

# NEWS OF THE LEPIDOPTERISTS' SOCIETY

Volume 51, Number 2 Summer 2009



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*Adelpha californica***

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The Lepidopterists' Society is a non-profit educational and scientific organization. The object of the Society, which was formed in May 1947 and formally constituted in December 1950, is "to promote internationally the science of lepidopterology in all its branches; to further the scientifically sound and progressive study of Lepidoptera, to issue periodicals and other publications on Lepidoptera; to facilitate the exchange of specimens and ideas by both the professional worker and the amateur in the field; to compile and distribute information to other organizations and individuals for purposes of education and conservation and appreciation of Lepidoptera; and to secure cooperation in all measures" directed towards these aims. (Article II, Constitution of The Lepidopterists' Society.)

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### Front Cover:

*Adelpha californica*. Photo by David James. See article on pp. 46.



# A Lesson in Self Defense from Your California Sister

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Natural enemy pressure and evolution have shaped some fascinating, clever, intricate and downright weird defense strategies among North American butterflies, and we continue to discover new ones. Presumably, the greater the pressure from predators and parasitoids, the more intense selection is to find novel ways of avoiding an early demise.

The greatest diversity of life occurs in tropical regions and it is among tropical fauna that we can expect to find the best defended insects including butterflies. The Nymphalid genus *Adelpha* is primarily a tropical genus but some species have extended their range beyond the tropics, most notably the California Sister, *Adelpha californica*, recently given species status by Prudic et al (2008). Given its tropical origins it is not too surprising to discover just how well defended this species is in all stages of its life cycle.

I recently reared and photographically documented the immature development of *A. californica* for an upcoming book Dave Nunnallee and I are working on ("Life Histories of Cascadia Butterflies"). The defense strategies employed by the immature stages of *A. californica* are striking and are summarized in the following notes and images.

Two trips to northern California in June and August 2008 yielded many male California Sisters, but precious few female Sisters. However, in mid-October populations in the Feather River Valley, east of Chico and the Trinity Forest area, north-west of Redding were comprised of similar numbers of males and females. Most individuals were fairly worn but three

females brought back to Washington State cooperated and produced a dozen eggs between them. Oviposition occurred in a Bioquip dome muslin cage on a potted Garry Oak (*Quercus garryana*), with eggs laid on upper leaf edges, often at the terminal end and usually on a leaf vein or rib. The large green sculptured eggs (2 X 1.8 mm) are characteristic of *Adelpha* and the related genus *Limenitis* (Fig. 1). They are pin-cushion-like due to a sharp pointed structure projecting from each junction of three hexagonal facets. It is tempting to speculate that these 'spines' are defensive and help protect the eggs from small predators or parasitoids. However, the experimental evidence to confirm or refute this has not yet been collected. At temperatures of 19-25 °C eggs hatch after 12 days with the first instar larva opening the top one third of the egg like a lid and exiting without consuming any of the shell. The larva immediately moves away from the egg and begins devouring the leaf on either side of a vein or the mid rib. Fecal pellets produced by the few hours old larva are not dropped but are silked together and used to extend the pier outwards. Within a few hours a plant-frass pier has been constructed on which the larva rests between bouts of feeding (Fig. 2).

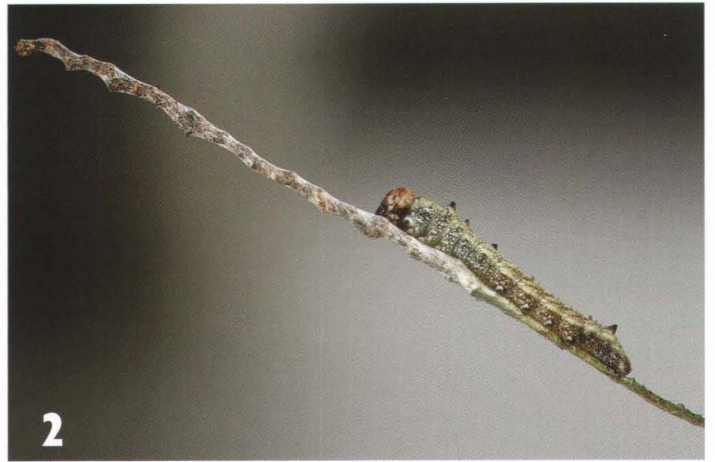
How the larva gets frass pellets into position at the end of the pier is uncertain. Figure 3 shows a larva apparently silking a frass pellet into position but how the pellet got to the end of the pier was not seen. Fox (2005) reported that the larva of the White Admiral (*Limenitis camilla*) "uses its head to manipulate pellets into the appropriate position". Another possibility is that the larva defecates at

the terminal end of the pier, but *A. californica* larvae are invariably positioned head out on the piers. Head/mandible manipulation of pellets appears to be the more likely construction strategy.

Frass piers or spars have been reported for a number of species in the Nymphalidae sub families, Limenitidinae and Charaxinae (Minno et al., 2005). Aiello (1984, 1991) and Freitas (2006) reported fecal supports or chains in a number of *Adelpha* spp. However, the function of frass piers, has not been determined. First and second instars of *A. californica* are tan-gray and inconspicuous resting on piers, thus camouflage may be an important attribute. Minno et al. (2005) suggested that ants find it difficult to find larvae resting at the end of a pier.

First and second instar *A. californica* use frass piers for a week or two before new ones are constructed. They may be constructed on mid ribs or lateral veins and the frass part comprises 40-60% of the pier. Typical piers constructed by second instar larvae measure 25mm, of which 14mm is silked together frass. Naturally more fecal pellets are produced than can be used in pier construction. The larvae have a use for these too. They store them in a kind of hanging bag at the base of the leaf, constructed from silk and chewed bits of leaf (Figs. 3 and 4). The function of this 'aerial latrine' is also unknown, but the behavior has been described for some other *Adelpha* spp (Aiello, 1984) and *L. camilla* (Fox, 2005). The first instar of *L. camilla* uses more leaf bits than frass to construct the 'aerial latrine' and visits the bundle of leaf bits to deposit fecal pellets inside. Fox





**Fig. 1)** *Adelpha californica* egg. **Fig. 2)** First instar of *A. californica* resting on oak leaf rib and frass pier. The silked frass pellet section begins under the fifth segment of the larva. **Fig. 3)** First instar adding to its pier with another frass pellet. **Fig. 4)** Late first instar on frass pier with 'aerial latrine'. **Fig. 5)** Third instar in 'Loch Ness Monster' pose.





(2005) also reported that the larva is able, with unerring accuracy, to shoot pellets into the latrine from 1-2 cm away! I did not observe 'poop-shooting' in *A. californica* but neither did Fox with *L. camilla* until he used a video camera. Morrell (1954) reported a range of similar coprophilic behaviors in early instar larvae of a number of Malayan nymphalids. Some of these behaviors include using frass and leaf bits to form larva-like 'dummies' to confuse predators!

Fox (2005) observed that no frass fell from the early instar platforms formed by *L. camilla*, however, this was not the case for *A. californica* where some frass did fall despite frass piers and aerial latrines. Frass from young larvae likely contain much un-digested nutrients, some of which may be volatile, attracting natural enemies. Intriguingly, larvae of some other butterfly families do their best to dispose of feces as far away from themselves as possible. Weiss (2003) showed that ejection of frass pellets up to 40 body lengths away by larvae of the skipper *Epargyreus clarus* (Cramer) eliminated chemical cues for natural enemies, thus is a defense strategy. Retention and storage of frass by *A. californica* and related species appears at first sight to be perhaps not a very sensible strategy. Perhaps the frass produced by these larvae and used in construction do not contain chemical cues for foraging natural enemies. Or perhaps the larvae are able to neutralize predator attractants in their frass by oral secretion and silking as suggested by Fox (2005). The evidence (albeit mostly circumstantial) to date from all species with early larval coprophilic behaviors, suggests they have a defensive function. Elucidating the chemical and ecological details for species like *A. californica* will no doubt provide further fascinating insights.

Frass piers and aerial latrines are abandoned in third instar *A. californica* and the defense strategy appears more dependent on crypsis, armor and intimidation. The most notable difference between this and the second

instar is the development of the tubercles on segments 2, 3, 5 and 11 into formidable spined horns and development of numerous facial spines. When disturbed the larva adopts a serpentine or 'Loch Ness Monster' posture by raising up both anterior and posterior segments. This may be crypsis (presenting an atypical caterpillar silhouette), intimidation, or both (Fig 5).

For 24-36 hours the fourth instar is reddish brown like the third instar, then becomes bright green dorsally and orange-red ventrally. The spiny horns are long (4-6mm) and orange-red (Fig. 6). Aggression is pronounced in this instar with the larva thrashing its anterior end around and 'attacking' objects that come too close. A fine brush dangled in front of the head was attacked multiple times with mandibles latching on. Notice the readied 'fangs' in Fig. 6. Presumably parasitic flies buzzing too close or ants wandering in the vicinity would be 'attacked' by these larvae. The spiny head does not have a pretty face, quite fearsome-looking, purplish with maturity and with a pair of enlarged, black-tipped bullae that resemble 'eyes' (Fig. 7).

Despite the intimidation and aggression apparent in this instar, the larva uses camouflage as the first line of defense, clearly hoping to avoid altercations. The beautiful green color of fourth instars allows them to blend in superbly well with oak foliage (Fig. 8). Serpentine postures are still adopted, helping to further break up a caterpillar outline. These postures tend to be used by fourth instars at rest as well as when disturbed.

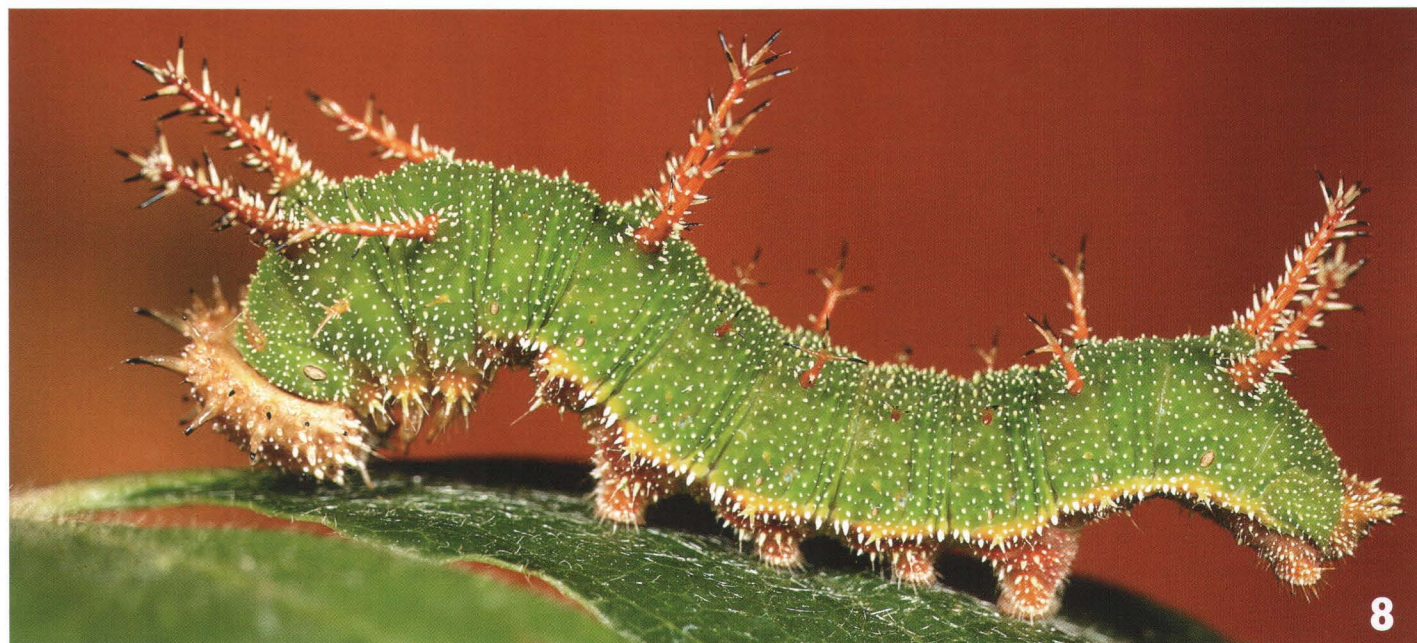
Autumn larvae of *A. californica* probably overwinter as third instars. In our rearing of autumn larvae we exposed them to warm, long day conditions to avoid dormancy. Development from first instar to pupation took 36 days at 20-30 °C with 10, 5, 8, and 13 days spent in consecutive instars. Interestingly, our *A. californica* larvae had only four instars as indicated by head capsule

widths. Although instar number has not been reported for *A. californica*, Aiello (1984), Otero and Aiello (1996) and Freitas (2006) reported five or six instars for 14 other *Adelpha* spp. Variability in instar number in Lepidoptera is relatively common (Esperk et al., 2007), and may be a feature of the life history of *A. californica*. Larvae of *A. californica* reared under different temperature and photoperiod regimes may develop through five instars. Host plant quality may also play a role in determining instar number. One more defensive strategy is practiced by fourth instar *A. californica* larvae: a chemical secretion is produced from a reddish ventral gland on segment one. This gland is found in many nymphalid species (and some other families) and is analogous to the osmeterium glands of papilionid larvae. The secretion from nymphalid ventral glands is presumed to be defensive but confirmation has not yet been published. The chemistry of secretions from different nymphalid species is likely to differ significantly according to the threat involved. Current research on *Argynnis* (*Speyeria*) ventral glands suggest repellent and dispersal chemicals are present (James, 2008 and in prep.).

Mature fourth instar *A. californica* nearing pupation change color from green to yellow-orange and look for a suitable site to suspend and pupate (Fig. 9). Pre-pupal larvae usually hang from a branch, adopting a serpentine posture and blend in extremely well, even in captivity. This theme is continued in the pupal stage with the whitish-tan-gray pupa resembling a dried, curled leaf. Pupae of most nymphalids hang vertically, but *A. californica* pupae invariably hang for most of the time in a 'bent' position, breaking up the traditional outline of a pupa and enhancing the curled dried leaf effect (Fig. 10).

Interestingly, the pupa of *A. californica* is 'stamped' with a silver/gold/sapphire butterfly-shaped motif dorsally between the thorax and abdomen (Figs. 10 and 11). It is hard to ascribe a defensive









10



12



11

## Lessons in Self Defense from a California Sister (*Adelpha californica*)

**Fig. 6)** Early fourth instar of *A. californica* showing aggression (note mandibles 'bared'). **Fig. 7)** Face to face with a late fourth instar. Note the pair of enlarged, black-tipped bullae that resemble 'eyes'. **Fig. 8)** Mature fourth instar showing serpentine posture., helping to further break up the caterpillar's outline. **Fig. 9)** Pre-pupal larva. **Fig. 10.)** Pupa of *A. californica* resembling a dried, curled leaf. The 'bent' position enhances this effect. **Fig. 11)** Dorsal 'butterfly motif' on *A. californica* pupa. **Fig. 12.)** Dorsal view of a male *A. californica*. Defense in adults appears to be based on distastefulness.



function for this motif, although no doubt the metallic colors serve the same crypsis-related function that they perform in other nymphalid pupae, but why in the shape of a butterfly?

Defense in adult *A. californica* (Fig. 12) appears to be based on distastefulness. Prudic et al. (2002) showed adult *A. californica* were moderately unpalatable to an avian predator, the scrub jay. The chemical basis of unpalatability in *A. californica* has not been investigated, but may originate from phenolic compounds contained in the oak larval hosts. If so, then larvae may have an additional line of defense: unpalatability. The unpalatability of adult *A. californica* has been used to advantage by the sympatric, palatable, Lorquin's Admiral (*Limenitis lorquini*) which is a Batesian mimic of *A. californica* (Prudic et al. 2002).

So there we have it, a life history replete with self defense. Coprophily, aggression, armor, intimidation, crypsis and unpalatability are the basics; the details remain to be fully elucidated. Clearly, these are successful

strategies, shared by many other related species and genera. The California Sister demonstrates how a multiplicity of defense tactics throughout a life history can successfully mitigate biotic threats, making *Adelpha* spp. one of the most successful genera in the Nymphalidae.

### Acknowledgments

*I thank Dave Nunnallee for providing the oak plants necessary to rear this species and to Art Shapiro for providing clues to locating Sisters in northern California. I am also grateful to my wife Tanya and daughters Jasmine and Rhiannon, for helping me pursue Sisters in California.*

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## Major Donor adds to Lepidopterists' Society Funds in Time of Need

Kelly Richers, Treasurer

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Doug Houck, a longtime member of the Society, has arranged a series of donations to the Lepidopterists' Society that will benefit members for years. Doug has arranged to donate \$5,000 per year for the remainder of his life and for five years beyond, from his estate planning.

Doug, from Canton Ohio, started collecting insects in ninth grade. As a junior in high school he won the "Ohio Science Day" competition for his insect collection. In 1958 he entered the Navy, where he spent four years. For a two year period after that he worked for Pan American World Airways at various

world locations as a base operations manager.

In 1975 Doug started his own plastic business, having developed expertise in that area from high school, and after working for other companies after leaving Pan AM.

Doug retired in July 2008 and spends his time raising Saturnid moths and Monarch butterflies.

Other donors of significant amounts this year (as of the end of April, 2009) are: Lincoln Brower, John Burns, Gary Collier, Charles Covell, Joann Karges, Leroy Koehn, Jim Riddle, Duncan

Robertson, Fred Unger, Bruce Walsh, and Frances Welden. Many others donated smaller amounts, and the Society thanks each person who donated.

Total donations this year amounted to exactly \$6,000.





# Two Trips to Taman Negara National Park, Malaysia: Part 4

Steve Fratello

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## Hesperiids

Like a good many other major butterfly groups, Hesperidae diversity reaches a zenith in the Neotropics; well over half the world's species are found there. Also in the Neotropics, the number of large, spectacular skippers far surpasses the rest of the world combined. The Oriental Region is second in Hesperiid diversity and among the most gorgeous of the region's large skippers are *Bibasis*, *Hasora* and *Choaspes* species, genera of the predominantly tropical, Old World Coeliadinae. *Bibasis* is restricted to the Oriental Region, both *Hasora* and *Choaspes* range beyond the Oriental Region into the tropical Australian Region; *Bibasis* with seven species resident on the Malay Peninsula, *Hasora* with approximately one and a half dozen species there, and *Choaspes* with four. *Choaspes* are exceptionally spectacular skippers with the larger part of their wings adorned with stunning blue to green iridescence. Eliot et al (1978) report that most *Bibasis* and *Hasora* species are crepuscular.

The most spectacular skipper seen on my two visits was a presumed *Hasora* species (or *Bibasis sena uniformis* Elwes & Edwards) that visited our camp at approximately 9 a.m., largely attracted to minerals on my daypack. It was medium-sized but robust, brown with a VHW white band and striking orange legs. Another skipper of note was the medium-sized, dark brown and white *Darpa striata* Druce (Pyrginae), one visiting urine soaked sediment on a bank of the Tahan River during my first visit. This first visit, skippers were rather scant but it seemed that nearly every one I saw was a different species – this pattern not untypical in tropical rainforests with many animal/plant

groups exhibiting great diversity but small numbers of individuals per species. The second visit, skippers were more common and I saw a good deal more species in which I saw more than one individual. During each visit (both Jan/Feb), presumed males of a small Hesperine perched on riverside shrubs at the same exact spot along the Tahan; a few individuals present, indicating a small local colony.

## Moths

My knowledge is extremely limited concerning the Oriental Region moth fauna but a few moths, some unseen, some seen, can account for the tremendous riches to be found in Taman Negara's primeval forests. Gracing Taman Negara's forest nights are a few Saturniids that are among the world's most spectacular lepidoptera: gigantic *Attacus atlas* Linnaeus (Atlas Moth) and *Archeoattacus edwardsii* White (Edward's Atlas Moth), the incomparable, exceptionally long-tailed *Actias maenas* Doubleday (Malaysian Moon Moth) and perhaps another giant, the rarely collected *Archeoattacus staudingeri* Rothschild. For those members not familiar with these moths, I highly recommend two sources: fellow member Kirby Wolfe's Saturniid web-site (<http://www.silkmoths.bizland.com/kirbywolfe.htm>) and "Wings of Paradise, The Great Saturniid Moths" (1996) by Saturniidophile/painter John Cody.

As for Kirby Wolfe's web-site, I will bluntly state that there is no more sublime web-site on this planet! John Cody's stunningly magnificent Saturniid paintings have won the highest praises from numerous quarters. I will leave it to John Cody (1996), with his superb aesthetic vision,

to describe in his own words the infinitely exquisite Malaysian Moon Moth – "Forced to name my favorite of all the world's saturniids, I would find the choice difficult, but in the end would doubtless say the male Malaysian moon moth, *Actias maenas*. For size, elegance of shape, and harmony of pattern and coloring, it has no rival."

As for things seen, I was fortunate to witness a few moth glories from the Oriental Region fauna. Foremost were diurnal Geometridae of the very colorful aposematic *Dysphania*, a widespread IndoAustralian genus. These large moths were not uncommon along the Tahan River, their fairly slow flight manner to be expected of these protected moths. *D. sagana* Druce was the more common of two species seen, *D. subrepleta* Walker possibly only seen once.

Less conspicuous and numerous were a few small diurnal moths of probably one species, *Callidula petavia* Stoll; belonging to Callidulinae (Butterfly Moths), a small subfamily restricted to the IndoAustralian Region. They flew about slowly in the low understory of primary forest, perching and resting often on the top of leaves with closed wings. In general appearance they resemble certain groups of African Lipteninae (Lycaenidae), their tapered antennae tips the clue that they are not Lycaenids. Many years prior, I saw another small Callidulinae fairly common in the understory of Papuan lowland rainforest, unaware of antennae structure at the time, I thought I was seeing a strange Lycaenid!

Seen a few times in the understory of primary forest was a medium-sized (wingspan approximately two inches) presumed Agaristine (Noctuidae:



Agaristinae), possibly the species *Longicella mollis* Walker. This pretty diurnal moth is patterned in gray-blue and black with some contrasting yellow-orange coloration on the body. As related in Part 3, one was seen in the late afternoon among a number of butterflies in and around a small light gap. This individual seemed to be patrolling along a small stretch of the trail, flying for prolonged periods with the weak, fluttery flight of a presumed aposematic species, occasionally perching on leaves from two to three meters above the forest floor.

During the first trip, I disturbed a large Arctiid, *Euplocia memblaria* Stoll, in the low forest understory, after which it proceeded to rest again under a few large leaves with wings closed, folded behind the body. Its light brown wings bear many fine white streaks on and parallel to the veins and the robust thorax and heavy abdomen are aposematic, red-orange dorsally and white with black spots ventrally. Also seen once was a striking Sesiidae (Clearwing Moths) species with spectacular hair plumes on the hind legs. By the cascades Lata Berkoh, it was attracted to minerals from sweat on my legs and my guess is that it is a rarely collected species. I saw few large spectacular caterpillars but one seen and photographed is certainly a moth caterpillar. Spotted by my girlfriend, Danusia, amongst low vegetation close to the forest floor, it was approximately two inches long and pilose, the whole caterpillar covered with fairly long, dense red-orange hairs and with lateral black stripes.

### Butterflies Visiting Flowers

Considering the incredible diversity of flowering plant species present, it is surprising to often see relatively few blossoms widely scattered about a primeval lowland rainforest. Such was the case, for the most part, during my 37 days visiting Taman Negara in January/February in two consecutive years. With this pattern of floral activity, butterflies feeding from blossoms will also be relatively

uncommon and scattered in occurrence. Twice during these 37 days, I observed a shrubs'/tree's flowers attract a small variety of butterflies in a brief period of time.

During the first visit to Taman Negara on Feb. 16, clusters of pendant, bell-shaped ericaceous flowers were the attractant. Very reminiscent of temperate blueberry/huckleberry blossoms, they bloomed from a common shrub among the poor soil, scrubby forest on the Gunung Indah ridge. Butterflies taking nectar included: *Delias hyparete* (Pieridae), presumed *Tanaecia* species (Limenitidinae: Adoliadini), *Cupha erymanthis* (Heliconiinae: Vagrantini) and a Lycaenid. The presumed *Tanaecia* was black with a terminal blue hindwing band that I distinctly saw contained black markings. Two species on the Malay Peninsula fit this description: the rare *T. clathrata violaria* Butler and the even rarer *T. coelebs* Corbet. It is interesting to note that *Tanaecia* and other Adoliadini are predominantly fruit and not flower feeders. On February 2 during my first visit to the Gunung Indah ridge, *C. erymanthis* and a few others were seen visiting these same flowers. The following year during the second Taman Negara trip, these shrubs were not in bloom when the Gunung Indah ridge was visited on January 27.

On this second trip, a visit to the canopy walkway on Feb. 4 provided observation of butterflies visiting the clustered whitish flowers of a middle story tree: *Paranticopsis delessertii* (Papilionidae), *Gandaca harina* (Pieridae), *C. erymanthis*, a black and white presumed *Neptis* (Limenitidinae: Limenitidini) and a Hesperid. A small orange and black *Pantoporia/Lasippa* (Limenitidinae: Limenitidini) species was sunning itself on this tree and another was in the local area; I presume they also visited this tree's flowers.

Over the course of a number of days along the Tahan River during both trips, I observed the white 'starburst' flowers of a common small riverside

tree (presumed Leguminosae) attract a few butterfly species, among them: *Papilio nephelus*, a *Troides* (Papilionidae) male in the late afternoon, a black and blue Danaine and a presumed *C. erymanthis*. Feeding at blossoms amongst rank natural secondary vegetation on a low bank of the Keniam River, a small skipper, The Chestnut Bob (*Iambrix salsala* Moore, Hesperinae) was only seen this one time.

Scattered over the course of many days in the primary forest interior, I recorded just a few observations of butterflies at flowers in the understory. Not far from the bank of the Keniam River, the lavender blossoms of a presumed Rubiaceae attracted a male *P. nephelus*, which had been patrolling along the rivers' edge. This common understory shrub was much in flower during the first visit, with just a few in bloom on the next year's visit; this was the only sighting of a butterfly visiting its blossoms. As related in Part 3, a pair of hairstreaks with a brownish orange venter were seen on a few flowered spike of a large herbaceous plant (presumed Marantaceae), one of them on a small inflorescence. Near the end of the second trip, a large brown hesperid fed from white, presumed ginger (Zingiberaceae) flowers.

### Other Animal Inhabitants

Taman Negara NP, with a large area of primeval lowland, hill and montane tropical rainforest, is the foremost, protected area for the Malay Peninsula's incredible fauna. The large mammal fauna of Neomalaya, as with the Afrotropics, is far more spectacular than in the Neotropics. Taman Negara is the realm of Asian Elephants, Tigers, Leopards, Clouded Leopards, Sun Bears, Asian Two-Horned, Hairy or Sumatran Rhinoceros, Malayan Tapirs, Gaurs or Seladangs, the world's largest cattle, large Sambar or Rusa Deer and common and easily seen Wild Boar.

On a smaller scale, there is a rich civet fauna, a few Mustelid species including two or three otter species and for rodentphiles like Danusia and myself,



Southeastern Asia and especially Neomalaya, is the center of diversity for squirrels. Many squirrel species are resident in Taman Negara including two species of giant squirrels, the world's largest tree squirrels at approximately three feet long, and a host of nocturnal flying squirrels of various sizes including giant flying squirrels (again, approximately three feet long). We were fortunate to see two Cream Giant Squirrels and crossing a limb overhanging the Trennggan River, the very beautiful black, white and chestnut Prevost's Squirrel. Primates include two species each of macaque and langur monkeys, two species of gibbons, lesser apes of Southeast Asia, including the largest gibbon, the unique, entirely black Siamang, and one Prosimian, the small, nocturnal, large-eyed Slow Loris. As the roars of howler monkeys are so characteristic of Neotropical lowland rainforests, so also with the far carrying whooping calls of gibbons in Southeast Asian lowland rainforests. Though I heard gibbons a number of times, we unfortunately saw none.

Others of our membership who are bird enthusiasts would find Taman Negara a superb arena to bird watch the Neomalayan avifauna. Unlike the Neotropics where parrots are prolific, Southeast Asian rainforests have a dearth of parrot species, but spectacular non-passerines abound. Among others, at Taman Negara there is a good variety of spectacular, colorful kingfishers and some magnificent rainforest pheasants including the not infrequently seen Crested Fireback Pheasant and the elusive, long-trained Great Argus Pheasant. Any mention of spectacular non-passerines in Old World tropical rainforests must include the iconic hornbills. Nine species inhabit Taman Negara's forests; the exceptionally striking Rhinoceros Hornbill, one of the largest species, is fairly common. Among the many gorgeous passerines are minivets, leafbirds, sunbirds, pittas, Asian Fairy Bluebird, Asian Paradise-Flycatcher, Common Green Magpie, Greater Racket-Tailed Drongo,...

As for reptiles, the Reticulated Python, which is the world's longest snake, and the King Cobra, which is the world's longest venomous snake, are both found in Taman Negara. The Water Monitor Lizard, one of the world's largest lizards growing to six feet in length, is common in Taman Negara. I saw them a number of times on the first visit, sometimes in alluvial forest, but more usually riverside and often swimming in/across rivers.

A few times while contemplating the forest's grandeur, I saw what appeared to be a large insect whiz past me and land on a nearby tree trunk. Closer inspection of the creature revealed that I had witnessed the gliding flight of the incredible *Draco*, the Flying Lizard. The Southeast Asian rainforests have the greatest abundance of gliding animals: *Draco*, numerous flying squirrels, the unique colugos (two species, also known as flying lemurs, though not at all closely related to lemurs) and even a flying snake and flying frog! I believe I read somewhere or saw on a nature video, in the great dipterocarp rainforests of Southeast Asia, that the rather open structure of the forest under the giant canopy trees, has led to the evolution of the gliding habit in a number of disparate animal groups. Many of these gliders are resident in Taman Negara!

### **Taman Negara: How to Get There, Where to Stay, Where to Go**

Taman Negara NP is extremely easy to get to because: West Malaysia has a well developed infrastructure and also this rainforest national park is a prime tourist destination for many visitors to Southeast Asia who would like to visit a tropical rainforest. My first visit, I landed in Kuala Lumpur early in the morning on a Monday, I was at the park late in the afternoon on Tuesday. I used a tourist service, like many others, that provided the normal route to Taman Negara: a few hour bus trip from Kuala Lumpur (with pick-up at your accommodations to the bus) to Kuala Tembeling on the Jelai River right near its junction with the Tembeling River,

then a few hour boat trip up the Tembeling River to the small village of Kuala Tahan on the opposite river bank from the main park headquarters. The tourist service I used, and most certainly the others, will advise taking their package deals of various activities while at the park. Besides the transportation, I strongly advise making all other arrangements on your own (as I expect other members would prefer), except perhaps lodging. The transportation to the park by both bus and boat from Kuala Lumpur cost less than \$20 US.

There are numerous lodging options at Kuala Tahan, from the most basic backpacker hostels to the somewhat luxurious Taman Negara Resort (TNR). I/we stayed at the Tahan Guest House; the approximate cost for one was \$12 per night, for two it was \$15. I highly recommend it for travelers who want reasonable, simple and clean lodging. Besides the TNR, which is in the park, the Tahan Guest House and other lodging in Kuala Tahan are across the river from the park entrance. Boats operate from 7AM to 11PM to give access to the main park hiking trails, which emanate from the TNR.

As just related, costs are very inexpensive in Malaysia if you don't desire luxury travel. For many years I had delayed a return trip to Southeast Asian rainforests because of lack of research on the costs involved. Surprising to me (and probably others!) is the fact that a trip to Taman Negara can be less expensive than to many Neotropical locales. My first trip to Taman Negara in Jan/Feb 2007 cost approximately \$1900 (including airfare, approximately \$1100) for a 27 day trip! Out of approximately \$800 for in country costs, approximately half was spent on boats I hired to take me to more remote parts/trails in the park away from Kuala Tahan.

For lepidopterists/naturalists visiting Taman Negara, I strongly recommend visiting the following destinations: Bukit Teresek, Lubuk Simpon, the Gunung Indah ridge, Bumbun



Kumpang and most definitely the cascades Lata Berkoh. Bukit Teresek is a small hill (334m) slightly less than 2km from the TNR. Besides splendid mixed dipterocarp hill forest along the way, there are two look-outs on the summit ridge of Bukit Teresek. Both provide great views over the canopy, the second a magnificent panorama over a vast area of primeval forest with many mountains, including some limestone hills in the distance; on clear days Gunung Tahan, W. Malaysia's highest peak (2,187m), can be seen looming afar. For more solitude, go in the afternoon after the tourist groups are gone. Lubuk Simpon is a river swimming hole in the black water Tahan not far from where it joins the much larger Tembeling. Only about 1/2k from TNR, I/we spent endless hours of superb butterfly and bird watching from a large log on a small beach at Lubuk Simpon. The Gunung Indah ridge is a 3-4k walk from TNR; on the way most of it in towering hill dipterocarp forest, as the trail along the Tembeling River is in country where hills rise steeply from the river. The Gunung Indah ridge was mentioned earlier and in previous parts, in reference to the distinctive, poor soil (from quartzite), scrubby forest that grows on it, including an ericaceous shrub whose blossoms attracted a number of butterflies. In sunny weather, punishing sweat bees aside, the Gunung Indah ridge is a great place to see a variety of butterflies, especially if the common ericaceous shrub is in bloom. The trail ends at a look-out over forested hills and the valley of the Tembeling, but I ascended a very small trail for a few hundred meters – above the scrubby forest into well developed forest; somewhere above was the summit of Gunung Indah (563m).

A spectacular boat ride from Kuala Tahan upriver, takes you through the Tembeling Gorge and seven rapids. Debark at Kuala Trengganu for the 3k hike to the Bumbun Kunbang animal hide. Stay here (12 bunks) or walk 10 minutes to the nearby small, shallow, clear water Trengganu River and camp

(we did on the second trip) in solitude. From either spot, trails lead through undulating terrain and some of the most magnificent lowland tropical lowland forest anywhere.

A very beautiful boat ride for approximately one hour up the black water Tahan brings you to a spot where the boats can go no further. Hike the remaining 600m along the rushing, now mountain river, to a rocky amphitheatre and the cascades Lata Berkoh, hopefully with many stops along the way – certainly one of the most paradisaical spots I have been to. A major tourist destination, hire a boat early and return late in the afternoon and you will have hours of solitude in a high use area. Better yet, camp at the designated campground halfway along the short walk and have a great deal more time in solitude. A trail heading up river from the cascades is seldom used – please take it! The Lata Berkoh locale provides phenomenal butterfly watching in a setting unmatched, and I don't believe I/we were there in the optimum butterfly season.

A trip I dreamed of making for some time, is the long trek (70 miles return) to Gunung Tahan, encompassing lowland, hill, lower montane and upper montane forest, and dwarf ericaceous forest on Gunung Tahan's summit. Who can imagine what lepidoptera would be encountered on such a trip? I still might do it (and I might not!), hopefully some of our young, adventurous lepidopterists will take the trip of a lifetime and tell us all about it!

### **A Partially Sullied Paradise**

In all my accounts up to this point, I have tried to paint a picture of a naturalists'/lepidopterists' paradise: magnificent, towering dipterocarp forests and the sublime tropical lepidoptera and some other creatures that reside there. Unfortunately, human presence usually results in the deterioration of nature's beauty and grandeur. In Taman Negara the problem is small in scale but nevertheless still disturbing. There is a serious litter problem at Taman

Negara, especially on the main trails close to the TNR. This problem is predominantly the result of local tourists and unfortunately, the park staff is apathetic in both solving the problem and cleaning it up. During and after the two visits of one American lepidopterist, those trails were probably the most litter free that they ever are. Fortunately, a bright note is that the unbelievably beautiful Lata Berkoh area of the Tahan River is remarkably clean. This probably results from this area, much visited by foreign tourists, getting some attention from the park authorities.

Related to the litter problem is the habitation of the Orang Asli, the original forest inhabitants, within Taman Negara National Park. This is a noble concept within the framework of a national park ostensibly created to preserve nature, and I fully support it if it is done right, with some rules and limitations. Unfortunately, there seem to be none, and again a park staff that seems entirely apathetic to the problems. On the second Taman Negara visit, we witnessed the deserted temporary camps/villages of small Orang Asli groups situated adjacent to a few of the main hiking trails with a good deal of vegetative destruction, including medium-sized trees cut down (I recollect with chainsaws!), right along the trails close to the camps. These trails close to the camps, as well as the camps themselves, were strewn with a great amount of modern refuse. They reminded one of garbage dumps and not the abode of people who purportedly live in harmony with nature. This is one more example, in my fair amount of exposure to native rainforest people, where presumed harmony with nature exists only because of a lack of technological development. The harmony, if it exists, is strictly for utilitarian purposes; their appreciation of nature's grandeur and beauty is no greater than the rest of humanity's, sometimes perhaps less.

Despite these problems, I still highly recommend a visit to Taman Negara; they are very small indeed compared to



the overall magnificence of this great rainforest park. I only related these problems to give an objective view to our members; yes you will be visiting a natural paradise, but as the section title states, a partially sullied paradise.

**Author's Notes:** As in previous parts, this section is at times comparative to the Neotropics. I hope this is of interest to the many I believe have more experience and knowledge of that region than the Oriental Region.

For the most part, nomenclature for the Hesperidae and other butterflies in this report follows Eliot et al (1978) solely for simplicity's sake and with no disrespect to later revisionary works. In a few cases, taxonomic levels above the genus level follow some later works. Again for simplicity's sake, a subspecific trinomial is only used in a couple of cases where I wished to make a specific reference concerning that W. Malayan race.

All photos (see pp. 80) were taken with a Canon Powershot S3 IS, in natural light.

"Taman Negara, Malaysia's Premier National Park", a Globetrotter Visitor's Guide by David Bowden (2000) is an excellent reference/guide to the park. I found it extremely helpful in planning visits and a great guidebook while there. With some experience based on 37 days within Taman Negara, I will be glad to advise any lepidopterist or group wishing to visits its magnificent rainforest.

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### Acknowledgements

*Thanks to my girlfriend Danusia for being such a great partner on the second Taman Negara trip. Thanks again to my friend Holly Gordon for generously giving of her time in regards to indispensable computer help with our digital photos. Thanks to moth expert Dr. Jim Miller at AMNH for giving me the familial designations for our Dysphania and Sesiidae photos. Thanks to the enthusiasts, collectors and authors whose passion and determination have broadened the horizons of myself, and many others. For the sublimity of this incredible universe, for giving people like Kirby Wolfe and John Cody the passion and talent to bestow on humankind great gifts, I Thank Our Great God.*



## From the Editor's Desk

Dale Clark

A late Summer issue, but it is still technically summer as I send it off to the printer. The one advantage to running behind schedule getting an issue out is that the next issue will be in your hands very quickly. If you've something you'd like to have included in the Autumn issue please send it in to me as soon as possible.

Sad news, which many of you have no doubt heard if you subscribe to the various butterfly listserves, is the passing of George T. Austin in Gainesville, Florida on June 30, 2009. Andy Warren and the folks at the Butterflies of America website have put together a page honoring George which can be viewed at [www.butterfliesofamerica.com/gta.htm](http://www.butterfliesofamerica.com/gta.htm). The page has many photos, video and a partial bibliography. A detailed obituary will be published in a future issue of either the NEWS or the Journal of the Lepidopterists' Society.

Word also comes of the death of William H. Howe, who passed away on August 18, 2009. Howe is best known for his editing and artistic work on the Butterflies of North America book published by Doubleday in 1975. A detailed obituary will appear in the Autumn issue of the NEWS.

Kenelm Philip sent a note to me several months ago of an article published in the Biological Survey of Canada Newsletter regarding an article by Greg Pohl that he thought would be worth bringing to the attention of the membership. The article is entitled "Why We Kill Bugs - The Case for Collecting Insects". You can access the article online at: [http://www.biology.ualberta.ca/bsc/news28\\_1/spring2009bscnews.pdf](http://www.biology.ualberta.ca/bsc/news28_1/spring2009bscnews.pdf). I know...a long url, but it's worth taking a look.

Dale Clark, Editor



# 2009 Meeting of the Pacific Slope Section of the Lepidopterists' Society

**Taft, California: Carrizo Plain National Monument, April 17-19, 2009**

Ken Davenport

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The 2009 meeting of the Pacific Slope Section of the Lepidopterists' Society was held in one of the most unlikely of places and at one of the most unusual of times for the annual meeting. Taft itself is not known for its butterflies or moths and mid-April is not when past meetings have taken place. Most or all have been held in the summer.

This writer was amazed when contacted by Peter Jump about having a Pacific Slope Meeting at Taft. My first reaction was utter disbelief. But that turned into a challenge. Taft is not far from Bakersfield, the site of the 2007 meeting of the Lepidopterists' Society. It is also near Kernville, the 2008 site for a semiannual NABA meeting. Both meetings were well attended with highly successful butterfly and moth field trips. My mission was to lead attendees to some place of interest near Taft. Santa Barbara Canyon in eastern Santa Barbara County, California had the best potential within easy driving distance of Taft. Peter Jump would also offer a field trip on Sunday: a special trip in Carrizo Plain National Monument to help inventory the lepidopteran fauna there. Legal collecting permits would be granted in exchange for information. The only endangered species of moth in the United States lives on the Carrizo Plains, the Kern Primrose Sphinx (*Euproserpinus euterpe*). Until recently, that moth was only known from Walker Basin on the other side of the San Joaquin Valley where the Piutes, Breckenridge Mountain and the Tehachapi Mts. converge.

The big question, would anyone come? Come Friday and Saturday, thirty six people showed up to register for the meeting and participate in the Santa

Barbara Canyon field trip. The big surprise was who came. Many were well known veteran lepidopterists who have authored scientific books and articles, studied specific hairstreak complexes in the *Callophrys gryneus* complex or contributed greatly to our knowledge. Others were veterans who specialize in moths. Unlike the field trips I led for meetings I did at Bakersfield and Kernville in previous years...few would carry a Field Guide with them in the field or even carry one in their car.

Unfortunately, cold and rainy weather had delayed the season and while butterflies of interest were present in Santa Barbara and Dry Canyons, many of these were relatively scarce. People did find enough to enjoy the day. One butterfly that did make a good showing was Davenport's Metalmark (*Apodemia "mormo" davenporti*) and that was good for the Emmels who were there to observe and study it in the California Coast Ranges. Its recent discovery in Santa Barbara and Dry Canyons was a significant westward range extension. Many others also found it in fairly good numbers. Mansfield's Hairstreak (*Callophrys siva mansfieldi*) and Leanira Checkerspots (*Chlosyne leanira*) were unfortunately quite scarce.

Saturday would be the day for formal papers. Moths would predominate: They included:

Kelly Richers: "The California, Arizona and Nevada Moth County lists, 2009 Update."

Ken Osborne: "On Continuing Researches into the Biology and Ecology of *Euproserpinus*". This

discussion covered species *phaeton* and *euterpe* and the unknown entity in the Coast Ranges to the north, discussed in more detail later by Paul Johnson.

Paul Johnson: "Field Observations of *Euproserpinus* in Central California.". The relationships in this genus require DNA and chemical studies. Are they really species or one species?

Peter Jump "Twenty-five years of study on Acrolophidae." It would become obvious as we watched the slides that we cannot expect a "Moths through Binoculars book" anytime soon.

Ron Leuschner would also cover moth information in discussions not listed on the program, and to some extent in his presentation "Donate your collection? It's Easy!." Actually it may not be so easy anymore based on his comments made there.

Not all presentations were moths:

Tom Emmel: "The Research Programs and Collection Resources of the McGuire Center for Lepidoptera and Biodiversity." Fewer and fewer Museums have adequate staff and researchers on staff. Tom discussed the reasons for considering the McGuire Center to donate ones collection.

Ray Stanford: "Recent Additions to Oregon Butterfly Records, with emphasis on Southwestern Oregon."

Ken Davenport: Butterflies Found near Taft and the nearby Coast Ranges."

Ken Davenport: The Mormon Metalmark complex. One species or several in California and Arizona?

John Lane: Gave a presentation on new things learned about the travels and life of Lorquin in California, including



newly learned things from historical records.

The 2009 John Adams Comstock Award went to David L. Bauer, the reasons for his selection given in a well written summary by Ray Stanford. David has made outstanding contributions in collecting and the study of checkerspots. He has written many scientific papers, articles and wrote important sections of William H. Howe's 1975 Butterflies of North America Butterfly book. *Agathymus baueri* and *Euphilotes baueri* are named after him. David Bauer was present at the 2007 Bakersfield meeting and at Taft

with his wife to receive his award.

Sunday was the final day of the meeting and many went back to Santa Barbara Canyon or to Frazier Park about an hour away from Taft. The "official" field trip for the day was led by Peter Jump. The highlight of the day for most of us was on Caliente Ridge in San Luis Obispo County. While it was very breezy, participants would see many dozens (I saw over one hundred) of Morrison's Desert Orange-tip (*Anthocharis cethura morrisoni*). A very few California Marbles (*Euchloe hyantis* "Mt. Pinos block", Spring Whites (*Pontia sisymbrii*) would also be

found. These are all scarcely known from that county and confirmed the old records of William Swisher who also attended this meeting. Newly emerged Great Purple Hairstreaks (*Atlides halesus*) perched on prominent junipers at the tops of ridges.

The meeting may have stimulated butterfly interest in that area because interest in Santa Barbara Canyon remains high. Peter Jump did a great job organizing this event. The dinners on Friday and Saturday were excellent and those attending thoroughly enjoyed visiting and sharing with each other.

#### Announcement

## The Lepidoptera Research Foundation and The Journal of Research on the Lepidoptera Announce New Website and Publications

The Lepidoptera Research Foundation has finally entered the 21st century by establishing its website: [www.lepidopteraresearchfoundation.org/](http://www.lepidopteraresearchfoundation.org/) that you may address at any time. Complete files of back issues of the Journal of Research on the Lepidoptera are available on the website free of charge, its previous access having been shut down. Volume 40, the Pelham catalogue of North American butterflies, however, is not on line but is available from Bioquip Products, Inc. Bioquip is our authorized distributor and handles most matters of Journal business, including billings and distribution. Payments for subscriptions can be made either on our website or to Bioquip. All inquiries regarding the Foundation should be addressed to Nancy Vannucci: [jrl\\_lepidoptera@yahoo.com](mailto:jrl_lepidoptera@yahoo.com)

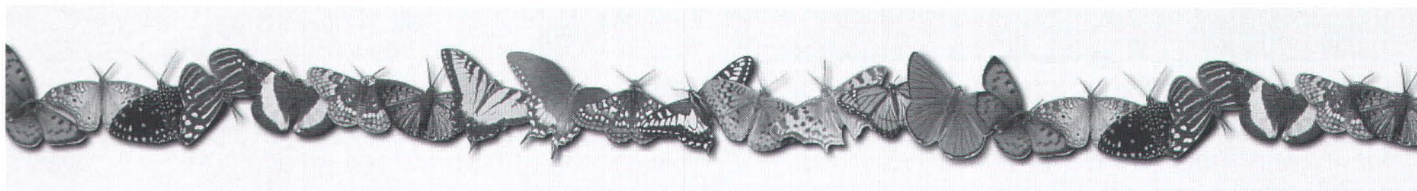
The Journal of Research on the Lepidoptera, volume 42 should be distributed by the time this notice

appears. The Foundation has the economic means to assure publication indefinitely as well as the production and business structure to support our efforts in a timely manner. Although we are still behind there is no structural reason for delays. We thus solicit manuscripts that are suitable. Upon review they will be published rapidly and without page charges. Shortly after distribution the volume will be added to the website as a high resolution PDF file for free download by anyone.

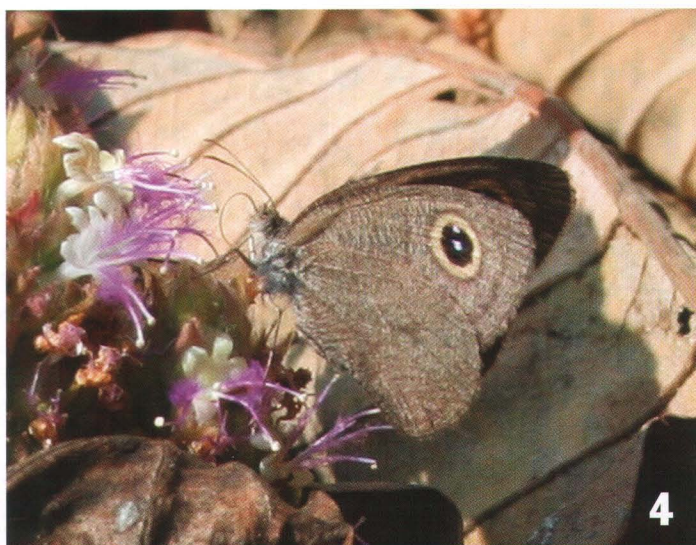
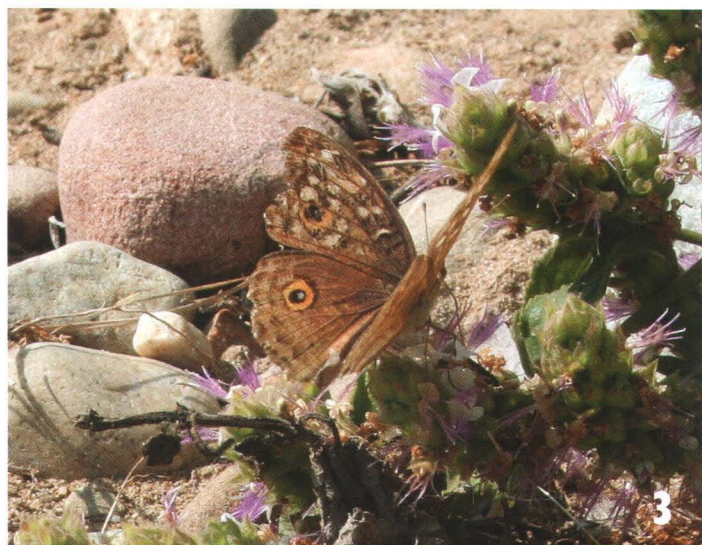
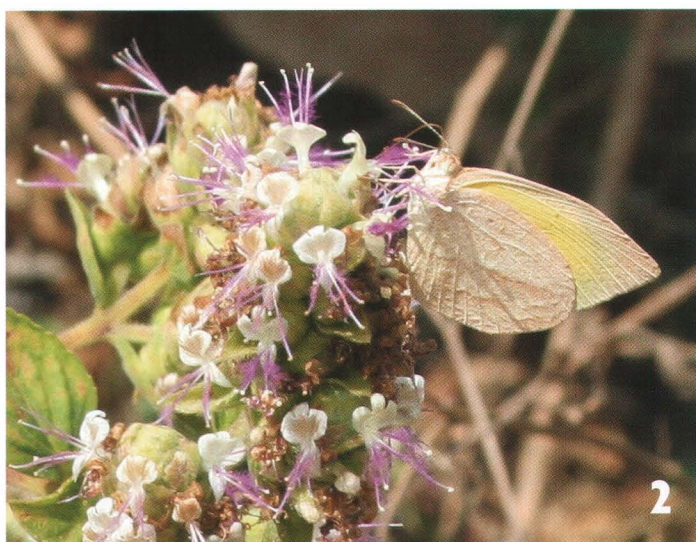
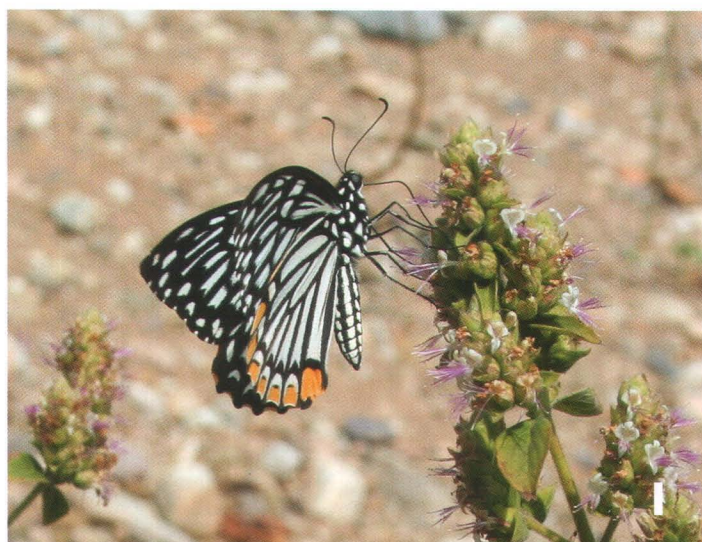
Given growth of our endowment because of hedged investments, the board of directors established grant programs that are described on our website. The first of these has been student support emphasizing students in developing countries. However, a new approach is under discussion to instead provide long-term support to a single individual for research in the service of expanding taxonomic knowledge regarding biodiversity. Our second

program involves developing exhibitions to educate the general public on the importance of Lepidoptera for the conservation of biodiversity. The first exhibition is now underway and involves a multidisciplinary approach with the world class artists to produce a high impact show.

Although the primary mission of the Foundation remains dissemination of scholarly research knowledge with Lepidoptera, increasing awareness of the entrained sixth mass extinction is an even greater responsibility. How this will all play out with the economic situation of a still undefined "new normal" scene and diminishing funding is unknown. In the meantime we are working with other organizations to have as wide an impact as possible. In spite of our limited means we will move forward and solicit your support. We will keep you informed of our progress. It will not be easy and we cannot do this alone. Check with our website.







***Pogostemon benghalense*, a nectar rich lure for lepidoptera**

**Fig. 1)** *Chilasa clytia* (Linnaeus), nectaring on *Pogostemon benghalense* at the Simbalbara Wildlife Sanctuary, Himachal Pradesh, India. **Fig. 2)** *Eurema laeta* (Boisduval). **Fig. 3)** *Junonia lemonias* (Linnaeus). **Fig. 4)** *Ypthima hubneri* (Kirby). **Fig. 5)** *Catopsilia pomona* (Fabricius). **Fig. 6)** *Junonia almana* (Linnaeus).



# Record of thirteen species of butterflies taking nectar from *Pogostemon benghalense* (Burm. F.) (Lamiaceae) in Simbalbara Wildlife Sanctuary, district Sirmour, Himachal Pradesh, India

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## Introduction

*Pogostemon benghalensis* (Burm. F.) belonging to the family Lamiaceae, is a cultivated small bush which also occurs naturally in open riverside forest in India. The economic importance of this plant is many folds. It contains an astringent resin, an alkaloid, and a yellow varnish of a slightly bitter taste. The leaves are used to distil a kind of patchouli oil which has an odor reminiscent of cedar wood. The oil is used as a stimulant and styptic. The leaves are used to clean wounds and promote their healing and show antifungal activity. Ashes of the stems are reported to be used as manure for paddy crops. The flowers are a well known source of pollen and nectar for bees to produce Panagol honey (Jansen, 1999). In general, while the best-known pollinators are honeybees and bumblebees there are a myriad of other insects that contribute to pollination. Some of the most beautiful and graceful are butterflies. Though butterflies may not be as efficient as bees in pollinating plants and crops, butterflies certainly do their fair share in bringing about seed and fruit production. Butterflies are diurnal, pollinating a wide variety of flowers that open during the day and act as incidental pollinators. But for butterflies themselves, nectar is the source of food for their survival. The recording of nectar food plants of butterflies is more important in the present day scenario where there is a great deal of habitat degradation. Butterflies are fragile to ecological change and they are an incredible indicator of the condition of an ecosystem. Further, these creatures are

themselves under threat due to environmental degradation. Simbalwara Wildlife Sanctuary considered to be one of the richest spots in faunal diversity in India is situated in Shiwalik hills of Himachal Pradesh. It is located in Sirmour district between 30° 24' to 30° 28' N and 77° 28' to 77° 32' E and the altitude of the sanctuary varies from 580 to 700 meters with a total area of 19.03 sqkms. The sanctuary was notified under Indian Wildlife (protection) Act, 1972 (amended up to 1991) on 27th March, 1974. The sanctuary encompasses five reserve forests viz., Marusidh, Danda Sukhchainpur, Karwe Ka Khala, Gharuk and Kaludev. Kittur et al. (2006) recorded 70 species and Sharma (2007) reported 48 species of butterflies from this sanctuary. Sidhu and Mehta (2008) added 16 species to the already reported list, making the total number of 95 species of butterflies from this sanctuary. During a recent survey in March, 2008 in Simbalbara wildlife sanctuary, thirteen species of butterflies have been recorded taking nectar from the wild bush, *Pogostemon benghalensis*.

## Observations

During the recent survey in Simbalbara Wildlife Sanctuary in district Sirmour, Himachal Pradesh, the bushy plant, *Pogostemon benghalensis* has been seen growing in open areas, near water tributaries flowing through the sanctuary. In March, 2008 thirteen species of butterflies have been recorded taking nectar from this plant besides some Hymenoptera specimens. These species have been collected and some of them have been photographed

in the field while nectaring on the flowers. They have been identified with the help of works of Evans (1932), Wynter-Blyth (1957), Cantlie (1962). The nomenclature has been updated from Varshney (1993, 1994 and 1997). Five species (*Junonia iphita*, *Junonia almana*, *Junonia lemonias*, *Phatanta phalantha* and *Vanessa cardui*) belong to family Nymphalidae; two species (*Papilio polytes* and *Chilasa clytia* form *dissimilis*) to family Papilionidae; one species (*Lampides boeticus*) to family Lycaenidae; two species (*Catopsilia pomona* and *Eurema laeta*) to family Pieridae; one species (*Ypthima hubneri*) of family Satyridae and two species (*Tirumala limniace* and *Euploea core*) of family Danaidae. It is noteworthy to record here that all the species were nectaring on the plant on the same day and the plant was flooded with butterflies. Though Hymenoptera specimens were also observed taking nectar from the plant, the number of butterflies present was more than the Hymenoptera.

## Literature Cited

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- Jansen, P.C.M., 1999. Minor essential oil plants. In Oyen, L.P.A. & Nguyen Xuan Dung (Eds.): Plant Resources of South-East Asia. No. 19: Essential-oils plants. Prosea Foundation, Bogor, Indonesia. pp. 181-182.
- Kittur, S.; Padmawathe, R.; Uniyal, V. P. and Sivakumar, K. 2006. Indian insects : 116-122.

*Continued on pp. 71*



# Membership Update...

Julian Donahue

Includes all changes received by 30 June 2009.

## "Lost" Members

(publications returned: "temporarily away," "moved," "left no address," or "addressee unknown"):

**Ballantine, A. (Dr.):** Hong Kong (life member; moved, no forwarding address)

## New and Reinstated Members

(members who have joined/renewed/ been found/or rescinded their request to be omitted since publication of the 2008 Membership Directory (not included in the 2008 Membership Directory; all in U.S.A. unless noted otherwise)

**Auth, David Leslie (Ph.D.):** 425 NE 7th Street, Gainesville, FL 32601-5545.

**Dion, Yves-Pascal:** 271 Leo-T-Julien, Quebec, Quebec G2M 0G6, Canada.

**Gillen, Erin (Ms.):** Baystate Environmental Consultants, 296 North Main Street, Suite 20, East Longmeadow, MA 01028-1833.

**Kobernus, Patrick:** 1072 Geneva Avenue, San Francisco, CA 94112-3820.

**Maglio, Frank:** 600 Moraga Road, Apt. 12, Moraga, CA 94556-2915.

**Nall, Berry:** P.O. Box 22, Falcon Heights, TX 78545-0022.

**Nieukerken, Erik J. van:** Department of Entomology, National Museum of Natural History Naturalis, P.O. Box 9517, 2300 RA Leiden, Netherlands.

**Peace, Avery:** [address omitted by request]

**Richter, John K.:** 334 Shannonbridge Drive, Hockessin, DE 19707-8920.

**Wander, Sharon (Ph.D.):** 28 Warner Road, Newton, NJ 07860-5059.

**Wander, Wade:** 28 Warner Road, Newton, NJ 07860-5059.

**Wasson, Richard:** 302 Belhaven Circle, Santa Rosa, CA 95409-6005.

**Watters, Scarlett:** 4155 Monroe Drive, Apt. B, Boulder, CO 80303-8310.

**Weber, Peter (Ph.D.):** P.O. Box 194, Masonville, CO 80541-0194.

**West, Renee:** 1105 Ocotillo Canyon Drive, Carlsbad, NM 88220-3160.

**Wilson, Karl A. (Ph.D.):** 214 Jamaica Boulevard, Endicott, NY 13760-2754.

## Address Changes

(all U.S.A. unless noted otherwise)

**Braby, Michael F. (Dr.):** Curator of Entomology, Museum & Art Gallery, Northern Territory, GPO Box 4646, Darwin, NT 0801, Australia.

**Glaeske, Daniel M. (M.D.):** Box 1421, Assiniboia, Saskatchewan S0H 0B0, Canada.

**Goldstein, Paul Z. (Ph.D.):** 111 Gay Head Avenue, Vineyard Haven, MA 02568.

**Haeuser, Christoph L. (Dr.):** Oberer Haldenweg 61, 73760 Ostfildern-Kemnat, Germany.

**Ludtke, Alvin F.:** c/o George Bishop, 8466 Noel Drive, Orangevale, CA 95662-3229.

**Marcus, Jeffrey M. (Dr.):** Department of Biological Sciences, Faculty of Science, 121 Machray Hall, University of Manitoba, Winnipeg, Manitoba R3T 2N2, Canada.

**Patton, Charles D.:** 331 Buckingham Drive, Branson, MO 65616-3764.

**Smith, Samuel R. (D.C.):** Smith Chiropractic Center, 37 A Brown Street, Middletown, PA 17057-1702.

**Weller, Susan J. (Ph.D.):** Bell Museum of Natural History, Room 300, University of Minnesota, 10 Church Street, Minneapolis, MN 55455-0145.

**Wienberg, Ronald D.:** P.O. Box 21507, Cheyenne, WY 82003-7029.

**Young, James John:** c/o 20/F Tun Wai Commercial Building, 109-111 Gloucester Road, Wanchai, Hong Kong.

**Zaspel, Jennifer M. (Ph.D.):** Department of Entomology, University of Minnesota, 219 Hodson Hall, 1980 Folwell Avenue, Saint Paul, MN 55108-6125.



## New Prices for Lepidopterists' Society T-Shirts

A new supply of Lepidopterists' Society t-shirts are now available and with this new supply comes a new price: \$12.00 each. Shipping remains unchanged at \$5.00 for the first shirt, \$2.00 for each additional shirt (U.S. and Canada; inquire for shipping charges to other countries). There is also a new size available: XXL, in both colors (navy blue or yellow).

The t-shirts are high quality, 100% cotton, preshrunk and proudly display a 7-inch diameter Lepidopterists' Society logo on the front. For ordering form please see the mailing insert that came with this issue, or indicate quantity, color and size desired and send along with a check to Kelly Richers, Treasurer, The Lepidopterists' Society 9417 Carvalho Court, Bakersfield, CA. 93311-1846.





# Metamorphosis...

Julian Donahue

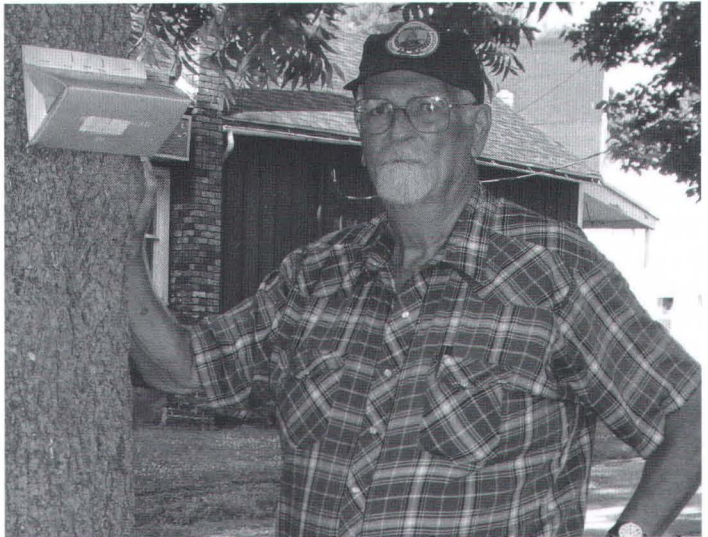
The Society has learned of the death of the following members. Our condolences to their families.

**Patrick J. Conway**, of Galva, Illinois, member of the Society since 1952 and a veteran Illinois collector, on 31 January 2009 at the age of 71. Memorials may be sent to the Illinois Natural History Survey, Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61280.

Patrick was born in Davenport, Iowa, on July 11, 1937. He was married to Catherine Sheahen who survives, as does a son, Patrick Conway, Jr. Patrick graduated from Aledo High School, served in the National Guard and was an insurance underwriter and broker for 35 years. For many years, he and his family resided in Downers Grove, Illinois before retiring to the Bishop Hill-Galva, Illinois area. For the last 10 years, he was a USDA Plant and Wildlife Inspector, trapping Gypsy Moths and Pine Shoot Beetles for population estimates. He had a remarkable collection of more than 20,000 insect specimens, chiefly butterflies and moths, from 26 states and three Canadian provinces, with a special interest in the distribution of Illinois Lepidoptera, Lepidoptera of the western U.S., HesperIIDae; Speyeria, and Catocala. Pat was an affiliate of the Illinois Natural History Survey and the Field Museum of Natural History in Chicago.

Patrick was a devoted student of the Illinois butterfly and moth fauna, kept painstaking notes and narratives in the field, and always had a net at his disposal in the rear of his car! These notes and records were an invaluable resource to David Hess and Dr. Yale Sedman in their 1985 publication "Butterflies of West Central Illinois." Patrick was also a capable contributor to Season Summaries, was the first to locate *Hesperia ottoe* at Sand Ridge State Forest, and co-authored a paper on Illinois butterfly distribution at the 1978 Lepidopterists' Society Meeting. Pat's expertise and friendship will be missed by both of us! [David Hess and Norm Seaborg]

**Leuschner, Jeanne**, at her home in Manhattan Beach, California, on 28 February 2009 at the age of 85. Jeanne had been an Affiliate Member since 1997. She was very active in civic and church affairs, and worked for many years as a travel agent—she celebrated her 80th birthday during a trip to China. She is survived by her husband of 52 years, well-known lepidopterist Ron Leuschner, who took advantage of their far-flung world travels to collect Lepidoptera, and three children and two grandchildren.



Patrick J. Conway with one of the many Gypsy Moth traps he used in his job as a USDA Plant and Wildlife Inspector.

## Lepidopterists' Society Treasurer Receives Award

Kelly Richers, Principal of Thomas Jefferson Middle School, has been named the 2009 California State Middle Grades Principal of the Year by the Association of California School Administrators (ACSA). ACSA represents over 16,000 school administrators throughout California. Mr. Richers has been a school administrator with WUSD for 16 years.

He has been previously honored by ACSA in 1997 & 2002 as West Kern and Region XI Co-Administrator of the Year." Kelly is the Treasurer of the Lepidopterists' Society.

In addition, he is the recipient of the John Adams Comstock Award for Research by the Lepidopterists' Society in 2008, and serves as the Assistant Managing Director for The Wedge

Entomological Research Foundation, dedicated to publishing reference volumes about the moths of America and Mexico for researchers and future reference.





## **Conservation Matters:** **Contributions from the Conservation Committee**

# **Managing Habitat for Lupines and Rare Butterflies**

Ernest H. Williams

Dept. of Biology, Hamilton College, 198 College Hill Road, Clinton, New York 13323-1295 ewilliams@hamilton.edu

To preserve crucial habitat for rare plants and butterflies, a group of conservationists in central New York has been focusing on habitat maintenance and restoration in the nearby Rome Sand Plains (RSP). The RSP is a patchwork of high sand dunes covered with pitch pines, water-logged swales between the dunes that support sphagnum moss and pitcher plants, a swamp with highbush blueberry and huckleberry, and occasional open sandy patches with populations of wild blue lupine, *Lupinus perennis*. The sand is a remnant of glacial times; when the last glacial advance melted around 12,000 years ago, water covered much of central New York, forming glacial Lake Iroquois. After thousands of years of the water eroding underlying rocks, the lake finally drained, leaving behind a barren landscape. Sand from the lake bed was blown into dunes, and the RSP is a remnant dune field from that time, lying over a high local water table.

The geological background explains why sand plains occur here so far from the ocean, but of greater interest is what lives in the RSP. Besides providing beauty, the lupine serves as the larval host for frosted elfin, *Callophrys irus*, butterflies. Little lupine remains, however; in the absence of disturbance, especially the natural fires that once opened up the vegetation, white pine trees have invaded the open lupine patches and pitch pine stands. A single large lupine stand remains in the center of the area, although small patches of lupine can still be found beneath canopy cover in several nearby places.

A significant population of frosted elfins occurs at the main lupine patch. Modified Pollard walks at this site have given peak counts of up to 30 frosted elfins in a single 12-minute transect, along with an occasional Eastern pine elfin. Pollard walks are censuses along established transects during which one counts all individuals of focal species seen within a certain distance; the counts provide measures of relative rather than absolute abundance, but they indicate the sizes of resident populations. No confirmed records exist of the federally endangered Karner Blue butterfly in the RSP, a species that uses the same lupine as a larval host, but they likely lived here in the past when the vegetation was more open and the lupine more abundant (Karner Blues, *Plebejus melissa samuelis*, are found in the Albany Pine Bush just 100 miles to the East). Given the presence of lupine, the Federal Recovery Plan for Karner Blues has designated the RSP as a potential recovery site. Other uncommon sand barrens species, such as rare tiger beetles, may also occur here.

The special characteristics of the RSP led to a collaborative effort starting more than 10 years ago. Spearheaded by The Nature Conservancy (Central and Western New York chapter), a Rome Sand Plains Management Team was formed to consider overall management of the area. In addition to The Nature Conservancy, this collaboration has included the New York State Department of Environmental Conservation, the city of Rome, Oneida County, the local chapter of the

Izaak Walton League, faculty from nearby Hamilton College, and others.

A specific goal of the collaborating partners is to expand the lupine population (any project like this is complex enough to require extensive collaboration). With greater lupine coverage, frosted elfins could increase in abundance, and we might be able to introduce Karner Blues. Two approaches are being taken towards these ends.

The first approach is to plant lupine seedlings, and we're doing so in open sand areas that have been bought by TNC and then transferred to the state of New York. Each summer TNC staff collect lupine seeds from our existing dense stand; each following spring botanists from nearby Morrisville State College germinate the seeds in peat plugs in their greenhouses; and six weeks later, work crews of volunteers plant the seedlings under the direction of TNC staff and the Hamilton College biologists. We then monitor the survival and growth of the seedlings to see what conditions lead to the greatest survival. We can collect enough seed to grow and plant seedlings, but we don't have enough for broadcast sowing of ungerminated seeds. Financial support for this effort has come from The Nature Conservancy and the National Wildlife Federation (Species Recovery Fund); we also have the full support and cooperation of staff from the NYS Dept. of Environmental Conservation.

What have we accomplished so far? Expanding lupine coverage is not easy.





**Volunteers endeavor to manage habitat to encourage populations of Frosted Elfins (*Callophrys irus*)**

**Fig. 1.** Frosted Elfin (*Callophrys irus*) on lupine in the Rome Sand Plains. **Fig. 2.** Part of the large natural lupine patch in the Rome Sand Plains, with moss and lichen encrusted sand. **Fig. 3.** Volunteers planting lupine seedlings. **Fig. 4.** A new patch of lupines in flower two years after planting seedlings.





Existing vegetation can overwhelm and outcompete lupine seedlings, particularly if the soil is nutrient rich. Where succession has led to trees growing on sandy substrate, removal of the trees can be challenging. Our group began careful planting of lupine seedlings in 2003, and except for one year, we've planted up to 1500 plugs each summer. By now we've established several new patches of lupines around the outskirts of the original large patch, and frosted elfins have dispersed to at least one of these new sites. We've created a metapopulation of lupine habitat at this site: a cluster of lupine patches separated by forest but connected by open corridors for dispersal, all within an area small enough that a few butterflies can readily move among these patches.

We've had even greater success two miles away at the site of an old sand mine. The open sand pits have provided ideal habitat for planting sand-dependent species like lupine, and seedlings that we planted in 2006 have grown into small dense patches. This area is comprised of two connected open sand areas, each about 3 acres in size, and with connections to additional nearby sites, the sand mine provides a potential second metapopulation site within the RSP.

We've learned a few things along the way. The first year we planted seedlings in three types of habitats: bare sand, sand covered with a moss and lichen crust, and vegetated sand. We quickly found that no seedlings survived among the grasses and sedges of vegetated sand. Next, because the summer is hot and dry, we thought that planting in the fall might give the seedlings a better chance to establish deep roots before the desiccation of the following summer. Deer quickly defeated that plan,

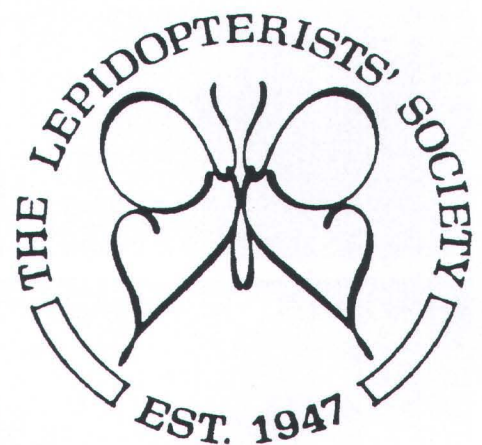
however; with little other fresh vegetation to eat at that time of year, they readily consumed all our fall-planted seedlings. More recently we've found that seedlings establish better if we first add wood ash to the sand, a treatment that raises the pH and adds nutrients. A question still to be answered is what limits nodule formation by nitrogen-fixing symbiotic bacteria on lupine roots. Next year the state will bulldoze a nearby field to open up more sand habitat for planting.

The second direction of our conservation efforts has been a study of habitat management in the RSP. With support from The Nature Conservancy, two ecologists from nearby Hamilton College (Bill Pfitsch, a plant ecologist, and I, a butterfly ecologist) and summer research students have been studying the growth of lupine and the ecology of frosted elfins. The main lupine patch is being invaded by Eastern white pines, and we wanted to measure the effect of this vegetative change on our focal species. We quantified lupine growth and use by frosted elfins near 18 white pines, and then in the winter of 2002-03, state foresters removed the nine of the 18 trees that we had randomly selected for removal.

We examined our nine removal plots and nine control plots over the following five years. We found that, where the canopy had been removed, lupine plants grew to larger sizes and produced more flowers; furthermore, frosted elfin abundance increased, and male elfins established several new mating territories in the newly opened plots right where we had removed trees. But tree removal was not a perfect solution; no new lupine plants became established. (This study has just been published in the journal *Restoration Ecology*.) We're now looking at whether

lupine growth is limited by insufficient micronutrients, nitrogen-fixing bacteria, or mutualistic fungi (mycorrhizae).

Conservation efforts in the RSP continue. Each year we plant more seedlings, and each year more patches of flowering lupines are visible. While their numbers fluctuate from year to year, frosted elfin numbers remain substantial, and they make use of more of the total lupine patch than before we removed the white pines. But despite heavy seed set in the original and planted lupine patches, little natural establishment of new lupines is taking place. Our research continues on lupine growth and the ecology of frosted elfins. Perhaps in a few more years we'll have the needed number of interconnected lupine patches to introduce Karner Blues into the RSP. After 10 years of conservation work, one important point stands out: all the successes to date, as well as those yet to come, have depended on the good-spirited collaboration of multiple partners, each of which has contributed expertise and support towards a common goal.





# White Morphos, Shotguns, and “Evil Women”

Gary Noel Ross

6095 Stratford Ave., Baton Rouge, Louisiana 70808, [GNR-butterfly-evangelist@juno.com](mailto:GNR-butterfly-evangelist@juno.com)

Many life experiences prove to be so profound that they become locked in our memory forever. As a seasoned lepidopterist, I, of course, have had numerous stellar moments in the field. Here is one such bit of vintage nostalgia.

While a graduate student at Louisiana State University between 1962 and 1967, I conducted research in the Sierra de los Tuxtlas (“Los Tuxtlas”), a small and isolated volcanic system located in southeastern Veracruz. Two of the dormant volcanoes there, Volcán San Martín and Volcán Santa Marta, rose from the Gulf of Mexico to just under 6,000 feet in altitude. Whereas much of the lands at the lower elevations had been dismantled into a checkerboard of villages, pastures, and milpas, elevations above 1,300 feet were pristine, that is, cloaked in secondary or virgin montane tropical rainforest. Scientific research had been scanty. But in 1962, Robert F. Andrle, a fellow graduate student received a research grant involving a biogeographical study of the area with a concentration on the ornithological fauna. Bob was looking for a field companion, and so I jumped at the opportunity. Bob would study birds, and I, butterflies.

The Andrle-Ross expedition began in June 1962 and was to last through December. Bob, his wife and four children, and I took up residence in a rented and comfortably furnished house in a small resort community called “Playa Azul” on the southern shore of Lake Catemaco, elevation 1,100 feet. Clear water and black sand beaches made for a picturesque weekend destination for many middle and upper class Mexicans.

Fieldwork settled into a routine. Consider: Each non-rainy morning Bob

and I would arise in the colorless predawn hours. Then we would drive—Bob’s station wagon or rented jeep—or ride mules to a predetermined destination as the first light washed the eastern horizon. (For you non-ornithologists, birds are most active in early morning.) Of course, butterflies are not early risers. Therefore, during the early hours I assisted Bob in spotting birds. Later, I would wander off by myself attending to butterflies. When bird activity slowed—noonish—we returned to our base. If the afternoons were clear, I would hike alone to sample the flower-rich roadsides, fields, hedgerows, and orchards encircling the lake.

Understandably, the more undisturbed areas were our primary targets, and so the slopes of the volcanoes were of particular interest. These higher destinations, though, were extremely difficult to negotiate: roads—even dirt trails—were almost non-existent outside the lowlands. However, on one of our forays in late July, we stumbled upon a newly constructed logging road ascending San Martín. But now in the midst of the rainy season, the road was impassable. As we gazed upon the road dissecting the pristine forest, our minds fantasized about what treasures lay ahead. But today was not the day.

August 10. The four previous days had been dry. So, about 4 AM Bob and I set off in a jeep for San Martín. Regrettably, we found that the road was still too wet for the jeep. But not easily dissuaded, we parked the vehicle and continued on “shank’s mare.” The farther we walked, the more challenging the road became. But we persevered, and by midmorning, we had climbed to about 2,200 feet in elevation. The forest was luxurious. Except for road

construction, the greenery was thick and layered with a canopy at least 100–130 feet above the forest floor. The titans were perhaps 150 feet in height. Their heavily buttressed trunks supported a crown festooned with exotic epiphytes such as mosses, lichens, bromeliads and orchids that pierced the canopy. Less monolithic types and feathery palms dominated the lower story. Everywhere, lianas, those “Tarzanesque” vines, girdled and looped up trunks searching for sunlight. Few plants other than the bromeliads and orchids were in flower, and so butterflies did not congregate anywhere. However, the shadowy forest did indeed harbor butterflies. Ithomiids, those peculiar almost transparent species commonly referred to as “glasswings” or “clearwings,” were the most common. Their transparency and slow flutterings created illusions of mystical apparitions. All in all, the day was proving a childhood dream come true.

Suddenly, I spotted what appeared to be a snow-white bird gliding above the high forest canopy. But no, the specter was instead an enormous butterfly. My mind reflected to my library perusals of “*Macrolepidoptera of the World: The American Rhopalocera*,” by A. Seitz (1923), at the time the only available illustrated reference I could find on tropical butterflies. If memory served me correctly, the butterfly could be no other than the “white morpho” (*Morpho polyphemus*)—an unusual member of a group of large butterflies that usually sport metallic blue wings.

From my vantage point along the road, I could now see that the butterfly was particularly attracted to those emergent trees displaying a tangled web of lianas. There the insect would

*Continued on pp. 70*



# The Marketplace

**IMPORTANT NOTICE TO ADVERTISERS:** If the number following your advertisement is "511" then you must renew your advertisement before the next issue! Remember that all revisions are required in writing.

## Books/Videos

Wanted: Books wanted: Zimmerman E. G. (1978) *Insects of Hawaii*, vol. 9 (parts 1 and 2) Microlepidoptera, Univ. of Hawaii Press. Also, Hampson, G.F. (1894) *Fauna of British India*, Moths, (Vol. 2 Arctiidae only) - preferably the 1976 reprint by Today and Tomorrow's Printers and publishers of India. Matthew Barnes Upper Cow Leys Far, Piddington, Bicester, Oxon OX25 1QE England email: mothman@belizemail.net

512

For Sale: Fascicle 118 (Noctuidae) of *Lepidopterorum Catalogus* by Robert W. Poole. Three volumes/mint condition. \$150 for set or best offer. Edgar Cohen 5454 Marsh Hawk Way, Columbia, MD 21045 edcohenfam@yahoo.com

511

New book on American butterflies: R.R. Askew & P.A. v.B. Stafford: *Butterflies of the Cayman Islands*. Hardback, 24x17cm., 172 pages incld. 6 color plates and 119 color photos. Maps and other figures. US \$69.50. Also available:

Larsen: *Butterflies of West Africa*. Hardback 28x21cm. 865 pages in two volumes. 125 color plates depicting 1,400+ specimens. US \$256.00. Monastyrskii: *Butterflies of Vietnam*, softcover, 21x15cm., Vol. 1: Satyrinae. 199 pages incl. 35 color plates, US \$64.00. Many others available. Visit website: [www.apollobooks.com](http://www.apollobooks.com) or contact Peder Skou, Apollo Books, Kirkeby Sand 19, DK-5771 Stenstrup, Denmark, or ask for a copy of our 2008-09 catalogue.

514

Small collection of *American Museum Novitates* on lepidoptera and small collection of Barnes & McDunnough's *Contributions to the Natural History of North American Lepidoptera*. Will consider trading for papered specimens. For details email: Russell.Rahn1@verizon.net

514

Wanted: Vol. 37 of the *Journal of Research on the Lepidoptera*. Jon H. Shepard, 6420 Barabanoff Rd. Nelson, BC V1L 6Y1 Canada shep.lep@netidea.com

511

## Specimens

For Sale: Eggs: Saturnidae: *Automeris amanda tucanmana*, *Copaxa flavolla*, *Syssphinx molina* plus other Saturnids from Argentina. Papered specimens of butterflies (all families), Saturnidae or Sphingidae, also some beetles. For a list of all Argentina species, please write or email to Nigel South, Mis Montanas, Los Robles 1818, Villa Los Altos, Rio Ceballos 5111, Cordoba, Argentina. Also collecting trips in Argentina from September to May. Contact Nigel South for further details. Email: butterflyconnections@hotmail.co.uk

514

For Sale or Trade: Worldwide butterflies, moths, beetles. Many rare insects from Central and South America, Laos, Cuba, Borneo, and African countries. We also trade for North American butterflies. Many unidentified species for sale. Check our lists of identified species on our website: [www.entomopro.com](http://www.entomopro.com) or visit our shop in Quebec City (contact us first). Yves-Pascal Dion, Insectes Mondiaux, C.P. 1018, Lac-Beauport, QC, G3B 2J8

The aim of the Marketplace in the *News of the Lepidopterists' Society* is to be consistent with the goals of the Society: "to promote the science of lepidopterology...to facilitate the exchange of specimens and ideas by both the professional worker and the amateur in the field,..." Therefore, the Editor will print notices which are deemed to meet the above criteria, *without quoting prices*, except for those of publications or lists.

No mention may be made in any advertisement in the *News* of any species on any federal threatened or endangered species list. For species listed under CITES, advertisers must provide a copy of the export permit from the country of origin to buyers. **Buyers must beware and be aware.**

Only members in good standing may place ads. **All advertisements are accepted, in writing, for two (2) issues unless a single issue is specifically requested.**

**Note: All advertisements must be renewed before the deadline of the third issue following initial placement to remain in place.**

All ads contain a code in the lower right corner (eg. 481, 483) which denote the volume and number of the *News* in which the ad. first appeared. **Renew it Now!**

Advertisements must be under 100 words in length, or **they will be returned for editing**. Ads for Lepidoptera or plants must include full latin binomials for all taxa listed in your advertisement.

**Send all advertisements to the Editor of the News!**

The Lepidopterists' Society and the Editor take no responsibility whatsoever for the integrity and legality of any advertiser or advertisement.

Disputes arising from such notices must be resolved by the parties involved, outside of the structure of The Lepidopterists' Society. Aggrieved members may request information from the Secretary regarding steps which they may take in the event of alleged unsatisfactory business transactions. A member may be expelled from the Society, given adequate indication of dishonest activity.

Buyers, sellers, and traders are advised to contact your state department of agriculture and/or PPQAPHIS, Hyattsville, Maryland, regarding US Department of Agriculture or other permits required for transport of live insects or plants. Buyers are responsible for being aware that many countries have laws restricting the possession, collection, import, and export of some insect and plant species. Plant Traders: Check with USDA and local agencies for permits to transport plants. Shipping of agricultural weeds across borders is often restricted.



Canada. Ph/Fax: 418-907-7367. Email: ypdion@entomopro.com 512

For Sale or Trade: Very rare *Propomacrus davidi* (China) Yoshiaki Furumi, 97-71 Komizo, Iwatsuki-Shi, Saitama-Ken, 339-0003 Japan 514

Wanted: Want to purchase butterfly collections U.S./non-U.S., common/rare. Contact: Brad Black, 2777 Carrington Street NW, North Canton, OH 44720-8163. email: doc3girls@aol.com 514

Wanted: Want to trade butterflies from Japan with individuals from USA and Canada. Shigeo Nomura 1-3 Goryoucho Higashimatu-yama-shi Saitama-ken Japan shigeonomura2@ybb.ne.jp 511

### Research

Material needed for research project on geographic differences in *Lophocampa maculata*. Eggs, larvae (all instars) or adults useful. Will pay for shipping. Please contact Ken Strothkamp, Chemistry Dept., Lewis & Clark College at kgs.lclark.edu 514

Seeking short series (5-10 individuals) of recently collected papered specimens (since 2003) of species in the genus *Celastrina* from the Americas (especially localities far from Kentucky), Asia, Europe, etc. for a student project in molecular phylogenetics. Good locality data essential. Specimens collected in 2009 are particularly desirable. We are happy to reimburse for postage. Jeffrey Marcus, Department of Biology, Western Kentucky University, 1906 College Heights Blvd., #11080, Bowling Green, KY 42101 USA or email: jeffrey.marcus@wku.edu 511

Seeking egg masses of the *Catalpa* *Sphinx*, *Ceratoma catalpa* (Sphingidae) for research on the chemical ecology of this species. Please contact Deane Bowers at: deane.bowers@colorado.edu or (303) 492-5530. I am happy to reimburse for express shipping. Send to: Deane Bowers, Dept. of Ecology and Evolution, Ramaley N122, UCB 334, University of Colorado, Boulder, CO 80309. 514

The Ecoinformatics lab of Dr. Jeremy Kerr at the University of Ottawa is conducting an analysis of mobility for butterflies in Canada. In the absence of experimental mobility data for the vast majority of species, I will rely on the cumulative knowledge of Canada's lepidopterists to construct a mobility index. I am distributing a survey to people with field experience with butterflies and skippers of Canada. Surveys of lepidopterists in the UK and Finland have produced mobility estimates remarkably similar to those obtained from field experiments. If you have field experience with Canadian butterflies then I hope you will take the time to complete my survey. Visit: [www.science.uottawa.ca/~jfitz049/survey.html](http://www.science.uottawa.ca/~jfitz049/survey.html) for more information on this project and to download the survey. Email me: [rburk091@uottawa.ca](mailto:rburk091@uottawa.ca) with any questions or comments you may have. 514

### Equipment

Light Traps: 12 VDC or 120 VAC with 18 inch vanes (15 & 32 Watt) and 24 inch (40 Watt). Rigid vanes of Stainless Steel, Aluminum, or Plexiglass. Rain Drains and beetle screens to protect specimens from damage. Collecting Light: Fluorescent UV 15, 32 & 40 Watt. Units are designed with the ballast enclosed in a weather tight cast aluminum enclosure. Mercury Vapor: 160 & 250 Watt self ballast mercury vapor with medium base mounts. Light weight and ideal for trips out of the country. Bait Traps: 15 inch diameter and 36 inches in height with a rain cloth top, nylon coated fiberglass screen, and supported with 3/16 inch steel rings. A plywood platform is suspended with eye bolts and S hooks. Flat bottom has a 3/16 inch thick plastic bottom that will not warp or crack. Bait container is held in place by a retainer. For more information, visit our website at: [www.leptraps.com](http://www.leptraps.com) or contact Leroy C. Koehn, Leptraps LLC, 802 South Third Street, Watseka, IL 60970-1607. Or telephone: 815-515-4060

### Announcement

#### The Lep Course: A Comprehensive Introduction to Lepidoptera Identification and Classification 7-14 August 2010

Held at the SouthWest Research Station (SWRS) in the Chirichahua Mountains in SE Arizona (a 2 1/2 hour drive from Tucson), the focus of the lep course is to train graduate students, post-docs, faculty, and serious citizen-scientists in the classification and identification of adult lepidoptera and their larvae.

With its extensive series of Sky-Island mountain ranges, SE Arizona has the highest lepidoptera diversity in the US. With low desert scrub, oak and mixed oak-pine woodland, lush riparian, juniper, Douglas fir, and mountain meadow habitats all within a 40 minute drive from the station, the SWRS is an ideal location from which to sample this diversity (of both habitats and species).

For more information visit [www.lepcourse.org](http://www.lepcourse.org)

### Announcement

#### Montreal Insect Show

Where: Maisonneuve College, 3800 Sherbrooke East, Montreal (nearby the Montreal Insectarium and the Olympic Stadium). When: October 24th, 2009 from 9 a.m. - 6 p.m.

A reunion for lepidopterists and all entomologists. Welcome to all collectors, amateurs and professionals from the USA. Thousands of worldwide butterflies and other insects to complete your collections. Exhibitors are societies, breeders, entomological supplies, book publishers, insect merchants, artists. This is the most important gathering of amateur collectors in America. Information and directions: <http://www.entomopro.com/catalog/salon.php> or contact Yves-Pascal Dion at: [ypdion@entomopro.com](mailto:ypdion@entomopro.com) or phone: 418-907-7367.



## White Morphos, Shotguns, and Evil Women"

*Continued from pp. 67*

circle—perhaps searching for a host plant or source of food? Seconds later, the butterfly would move on, flapping its wings with deep, deliberate strokes. The controlled grace was like nothing I had ever observed before. I stood there praying with mouth agape that the butterfly would descend to ground level when it encountered the road.

But no such luck. The butterfly simply dipped before resuming its original altitude and disappearing above the emerald wall of forest on the other side. Within seconds, though, two similar individuals made their appearance above the road. Alas, they too remained beyond reach. But to my surprise, they began to encircle each other as if pirouetting in a silent ballet. Intrigued with the bird-like size of the butterflies, my ornithologist partner hatched a plan: he would attempt to shoot down the insects with his 12 gauge shotgun with hand-packed "dust shot," a proven method for bringing down distant small birds. Frankly, I was apprehensive. All I could envision was the butterflies being turned into confetti. But, certainly this was worth a try. After all, specimens in any shape would serve as acceptable vouchers for my research collection.

Bob took aim then pulled the trigger. Bemused, I watched as not one but *both* butterflies remained intact as they drifted like leaves to the ground barely 30 feet before me. I ran! To my amazement the hapless specimens were still alive—barely. Their wings had been peppered, but fully 90 percent of the membranes were still in place. Now I could examine the butterflies close-up. Wingspan was a whopping 7-8 inches; both forewings and hindwings were equal in size and so the wing surface was massive (no wonder the "dust shot" had impacted its target!); color was basically snowy white with an overlay of faint opalescence; a few black

markings accented the ground color. Oddly, the underlying membranes seemed unusually thin, tenuous; in fact, the black ocellus-like markings on the undersides actually showed through to the dorsal surfaces. And there was another extraordinary feature: The body, also white, was inordinately small in comparison to the expansive wings. (Perhaps, this lack of muscle was the reason for such slow flight?) With the specimens now in hand, I confirmed that the species was *Morpho polyphemus*. (Subsequent identification proved the subspecies to be *M. p. luna*, the taxon with the most sizable individuals.) After dispatching the butterflies, I placed them into the largest glassine envelopes I carried; in turn the envelopes went into a plastic container for protection in my field bag.

As the morning progressed, white billowy clouds formed, but no rain. We continued to encounter other white morphos. All exhibited similar behavior. Then one of those heart-thumping moments that opens a window into the soul, occurred. About noon, a single morpho began descending toward a sizable patch of shrubbery growing in full sun along the roadside no more than 100 feet ahead of me. I began running, but stopped clear of the greenery. You see, the plants, 4-5 feet in height, large, palmate leaves, and small white clusters of flowers, could be no other than the infamous *mala mujer* ("bad, wicked, or evil woman")—and no wonder since every leaf and stem is covered with a dense array of nettle-like hairs and spines that inflict severe pain to any transgressing mammal. Moreover, I had on another occasion experienced the wrath of this species, labeled by botanists as *Cnidoscolus angustidens* (family Euphorbiaceae), when I had unknowingly brushed a leaf with my hand. My skin began to tingle instantly with fiery prickles. The pain rapidly intensified to the point that it seemed as if I were on fire. This continued for an hour or so before subsiding and leaving behind only red dots as testimony to the unwitting encounter.

But here the *mala mujer* was growing in an assemblage covering 150-200 square feet—a potential whole lot of trouble. Adding insult to injury, the morpho selected a leaf in the middle of the stand to alight. There, like the proverbial Siren of the deep, it flaunted its assets. The gleaming sun, lustrous white, and green background presented a surreal image. I moved quickly to the edge of the colony. I could judge that even the long handle of my net could not reach the butterfly from my position. If I were to be successful, I would have to muster the courage to endure the *mala mujer*. I paused: Could I tolerate what were sure to be hundreds or more stings on my hands, neck, and face? Would I ever again have another such opportunity for netting a white morpho in good or even perfect condition? An unsettling predicament. What was I to do?

In the end, my zeal as an aspiring, nascent scientist overruled common sense. So, after checking to make sure the buttons on my full-sleeved shirt were secured, I dashed intrepidly into the green Hell. (I confess that I also muttered a sanctimonious "God have mercy.") When I judged the butterfly to be within netting range, I swung the net vigorously, and without taking stock of my effort, about-faced and beelined it back to the road. Only when I cleared the *mala mujer* did I check the net. I, of course, feared the worse. However, my quarry was indeed within the net, its wings producing a sound that reminded me of a bird trying to dislodge itself from a mist net Bob often employed for collecting small species. Still energized, I shouted: "I got it! I got it!" I gently removed the butterfly, a female in mint condition. I now possessed my "Holy Grail."

My adrenalin now began to wane. As I rejoined the real world, my bliss quickly metamorphosed into a decided wince. The skin covering my hands, neck, and chin were mottled red and burning—really burning. In an effort to cool the fiery sensation, I doused the afflicted areas with water from my canteen. No relief. If anything, the water



exacerbated the pain. So, trying to think positively, I focused on securing the specimen for transport. Task completed, I sat in the muddy road to again consider my plight. Mercifully, the pain now seemed to have plateaued and I wasn't reacting with signs of anaphylactic shock. I quipped to Bob: "I'm glad I wasn't wearing a short-sleeved shirt!" (Other than displaying patches of sensitive red skin for the next few days, I experienced no permanent aftereffects of my close encounter with the "evil woman.")

During subsequent excursions into the virgin forests in Los Tuxtlas, I often

encountered white morphos, but only in upper elevation virgin forests and only between August and October. The butterflies always flew above the canopy except on those occasions when their curiosity brought them closer to the ground. Over my nearly two years of research within the area, I collected a dozen or so other specimens. However, I must admit, that my first capture, although bittersweet, remains my most salient memory.

And if you were to ask if I would do it again, my answer would be a resounding "You bet!"

## The Fruit Piercing Moths in Texas

*Continued from pp. 73*

either frequent or infrequent strays from Mexico, where appropriate host plants exist. Of the known larval hosts for the genus, *Sterculaceae*, *Menispermaceae*, *Solanaceae* and *Ebonaceae* occur naturally in south Texas. The known larvae are semiloopers with no prolegs on the third abdominal segment, and are black or reddish brown with orange to white dorsal and lateral maculation. Some species have a dorsal hump on the 8th abdominal segment (Todd, 1959).

There are no reports in the recent literature of any *Gonodonta* species causing economic damage to citrus in Texas. It is possible that some damage may be unrecognized, but the citrus industry in south Texas is in considerable decline, for other reasons. It is also important to remember that *Citrus sp.* are not native to the new world. Therefore the fruit piercing habits of *Gonodonta* upon these plants is an acquired, opportunistic behavior and it is likely that other, native fruiting trees and shrubs are more often attacked in this manner.

## Acknowledgements

*Some collections and observations by the senior author, were made in Bentsen Rio Grande Valley State Park and Estero Llano Grande State Park, Audubon Sabal Palm*

*Grove Sanctuary, Big Bend National Park, and Yasuni National Park, Ecuador, under provisions of official permits. The senior author, therefore thanks the officials and staff of the National Park Service, Texas Parks and Wildlife Dept., the Audubon Society of Texas, and Yasuni Nat. Park, and Pontificia Universidad Catolica del Ecuador. Both authors thank Charles Bordelon for critical review of the manuscript.*

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## Record of Thirteen Species of Butterflies

*Continued from pp. 61*

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UPDATE: Currently the vast majority of the land within the Sierra de los Tuxtlas has been deforested. Unlogged remnants occur only on the extreme upper slopes and lower Gulf-facing slopes of the major volcanoes. A national preserve, *Estación de Biología Tropical Los Tuxtlas*, is maintained on the Gulf-facing lower flank of Volcán San Martín. I have no knowledge of the current status of the population of *Morpho polyphemus luna*.



## An Unexpected Florida State Butterfly Record

*Continued from pp. 77*

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# The Fruit Piercing Moths (*Gonodonta* Hubner, 1818, Noctuidae) in Texas, with Report of a New Record for the USA

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## Introduction

The purpose of this article is to illustrate the species in the genus *Gonodonta* known to occur in Texas, and document the status of *G. fulvangula* as a new record for the USA. Two of three additional species, known from Florida and two other species, unrecorded from the USA, will also be illustrated.

*Gonodonta* is a moderate sized genus of about 40 species of exclusively Neotropical noctuid moths, including eight species that have been recorded from north of Mexico, mostly in subtropical Florida and Texas. They are easily recognized to genus, but some species are confusingly similar.

In general, the moths are moderate in size, with the forewings (in all but one sp.) having a prominent tooth at the tornus. The forewing patterns vary, but are fairly simple, often having a large dark brown patch covering the median area. The hindwings are bicolored in yellow and black, with the yellow portion sometimes reduced or absent. The middle male tibia has a well developed hair pencil (fig.9, pp. 73). The proboscis is heavily sclerotized, and barbed. There is no significant sexual dimorphism. Our knowledge of these moths is based largely on Ed Todd's 1959 revision.

These moths can be of significant economic importance in that about five species are known to cause harm to citrus fruits, chiefly oranges. They do this by the adult habit of piercing the fruit for nourishment, using a strong barbed proboscis (haustellum). According to Todd, 1959, the moths may

pierce a single fruit multiple times, without returning to the same hole. This leaves a pathway for oxidation, molds and other insects to attack the fruit, especially various fruit flies, and also other moths that do not have the ability to pierce the fruit. Thus, the fruit will rot and drop prematurely, and be commercially unusable.

Curiously, no species is known to utilize citrus trees, or other Rutaceae, as a larval host, but until recently information on life history is very limited. The known larval hosts cited by Todd, 1959, include plants in the families *Annonaceae*, *Piperaceae*, *Solanaceae* (including Tomato), *Labiaceae* (Basil), *Lauraceae*, and possibly *Ebonaceae* (Persimmon). Janzen & Hallwachs, (<http://janzen.sas.upenn.edu>), reported additional hosts to be in *Sterculaceae*, *Lamiaceae*, *Menispermaceae* and *Hernandiaceae* in Costa Rica. It is likely that the adults also feed upon the fruits of the larval hosts, but this has only been proven in a few cases.

*Gonodonta* is placed in the Noctuid subfamily, *Calpinae*, Boisduval, 1840. Other members of this subfamily occur world wide, some of which have similar feeding habits.

## *Gonodonta sinaldus* Guenee 1852

Diagnosis: Head not contrastingly white, abdomen yellow. Forewings with large dark brown patch, stopping short of the subterminal area, but extending into tornus. Hindwings with inner 2/3 yellow. A very similar species from Mexico, *G. indentata* (Hampson, 1926) differs in that the brown patch on the forewing does not extend into the tornus and the inner 1/2 of the hindwing is

yellow. However, the yellow hindwing patch may be reduced or absent in both species and is not a reliable character.

This is the most common species in south Texas occurring south to Brasil. It is not known from other states. Known larval hosts are in the *Menispermaceae*, including *Cocculus* sp. (Moon seed or Snail seed vines), in Texas. (Wagner, et al., in prep.) This species has not been implicated in causing damage to citrus fruit, but has been observed frequently on ripe Anacua fruit, and comes to cut up oranges placed out for birds

It was not recorded from the USA by Todd, 1959, but first cited as occurring in south Texas by Blanchard, 1973. The moths come to UV and other collecting lights, as well as fermented baits and may be found in moderate numbers in extreme south Texas, mainly June-January.

## *Gonodonta sicheas* (Cramer, 1777)

Diagnosis: Fairly large, with mahogany brown forewing, slightly paler in subterminal area, and at extreme base and costa. The subterminal line is black, well marked, and there is usually a dark discal spot. The hindwing has inner 2/3 yellow. The abdomen is yellow. Head not contrastingly white.

An uncommon species in the USA, having been recorded about a dozen times from south and central Texas, and multiple times from southern Florida. It was first reported from Texas by Blanchard, 1973. The junior author collected two individuals in a bait trap in Cameron Co., TX, Nov. 2007. It occurs throughout Central and South America and the Greater Antilles.



Larval hosts reported in Costa Rica are various *Menispermaceae* (Janzen & Hallwachs). It has not been observed feeding on citrus as an adult.

### ***Gonodonta syrna* Guenee, 1852**

Diagnosis: A large species, with dark brown forewing, lighter in subterminal area, and narrowly white along costal margin. Hindwing with inner  $\frac{1}{2}$  yellow, with nearly vertical border separating the black outer  $\frac{1}{2}$ . The head is gray, concolorous with thorax, abdomen yellow.

This species is not known from the USA or Mexico. It occurs from Guatemala to Brasil.

Larval hosts include *Menispermaceae* and *Piperaceae* (Janzen & Hallwachs). It is not reported to be of economic importance. Included here to show the scale tuft on the male tibia.

### ***Gonodonta pyrgo* (Cramer, 1777)**

Diagnosis: The largest species in our area. Head contrastingly white, abdomen gray-brown with yellow anal tuft. Forewing elongate, mahogany-brown with fairly broad white costal stripe. Hindwing blackish with variable yellow patch along mid-costa and a yellow fringe.

Uncommon, but fairly widespread in the southwestern USA. It is known from Louisiana to Arizona, but most USA records are from southern Texas. Most recently collected by the senior author at light, in Mission, TX, Oct. 2005. It is otherwise known from Mexico south to Paraguay (Todd, 1959).

Larval hosts reported from *Annonaceae* and *Hernandiaceae* in Costa Rica (Janzen & Hallwachs). It has been observed damaging citrus in Nicaragua and Panama (Todd, 1959).

### ***Gonodonta fulvangula* Geyer, 1832**

Diagnosis: A small species. Head contrastingly white, abdomen blackish brown. Forewings chestnut brown with darker patch along inner margin. The tornus is contrastingly orange, with a thin orange line extending upward along subterminal line. Hindwings

black with quadrate yellow discal patch. A similar species, *G. incurva* (Sepp, 1832-1840), is known from Mexico to Paraguay and the Antilles, with one record from south Florida. It also has an orange tornus on the forewing, but lacks the subterminal orange line and has reddish lines between the veins on the disc of the forewing.

*G. fulvangula* is known from the USA, based on a single 2007 record by the junior author, from Starr Co., TX, specifics as indicated in the plate legend. It is otherwise known from Mexico to Uruguay.

The larval host is stated to be in *Annonaceae*. (Todd, 1959); many species in the same family in Costa Rica (Janzen & Hallwachs). It is not known to damage citrus.

### ***Gonodonta bidens* Geyer, 1832**

Diagnosis: Moderate in size. Head contrastingly white, abdomen blackish. Forewing dark blackish-brown, with contrastingly pale basal and terminal  $\frac{1}{3}$ 's. The postmedian line is pale, highly sinuate. Hindwing black with quadrate yellow patch, as preceding species. There are two additional subspecies: *meridionalis* Todd, 1959, South America (illustrated here) and *tenebrosa* Todd, 1959, from Texas into Central America. The nominate subspecies is Antillean and has been taken once in Florida. The differences between these are related to maculation on the undersurfaces of the wings.

This species is known from single, older records from southern Texas and Florida (Todd, 1959). These records may have coincided with severe outbreaks of this species in northern Mexico and Cuba. According to these reports, citrus crops were devastated in these areas. It has not been seen in Texas since the 1950's.

The larval hosts reported from Costa Rica include, *Annonaceae*, *Lamiaceae*, *Lauraceae*, and *Sterculaceae* (Janzen & Hallwachs).

### ***Gonodonta clotilda* (Stoll, 1791)**

Diagnosis: Head white, thorax and

abdomen dark brown. Forewing dark brown, with an elongate black patch along the inner margin, with some orange scales near tornus. Postmedial line faint, straight. Hindwing black with quadrate yellow discal patch.

This is included as a hypothetical species for the US, since its range is identical to that of *G. bidens* and its subspecies. The life history is fairly well known.

Larval hosts include various species in the *Annonaceae* and *Lauraceae*. There is one report from Cuba of damage to citrus.

### ***Gonodonta nutrix* (Cramer, 1780)**

Diagnosis: Head white, abdomen yellow with black dorsal spots. Forewing dark brown with broad white costal stripe, outer margin contrastingly lighter. Hindwing with basal  $\frac{2}{3}$  yellow.

Fairly common in south Florida in the appropriate habitat (swamps with abundant pond apple). This moth also occurs from northern Mexico to Paraguay and the Antilles. Potential stray to Texas.

Host: *Annona glabra* (Pond Apple), also *Solanaceae* including Tomato. Known to damage citrus in Florida, Cuba, and Mexico.

### ***Gonodonta unica* Neumoegen, 1891**

Diagnosis: Head white, abdomen yellow. Forewing two toned brown, paler beyond postmedian line. Hindwing yellow with black submarginal spots or a thin band.

Fairly common in south Florida in swamps. More information on Floridian species may be found in Heppner, 2003. Also known from Cuba. Unlikely stray to Texas, except by Hurricanes.

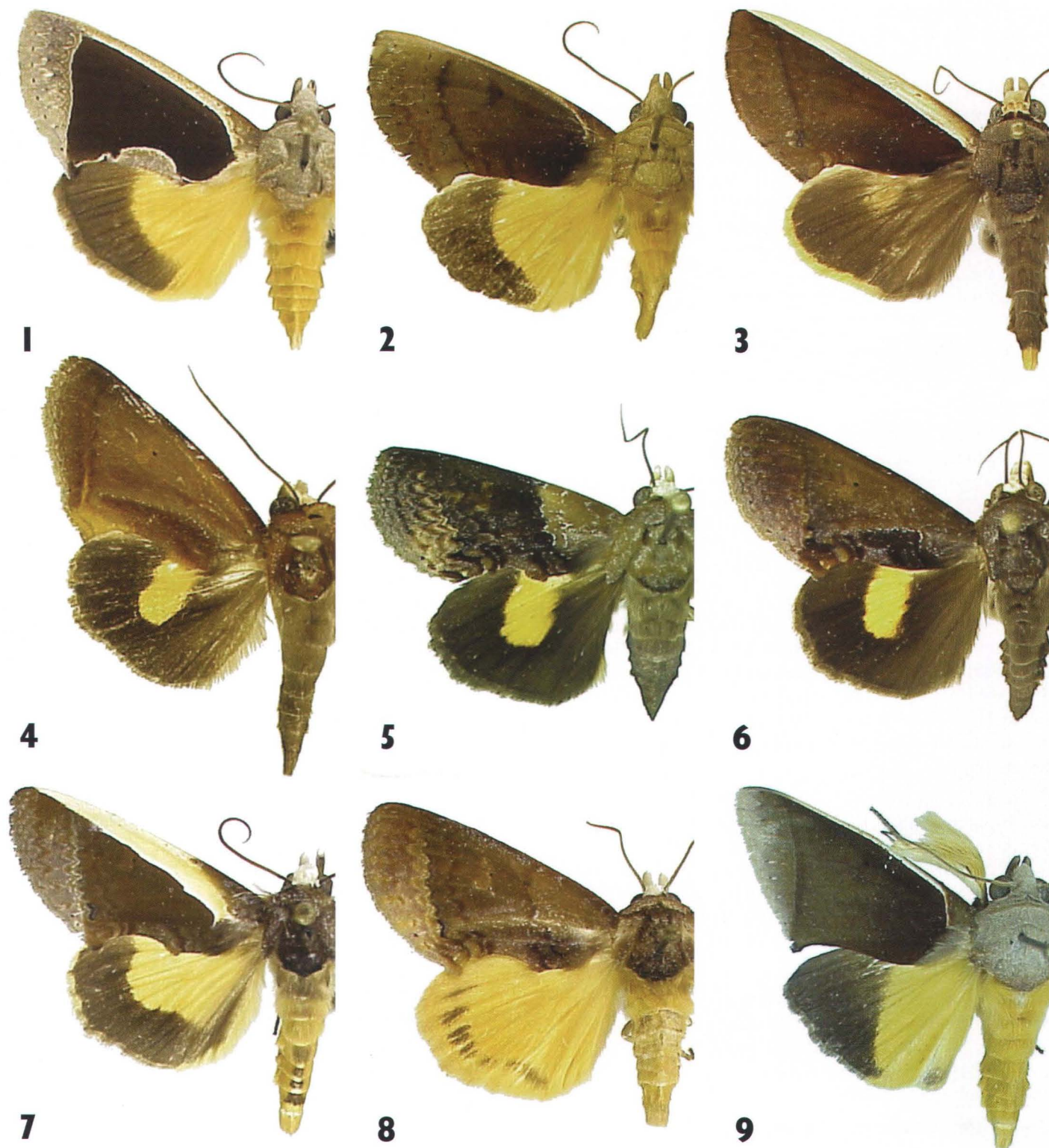
Larval host is *Annona glabra*. Not known to damage citrus.

### **Comments:**

Aside from *Gonodonta sinaldus*, which is resident, and *Gonodonta sicheas*, which may be sporadic resident, the other species in Texas are probably

*Continued on pp. 71*

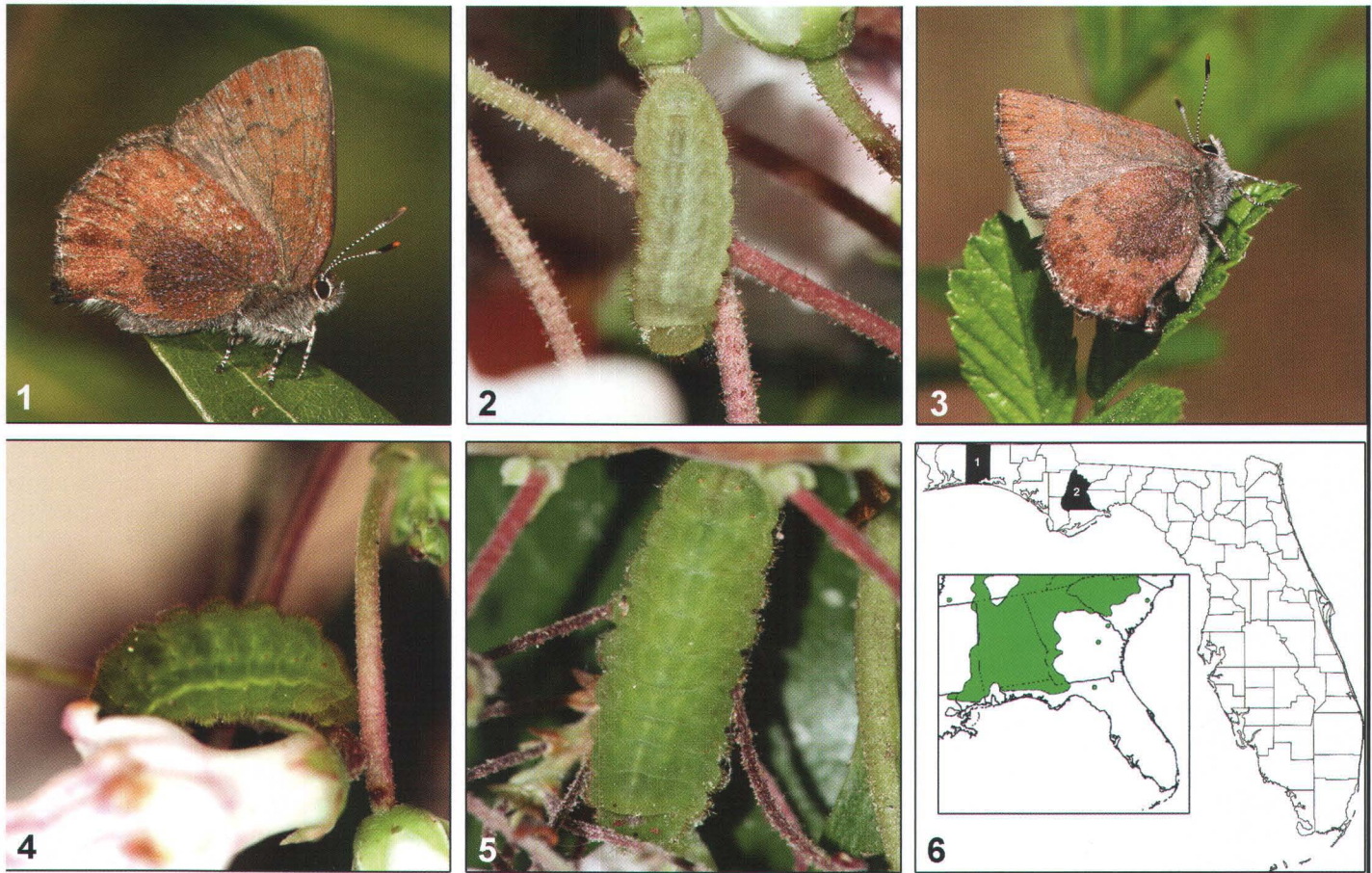




## Fruit Piercing Moths in Texas

1) *Gonodonta sindaldus*, female. Cameron Co., TX, Audubon Sabal Palm Grove Sanctuary, 4-XII-94, E. Knudson, at light. 2) *Gonodonta sicheas*, male. Hidalgo Co., TX. Bentsen Rio Grande Valley State Park, 30-X-02, Bordelon & Knudson, at light. 3) *Gonodonta pyrgo*, male. Hidalgo Co., TX, Mission, 20-X-05, Bordelon & Knudson, at light. 4) *Gonodonta fulvangula*, male, Starr Co., TX, Rio Grande City, SR 755, 1.6 miles NE of US 83, Leroy Koehn, in light trap. 5) *Gonodonta bidens meridionalis*, female, Ecuador, Napo, Yasuni National Park, 20-IX-4-X-03, Bordelon & Knudson, at light. 6) *Gonodonta clotilda*, male. Ecuador, Napo, Yasuni National Park, 20-IX-4-X-03, Bordelon & Knudson, at light. 7) *Gonodonta nutrix*, male. Collier Co., FL, Jane's Scenic Drive, 8-V-75, E. Knudson, at light. 8) *Gonodonta unica*, male. Collier Co., FL, Jane's Scenic Drive, 8-V-75, E. Knudson, at light. 9) *Gonodonta syrna*, male. Ecuador, Napo, Yasuni National Park, 20-IX-4-X-03, B&K, at light.





## *Callophrys augustinus* in Florida

*Callophrys augustinus* in Florida. 1) Adult male 17.iii.09, Blackwater River S. F., Okaloosa County (MAF). 2) Larva, 4.iv.09, BRSF (MAF). 3) Adult male, 21.iii.09, Apalachicola N. F., Liberty County (JRS). 4) Larva, 9.iv.09, ANF on *K. latifolia* flower bud (JRS). 5) Larva, 16.iv.09, Baker, Okaloosa County (MAF). 6) Location of known populations in the Florida panhandle: 1 = Okaloosa Co.; 2 = Liberty Co. Inset shows distribution of *K. latifolia* in southeastern US (from USGS 2006). 7) Creek forest habitat in BRSF (MAF). (See article on pp. 76)



# A Most Unexpected Florida State Butterfly Record

John V. Calhoun<sup>1</sup>, MaryAnn Freidman<sup>2</sup>, and Jeffrey R. Slotten<sup>3</sup>

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Over 500 miles in length, Florida is inhabited by a mixture of temperate and tropical species of plants and animals. Although we local lepidopterists have always expected that a few more species of butterflies would be discovered in Florida, one particular species never appeared on any of our "hypothetical" lists. It is not a colorful stray from the Neotropics, but perhaps the most overlooked resident of Florida.

On 13 March 2009, while exploring a portion of Blackwater River State Forest (BRSF) in Okaloosa County of the western Florida panhandle, MaryAnn Freidman (MAF) observed what appeared to be two *Callophrys henrici* (Grote & Robinson) flying near the ground. Upon closer inspection, they did not possess the hindwing tails found in *C. henrici* and they flew in a less erratic fashion. The butterflies were photographed and the images were forwarded to John V. Calhoun (JVC), who immediately confirmed their identity as *Callophrys augustinus* (Westwood) (Fig. 1, pp. 77). This record is extremely significant, given that the closest verified records of this species are from the rich forests of northern and central Georgia and northern Alabama. Harris (1972) listed an isolated record of *C. augustinus* from Bibb County in central Georgia, but this species is more widespread in the Appalachian forests of extreme northern Georgia, southward to Cobb County. The population at BRSF is located about 400 km (250 mi) southwest of Cobb County, Georgia. This discovery was made during a survey of rare butterflies under a grant from the Florida Natural Areas Inventory (FNAI). This program was

discussed in detail by Jue (2008). Now in its second year, this survey has documented many previously unknown populations of rare species. The first Florida record of *C. augustinus* underscores the great value of such organized statewide surveys.

Additional adults of *C. augustinus* were observed at BRSF until 3 April when one worn individual was photographed. No more than four adults were encountered on any given day. Most of the butterflies remained within three feet of the ground and basked on the sunlit leaves of small saplings. A few briefly visited the flowers of wild olive (*Osmanthus americanus* (L.) Benth. & Hook. f. ex A. Gray) and horse sugar (*Symplocos tinctoria* (L.)) in mid-afternoon. Adults of *C. henrici* also were seen in the same area nectaring on horse sugar. Males of *C. augustinus* occasionally interacted with one another and investigated other insects (e.g. *Erynnis* sp. and flies).

On 18 March a female *C. augustinus* was observed around the flower buds of mountain laurel, *Kalmia latifolia* L. (Ericaceae). This plant was confirmed as a host on 22 March when an egg was found on an unopened flower bud. On 4 April a third instar larva was discovered feeding on a partially opened flower bud of *K. latifolia* (Fig. 2). The identification of the early stages was confirmed by David M. Wright who had previously reared this species on *K. latifolia* in Pennsylvania. The larva was confined and fed *K. latifolia* flower buds until it pupated on 21 April. *Kalmia latifolia* is recorded as a host of *C. augustinus* elsewhere in the southeast, most notably in Virginia and North Carolina (Clark & Clark 1951, Lagrand

& Howard 2009). This plant is believed to be the primary host in the mountains and piedmont of North Carolina (Lagrand & Howard 2009). It is possible that *C. augustinus* exploits additional plants in Florida, especially *Vaccinium* (Ericaceae) species, which are reported in other portions of its eastern range.

After learning of this discovery, Jeffrey R. Slotten (JRS) visited a site on 21 March where he had formerly found *K. latifolia* growing abundantly in the Apalachicola National Forest (ANF) of Liberty County, Florida. Surprisingly, several adults of *C. augustinus* were encountered upon arrival (Fig. 3). This locality is situated in the central panhandle, about 161 km (100 mi) east of BRSF. A larva was also found, which was reared to pupation on flower buds and young leaves of *K. latifolia* (Fig. 4). This record suggests that *C. augustinus* is more widespread across the Florida panhandle.

There was yet another surprise on 16 April when a larva of *C. augustinus* was inadvertently collected near Baker, Okaloosa County, by Norm Friedman who was randomly gathering cuttings of *K. latifolia* to feed the original larva. This site is located about 8 km (5 mi) east of the BRSF population. This larva (Fig. 5) was also reared to pupation. Three separate Florida populations of *C. augustinus* are currently known in Okaloosa and Liberty Counties (Fig. 6).

*Kalmia latifolia* is classified as threatened in Florida, where it is distributed locally in the panhandle eastward to Leon County. There is an isolated record from Suwannee County, just beyond the eastern boundary of the



panhandle (Wunderlin & Hansen 2008) (Fig. 6 inset). An evergreen deciduous shrub, *K. latifolia* grows in thickets near water courses in mesic hardwood or mixed pine-hardwood forests, bluff forests, and creek swamps. This plant is uncommon at the BRSF site, which is best described as a creek swamp (Fig. 7). This area is prone to seasonal flooding and remains damp most of the year. Other plants present here are mountain azalea (*Rhododendron canescens* (Michx.) Sweet), sparkleberry (*Vaccinium arborium* Marshall), and switchcane (*Arundinaria gigantea* (Walter) Walter ex Muhl.). The Baker location, a slope forest, supports little *K. latifolia*. The floral composition of this area is similar to that of the BRSF site with the addition of the endangered Alabama azalea (*Rhododendron alabamense* Rehder). The flora of the Liberty County site, a drier bluff forest, includes oaks (*Quercus* sp.), American beech (*Fagus grandifolia* Ehrh.), blueberries (*Vaccinium* sp.), sparkleberry (*V. arborium*), and bayberry (*Myrica* sp.). *Kalmia latifolia* is locally common.

Several resident species of Florida butterflies have been validly recorded only in the panhandle, where they are generally rare and local (Minno & Emmel 1994, Calhoun 1996a, Calhoun 1996b, Calhoun & Sloten 1997, Glassberg et al. 2000, Calhoun 2004, Minno et al. 2006). Hardwood forests of this region are unusual among southern hardwood forests, as they contain a large amount of tree species, some of which are endemic. In addition, a number of understory plants in this region maintain populations that are disjunct from the Appalachian Mountains (Platt & Schwartz 1990). Over 83,507 ha (206,350 ac) in size, Blackwater River State Forest is one of the largest state forests in Florida. It contains a diverse array of habitats that support many rare species of animals and plants. Apalachicola National Forest is the largest national forest in Florida, encompassing 228,650 ha (565,000 ac). One of the largest contiguous blocks of public land east of the Mississippi River, it likewise

includes a diversity of habitats that are occupied by numerous rare Florida species.

Four species of elfin butterflies are now known to reside in Florida: *C. henrici*, *C. augustinus*, *Callophrys niphon* (Hübner), and *Callophrys irus* (Godart). The latter was first discovered in Florida by Tom Neal in 1990 in Clay County in the northeastern corner of the state. The hostplant was found to be sundial lupine (*Lupinus perennis* L.). Searching stands of this hostplant subsequently resulted in the discovery of new populations of *C. irus* in six counties across northern Florida. Most recently, larvae were found by MAF and Marc Minno on *L. perennis* in Okaloosa County on 26 April 2009. This population is located nearly 470 km (290 mi) west of the original site in Clay County. This situation is analogous to that of *C. augustinus*; additional populations of a previously overlooked butterfly were found by searching areas that support its highly localized hostplant.

Populations of *C. augustinus* can easily go unnoticed because of its retiring habits, brief spring flight period, localized occurrence in dense woodlands, and paucity of flying adults. In fact, this species was unrecorded in Georgia until the 1950s (Harris 1972). Adults are not as wary and fly more slowly than *C. henrici* or *C. niphon*. The behavior of *C. augustinus* is more similar to that of *C. irus*. In Florida, adults of *C. augustinus* were observed in close proximity to the hostplant, but some females probably disperse widely and establish small ephemeral colonies, even where limited quantities of the hostplant are available. This is suggested by the single larva found at Baker, Florida where no adults had previously been observed during numerous visits to that locality over several years. Similar metapopulations of *C. augustinus* were observed by JVC in Kentucky and Ohio. Preliminary comparisons indicate that Florida adults are most similar to the subspecies *C. a. croesioides* (Scudder), which is currently applied to other

eastern populations distributed from Massachusetts south to Georgia and Alabama. Florida individuals, however, seem to be a bit larger and darker. Further study is necessary to determine their relationship with other southeastern populations.

The occurrence of *C. augustinus* in Florida likely represents the southern terminus of a patchwork of riparian populations that extend northward into the Appalachians. *Kalmia latifolia* has been recorded from numerous counties in western Georgia and throughout Alabama (USGS 2006, USDA 2009) (Fig. 6 inset). It is hoped that this discovery will encourage others to search stands of *K. latifolia* for the presence of *C. augustinus* and contribute to a better understanding of this species at the southeastern periphery of its broad range.

### Acknowledgements

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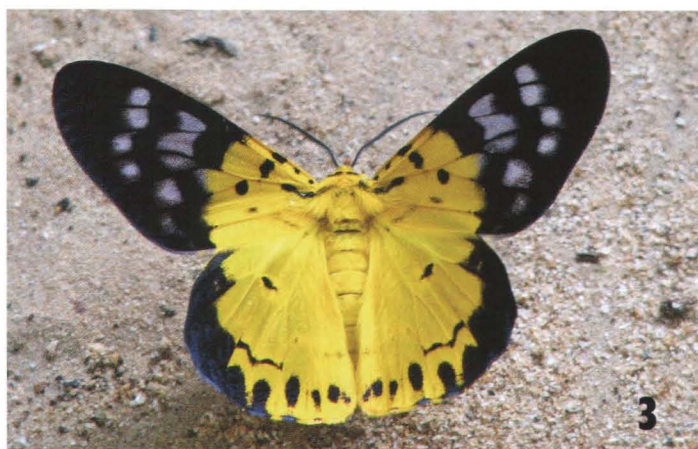
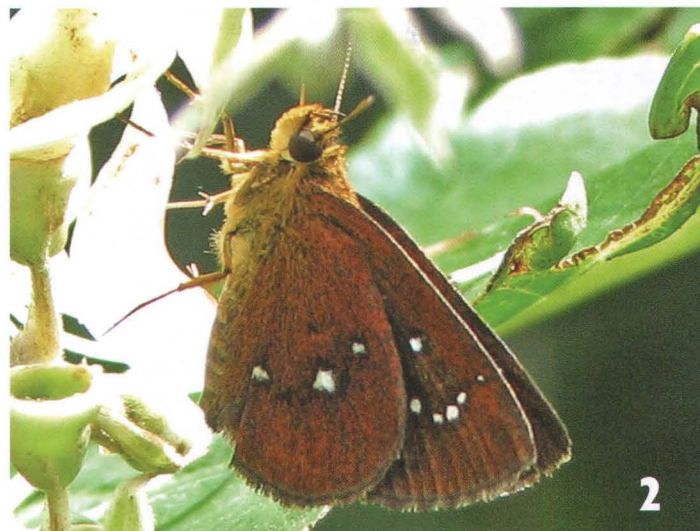
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## Lepidoptera of Taman Negara National Park, Malaysia

**Fig. 1)** *Darpa striata* (Pyrginae) male on urine soaked sediment, bank of the Tahan River. **Fig. 2)** *Iambrix salsala* (Hesperiinae) on blossom amongst rank natural secondary growth on a low bank of the Keniam River. **Fig. 3)** *Dysphania sagana* (Geometridae: Geometrinae) on urine soaked sediment, bank of the Tahan River. **Fig. 4)** Sesiidae species feeding upon minerals on skin at the cascades Lata Berkoh. **Fig. 5)** *Mycalesis maianus* male (Satyrrinae), low understory, uncommon. **Fig. 6)** *Paranticopsis delessertii* (Papilionidae: Leptocircini), male trio feeding, bank of the Tahan River. Photos 1 - 3, 6 by Steve Fratello; photos 4, 5 by Danusia Antonowicz. See article pp. 52.