Wisconsin Entomological Society Newsletter

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More to a Monarch Than Meets the Eye

by Jessica Miller

The monarch butterfly is one of the most popular butterflies in the world. Ask anyone, young or old, and most can identify the orange and black beauty without hesitation. However, not many people know the intricate life cycle of the insect or the precarious situation their population is in.

Monarchs are found all over the world, except for Antarctica. The monarchs (*Danaus plexippus*) that reside on the eastern side of the Rocky Mountains in the United States, though, are very special. Because these monarchs cannot tolerate cold temperatures, they must move to a warmer climate in autumn. The location that they migrate to annually is in the Sierra Madre mountain range in central Mexico. From northeast Wisconsin, the journey is about 1800 miles (one way) and takes close to two months to complete. If that's not remarkable enough, consider the fact that these migrating monarchs have never been to Mexico before, so they are not relying on memory to get them to their destination. In fact, the last monarch relatives to have made this journey were their great-great grandparents. Monarchs born in late summer (late July-early September) can live upwards of 10 months, allowing them to make the trip to Mexico and overwinter. All monarchs born before that only live six weeks, at best, and do not migrate.

Arriving in Mexico in November, monarchs literally "hang out" on the trees in one of 12 designated sanctuaries. Due to the lack of food there, they discontinue eating and reproducing, living only on their stored fat reserves until spring. In March, monarchs will begin leaving their overwintering grounds and migrate north. When they reach the Texas latitude, they will find food (flower nectar) and reproduce. Shortly thereafter, they will die. It is their children that continue to fly northward across the U.S. and Canada. Monarchs usually arrive in Wisconsin in mid-late May, mate, and die. Their offspring then continue the monarch legacy, producing another two to three generations before the fall migration.

Unfortunately, the eastern U.S. monarch population has sharply declined over the past eight years due to habitat loss, a decrease in milkweed (the host plant on which females lay eggs), and severe drought. The total migrating monarch population suffered another blow last winter. Using aerial photos of the sanctuaries in Mexico, scientists count the number of hectares (one

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In This Issue...

The Wisconsin Entomological Society Newsletter is published three times a year, at irregular intervals. The newsletter is provided to encourage and facilitate the exchange of information by the membership, and to keep the members informed of the activities of the organization. Members are strongly encouraged to contribute items for inclusion in the newsletter. Please send all news items, notes, new or interesting insect records, season summaries, and research requests to the editor by Jan. 15, May 15, or Sept. 1st:

J. Mingari, P.O. Box 105, New Holstein, WI 53061, email: dragonflypond@tds.net (Put WES in subject line)
NOTE: Please report any address changes to Les Ferge, 7119 Hubbard Ave., Middleton, WI 53562, email: lesferge@gmail.com

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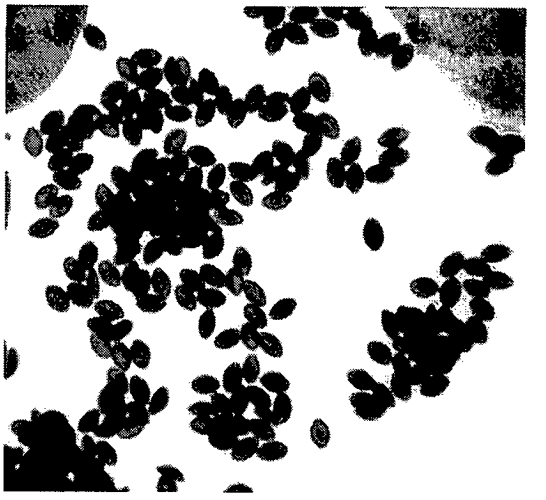
hectare = 2.47 acres) of trees that are occupied by monarchs. Each hectare can contain anywhere from 10-50 million monarchs. In 2010, 4.02 hectares were counted. This past winter, biologists counted 2.89 hectares (the average is seven hectares). Why the loss? The southern states, especially Texas, suffered a severe drought last summer. Not only did this affect the amount of milkweed available for monarch larvae to eat but it depleted nectar sources for adult monarchs. All migrating monarchs funnel through Texas as they enter Mexico each fall, en route to their overwintering sites. This is where they refuel with nectar to not only get them to Mexico but also to get them through the winter, as they solely live off of their fat reserves. With lack of food, many monarchs perished. This summer, much of the U.S. still experienced moderate to severe drought conditions. The lack of rain across the country will no doubt have an even greater impact on an already record low monarch population. Chip Taylor, Director of Monarch Watch, an organization dedicated to the preservation of monarch butterflies, recently reported that due to the 2012 drought, the overwinter population will most likely sit around three hectares again year.

And if that isn't bad enough, monarchs frequently contend with parasites, and lots of them. *Ophryocystis elektroscirrha*, or Oe for short (pronounced oh-ee), is a protozoan parasite that develops in the gut of Monarch and Queen (*Danaus gilippus*) butterfly larva and where it reproduces and forms spores. These dormant spores make their way to the outer abdomen of an adult butterfly, and are then transmitted to other monarchs. Spores can be transferred b tween sexes while adults are mating. As monarchs land on milkweed to either nectar from the flowers or, in the case of females, lay eggs, spores rub off from the host butterfly and are inadvertently picked up by the next generation. When a newly emergent larva eats its eggshell for the nutrients and the surrounding milkweed foliage, it ingests the Oe spores. Once consumed, the spore's outer covering is broken down by the larva's digestive chemicals, thereby allowing the parasite to replicate and take over. In some cases, infected monarch larva die within the first few days or if they are able to pupate, they die shortly thereafter. However, more often than not, adults manage to eclose (emerge from their chrysalis) but are usually quite weak or smaller in size and die prematurely. That said, there are many-a-monarch that look and act perfectly healthy which test positive for Oe.



OE spores at 400x, from http://monarchparasites.uga.edu/whatisOE/index.html

I have been participating in the Monarch Larva Monitoring Project (www.mlmp.org) for the past 10 years. MLMP is a citizen science research project that focuses on the presence/abundance (or lack thereof) of monarchs in various stages (egg, larva, pupa, adult) across North America and was started by Dr. Karen Oberhauser, Department of Fisheries, Wildlife and Conservation Biology, at the University of Minnesota. Karen's parents, Sanny and Pete, have volunteered for our nature center for many years and they too have been participating in MLMP. About seven or eight years ago Karen told me about a research study that was being done through the University of Georgia called Project Monarch Health (http://www.monarchparasites.org/) and encouraged us to participate, given the sheer amount of monarchs that we rear annually for Mosquito Hill Nature Center's New London butterfly house. Karen also suggested that we start testing our monarchs for Oe before releasing them in the butterfly house to ensure that they were healthy (so as not to perpetuate the Oe protozoan year after year). It should also be noted that we were seeing lots of monarch mortality in our rearing lab (in the larval and pupal stage) in the year or two prior to our onset of Oe testing. This prompted us to start testing our adult monarchs to see if OE was present and if so, what we could do to minimize it in our lab.

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For the first few years (2007 and 2008), we were not officially participating in Project Monarch Health, despite the fact that we were testing all of our monarchs. We began sending our Oe results to the University of Georgia in 2009 and have continued to do so.

Unofficial (not sent to UG) data:
2008: tested 361 monarchs - 118 were infected with Oe
2007: tested 638 monarch - 431 were infected with Oe

Official data for the past few years that was submitted to the University of Georgia:
2009: 247 samples submitted - 13 were infected with Oe
2010: 827 samples submitted - 124 were infected with Oe
2011: 627 samples submitted - 6 were infected with Oe

Due to the extreme drought in WI this summer (and across the U.S.) monarch populations were down significantly. We will, most likely, submit less than 150 samples this fall.

Why kill infected monarchs, rather than release them to reproduce? We were instructed/encouraged by Karen Oberhauser to kill infected monarchs to minimize the spread of Oe at Mosquito Hill. If left to reproduce, infected monarchs would pass Oe spores to their offspring, which in turn would become infected and pass the Oe spores to their offspring, and so on. An Oe-infected monarch's life expectancy is significantly shorter anyway, so it makes sense to euthanize the insect to keep the existing monarch population as healthy as possible. While Oe is found naturally in the wild (about five percent of all migratory monarchs are infected with Oe), we could not, in good conscience, release infected monarchs into the wild knowing full well that we were contributing to the demise of this insect. In addition, by releasing Oe positive monarchs into our butterfly house, we would be contaminating the structure. Oe spores can tolerate extreme high/low temperatures and could be viable year after year, infecting any monarchs released into the house.

Once we began testing our monarchs and seeing high percentages of Oe (and bacterial/fungal infections as well), we changed our rearing practices.

Spores and abdominal scales at 200x. from http://monarchparasites.uga.edu/whatisOEindex.html

Where we once reared multiple monarch larvae in one container, we began rearing larvae one/container to prevent the spread of infections. We also began sanitizing our rearing equipment better/longer, using a 10-20 percent bleach solution to wipe down tables, walls, cages, nets, utensils and rearing containers. We wear latex gloves when handling larvae/adults; wash off milkweed plants before feeding our captive larvae to rid the plants of invertebrates (spiders, ants, etc) and reduce Oe spores, and lastly, euthanize infected monarchs. As you can see by looking at our Oe percentages in recent years, these rearing changes have reduced our Oe infection quite a bit.

Even with best practices, however, a percentage of monarchs will still succumb to the evils of Oe. Any larva collected could already be infected. The only way to know for sure is to raise em' and test em'.

Testing is rather straightforward but limited to the adult stage only. Because the Oe spores reside on the external abdomen of the adults, removing some of the scales from the butterfly and examining them under a microscope reveals any presence of the parasite.

I've just scratched the surface here. Monarchs can also succumb to a multitude of other parasites, bacterial and fungal infections, not to mention invertebrate predators such as spiders and wasps. Human impact is probably the most threatening of all. Herbicides, pesticides, vehicular collisions and milkweed/habitat loss all contribute significantly to a monarch's demise. The solution, I'm convinced, is awareness and education. Never before has it been so important to think globally and act locally. Plant a multitude of nectar producing plants in your yard. Better yet,

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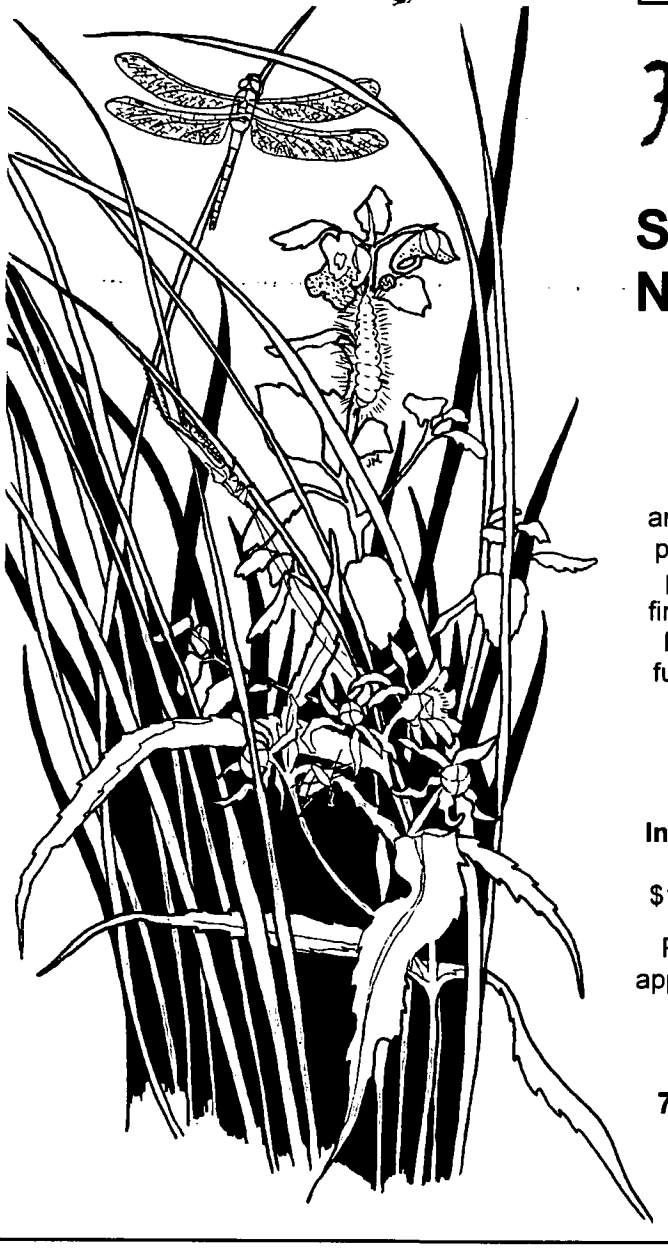
plant a plethora of milkweed. Reduce or eliminate your dependence on chemical agents in your yard. Teach a child how to rear a monarch caterpillar...or seven. Purchase tags from Monarch Watch (www.monarchwatch.org) and tag any monarchs you see in the fall. Not only will your actions contribute to science by allowing researchers to learn more about monarch migration routes, it helps to offset costs to protect overwintering grounds in Mexico. Most importantly, talk about monarchs. Talk about them with friends, family, neighbors and strangers. Chances are great that once someone knows the most recognizable insect is in trouble, they too will want to help.

Yet another monarch parasite that wreaks havoc is the tachinid fly. *Lespesia archippivora* is a widespread generalist parasitoid whose hosts include monarch butterfly larvae. There are many species of tachinid flies, all of which sport a very bristly abdomen. Females search out soft-bodied larvae, such as monarchs, and lay eggs on their outer cuticle. The maggots then burrow into the monarch, consume its hemolymph (fluid), and eventually kill their host. To continue their life cycle, the tachinid larvae emerge from the monarch larva or pupa on long silken threads, and then pupate outside the host. A real, live horror film in the making! And while predation by tachinid flies isn't always seen as a negative, since they also parasitize crop pests, any infringement on our minimal monarch population deems this predator a downright menace.



Fall Meeting

Saturday, Nov. 10
Noon-4 pm

at Russell Labs (room 170)
on the UW-Madison Campus

Join us for a day of insect fun!
Lunch will be provided around noon, followed by our annual photo salon (enter up to five pictures). Bring extra pictures, specimens, or stories to share highlights of the past field season; there should be plenty of interesting finds, given the hot and dry weather this year! The Insect Research Collection (WIRC) will be open and features further improvement and expansion. A local field trip will follow the meeting, pending weather and interest.

Membership Dues

Individual or Family	**Sustaining**	**Patron**
$10 per year	$15 per year	$25 per year

Please note that the year through which dues are paid appears on the newsletter's mailing label after your name.

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http://wisentsoc.org/

iology of Spiders by R. Foelix, in its third edition, is considered a "classic" in spider literature, dealing with an entire range of issues concerning spiders. **Giant Silkmoths - Color, Mimicry & Camouflage**, by P. Howse & K. Wolfe, is masterly dealing with this group of insects, interspersed with magnificent photos of the second author, whom you might remember from his website. And while we're on the subject, **A Guide to the Breeding of Tropical Silk Moths** by F. Meister is for those who prefer not to collect insects but to replenish the nature (or both for that matter). **A Survey of Entomology** (second edition) by G. Kritski et al. is a concise introduction to the study of insects for intermediate reader. **A Field Guide to the Ants of New England** by A. Allison is a great help to those still struggling to identify their ants -- it offers up the info, very detailed drawings, and photos of ant species, many of which inhabit Midwest, too. Right on the heels of the first volume, **Butterflies of Central America** (Volume 2) by K. Garwood et al. is now available. **Butterflies of Colorado** (Part 5) by M. Fisher is out, too, but the strange part is -- I don' t recollect seeing the previous four parts (maybe they started with #5 just like Star Wars started with #4). We've all heard a lot about insect *pests*, but what about insect *pets*? The former are well-known, but the latter are coming into fashion. There is whole slew of books offering advice on how to rear roaches (it involves little bit more than keeping your place unkempt), beetles, and other insects. Just to mention a few: **The Complete Guide to Rearing the Rainbow Scarab & Other Dung Beetles** by S. Barney et al., and **The Complete Guide to Rearing Darkling Beetles, The Complete Guide to Rearing The Elephant Stag Beetle, The Complete Guide to Rearing Flower and Jewel Scarabs, The Complete Guide to Rearing Grant's Rhinoceros Beetle,** and **The Complete Guide to Rearing The Eastern Hercules Beetle** by O. McMonigle. If you get really interested in this subject, the same author offers **The Ultimate Guide to Breeding Beetles: Coleoptera Laboratory Culture Methods**. Breeding other insect orders can be fun, too (and you don't have to breed insects just to keep them as pets -- helping the nature to replenish rare species is a noble task; and many farms breed insects for collectors, so that people don't remove them from the nature). **Complete Guide to Breeding Stick and Leaf Insects** by P. Brock is one of those books.

Books & Websites

By Andrew Khitsun

One interesting site I've come across recently is **Bug Life Cycles** at http://www.buglifecycle.com/. The author tries to follow life cycles of insects and other invertebrates, and link to photos on other sites (like BugGuide) relevant to the development of particular species or a group. The site is pretty new but expected to grow fast. For those interested in foreign fare, **Siberian Spiders** at http://araneus.narod.ru/ is another young site featuring images of spiders living in that general region. For those traveling the continent, the regional site of interest is **Insects of Alberta** at http://www.insectsofalberta.com/. The site is pretty old but I don't think I mentioned it before. **Ant Ark** at http://www.antark.net/ is another beginner's site aiming to introduce a reader to the fascinating world of ants (at this point is in beta stage). If you noticed, lots of sites I mention on this page are new ones, often promising to expand into something more comprehensive and complete. Some of them do, and some of them don't. I often revisit the sites a couple of years later, and find them thriving. Or the link could lead to a dead end, meaning the site has folded, and you blame yourself for not saving that picture or article. Do not despair! Head to **Wayback Machine** at http://archive.org/, and chances are you'll find a snapshot of that vanished website, complete with pictures, articles and interactive features (occasionally some stuff will be missing).

And, risking to annoy those who hate everything wet, **Aquatic Plants of Wisconsin** by P. Skawinski is an excellent self-published book, available to order from the author -- see details at Botanical Club of Wisconsin at https://sites.google.com/site/botanicalclubofwisconsin/news/bookreviewaquaticplantsofwisconsin.

Probable gynandromorphy in a species of wasp, *Vespula vidua* (de Saussure) (Hymenoptera: Vespidae)

By Jordan D. Marché II

On 22 Sept. 2010, at the Town of Oregon Park, Dane County, WI, I collected a wasp of the species *Vespula vidua* (de Saussure) on goldenrod which differed notably in appearance from either a regular male or worker of the same species (Figs. 1, 2, and 3 respectively). On the third dorsal segment (tergum) of the wasp's abdomen, a pair of small horizontal spots is located to either side of the central, rearward-pointing macula. This combination of markings is very similar to that found on a queen of the species (Fig. 4), an example of which I finally captured at the same locality on 28 Aug. 2012 (Buck, Marshall, and Cheung, 2008).

However, the 2010 specimen is unquestionably a male, because of its possession of 13, rather than 12, antennal segments (the number for female workers and queens). This dimorphism of antennal segments is characteristic of both the superfamilies Vespoidea and Apoidea (Grimaldi and Engle, 2005, 430). As a result of the mixture of its sexual characters, the 2010 specimen appears to be a gynandromorph.

The term "gynandromorph" refers to "individuals having some male tissues and some female tissues" (Borror, Triplehorn, and Johnson, 1989, on p. 60). For reasons that are explained ahead, such individuals are most commonly encountered within the Lepidoptera or Hymenoptera. In their most striking forms, again found chiefly within the Lepidoptera, this sexual division may result in half of the individual displaying male traits, and the other half displaying female traits (Capinera, 2004, 1039). But more typically, gynandromorphs result in "sexual mosaics, some parts of the body possessing typical male traits and other parts typically female traits" (Romoser and Stoffolans, 1998, on p. 149; see also Wigglesworth, 1972, 93-94). The latter appears to be the case with the 2010 specimen of *Vespula vidua*.

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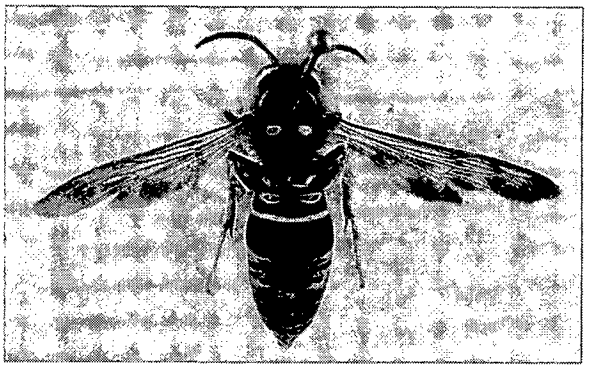

Fig. 1. *Vespula vidua, probable gynandromorph. Collected 22 September 2010.*

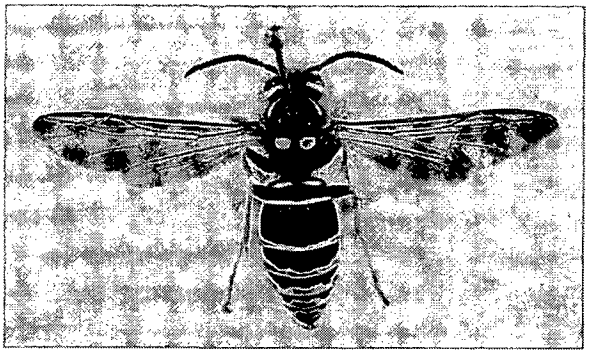

Fig. 2. *V. vidua, male specimen. Collected 8 September 2010.*

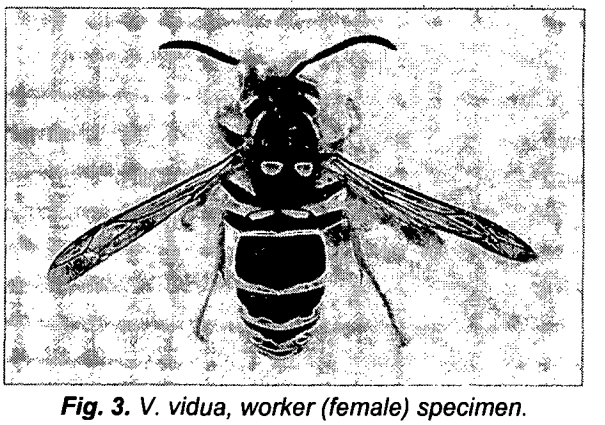

Fig. 3. *V. vidua, worker (female) specimen. Collected 8 September 2011.*

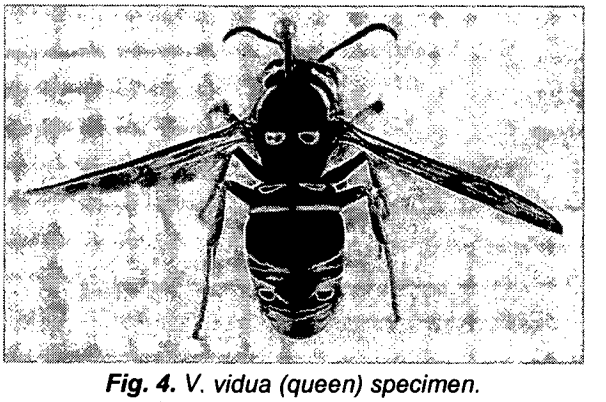

Fig. 4. *V. vidua (queen) specimen. Collected 28 August 2012.*

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Within most insect orders, males possess one X chromosome and females possess two X chromosomes, or else males possess one X and one Y chromosome. But in the Lepidoptera, females likewise possess one X and one Y chromosome (Borrer, Triplehorn, and Johnson, 1989, p. 60), which seemingly heightens the possibility for gynandromorphy or intersexed individuals.

Additional circumstances affecting development of offspring are found within the Hymenoptera (and a few other orders). Here again, males possess only one X chromosome but develop from unfertilized eggs. Females, by contrast, possess two X chromosomes but develop from fertilized eggs. This specialized method of development is usually called haplodiploidy (e.g., Grimaldi and Engle, 2005, 408).

Gynandromorphy is believed to occur from the development of a binucleate egg, in which only one of the nuclei has been fertilized, or else when an extra sperm has entered the egg to produce haploid (male) tissue in an otherwise female individual (Borrer, Triplehorn, and Johnson, 1989, p. 60). As may be expected, the condition is rare within populations.

As it has been repeatedly demonstrated from the history of science (e.g., Kuhn, 1970), we sometimes learn as much or more from the occurrence of an anomaly than we do from the patient accumulation of ordinary facts (i.e., 'normal science').

References:

Borror, D. J., C. A. Triplehorn, and N. F. Johnson (1989). *An Introduction to the Study of Insects*, 6th ed. Philadelphia: Saunders College Publishing.

Buck, M., S. A. Marshall, and D. K. B. Cheung (2008). "Identification Atlas of the Vespidae (Hymenoptera, Aculeata) of the northeastern Nearctic region." *Canadian Journal of Arthropod Identification* (Biological Survey of Canada). http://www.biology.ualberta.ca/bsc/ejournal/bmc_05/97v_vidua.html

Capinera, J. L., ed. (2004). "Gynandromorph." In *Encyclopedia of Entomology*, vol. 2. Dordrecht: Kluwer Academic Publishers.

Grimaldi, D., and Engle, M. S. (2005). *Evolution of the Insects*. Cambridge: Cambridge University Press.

Kuhn, T. S. (1970). *The Structure of Scientific Revolutions*, 2nd ed. Chicago: University of Chicago Press.

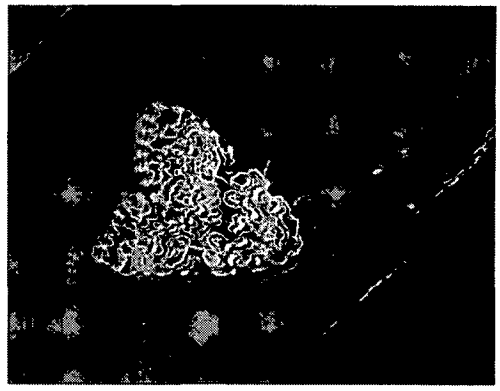
Romoser, W. S., and Stoffolans, J. G., Jr. (1998). *The Science of Entomology*, 4th ed. Boston: McGraw Hill.

Wigglesworth, V. B. (1972). *The Principles of Insect Physiology*, 7th ed. London: Chapman and Hall.

Mystery Insect

The moth was green, black, and white, and it was found in June in Calumet County.

Email your ID to the editor (please put WES in the subject line): dragonflypond@tds.net



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Cold Case?

By J. Mingari

You know that phrase, "to butter someone up?" —Used to describe a slathering of something pleasant on someone, in order to obtain something else? What if the slathering were accidentally fatal?

No idiom conveying this experience comes to my mind. Must be a pretty rare event. Or a well-hidden one. Something that would suit a Quentin Tarantino movie.

Anyway, this is why—on a walk along an area of wildflowers one day last June—I did a doubletake at the milkweed.

My first thought was: Spiders. Common field milkweed (*Asclepias syriaca*) is a great place for spider hunting when the pinkish flowers are in bloom. Crab spiders hide easily between the crowded flower heads; and alert, furry jumping spiders patrol the stalks and leaves like soldiers. As far as I know, they're not devouring their victims; they're just sucking the life out of them, leaving the corpses behind. So this could explain the dead "bugs" lying on the milkweed leaves that sunny morning, beneath the warmly fragrant flower umbels.

Some of these turned out to be bugs I did not recognize. Identification was not as straightforward a job as I had imagined, however. One body insisted on lying on its back, so I couldn't properly see the wings. Investigation revealed that it had no feet to stand upon. In fact, the other insect, also, was missing feet.

("Curiouser and curiouser!" cried Alice.)

Back to the milkweed next day.

Another dead bug with no feet! And there was a bug on another leaf below the flowers, laboriously dragging what looked like little balls and chains from each foot. And dead insects dangling from some of the flowers. Not only that, but these dead insects didn't let go of their blossoms. They were firmly attached... by the feet.

I didn't expect insect-pollinated flowers to be user-unfriendly.

The flowers of common field milkweed employ an unusual process for pollination. The yellow pollen is not exposed as spiky or sticky grains, where it can be picked up and transported by hairs on insect bodies. Instead, it grows together in waxy golden packets, hidden inside little envelopes around the crown of each flower. The 10 packets are tethered in pairs to a minute black body, or corpusculum. If you take off your glasses and hold a flower up to your nose, you may just be able to see the corpuscula as five pin-prick black specks around the crown of the flower. They are more interesting with magnification.

< Top view of milkweed flower.

Side view of the flower with one hood removed. > The black dot in the center is the corpusculum.

The process: An insect landing on the milkweed for its nectar has tricky footing due to the flower's weird horns and hoods. As it steps around, its claw or hair may be snagged by a tapered fine groove in the little black corpuscula.

A large and strong enough insect, pulling away, is now chained with two "balls"—the two packets of pollen—that go with the insect to another milkweed flower. There, the insect has the same trouble with its footing: a foot slides over the top of a corpusculum on that flower, into the slot below it, taking the pollen with it. That's how the flower is pollinated. As the insect pulls its foot back up, the pollen packets are torn off, but the insect or the broken tethers are snagged by *that* corpusculum, and a whole new ball and chain set are hauled off.

Other insects have a different experience: the feet come off and remain on the flower. The legs come off and remain on the flower. Life comes off and the dead insect remains on the flower. And yes, if you look over the milkweed

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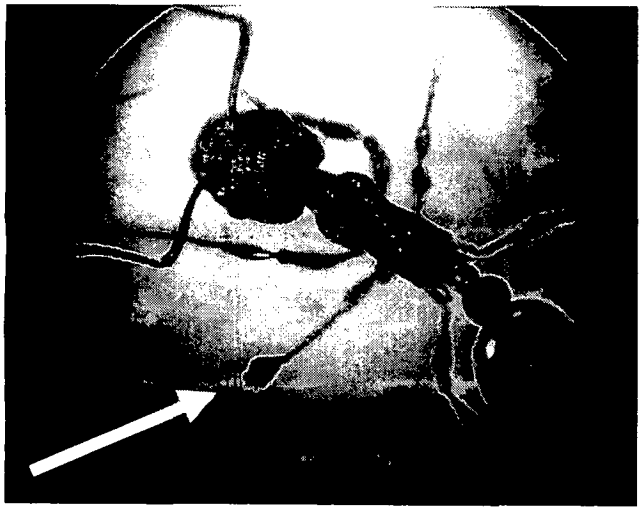
MILKWEED *from page 8*

flowers closely enough, you may find disembodied insect legs and feet trapped in a little corpusculum here and there.

Though this was all new to me, the phenomenon has been known and studied since at least 1793.

Does a corpusculum ever come off an insect's foot? I don't know. It doesn't seem to. Morse (1982), working with *Bombus vagans*, observed that "once a corpusculum became attached to a bee's foot, it was seldom dislodged." He concluded that "the average single corpusculum will remain affixed for much of the life of a bee."

Nectar thieves like little red ants, with chewing mouthparts, can free themselves of the ball and chain, but they, too, travel on with an awkward black corpusculum shoe.



Corpuscula don't uniquely attach to insect feet, however; they may also be snagged by mouthparts.

I was surprised to find a lot of honeybees (*Apis mellifera*) dangling dead from the flowers, leading to bad jokes on colony collapse. Morse/Fritz (1989) report that it's actually not common for honeybees to get stuck on the milkweed flowers, but they are more likely to get stuck than *Bombus* species, maybe partially due to the difference in the way the two bees engage the flower (Macior 1965): Bumble bees tend to grasp the base of the flower and will hang upside-down when their weight bends the flower; honeybees seem to prefer to maintain a particular angle, and will work hard to keep it, hovering as they step and slip.

The fact that I found many dead, trapped honeybees on the flowers may just be the result of having two hives nearby, but it struck me as odd, since more than one study has reported honeybees as the apparent primary pollinator for the plant.

Since *A. syriaca* is a native plant, and honeybees are not native insects, who pollinated the milkweed before the honeybees arrived? It wasn't a monarch butterfly. They don't seem to carry any of the milkweed's pollinia (Morse 1982).

Macior observed that it takes an insect of a certain size, leg length, and behavior to snag the pollinia of *Asclepias syriaca*; but further (and

Brown stinkbug (Euschistus) with four feet encumbered. Below, (Polemius laticornus) beetle with pollinia.

MILKWEED *continues on page 10*

MILKWEED *from page 9*

this wasn't known in 1965) it also takes an insect who travels, because *A. syriaca* forms clone groups and sets no seed from pollen of its own clone group. Since a corpusculum (and its balls and chains) have to travel to be useful to the plant, it makes sense that it would "hold on tight," even if for the life of an insect.

Studies have recorded, marked, and tallied both diurnal and nocturnal visitors to the flowers, counted the "links" in the pollinia chains that make the insects clumsy, and recorded recaptures at clone groups at a distance. The conclusion seems to be that where honeybees are most abundant, they are the primary pollinator; where bumble bees (*Bombus terricola, vagans,* and *ternarius*) are more abundant, they become the primary pollinator (Morse 1982); where honeybees and wasps (*Ammobia ichneumonia, Tachytes mandibularis, Vespula maculata, V. maculifrons,* and *V. vidua*) are present with bumble bees in general, the honeybees and wasps beat the bumble bees for pollinium/corpusculum load (Macior; Jennersten/Morse 1991).

So whodunnit? - Extinct bumble bee or/and the wasps?

Betz, Robert F., Roy D. Struven, James E. Wall, and Francis B. Heitler. Insect pollinators of 12 milkweed (Asclepias) species, pp. 45-60. Proceedings of the 13th North American Prairie Conference: Spirit of the Land, Our Prairie Legacy: held 6-9 August 1992, Windsor, Ontario, Canada. http://digital.library.wisc.edu/ 1711.dl/EcoNatRes.NAPC13

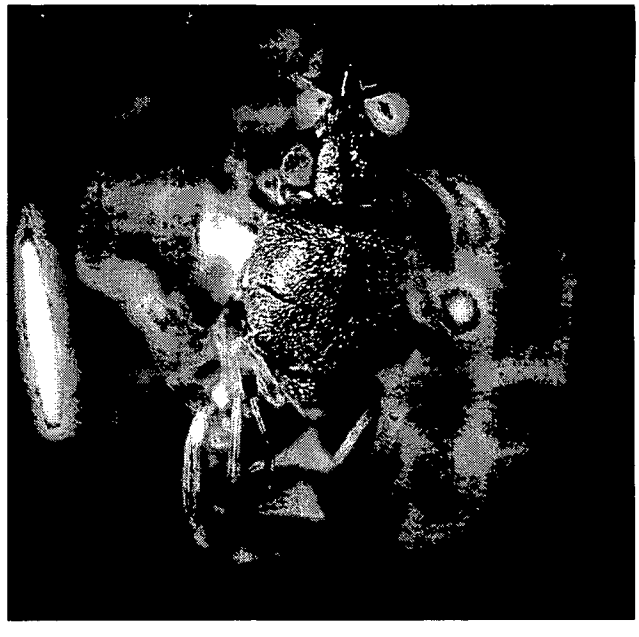
Jennersten, O. and D.H. Morse. 1991. The quality of pollination by diurnal and nocturnal insects visiting common milkweed, Asclepias syriaca. *American Midland Naturalist,* vol. 125, #1, pp. 18-28.

Macior, L.M. 1965. Insect adaptation and behavior in Asclepias pollination. *Bulletin of the Torrey Botanical Club,* vol. 92, #2, pp. 114-126.

Morse, Douglass H. 1982. The turnover of milkweed pollinia on bumble bees, and implications for outcrossing. *Oecologia,* vol. 53, #2, pp. 187-196.

Morse, Douglass H. and Robert S. Fritz. 1983. Contributions of diurnal and nocturnal insects to the pollination of common milkweed (*Asclepias syriaca*) in a pollen-limited system. *Oecologia,* Vol. 60, #2, pp. 190-197.

Morse, Douglass H. and Robert S. Fritz. 1989. Milkweed pollinia and predation risk to flower-visiting insects by the crab spider Misumena vatia. *American Midland Naturalist,* Vol. 121, #1, pp. 188-193.

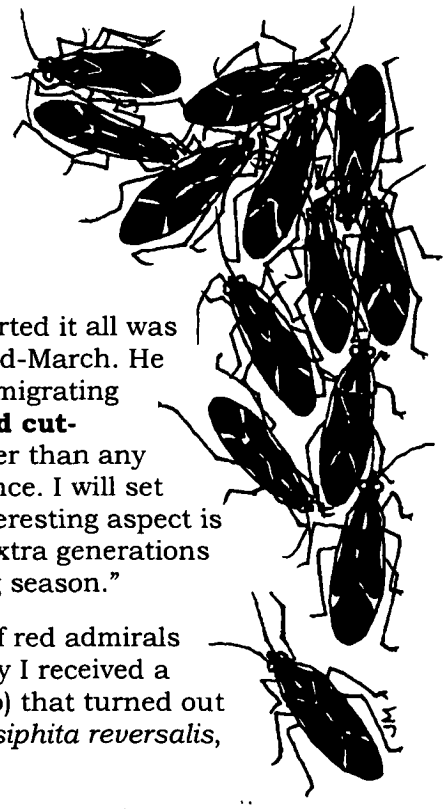


(Archytas) Tachinid flies die trapped on the flowers, along with soldier flies (Nemotelus above).

My computer crashed, taking with it the name of the person who was interested in compiling Insect News. Please try again!
— Editor

News from the Insect Diagnostic Lab

By Phil Pellitteri

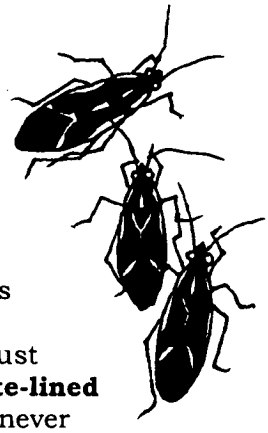


Oh my...

So the email that started it all was from Les Ferge in mid-March. He had captured some migrating noctuids including **variegated cutworm**-- *Peridroma saucia*— a month earlier than any records he had. It has been an interesting ride ever since. I will set a record for most samples processed in a year, but the more interesting aspect is all of the odd things that popped up. Many insects tried to get extra generations in, but that is not surprising when you add a month of "growing season."

It did not seem like a good year for butterflies. There were lots of red admirals early, and early emergence of many species in the spring. In May I received a number of emails of orange larvae striping *Baptesia* (false indigo) that turned out to be a pyralid called the **Genista broom moth**/caterpillar, *Uresiphita reversalis*, which is normally more of a southern critter.

About the same time I had numerous calls and emails of egg masses on the sides of people's homes in Northern Wisconsin. It was not hard to figure they were **cutworms** of some type, but what species? A picture from a person in Rhinelander told me it was variegated – so no surprise, we had "biblical" populations of climbing cutworms in the northern half of the state. I saw pictures of 20 larvae per square foot and damage I had only seen in pictures that pre-date my work in the lab.



The BIG SURPRISE was the email from Columbus, WI of a **zebra swallowtail** in a flower garden in early August. I checked Mike Reese's website and saw the records from Iowa Co. in May. In June a number of samples of adult **Lucerne moth** — *Nomophila neartica*— were submitted because people were finding lots of moths just hanging out and wanted to know who it was. I had early calls of hundreds of **white-lined sphinx moth larvae** crossing the highways of Chippewa and Wood counties, but never did see the big adult emergence I expected.

In a normal year I see two species of Coreid (**leaf-footed bugs**)— the Western conifer seed bug (*Leptoglossus occidentalis)* and the squash bug *Anasa tristis*, but this year add the horned squash bug, *Anasa armigera,* the helmeted squash bug, *Euthorchtha galeator*, the large brown *Acanthocephela terminalis*, and a new state record for the citron bug, *Leptoglossis gonagra*, which was found on a squash in Wisconsin Rapids. The dry, hot weather brought back congregations of the **false chinch bugs** (*Nysius raphanus*), a critter I had not seen since 1988. The hot, dry weather gave us lots of **spider mites** and **boxelder bugs**.

The big news on the invasive front was the addition of Walworth, Rock, Waukesha, and Trempeleau counties with infestations of **emerald ash borer** and a major outbreak of an Asian fruit fly called the **Spotted-winged Drosophila**. Adult *Drosophila suzuki (SWD)* had been captured in both 2010 and 2011 in limited numbers, but no problems were seen in fruit. In 2012 there have been statewide infestations in fall raspberries and strawberries. The female has a modified ovipositor which allows her to lay eggs under the skin of fruit just as it starts to color. Was this another "blow-in," or were there other factors involved? We are not sure, but I suspect the winds had something to do with it.

Wisconsin Entomological Society

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Address Services Requested

From the west:
From U.S. Hwy. 12 or U.S. Hwy. 14, take University Ave. east onto campus.
Turn left (north) onto Charter Street.
Turn left (west) onto Linden Drive.

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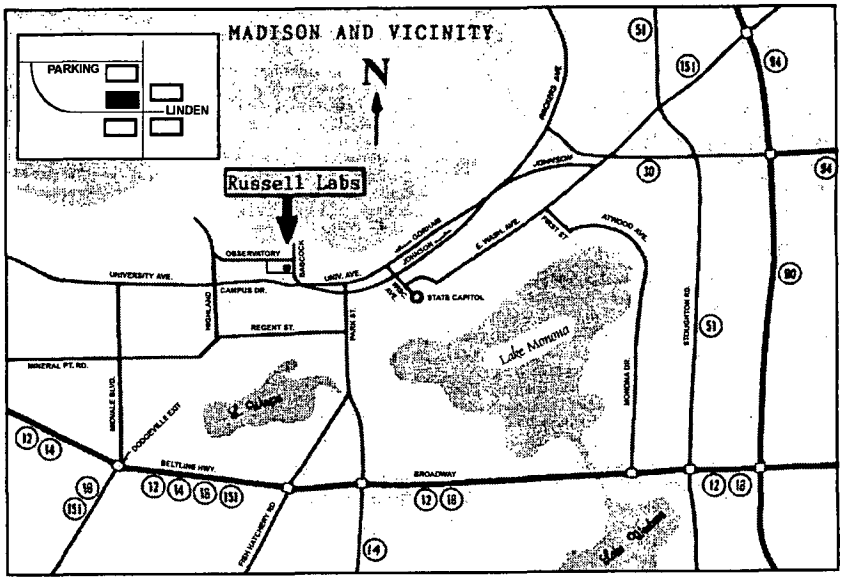
Take the Park Street exit north into the city.
Turn left (west) on University Ave.
Turn right (north) onto Charter St.
Turn left (west) onto Linden Drive.



At the third stop sign you will be at the intersection of Linden Drive and Babcock Drive. Russell Lab is the building on the northwest corner of this intersection. Public parking is available one block farther west at the west end of Babcock Hall (on your left), and on the parking ramp located on the north side of Russell Labs.

Fall Meeting
Saturday, Nov. 10 ~ Noon-4 pm