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NEWS OF THE LEPIDOPTERISTS' SOCIETY

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The **News of the Lepidopterists' Society** (ISSN 0091-1348) is published quarterly by The Lepidopterists' Society, c/o Los Angeles County Museum of Natural History, 900 Exposition Blvd., Los Angeles, CA 90007-4057, USA., and includes one or two supplements each year. The **Season Summary** is published every year as Supplement S1 and is mailed with issue 1 of the News. In even numbered years a complete **Membership Directory** is published as Supplement S2 and is mailed with issue 4 of that volume of the News. Please see the inside back cover for instructions regarding subscriptions, submissions to, and deadline dates for, the News.

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Graphium eurypalus, on urine soaked sediment, Tahan River, Malaysia. Photo by Steve Fratello. See article on pp. 44.

Two Heads Better Than One? A False Head in California Tortoiseshell Larvae

David G. James

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Mimicry used as a strategy to deceive predators has presumably evolved via selective pressures from predators that hunt primarily by sight. A familiar example of this among the Lepidoptera is that of the ventral wing pattern and behavior of many adult lycaenid butterflies. The presence of spots or spot-like markings at the anal angle, usually accompanied by the presence of 'tails', are considered to resemble eyes and antennae, respectively (Salt, 1931, Robbins, 1980, 1981). The putative 'head' at the posterior end of these lycaenids is expected to deflect predator attacks from the real head and Robbins (1980, 1981) obtained data consistent with this hypothesis.

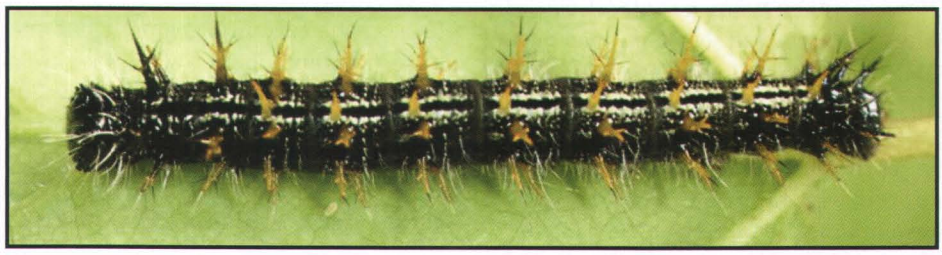
A number of lepidopteran larvae possess eyespots at the head end, but these, along with swelling, serve to emphasize, rather than deflect interest from the head, creating a 'frightening' appearance. This presumably helps to ward off visually-searching predators by mimicking some larger, more fearsome (and better defended) creature! Examples of this occur among late instar larvae of certain papilionid butterflies (e.g. *Papilio rutulus* Lucas) and sphingid moths (e.g. *Deilephila elpenor* (L.)), which might resemble snakes from a bird or small mammal's perspective. A 'false head' deflection strategy against visually-orienting predators also occurs in some caterpillars. Caterpillars of a number of danaid (e.g. *Danaus plexippus* (L)) and some papilionid (e.g. *Battus philenor* (L.)) species possess filaments on or near the terminal segments (Allen et al., 2005). These may be used to ward off insect parasitoids by waving them around (Wells and Wells, 1995), alternatively, they may serve as false antennae directing the attention of predators to the less vulnerable tail end. Striking examples of caterpillar 'false heads' occur in the Notodontidae and Noctuidae. Larvae of *Dasylophia anguina* (J. E. Smith) and *D. thyatiroides* (Walker) have swollen terminal segments, bear black 'eyespots' and have elongate prolegs that resemble antennae (Wagner, 2005). Mature larvae of *Phosphila turbulenta* Hubner have a terminal 'head' that is larger and more boldly marked than the real head (Wagner, 2005).

Here, I show by illustration, the appearance of a 'false head' on the terminal abdominal segments of larvae of the California Tortoiseshell butterfly, *Nymphalis californica* Boisduval.

Larvae of *N. californica* were reared from eggs laid by a captive female in June 2006, as part of research on the identification and biology of immature stages of Washington State butterflies (James and Nunnallee, in prep.). Images (taken using a Canon EOS-1 Ds Mark II digital camera equipped with a MP-E 65mm macro lens) of larval instars 1-5 are shown in Figure 1. The two posterior abdominal segments of all instars are dark/black colored increasing in intensity and in their resemblance to a larval head capsule as the larva matures from the first to fourth instar. In the first instar there is a sclerotized black plate situated dorso-posteriorly on the terminal segment. The remainder of the segment and the adjacent one are darker colored than the rest of the body. In the second instar, the two posterior segments darken further, becoming fully sclerotized and shiny black in the third instar. The sclerotized posterior segments most closely resemble the appearance of a larval head capsule in the fourth instar (pp. 36). In the fifth instar, a profuse covering of white setae covers the body including the posterior segments, effectively masking the 'false head' (pp. 36`).

The distinctive 'two-headed' appearance of third and fourth instar *N. californica* larvae has not been reported previously. Edwards (1876), Reinhard (1981) and Scott (1992) made no mention of sclerotized posterior segments or the 'false head' appearance of these segments in their detailed descriptions of *N. californica* larvae. However, two recently published books contain images of third instar *N. californica* larvae and both show an apparent 'head' on each end of the body, similar to the images presented here (Guppy and Shepard, 2001, Allen et al., 2005). Some other species in the Nymphalidae also appear to have a tendency towards darkening of the terminal abdominal segment. For example, instars 2-4 of *Vanessa cardui* (L.) have a sclerotized plate on the terminal segment but this doesn't extend to the whole segment and adjacent one as it does in *N. californica*. Consequently, the posterior segments do not take on the appearance of a larval head capsule in larvae of this species (James, unpubl. obs.).

Confirmation that the 'false head' appearance of *N. californica* larvae is indeed a strategy to divert the attention of visually searching predators like birds away from the real head, awaits appropriate experimental testing. Early (1-3) instars of *N. californica* feed and rest communally and the appearance of twice the number of 'heads' in a community may reduce the risk that real heads are attacked by a predator. However, an approaching predator is usually met with a communal 'head-



Larval instars (1-5) of *Nymphalis californica* showing development of posterior 'false head'. Image L4-R shows detail of scelerotized posterior segments of instar 4.

jerking' reaction (Edwards 1876, Reinhard 1981). This may be a second tier of defense with 'confusion' the first. The 'false head' of *N. californica* larvae is most apparent in the fourth instar (below), coinciding with loss of communal behavior, which may also increase predation risk. The fifth instar is characterized by greater development of spines and setae which presumably enhance defense. In this instar the sclerotized posterior segments are covered with white setae, as is the rest of the body, obscuring the 'false head' illusion.

Employment of a 'false head' as an apparent defense by caterpillars against visually-orienting predators has been described for a number of moth species. This report presents the first example of a butterfly species with 'false-headed' larvae. However, no rigorous experimental testing of the defense hypothesis has been conducted for any species. Most moth caterpillars with 'false heads' are aposematic (e.g. *Dasylophia*, *Phosphila*), and may use deception in combination with chemical defense. Although *N. californica* larvae are not aposematic they are also chemically defended, possessing a ventral gland on the first abdominal segment (James, unpubl. obs.).

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Lange's Metalmark Butterfly: Success in Small Packages

From: U.S. Fish & Wildlife Service, Sacramento Fish and Wildlife Office, 2800 Cottage Way, Room W-2605, Sacramento, CA 95825
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A daring attempt to help a nearly-extinct butterfly that began last August has been successful beyond the most optimistic hopes, and now biologists are about to re-populate one of the species' few remaining habitats.

About 8:15 am on Friday, Aug. 29, 2008 (before the day's heat builds up) biologists from Moorpark College and The Urban Wildlands Group will join with U.S. Fish and Wildlife Service (Service) biologists to release about 30 endangered Lange's metalmark butterflies in the Antioch Dunes National Wildlife Refuge in the City of Antioch in eastern Contra Costa County. Biologists will also release some larvae that biologists hope will soon mate in their natural environment.

The only home to the Lange's metalmark butterfly is a few remnant sand dunes along the river in Antioch, preserved in the Refuge. Last year the population plummeted to 45 butterflies, from hundreds or thousands of animals less than a decade ago. In a desperate attempt to save the species, last August biologists carefully collected a few of the remaining Lange's metalmarks and placed them in two experienced breeding facilities. The Moorpark College site, operated in conjunction with Urban Wildlands, has produced 185 butterflies with that initial stock. Butterflies not released now will be used to increase the breeding population for release next year.

The breeding and release program is one-half of a joint project by the Refuge, the Service's Ecological Services program in Sacramento, Moorpark, Urban Wildlands and others to establish the captive-breeding program.

The other key component of the restoration is rejuvenation of naked stem buckwheat, a whispy plant that is the Lange's sole food supply.

The task facing the Refuge was how to save dune-dependent naked buckwheat, and the butterfly that depends on them, when the dynamic movement of sand dunes had dramatically diminished. The native plants need the shifting sand, steep banks and clear ground of naturally functioning dunes. But an increasingly thick invasive weed base stabilizes the soil, which in turn leads to the growth of more weeds. Vetch, the Refuge's worst culprit, covers the ground with a thick carpet, choking out the buckwheat.

Refuge managers are removing the non-native plants that crowd out the buckwheat, allowing the butterfly's food source to recover. Using controlled cattle grazing to eat the weeds last spring, Refuge biologists cleared major areas of exotic plants, allowing a good growth of buckwheat in some areas of the Refuge.

A similar two-pronged approach – habitat improvements and captive-breeding – has stabilized the population of the endangered Palos Verdes blue butterfly, a Southern California species once thought to be extinct. Efforts by the Defense Logistics Agency, Urban Wildlands, Moorpark, and the Service has helped in the recovery of this animal.

One of the first insects to be protected under the Endangered Species Act, the Lange's metalmark has been federally listed as endangered since 1976. It is a fragile, brightly colored butterfly in the Riodinidae (metalmark) family, with an adult wingspan up to 1 ½ inches.

Metalmark butterflies are named for the grey, or metallic-colored, outsides of their wings, which make them nearly invisible when their wings are closed. But when they are open, the top side of their wings are a colorful pattern of oranges and browns. The species is named for William H. Lange Jr., a young UC Berkeley entomology student and future UC Davis professor who first identified it in the 1930's.

Unlike some butterflies that can travel hundreds of miles, the Lange's is a home body that never ventures beyond the sand dunes along the southern bank of the San Joaquin River, at the western edge of the Sacramento-San Joaquin Delta. Now, with most of those dunes destroyed, the butterfly's only remaining habitat is on and near the Antioch Dunes National Wildlife Refuge.

Unlike many other butterflies that produce several generations in a year, Lange's metalmark breeds only one group of offspring per year. So each summer's tally of adult butterflies is a critical indicator of the species' condition. Unfortunately, Lange's numbers were declining for years. In 2006 biologists recorded only 45 adult Lange's, down from 2,342 in 1999.

Biologists have been encouraged this August, with 112 Lange's counted in surveys through Aug. 20. Late August through early September are normally peak seasons for the butterfly, so biologists are hoping to see continued increases, indicating that they are on the right track.

The 55-acre Refuge is a "biological island" of rare and exotic plants and insects, some found nowhere else. The Refuge was established in 1980 as a haven for the Lange's and two federally and State listed endangered plants, the Contra Costa wallflower and the Antioch Dunes evening primrose.

2008 Karl Jordan Medal Award Recipient: Gaden S. Robinson

Jacqueline Y. Miller

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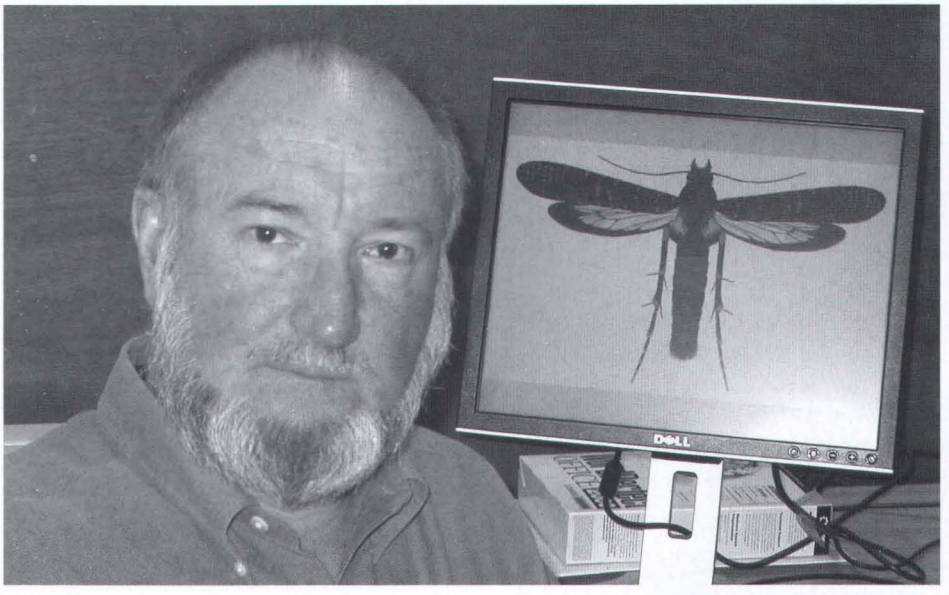
Born on 11 April 1949 in Hampshire, southern England, Gaden S. Robinson received his B. S. degree at Durham University in 1970. He was encouraged to continue his postgraduate studies there and was awarded a Ph. D. in 1974 on the taxonomy and biogeography of the Lepidoptera of Fiji. With his wife, Beth, he is the father of two sons, Richard (b. 1979) and Hugh (b. 1982).

Following the completion of his degree, Dr. Robinson traveled widely for three years in the western Pacific. In 1974, he accepted a position as Research Entomologist in the Department of Entomology of the Natural History Museum (formerly British Museum (Natural History), London. Dr. Robinson has focused his research efforts on the more primitive Lepidoptera, especially the superfamily Tineoidea, and also completed thorough biodiversity surveys on the systematics of the Microlepidoptera of southeastern Asia. In addition, he worked with local scientists but also assisted with the development of synoptic reference collections in Nepal, Thailand, Malaysia, Brunei, Indonesia, Australia, Vanuatu, Fiji, and the U. S. Additionally, his most recent research interests encompass faunistic and biodiversity studies of insular and Asian rainforest faunas and hostplant and host-substrate relationships, including the evolution of specialized forms of detritivory in Tineoidea. He also recently completed a collaboration on a *Catalogue of the Hostplants of the Neotropical Butterflies* (2008).

Dr. Robinson initiated cooperative studies on the Patagonian ghost-moths and the Linnaean type-specimens with the late Ebbe Nielsen at the Australian National Insect Collection in Canberra. In 1986, he spent a half year sabbatical with Dr. Nielsen working on a review of the Australian tineid fauna. These studies resulted in several publications, including the *Tineid Genera of Australia* (1993), and the results of the southeastern Asian field work were encapsulated in *Field Guide to the Smaller Moths of South-East Asia* (1994).

Very active in the scientific community, Dr. Robinson has been a member and held office in several professional societies, including Fellow of the Royal Entomological Society (London) in which he served as a member of the Council and the Library Committee. He is also a Fellow of the Royal Geographical Society. Dr. Robinson served as the editor of *Systematic Entomology* (1980-85), *Bulletin of the Natural History Museum, Entomology and Occasional Papers on Systematic Entomology* (1995-2002), and currently serves as the Associate Editor for entomology for *Systematics and Biodiversity*. He also is the newsletter editor and an enthusiastic member of the Malaya Study Group, the international society for Malaysian philately. In 1994, he was awarded a D. Sc. by the University of Durham for his contributions to Microlepidoptera systematics, especially the studies of Tineoidea.

Author and co-author of more than 91 publications including 17 books, his research covers a wide variety of topics from systematics, taxonomy, biogeography, evolution, mimetic patterns in the Zygaenidae, and moth and bird interactions to the hostplants and associated biology of Lepidoptera. He established the standard for online databases with the development of the Global Taxonomic database of the Tineidae in 2001. In addition, he initiated HOSTS - a database of the hostplants of the world's Lepidoptera and collaborated on *LepIndex:The global Lepidoptera names index* (2003). It is for all of the above and particularly for his remarkable contributions on the systematics of the Microlepidoptera, especially his extraordinary efforts on the Tineoidea, that the 2008 Committee recognizes Dr. Gaden S. Robinson with the Karl Jordan Medal.



Notes on the Red-spotted Purple (*Limenitis arthemis astyanax*) in Michigan

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On August 18, 2005 ca. 8:00am I observed three *Limenitis arthemis astyanax* feeding on the blood of a road-kill opossum. When I returned with camera, traffic had increased and the butterflies were chased away each time a car passed. Most escaped toward the river and trees on the west, but returned from the southeast facing into a light breeze. It appeared that they were picking up the scent of blood and following an odor trail to the opossum. Red-spotted purple butterflies have a varied diet, feeding on sap, fruit, flower nectar, carrion, dung, honeydew, decaying wood, etc. (J. A. Scott, 1986); and as evidenced in Fig. 1 &2 (pp. 57), fresh blood.

This observation appears to be a record for *L. arthemis astyanax* in Alcona County, Michigan. Nielsen (1999) shows both subspecies of *L. arthemis* (*L. a. arthemis* (White Admiral) and *L. a. astyanax* (Red-spotted Purple)) in counties bordering Alcona on the north, west and south; and Lake Huron borders Alcona County on the east. It is reasonable to expect both subspecies in Alcona County. The range of *L. a. astyanax* extends from the southern boarder to the northern counties of Michigan's lower peninsula, and the *L. a. arthemis* range extends from the upper peninsula to Iosco County, south of Alcona. The two subspecies form a hybrid swarm in this zone of overlap (M. C. Neilsen, per. com.), but none of the individuals I saw showed the white banding typically of *L. a. arthemis* and hybrids of these subspecies. Platt & Brower (1968) have shown that breeding of *L. a. arthemis* and *L. a. astyanax* within their hybridization zone (ca. two degrees of latitude across the U.S. and southern Ontario) is at random. Laboratory crosses show no evidence of inviability consequently they are considered conspecific.

The latitudinal/longitudinal coordinates (Goggle Earth) for the picture in Figures 1 and 2 are (44o 37' 53"N and 83o 26' 36"W). I also observed *L. a. astyanax* at two other sites in Alcona county, August 19, 2005 at (44o 37' 53"N and 83o 26' 37"W) and (44o 37' 34.6"N and 83o 32' 00.2"W). These are three casual observations (i.e. no effort to find butterflies) within two days, which leads me to believe that *Limenitis arthemis* is fairly common in Alcona County. For perspective on how this could be omitted from a truly excellent field guide (Nielsen 1999), by a careful scholar who is arguably the most knowledgeable about Michigan butterflies, see (Shapiro 2007). The short answer is; the county has been inadequately sampled and records are not available. We could also cite examples of collecting excesses. The exchange of ideas by proponents on either side of the collecting controversy is good for everyone fond of butterflies.

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New Service Available on the Lepidopterists' Society Website

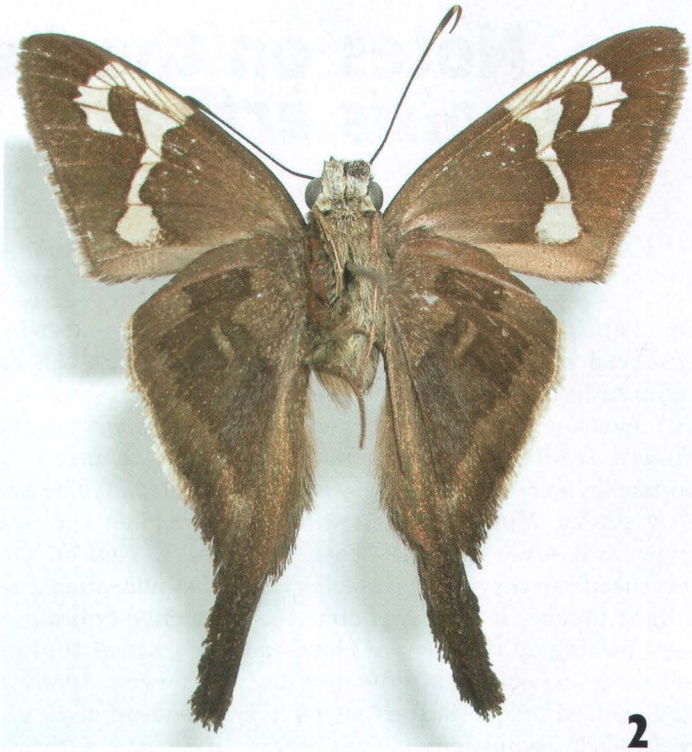
As the end of the year approaches, membership renewal forms will be in the mail for all Society members. If you want to save on postage, you can now renew your membership online by visiting the Lepidopterists' Society website (www.lepsoc.org). Just click on the "Membership Advantages" section on the navigation bar and follow the instructions.

If you haven't visited the website recently you'll be surprised by the changes that have taken place. Webmaster John Snyder has completely revamped the site making it much more user friendly and informative.

All articles that appeared in the Journal of the Lepidopterists' Society from five years ago and beyond are now available by downloading PDF files. Plans are underway to do the same with issues of the NEWS as well.

Hats off to all who have contributed their time, photos and expertise to making the website better than ever.

---Editor



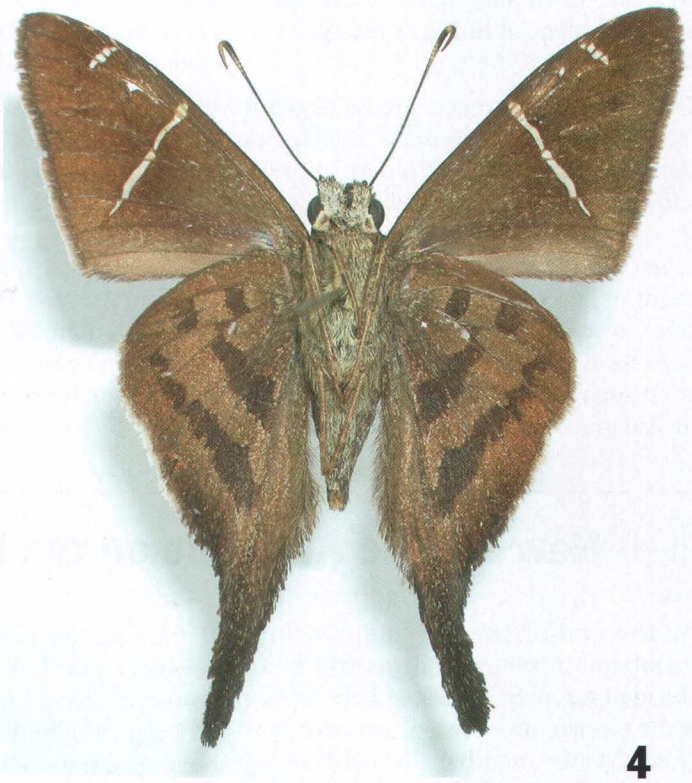


Fig. 1. Aberrant *Urbanus teleus*, male, dorsal surface (BRAZIL: Rondônia; vic. Cacaulândia, Fazenda Rancho Grande, 13 November 1991, GTA dissection # 1789). **Fig. 2.** Aberrant *Urbanus teleus*, ventral surface (same specimen as Fig. 1). **Fig. 3.** Typical *Urbanus teleus*, male, dorsal surface (GUATEMALA: Petén, Parque Nacional Tikal, 2 February 1992, G. T. Austin disscetion #14069). **Fig. 4.** Typical *Urbanus teleus*, ventral surface (same specimen as Fig. 3).

An Aberrant *Urbanus teleus* (Hübner, 1821) (Hesperiidae: Eudaminae)

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Aberrations are known for a wide variety of butterflies (Frohawk 1938, Clench 1948, Russwurm 1978, Tubbs 1978), but are more prevalent in some taxa than in others (Kendall and McGuire 1984). Aberrant individuals of skippers (Hesperiidae) are very infrequently encountered. The authors have seen very few obviously aberrant individuals among hundreds of thousands of specimens examined of this family. A particularly striking aberrant male *Urbanus* Hübner, [1807] (Hesperiidae: Eudaminae) was taken by Jim Brock near Cacaulândia in Rondônia, Brazil, on 13 November 1991 (Figs. 1, 2). Wing pattern elements of

offset proximad from the anterior ends of the bands so that the distal most macule is situated between the two more caudal bands.

On the aberrant individual, the white macules on the forewing are expanded in size and extent. A curved series occurs around the distal end of the discal cell from the costal cell to vein M1. These macules are much longer than typical for *U. teleus* and entirely fill cells Sc-R1 through R2-R3. The macules of the diagonal stripe include an expanded, somewhat triangular macule of the discal cell; narrower macules (but still considerably broader than on typical *U. teleus*) in M1-M2 and

Científico e Tecnológico kindly issued the authorization permits from the Ministério da Ciência e Tecnologia for studies in Rondônia in collaboration with EMBRAPA/CPAC and the Universidade Federal do Paraná. The junior author thanks DGAPA-UNAM for funding.

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Conservation Matters:
Contributions from the Conservation Committee

Rearing Mitchell's satyr at the Toledo Zoo – a first step towards eventual re-introduction in secure habitats

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The Mitchell's satyr, *Neonympha m. mitchelli*, is a critically endangered butterfly that inhabits sedge-dominated fen communities in Indiana and Michigan. Recently discovered populations that may be this subspecies inhabit swamps and the margins of beaver ponds in northern Alabama and Mississippi (the taxonomic status of these populations is still uncertain) and valley wetlands in the Virginia mountains. Another subspecies, the St. Francis' satyr (*N. m. francisci*), occurs in North Carolina. Extirpated from Ohio, New Jersey, and possibly Maryland, the nominotypical subspecies is now the subject of considerable concern and study with an eye towards reintroduction to historically occupied sites in Indiana and Michigan. The effort to recover Mitchell's satyr is being led by the U.S. Fish and Wildlife Service's Mitchell's Satyr Working Group- a consortium of federal officials, state wildlife agencies, land conservancies such as The Nature Conservancy, and Zoos. A boost to Mitchell's satyr recovery came in 2006, when a grant to the Michigan and Indiana Departments of Natural Resources allowed development of a Habitat Conservation Plan (HCP) to provide a framework for managing prairie fens for Mitchell's satyr butterflies.

There is an insufficient understanding of the specific ecological conditions that the Mitchell's satyr needs to survive, but the prospects for recovery of this subspecies seem best in Michigan, where there are more than 15 sites where the butterfly is still present. Michigan also has several additional localities that seem to possess the necessary hydrologic conditions and plant community structure to support the Mitchell's satyr, yet the butterflies are absent, and it is unknown whether their absence is due to chance or some inherent unsuitability as Mitchell's satyr habitat. To eliminate guesswork from the process of reintroduction planning, any successful attempt at reintroduction will depend on an understanding of which habitat attributes contribute to the successful retention or colonization of Mitchell's satyr in any given fen. One starting point we will use in evaluating potential habitat is determining the species of wetland grasses and sedges that are utilized by the larvae as host plants. Although Mitchell's satyr is usually found in sedge meadows and fens dominated by the tussock sedge, *Carex stricta*, (and some larvae undoubtedly feed on *C. stricta*), several reports indicate that early-instar larvae of the Mitchell's satyr feed on a variety of grasses and sedges.

Finding Mitchell's satyr larvae in the wild is challenging. Small and cryptic, the early instar larvae tend to remain at the base of the host plant, very close to the surface of the saturated substrate where humidity is the highest. Trying to inspect these areas in boot-sucking muck, surrounded by poison sumac (which offers the only solid hand-hold), while trying not to trample the sensitive species around you is a character-building experience. Raising satyrs in a zoo setting eliminates some of the messier aspects of the grunt work while allowing more control over some of the sensitive variables associated with butterfly survival and fitness. At the Toledo Zoo, we decided to concentrate on two activities: finding a way to breed Mitchell's satyrs in captivity and testing the suitability of a variety of sedges and grasses for use as larval host plants. Instead of jumping headlong into satyr rearing, we decided to breed and raise a model species related to the satyr as first step- this would test our systems to determine their suitability and minimize risk to such a critically endangered species. We used the northern eyed brown, *Satyrodes eurydice*, a common inhabitant of the same fens used by Mitchell's satyr- and one that likely uses the same host plants.

After raising three generations of eyed browns and several species of sedges we believed that we were ready to try our luck with the Mitchell's satyrs. We found that we could breed them easily in 100 cm x 200 cm x 31 cm polyethylene tubs covered with white poly mesh netting. Adults would mate inside the enclosures and oviposit on small forbs we provided, such as clearweed, *Pilea pumila*, and swamp violet, *Viola nephrophylla*.

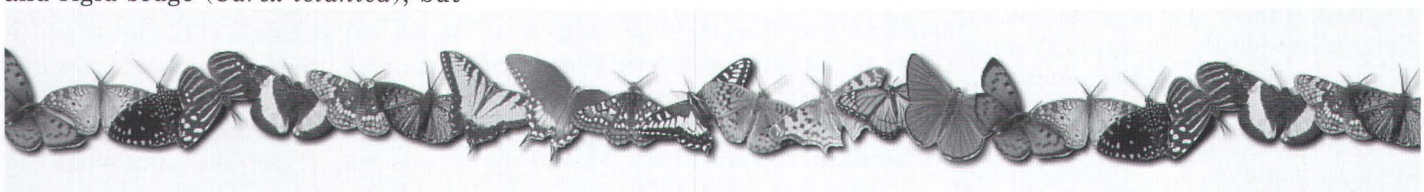
Concurrently, with the aid of the Michigan Natural Features Inventory

Fig. 1) Captive mating pair of Mitchell's satyr (*Neonympha mitchelli*). **Fig. 2)** *N. mitchelli* ovae and larvae. **Fig 3)** Late instar larva on host plant. **Fig. 4)** *N. mitchelli* pupa. **Fig. 5)** Rearing cages/oviposition tubs for the reintroduction project.

and the Michigan Department of Natural Resources, we collected several species of potential host plants from the fens of Southern Michigan, grew them at the Zoo, then offered them to newly-hatched Mitchell's satyr larvae. *Carex stricta* was always offered as one of the four plant species available to the larvae, but we've found that they prefer a variety of foods: panic grass (*Panicum implicatum*), fowl bluegrass (*Poa palustris*), and bristlystalked sedge (*Carex leptalea*), as well as the expected tussock sedges. Some larvae selected spikerush (*Rhyncospora capillacea*) and rigid sedge (*Carex tetanica*), but subsequently died. First instar larvae seem to prefer remaining on the selected host plant until the 3rd instar. By mid August most larvae had migrated to *C. stricta* to begin diapause.

All in all, things have gone pretty smoothly with our conservation breeding efforts, but we have had some problems- predation of early instar larvae by miniscule theriid spiders being at the top of the list. We check the enclosure every day for potential predators, but the spiders are so small and the vegetation so relatively dense that it is very difficult to find them all. Another problem is that newly-hatched larvae do not automatically go to host plants. Some just wander around on the substrate and die. Because we are testing host plant selection, we don't rescue them.

We have confirmed that 1st instar Mitchell's satyr larvae will select and feed upon several different grasses and sedges, not all of which can support successful development; in 2008 we will test even more species as we work on unraveling the complex puzzle of the Mitchell's satyr life history.



Two Trips to Taman Negara National Park, Malaysia

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After a hiatus of approximately 20 years, I returned to the tropical rainforest of the Indo-Australian Region, more specifically, my first visits to the great dipterocarp lowland forest of the Malay Peninsula. The Malay Peninsula, together with Sumatra and Borneo, comprise the major part of the very homogeneous biogeographic area of Neomalaya.

Taman Negara NP, Malaysia, which is the country's largest conservation area, protects extensive areas of pristine lowland and montane rainforest and includes peninsular Malaysia's highest peak – 7,175 ft Gunung Tahan. I spent 20 days at Taman Negara in Jan/Feb 2007 and in Jan/Feb of 2008, I returned to Taman Negara for 17 days, this time accompanied by my girlfriend Danusia, her first trip to a tropical rainforest. During both trips, all the time was spent in the lowlands of both alluvial and hill mixed dipterocarp forest.

Dipterocarps, Tualang, Rattan, Bamboos, Pandanus & No Bromeliads

In both Neotropical and Afrotropical lowland rainforests, Leguminosae is the most dominant family of rainforest trees. In Southeast Asia and especially in Neomalaya, the pantropical (very minor highland Neotropical component) Dipterocarpaceae is the most dominant lowland rainforest tree family. Many dipterocarps are forest giants with great-buttressed trunks rising unbranched to rather open broccoli-shaped crowns.

The largest trees of this forest are not dipterocarps but the emergent Tualang (Koompassia excelsa – Leguminosae), some growing to the immense height of approximately 80 meters. At Taman Negara, Tualang, with their striking creamy trunks, are fairly common in both alluvial and hill (lower slopes) mixed dipterocarp forests. Other striking vegetative aspects of this rainforest include abundant rattans and bamboos, the monocot Pandanaceae and giant epiphytic ferns.

Restricted to the Indo-Australian rainforest region, rattans are palm lianas and constitute a major component of the lowland rainforest structure. The rattans are equipped with sharp barbs that serve a dual function: they help in the climb to higher forest levels by grasping on to the supporting tree(s) and also protect the plants against herbivores.

Bambusoid grasses are prevalent and speciose in the Southeast Asian rainforests. In the lowlands, most species are indicative of disturbed habitats; in Taman Negara, the natural secondary vegetation found along rivers and large creeks harbors a number of bamboos including some giant species.

Strictly Old World in distribution and predominantly tropical, Pandanaceae (screw pines or screw-palms) are very characteristic of the understory of Indo-Australian lowland rainforests. *Pandanus*, the most important genus, consists of shrubs and trees; their branched stalks/trunks bearing terminal strap-like leaves and cone-like fruits. In Taman Negara, I encountered mostly shrub-sized species, some stalkless.

As the almost strictly Neotropical bromeliads (Bromeliaceae) are such a striking and characteristic component of that region's epiphytic flora, the same is true concerning the large, massed epiphytic ferns of the Indo-Australian Region: Bird's Nest Ferns (*Asplenium* sp.) and Stag's Horn Ferns (*Platycerium* sp.).

Lepidoptera

Most renowned for its giant birdwings and gargantuan moths: atlas moths, Hercules Moth and others, as in the other major tropical rainforest regions, the Indo-Australian rainforests boast a lepidoptera fauna of seemingly infinite variety and unfathomable beauty. What follows is the most cursory introduction to the Neomalaya fauna.

Like myself, I believe most of our members, if they have experience in tropical rainforests, this would be predominantly in the Neotropics. With this in mind, this small report is at times comparative in nature – comparing and contrasting the Malayan lowland butterfly fauna with the Neotropical lowland fauna.

Parading Papilios, Streaming 'Graphiums' and Giant Birdwings

In my experience in pristine and near pristine Neotropical lowland rainforests, Papilionini or fluted swallowtails were, at best, only occasional along large creeks and rivers, with the very widespread *Papilio thoas* Linnaeus being the most commonly encountered species. Among *Papilios*, it is a much different story in the IndoAustralian region. At Taman Negara, a parade of *Papilio* males of various species accounted for quite a spectacle along stretches of the gorgeous, small black water Tahan River (Fig. 1, pp. 60). At times, fairly common to common, were *P. nephelus* Boisduval, *P. memnon* Linnaeus and *P. helenus* Linnaeus (and/or *P. iswara* White); much less frequent was *P. demolion* Cramer and seen only a few times was *P. polytes* Linnaeus, the

smallest of the species mentioned.

The helenus group consists of black swallowtails with white markings, most species quite to very similar. The Malayan race of the Black and White Helen (*P. n. sunatus* Corbet), along with some other races, are easy to recognize even when flying, as they possess a band of white forewing marks that most other species in the group lack. The Neomalayan *P. iswara is* the giant of the group and based on size alone, without seeing the telltale field marks, I strongly believe I saw both this species and the much more widespread, smaller Red Helen (*P. helenus*).

The remarkable Great Mormon (*P. memnon*) is famous for its mimetic and polymorphic females, some tailed and some tailless even in the same localities. On the Malay Peninsula, the models are all *Atrophaneura* (troidines) species. I didn't knowingly see any *P. memnon* females but did see one of the models, *A. coon* Fabricius, a good many times – a classic example of Batesian mimicry.

The large, strikingly beautiful male is deep, deep blue and black with a dusting of lighter blue along the veins on the dorsum and the venter has some bright red marks. The author(s) of the impressive "The Butterflies of the Malay Peninsula, Third Edition" (1978) point to a probable mimetic relationship between male *P. memnon* and *Atrophaneura nox* Swainson and *Atrophaneura varuna* White. Though *P. memnon* is quite a bit larger than these two species, in general appearance, the similarity of *P. memnon* to them makes this theory plausible. Though plausible and with great respect to the authors experience, knowledge and magnificent volume, some serious anomalies present themselves concerning this theory.

P. memnon males have a fairly rapid, erratic flight manner and if mimetic on the wing, should exhibit the slow, leisurely flight to be expected (I didn't see *A. nox*, *A. varuna* would be at higher elevations) of their models. And what of abundance? As stated above, I didn't see a single *A. nox* and *P. memnon* males were locally common along forest rivers – a complete reversal of expected abundance between Batesian model and mimic. In Eliot et al (1978), it is stated, with the increasing cultivation of the hostplant *Citrus*, *P. memnon* "has become a fairly common butterfly of gardens and cultivation". I seriously doubt this situation would impact on the abundance of *P. memnon* males in the habitat I encountered the species, namely, forested rivers deep within a vast tract of primeval forest.

Why and how have evolutionary forces shaped this swallowtail species' and other species' male facies so, while others of their clan remain non-mimetic in facies while coupled with stunning female mimics? And with the above stated ecology, do *P. memnon* males and others of similar ecology derive protective resemblance benefit while feeding or resting?

Certainly a very good mimic, both in appearance and flight manner, is the female form *polytes* Linnaeus (Fig. 2, pp. 60) of the Common Mormon (*P. polytes romulus* Cramer); outside of India and Sri Lanka, this race has one other female form, the non-mimetic form *cyrus* F., which greatly resembles males. Photographed along the river's edge, I may have seen a couple of others in riverine forest or/and its model, the troidine Pachlioptera aristolochiae Fabricius.

In the Neotropics, I have encountered a fair number of Leptocircini *Eurytides* in season but nowhere near the bonanza of their Old World counterparts, multitudes of '*Graphiums*' along large streams and rivers in Oriental Region rainforests.

The swift flying Fivebar Swordtail, *Pathysa antiphates* Cramer (Fig. 3), was common to abundant along the rivers, looking very much like a pierid while on the wing. Even faster and more erratic in flight are the mostly tailless *Graphium*; as a trio, three species of the aquamarine *G. eurypylus* Linnaeus group: *G. eurypalus* (Front Cover), *G. doson* Felder and *G. evemon* Boisduval were fairly common at times, all three very similar in general appearance. Seen once was the gorgeous, yellow-green spotted Tailed Jay, *G. agamemnon* Linnaeus and though I didn't see the scintillating, deep aqua Commom Bluebottle, *G. sarpedon* Linnaeus, they should be common in season along the rivers.

Unlike their Neotropical counterparts *Mimoides*, which I have found to be very rare, two species of the mimetic *Paranticopsis*: *P. delessertii* Guerin and *P. ramaceus* Westwood (Fig. 4) were common to abundant along the forested rivers. Eliot et al's statement that *P. ramaceus* "is an uncommon forest species" certainly does not account for the season, habitat and numbers that I encountered. With these numbers and their rapid flight (maybe a tad slower than *P. antiphates*), while active, the males could never be considered Batesian mimics of their Danaine models. As in *P. memnon*, it seems the females are the predominant mimics; as for the Malayan Zebra (*P. delessertii*), "In its slow fluttering flight the exceedingly scarce female resembles *Ideopsis gaura*" (Eliot et al). *P. delesserti* males, when alive, have the palest blue sheen on their wings' dorsal surface, especially noticeable when they are flying.

A highlight of these two trips was the congregations of '*Graphiums*' at urine soaked sediments along the small forest rivers, especially the Tahan. Hoped for but not seen were the small, fantastically shaped Leptocircini, the Green Dragontail (*Lamproptera meges* Zinken) and the much more rare, White Dragontail (*L. curius* Fabricius).

In Neotropical lowland rainforests, troidines are represented by the speciose understory *Parides* and much less speciose, higher-flying *Battus*. Their IndoAustralian rainforest cousins are the glorious birdwings and their smaller relatives, *Atrophaneura* and *Pachlioptera*, most members of both these genera still quite a bit larger than most of their New World relatives.

Three, possibly four, birdwings occur in

Taman Negara's lowlands: Rajah Brooke's Birdwing (*Trognoptera brookiana* Wallace) and the *Troides* species, *T. amphrysus*, *T. helena*, The Common Birdwing, and possibly *T. aeacus* Felder. Easily vying for the title of the Oriental Region's most spectacular butterfly, I didn't see any Rajah Brooke's Birdwings on these two trips; this is probably due to seasonality and/or not being high enough in the hill forest along rivers.

I saw *Troides* a number of times, mostly giant *T. amphrysus* females along forested river edges and once or twice in large forest light gaps. In the late afternoon, I saw what I believe was a male *T. amphrysus*, feeding at a riverside shrub flower. Contrary to its appellation, The Common Birdwing, I may or may not have seen this species.

Seen more often then *Troides* was the extraordinarily exotic Common Clubtail, *A. coon*, both along forested rivers and in forest light gaps. Possessing the leisurely flight expected of poisonous, aposematic species, its exaggerated papilionid flight manner is incredible to behold – it seems the hindwings are held almost motionless and the forewings beat ever so slowly. On the last day of the second trip, a couple of presumed males were seen patrolling a forest light gap, upper understory level, from approximately 5-6 P.M., encounters between them resulting in more rapid flight.

A Great Orange Tip, A Flaming Appias, A Blue White, A Lowland Jezebel and Grass & Tree Yellows

Both the largest pierid in the Oriental Region and one of the world's largest is *Hebomoia glaucippe* Linnaeus, The Great Orange Tip. Outside of the possibility that I saw one flying rapidly over a ridge-top light gap, I did not see the species. I was hoping/expecting to see at least a few along forest rivers but Eliot et al's statement, "The butterfly is most evident in May and June", could be the prime reason for no encounters.

Seasonality was most definitely a factor in why I saw so few *Appias*; in season, one would expect to see numbers of both The Chocolate Albatross (*A. lyncida* Cramer) and The Orange Albatross (*A. nero* Fabricius), which are common species, plus a few other species. Disappointing to say the least, the flaming red-orange *A. nero* was conspicuous in its absence – I did not see one; Eliot et al state "They are most in evidence from March to June,...". On the second visit, a white *Appias* species, probably *Appias paulina* Cramer, was seen twice feeding along a forested river and once feeding along a very tiny forest stream.

A very beautiful sight is seeing the swift, very pale blue males of The Wanderer, *Pareronia valeria* Cramer, course along the edges of forested rivers, flying usually at the upper understory/middle story level. I hardly witnessed any alight, except on a few occasions, when they sought flower nectar. Males were fairly common at times and if I did see a female, I would have been unaware, as they are very good mimics, flight manner included, of the Danaine, *Parantica aspasia*.

One of the greatest of butterfly genera is *Delias*, the Jezebels, numbering well over 150 species and ranging from Sri Lanka to southeastern Australia and New Caledonia. Their center of diversity is the mountains of New Guinea and the 10 Malaysian species are predominantly residents of montane forests. The Painted Jezebel, *D. hyparete* Linnaeus, is found in the lowlands to approximately 4,000 ft and its appearance is typical of the genus, being predominantly white dorsally with patches of bright color ventrally, *D. hyparete* with bright yellow and red. Seen occasionally and most frequently at middle story level along forested river edges, these aposematic butterflies fly rather slowly but that was not the case when I observed many dashing species in montane New Guinea. What I first believed were fast flying *D. hyparete* could actually have been another large pierid, the somewhat similar Redspot Sawtooth, *Prioneris philonome* Boisduval.

Dismorphiines are predominantly Neotropical, none are found in the Indo-Australian rainforests. All the aforementioned pierids are Pierinae, so rich in all the major tropical rainforest regions. Seasonally, immense numbers of Coliadinae: *Aphrissa*, *Phoebis* and *Rhabdodryas*, ply river and creek courses in Neotropical lowland rainforests. I don't know if their Old World counterparts *Catopsilia* (three species in Malaya), also seasonally abundant and migratory, utilize the same habitats. I may have seen a few *Catopsilia* flying through/over forest light gaps.

In my experience concerning Neotropical lowland rainforests, *Eurema* and their close relatives *Pyrisitia* have been absent to very scant in almost all the many localities I explored. Along the forested rivers in Taman Negara, small coliadine Grass Yellows (*Eurema*) were common to abundant, especially one species, *E. simulatrix* Staudinger (Fig. 5). Among many congregations of this species, I definitely discerned at least one other smaller *Eurema* species. At odds with Eliot et al's statement that males never congregate along forest watercourses, The Tree Yellow (*Gandaca harina* Horsfield) (Fig. 6) would sometimes join feeding *Eurema* on forest riverbanks. Besides frequenting forest river edge, both *G. harina* and *Eurema* were found in forest light gaps, with the former more common in this habitat and usually flying higher.

I believe I saw the small, weak flying Psyche, *Leptosia nina* Fabricius, once, in riverine forest and possibly, The Forest White, *Phrissura aegis* Felder, a few times, along forested river edge. Not knowingly seen were *Saletara liberia* Cramer, *Ixias pyrene* Linnaeus and the two *Cepora* species that should be resident in Taman Negara: *C. iudith* Fabricius and *C. nadina* Lucas. With these and other expected pierids absent or scarce, there must be a better pierid season(s) than the Jan/Feb season of my visits.

To be Continued

Planned reports with associated photos are to follow - Part 2 will include Nymphalidae and Riodinidae and Part 3 will include Lycaenidae, Hesperidae, Moths and a summation on Taman Negara.

Author's notes: solely for simplicity's sake and with no disrespect to later revisionary works, nomenclature in this report follows Eliot et al. Also for simplicity's sake, subspecific trinomials are only used in a few cases where I wish to make a specific point concerning the Malayan race. All photos were taken with a Canon Powershot S3 IS in natural light.

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Acknowledgements

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Announcement

The 2nd Asian Lepidoptera Conservation Symposium 2008

We are cordially inviting you to the 2nd Asian Lepidoptera Conservation Symposium (ALCS) which will be held in the sunny and beautiful tropical Island of Penang, Malaysia from 24th to 28th November 2008. This forthcoming symposium aims to review the conservation status of butterflies and moths in the region and addressing the challenges faced by Lepidopterists.

With the theme of ´Conservation of Lepidoptera through Education and Researchi, the symposium will provide the latest findings and research work of top experts in the Lepidoptera industry with the focus on the following core themes:

- Identifying the Asian Lepidoptera status and its needs
- Lepidoptera Research and Info Sharing
- Education towards Lepidoptera Conservation
- Global / Asian Lepidopteran Trend

The following are our key speakers and speakers:

Key Speakers

- Dr. Jeremy D. Holloway (The Natural History Museum, London, UK)
- Dr. Peggie Djunijanti (Museum Zoologi, Bogor, Indonesia)
- Dr. Isaac Kehimkar (General Manager, Bombay Natural History Society, India)
- Dr. Daniel, Bexell-Ayyachamy (Zoo Outreach Organisation, India)

Speakers

- Prof. Li Hou Hun (College of Life Sciences, Nankai University, China)
- Dr. Laurence G. Kirton (FRIM, Malaysia)
- Dr. Kodi Isparan Kandasamy (Senior Scientist, FRIM, Malaysia)
- Dr. Henry Barlow (Member of IUCN/SSC; Lepidopterist)
- Dr. Roger C. Kendrick (Senior Conservation Officer, Kadoorie Farm & Botanic Garden, Hong Kong)
- Dr. Victor Wu Yun (Kunming Expo, Yunnan, China)
- Mr Kazuo Unno (International Entomology Photographer, Entomologist, Japan)
- Mr Simon Chen (Chairman of Butterfly Group, Nature Society Of Singapore)
- Mr Gan CW (Vice Chairman of Butterfly Group, Nature Society Of Singapore)
- Ms Wu I Hsin (Curator, Animal Department, Taipei Zoo, Taiwan)

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  - Penang Butterfly Farm's Breeding Facilities
  - Penang National Park (habitat of 50+ species of butterflies)
  - Matang Mangrove Forest Reserve (one of the world's best managed mangrove forests)
  - Taiping Zoo & Taiping Lake Garden
  - Georgetown City Heritage Tour (UNESCO World Heritage Site)
- Largest networking session in 2008 with international experts of the Lepidoptera scene
- A concurrent ´Butterfly Awareness Conservation Weeki campaign held at Penang Butterfly Farm

To obtain more information or register for the symposium, please visit our website at http://www.butterfly-insect.com/alcs2008/ .

The Marketplace

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For sale: Book by David W. MacDougall A Field Guide to the Karner Blue Butterfly. 2007. $8 postpaid in US Send checks to: ECOS, PO Box 9118, Niskayuna, NY 12309. Signed copies available on request, no charge. 503

For Sale: Natural history books. Condition ranges from new to somewhat worn, ask for specifics. Some paperback, some hardcover. Selling for half their retail value. Ask for prices. Simon and Schuster's Guide to Insections, Arnett and Jacques; Discovering the Butterflies of Lassen Volcanic NationalPark, Crabtree; A Golden Guide to Familiar Butterflies Caterpillars Chrysalides, Moucha, A Golden Guide Orchids, Shuttleworth, Zim and Dillon; Lower Animals, Wells; The Year of the Butterfly, Ordish; Fremontia Journal of the California Native Plant Society Special Issue, July-October 2001; An Introduction to the Study of Insects, 6'th edition, Borror, Triplehorn and Johnson; The American Wilderness/Time-Life Books, The Grand Canyon and The Badlands; The Moths of America North of Mexico, fascicle 5.1, Sessioidea; Eichlin and Duckworth; fascicle 18.1, Ferguson; Butterflies of the Neotropical Region, part II, Danaidae, Ithomiidae, Heliconiidae, Morphidae; D'Abrera. Contact: Alvin Ludtke, 916-344-1626, *aludtke@earthlink.net* 503

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New Issues of Papilio (New Series):#18, Geographic variation and new taxa of western N.A. butterflies, especially from Colorado. By James Scott and Mike Fisher, some parts by David Wright, Stephen Spomer, Norbert Kondla, Todd Stout, Matthew Garhart and Gary Marrone. 72 p., 4 color plates, $9. #19, Corrections/reviews of 58 North American butterfly books. J. Scott. 127 p., $8. #20, Biological Catalogue of North American

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.

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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.

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For Sale or Trade: Assorted worldwide Lepidoptera and Coleoptera. Local specimens are personally collected with detailed data. Will consider trades for beetles, including Lucanids and Scarabs. U.S. sales/trades only. Contact: Edward J. Komperda III. 111 Crestmont Road, Greene, New York 13778. Phone: 607-656-6588 Website: www.bigedsbugs.tripod.com

Research

Delano S. Lewis (PhD candidate) and Dr. Charles V. Covell Jr. seek to borrow, purchase or exchange for specimens of yellow-and-black, diurnal, neotropical geometrid moths (Sterrhinae, Cyllopodini) for revisionary study. These mimetic moths are often mixed with similarlly colored members of other moth families in collections, such as Notodontidae (Dioptinae) and Arctiidae. Many thanks. Please contact us at *dlewis@ufl.edu* or *covell @louisville.edu* McGuire Center for Lepidoptera and Biodiversity, FLMNH, Hull Rd. at SW 34th St., Gainesville, FL, 32611-2710. 503

Ken Strothkamp, a biochemist at Lewis & Clark College in Portland, Oregon currently conducting a research project on *Lophocampa maculata*, the spotted tussock moth. Working on a series of comparative studies between the individual I have from Oregon and individuals from Eastern Canada or the Northeastern U.S. Looking for someone who can supply me with either eggs or first instar larvae this summer from a location in Northeastern North America. All shipping expenses would be reimbursed. Ken Strothkamp, *kgs@lclark.edu* 503

Cercyonis pegala

Continued from pp. 52

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The Lepidoptera Research Foundation Announces Award Program For Student Research Grants

Initiation

In July 2005 the Lepidoptera Research Foundation established an award program to provide funding for students worldwide to support their study projects. The initiative was inspired by the high quality of work presented by young lepidopterists at the first ELEN meeting in Brasil as well as the enthusiasm exhibited by the hundred or so students in attendance. Recognition of the difficulty for funding among students of the less developed nations was an emphatic issue.

Level of support

The 2005 program awarded $5000 to 10 of 11 applicants.

Because the current financial situation of the Foundation is strong, the board has made the decision to allocate $10,000 annually for it's grant program to students at all academic levels engaged in studies of Lepidoptera. The grants should not exceed $1000 each with applicants in non-wealthy countries given highest priority. Consideration will be given also to applicants with special hardships in wealthy countries.

Eligibility

Applicants must be enrolled students at accredited Universities or Colleges. There is no age limit. Preference is for graduate level research, but is not restricted to graduate level. Post-doctoral research is not included.

Application

Applicants must submit a maximum 500 word description of their project, including a description of its significance. Where appropriate there must be a clear statement of hypothesis to be tested. A separate literature citation should be appended. A brief vita, stating academic status and at least one letter of recommendation (from a scientist affiliated with the academic institution where the applicants are enrolled) must be included. There must be a clear and concise budget plan. The entire submission will be electronic, preferably as a Word Document in 12 point Times Roman type, right margin not justified.

Scope

Any aspect of research concerning Lepidoptera is suitable. Evolutionary and conservation aspects should be emphasized, as we recognize "natural history" approaches as valuable in the politically popular molecular biology of today. Strong statistical backgrounds will be rewarded.

Evaluation

An international panel of professionals will evaluate all proposals. Should the total of meritorious proposals exceed funding available, grant amounts may be proportionately reduced to distribute some funding to all acceptable submissions.

Reports

A brief final report will be expected from all awardees. This should include reprints of published papers or copies of accepted manuscripts (both in pdf format), where applicable. Reports are mandatory for those applying for follow-on funding.

Submission

Applications are now accepted and will be open until October 31, 2008. They should be transmitted to Rudi Mattoni mattoni@ucla.edu until further notice.

We believe this program will have significant impact on the future development of the study of Lepidoptera. We strongly feel there is no better way to use our funding resources. We will further actively seek expanded membership and contributions to expand the awards program.

Further Annoucements

1) The foundation will be directed by a four person board that includes Konrad Fiedler (U. Vienna), Dan Rubinoff (U. Hawaii), Jeremiah George (U. California/Riverside), and Rudi Mattoni.

2) The foundation will continue to provide a venue for publication of special monographic works through the Journal of Research on the Lepidoptera. The acting editor is Rudi Mattoni, The executive editor is Nancy Vannucci. They may be contacted at: jrl_lepidoptera@yahoo.com

3) We welcome your membership in the foundation. This will not only support the JRL, but also assure continuation of a strong awards program. Note that all past JRL issues are available on - click on contents for access to our 5000 page archive as pdf files. Data on the foundation organization is not up-to-date.

4) To receive an application email : jrl_lepidoptera@yahoo.com . Note we are planning our own website to provide all pertinent information in one place.

5) All business matters relating to the Journal, subscriptions, billings, mailing, etc. are being managed by Bioquip Products, Inc. , 2321 Gladwick St. Rancho Dominguez, CA 90220, USA,

First Arctic Alaskan Collections of Compton Tortoiseshell (*Roddia vaualbum*) Made in November 2007

Jordan S. Metzgar

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Shortly after moving to the remote Arctic village of Fort Yukon, Alaska, I collected nine specimens of the Compton Tortoiseshell (*Roddia vaualbum*; synonym *Nymphalis vaualbum j-album*, Nymphalidae) on November 20, 2007. Given the maximum outdoor temperature of 14° F (-10° C) that day, I was not expecting to see butterflies, and was startled when I discovered a Compton Tortoiseshell crawling across the floor of my office building's lobby (Fig. 1, pp. 57). A thorough search of the room revealed eight additional butterflies (Fig. 2; Fig. 3, pp. 57) on a drafty windowsill and by the front door. Some of them were already dead, although several seemingly deceased specimens revived when placed in a warmer location.

I believe the butterflies were over-wintering in dead trees and emerged prematurely when these trees were harvested and placed in the heated lobby as firewood. The local practice is to fell dead black spruce (*Picea mariana*, Pinaceae) trees for indoor heating. A large pile of these logs was present in the lobby at the time of the discovery (Fig. 1, pp. 57). Although my two-story, 20-year-old office building is made of logs, it is unlikely that the Compton Tortoiseshells were over-wintering in the walls, as I only located specimens near the firewood. My coworkers estimated that the wood was supplied around the beginning of October, and was harvested 15-20 miles (24-32 km) northeast of town on the "Wood Road," a dead-end dirt road used to access the village's firewood. Temperatures at the lobby's woodpile usually hover around 70° F (21° C), but can rise above 80° F (27° C) when the woodstove is in use. Most homes in the area store firewood outside, so I have been unsuccessful in finding other reports of winter butterfly sightings in town.

Fort Yukon is a small village accessible only by river or air, and is 8 miles north of the Arctic Circle (66° 33' 57" N, 145° 14' 19" W; Fig. 4). It is located in the Yukon Flats, a large expanse of taiga-dominated rolling hills and wetlands 150 miles northeast of Fairbanks, Alaska. Black spruce is the dominant tree, although cottonwood and aspen (genus *Populus*, Salicaceae), alder (genus *Alnus*, Betulaceae), and birch (genus *Betula*, Betulaceae) are also present.

Although this is the only Arctic Alaskan collection of the Compton Tortoiseshell, it is not the northernmost sighting of this taxon in Alaska. Two reports are known from taiga habitats along the Dalton Highway in Alaska (K. Philip, *pers. comm.*): one photographed in 2005 at the Grayling Lake wayside parking lot (66° 57' 31" N, 150° 23' 35" W), and another observed in Wiseman (67° 24' 36"N, 150° 6' 28.8" W). However, the northernmost North American *specimen* is a 1996 collection from a tundra fellfield habitat at the western base of the Richardson Mountains along the Dempster Highway in Canada's Northwest Territories (66° 37' 48" N, 136° 17' 00" W; K. Philip, *pers. comm.*). A brief warm spell in mid-February 2008 also produced an additional mid-winter sighting of a single Compton Tortoiseshell in Delta Junction, Alaska (approximately 100 miles southeast of Fairbanks; Smetzer 2008; Fig. 4, pp. 56).

This species has spread north rapidly through Alaska over the last five years, with the first sighting north of the Alaska Range coming in 2002 (Rozell 2003; Fig. 4). Within three years of this sighting the Compton Tortoiseshell had been spotted above the Arctic Circle at Grayling Lake (see above) and had become abundant in the Fairbanks area (K. Philip in Smetzer 2008; Fig. 4). It is possible that the species was previously present but uncollected in the Alaskan interior, or that we are observing a periodic oscillation of its range. However, it is also plausible that this butterfly is extending its range northward as a result of global warming, which has had a disproportionately strong impact in the Arctic (Hassol 2004) and has been implicated in changes in numerous species' natural history (Root et al. 2003) and in the spread of warm weather species to previously colder habitats (Truong et al. 2007). If so, its spread would demonstrate the ability of a sub-Arctic taxon to cover large distances with great speed to colonize a rapidly warming Arctic.

Movements of this butterfly are only vaguely known. Periodic massed migrations of adult Compton Tortoiseshells have been reported at lower latitudes in eastern North America (coastal Massachusetts, Scudder 1889:386; and Catskill Mountains, New York, R. Dirig, *pers. comm.*). The current irruption of Compton Tortoiseshells in interior

Continued on pp. 56

Artificial hybridization and natural subspeciation in *Cercyonis pegala* (Nymphalidae, Satyrinae)

Andrei Sourakov

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Key words: hybridization, hybrid, speciation, subspecies, wing pattern.

To paraphrase Voltaire, if subspecies did not exist, it would be necessary for man to invent them. There is no other butterfly species occurring in the U.S. that has stimulated invention of subspecies more than the Common Wood Nymph, *Cercyonis pegala* (Fabricius). Although all *C. pegala* populations are equal, none of them are the same. In fact, it is true even on the individual level: so variable are the phenotypes even within a local population, that "the assignment of existing names to these populations has been inconsistent and usually incorrect" (Austin, 1992). Austin was the first to interpret taxonomically the variation found within and between local populations using a statistical rather than a typological approach, but limited his treatment to the Great Basin in the western United States, where populations are well isolated.

Fig. 1P illustrates typical examples from populations even more geographically distant than those of the Great Basin. The climates of Ohio, Colorado, and northern California from where these three specimens are taken are so different, that posing the question of how much of this variation might be environmentally induced is not unreasonable. After all, there are many known seasonal forms in satyrines (e. g., *Bicyclus anynana* (Butler)) in the tropics, which are induced through the hormone-mediated responses to the environment (e. g., Brakefield and Larsen, 1984), and there exist other *Cercyonis* species, such as *C. meadi* (Edwards), that exhibit phenotypic plasticity similar to that of *C. pegala* (e. g., Emmel & Emmel, 1969).

To answer this question, I reared specimens from eggs from Colorado and Ohio stocks under similar conditions (see Sourakov, 1995 for details). Here, for the first time, I illustrate the F1 specimens reared from the same batch for both populations (Fig. 1F-1) and the F2-hybrids between the two populations (Fig. 1F-2).

F1 specimens fell phenotypically within the variation range of their parental populations, in which the males are much more likely to exhibit eyespots on their hind wings than females. The extent of yellow coloration on the forewing in the Ohio parental population was variable: from a thin yellow ring surrounding the eyespot (similar to that of Colorado specimens) to a large yellow patch occupying roughly 1/3 of the forewing. This particular population is located in a hybrid zone, where the more northern dark form of *C. pegala* (known as *nephele*) meets the yellow-patch-bearing form (known as *alope*) found throughout southeastern United States. Two F1 males reared from the same egg batch with different degrees of expression of the latter character are illustrated here.

Hybridization between Ohio female (non-yellow-patch bearing) and Colorado male resulted in two similar female specimens, which are phenotypic intermediates of the two parental populations (Fig. 2F-2). The hybrid specimens are more similar to the recently described *C. p. australosierra* from southern California, which is characterized by "pale grayish underside" and by "more prominent forewing eyespots," which are made such by wide black and yellow rings (Emmel, et al., 2008). It is possible that the degree to which the yellow coloration was expressed in F2 females could have been increased by choosing a different parental F1 female, making the hybrids even more similar to the new Californian subspecies.

Gene flow between subspecies of *C. pegala*, and introgression of genes from other *Cercyonis* species, were previously suggested to contribute to the evolution of new, phenotypically distinct *C. pegala* populations (Emmel, 1969). With gene flow being reduced by habitat fragmentation, with time we should see an increase in the number of distinctive local populations as "evolution of eyespot pattern can occur rapidly ... and requires only single or very few, changes in regulatory genes" (Brakefield et al., 1996). More importantly for the survival of the species, each such population will bear not only visible (wing pattern), but also numerous physiological characteristics, such as cold tolerance, host plant specificity, disease and parasite resistance. Conservation of as many of such fragmented populations as possible will allow preservation of the remarkable diversity exhibited by this uniquely variable and adaptable species.

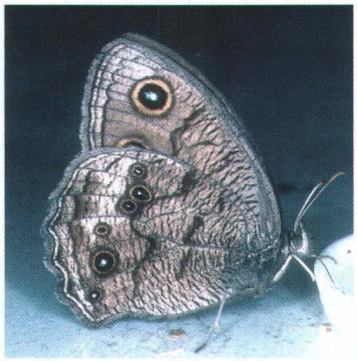
Acknowledgements

I would like to thank George Austin and Keith Willmott for proofreading this note and offering helpful suggestions.

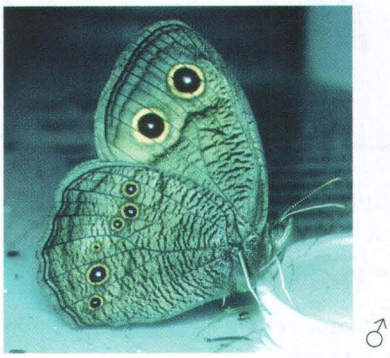
Continued on pp. 49

P

Wild *C. pegala*, San Francisco, California

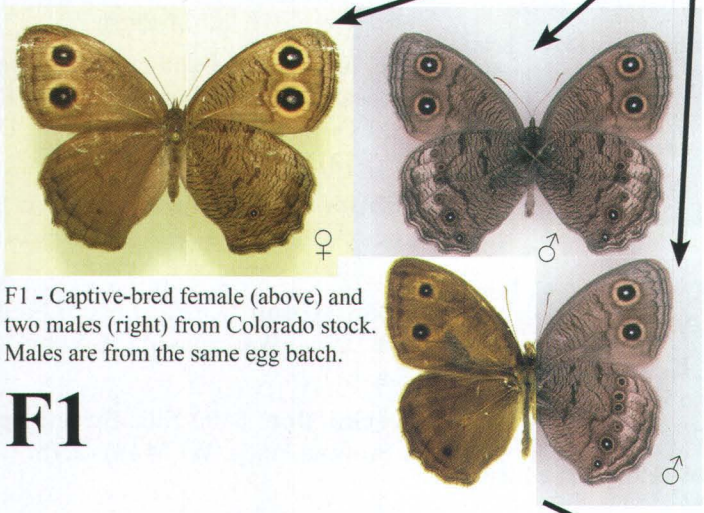


Wild *C. pegala*, Mesa Co., Colorado

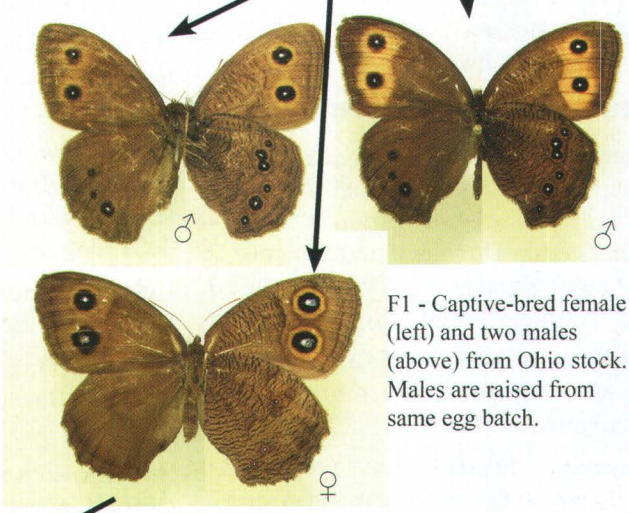


Wild *C. pegala*, Lucas Co., Ohio

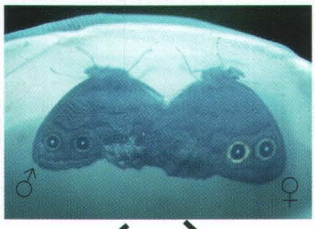
F1



F1 - Captive-bred female (above) and two males (right) from Colorado stock. Males are from the same egg batch.

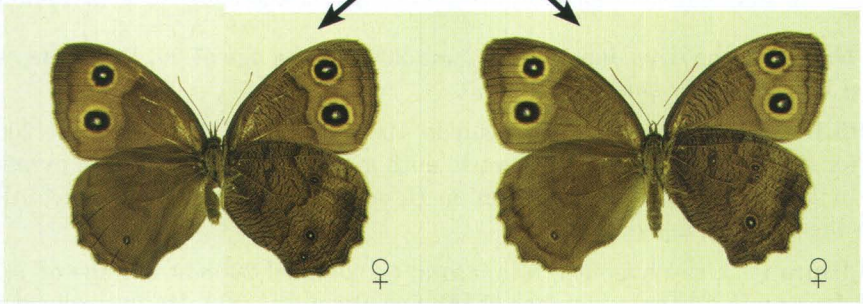


F1 - Captive-bred female (left) and two males (above) from Ohio stock. Males are raised from same egg batch.



Hybridization between captive-bred Ohio female and Colorado male.

F2



F2-females resulting from crossing Ohio female with Colorado male exhibit phenotypes known from west-coast populations.

Membership Update...

Julian Donahue

This update includes all changes received by 6 August 2008.

"Lost" Members:

Publications returned: "temporarily away," "moved," "left no address," or "addressee unknown":

Hisashi, Dr. Fujii (Kyoto, Japan)

Nunnallee, Dave (Sammamish, WA)

Piot, Debra (Sedgwick, ME, "temporarily away")

New and Reinstated Members:

members who have joined/renewed/ been found/or rescinded their request to be omitted since publication of the 2006 Membership Directory (not included in the 2006 Membership Directory; all in U.S.A. unless noted otherwise)

Anderson, Rachel (Ms.): 5/539 Main Road, Montrose, Tasmania 7010, Australia.

Barton, Madeleine (Ms.): 10 Rotherwood Street, Richmond, Victoria 3121, Australia.

Bell, Elizabeth A.: [address omitted by request]

Daniels, Emily V.: 2732 Verano Place, Irvine, CA 92617-3131.

D'Alessandro, Juan Carlos: Barragan 688, 1408 Buenos Aires, Argentina.

Dowhower, Dallas D.: 428 North 6th Avenue, Lebanon, PA 17046-4064.

Hassell, Clifford H.: 9413 East Leavenworth Road, Leavenworth, WA 98826-9358.

Kanazawa, Itaru: Osaka Museum of Natural History, Nagai Park 1-23, Higashi-sumiyoshi-ku, Osaka 546-0034, Japan.

Lyttle, Randy W.: 9881 Briggs Road Ext., North Rose, NY 14516-9601.

Meade, Daniel E. (Ph.D.): 1875 Wellsona Road, Paso Robles, CA 93446-8521.

Sourakov, Andrei (Ph.D.): [address omitted by request]

York, Matthew W.: P.O. Box 17364, San Diego, CA 92177-7364.

Address Changes

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

Deutsch, Barbara: P.O. Box 203, Point Reyes Station, CA 94956-0203.

Dievendorf, Jerry: 160 Hudson Avenue, Delmar, NY 12054-1029.

Oliver, Jeff: 70 Mechanic Street, #1, New Haven, CT 06511-2634.

Patton, Charles D.: 6045 Lexington Park, Orlando, FL 32819-4433.

Prudic, Katy: 70 Mechanic Street, #1, New Haven, CT 06511-2634.

Rota, Jadranka: Dept. of Entomology, Smithsonian Institution, NMNH, MRC 105, P.O. Box 37012, Washington, DC 20013-7012.

Schappert, Phillip J. (Ph.D.): 27 Clovis Avenue, Halifax, Nova Scotia B3P 1J3, Canada.

Taylor, Milton D. (Ph.D.): 130 Pecan Bluff Drive, Watkinsville, GA 30677-6064.

Veverka, Joe: 3100 Ellis Street, Apt. 27, Stevens Point, WI 54481-3278.

Metamorphosis...

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

Inoue, Hiroshi (Prof. Dr.) of Iruma City, Japan, on 2 June 2008 at the age of 90. Dr. Inoue, who was born on 8 July 1917, had been a member of the Society since about 1950.

Munroe, Eugene G. (Ph.D.) of Dunrobin. Ontario, Canada, the weekend of 31 May/1 June 2008, at the age of 87. He had been in poor health for some time. Dr. Munroe, a world authority on the systematics of pyralid moths, was a Charter Member of the Society. In 1973 the Society elected him an Honorary Life Member in recognition of his distinguished lifelong contributions to the study of Lepidoptera.

Patterson, James C. ("Bumpy"), of Plymouth, Minnesota, on 11 April 2008 at the age of 71, from complications of pancreatic cancer. Mr. Patterson had been a member of the Society since 1993. He is survived by his wife of 48 years, Sandy, five children, and 15 grandchildren.
[http://www.legacy.com/startribune/obituaries.asp?Page_LifeStory&PersonID=107560812]

NEW MEMBERSHIP DIRECTORY: Is Your Information Current?

Once again it's preparation time for the Society's biennial Membership Directory. We pride ourselves on the accuracy of the information in the Directory, but we rely on you to ensure that your information is correct and up-to-date. If you have new phone or FAX numbers, or a new e-mail address, or if your interests have changed—you should tell us about it. (You had a chance to update your information with the 2008 dues notice and ballot, but be sure to tell us if anything has changed since then.)

The absolute deadline for updating your information is Saturday, 11 October 2008. So check your listing in the 2006 Membership Directory for accuracy and inform us of any changes. New members since 2006, who are not in the 2006 Membership Directory, and others who may have misplaced their Directory, may request a "screenshot" of their membership record to review for accuracy. The screenshot will be e-mailed as a PDF attachment.

Please e-mail Julian Donahue (Julian@Donahue.net) to update your information or to request a screenshot. Snail mail requests can also be sent (with a self-addressed, stamped envelope if you want a screenshot returned) to Julian: 735 Rome Drive, Los Angeles, CA 90065-4040.

Moth Book Wins Prestigious Medal

Edward D. Edwards
c/o Division of Entomology, CSIRO, P. O. Box 1700 Canberra, A.C. T. 2601 Australia Ted.Edwards@csiro.au

The inaugural Westwood Medal has been won by Dr Marianne Horak for her monograph *Olethreutine Moths of Australia* published in 2006. The medal will be presented at the meeting of the International Congress of Entomology at Durban, South Africa, later this year.

The Westwood Medal has been instituted by the Natural History Museum, London and the Royal Entomological Society with the aim of encouraging the production of monographic works in arthropod taxonomy. It will be awarded biennially for "the best comprehensive taxonomic work on a group of terrestrial arthropods" published anywhere in the world. It is judged by an independent, international panel of experts and "the award of the medal will recognize only the highest standards of descriptive taxonomy".

Dr Horak is curator of the Lepidoptera unit at the Australian National Insect Collection, CSIRO Entomology, Canberra, Australia, and has spent many years researching Australian and Asian Tortricidae.

The book, with a contribution authored by Furumi Komai of Japan, reviews all 90 genera of Australian Olethreutinae giving detailed generic descriptions and characterisations with the included species listed and new genera and species described as necessary. It also contains a phylogeny and detailed descriptions of important taxonomic characters and their polarity. It is illustrated by outstanding photographs of the genitalia of both sexes for two species in each genus as well as representative adult moths. The book acknowledges its debt to the Australian National Insect Collection and the many people who have contributed to making the collection the first class and comprehensive tool that it is today.

The award not only recognizes the high achievement of Marianne Horak but also the book series *Monographs of Australian Lepidoptera*, staff and administrators who were prepared to support her long-term research and CSIRO Publishing who were willing to publish titles likely to lose money but contribute good science.

Further information on the medal can be found on http://www.royensoc.co.uk/about_awards.shtml

and about the book on http://www.publish.csiro.au/nid/18/pid/5147.htm

Alaskan Tortoiseshell

Continued from pp. 51

Alaska has proven surprisingly long lasting, with the size of the 2007 population second only to 2005; it is possible that the population will soon be reduced by the arrival of parasites (K. Philip, *pers. comm.*).

Eight of the nine specimens collected in Fort Yukon were males. All seen were very fresh, and average a little smaller than specimens from New York (R. Dirig, *pers. comm.*). These collections have been deposited at the Cornell University Insect Collection and with the Alaska Lepidoptera Survey. In addition, I have discovered additional specimens at the same location on two occasions. On February 24, 2008, I found three dead male specimens behind a desk near the firewood. One last male was found crawling near the woodstove on April 14, 2008. These later specimens were also deposited as above.

Acknowledgments

I owe a great deal of gratitude to Robert Dirig of Cornell University for confirming the species identification, making the sex determinations, and providing background information; and to Kenelm Philip of the University of Alaska, Fairbanks, for providing information on the other collections mentioned above.

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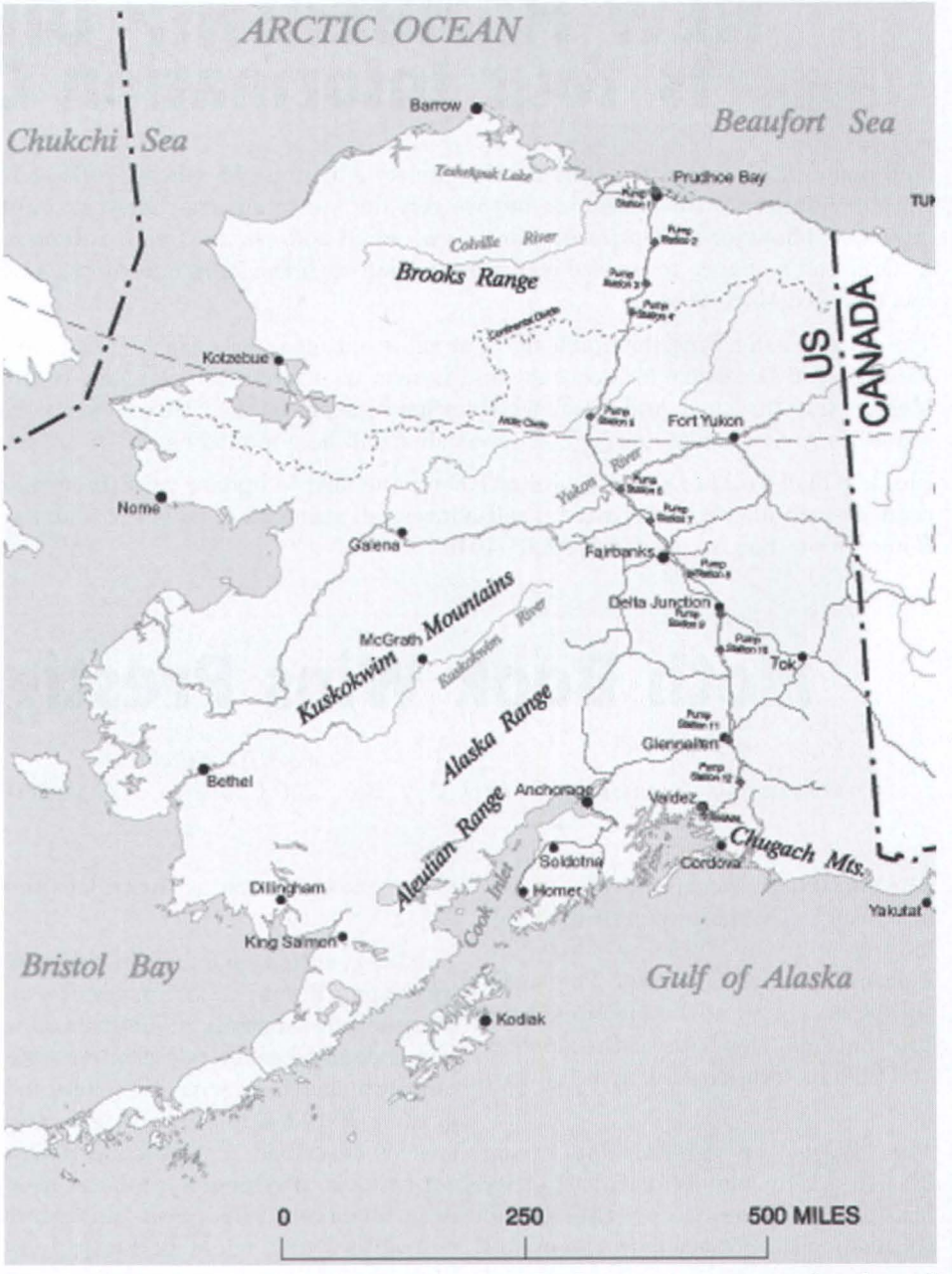
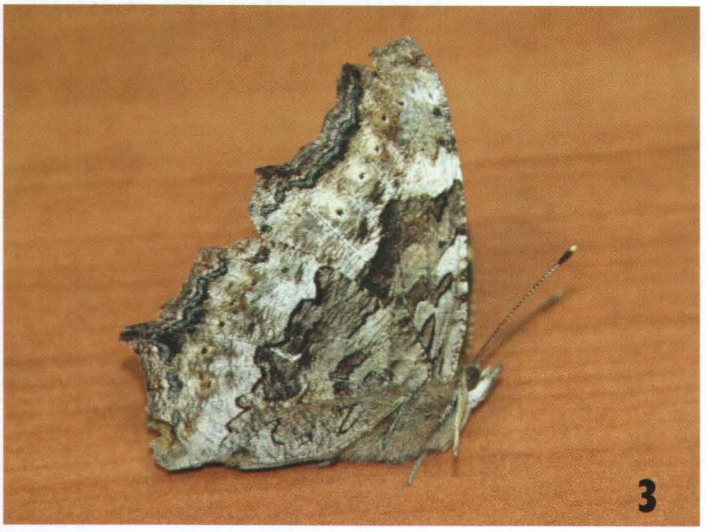


Figure 4. Map of Alaska. Modified from public domain image stored at http://commons.wikimedia.org/wiki/Image:State-of-Alaska-Map.png.

Blood-Sucking *Limenitis arthemis astyanax* on road-killed opossum in Alcona County, Michigan

Figure 1 *Limenitis arthemis astyanax* (dorsal view) and **Figure 2** (ventral view) feeding on blood of a freshly road-killed opossum (*Didelphis virginiana*) in Alcona County, Michigan. See article pp. 39



A Frigid Sleep: Numerous Arctic Alaskan Hibernating Compton Tortoiseshells

Figure 1. Front lobby of the Council of Athabascan Tribal Government's Natural Resources building. All specimens were found near the black spruce woodpile. **Figure 2.** Upper-side of Compton Tortoiseshell specimen. **Figure 3.** Under-side of Compton Tortoiseshell specimen. See article on pp. 51.

Membership

The Lepidopterists' Society is open to membership from anyone interested in any aspect of lepidopterology. The only criterion for membership is that you appreciate butterflies or moths! To become a member, please send full dues for the current year, together with your current mailing address and a note about your particular areas of interest in Lepidoptera, to:

Kelly Richers,
Assistant Treasurer,
The Lepidopterists' Society
9417 Carvalho Court
Bakersfield, CA 93311

Dues Rate

Active (regular)	$ 45.00
Affiliate (same address)	10.00
Student	20.00
Sustaining	60.00
Contributor	100.00
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Journal of the Lepidopterists' Society

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Submissions are always welcome! Preference is given to articles written for a non-technical but knowledgable audience, illustrated and succinct (under 1,000 words). Please submit in one of the following formats (in order of preference):

1. Electronically transmitted file and graphics—in some acceptable format —*via* e-mail.

2. Article (and graphics) on diskette, CD or Zip disk in any of the popular formats/platforms. Indicate what format(s) your disk/article/graphics are in, and call or email if in doubt. Include printed hardcopies of both articles and graphics, a copy of the article file in ASCII or RTF (just in case), and alternate graphics formats. Media will be returned on request.

3. Color and B+W graphics should be good quality photos or slides suitable for scanning or—preferably—electronic files in TIFF or JPEG format at least 1200 x 1500 pixels for interior use, 1800 x 2100 for covers. Photos or slides will be returned.

4. Typed copy, double-spaced suitable for scanning aand optical character recognition. Original artwork/maps should be line drawings in pen and ink or good, clean photocopies. Color originals are preferred.

Submission Deadlines

Material for Volume **50** must reach the Editor by the following dates:

Issue	Date Due
3 Autumn	Oct. 15, 2008
4 Winter	Nov. 15, 2008

Reports for Supplement S1, the Season Summary, must reach the respective Zone Coordinator (see most recent Season Summary for your Zone) by Dec. 15. See inside back cover for Zone Coordinator information.

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Papilionids and Pierids of Taman Negara National Park, Malaysia...

1) Tahan River just downriver from the cascades of Lata Berkoh. **2)** *Papilio polytes*, female form *polytes*. 3) *Pathysa antiphates*. 4)*P. antiphates*, *G. evemon*, *P. delessertii*. 5) *E. simulatrix* on bird dropping. 6) *E. simulatrix* and *G. harina*. See article on pp. 46.