notodontidae, Strepsimanidae, Thaumetopoeidae, Thyretidae.* British Museum (Natural History), Publ. No. 811, London. 228 p.

Weller, S., M. DaCosta, R. Simmons, K. Dittmar, and M. Whiting, 2009. Evolution and Taxonomic Confusion in Arctiidae. Chap. 2 In: Conner, W. E. (ed.) *Tiger Moths and Woolly Bears: Behavior, Ecology, and Evolution of the Arctiidae.* Oxford Univ. Press.

Note: A more complete bibliography and an Excel spreadsheet of taxa is available from the author.

(Chuck Sexton, 6007 Salton Dr., Austin, TX 78759; E-mail: gcwarbler@austin.rr.com)

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White-striped Longtail: *Chioides catillus albofasciatus*
October 8, 2022, in front of Texas State Aquarium in Corpus Christi, Texas (Photos by Richard Lombardini)

INTRODUCING BUTTERFLY TAMPA (TAMPA BAY BUTTERFLY FOUNDATION AND LITTLE RED WAGON NATIVE NURSERY)

BY

ANITA CAMACHO

Fig. 1. Front entrance Little Red Wagon Native Nursery, the first native nursery in the Tampa Bay area opened on August 29, 2020, in Tampa, Florida

I would like to introduce myself, Anita Camacho, owner of Little Red Wagon Native Nursery (LRW), President and Founder of Tampa Bay Butterfly Foundation (TBBF), and President of NABA Tampa Bay Chapter. For humankind and our surrounding natural world, the mission of the Little Red Wagon, Hillsborough County's only native nursery, is to put as much of real Florida back into its landscape as possible.

My career has been as a Certified Public Accountant (CPA), working in high level positions with the biggest and the best firms including Deloitte, USA Networks, and The New York Times Company. I then ventured and started my own firm. So how did a CPA of over 30 years go from accounting to native plants and butterflies?

Truth is, I was always a "nature girl", growing up in then-rural Land O' Lakes, Florida (just north of Tampa) in a horse community. Whenever I was not in school, I'd spend my entire day, from sunup to when the streetlights came on, on my horse in wild Florida. This was before population sprawl claimed the land between Tampa and Land O' Lakes, now effectively a suburb of the metropolis. Development has sprawled!

Early in life, I gravitated to nature and had a passion for butterfly and rose gardening. However, some of my earliest exposure was through my childhood chores. One of those, pulling "weeds", I now appreciate as inadvertently not helpful that advice was given how many of those weeds were most likely important native plants. Like much in conservation, we learn that past behaviors were based on incorrect assumptions and knowledge. Our parents and grandparents did the best they could! What will our children and grandchildren learn about what we are teaching them?

Most of my initial gardening knowledge and enthusiasm came from my time spent in nature on my own and also with my mother and grandmother in their gardens. In my late teens, I joined the Tampa Rose Society furthering my gardening knowledge. This knowledge, focused on growing roses and competitively displaying them in rose shows, was focused mainly on how to kill insects, stop fungus growth, and keeping, yes again, the "weeds" from infiltrating the beds. Instinctively, I planted my butterfly garden as far away from my rose garden as possible to protect the butterflies from all the spraying and other activity I was doing to maintain my competitive roses. It took me a few years to understand what my intuition was telling me early on as I didn't like killing the insects.

My perspective changed dramatically 26 years ago when my mother was diagnosed with Parkinson's disease at, for her, a relatively young age. At the time of her diagnosis, she was still hard at work as a nurse. While she tried to continue to practice through her own health issues, she eventually retired but not until she had helped people through 50 years of service. I didn't understand the disease and quickly did a great deal of research to understand it to determine how to help her. In the background, I was also concerned whether there was a genetic component that might affect me and my future children. My research found a consistent relationship between Parkinson's disease and environmental exposure to pesticides, and now to herbicide exposure as well. Over 1 million people in the US have Parkinson's Disease with 60,000 new diagnoses per year. Armed with this information, I stopped using pesticides, herbicides and fungicides immediately in my gardening and household. Soon after I shifted my plan even further regarding the treatment of my landscape, if I won't eat or drink it, it doesn't go into my landscape. This includes soap solutions. No one likes to eat soap!

After 6 months of watching my rose garden struggle, only undergoing frequent "dead-heading" and watering without fertilizers, I found the roses rebounded and the plants were stronger. I later learned that the plants have their own defense innate mechanisms. Even without fertilizers and chemicals, my roses haven't had issues with thrips, aphids, black spot, or any other previously common problems. By constantly spraying on the recommended routine, the plants could not defend themselves naturally. This was both expensive and extremely detrimental on so many levels.

This shift lead me to native plants and continuing my path with chemical free gardening. At once, I wanted to share what I was learning and help others learn from the tragedy that had affected my mother and family. But how? Everywhere I traveled, I sought out locations in search of butterfly conservatories and educational facilities with butterflies. During one particular vacation with my husband, he saw the positive impact visiting a conservatory had on my mood and happiness. All I needed was a few minutes among these beautiful winged creatures! From there, with his encouragement, I knew that my path was to educate the public to hopefully change their ways and eliminate the use of toxic chemicals in yards and gardens. While I enjoyed my vacation, my enthusiasm could not be contained and I whipped up a business plan!

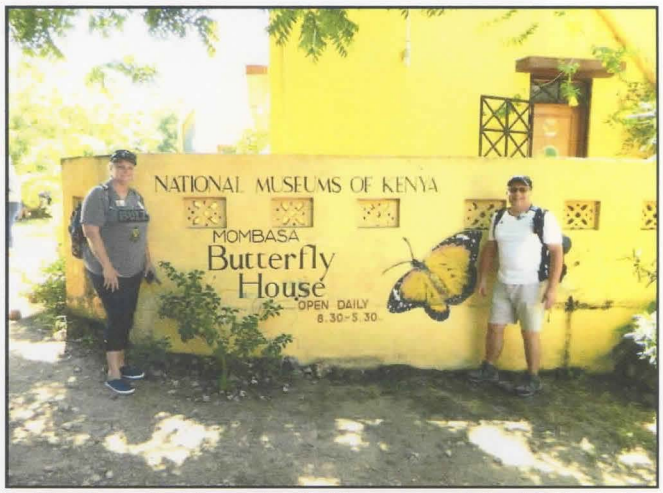


Fig. 2. Anita Camacho (left), owner of the Little Red Wagon Native Nursery, and her husband, Marc, visiting Mombasa Butterfly House in Mombasa, Kenya in 2018

From that point, LRW and TBBF were formed in 2017 and 2018, respectively. The profits from the nursery go to TBBF for the protection of butterflies, increasing their native habitat, public education, and supporting research in the Tampa Bay area and around Florida and beyond.

TBBF started ahead of the nursery with numerous iterations of trying to bring an immersive butterfly conservatory experience to the Tampa Bay area. That effort continues today. The first incarnation of the nursery premiered during the week of Earth day in April 2020 during the early days of worldwide COVID-19 pandemic shutdown. The first pop up sale featured 2 truckloads of 12 species of native plant, following COVID guidelines, curbside pickup of pre-ordered plants. Even with self-inflicted logistics by allowing myself only 3 days via Facebook and email blast, the public response was overwhelming and the plants sold out in 5 hours! I held 2 more pop up plant sales in May and June that year, likewise successful. I took July off for the annual NABA butterfly counts, which

had become routine for me as President of the local Tampa Bay chapter of the North American Butterfly Association (NABA), which I also founded in 2017.

Fig. 3. June 2002 LRW pop up sale at temporary location

Fig. 4. Delivering plants to healthcare worker at Tampa General Hospital during worldwide COVID-19 pandemic

It was in August of that year that I found my current nursery location in South Tampa and officially opened at the end of that month. One early community project I undertook was to deliver plants to frontline health care workers, who were working hard and bearing the brunt of the pandemic, to make their day just a little brighter. Now I have over 250 species of Florida native plants and a few non-natives that are simply host plants for butterflies that are also edible herbs for humans (pesticide-free, of course, which is hard to find in other nurseries, and even grocery stores, as herb plants are commonly treated with toxic chemicals).

TBBF has done several planting projects with numerous volunteers since inception. In 2020 and 2021, we coordinated 165 volunteers contributing 3,200 hours to our mission. The Center for Conservation was the first major project. TBBF partnered with the Florida Aquarium, Florida Fish and Wildlife Commission, and Tampa Electric Company (TECO) to bring a 20-acre parcel to life with pollinators after the property had been scraped for construction. There have been several projects with City of Tampa Park and Recreation Departments to incorporate additional native plants to help pollinators. TBBF also participated with the National Football League (NFL) "green week" initiative during the Super Bowl hosted in Tampa in early 2021. Additional projects were undertaken with Eagle Scouts, Girl Scout troops, a Young Women's Lawyer group, and 6 therapy butterfly gardens for a Tampa Crossroads shelter for at risk women. Another major project was to plant a ½ acre park in downtown Tampa at the Encore Technology Park. This is a partial list of the projects undertaken thus far.

Both LRW and TBBF participated with University of South Florida (USF) students to protect the university's Forest Preserve, 769 acres of undeveloped land, near the main campus in Tampa against sale for development. This has been successful in protecting the native plant communities there and some of the last remaining sandhill habitat in Hillsborough County. At the time of this writing, the beautiful wildlife habitat is safe – for now. Hopefully someday the various partnered groups can make it permanently protected.

Fig. 5. Eagle Scout volunteers at a planting at Edward Medard Park & Preserve on January 30, 2022

At the core, TBBF's main mission is education. The foundation sponsored travel and housing for a University of Georgia (UGA) PhD student working on her dissertation on milkweed butterflies throughout Florida. TBBF hosts numerous kids' camps throughout the year at LRW during various school breaks throughout the year. TBBF also hosts adult educational events and a significant number of presentations to various groups

throughout Florida and beyond about pollinators and the native plants on which they rely. Taking care of insects, our native plants, and the overall ecosystem is critical to human health. Helping people to rewire their thinking to include nature in their landscapes instead of evicting it is making an impact.

At LRW, my team of what I call "nature interpreters" provide guidance to customers with their own journey with native plants and the connection to nature through butterfly gardening. It is a great place to start and you cannot help butterflies and use toxic chemicals in your garden. Customers typically bring in pictures and little sketches of their garden areas with measurements and we help them plan out what can work in spaces they designate for their butterfly and pollinator gardens. I also have a consulting division R6 Enterprises that works with businesses on design for larger planned projects.

Fig. 6. TBBF kids' camp in Gallery meeting room

Fig. 7. Temple Terrace Garden Club Field Trip at LRW

Fig. 8. The Klash family donating a butterfly collection to the TBBF in April 2021 in loving memory of Marc Katash

I am happy to report there is a willing and growing audience for the message. Through effective networking and positive word-of-mouth (and an outstanding public relations professional), TBBF and LRW (and yours truly) have been featured on all local TV stations, some radio stations, internet, and print media and more to spread the word to make a difference in the Tampa Bay community. A living education exhibit room maintained at LRW encapsulates the message with live butterflies, larvae eating their host plants, an emergence habitat of pupae, as well as native reptiles (next up on the food chain as predator and prey and many misunderstood creatures). I was also blessed with a butterfly collection that is part of the education exhibit donated by the family of Marc Kutash, a long-time member of Southern Lepidopterists' Society (Fig. 8).

The effort to bring an immersive butterfly experience, where people can commune with these beautiful creatures in a tranquil environment to increase the connection to nature, continues. Butterflies are beautiful and non-threatening. They are a perfect vehicle to introduce the idea of taking better care of our natural world as people fall in love with butterflies.

"We will protect what we fall in love with" – Louie Schwartzberg.

Visit us at 4113 Henderson Blvd in South Tampa, Florida or Online:

Our website: ButterflyTampa.com,

Instagram: @Butterfly_Tampa and @TampaBayButterflyFoundation,

Facebook: Little Red Wagon Native Nursery and Tampa Bay Butterfly Foundation,

Twitter, and Tik Tok

(Anita Camacho: E-Mail: anita@butterflytampa.com)

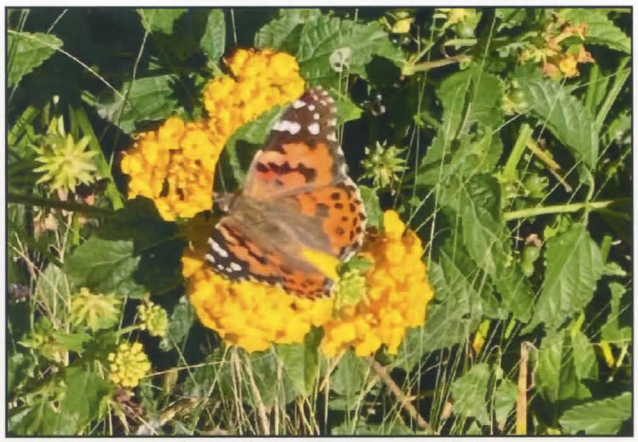
PHOTOS FROM LUBBOCK, TEXAS

BY

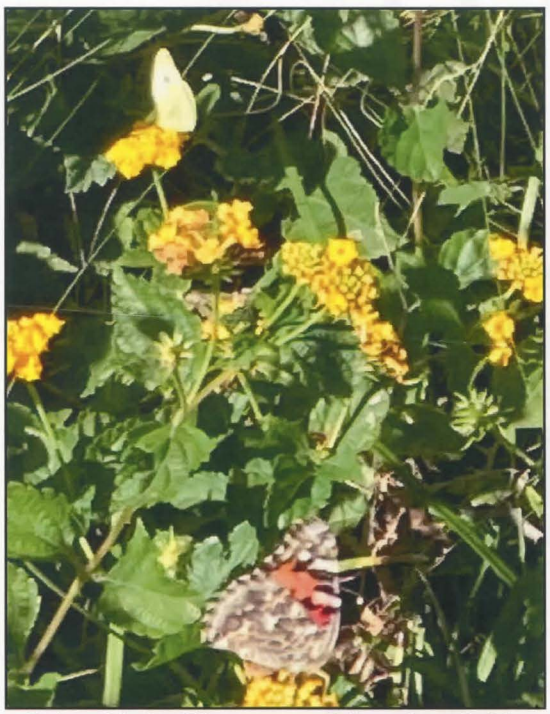
REID NORMAN

Butterflies were nectaring on *Lantana* from October 20 to October 24, 2022, when these photos were taken.

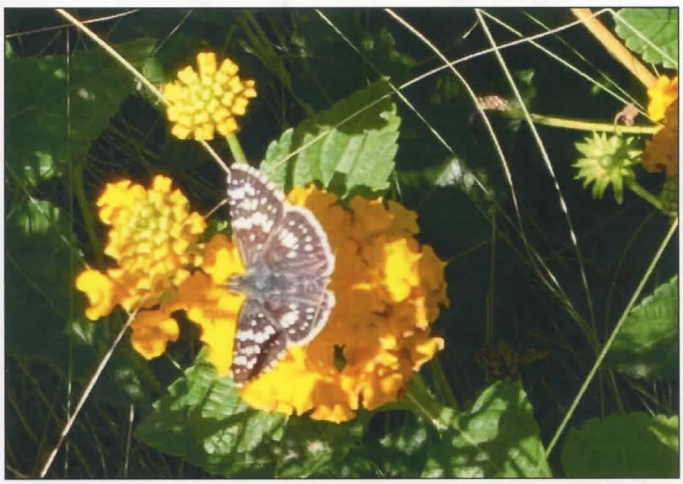
Black Swallowtail (*Papilio polyxenes*)



Painted lady (*Vanessa cardui*)
(formerly in North America the cosmopolitan).



Painted lady (*Vanessa cardui*) and probably Cabbage Butterfly (*Pieris rapae*)



Common Checkered-Skipper (*Pyrgus communis)*

MORNING VS AFTERNOON OCCURRENCE OF ADULT BUTTERFLIES IN A SUBURBAN LANDSCAPE OF SUWANNEE COUNTY, NORTHERN FLORIDA

BY

MARC C. MINNO

INTRODUCTION

The daily activity of adult butterflies is poorly known for most species. In my garden in Gainesville, Florida I've noticed that the Zebra Heliconian (*Heliconius charithonia tuckeri*) may be relatively numerous in the morning, but scarce later in the day. I've wondered, "Where do they go?" Are they resting somewhere or wandering in the neighbor's yards?

Typical butterflies are by nature diurnal (Kawahara *et al*., 2018) and in Florida most species seem to fly and visit flowers throughout the daylight hours. However, some skippers (Hesperiidae) and hairstreaks (Lycaenidae: Theclinae) are mostly torpid during the daytime, languidly perching on leaves or occasionally visiting flowers, but then awake and actively fly a few hours before sunset into evening. Mary Ann Friedman discovered this pattern of activity for the Arogos Skipper (*Atrytone arogos arogos*) and Cofaqui Giant-Skipper (*Megathymus cofaqui cofaqui*) while walking her dog at sunset on trails at Eglin Air Force Base in Okaloosa County, Florida. Paula Cannon (2014) found the same pattern of activity for the Amethyst Hairstreak (*Chlorostrymon maesites*) in her garden on Big Pine Key, Monroe County, Florida.

I recently published a paper on the butterflies observed on a 12 acre parcel owned by Suwannee River Water Management District (SRWMD) in Live Oak, Suwannee County (Minno, 2022). I made lists of butterflies observed on short walks on the property in mid to late morning and/or mid to late afternoon. This paper compares the relative abundance and species richness of adult butterflies observed on the SRWMD property in morning versus afternoon.

METHODS

I kept notes about the butterflies that I observed on the SRWMD nature trail from June1, 2018 until August 31, 2022. I wrote down the time spent searching, weather conditions, the species and numbers of butterflies seen, host plants, flowers visited, and other information. I usually looked for butterflies about 10 minutes each time between 10:00 to 11:00 in the morning and 15:00 to 16:00 in the afternoon, time and weather permitting. Sampling was interrupted from March 19 through November 11, 2020 due to covid pandemic lockdown. I made observations on 571 days for a total of about 145 hours. Some 73.4 hours of observation were in the morning and 71.5 hours were in the afternoon.

RESULTS

I found a total of 61 species of adult butterflies on the SRWMD nature trail. Slightly fewer species were seen in the morning (53) vs. afternoon (55). Many of the butterflies observed were just passing through the area. Only one or two adults were seen for 15 of the species (25%) and less than 10 adults were seen for another 12 species.

Many of the more abundant butterfly species had equal or nearly equal numbers observed in morning and afternoon. But ten species were strongly more abundant in the morning (Table 1) including *Urbanus proteus proteus*, *Agraulis incarnata nigrior*, *Abaeis nicippe*, *Eurema daira daira*, and *Phoebis sennae eubule*, which are known to disperse widely, especially in late summer and fall. Another fourteen species were clearly more abundant in the afternoon, but only two of these (*Cecropterus dorantes dorantes* and *Junonia coenia*) are strong dispersers.

Table 1. Number of adult butterflies observed in the morning vs the afternoon in a suburban landscape of Suwannee County, northern Florida. Green highlights cases where the number observed is skewed.

SPECIES	FAMILY: SUBFAMILY	# in AM	# in PM	TOTAL
Cecropterus confusis	*Hesperiidae: Eudaminae*	2	2	4
Cecropterus dorantes	*Hesperiidae: Eudaminae*	51	72	123
Epargyreus clarus	*Hesperiidae: Eudaminae*	2	3	5
Urbanus proteus	*Hesperiidae: Eudaminae*	86	70	156
Anatrytone logan	*Hesperiidae: Hesperiinae*	1	0	1
Atalopedes campestris	*Hesperiidae: Hesperiinae*	0	1	1
Copaeodes minima	*Hesperiidae: Hesperiinae*	1	0	1
Euphyes vestris	*Hesperiidae: Hesperiinae*	125	152	277
Hylephila phyleus	*Hesperiidae: Hesperiinae*	10	10	20
Lerema accius	*Hesperiidae: Hesperiinae*	21	21	42
Lerodea eufala	*Hesperiidae: Hesperiinae*	0	1	1
Nastra lherminier	*Hesperiidae: Hesperiinae*	1	0	1
Nastra neamathla	*Hesperiidae: Hesperiinae*	1	0	1
Oligoria maculata	*Hesperiidae: Hesperiinae*	4	2	6
Panoquina ocola	*Hesperiidae: Hesperiinae*	10	10	20
Poanes zabulon	*Hesperiidae: Hesperiinae*	1	2	3
Polites vibex	*Hesperiidae: Hesperiinae*	20	52	72
Wallengrenia egeremet	*Hesperiidae: Hesperiinae*	1	0	1
Wallengrenia otho	*Hesperiidae: Hesperiinae*	3	1	4
Burnsius albescens	*Hesperiidae: Pyrginae*	4	4	8
Burnsius oileus	*Hesperiidae: Pyrginae*	197	301	498
Erynnis horatius	*Hesperiidae: Pyrginae*	71	61	132
Erynnis zarucco	*Hesperiidae: Pyrginae*	0	1	1
Celastrina neglecta	*Lycaenidae: Polyommatinae*	1	0	1
Hemiargus ceraunus	*Lycaenidae: Polyommatinae*	1	5	6
Atlides halesis	*Lycaenidae: Theclinae*	0	1	1
Calycopis cecrops	*Lycaenidae: Theclinae*	92	131	223
Mitoura gryneus sweadneri	*Lycaenidae: Theclinae*	2	4	6
Parrhasius m-album	*Lycaenidae: Theclinae*	3	10	13
Strymon melinus	*Lycaenidae: Theclinae*	2	3	5
Asterocampa celtis	*Nymphalidae: Apaturinae*	0	1	1
Asterocampa clyton	*Nymphalidae: Apaturinae*	5	2	7
Anaea andria	*Nymphalidae: Charaxinae*	4	9	13
Danaus plexippus	*Nymphalidae: Danainae*	1	1	2

Table 1. Continued.

SPECIES	FAMILY: SUBFAMILY	# in AM	# in PM	TOTAL
Agraulis incarnata	Nymphalidae: Heliconiinae	749	529	1278
Euptoieta claudia	Nymphalidae: Heliconiinae	6	10	16
Heliconius charithonia tuckeri	Nymphalidae: Heliconiinae	1130	945	2075
Libytheana carinenta bachmanii	Nymphalidae: Libytheinae	4	3	7
Limenitis archippus floridensis	Nymphalidae: Limenitidinae	12	3	15
Limenitis arthemis astyanax	Nymphalidae: Limenitidinae	43	19	62
Junonia coenia	Nymphalidae: Nymphalinae	35	56	91
Nymphalis antiopa	Nymphalidae: Nymphalinae	0	1	1
Phyciodes phaon	Nymphalidae: Nymphalinae	19	18	37
Phyciodes tharos	Nymphalidae: Nymphalinae	48	37	85
Polygonia interrogationis	Nymphalidae: Nymphalinae	3	1	4
Vanessa atalanta	Nymphalidae: Nymphalinae	2	71	73
Vanessa virginiensis	Nymphalidae: Nymphalinae	4	10	14
Hermeuptychia species	Nymphalidae: Satyrinae	1497	1632	3129
Megisto cymela viola	Nymphalidae: Satyrinae	0	1	1
Battus philenor	Paplionidae: Papilioninae	14	26	40
Eurytides marcellus floridensis	Paplionidae: Papilioninae	12	18	30
Heraclides cresphontes	Paplionidae: Papilioninae	19	32	51
Papilio polyxenes asterius	Paplionidae: Papilioninae	2	5	7
Pterourus glaucus	Paplionidae: Papilioninae	23	24	47
Pterourus palamedes	Paplionidae: Papilioninae	7	7	14
Pterourus troilus	Paplionidae: Papilioninae	81	138	219
Abaeis nicippe	Pieridae: Coliadinae	71	59	130
Eurema daira	Pieridae: Coliadinae	450	394	844
Nathalis iole	Pieridae: Coliadinae	0	2	2
Phoebis sennae	Pieridae: Coliadinae	298	247	545
Pyrisitia lisa	Pieridae: Coliadinae	10	13	23
	TOTAL ADULTS	5262	5234	10496
	TOTAL SPP	53	55	61

DISCUSSION

My results indicate that at least 24 (40%) of the 61 species observed had a tendency to be more active in the morning or afternoon. However, further observation is needed to verify that these tendencies are consistent for those species. One of the best examples of a mostly afternoon active butterfly is the Red Admiral (*Vanessa atalanta rubria*). Males of the Red Admiral perched at a particular spot along the nature trail in the afternoon to await females. Males of the Dun Skipper (*Euphyes vestris metacomet*) also perched in this same area, but their numbers were less skewed toward the afternoon.

In addition to the late flying species mentioned in the introduction, other Florida butterflies such as Red-banded Hairstreak (*Calycopis cecrops*), White M Hairstreak (*Parrhasius m-album*), *Satyrium* spp., Gray Ministreak

(*Ministrymon azia*), Three-spotted Skipper (*Cymaenes tripunctus tripunctus*), Clouded Skipper (*Lerema accius*), and Brazilian Skipper (*Calpodes ethlius*) seem to be most active toward the end of the daylight hours (Figs. 1 and 2). Some of these butterflies have reddish rather than black opaque eyes. Red eyes most often occur in forest dwelling butterflies and appear to be an adaptation to low light conditions (Kawahara *et al*., 2018).

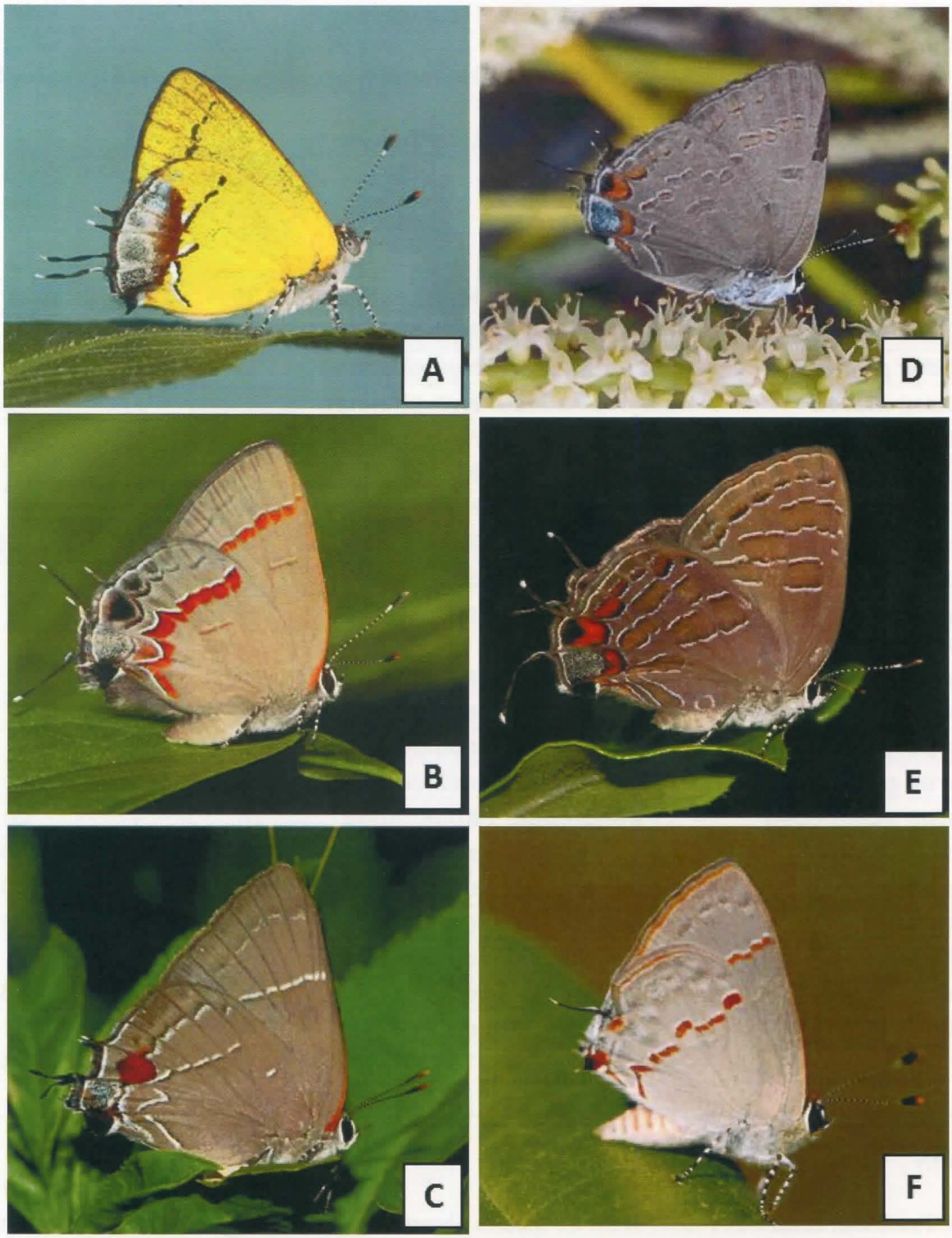


Figure 1. Florida hairstreaks (Lycaenidae: Theclinae) that are or maybe most active late in the day into evening.

A: *Chlorostrymon maesites.*
B: *Calycopis cecrops.*
C: *Parrhassius m-album.*
D: *Satyrium kingi.*
E: *Satyrium liparops floridensis.*
F: *Ministrymon azia.*

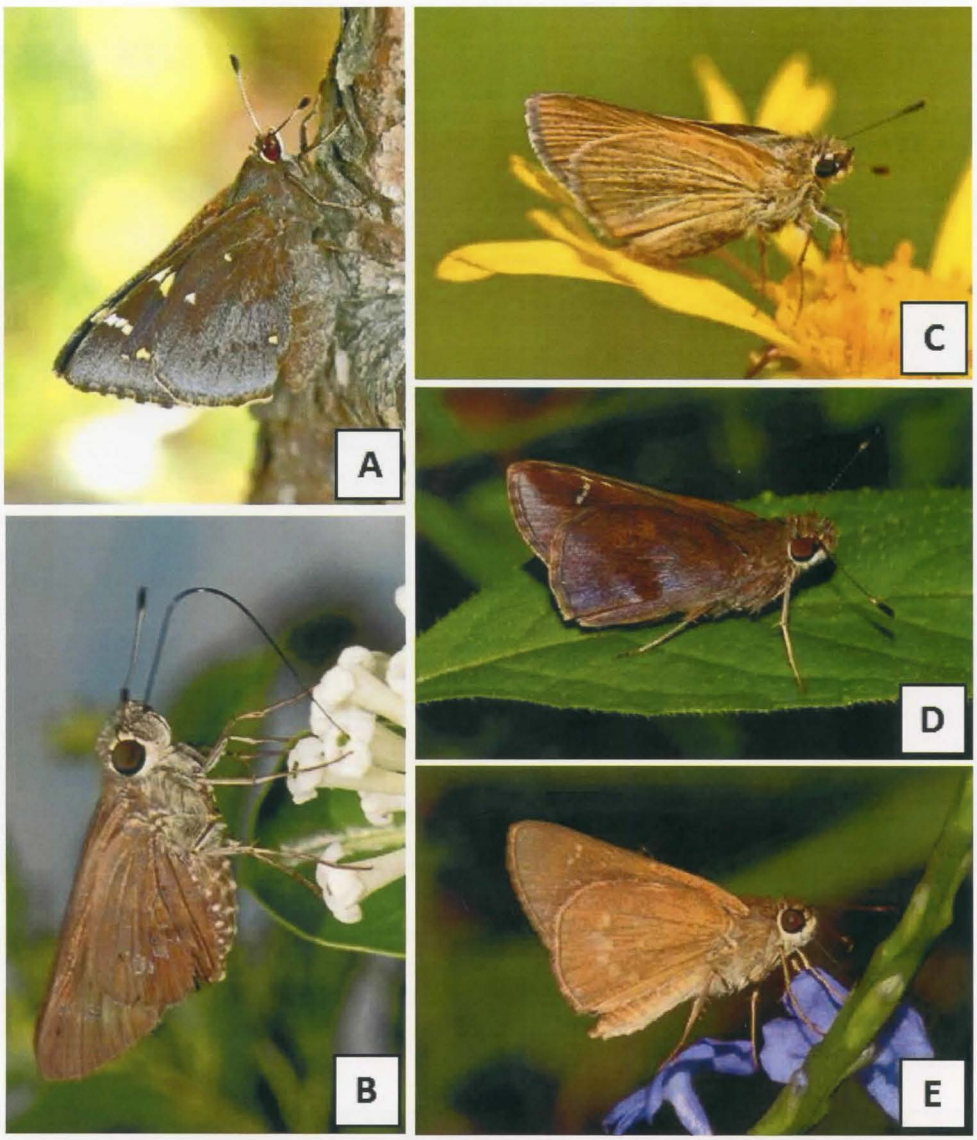


Figure 2. Florida skippers (Hesperiidae) that are or maybe most active late in the day into evening.
A: *Megathymus cofaqui slotteni.*
B: *Calpodes ethlius.*
C: Atrytone arogos arogos.
D: *Lerema accius.*
E: *Cymaenes tripunctus tripunctus.*

LITERATURE CITED

Cannon, P., 2014. Jewel of the Isle: Mysteries of the Amethyst Hairstreak revealed. *American Butterflies* 22(3):4-10.

Kawahara, A. Y., D. Plotkin, C. A. Hamilton, H. Gough, R. St.Laurent, H. L. Owens, N. T. Homziak, and J. R. Barber, 2018. Diel behavior in moths and butterflies: a synthesis of data illuminates the evolution of temporal activity. *Organisms Diversity & Evolution* 18:13-27.

Minno, M. C., 2022. Diversity and relative abundance of butterflies in a suburban landscape of Suwannee County, northern Florida. *Southern Lepidopterists' News* 44(3):321-331.

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2022 SPRING VISITORS TO THE **ABITA ENTOMOLOGICAL STUDY SITE* (AESS)

BY

VERNON ANTOINE BROU JR. AND CHARLOTTE DOZAR BROU

On March 2, 2022 entomologists from Mississippi, Rick Kergosien (L) and Ricky Patterson (R) visited Vernon and Charlotte Brou at their Abita Springs, Louisiana home. Both Rick and Ricky have been collecting insects for a half century in Mississippi and elsewhere. But surprisingly, neither of them had met each other face to face until this visit. Both collectors singly have visited the AESS numerous times previously over decades. Below, Rick Kergosien is looking over four drawers of an automatic-capture light trap with collection chamber.

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HERACLIDES CRESPHONTES (CRAMER, [1777]) (LEPIDOPTERA: PAPILIONIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR. AND CHARLOTTE DOZAR BROU

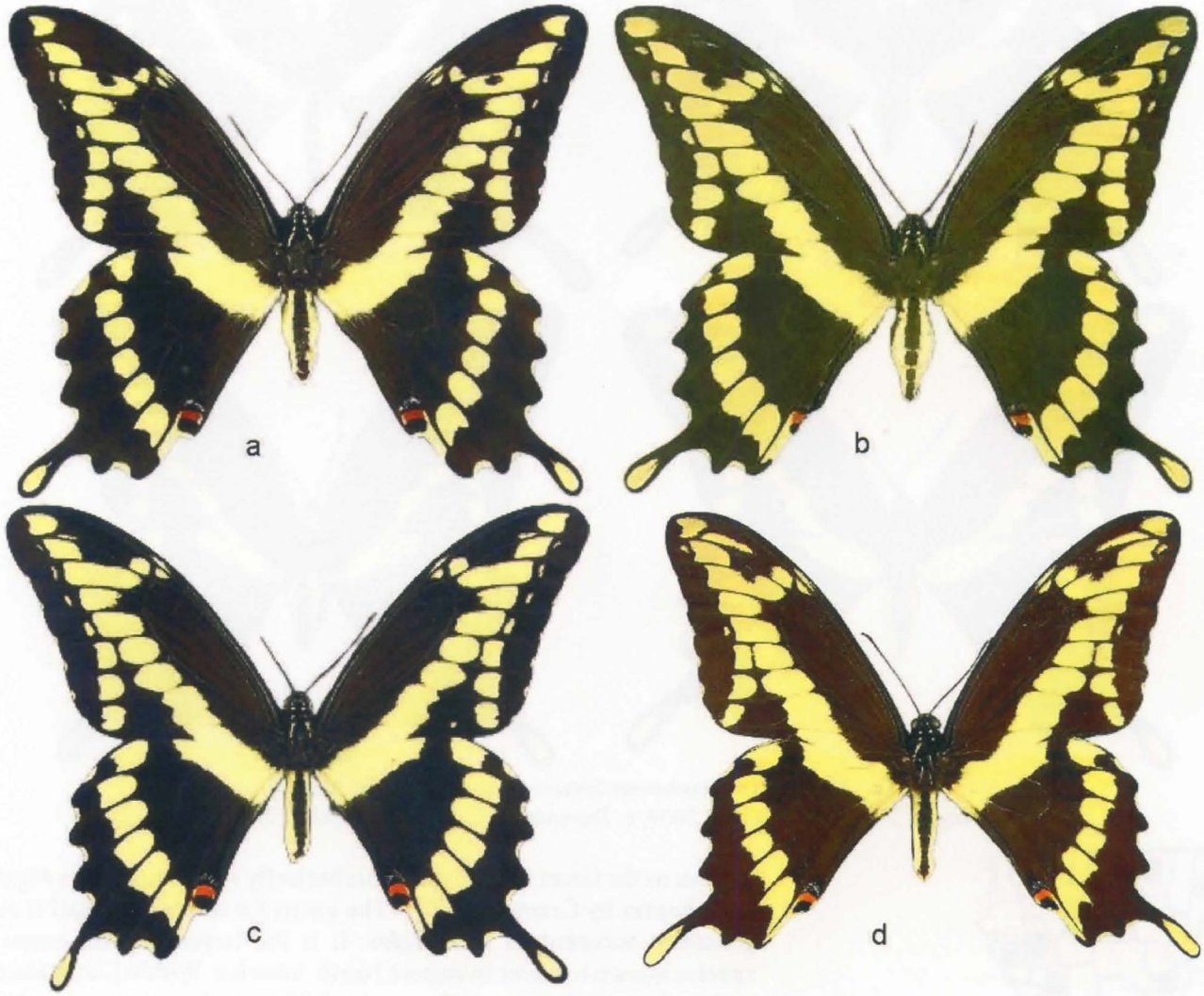

Fig. 1a. ***Heraclides cresphontes*** male phenotypes at the AESS:
a. August 27, 2009. **b**. March 30, 2007, **c**. December 22, 2010, **d**. March 30, 1997.

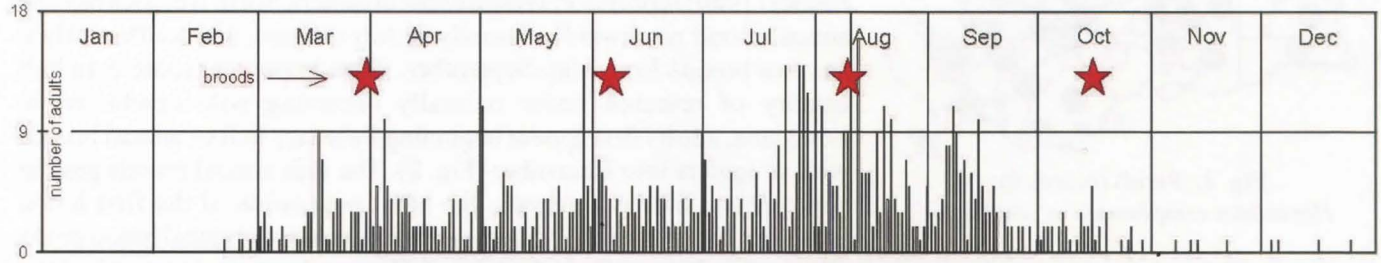

Fig. 2. Adult wild ***Heraclides cresphontes*** captured in Louisiana. n = 872

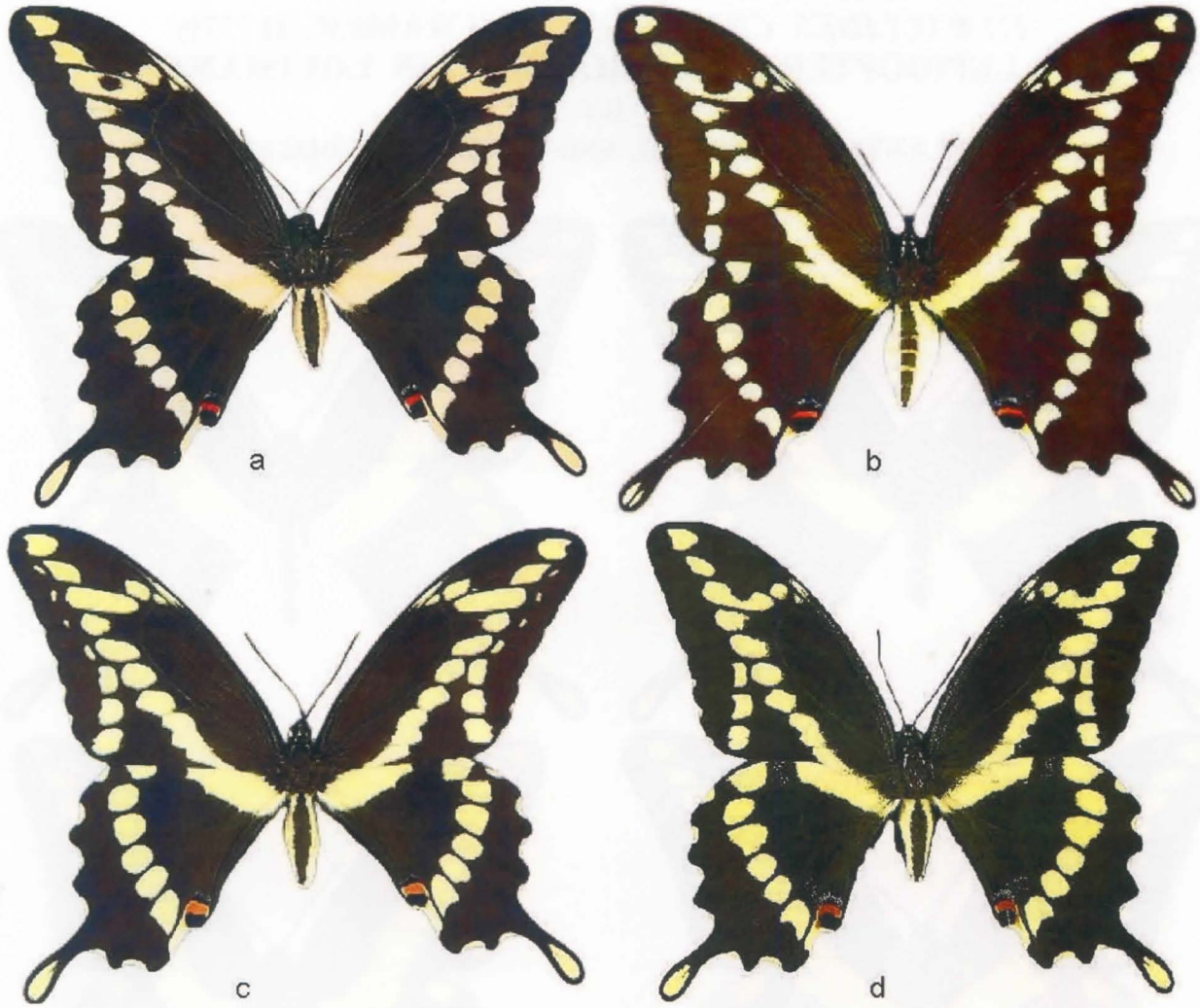

Fig. 1b. ***Heraclides cresphontes*** female phenotypes at the AESS:
a. August 21, 2009, **b.** July 5, 2009, **c.** December 12, 2008, **d.** March 1, 2011.

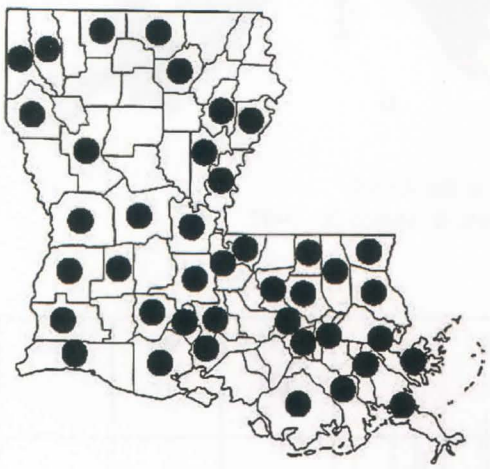

Fig. 3. Parish records for ***Heraclides cresphontes*** in Louisiana.

Known as the Giant Swallowtail, this butterfly was described as ***Papilio cresphontes*** by Cramer in 1777. The genus for this swallowtail is now generally accepted as ***Heraclides***. It is the largest in size butterfly species known to occur in eastern North America. Within Louisiana the earliest known documented records of ***H. cresphontes*** were made by von Reizenstein (1863) who apparently reported this species as ***Papilio thaos*** Linnaeus on orange trees from the New Orleans area.

Forbes (1960) reported ***P. cresphontes*** in eastern North America has one annual brood northwardly, usually in July-August, and southwardly it has two broods from May-September. Based upon our more than half century of research under naturally occurring wild conditions in Louisiana, adults first appear beginning February in four annual broods with stragglers into December (Fig. 2). The four annual broods peak at approximate 67-day intervals, the adult population of the first brood peaks the fourth week of March; see red stars noting typical brood peaks on Fig. 2. Within Louisiana we have personally captured or confirmed adults of ***H. cresphontes*** taken in 42 of the 64 Parishes, (two-thirds) of Louisiana (Fig. 3).

Comstock (1882) reported ***P. cresphontes*** from Terrebonne Parish. Rothschild and Jordan (1906) and Hine (1906) reported ***P. cresphontes*** as occurring in Louisiana. Jung (1950) reported ***P. cresphontes*** from the parishes of Orleans,

St. Bernard and Plaquemines. Lambremont (1954) reported over 30 ***P. cresphontes*** records from the Parishes of Claiborne, Jefferson, Lafayette, Livingston, Orleans, Plaquemines, St. Tammany, Terrebonne and Vermilion. Ross & Lambremont (1963) added the following additional Parish records for ***P. cresphontes***: Beauregard, East Baton Rouge, Sabine, St. Charles and Tangipahoa. Heppner (2003) reported ***P. cresphontes*** from Nova Scotia to Florida/Colorado and California to Cuba, and Mexico to Colombia in all 12 months.

Handfield (2011) reported ***Papilio cresphontes*** from Quebec, Ontario. Klotz (1951) stated ***P. cresphontes*** is rare and sporadic northward, and has two broods northward, three in the south. Mather and Mather (1958) reported 30 ***P. cresphontes*** for neighboring Mississippi in the months May-December. Erlich and Erlich (1961) reported ***P. cresphontes*** from Canada to Costa Rica. Harris (1972) reported ***P. cresphontes*** from the Piedmont and Coastal regions of Georgia, but no other records. Howe (1975) reported ***P. cresphontes*** from the Canadian border to Mexico and westward... to southern Arizona. In 2014, what was formerly known as ***H. cresphontes*** in western and southwestern North America was reclassified as ***Heraclides rumiko*** Shiraiwa & Grishin. Heitzman & Heitzman (1987) reported ***H. cresphontes*** throughout Missouri, adults in two broods from April to October. Opler (1992) reported ***P. cresphontes*** is found in eastern Canada, southward into South America, with *'two flights'* in the north.

No species of swallowtail butterflies were reported by Brou (1974) among the 607 butterflies taken in UV light traps during 1973 at Edgard, St John the Baptist Parish, though this species was fairly common there, especially around citrus trees. In contrast, at the AESS we have taken most Louisiana swallowtails numerous times each in UV light traps and on lesser occasions in fermenting fruit bait traps as well: ***Battus philenor*** (Linnaeus), ***Papilio polyxenes*** Fabricus, ***H. cresphontes*** (Cramer), ***Pterourus glaucus australis*** (Maynard), ***Pterourus troilus*** (Linnaeus), and the most abundantly encountered swallowtail species in St. Tammany Parish captured at least 60 times in UV light traps at the *AESS* is ***Pterourus palamedes*** (Drury). ***Eurytides marellus*** (Cram.) was first reported by von Reizenstein (1863) apparently under two different species names, but has not been seen as of yet at the AESS, but it has been captured on several occasions in UV ligh traps in other Parishes. Brou (2015) addressed this species in Louisiana as ***Protographium marcellus*** (Cramer).

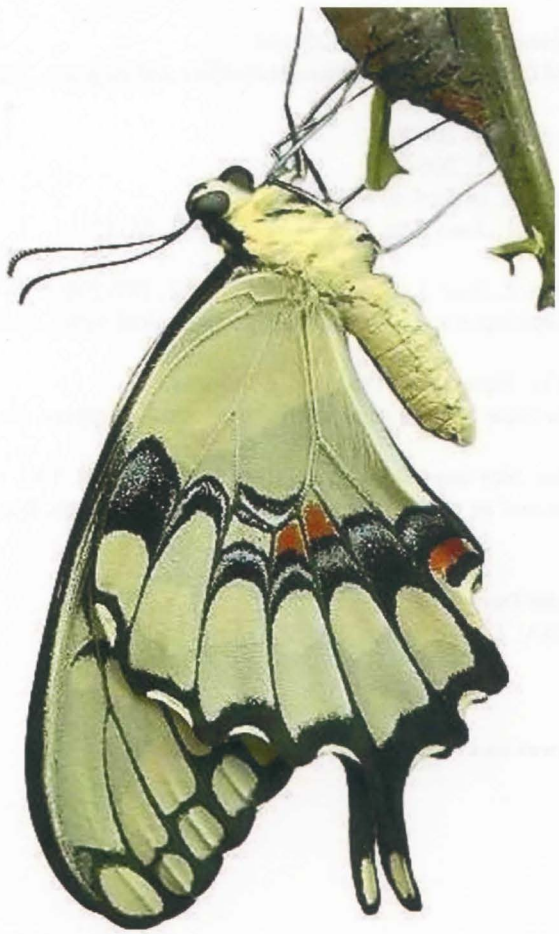

Fig. 4. Newly emerged adult ***H. cresphontes*** on kumquat at the AESS.

Battus polydamus Linnaeus was previously reported from Orleans Parish by von Reizenstein (1863), but has not been seen or documented in Louisiana since then. Possibly ***Battus polydamus lucayus*** (Rothschild & Jordan) was the actual butterfly, but today there are at least 20 described subspecies of ***B. polydamus***. ***B. polydamus*** occurs in Florida and southern Texas, with reports of occasional captures in Georgia (Harris, 1938) and in Arkansas (Masters, 1967). ***B. polydamus*** was not reported for the state of Mississippi by Mather and Mather (1958), (1959) nor (1976).

Records of ***H. cresphontes*** in Louisiana were not mentioned *by* Montgomery (1932), nor Lambremont and Ross (1965), nor Mather (1966)), nor Jung (1939), though Lambremont (1954) incorrectly reported that Jung (1939) had listed ***P. cresphontes*** from Orleans Parish.

Over a half century we reared ***H. cresphontes*** on a variety of ***citrus*** Linnaeus species obtained from local commercial nurseries including oranges, lemons, tangerines, mandarins, grapefruit, and kumquats (both large oval and round 'Meiwa' varieties). Wild adults of ***H. cresphontes*** were naturally attracted to all of these trees at the AESS, and females readily oviposited usually on the undersides of freshly sprouting leaves, avoiding mature leaves. Both wild plants ***Ptelea trifoliata*** Linnaeus and ***Poncirus trifoliata*** (Linnaeus) Raf. occur at the AESS, but we have never found ***H. cresphontes*** larvae on these plants.

We thank Ricky Patterson for most helpful critique and invaluable assistance especially concerning current lepidoptera taxonomical nomenclature.

Abita Entomological Study Site* **(AESS): *sec.24,T6S,R12E, 4.2 miles northeast of Abita Springs, St. Tammany Parish, Louisiana USA.*

Literature Cited

Brou Jr., V.A., 1974. Butterflies taken in light traps. *Jour. Lepid. Soc.* 28:331.

Brou Jr., V.A., 2015. Protographium marcellus (Cramer) (Lepidoptera: Papilionidae) in Louisiana. *South. Lepid. News* 37:25-26.

Comstock, J.H., 1882. *The hog caterpillar of the orange.* Rept. U.S. Comm. Agric. 1881: 246-248.

Cramer, P., 1775-82. *De uitlandsche kapellen, voorkomende in de drie waereld-deelen Asia, Africa en America/by een verzameld en beschreeven door den Heer Pieter Cramer, vervattende naauweurige afbeeldingen van Surinaamsche Rupsen en Poppen; als mede van veele zeldzaame en niuwe ontdekte Uitlandsche Dag-en Nagt-Kapellen. Gravius*, Amsterdam. 4 vol. 400 pl.

Erlich, P.R. and A.H. Erlich, 1961. *How to know The Butterflies.* Wm. C. Brown Co. Dubuque, Iowa.

Forbes, W.T.M., 1960. *Lepidoptera of New York and neighboring states, part IV*, Cornell Univ. Agr. Exp. St. Mem. 371. 188 pp.

Handfield, L., 2011. Les Papillons du Quebec. Broquet Inc., Boucherville, Quebec. 674 pp., 166 pls.

Harris, L., Jr., 1972. *Butterflies of Georgia.* Norman: University of Okla. Pr. 326pp., 25 pls.

Heitzman, J.R. & J.E. Heitzman ,1987. *Butterflies and Moths of Missouri.* Missouri Dept. of Conservation, 385 pp.

Heppner, J.B., 2003. *Arthropods of Florida and neighboring land areas,* vol. 17: Lepidoptera of Florida, Div. Plant Industry, Fla. Dept. Agr. & Consum. Serv., Gainesville. x + 670 pp., 55 plates.

Hine, J. S., 1906. *A second contribution to the entomology of the region of the Gulf Biologic Station*, Bull. Gulf Biol. Sta. No. 6.

Howe, W. H., 1975. *The butterflies of North America.* Doubleday, Garden City. 633 pp, 97 pl.

Jung, R.C., 1939. On the occurrence of some of southern Louisiana's more common butterflies. *Tulane Biol.* 3:17-18.

Jung, R.C., 1950. An annotated list of the Lepidoptera of the New Orleans area. *Proc. Louisiana Acad. Sci.* 13: 42-48.

Klots, A.B., 1951. *A field guide to the butterflies of North America East of the Great Plains.* Boston: Houghton Mifflin. 349 pp. 40 pl.

Lambremont, E.N., 1954. The butterflies and skippers of Louisiana. *Tulane Studies Zool.* 1:125-164.

Lambremont, E.N., and **G.N. Ross** 1965. New state records and annotated field data for Louisiana butterflies and skippers. *Jour. Lepid. Soc.* 19: 47-52.

Masters, J.H., 1967. Observations on Arkansas Rhopalocera. *Jour. Lep. Soc.* 21: 206-209.

Masters, J.H., 1967. Observations on Arkansas Rhopalocera. *Jour. Lep. Soc.* 21: 206-209.

Mather, B. and **K. Mather,** 1958. The Butterflies of Mississippi. *Tulane stud. in zool.* 6: 63-109.

Mather, B. and **K. Mather,** 1959. The Butterflies of Mississippi, supp. No. 1. *Jour. Lep. Soc.* Vol. 13, No. 1. 71-72.

Mather, B., 1966. Louisiana butterfly records. *Jour. Lepid. Soc.* 20: 102.

Mather, B. and **K. Mather,** 1976. The Butterflies of Mississippi. supp. No. 2. *Jour. Lep. Soc.* Vol. 13, No. 2. 197-200.

Montgomery, Robert Wallace, 1932. Records of Louisiana Butterflies (Lepidoptera: Rhopalocera). Entomological News, 43(7): 182.

Opler, P., 1992. *A field Guide to Eastern Butterflies.* Houghton Mifflin Co., New York. 486 pp.

Ross, G.N. and **E.L. Lambremont,** 1963. An Annotated Supplement to the State List of Louisiana Butterflies and Skippers. *Jour. Lepid. Soc.* 17: 148-158.

Rothschild, W. and **K. Jordan,** 1906. *A revision of the American Papilios.* Novitates Zoologica, Tring, England. Vol. 13.

von Reizenstein, L., 1863. *Catalogue of the Lepidoptera of New Orleans and its vicinity.* Isaac T. Hinton. New Orleans, 8pp.

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2023 – A NEW YEAR, A NEW PROJECT

BY

SCOTT D. ANDERSON

On September 28, Hurricane Ian made landfall at Cayo Costa in southwest Florida, only 36 miles from my house and one of my favorite preserves for butterflies - Sleeping Turtles North in Sarasota County. At landfall, it has been reported that the eye of the hurricane was 35 miles across with maximum sustained winds of 150 miles per hour, a very high level category 4 storm. Hurricane force winds extended 30-40 miles from the eyewall which meant my house and my favorite local preserve were on target.

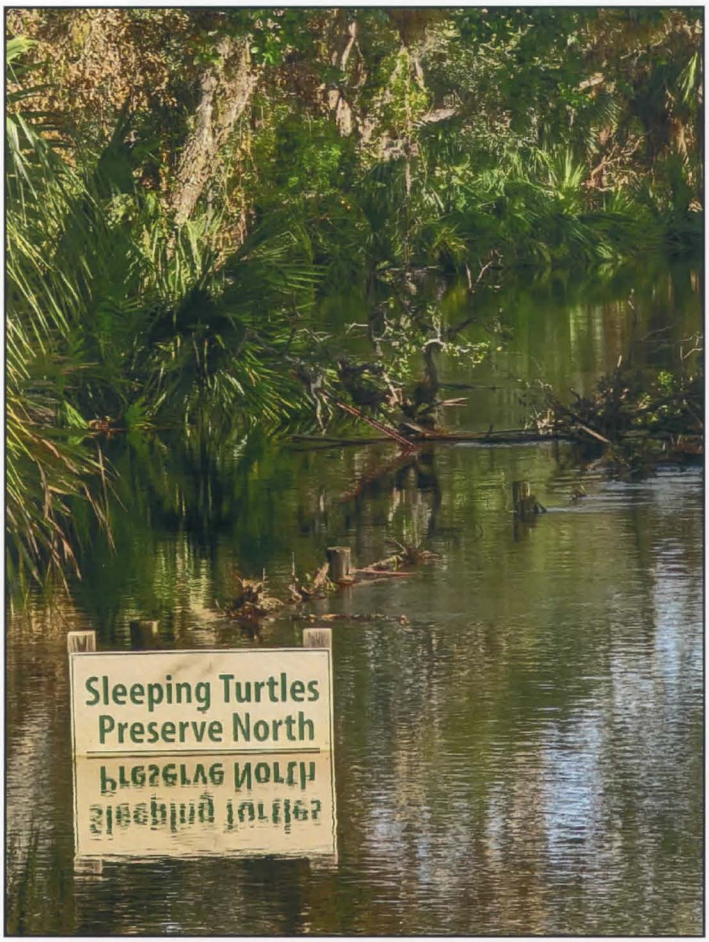

Fig. 1. Flooded entrance and parking area for Sleeping Turtles North on October 5, one week after Hurricane Ian.

As Ian came inland, it came closer, but the winds diminished some. However, we still experienced about 8 hours of hurricane force winds, with 4 continuous hours around 90 plus miles per hour and gusts above 100. Rainfall varied wildly but in our immediate area reports were for 17.5 inches. As the wind subsided, the flooding began and the area all around Sleeping Turtles North flooded when the Myakka River breached its banks. Most of the entire preserve was under 3-4 feet of water for about 10 days and I-75, our major north-south transportation artery, which skirts the south end of the preserve, was even closed for a time. Needless to say, the whole event was terrible in its widespread destruction and Sleeping Turtles North, as of this writing, more than 2 months later, is still closed.

In 2020, for my book "The Butterflies of Sarasota County, A Year-long Data Driven Survey *(Southern Lepidopterist Society)*, published June, 2021" I surveyed Sleeping Turtles North 32 times, identifying 46 species of butterflies throughout the year and counted a total of 5,313 individual butterflies. In 2023, after the preserve has experienced the full wrath of Hurricane Ian, I hope to repeat my survey. While in 2020, I surveyed the whole of Sarasota County, in 2023, my focus will be on one preserve.

In Sleeping Turtles North, I plan to replicate my study from 2020 as much as possible – same number of visits, follow the same transects, visit at the same time of day and in similar weather (temperatures) as much as possible. I will track all of my findings using the same data collection methods and report using comparative models (charts and graphs) so an accurate depiction of 2020 versus 2023 can be visualized. At year's end, I will report my full findings. I don't know what I will find beyond a badly damaged habitat but then, we know nature is good at restoring itself.

Some of the questions I have are:

* Will there be any butterflies during the first year of recovery or was the damage simply too great?

* If there are butterflies, which species and in what volume?

* Did the storm impact certain families of butterflies more than others?

* If there is a general absence of butterflies or at least certain species at the beginning of the year, how quickly will they return, if they return at all?

* Did the storm blow in new species from the south that were not previously present?

* Were certain areas of the preserve impacted more than others?

Fig. 2. The Myakka River at Sleeping Turtles North well out of its banks.

My biggest obstacle to beginning the study is that Sleeping Turtles North, as of mid-December, is still closed. Significant progress is being made by the county to make the preserve safer by clearing substantial amounts of debris. If I can get into the preserve in January, I will start the project. I prefer collecting data during full calendar years but if need be, I can start after the year begins. Through Southern Lepidopterist News I hope to provide quarterly updates and then look forward to providing a full year summary as soon as possible in 2024. Wish me luck and hopefully, there will be butterflies to count.

[Note: My house sustained no serious damage. It is new and well built for hurricanes. There are still signs of damage everywhere and we lost an extraordinary number of hardwood trees, especially oaks, throughout a widespread area.]

(Scott Anderson, scottdanderson53@gmail.com)

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BREPHIDIUM EXILIS (LYCAENIDAE) COLONIZES THE TAMPA BAY AREA AS A NEW FLORIDA STATE RECORD

BY

JOHN V. CALHOUN AND RON SMITH

The year 2022 saw three butterfly taxa recorded in Florida for the first time. Minno et al. (2022) announced the discovery in the Florida Keys of *Anteos clorinde* (Godart) (white angled-sulphur), undoubtedly of Cuban origin [sometimes recognized as the subspecies *A. c. nivifera* (Fruhstorfer)], and *Marpesia eleuchea bahamensis* Munroe (Antillean daggerwing) of the Bahamas. It is surprising that these butterflies had not previously been found in Florida, though the nominotypical subspecies of *M. eleuchea* has been recorded at least three times in the Keys (Czaplak and Calhoun 2018). The third butterfly new to Florida is much less conspicuous and came as a complete surprise.

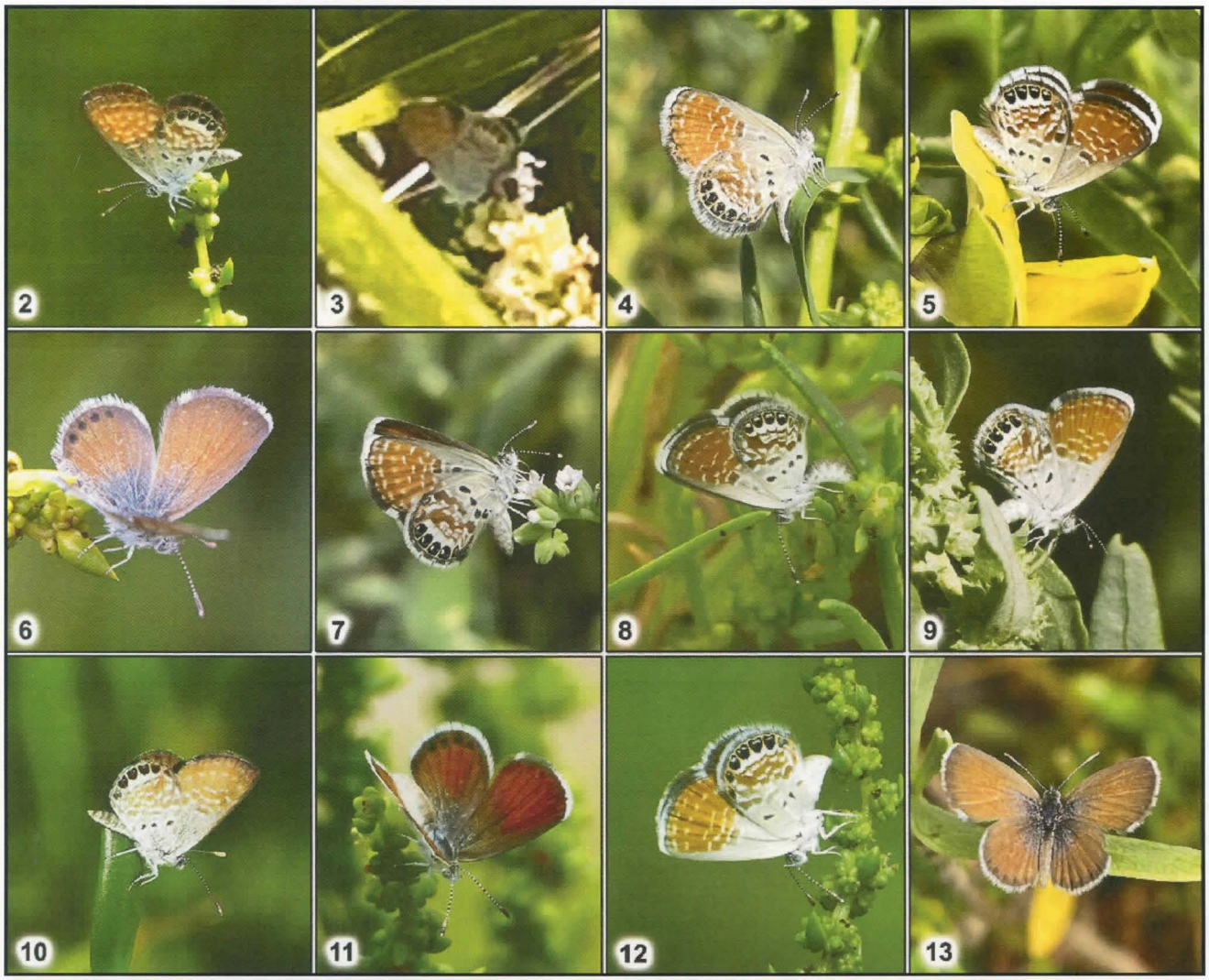
On 23 July 2022, while conducting a butterfly count at Fort De Soto Park, Pinellas County, Florida, several participants encountered about 200 pygmy-blue butterflies in the campground on St. Christopher Key. Some were photographed by Delia Smith and Rachel Sanchez (Fig. 1). Ron Smith (RS) returned to the area on 25 July to photograph more of the butterflies. He posted one of his images (Fig. 2) on iNaturalist and initially identified it as *Brephidium pseudofea* (eastern pygmy-blue), which is known to occur in the park. Harry Pavulaan, who has studied *Brephidium* in Florida and elsewhere, reviewed the image on iNaturalist and commented that it was "a typical Western Pygmy-Blue by all characters." Because this would be a significant new Florida state record and range extension, John Calhoun (JC) requested additional images from RS to confirm the identification. Upon receipt of the images, there was no doubt that *Brephidium exilis* (western pygmy-blue) had reached the Tampa Bay area of Florida, and it seemed to be established, at least temporarily. The butterflies were morphologically consistent with the nominotypical subspecies (*B. e. exilis*), rather than the West Indian *B. e. isophthalma*, which occurs in Cuba and the Bahamas.

We soon discovered that *B. exilis* was present in the Tampa Bay area at least three months earlier. On 29 April 2022, Liz Childress photographed what she believed was a single *B. pseudofea* nectaring at saw palmetto (*Serenoa repens*) near the visitor center at Weedon Island Preserve in southeastern Pinellas County. She posted an image (Fig. 3) on iNaturalist (2022), which JC identified as *B. exilis*, representing the first known record of this species in Florida. This suggested that *B. exilis* was more widely distributed in the area. Additional breeding populations were subsequently found, but two hurricanes and the seasonal senescence of food plants took a toll. By mid-October, *B. exilis* seemed to have disappeared from all but one known locality, which was still active in early December.

Fig. 1. Female *Brephidium e. exilis*, 23 July 2022, Ft. De Soto Park, Pinellas Co., Florida (R. Sanchez).

The circumstances surrounding the sudden arrival of *B. exilis* in the Tampa Bay area remain a mystery, and its continued presence is uncertain. It has possibly been established in central Florida for several years, but went unnoticed until it colonized Fort De Soto Park, where butterfly counts are routinely conducted. Winter weather in the Tampa Bay area has been relatively mild over the past several years, and it has not dipped below freezing in Pinellas County since January 2018 (Weather Spark 2022). Local populations of *B. exilis* would likely perish if exposed to freezing temperatures.

Additional records. On 26 July 2022, Donald Fraser found 15-20 *B. exilis* at the northern tip of Honeymoon Island State Park, Pinellas County, almost 30 mi (48 km) north of Fort De Soto Park (D. Fraser pers. Comm.). On 2 August 2022, JC located a sizable



Figs. 2-13. *Brephidium e. exilis* in Florida in 2022 (nos. 2-12 from Pinellas Co.). 2, male, Fort De Soto Park, 25 July (R. Smith). 3, female (?) nectaring on saw palmetto, Weedon Island Preserve, 29 April; first known Florida record (L. Childress). 4, female perching, Honeymoon Island, 2 August (J. Calhoun). 5, female nectaring on hairypod cowpea, Dunedin Causeway, 8 August (J. Calhoun). 6, male basking, Belleair Causeway, 11 August (C. Evans). 7, female nectaring on seaside heliotrope, Dunedin Causeway, 8 August (J. Calhoun). 8, female ovipositing on sea blite, Gandy Bridge, 11 August (R. Smith). 9, female ovipositing on crested saltbush, Honeymoon Island State Park, 15 August (R. Smith). 10, male perching, Fort De Soto Park, 5 August (R. Smith). 11, female basking, Sunshine Skyway Bridge, 8 August (R. Smith). 12, female ovipositing on sea blite, Sunshine Skyway Bridge, 8 August (R. Smith). 13, male basking, Terra Ceia, Manatee Co., 29 August (J. Calhoun).

colony of *B. exilis*, consisting of several hundred individuals, along the southeastern shore of Honeymoon Island, just east of the entrance to the state park (Figs. 4, 14). The next day, JC found large numbers of the butterfly at several shoreline spots along the Dunedin Causeway, east of Honeymoon Island (Fig. 15). In these areas, as well as at Fort De Soto Park, the butterflies were closely associated with crested saltbush (*Atriplex pentandra*) and especially sea blite (*Suaeda linearis*) (Figs. 14-17). Both of these plant genera, in the Amaranthaceae (formerly Chenopodiaceae), serve as food plants of *B. exilis* in other parts of its range (Shapiro 1973, Robinson et al. 2002).

During August 2022, we conducted exhaustive searches of shoreline habitats in Pinellas County, as well as those in Citrus, Hillsborough, Levy, Manatee, and Pasco counties. As a result, we documented *B. exilis* at four additional locations in Pinellas County and two in northern Manatee County (Figs. 18-21). This includes several shoreline sites along the Sunshine Skyway Bridge crossing lower Tampa Bay. As news of the butterfly's discovery spread, other observers recorded *B. exilis* at additional spots in Fort De Soto Park. Specimens collected by JC confirmed that these populations represented the subspecies *B. e. exilis*.

Distribution. *Brephidium e. exilis* is a resident of lowland, arid, and disturbed habitats from Texas to California, south to Venezuela. It is known to periodically expand its range in spring and summer, reaching as far as Washington, Wyoming, Nebraska, and Missouri. Such immigrants are probably driven from their permanent breeding areas by strong winds and weather fronts (waif dispersal) (Pittaway et al. 2006). The species was accidentally introduced into Hawaii in the 1970s and it is now firmly established there (Riotte and Uchida 1978, Jamieson and Denny 2001). In the 1990s, *B. exilis* was inadvertently introduced into the Persian Gulf (Arabian Gulf) region, where it has since become locally common, feeding on both native and introduced plants (Pittaway et al. 2006, Pope and Nithyanandan 2014).

Brephidium exilis was first recorded in coastal Louisiana in 1970 (Mather 1971), and it has been more frequently recorded there in recent years (Marks 2018, iNaturalist 2022). On 30 July 2018, a male *B. exilis* in good condition was photographed at Mobile, Alabama (iNaturalist 2022), but no others were seen at the locality (C. Stempien pers. comm.). Although this species is considered to be a stray in Alabama (ABA 2022), a population was probably present in 2018.

Figs. 14-22. *Brephidium e. exilis* habitats in Florida in 2022 (all but no. 20 from Pinellas Co.). 14, Honeymoon Island, 2 August (J. Calhoun). 15, Dunedin Causeway, 3 August (J. Calhoun). 16, abundant sea blite, Fort De Soto Park, 1 October (R. Smith). 17, crested saltbush, Fort De Soto Park, 8 August (R. Smith). 18, salt flat (note sea blite in foreground), Belleair Causeway, 4 August (J. Calhoun). 19, sea blite patch, Gandy Bridge, 4 August (J. Calhoun). 20, salt flat (with abundant small sea blite), Terra Ceia, Manatee Co., 19 August (J. Calhoun). 21, sea blite along shoreline, Sunshine Skyway Bridge, 8 August (J. Calhoun). 22, Hurricane Ian impact to same locality shown in previous image, 10 October (J. Calhoun).

In Florida, JC searched many coastal parks and shorelines north to Cedar Key (Levy County) and south to Holmes Beach (Manatee County), but no other populations of *B. exilis* were found, despite the presence of seemingly suitable habitat in several areas. RS also explored along the coast in Taylor County, in the Big Bend region of Florida, without success. To date, there are no known Florida records of *B. exilis* north of Honeymoon Island (Pinellas County) or south of Terra Ceia (Manatee County). The species seemed to be confined to about 50 miles (80 km) of the west-central coast (Fig. 23).

Fig. 23. Map showing localities of *B. e. exilis* in Florida in 2022. Named counties without records are those searched unsuccessfully for the species.

The apparent lack of populations of *B. exilis* along the northwestern coast of Florida, and general scarcity of suitable habitat there, suggests that the species did not gradually spread around the Gulf of Mexico to the Tampa Bay area. More likely, strong winds associated with a storm system or weather front from the northwest conveyed *exilis* adults across the northern Gulf of Mexico. Other small species of Lepidoptera are known to travel great distances via wind-borne dispersal (e.g., Dantart et al. 2009). Temporary populations may regularly be established in the southeast, including Florida, but they are overlooked due to their localized nature and the inconspicuous size of the adult butterflies.

Habitat. In the Tampa Bay area, *E. exilis* was found only in coastal habitats, particularly salt flats and disturbed shorelines where sea blite and crested saltbush were abundant (Figs. 14-21). They preferred open patches of these plants that grew in the direct sun and were not shaded during the day by surrounding vegetation. This was observed in several areas where the butterflies swarmed around open patches of sea blite, while none were seen just a few feet away where the plants were partially shaded by mangroves. The butterflies favored more mature plants, 2-3 feet in height, though they were also found around shorter plants if they grew abundantly in open spaces. Although sea blite is an annual in the temperate zone, it is a long-lived annual or weak perennial in the subtropics. It is a pioneer, halophytic species, inhabiting a variety of coastal ecosystems that are seldom flooded by high tides (Lonard et al. 2016). In Florida, sea blite is frequent in salt marshes, strands, and salt flats of the peninsula, north to the central panhandle. Crested saltbush occurs in similar habitats along much of coastal Florida (Wunderlin et al. 2017). These plants often grow directly along the shoreline, at the upper edge of the wrack zone (Figs. 15-17, 21). Bigleaf sumpweed (*Iva frutescens*) sometimes occurs in the same areas and can be mistaken for sea blite, especially at a distance.

Populations of *B. exilis* were extremely localized, yet the tiny butterflies could be abundant where found, fluttering in small clouds around patches of sea blite and crested saltbush. Males spent most of day in search of females, which were less common and usually kept to the periphery of the food plants, where they oviposited on leaves and flowering terminal spikes (Figs. 8, 9, 12). Both males and females often perched and basked on the food plants (Figs. 4, 6, 10, 11, 13), and visited nearby flowers (Figs. 5, 7).

Nectar sources were always present around colonies of *B. exilis*. We observed adults nectaring at shoreline seapurslane (*Sesuvium portulacastrum*), turkey tangle fogfruit (*Phyla nodiflora*), seaside heliotrope (*Heliotropium curassavicum*) (Fig. 7), silverhead (*Blutaparon vermiculare*), beggarticks (*Bidens alba*), and hairypod cowpea (*Vigna luteola*) (Fig. 5). Shoreline seapurslane is reported as a food plant of *B. exilis* elsewhere (Scott 1986, Warren et al. 2022). Although it grows abundantly in many areas where *B. exilis* was found in the Tampa Bay area, we did not observe oviposition on this plant. At one site in late November and early December, males of *B. exilis* were seen patrolling for females around shoreline seapurslane, and both sexes were perching and nectaring on the plants. This may be a sign that this plant is fed upon if sea blite and crested saltbush are diminished or unavailable. However, some green sea blite was still available at that site, and no *B. exilis*

were seen around seapurslane at other localities where sea blite and crested saltbush had died back. Shoreline seapurslane serves as a food plant of the Hawaiian beet webworm (*Spoladea recurvalis*) and this moth can be very common around patches of the plant. It is easily mistaken for *B. exilis* in flight.

Flight period. *Brephidium exilis* is a year-round resident in the southwestern United States, where it is capable of producing up to eight or nine broods, one about every three weeks (Shapiro and Manolis 2007, James and Nunnallee 2011). In southern Louisiana, it has been recorded all year and is thought to produce multiple broods (Marks 2018). The total number of generations produced in Florida is unknown, but fresh adults were present from late July through early December, suggesting multiple, overlapping broods. In September, the number of *B. exilis* was down considerably from that observed in August. Despite searches into early December, the last known record at Fort De Soto Park was 15 October, when RS and others photographed a few individuals. It was not seen along the Dunedin Causeway after 16 October, when JC counted eight individuals around a couple of surviving sea blite plants. No *B. exilis* were found by JC anywhere on Honeymoon Island on 25 November. Only in a small, sheltered salt flat along the Belleair Causeway in Pinellas County (Fig. 18), where some green sea blite plants remained, was *B. exilis* still flying in early December.

In central California, *B. exilis* does not appear to diapause during the winter. It continues to reproduce in limited areas where food plants remain available. In spring, population levels increase until adults begin to disperse into additional habitats (Thacker 2004, Shapiro and Manolis 2007). The butterfly may employ a similar strategy to survive the winter in Florida, continuing to breed in small numbers where sea blite maintains a sufficient amount of green growth. With a burst of new food plant growth in spring and summer, broods of the butterfly may gradually increase in size, producing hundreds of individuals that spread to new areas on coastal winds. Numbers peak in late July-August, only to decline as food plants begin to die back in autumn. Of course, the presence of *B. exilis* in the Tampa Bay area may prove to be temporary. Population sites will continue to be monitored.

Hurricane impact. On 28 September 2022, Hurricane Ian made landfall in southwest Florida as a strong Category 4 storm. Although the highest winds remained south of the Tampa Bay area, gusts of up to 75 mph (121 kph) were reported as rainbands passed over the region. Many of the plants along the shore were damaged, including sea blite growing at the high tide line. Communities of sea blite are prone to burial or removal during storm surges (Lonard et al. 2016). After the hurricane, most of the sea blite at some localities was blown down or buried in debris, and very little remained green (Figs. 21, 22). On Honeymoon Island, where a large colony of *B. exilis* existed along the southeastern shoreline, food plants were heavily impacted by the storm and no butterflies were seen there on 7 October. Along the northern side of the Dunedin Causeway (where winds and tides had less impact), about a dozen *B. exilis* were observed on that date. No *B. exilis* were seen at several localities on 10 October, including along the eastern shores of the Sunshine Skyway Bridge and Fort De Soto Park, which were most affected by winds that blew unabated from the east/northeast across the open waters of Tampa Bay. The butterfly was still present in small numbers on the western shore of the park, where winds were less direct. We suspect that adults and early stages of *B. exilis* were forcibly extricated from patches of the plants by strong winds, driving rain, and tidal inundation.

Remnants of existing populations were possibly also affected by Hurricane Nicole, which passed over the Tampa Bay region as a tropical storm on 10 November after making landfall on the east coast of Florida as a Category 1 hurricane. Winds gusted from the north/northwest in excess of 50 mph (80 kph) in some coastal locations, with strong west winds and rain as the storm continued up the peninsula. This coincided with the seasonal senescence of the food plants, leaving no living crested saltbush and very little sea blite with green growth.

Taxonomic notes. The perceived relationship between the two North American species of pygmy-blues has shifted over the years, resulting in confusion over their scientific names. The western pygmy-blue was originally described as *Lycaena exilis* by Boisduval (1852) based on one male specimen (which Boisduval thought was a female) collected in 1850 or 1851 by P. J. M. Lorquin in the vicinity of San Francisco, California (Emmel et al. 1998). Two decades later, the eastern pygmy-blue was described as *Lycaena pseudofea* by Morrison (1873) based on three specimens captured in 1869 at Key West, Florida. However, Scudder (1876), believed that *pseudofea* was the same species as *Lycaena isophthalma*, which had been described eleven years earlier by Herrich-Schäffer (1862) from specimens collected in Cuba by J. Gundlach. Scudder (1876) also placed these species in their own genus, *Brephidium*. As a result, the eastern pygmy-blue was then known as *Brephidum isophthalma*.

Morphological differences led Comstock and Huntington (1943) to treat *isophthalma* as a West Indian subspecies of *B. exilis*, while recognizing the eastern pygmy-blue as a separate species named *B. pseudofea*. Most subsequent authors (e.g., Klots 1951, Brown and Heineman 1972, Riley 1975, Smith et al. 1994) agreed with this arrangement. However, checklists by dos Passos (1964) and Miller and Brown (1981) treated the eastern pygmy-blue as the subspecies *B. isophthalma pseudofea*. Scott (1986) went so far as to consider the eastern pygmy-blue as a subspecies of the western pygmy-blue, using the combination *B. exilis pseudofea*. This treatment was not widely accepted, as there is little evidence to suggest that they are conspecific (Opler and Warren 2002). In fact, genomic studies by Zhang et al. (2019) support their segregation. Most authors now recognize the eastern and western pygmy-blues as discrete species (*B. pseudofea and B. exilis*, respectively), as reflected by Pelham (2008, 2022). Nonetheless, some recent references (e.g., Glassberg 2017) identify the eastern pygmy-blue as *B. isophthalma*.

In an attempt to comply with the rules of zoological nomenclature, some authors prefer an alternative spelling of the name *exilis*. Article 31.2 of ICZN (1999) dictates that adjectival Latin species names must agree in gender with the generic names with which they are associated. In Latin, *Brephidium* is neuter, but *exilis* is feminine. As noted by Ferris (1989), the name *exilis* should therefore be amended to the neuter *exile*. However, this nomenclatural provision is extremely controversial and routinely ignored. In this case, the Latin *exilis* is an adjective meaning small or meagre, which certainly is appropriate for one of the world's smallest butterflies. We prefer the original spelling of *exilis* for historical reasons and because *exile* is too reminiscent of the English word "exile," though this also seems fitting given the species' propensity for being forcibly blown from its home.

The story behind the name *pseudofea* is also noteworthy. Several butterfly specimens captured by G. W. Belfrage near Waco, Texas, were described by Edwards (1871) as a new species named *Lycaena fea*. Edwards noted that *fea* is "allied to *Exilis* . . . of California." Two years later, Morrison (1873) described *Lycaena pseudofea*, noting that it was similar to Edwards' *fea*. Morrison therefore named his new butterfly *pseudofea* because it was a false (i.e., pseudo) *fea*. We now know that the specimens that Edwards described as *fea* were actually *B. exilis* (Brown 1970), which still occurs around Waco, Texas (Wauer (2006). The butterfly we know today as *Brephidium pseudofea* is, quite literally, a false *Brephidium exilis*.

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Literature Cited

ABA [Alabama Butterfly Atlas]. 2022. Webpage: https://alabama.butterflyatlas.usf.edu/.

Boisduval, J. B. A. D. de. 1852. Lepidoptères de la Californie. *Ann. Soc. Entomol. Fr.* (2)10:275-324.

Brown, F. M. 1970. The types of lycaenid butterflies named by William Henry Edwards. Part III. Plebejinae. With four neotypes established by John C. Downey. *Trans. Amer. Entomol. Soc.* 96-353-433.

Brown, F. M., and B. Heineman. 1972. *Jamaica and its butterflies*. E. W. Classey Ltd., London. xv+478 pp., 10 pls.

Comstock, W. P., and E. I. Huntington. 1943. Lycaenidae of the Antilles (Lepidoptera, Rhopalocera). *Ann. New York Acad. Sci.* 45:49-130.

Czaplak, D. and J. V. Calhoun. 2018. Antillean daggerwing in the Florida Keys. *S. Lepid. Soc. News* 40:87.

Dantart, J., C. Stefanescu, A. Avila, and M. Alarcón. 2009. Long-distance wind-borne dispersal of the moth *Cornifrons ulceratalis* (Lepidoptera: Crambidae: Evergestinae) into the northern Mediterranean. *Eur. J. Entomol.* 106:225-229.

dos Passos, C. F. 1964. *A synonymic list of the Nearctic Rhopalocera*. Lepid. Soc. Mem. No. 1. v+145 pp.

Edwards, W. H. 1871. Descriptions of new species of diurnal Lepidoptera found within the United States. *Trans. Amer. Entomol. Soc.* 3:205-216.

Emmel, J. F., T. C. Emmel, and S. O. Mattoon. 1998. *The types of California butterflies named by Jean Alphonse Boisduval: designation of lectotypes and a neotype, and fixation of type localities*. Pp. 3-36. *In* Emmel, T. C. (ed.), Systematics of western North American Butterflies. Mariposa Pr., Gainesville, Florida.

Ferris, C. D. 1989. *Supplement to: a catalogue/checklist of the butterflies of America north of Mexico*. Lepid. Soc. Mem. No. 3. vii+103 pp.

Glassberg, J. 2017. *A swift guide to butterflies of North America*. Second edition. 420 pp.

Herrich-Schäffer, G. A. W. 1862. Schmetterlinge aus Cuba. Corresp.-Bl. zool.-min. *Ver Regenburg* 16:141-143.

ICZN [International Commission on Zoological Nomenclature]. 1999. *International code of zoological nomenclature*. Fourth edition. The International Trust for Zool. Nomen., London, UK. xxix+306 pp.

iNaturalist. 2022. Online database. Webpage: https://www.inaturalist.org.

James, D. G., and D. Nunnallee. 2011. *Life histories of Cascadia butterflies*. Oregon St. Univ. Pr., Corvallis. 447 pp.

Jamieson, D., and J. Denny. 2001. *Hawai'i's butterflies and moths.: an identification guide to easily observed species*. Mutual Publ., Honolulu, Hawaii. xvii+94 pp.

Klots, A. B. 1951. *A field guide to the butterflies of North America, east of the Great Plains*. Houghton Mifflin Co., Boston, Massachusetts. xvi+349 pp., 40 pls.

Lonard, R. I., F. W. Judd, R. Stalter, and J. J. Brown. 2016. A review of the North American halophyte *Suaeda linearis* (Ell.) Moq. Pp. 73-84. *In* Khan, M., B. Boër, M. zturk, M. Clüsener-Godt, B. Gul, and S. W. Breckle (eds.), Sabkha ecosysems. Vol. V: the Americas. Tasks for Veg. Sci. 48. https://doi.org/10.1007/978-3-319-27093-7_5.

Marks, C. 2018. *Butterflies of Louisiana: a guide to identification and location*. Louisiana St. Univ. Pr., Baton Rouge. viii+462 pp.

Mather, B. 1971. Annual field season summary for 1970. Zone 6 – southeast. Louisiana. *News Lepid. Soc*. No. 3:4.

Miller, L. D., and F. M. Brown. 1981. *A catalogue/checklist of the butterflies of America north of Mexico*. Lepid. Soc., Mem. No. 2. vii+280 pp.

Minno, M. C., J. R. Slotten, D. Vollmar, and S. Kolterman. 2022. Two Caribbean butterflies new to Florida. *News Lepid. Soc.* 64:174-175.

Morrison, H. K. 1873. Notes on North American Lepidoptera. Bull. *Buffalo Soc. Nat. Sci*. 1:186-189.

Opler, P. A., and A. D. Warren. 2002. *Butterflies of North America. 2. Scientific names list for butterfly species of North America, north of Mexico.* Contrib. C. P. Gillette Mus. Arth. Div., Colorado St. Univ. 79 pp.

Pelham, J. P. 2008. *A catalogue of the butterflies of the United States and Canada: with a complete bibliography of the descriptive and systematic literature*. J. Res. Lepid. 40:i-xiv, 1-658.

Pelham, J.P. 2022. A catalogue of the butterflies of the United States and Canada. Revised 2 February 2022. Webpage: https://www.butterfliesofamerica.com/US-Can-Cat.htm.

Pittaway, A. R., T. B. Larsen, A. Legrain, J. Majer, Z. Weidenhoffer, and M. Gillet. z2006. The establishment of an American butterfly in the Arabian Gulf: *Brephidium exilis* (Boisduval, 1852) (Lycaenidae). *Nota Lepid*. 29:5-16.

Pope, M., and M. Nithyanandan. 2014. Record of the western pygmy blue butterfly *Brephidium exilis* (Boisduval, 1852) (Lepidoptera: Lycaenidae) from Sabah Al Ahmad Sea City, Kuwait. *J. Threatened Taxa*. 6:6723-6725.

Riley, N. D. 1975. *A field guide to the butterflies of the West Indies*. Demeter Pr, Boston, Massachusetts. 224 pp., 24 pls.

Riotte, J. C. E., and G. Uchida. 1978. Butterflies of the Hawaiian Islands. *J. Res. Lepid*. 17:33-39.

Robinson, G. S., P. R. Ackery, I. J. Kitching, G. W. Beccaloni, and L. M. Hernández. 2002. *Hostplants of the moth and butterfly caterpillars of America north of Mexico*. Mem. Amer. Entomol. Inst. 69:1-824.

Scott, J. A. 1986. *The butterflies of North America: a natural history and field guide*. Stanford Univ. Pr., Stanford, California. xiii+583 pp., 64 pls.

Scudder, S. H. 1876. Synonymic list of the butterflies of North America, north of Mexico. Part II. Rurales. Bull. *Buffalo Soc. Nat. Sci*. 3:98-129

Shapiro, A. M. 1973. Host records for *Brephidium exilis* (Lycaenidae). *J. Lepid. Soc*. 27:157-158.

Shapiro, A. M., and T. D. Manolis. 2007. *Field guide to butterflies of the San Francisco Bay and Sacramento Valley regions.* Univ. California Pr., Berkeley and Los Angeles. xiv+343 pp., 31 pls.

Smith, D. S., L. D. Miller, and J. Y. Miller. 1994. *The butterflies of the West Indies and South Florida*. Oxford Univ. Pr., New York. x+264 pp., 32 pls.

Thacker, P. D. 2004. California butterflies: at home with aliens. *BioScience* 54:182-187.

Warren, A. D., K. J. Davis, E. M. Stangeland, J. P. Pelham, K. R. Willmott, and N. V. Grishin. 2022. Butterflies of America. Webpage: http://www.butterfliesofamerica.com/.

Wauer, R. H. 2006. *Finding butterflies in Texas: a guide to the best sites.* Johnson Books, Boulder, Colorado. viii+327 pp.

Weather Spark. 2022. Interactive weather data. Webpage: https://weatherspark.com/.

Wunderlin, R. P., B. F. Hansen, and A. R. Franck. 2017. *Flora of Florida*. Volume IV. Dicotyledons, Combretaceae through Amaranthaceae. Univ. Pr. Florida, Gainesville. 400 pp.

Zhang, J., Q. Cong, J. Shen, P.A. Opler, and N.V. Grishin. 2019. Genomics of a complete butterfly continent. bioRxiv 829887.

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ALMOST A NEW RECORD: A MITE LARVA ON *PENESTOLA BUFALIS* (CRAMBIDAE) FOUND AND LOST

BY

LAWRENCE J. HRIBAR

Part of my job involves surveillance of species composition, relative abundance, and seasonal distribution of mosquitoes. This is accomplished by deployment of various kinds of traps. Often times a remarkable variety of bycatch is collected as well. As time permits, I have been examining the small moths for attached mites. I have found larval Erythraeidae, *Leptus* sp., on *Lygropia fusalis* (Hampson) (Lepidoptera: Crambidae) and *Pigritia* sp. (Blastobasidae) (Hribar 2020, 2022). A moth collected on 19 December 2022 on Long Key (Monroe County, Florida) was almost another record. A specimen of *Penestola bufalis* (Guenée) (Crambidae) had a small orange mite attached near the base of the wings. Unfortunately, the mite became dislodged and lost while I was attempting to remove it. Based on the color of the mite, I believe that it was another Erythraeidae, but I cannot be certain without the specimen. This would have been another host species record, although not a host family record. Hayden and Burnette (2022) recently reported on their efforts to rear *P. bufalis* in the laboratory; they provide details of this moth's biology in their article.

Literature Cited

Hayden, J.E. and K.M. Burnette, 2022. Rearing *Penestola bufalis* (Crambidae). *Southern Lepidopterists' News*, 44: 287-291.

Hribar, L.J., 2020. A parasitic mite larva (Acari: Erythraeidae) recovered from *Lygropia fusalis* (Hampson) (Lepidoptera: Crambidae). *Southern Lepidopterists' News*, 42: 127-128.

Hribar, L.J., 2022. A parasitic mite larva (Erythraeoidea: Erythraeidae) taken from a blastobasid moth (Gelechioidea: Blastobasidae) from Vaca Key, Florida. *Southern Lepidopterists' News*, 44: 259-261.

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DEPOSITION OF THE PARASITIC MITE LARVA (ERYTHRAEIDAE: *LEPTUS* SP.) TAKEN FROM A BLASTOBASID MOTH (BLASTOBASIDAE: *PIGRITIA* SP.) INTO THE FLORIDA STATE COLLECTION OF ARTHROPODS

BY

LAWRENCE J. HRIBAR

Previously I reported a larval Erythraeidae, *Leptus* sp., taken from a female *Pigritia* sp., Blastobasidae (Hribar 2022). The moth and its dissected genitalia were deposited into the Florida State Collection of Arthropods (accession number E2948-01-06142022-05408; dissection slide #6497). The mite specimen taken from the moth has been deposited into the Florida State Collection of Arthropods (FSCA), accession number E5541-01-12022022-10606. Thanks to Sam Bolton, FSCA, for his assistance.

Literature Cited

Hribar, L.J., 2022. A parasitic mite larva (Erythraeoidea: Erythraeidae) taken from a blastobasid moth (Gelechioidea: Blastobasidae) from Vaca Key, Florida. *Southern Lepidopterists' News*, 44: 259-261.

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RESPONSE TO VERNON A. BROU JR.'S ARTICLE ON THE GREAT PURPLE HAIRSTREAK (*ATLIDES HALESUS*)

BY

CRAIG W. MARKS

Vernon Brou recently published an article in the *Southern Lep Society's Newsletter* (Vol. 44 No. 3, Pgs. 317- 319) about Great Purple Hairstreaks (*Atlides halesus*, hereinafter referred to as "GPHS"), primarily, but not exclusively, in Louisiana (LA). While Vernon's articles addressing particular LA butterflies are always illuminating, on this occasion he chose to expand the scope of that article to include a critique of my book, *Butterflies of Louisiana*. I have determined a response is required.

Specifically, Vernon wrote:

"*Marks (2013) conjectures there are three broods in LA but furnishes no proof. Marks listed 22 parish records for A. halesus, though many of these, as others throughout this publication are second-hand information from amateurs, acquaintances, butterfly watchers, amateur butterfly counts and ever-changing temporary websites, consequently unconfirmed and undocumented hearsay stated as fact.*"

I'm going to first address Vernon's statement regarding my "conjecture" that the GPHS has 3 broods, "but offered no proof." Here is what I stated in my book, "My records reflect that this hairstreak is multi-brooded, flying from late Feb into Apr, then again in late May into June, and finally in Sept. I believe there are three broods." I read the flight data available to me as suggesting 3 broods. Vernon has suggested the data he had established that hairstreak had 4 broods. He may very well be right. My point is that I did provide a basis for my belief, what appeared to be 3 separate flight periods.

The parish distribution map that Vernon included within his article presented 17 parish records. That map was based, in part, on several articles cited at the end of that article (all of which were also included in the database on which I based my book). Of the 17 records he identified, only 2 were from those articles (Orleans and E. Baton Rouge). He referenced his records from St. Tammany Parish, but for the other 14, Vernon provided no supporting descriptions or references.

Vernon has criticized my records as being insufficiently supported because I relied on second-hand information. It appears to me that Vernon has also relied on second-hand information, selecting those records he has decided to accept without giving reasons for those decisions. I used the same methodology but with full disclosure, yet he has criticized my decisions without providing any specific examples of mistake on my part.

(Continue on next page)

I would next note that Vernon's research was incomplete. While I did identify 22 parish records for the GPHS in my book (published in 2018, not 2013 as Vernon suggested), I have since supplemented those records via three separate SLS Newsletter articles (Vol. 42 No. 1, Vol. 43 No. 1 and Vol. 44 No. 22). Within those articles, I have identified records in 8 additional parishes, for a current total of verified records in 30 parishes. Those additional parishes included Calcasieu, Ouachita, Catahoula, Evangeline, Jefferson, LaSalle, St. James and Livingston Parishes.

I use the word "verified" intentionally. The Evangeline record was my own, a 2016 sighting that I simply failed to discuss in my book but did include on the map. The Jefferson record was listed on BAMONA. The entry stated a photo had been submitted and verified by Nick Grishin. That was good enough for me to include it in my database.

For each of the remaining 6 sightings that I accepted as new parish records, I would note that each sighting was supported by the identity of the person making the report, a date, a location and a photo. Since GPHS are a unique hairstreak, not likely to be confused with anything else flying in LA, the presence of a photo was sufficient for my purposes. Frankly, if I am provided a date, location and picture by the person making the report, I don't see how it matters whether they are an amateur or an acquaintance, or on what website the sighting was posted.

By way of example, after the publication of my book I learned of sightings in Calcasieu, Ouachita and Catahoula. For Calcasieu, there was a post on iNaturalist of a sighting on 4/29/19 with a picture. For Ouachita, there was another post on iNaturalist of a sighting on 10/23/21, again with a photo. And for Catahoula, Phillip Wallace sent me a picture of a GPHS he photographed on 4/04/21 (I even included his photo within my SLS Newsletter article in Vol. 44 No. 2).

Getting back to the parish records in my 2018 book that Vernon declined to accept, they included records for Bossier, Desoto, East Feliciana, Grant, Avoyelles and Terrebonne Parishes. Vernon also suggested those additional records contained in my book may not be sufficient for recognition due to my reliance upon data from amateurs and/or acquaintances. The implication I take is that only professionals are qualified to identify a GPHS. The irony of Vernon's rational is that the East Feliciana record was by Michael Israel who has a Masters' degree in Entomology and did his PhD dissertation on the Butterflies of the Tunica Hills region. Yet, Vernon declined to recognize Israel's sighting in East Feliciana, without any reason given.

The Grant Parish and Avoyelles records were mine, and in each instance I took a specimen. I consider myself to be an amateur butterflier. Neither my education nor my work history qualify me as a "professional." Butterflies are my hobby, albeit a serious and consuming hobby. That said, I know what a GPHS looks like, I have the specimens to prove it.

The vast majority of the people who helped me gather the parish records database, fall into this same category. For example, the Bossier and Desoto records were by the late Jeff Trahan. He provided me with dates, locations and pictures of his sightings. In fact, he had multiple sightings in Bossier Parish. I did not then, nor did I ever question Jeff's ability to identify a particular butterfly. I acknowledge the record for Terrebone was by an individual unknown to me. I found it within the TLS' database, with applicable details to justify its inclusion.

(Continue on next page)

I recognize that Vernon may not have known of the specifics of those sightings by Israel, Trahan or myself, or of the TLS record. My point is that I knew of them because I did the research. I was in constant contact with Jeff Trahan as I knew he had been gathering records for several years and continued to do so. I reached out to Michael Israel after meeting him once at his home at the Asphodel Plantation in East Feliciana Parish, and he was kind enough to send me a great volume of data for that parish and West Feliciana Parish. I repeatedly searched the TLS database. Accordingly, my parish records database is based on 14 years of on-going field work and extensive research into other available sources of data. For example, Vernon was kind enough to allow me to spend a day researching his extensive collection, and I cited all of his past articles on various individual butterflies in LA, giving him full credit when I mentioned his data.

One of the reasons Vernon gave for not accepting the GPHS parish records listed in my book is that I have included the results of various LA NABA Fourth of July Counts. I don't know if he has ever participated in such a Count, but I have organized many. As a result, I know NABA has built in checks to better assure the Count results are accurate.

Of even more import, at least to me, are the people who have conducted the past counts in LA. Aside from the 3 to 4 I conduct annually, those counts have been conducted by experienced butterfliers like Gary Noel Ross (PhD), Linda Barber Auld (the NOLA Bug Lady), Charles Allen (PhD), Marty Floyd, and the late Jeff Trahan. I have complete confidence in their ability to recognize and report a GPHS during one of their counts, and, therefore I accepted the great majority of past LA Count results.

Had Vernon asked, I would have been more than happy to provide details on the additional GPHS records in my book. In fact, I can provide similar specifics for each species discussed in my book. Instead, Vernon chose, through vague innuendo, to suggest a lack of credibility for those records and, therefore, for my book. I consider Vernon's comments to both uniformed and incorrect.

As is probably reflected in the above comments, I was disappointed in Vernon's criticisms. After all, what we are dealing with is a hobby involving butterflies, not rocket science or brain surgery. And the species in particular is neither endangered, unusually rare or out of range. I have engaged in the pursuant and study of butterflies for over 30 years and continue to do so because it is fun. Working to compile the data for my book was a labor of love. When I completed my book, I was satisfied with the accuracy of what I reported. I remain so.

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We believe that these comments are fair in that Craig Marks was due a rebuttal for the comments that were made in Vernon Brou's article. However, lets all accept that this is the last time that we have such comments exchanged between Southern Lepidopterists' Society members. It is too bad that this has gone so far as to alienate two excellent productive lepidopterists. Their articles that they have contributed to the SLS NEWS has been very valuable to our Society. [J. Barry Lombardini, Editor; Jeffrey R. Slotten, Treasurer]

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REPORTS OF STATE COORDINATORS

Alabama: C. Howard Grisham, 573 Ohatchee Road, Huntsville, AL 35811, E-Mail: chgrisham@Comcast.net

Arkansas: Mack Shotts, 514 W. Main Street, Paragould, AR 72450, E-Mail: cshotts@grnco.net

David Rupe sent in the following report to Mack:

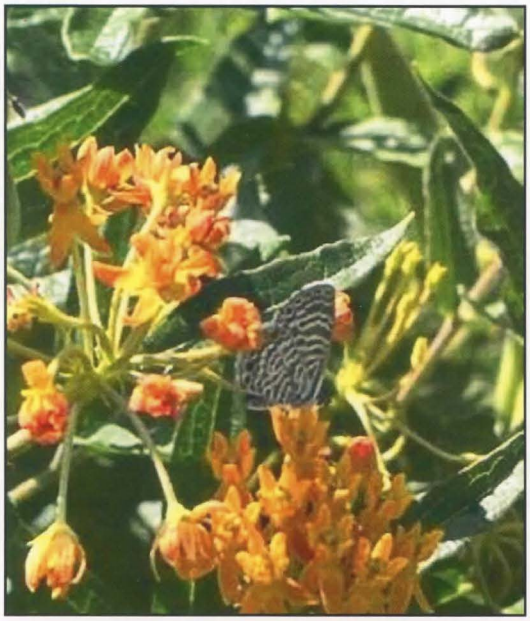
Been a long while since I've reported anything; however, I have a few interesting species that I have seen in my yard over the past few weeks that seem worth mentioning. These were all either photographed or collected at my residence at Crane Court, Fayetteville, Washington County, Arkansas. I've attached photos of some of the species.

Leptotes marina: July 18, 2022

Echinargus isola: July 18, 2022

Carmenta bassiformis: July 5, 2022

Amblyscirtes belli: July 18, 2022



Marine Blue *Leptotes marina* (July 18, 2022)

Reakirt's blue *Echinargus isola* (July 18, 2022)

Eupatorium borer moth or ironweed clearwing moth *Carmenta bassiformis* (July 5, 2022)

I've (David Rupe) got one more, but I'm not 100% sure about this one. Please take a look at the attached photo titled "buckeye". I collected this July 22, 2022, nectaring on Vitex. To my eye it looks like *Junonia evarete* (tropical buckeye), but I'm not completely convinced. It has several features consistent with *evarete* (or the subspecies *Junonia evarete zonalis*) although it seems to me that the common buckeye (*Junonia coenia*) is fairly variable. Let me know your thoughts about it. If it indeed is that species (*evarete*), certainly want to include in this list and report. Might be a state record, not sure.

David Rupe states that he is leaning towards the Tropical Buckeye, but just not certain. If a Tropical Buckeye this would be an Arkansas state record? Perhaps the members of the SL Society could drop David a line if they have a comment and/or opinion (dmrupe@att.net).

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David Rupe also states: Collected a Queen (*Danaus gilippus*), a worn male, in my front yard at Crane Court, Fayetteville, Arkansas, on October 14, 2022. Fairly rare find in northwest Arkansas.

Florida: Charles V. Covell Jr., 207 NE 9th Ave, Gainesville, FL 32601, E-Mail: covell@louisville.edu

Georgia: James K. Adams, 346 Sunset Drive SE, Calhoun, GA 30701, E-Mail: jadams@daltonstate.edu
(Please check out the GA leps website at: http://www.galelps.org/

Most records are from James Adams (JKA or no notation) and Lance Durden (LD). Other contributors are spelled out with the records. Most records are of first of the year specimens, uncommon species, county records, and records for new locations. Records are from 2022 unless otherwise specified.

Rocky Face Ridgeline, just south of Dalton, Whitfield Co.:
Oct. 24-25:
EREBIDAE: *Catocala carissima, C. robinsonii*. **NOCTUIDAE:** *Papaipema cataphracta, P. marginidens.*

Taylor's Ridge, 5 miles W Villanow, south of Hwy 136, Walker Co.:

Oct. 1-2:

DREPANIDAE: *Euthyatira cymatophoroides*. **EREBIDAE:** *Catocala robisonii, C. luctuosa, C. carissima.* **NOCTUIDAE:** *Papaipema polymniae, P. marginidens.*

Oct. 15-16:

EREBIDAE: Over 40 *Catocala* of seven species: *ilia, paleogama* (LATE), *lacrymosa, residua, luctuosa, vidua* and *robinsonii*. **NOCTUIDAE:** *Papaipema marginidens*, "*Platypolia*" *mactata.*

Crockford-Pigeon Mountain WMA, Walker Co., Oct. 7-8:

GEOMETRIDAE: *Xanthorhoe packardata* (COUNTY). **NOCTUIDAE:** *Papaipema cerussata, P. marginidens, P. insulidens, P. polymniae*, "*Platypolia*" *mactata, Anathix ralla.*

Statesboro, Bulloch Co., Lance Durden:

GEOMETRIDAE: *Sphacelodes vulneraria*, Nov. 12 (COUNTY). **NOCTUIDAE:** *Mouralia tinctoides*, Sept. 30 (see image) and Nov. 9, *Meropleon cosmion*, Nov. 12 (COUNTY).

Sapelo Island, McIntosh Co., Sept. 15-17:

PSYCHIDAE: *Basicladus tracyi* (island record). **TORTRICIDAE:** *Pelochrista quinquemaculana* (common). **PYRALIDAE:** *Macalla zelleri* (LATE). **CRAMBIDAE:** *Lineodes integra, Diaphania hyalinata, Condylorrhiza vestigialis* island record), *Pyrausta inornatalis*. LYCAENIDAE: *Hemiargus ceraunus*. **SATURNIIDAE:** *Citheronia sepucralis* (LATE). **GEOMETRIDAE:** *Leptostales laevitaria, Hypomecis umbrosaria* (LATE). **NOTODONTIDAE:** *Heterocampa umbrata, Dasylophia puntagorda*. **EREBIDAE:** *Pygarctia abdominalis, Eublemma recta* (STATE), *Zale obliqua* (LATE), *Zale declarans*. **NOCTUIDAE:** *Litoprosopus futilis* (LATE), *Acronicta lobeliae* (LATE), *Heliocheilus lupatus* (common), *Schinia saturata, S. sanguinea, S. tuberculum, S. petulans*, *Callopistria floridensis* (second island record), *C. cordata* (LATE).

***Mouralia tinetoides* (Lance Durden, September 30, 2022).**

Louisiana: Michael Lockwood, 215 Hialeah Avenue, Houma, LA 70363, E-Mail: mikelock34@hotmail.com

White Peacock (*Anartia jatrophae*), 17 October 2022, Terrebonne Parish, Houma, Louisiana, Parish Record Terrebonne Parish.

Michael Lookwood sends in the photo and quote ; "*No photo in wild, only on table*".

Mississippi: Ricky Patterson, 400 Winona Rd., Vicksburg, MS 39180, E-Mail: rpatte42@aol.com

Ricky sent in the following report on November, 2022 — Records by Ricky Patterson unless otherwise specified:

12 September 2022, Sandhill Crane NWR, Jackson county, MS:
Cercyonis pegala pegala, Euphyes arpa, tryrone arogos arogos, Polites otho otho, Anatrytone logan logan, Nastra lherminier, Neonympha areolatus areolatus, Polites themistocles themistocles, Euptoieta Claudia.

12 September 2022, Grand Bay NWR, Jackson county, MS:
Euphyes dion alabamae, Euphyes berryi, Euphyes pilatka pilatka, Anatrytone logan logan,

North Carolina: Harry LeGrand, 1109 Nichols Drive, Raleigh, NC 27605, E-Mail: hlegrandjr@gmail.com

FALL BUTTERFLY RECORDS FOR NORTH CAROLINA – 2022
by Harry LeGrand

Records are from September through November 15, 2022, except as indicated. Names in parentheses are counties; when in bold, a first county record.

The fall season continued to be mostly dry and warmer than usual, and with many sunny days, conditions for getting afield were excellent. There were one or two tropical systems that dumped considerable rain, mostly in the mountains. However, no one complained about poor conditions for butterflies on a local scale.

The butterfly problem was a continuation from summer: a scarcity of southern or western migrants moving into the state. Though reports of Vanessa cardui increased in fall, they were still uncommon, with many statewide reports but nearly all just of a single individual. There was only one report each of Heliconius charithonia and Calpodes ethlius, thanks to photo reports on iNaturalist. The state did continue with a few reports of Burnsius oileus, a pleasant trend for a few years, and it now seems to be a resident in the southeastern counties.

PAPILIONIDAE:
Heraclides cresphontes, there were a number of reports away from their main coastal and montane range. Chatham County again had several reports this season – one in the southwestern portion on September 1 (Parker Backstrom) and two near Pittsboro on September 4 (Debbie Roos). One was seen by Loretta Lutman in her Asheboro (Randolph) yard on September 8. Breeding has previously been confirmed in both of these counties. On the other hand, one photographed in **Durham** on September 21 by Georgia Dabinett was a first for that heavily worked county.

PIERIDAE:
Pyrisitia lisa, though sightings picked up across the state from the summer, it remained scarce – typically just a single individual seen on a trip -- except in the Sandhills, where there were several counts of 20 or more.

Pontia protodice, there were several reports for the season, about average in recent years; most notable was one photographed in the Mud Creek area of **Henderson** by Marilyn Westphal on September 17.

NYMPHALIDAE:
Danaus gilippus, John Taggart had a good count of six at its usual stronghold at Fort Fisher (New Hanover), on September 27. Most surprising, and a very rare report for the northern half of the coast, was one seen by Taylor Piephoff at Cape Hatteras (Dare) on October 21.

Heliconius charithonia, after a flurry of state records in both 2020 and 2021, there was just a single fall report for 2022 – one photographed far inland near Rutherfordton (Rutherford) on October 8, by an unnamed person, who submitted the photo to iNaturalist.

Polygonia faunus, the scarcity of this species at Mount Mitchell State Park (Yancey) continued again this fall, as Sven Halling was the only person to report it, one on September 21. Seemingly at a low elevation was one photographed

near Marshall (**Madison)** on September 9, by Elizabeth McPherson. This species seems to be succumbing to global warming and the loss of Eastern Hemlock; though the conifer is not a hostplant, the butterfly is/was often found associated with hemlocks presumably as they provided a cool microclimate for this "Northern" species.

Vanessa cardui, thankfully there were a few dozen records across the state this fall. However, nearly all reports were of a single individuals. In better years, observers can report five or more individuals at a site.

Anartia jatrophae, a belated report was of one photographed at Oak Island (**Brunswick**) on October 22, 2021, by Cole Tiemann. There are fewer than 20 state records, typically just a single report every 2-3 years. However, few butterfliers live along and near the southern coast, where strays such as this species are most likely to be found. Thankfully, there are plenty of local or other photographers who visit coastal areas and submit photographs of any butterfly to iNaturalist. Thus, this website database is becoming more valuable in helping to document our state's butterfly distribution, such as this important record.

Chlosyne nycteis, more than 40 miles outside the known range, three were seen by Mike Turner along the Cape Fear River near Tar Heel (**Bladen**) on September 10. Undoubtedly, this species is slowly spreading downriver along a few brownwater floodplains into the Coastal Plain – previously along the Roanoke River into Bertie County, and now along the Cape Fear system. However, it has not yet been found in Cumberland County, which lies between Bladen and the previous downriver site in Harnett County.

HESPERIIDAE:

Pholisora catullus, one seen by Nick Flanders in **Hertford** on September 5 was a rare report for the far northeastern part of the state.

Burnsius oileus, this increasing species was photographed twice this fall: singles by Vanessa Roberts near Whiteville (Columbus) on September 7, and by Amy Padgett in **Bladen** on October 18. Padgett also photographed another in that latter county on October 27, 2021, though this editor was not made aware of it until this fall.

Euphyes berryi, the only seasonal report was one photographed by Audrey Whitlock in southern Dare County, at a known site, on September 16.

Euphyes dukesi, Nick Flanders saw three in a previously known colony near Waterlily (Currituck) on September 24. Audrey Whitlock checked on this population, and photographed one there on the quite late date of October 11; the previous late state date was September 24 (in 2010).

Hesperia leonardus, again the only record was one photographed by Pete Dixon in Madison County, on September 9. It has been a handful of years since any have been reported from the eastern Piedmont, a former stronghold for the species. Recent records have only been from the mountains, suggestive of global warming issues.

Hesperia meskei, the first recent record for Onslow County was one photographed by Mark Shields at Stones Creek Game Land on September 25. The species is very rare east of its Sandhills region stronghold.

Poanes aaroni, Audrey Whitlock and Al Hooks found the species at several sites in Dare County, where previously known, but recent reports have been sparse owing mainly to observer apathy. From September 2-16 they noted singles at the Roanoke Island Visitor Center, near Stumpy Point, and in Alligator River National Wildlife Refuge in the southern part of the county. Though brackish marshes lie close to the visitor center, the sighting of this species on lantana planted at the center must have been a surprise!

Copaeodes minima, a count of 42 made by Mike Turner near Tar Heel (Bladen) on September 10 was one of the better state totals.

Calpodes ethlius, this species was disturbingly scarce this fall, with only a single report of an adult, one photographed in the mountains – of all places – at Swannanoa (Buncombe) on August 31 by A. Hamernik. There were eight state reports in 2021 and many in 2020, so the near absence in 2022 makes little sense.

South Carolina: Brian Scholtens, College of Charleston, Charleston, SC 29424, E-Mail: scholtensb@cofc.edu

Brian sends in the following South Carolina Fall 2022 records:

Tom Austin – Parris Island, Beaufort Co., `20 Aug 22

Pieridae:
Ascia monuste

Tom Austin – Edisto Island, Charleston Co., 26 Aug 22

Pieridae:
Ascia monuste

Richard Hughes and Alison Smith – Hyde Park Rd. & Edisto Island, Charleston Co., 27 Aug 22

Papilionidae:
Pterourus palamedes
Pterourus glaucus
Heraclides cresphontes
Pieridae:
Phoebis sennae
Abaeis nicippe
Pyrisitia lisa
Nymphalidae:
Heliconius charithonius
Dione incarnata
Phyciodes tharos
Cercyonis pegala
Lycaenidae:
Strymon melinus
Calycopis cecrops
Cupido comyntas
Hesperiidae:
Epargyreus clarus
Urbanus proteus
Erynnis zarucco
Burnsius oileus
Nastra lherminier
Hylephila phyleus
Atalopedes campestris
Polites vibex
Poites otho
Euphyes dion
Oligoria maculata
Lerema accius

Dennis & Donna Forsythe - Hyde Park Rd., Charleston Co., 31 Aug 22

Papilionidae:
Pterourus palamedes
Pterourus glaucus
Pieridae:
Phoebis sennae
Abaeis nicippe
Pyrisitia lisa
Nymphalidae:
Heliconius charithonius
Dione incarnata
Polygonia interrogationis
Junonia coenia
Phyciodes tharos
Lycaenidae:
Calycopis cecrops
Celastrina neglecta
Hesperiidae:
Epargyreus clarus
Urbanus proteus
Erynnis horatius
Burnsius oileus
Hylephila phyleus
Polites origenes
Polites themistocles
Poites otho
Euphyes dion
Euphyes vestris
Problema byssus
Amblyscirtes aesculapius
Nastra lherminier
Oligoria maculata
Panoquina ocola

Dave & Marty Kastner - Wateree River HP/WMA, 9 Sep 22

Papilionidae:
Pterourus palamedes
Pterourus glaucus
Pterourus troilus
Eurytides marcellus
Pieridae:
Phoebis sennae
Abaeis nicippe
Pyrisitia lisa
Zerene cesonia
Nymphalidae:
Dione incarnata
Euptoieta claudia
Phyciodes tharos
Polygonia comma
Polygonia interrogationis
Vanessa atalanta
Junonia coenia
Limenitis arthemis astyanax
Limenitis archippus
Asterocampa celtis
Asterocampa clyton
Lethe appalachia
Hermeuptychia sosybius

Lycaenidae:
Strymon melinus & larva
Cupido comyntas
Hesperiidae:
Achalarus lyciades
Thorybes bathyllus
Urbanus proteus
Erynnis zarucco
Erynnis horatius
Burnsius albescens
Burnsius oileus
Hylephila phyleus
Euphyes vestris
Euphyes dion
Lon zabulon
Lerema accius
Panoquina ocola

Richard Stickney – US 17 and Purrysburg Rd., Jasper Co., 12 Sep 22
Papilionidae:
Pterourus glaucus
Pterourus troilus
Pieridae:
Phoebis sennae
Pyrisitia lisa
Abaeis nicippe
Lycaenidae:
Strymon melinus
Calycopis cecrops
Nymphalidae:
Heliconius charithonius
Dione incarnata
Phyciodes tharos
Junonia coenia
Danaus plexippus
Hesperiidae:
Epargyreus clarus
Urbanus proteus
Erynnis horatius
Hylephila phyleus
Polites vibex
Pompeius verna
Panoquina ocola
Problema byssus
Euphyes vestris
Poanes viator
Oligoria maculata
Amblyscirtes aesculapius
Lerodea eufala
Lerema accius

John Demko, Dave & Marty Kastner – Etheredge Millpond, North, S C, 16 Sep 22
Papilionidae:
Pterourus palamedes
Pterourus glaucus
Pterourus troilus
Battus philenor
Pieridae:
Phoebis sennae
Abaeis nicippe
Pyrisitia lisa
Lycaenidae:
Strymon melinus
Nymphalidae:
Dione incarnata
Junonia coenia
Limenitis arthemis astyanax
Hesperiidae:
Achalarus lyciades
Erynnis horatius
Burnsius oileus
Ancyloxypha numitor
Hylephila phyleus
Polites vibex
Polites themistocles
Polites otho
Euphyes vestris
Lerema accius
Lerodea eufala

Dennis and Donna Forsythe – Calhoun Co. east, 17 Sep 22
Papilionidae:
Pterourus palamedes
Pterourus glaucus
Pieridae:
Phoebis sennae
Pyrisitia lisa
Abaeis nicippe
Pieris rapae
Nymphalidae:
Dione incarnata
Euptoieta claudia
Limenitis archippus
Limenitis arthemis astyanax
Vanessa cardui
Junonia coenia
Hesperiidae:
Epargyreus clarus
Urbanus proteus
Burnsius albescens
Hylephila phyleus
Polites vibex
Panoquina ocola

Dennis and Donna Forsythe – Rutledge Rd., FR 204, FR 204D, 21 Sep 22
Papilionidae:
Pterourus palamedes
Pieridae:
Phoebis sennae
Pyrisitia lisa

Abaeis nicippe
Ascia monuste
Lycaenidae:
Strymon melinus
Riodinidae:
Calephelis virginiensis
Nymphalidae:
Heliconius charithonius
Dione incarnata
Phyciodes tharos
Junonia coenia
Hesperiidae:
Urbanus proteus
Burnsius oileus
Hylephila phyleus
Anatrytone logan
Euphyes vestris
Panoquina ocola

Dave & Marty Kastner - Timmerman Trail, Cayce, SC, 27 Sep 22
Pieridae:
Phoebis sennae
Abaeis nicippe
Pyrisitia lisa
Lycaenidae:
Strymon melinus
Nymphalidae:
Dione incarnata
Phyciodes tharos
Vanessa virginiensis
Junonia coenia
Limenitis arthemis astyanax
Limenitis archippus
Asterocampa celtis
Lethe portlandia
Hermeuptychia sp.
Cyllopsis gemma
Hesperiidae:
Urbanus proteus
Burnsius albescens
Hylephila phyleus
Polites vibex
Lerema accius
Lon zabulon
Amblyscirtes aesculapius

Dave & Marty Kastner – Congaree Creek HP area and Old State Road, Cayce, Lexington Co., SC, 27 Sep 22
Papilionidae:
Eurytides marcellus
Pieridae:
Phoebis sennae
Abaeis nicippe
Lycaenidae:
Strymon melinus
Nymphalidae:
Dione incarnata
Euptoieta claudia
Phyciodes tharos
Vanessa virginiensis
Limenitis arthemis astyanax
Limenitis archippus
Asterocampa celtis
Anaea andria - larvae
Hermeuptychia sp.
Hesperiidae:
Epargyreus clarus
Urbanus proteus
Erynnis zarucco
Burnsius albescens
Burnsius oileus
Lerema accius
Panoquina ocola

JN Chandler – Aiken Co., SC, 10 Oct 22, photo documentation
Geometridae:
Eupithecia peckorum

Alison Smith, Dennis & Donna Forsythe, Dave & Marty Kastner –Fort Moultrie, Charleston Co., 16 Oct 22
Pieridae:
Phoebis sennae
Pyrisitia lisa
Abaeis nicippe
Nymphalidae:
Dione incarnata
Phyciodes phaon
Junonia coenia
Danaus plexippus
Hesperiidae:
Urbanus proteus
Hylephila phyleus
Panoquina ocola

Dennis Forsythe – Grice Marine Lab, James Island, Charleston Co., 20 Oct 22
Pieridae:
Phoebis sennae
Pyrisitia lisa
Nymphalidae:
Dione incarnata
Phyciodes phaon
Junonia coenia
Hesperiidae:
Urbanus proteus
Hylephila phyleus
Panoquina panoquin
Panoquina ocola

Carolina Butterfly Society trip – Wateree River HP/WMA, 22 Oct 22

Pieridae:
- *Phoebis sennae*
- *Abaeis nicippe*
- *Pyrisitia lisa*
- *Zerene cesonia*

Nymphalidae:
- *Heliconius charithonius*
- *Dione incarnata*
- *Euptoieta claudia*
- *Phyciodes tharos*
- *Vanessa virginiensis*
- *Junonia coenia*
- *Limenitis archippus*
- *Lethe appalachia*
- *Cyllopsis gemma*
- *Hermeuptychia sp.*

Lycaenidae:
- *Calycopis cecrops*

Hesperiidae:
- *Epargyreus clarus*
- *Urbanus proteus*
- *Burnsius albescens*
- *Burnsius oileus*
- *Lerodea eufala*
- *Hylephila phyleus*
- *Euphyes vestris*
- *Lerema accius*
- *Panoquina ocola*

Dennis and Donna Forsythe – Pinckney Park, James Island, Charleston Co., 26 Oct 22

Pieridae:
- *Phoebis sennae*
- *Pyrisitia lisa*

Nymphalidae:
- *Dione incarnata*
- *Vanessa virginiensis*
- *Junonia coenia*
- *Danaus plexippus*

Lycaenidae:
- *Hemiargus ceraunus*

Hesperiidae:
- *Burnsius albescens*
- *Burnsius oileus*
- *Hylephila phyleus*
- *Panoquina ocola*

Dave & Marty Kastner – Wateree River HP/WMA, 4 Nov 22

Papilionidae:
- *Papilio palamedes larvae*

Pieridae:
- *Pieris rapae*
- *Phoebis sennae*
- *Abaeis nicippe*
- *Pyrisitia lisa*
- *Zerene cesonia*

Nymphalidae:
- *Dione incarnata*
- *Euptoieta claudia*
- *Phyciodes tharos*
- *Junonia coenia*
- *Hermeuptychia sp.*

Lycaenidae:
- *Calycopis cecrops*

Hesperiidae:
- *Urbanus proteus*
- *Burnsius albescens*
- *Burnsius oileus*
- *Hylephila phyleus*

Dennis and Donna Forsythe – Folly Island, Charleston Co., 5 Nov 22

Pieridae:
- *Phoebis sennae*
- *Pyrisitia lisa*

Nymphalidae:
- *Heliconius charithonius*
- *Dione incarnata*
- *Vanessa atalanta*

Lycaenidae:
- *Leptotes cassius*

Hesperiidae:
- *Urbanus proteus*
- *Burnsius albescens*
- *Hylephila phyleus*
- *Panoquina panoquin*

Doug Allen – Windmill Hill, Inman, Spartanburg, Co., 7 Nov 22

Nymphalidae:
- *Heliconius charithonius*

Dave & Marty Kastner - Timmerman Trail and Old State Road, Cayce, SC, 12 Nov 22

Pieridae:
- *Phoebis sennae*
- *Abaeis nicippe*

Nymphalidae:
- *Dione incarnata*
- *Euptoieta claudia*
- *Phyciodes tharos*
- *Polygonia interrogationis*
- *Vanessa virginiensis*
- *Vanessa cardui*
- *Junonia coenia*
- *Limenitis archippus*

Hesperiidae:
- *Urbanus proteus*
- *Burnsius albescens*
- *Burnsius oileus*
- *Hylephila phyleus*

Dennis and Donna Forsythe – Francis Marion NF, locations in Charleston and Berkeley Cos., 12 Nov 22

Pieridae:
Phoebis sennae
Pyrisitia lisa
Abaeis nicippe
Nymphalidae:
Dione incarnata
Phyciodes tharos
Danaus plexippus
Riodinidae:
Calephelis virginiensis
Hesperiidae:
Urbanus proteus
Problema byssus
Panoquina ocola

Dennis Forsythe – Pinckney Park, James Island, Charleston Co., 18 Nov 22

Pieridae:
Phoebis sennae
Pyrisitia lisa
Nymphalidae:
Dione incarnata
Vanessa cardui
Junonia coenia
Lycaenidae:
Hemiargus ceraunus

Tennessee: John Hyatt, 233 Park Ridge Court, Kingsport, TN 37664, E-Mail: jkshyatt@centurylink.net

Texas: Terry Doyle, 13310 Bar C Drive, San Antonio, TX 782253, E-Mail: tdoyle335@yahoo.com
Stuart Marcus, P.O. Box 463 Liberty, TX 77575, E-Mail: stuartmarcus13@gmail.com
Stuart sends in the following report:

Moths for Trinity River National Wildlife Refuge
Liberty County, TX (Aug 1 2022 through Oct 31, 2022)

The following moths were seen at least once during the month indicated on sheets using black and mercury vapor lights at Trinity River National Wildlife Refuge. If you would like any photographs or phenology data dating back to 2012, please let me know at stuart.marcus13@gmail.com.

ATTEVIDAE
Atteva aurea Aug, Sept, Oct

AUTOSTICHIDAE
Gerdana caritella Sept, Oct
Glyphidocera juniperella Aug, Sept
Glyphidocera lactiflosella Aug, Oct

BLASTOBASIDAE
Blastobasis glandulella Aug
Hypatopa punctiferella Sept, Oct
Pigritia sp. Sept, Oct

BOMBYCIDAE
Apatelodes torrefacta Aug

BUCCULATRICIDAE
Bucculatrix sp. Sept

COLEOPHORIDAE
Coleophora cratipennella Aug, Oct
Coleophora querciella Sept
Coleophora sp. Aug, Sept

COSMOPTERIGIDAE
Cosmopterix sp. Sept, Oct
Euclemensia bassettella Aug, Sept
Limnaecia phragmitella Oct
Triclonella bicoloripennis Aug, Sept, Oct

COSSIDAE
Givira anna Aug, Sept
Givira arbeloides Aug

CRAMBIDAE
Achyra rantalis Aug, Sept, Oct
Aethiophysa invisalis Aug, Sept
Anageshna primordialis Aug, Sept, Oct
Argyria lacteella Aug, Sept, Oct
Carectocultus perstrialis Sept
Chrysendeton medicinalis Aug, Sept
Crambus quinquareatus Aug, Oct
Crambus satrapellus Sept
Desmia sp. Aug, Sept, Oct
Diaphania hyalinata Sept
Diasemiopsis leodocusalis Aug, Sept
Diastictis fracturalis Aug, Sept, Oct
Diatraea lisetta Aug, Sept, Oct
Dicymolomia julianalis Sept, Oct
Donacaula sp. Aug, Oct
Elophila gyralis Sept, Oct
Elophila obliteralis Aug, Sept, Oct
Elophila tinealis Aug, Sept, Oct
Eoreuma densellus Sept, Oct

Epipagis fenestralis Aug, Sept, Oct
Euchromius ocellea Aug, Oct
Eudonia strigalis Aug, Oct
Fissicrambus sp. Aug, Sept, Oct
Glaphyria glaphyralis Aug
Glaphyria sesquistrialis Aug, Sept
Herpetogramma bipunctalis Sept
Herpetogramma fluctuosalis Sept
Herpetogramma phaeopteralis Aug, Sept, Oct
Herpetogramma theseusalis Oct
Hyalorista taeniolalis Sept, Oct
Hymenia perspectalis Aug, Sept, Oct
Lamprosema victoriae Aug, Sept, Oct
Lineodes fontella Sept
Lineodes integra Oct
Lipocosma septa Sept
Marasmia trapezalis Aug, Sept, Oct
Microcrambus biguttellus Aug
Microcrambus elegans Aug, Sept
Microcrambus kimballi Aug, Sept
Microcrambus sp. Oct
Niphograpta albiguttalis Sept, Oct
Nomophila nearctica Sept, Oct
Oenobotys vinotinctalis Aug
Ostrinia penitalis Aug, Oct
Palpita atrisquamalis Oct
Palpita freemanalis Aug, Sept, Oct
Palpita magniferalis Aug, Sept
Parapediasia decorellus Aug, Sept, Oct
Parapediasia teterrellus Aug, Sept, Oct
Parapoynx allionealis Aug, Sept, Oct
Parapoynx diminutalis Sept, Oct
Parapoynx obscuralis Aug
Pyrausta acrionalis Aug
Pyrausta laticlavia Aug
Pyrausta tyralis Aug, Sept, Oct
Raphiptera argillaceellus Oct
Rupela tinctella Aug, Sept
Samea baccatalis Aug, Sept, Oct
Samea ecclesialis Aug, Sept, Oct
Samea multiplicalis Sept, Oct
Spoladea recurvalis Aug, Sept, Oct
Stegea sp. Sept
Udea rubigalis Oct
Uresiphita reversalis Oct
Urola nivalis Aug, Sept, Oct
Vaxi critica Sept

DEPRESSARIIDAE
Antaeotricha leucillana Aug, Sept, Oct
Eupragia hospita Sept
Psilocorsis sp. Sept

EREBIDAE
Amolita obliqua Oct
Anomis illita Oct
Anticarsia gemmatalis Aug, Sept, Oct
Apantesis phalerata Sept, Oct
Bleptina caradrinalis Oct
Caenurgina erechtea Oct
Catocala agrippina Aug
Catocala carissima Oct
Catocala maestosa Sept, Oct
Cisseps fulvicollis Aug, Sept, Oct
Cisthene packardii Sept, Oct
Cisthene plumbea Aug, Sept, Oct
Colobochyla interpuncta Sept
Crambidia pallida Aug, Sept
Cutina albopunctella Aug
Cutina aluticolor Aug, Sept
Cutina distincta Sept
Dasychira meridionalis Aug, Sept, Oct
Dasychira tephra Sept
Doryodes sp. Oct
Estigmene acrea Aug, Sept
Eublemma minima Oct
Eublemma recta Oct
Eubolina impartialis Sept
Gabara distema Aug
Halysidota sp. Aug, Sept
Hemeroplanis sp. Aug, Sept
Hypena scabra Oct
Hypercompe scribonia Aug, Sept
Hyperstrotia flaviguttata Sept
Hypocala andremona Oct
Hypoprepia fucosa Sept
Hypsoropha hormos Aug
Idia americalis Aug, Sept, Oct
Isogona tenuis Sept, Oct
Ledaea perditalis Sept
Lesmone detrahens Sept
Melipotis cellaris Oct
Metalectra discalis Aug, Sept
Metalectra sp. Sept
Mocis marcida Sept
Orgyia leucostigma Oct
Palthis angulalis Oct
Palthis asopialis Aug, Sept, Oct
Panopoda carneicosta Aug, Sept, Oct
Panopoda rufimargo Aug, Sept, Oct
Phalaenostola larentioides Oct
Phyprosopus callitrichoides Aug
Ptichodis vinculum Aug, Sept
Pyrrharctia isabella Aug, Oct
Schrankia macula Oct
Scolecocampa liburna Aug
Selenisa sueroides Oct
Simplicia cornicalis Oct
Spilosoma congrua Aug, Sept
Tetanolita floridana Aug, Sept
Tetanolita mynesalis Sept, Oct
Virbia laeta Aug, Sept, Oct
Zale lunata Oct

EUTELIIDAE
Paectes abrostoloides Oct

GELECHIIDAE
Anacampsis New Sp - 420495.96 Aug
Aristotelia corallina complex Aug, Oct
Aristotelia fungivorella Oct
Aristotelia sp. Aug, Oct
Battaristis undescribed - Battaristis n. sp. - 420470.96 Sept
Dichomeris kimballi Oct
Dichomeris sp. Oct
Helcystogramma chambersella Aug, Sept, Oct
Neodactylota liguritrix Aug
Numata bipunctella Aug, Sept
Polyhymno luteostrigella Sept, Oct
Stereomita andropogonis Oct
Untomia albistrigella Aug, Sept, Oct

GEOMETRIDAE
Anavitrinella pampinaria Oct
Archirhoe neomexicana Oct
Chlorochlamys chloroleucaria Aug, Oct
Costaconvexa centrostrigaria Oct
Digrammia gnophosaria Aug, Sept
Eulithis diversilineata Complex Oct
Eupithecia miserulata Oct
Glenoides texanaria Aug, Sept
Hypagyrtis esther Aug, Sept
Idaea celtima Oct
Idaea tacturata Aug, Sept
Iridopsis defectaria Aug, Sept
Leptostales laevitaria Sept
Leptostales pannaria Aug, Sept, Oct
Lobocleta ossularia Aug, Sept, Oct
Lophosis labeculata Oct
Lychnosea intermicata Aug, Sept, Oct
Macaria aequiferaria Sept
Macaria transitaria Aug, Oct
Macaria sp. Aug
Nemoria elfa Aug, Sept, Oct
Nemoria lixaria Sept
Orthonama obstipata Sept
Patalene olyzonaria Sept
Pleuroprucha insulsaria Sept, Oct
Prochoerodes lineola Aug, Sept
Psamatodes abydata Aug, Sept, Oct
Psamatodes trientata Oct
Rindgea nigricomma Sept, Oct
Scopula aemulata Aug
Scopula compensata Aug, Sept
Scopula lautaria Sept
Synchlora frondaria Sept, Oct
Timandra amaturaria Sept, Oct
Tornos scolopacinaria Aug, Sept, Oct

GLYPHIPTERIGIDAE
Drymoana blanchardi Oct
Diploschizia impigritella Sept

GRACILLARIIDAE
Acrocercops quinquistrigella Oct
Cameraria sp. Oct
Caloptilia belfragella Oct
Caloptilia triadicae Aug, Sept, Oct
Leucospilapteryx venustella Sept

LASIOCAMPIDAE
Heteropacha rileyana Aug, Sept

LIMACODIDAE
Adoneta gemina Aug
Adoneta spinuloides Oct
Apoda y-inversa Aug, Sept
Euclea delphinii Aug, Sept, Oct
Isa textula Aug
Isochaetes beutenmuelleri Aug, Sept
Monoleuca semifascia Aug
Natada nasoni Aug
Phobetron pithecium Aug, Sept
Prolimacodes badia Aug, Sept

LYONETIIDAE
Leucoptera erythrinella Aug

MEGALOPYGIDAE
Megalopyge opercularis Aug, Sept

MOMPHIDAE
Mompha murtfeldtella Aug, Oct
Mompha sp. nr. metallifera (421856.97) Aug

NOCTUIDAE
Acronicta connecta Oct
Acronicta impleta Oct
Acronicta longa Aug, Sept, Oct
Acronicta ovata Aug
Acronicta rubricoma Sept
Acronicta vinnula Sept
Agrotis ipsilon Sept, Oct
Amyna stricta Sept, Oct
Anicla infecta Sept, Oct
Argyrogramma verruca Sept, Oct
Azenia obtusa Aug
Bagisara repanda Sept, Oct
Callopistria floridensis Oct
Chloridea virescens Aug
Chrysodeixis includens Aug, Sept, Oct
Condica sutor Aug, Sept, Oct
Condica videns Aug, Sept, Oct
Cydosia aurivitta Aug, Sept, Oct
Elaphria chalcedonia Aug, Sept, Oct
Elaphria nucicolora Sept, Oct
Enigmogramma basigera Aug, Sept
Eudryas grata Aug
Feltia subterranean Oct
Galgula partita Aug, Sept, Oct
Helicoverpa zea Aug, Sept, Oct

Homophoberia apicosa Aug, Sept
Lacinipolia laudabilis Sept, Oct
Leucania adjuta Aug, Oct
Leucania incognita Aug, Sept, Oct
Magusa divaricate Sept
Marimatha nigrofimbria Aug, Sept, Oct
Micrathetis triplex Oct
Mythimna unipuncta Oct
Ogdoconta cinereola Aug, Sept
Ozarba nebula Sept
Perigea xanthioides Aug, Sept
Ponometia candefacta Sept, Oct
Ponometia exigua Aug, Sept
Ponometia phecolisca Oct
Pseudeustrotia indeterminata Aug
Rachiplusia ou Oct
Raphia frater Aug, Sept
Schinia arcigera Sept, Oct
Schinia gracilenta Sept
Schinia lynx Aug
Schinia rivulosa Oct
Schinia saturate Sept
Schinia siren Sept, Oct
Schinia trifascia Sept
Spodoptera dolichos Oct
Spodoptera frugiperda Aug, Sept, Oct
Spodoptera latifascia Aug, Oct
Spodoptera ornithogalli Aug, Sept, Oct
Spragueia apicalis Sept
Spragueia dama Sept
Spragueia jaguaralis Sept
Spragueia margana Oct
Tarache aprica Aug, Sept, Oct
Tripudia flavofasciata Sept, Oct
Tripudia quadrifera Aug
Tripudia rectangular Aug, Sept, Oct

NOLIDAE
Afrida ydatodes Aug, Sept, Oct
Baileya acadiana Aug
Diphthera festiva Sept, Oct
Garella nilotica Sept, Oct
Nola cereella Aug, Sept, Oct

NOTODONTIDAE
Cecrita guttivitta Aug
Clostera inclusa Sept
Coelodasys unicornis Aug
Datana integerrima Aug
Furcula cinerea Aug, Sept
Heterocampa obliqua Aug
Lochmaeus bilineata Sept
Macrurocampa marthesia Aug
Misogada unicolor Aug, Sept
Oedemasia leptinoides Aug, Sept
Peridea angulosa Aug, Sept, Oct
Rifargia subrotata Sept
Symmerista sp. Sept

OECOPHORIDAE
Inga sparsiciliella Aug, Sept
Ymeldia janae Aug

PLUTELLIDAE
Plutella xylostella Sept, Oct

PSYCHIDAE
Cryptothelea sp. Aug, Sept, Oct
Oiketicus abbotii Aug, Sept

PTEROPHORIDAE
Adaina ambrosiae Sept
Adaina simplicius Sept, Oct
Dejongia californicus Aug
Hellinsia balanotes Sept
Hellinsia inquinatus Oct
Lioptilodes albistriolatus Aug, Oct
Pselnophorus belfragei Aug, Sept, Oct
Sphenarches anisodactylus Aug, Sept, Oct
Stenoptilodes sp. Aug, Sept, Oct

PYRALIDAE
Acrobasis exsulella Aug, Sept, Oct
Acrobasis minimella Oct
Acrobasis texana Aug, Sept
Acrobasis sp. Oct
Adelphia petrella Aug, Sept
Dioryctria pygmaeella Aug, Sept
Elasmopalpus lignosella Aug, Oct
Ephestiodes sp. Aug, Sept
Eurythmia angulella Aug, Sept, Oct
Galasa nigrinodis Oct
Galleria mellonella Sept
Hypsopygia binodulalis Aug, Sept, Oct
Hypsopygia nostralis Aug, Sept, Oct
Hypsopygia olinalis Sept, Oct
Laetilia coccidivora Aug, Sept
Macrorrhinia endonephele Aug, Sept
Melitara prodenialis Aug
Moodna pallidostrinella Sept, Oct
Penthesilea sacculalis Aug, Oct
Phycitodes reliquellum Oct
Pococera asperatella Aug, Sept, Oct
Salebriaria sp. Sept
Sciota celtidella Sept
Sciota uvinella Aug, Sept, Oct
Tallula atrifascialis Aug, Sept, Oct
Tampa dimediatella Aug, Sept, Oct
Tlascala reductella Sept
Tosale oviplagalis Sept
Varneria atrifasciella Sept

SATURNIIDAE
Actias luna Aug, Oct
Antheraea polyphemus Sept
Automeris io Aug
Eacles imperialis Sept

Syssphinx bicolor Aug

SCYTHRIDIDAE
Scythris trivinctella Aug

SPHINGIDAE
Agrius cingulata Aug, Oct
Amorpha juglandis Sept
Ceratomia undulosa Aug, Sept
Darapsa myron Aug, Sept
Enyo lugubris Sept, Oct
Erinnyis obscura Oct
Eumorpha fasciatus Aug
Manduca rustica Aug, Sept
Manduca sexta Aug
Paratrea plebeja Sept
Xylophanes tersa Sept

TINEIDAE
Acrolophus heppneri Aug, Sept, Oct
Acrolophus mycetophagus Aug
Acrolophus popeanella Aug, Sept
Acrolophus texanella Aug, Sept
Amydria margoriella Oct
Bucculatrix sp. Oct
Homostinea curviliniella Aug, Sept, Oct
Phaeoses sabinella Sept, Oct
Tiquadra inscitella Aug

TORTRICIDAE
Aethes angulatana Sept
Aethes sp. Aug, Sept, Oct
Ancylis comptana Aug, Oct
Bactra verutana Aug, Sept, Oct
Cagiva cephalanthana Aug, Sept, Oct
Choristoneura rosaceana Aug
Clepsis peritana Aug, Sept
Cochylichroa hospes Aug, Sept
Cochylis caulocatax Oct
Crocidosema plebejana Sept
Cydia caryana Aug, Sept
Cydia latiferreana Aug, Sept, Oct
Ecdytolopha mana Aug
Epiblema abruptana Sept, Oct
Epiblema boxcana Aug
Epiblema otiosana Aug, Oct
Epiblema scudderiana Aug
Epiblema strenuana Aug, Sept, Oct
Epiblema undescribed sp. Sept
Episimus argutana Sept
Eucosma raracana Oct
Eugnosta bimaculana Sept
Eugnosta erigeronana Sept
Eumarozia malachitana Aug, Sept
Paralobesia viteana Aug, Sept, Oct
Pelochrista matutina Sept
Phaneta argutipunctana Sept
Platphalonidia magdalenae Sept, Oct
Platynota flavedana Aug, Sept, Oct
Platynota idaeusalis Aug, Sept
Platynota rostrana Aug, Oct
Platynota semiustana Aug, Sept, Oct
Pseudogalleria inimicella Oct
Rhyacionia sp. Oct
Sonia constrictana Aug, Sept, Oct
Sparganothis distincta Aug, Oct
Sparganothis sulfureana Aug, Sept, Oct
Sparganothoides lentiginosana Sept, Oct

ZYGAENIDAE
Harrisina americana Sept

Virginia: Harry Pavulaan, 606 Hunton Place, Leesburg, VA. 20176, E-Mail: Pavulaan@aol.com

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The Southern Lepidopterists' News is published four times annually. Membership dues are $30.00 annually. The organization is open to anyone, especially those with an interest in the Lepidoptera of the southern United States. Information about the Society may be obtained from Marc Minno, Membership Coordinator, 600 NW 34 Terrace, Gainesville, FL 32607, E-Mail: marccminno@gmail.com, and dues may be sent to Jeffrey R. Slotten, Treasurer, 5421 NW 69th Lane, Gainesville, FL 32653.

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