Phaëton

The Official Newsletter of the
Maryland Entomological Society

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1000 Hilltop Circle
Baltimore, **MD** 21250

November 2009
Volume: 30, Number 2

Meeting Announcement

The **M**aryland **E**ntomological **S**ociety's **271st** regular meeting will be held **Friday, November 20**, 2009; beginning at 8:00 P.M., in **Room 004** (one floor below the street level), Biological Sciences Bldg., University of Maryland, Baltimore County (UMBC). Bring a friend and specimens/observations to share. Refreshments will be provided. Presentations are scheduled to begin about 8:15 P.M.

Speakers: **Dr. Chris Thompson** and **Dr. Wayne Mathis**, Entomology Department, Smithsonian Institution, National Museum of Natural History, Washington, **DC**

Title: **"**Diptera of DelMarVa. "A re-focus on our local biodiversity"
Possible Subtitle: "With today's World concern about climate change, loss of biodiversity, *etc*., and new initiatives like the Encyclopedia of Life, Global Biodiversity Information Facility, *etc*., we should begin in our own backyard."

Dr. Thompson's research focus for 45 years has been on the systematics and zoogeography of flower flies (Diptera: Syrphidae). These flies serve as critical pollinators, predators of plant pests and recyclers of environmental waste. He has written about flower flies from all regions with a primary focus on New World, Australia and New Zealand. His current research work includes Flower Flies of Costa Rica, Nearctic Flower Flies and Genera of Flower Flies. He also serves as editor of the Biosystematic Database of World Diptera. His Collection responsibilities at the NMNH currently includes 28 different families of Diptera.

Dr Mathis is the curator of Diptera at the Smithsonian. For forty years, his research has focused on the systematics and evolution of Diptera through cladistic analyses to reconstruct phylogenetic relationships. His comprehensive studies are global in nature with focused studies in the neotropics, especially the Caribbean, and with special emphasis on the superfamilies: Ephydroidea and Opomyzoidea. His current Collection responsibilities at the NMNH include >750,000 specimens in >20 different families of Diptera.

If you want more information concerning this meeting, contact one of the following people:

Annapolis Area -	Harold Harlan	(410) 923-0173 (Home)	"haroldharlan@comcast.net "
Baltimore Area -	Phil Kean	(410) 944-4630 (Home)	
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Minutes of the October 2009 MES Meeting

The 270th general meeting of the Maryland Entomological Society was held on Friday, October 16, 2009 at UMBC and was begun at 8:44 p.m. (after some delays in initiating the projector) with a welcome by Fred Paras and then a short business meeting. The May 2009 meeting minutes were read and approved, and then the treasurer's report was given. Treasurer Ed Cohen stated that the MD state taxation exemption certificate for the society had been approved. The MES Funds total presently stands at $1485.32. This total was after an expenditure of around $900.00, consisting mostly of costs for publishing the new issue, Volume 5, Number 1, of ***The Maryland Entomologist***. This issue contains articles on tiger and long-horned beetles, an annotated list of Maryland mosquito species, and results of an ant survey at Assateague Island. Editor Gene Scarpula is to be highly congratulated for his completion of this professionally finished and attractively color-illustrated issue, and all accomplished within a record-setting one year after the previous issue. Gene reported that costs were trimmed by using 80- rather 100-bond weight paper and that about 22 issues had been ordered by the MD Dept. of Agriculture. Harold Harlan said that several copies would also be purchased by some of his USDA associates. As a follow-up to Fred Paras' record of a Milbert's Tortoiseshell in Carroll County, MD, in September 2008; Dick Smith announced and showed a copy of a photo that Jim White, a Delaware nature photographer, had recently taken of another specimen of this northern species (and almost never encountered south of PA) in the Barrows Run Preserve area of New Castle County, DE on Sept. 28, 2009. Dick also mentioned that the Natural History Society of Maryland's public Critterpalooza event held at their Belair Rd. center on October 10 was a stirring success.

The main program for the meeting, titled "Dropping like flies: Fungal insect pathogens of the order *Hypocreales* (*Ascomycota*)," was presented by Dr. Joseph Bischoff, the National Mycologist at the USDA's Animal and Plant Health Inspection Service (APHIS) at Beltsville, MD. Dr. Bishoff started his presentation with a discussion of fungi in general. They are eukaryotes, which includes most familiar organisms whose cells contain complex structures enclosed within membranes. They are heterotrophic; and so like animals and bacteria, they do not synthesize their own food but instead obtain nutrition by digesting organic compounds. Members of the fungi kingdom have cell walls that contain chitin, unlike the cell walls of plants, which contain cellulose. Carbohydrates are stored as glycogen. There are believed to be 1.5 million species of fungi, but only about 80,000 species are currently described. Fungi often infest humans who have suppressed immune systems. Typical human fungal pathogens include *Histoplasma capsulatum* and *Cryptococcus neoformans*, which usually infect the lungs, and *Candida albicans*, a form of yeast that often infects the mouth or genital area. Fungi are injurious to agricultural crops: some major problem species are Wheat Rust (*Puccinia triticina*) and Rice Blast (*Magnaporthe grisea*). Some fungi are symbionts, such as *Leucocoprineae* and *Pterulaceae*, which are grown as food by colonies of attine ants, the lichen fungi *Mycophycophyta*, that have evolved mutualistic partnerships with green algae (*Chlorophyta*), and the mycorrhizal fungi that assist mineral absorption in plant roots. Saprophytic fungi utilize dead and decaying plant material for nutrition, and coprophilous fungi utilize dung. *Cookeina sulcipes* is a cup-shaped tropical edible fungus that grows on dead wood. There are seven fungal phyla as follows:

(1) *Basidiomycota* – the most common larger species, such as gill fungi, pore fungi, stinkhorns, coral fungi, puffballs, bird's nest fungi, jelly fungi, rusts, smuts & stem rot,

(2) *Ascomycota* – sac fungi (mildews, molds, morels),

(3) *Zygomycota* - bread molds and related taxa (the gypsy moth pathogen *Entomophaga maimaiga* is in this group),

(4) *Glomeromycota* – these form *mycorrhizae* on higher plants,

(5) *Chytridiomycota* - microscopic, simplest of the true fungi, mostly aquatic,

(6) *Blastocladiomycota* - microscopic parasites and saprotrophs closely related to the above *Chytridiomycota*, and

(7) *Neocallimastigomycota* - microscopic, living in the digestive systems of larger herbivorous mammals.

Dr. Bischoff ha s focused his studies on the order *Hypocreales* in the *Ascomycota* phylum. The *Ascomycota* are monophyletic (*i.e.*, consisting of a common ancestor and all its descendants) and account for approximately 75% of all described fungi. Many are pleomorphic and therefore possess sexual and asexual spore-producing stages in their life cycles. The *Hypocreales* consists of 7-8 families, and three families, *Clavicipitaceae*, *Cordycipitaceae*, and

Ophiocordycipitacea, have received the most study. Within *Clavicipitaceae* is *Claviceps purpurea*, which commonly infects the floral portions of rye. It induces the floral cells to divide, enlarge, and eventually create large brown projections within the rye seed clusters called sclerotia. The sclerotia may inadvertently get mixed in with the grains and incorporated into foods, thus causing a devastating and sometimes deadly syndrome called ergotism (also called "St. Anthony's Fire" and "Holy Fire") in humans and other animals. Ergot alkaloids from the sclerotia contain ergotamine, which is used to synthesize LSD. Symptoms of ergotism include convulsions, diarrhea, hallucinations, dementia, and may lead to dry gangrene in serious cases. The sclerotia are prevalent in wet summers, and an historical study of weather patterns implicates ergotism fomenting such historical events as the Salem Witch Trials and the French Revolution and playing a part in delaying Europe's recovery from the Black Plague. However, due to an increased knowledge of this fungus and a more varied modern diet, such epidemics no longer occur in humans. Useful chemicals are also derived from Hypocrealean fungi. *Cordyceps subsessilis* is a source of cyclosporine used to suppress the immune system during organ transplants. *Ustilaginoidea virens* is able to arrest mitotic division of cancer cells in breast and lung cancer patients. *Claviceps purpurea* is also a source of the alkaloid ergotamine which has been used extensively to relieve migraine headaches through the constriction of blood vessels. Finally, *Hypocreales* includes species that are entomopathogens. For example, *Metarhizium anisopliae* is a fungus that grows naturally in soils throughout the world and causes disease in a broad range of pest insects by acting as a parasite. This fungus penetrates the insect's exoskeleton, travels through the hemolymph, replaces the insect's interior with fungal cells, and affects the insect's brain so that it crawls to die on plant tips where the fungal spores are released from the insect's remains and disperse easily. *M. anisopliae* (trademark name "Green Muscle") is used as a biocontrol agent and is spread from airplanes in Niger to control locusts and mosquitoes. Much of the remainder of Dr. Bischoff's presentation concentrated on molecular and morphological studies he has conducted to isolate lineages and additional species of fungi in the genus *Metarhizium.* From an original batch of 400 different *Metarhizium* isolates, a smaller set of 59 were selected that showed greatest morphological diversity in features including spore size and shape. He performed sequencing on four gene loci: Beta-tubulin (Bt), translation elongation factor 1-a (TEF), and RNA polymerase II subunits 1 and 2 (RPB1 and RPB2). About 750 base pairs using one primer sequence are sufficient to separate species using these genes. He applied a phylogenetic sequencing criterion called Genealogical Concordance Phylogenetic Species Recognition (GCPSR) to determine lineages. Initially 14 species were identified, and later analysis raised that number to 16 species. *Metarhizium frigidum* and *M. flavoviride* were two of the morphologically cryptic species that were successfully isolated. New pathogens of the European Fire Ant (*Myrmica rubra* L.) may be byproducts of this work. Dr. Bischoff is also currently working on a general-use internet database to aid other researchers in determining species of *Hypocreales*. The database includes a taxonomic list, culture disc pictures, micrographs, geographic origins of samples, and links to the GenBank™ nucleotide sequences database.

Respectfully submitted,
Richard H. Smith
MES Secretary

Announcements

1. Distributing this newsletter by e-mail saves costs of printing and mailing, and allows rapid distribution of information. Members with no current e-mail address will still be sent hard-copies for the foreseeable future. For questions, please contact any person listed at the bottom of the first page. **Also** please provide your current e-mail address. Dues for 1 Oct. 2009 **through** 30 Sep. 2010 , are **$10.00/year**. Please send dues & any address or other corrections to:

Edgar Cohen, Jr., MES Treasurer Phone: (410) 740-0481
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2. Regular MES meetings are held the 3rd Friday of each of 6 months each year: Oct., Nov., Feb., Mar., Apr. & May (parallel to UMBC's academic year). The remaining meetings for the 2009 "MES year" include:

month	date	speaker (if known)	topic
Nov. '09	20th	Drs. Thompson/ Mathis	(See 1st Page)
Feb. '10	19th	TBA	TBA
Mar. '10	19th	TBA	TBA
Apr. '10	16th	TBA	TBA
May. '10	21st	TBA	(members' potpourri)

3. MES member, Frank Guarnieri sent these items:

a.) I've done some organizing/thinning of my collection and have about $50 worth of BioQuip Cornell drawer pinning trays (a mix of 1/2, 1/4, 1/8) with polyethylene foam. Some are a bit old with the pinning bottoms becoming brittle and yellowed a bit but most still in great shape and even those oldest are still very functional. I will give them away - FREE - including shipping - to anyone who wants/needs them. No partial orders, it's the whole box or nothing!!!

b.) My family has a 200-acre tree farm in Belgrade, Maine (about one hour north of Portland Jetport). There are lots of trails and a good mix of field, forest, and the property backs to a huge (1000s of acres) bog. The flight from BWI is about 45 min. and it is possible to get $49 AirTran™ tickets if you pay attention to sales, dates, *etc*. It is very feasible to spend a day up here collecting if you have an interest in the north woods fauna. Collect all you want, but the mosquitoes and tabanids are generally brutal all summer, so bring your bug spray. We are on the way to Acadia National Park and Baxter State Park (sorry, it is illegal to collect at both places!). And yes, we do have moose back there too!!!

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4. The **Audubon Naturalist Society** (ANS) has lots of nature events and experiences for all ages. They reach thousands of children each year through special nature-oriented programs for preschool, family, scouts, and schools through their 3 wildlife sanctuaries: Woodend, Rust, & Webb. They offer adult natural history classes, local outings, & travel experiences. They work with various civic, environmental and conservation groups on issues related to the watershed, rural lands, and more. They offer PDFs of local & regional Nature activities, & you can download the Naturalist News. Some classes, events, & bird walks are free, but most require pre-registration & many require a fee, as well. For details, or to register, call: (301) 652-9188, ext. 10, or go to their website at: "www.AudubonNaturalist.org".

5. The **National Zoological Park**, 3001 Connecticut Ave., NW, Washington, **DC**, offer current displays of >4,000 species of animals for free public viewing. Main attractions include: pandas, exotic birds, reptiles, elephants, big cats, *etc*. Many of these displays can be viewed via "live" web cameras. Their web site has many scientific articles from current research, w/ images & lots of "links" to other resources. Sub-pages include the some that feature "Invertebrates" & "Wildlife Gardening". You may wish to join the Friends of the National Zoo (FONZ). Go to: www.nationalzoo.si.edu or call: (202) 673-4717.

6. The **Maryland DNR** website this month has news about lots of current state programs on conservation, trees, nature walks & classes, Autumn &/or Winter programs & opportunities to volunteer. There are details & links about hunting & fishing, regulations, seasons, & advice for outdoorsmen & campers. For details or reservations go to: www.dnr.state.md.us .

7. Additional websites worth checking include:

- the USDA website, http://soils.usda.gov/education

- the National Aquarium (in Balto.), "www.aqua.org"

- the Maryland Science Center, "www.mdsci.org"

- The U.S. Centers for Disease Control and Prevention (CDC) www.cdc.gov (then search by topic)

- The Jug Bay Nature Center, at Jug Bay, Lothian, MD. at: www.jugbay.org, or call (410) 741-9930.

8. Take part in local or regional Thanksgiving & Autumn/Winter festivities & events in Baltimore, Washington & central Maryland. Most take place from the last week of Nov. through Dec. (& maybe New Year's events). For details, check out the "**What's Up? Annapolis**" magazine. For a free subscription mailed to your home (limited to Annapolis & surrounding areas), contact: What's Up?, Inc., 929 West St., Suite 208A, Annapolis, MD 21401; call: (410) 267-9390; or go to: "www.whatsupmag.com".

9. Current (SocietyYear 2010) MES Officers

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