NEWSLETTER

of the

MICHIGAN ENTOMOLOGICAL SOCIETY

Volume 46, Numbers 1 & 2 **February 2001**

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Hylurgus ligniperda: *A New Exotic Pine Bark Beetle in the United States*

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Initial Detection. Overwintering adults of the red-haired pine bark beetle, *Hylurgus ligniperda* (F.) (Coleoptera: Scolytidae), were accidentally discovered on 10 November 2000 in a Christmas tree plantation east of Rochester, New York (near Webster). A Cornell University plant pathologist was initially summoned to the site by the grower to determine why so many conifers, of various species, were declining and dying. During his visual survey of the site, and quite by accident, he found a large number of *H. ligniperda* adults in an overwintering aggregation under the thick bark of a single conifer stump. A subsequent survey of the plantation on 20 November 2000 determined that this exotic bark beetle was well established at this site.

Hylurgus ligniperda was first detected in North America as a result of the Cooperative Agricultural Pest Survey (CAPS) exotic bark beetle survey project in New York. In May 1994, a single specimen was identified from a Lindgren funnel trap baited with alpha-pinene near Rochester, NY (Monroe Co., near Greece). Another individual specimen was collected in May 1995 at the same site, using the same type of trap and lure, but no breeding population was ever found in the Rochester vicinity.

Distribution. *Hylurgus ligniperda* is native to Eurasia and north Africa. It has been accidentally introduced into several other countries, including Australia, Japan, New Zealand, South Africa, Brazil, Chile, Uruguay, and now the U.S.

Interception History. *Hylurgus ligniperda* is frequently intercepted at U.S. ports-of-entry on solid wood crating and dunnage (e.g., wood used to brace cargo in ships). There were at least 84 *H. ligniperda* interceptions on wood packing materials at U.S. ports during 1973-1981, and 167 interception during 1985-1998. During 1985-1998, the *H. ligniperda* interceptions originated on goods imported from 12 countries, primarily Italy (76 interceptions), Portugal (29), Spain (26), and Chile (10). *Hylurgus ligniperda* is most frequently associated with imported tiles and quarry products such as granite and marble.

Hosts. This beetle breeds primarily under the bark of unhealthy pines (*Pinus* spp.), usually near the base of the trunk or in large exposed roots

Damage. *Hylurgus ligniperda* has the potential to be a serious vector of diseases associated with intensive pine management, such as blackstain root disease caused by *Leptographium wagneri*. According to Dr. Martin MacKenzie (USDA Forest Service, Morgantown, WV, in litt. and pers. comm.), the detection of both the beetle and the fungus *Leptographium truncatum* in New Zealand in 1974 was

not a coincidence. In a survey of fungi associated with *H. ligniperda*, Dr. MacKenzie found that 106 of 112 dispersing beetles carried *Leptographium* when they landed on freshly-peeled pine logs. Moreover, some of the *H. ligniperda* collected in New York in 2000 were also carrying spores of various fungi, including a *Leptographium* species.

In South Africa, *H. ligniperda* is considered a minor pest. It is known to introduce bluestain fungi in the genus *Ophiostoma* to the wood through their galleries, and it also transmits root pathogens in the genus *Leptographium*.

In Chile, there it concern that the presence of this bark beetle, as well as the exotic scolytid *Hylastes ater*, could adversely affect the establishment of new Monterey pine (*Pinus radiata*) plantations. In Chile, *H. ligniperda* has been reported to reproduce in slash as well as young Monterey pine trees, and through their maturational feeding cause up to 10% mortality of newly established pine plantations.

Biology and Seasonal History. *Hylurgus ligniperda* has just one generation per year in the cooler parts of its range, but 2 to 3 generations per year are completed in the warmer portion of its range. Adult beetles breed in freshly cut stumps, logs, and slash following timber harvesting. Reproduction also occurs in recently dead, dying, and fallen trees. Reproduction can also occur along the root collar region of live trees, but such trees are generally weakened by nutrient deficiencies, mechanical injury, disease, or insect attack.

Females of *H. ligniperda* initiate construction of the egg galleries. After constructing a short entry tunnel into the inner bark, the female enlarges an area that is called the nuptial chamber. A male soon joins her and mating occurs in the nuptial chamber. Each female then constructs a single egg gallery that extends from the nuptial chamber and runs parallel with the wood grain. Egg galleries are typically 10-20 cm long. At times, adults overwinter gregariously in tunnels in the bark of the root collar region of larger trees (see Figure). *Hylurgus ligniperda* also overwinters in the inner bark as fourth instar larvae and then pupates in late spring. Adults emerge in about 2 weeks. Some reports state that newly emerged adults feed at the root collar area of pine seedlings, often forming a spiral feeding gallery. Other reports do not mention any maturation feeding by this species. During periods of maturation feeding, new adults become sexually mature. If *H. ligniperda* overwinters and conducts maturation feeding on live trees, then fungal pathogens like *Leptographium* could enter through the wounds.

Literature Sources. The above information was mostly gathered from personal communications, unpublished memoranda, and the publications listed below.

Bain J. 1977. *Hylurgus ligniperda* (Fab.), Forest Research Institute, New Zealand Forest Service, Forest and Timber Insects in New Zealand, No. 18.

Ciesla W. 1988. Pine bark beetles: a new pest management challenge for Chilean foresters. Journal of Forestry 86(12): 27-31.

Ciesla W. 1993. Recent introductions of forest insects and their effects: a global overview. FAO Plant Protection Bulletin 41(1): 3-13.

Haack RA, Cavey JF. 2000. Insects intercepted on solid wood packing materials at United States ports-of-entry: 1985-1998. *In* Proceedings: International conference on quarantine pests for the forestry sector and their effects on foreign trade, 27-28 June 2000, Concepcion, Chile. CORMA, Concepcion, Chile. 16 pp.

Tribe GD. 1984. The red-haired bark beetle *Hylurgus ligniperda* (Fabricius) (Coleoptera: Scolytidae). Pests and diseases of South African forests and timber, Pamphlet 273. 6 pp.

Tribe GD. 1991. Phenology of *Pinus radiata* log colonization by the red-haired pine bark beetle *Hylurgus ligniperda* (Fabricius) (Coleoptera: Scolytidae) in the south-western Cape Province. Journal of the Entomological Society of Southern Africa 54(1): 1-7.

Tribe GD. 1992. Colonisation sites on *Pinus radiata* logs of the bark beetles, *Orthotomicus erosus*, *Hylastes angustatus* and *Hylurgus ligniperda* (Coleoptera: Scolytidae). Journal of the Entomological Society of Southern Africa 55(1): 77-84.

U.S. Department of Agriculture, Forest Service. 1991. Pesk risk assessment of the importation of larch from Siberia and the Soviet Far East. USDA Forest Service Miscellaneous Publication 1495. Washington, D.C.

U.S. Department of Agriculture, Forest Service. 1993. Pesk risk assessment of the importation of *Pinus radiata*, *Nothofagus dombeyi*, and *Laurelia philippiana* logs from Chile. USDA Forest Service Miscellaneous Publication 1517. Washington, D.C.

Aggregation of overwintering Hylurgus ligniperda *inside pine stump.*

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Current Annual Dues Schedule

Student (through High School) $5.00
Active $15.00
Institutional $35.00
Sustaining $25.00
Life $300.00

MES Annual Meeting to Include Student Competition

Randall Cooper
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For the second consecutive year, the MES Annual Meeting will include a student paper competition complete with prizes. Meetings of a state society such as the MES are an excellent training ground for students wishing to practice and improve upon their oral presentation of entomological research. Both undergraduate and graduate students are invited to check "Student Competition Entry" on the "Call for Papers" form included in this Newsletter and submit an abstract of their paper. Presentations will be on a strict time limit of 15 minutes and will be scored by a panel of three judges. Judging will consider the quality of the written abstract, the presentation itself, and the creativity, scientific rigor, and significance of the research. An article in the March 2000 MES Newsletter provides some guidelines to preparing an oral paper. Cash prizes will be $200.00 for 1st Place, $100.00 for 2nd Place, and $50.00 for 3rd Place.

The Society wants to increase student interest in MES activities and promote excellence in student research.

Brief Biographies of Candidates for the 2001 Michigan Entomological Society Election

Ron Priest, Chair, Nominations Committee

This year there are 7 candidates for the following positions: **President-elect:** James P. Dunn and Thomas E. Wallenmaier; **Treasurer:** Mogens C. Nielsen; **Secretary**: Robert D. Kriegel; **Member-at-Large**: Martin J. Andree, John F. Douglass, and Gary Parsons.

Following are biographies for the candidates including their entomological interests, entomological accomplishments, and personal experience that would assist the candidate as a board member.

MARTIN J. ANDREE

Interests: Collecting insects, mainly noctuid Lepidoptera. **Accomplishments:** Collecting insects since 1967. **Experience:** Independent business consultant, farmer; served on the Board of the Grand Rapids Township as an elected Trustee for Fire Board and Planning Commission; President and CEO of Flowers of the Field, Inc. for 21 years; managing partner of Flowers of the Field, Inc.

JOHN F. DOUGLASS

Interests: Distribution and ecology of Michigan Sphingidae, Geometridae, and Papilionoidea; especially interested in using insects as vehicles for helping people learn about and value the natural environments of Michigan; visiting Lepidoptera specialists; travel to museums and universities; use of libraries; writing and editing scientific papers; instructing young people in techniques. **Accomplishments:** Teacher at St. John's High School, Toledo, OH; BA in biology, Harvard University; MS in zoology, University of Michigan; published 26 scientific papers on insects, reptiles, birds, mammals, and paleoindians. **Experience:** Member of the 3-year, 6-member Advisory Board of the Field Museum of Natural History, Chicago to renovate the entire zoology exhibit. This provided valuable experience in achieving consensus and compromise among people of disparate interests within the museum.

JAMES P. DUNN

Interests: Insect herbivory; forest and aquatic entomology; conservation of endangered insects. **Accomplishments:** Associate Professor of Biology at Grand Valley State University, Allendale, MI; teach general and aquatic entomology; conduct research projects with undergraduate students; received BS in Forestry, University of Michigan, MS and Ph.D. in Entomology, University of Kentucky; worked with USDA Forest Service as a research entomologist; consultant with environmental group on water quality/insect projects. **Experience:** Served on several professional committees.

ROBERT D. KRIEGEL

Interests: Distribution and phenology of Great Lakes Lepidoptera, especially Tortricidae and bog butterflies; biodiversity surveys & conservation; computer modeling; development of computer software for biological sciences. **Accomplishments** B.A. (Biology),

Northwestern University; M.S. (Entomology) Michigan State University. **Experience** M.E.S. Secretary from 1997 to present.

MOGENS C. NIELSEN

Interests Life history and distribution of Michigan Lepidoptera. **Accomplishments** Adjunct Curator of Lepidoptera at A.J. Cook Arthropod Research Collection, Michigan State University from 1973 to present; published 16 and co-authored 5 scientific papers on Lepidoptera; published the first comprehensive check list of Michigan Lepidoptera 1992-1998; authored section on insects in, "Endangered and Threatened Wildlife of Michigan", by Evers, 1994; authored, "Michigan Butterflies and Skippers, a Field Guide and Reference" 1999; contracted by several environmental survey businesses for work on endangered Lepidoptera. **Experience** M.E.S. President 1964-1965; Editorial Board Chair 1966-1967; Executive Secretary (Secretary/Treasurer) 1968-1991; Treasurer 1992- present; Lepidopterists' Society Executive Council.

GARY PARSONS

Interests: Biodiversity and natural history of insects; taxonomy & identification of beetles. **Accomplishments:** Collection Manager of the A.J. Cook Arthropod Research Collection, Michigan State University; working entomologist for 30 years; research assistant in Entomology, Oregon State University; Extension Insect Identification Specialist at OSU; lead author of annotated arthropod checklist of Andrews Long Term Ecological Research Site (Western Coniferous Forests); research on Lepidoptera biodiversity in Oregon forests; coordinated OSU "Museum Days", an outreach program of Entomology, Botany, and Wildlife displays. **Experience:** President, Vice President, Bulletin Editor, and Secretary/Treasurer of the Oregon Entomological Society.

THOMAS E. WALLENMAIER

Interests: Regulatory entomology; taxonomy of microlepidoptera, especially Gelechioidea and Tineoidae. **Accomplishments:** Retired Ph.D. from USDA, APHIS-PPQ as quarantine officer and staff specialist for insect identification, exotic pest detection and domestic survey programs at PPQ headquarters; Assistant Survey Coordinator for CAPS survey program including cooperative agreements, organizing national and regional survey meetings, and assisting in development of the national computer survey system; established the Maryland Insect Survey in 1983. **Experience:** President of Entomological Society of Washington; President (twice) of the Maryland Entomological Society; chaired committees and developed symposia for the Entomological Society of America; M.E.S. Member-at-Large 1996-1999.

An Update on The Great Lakes Entomologist

Randy Cooper, TGLE Editor
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I want to reassure the membership of the MES and institutional subscribers that The Great Lakes Entomologist is in full production. Although off schedule, the production of quarterly issues continues. In order to get back on schedule I will produce some combined issues. For Volume 33 (2000), Number 1 is "in press" and 33(2) is in the final stages before being sent to the typesetter. The last two issues of Volume 33 will be combined.

In Volume 32 (1999) of TGLE there were 31 manuscripts published. I have 21 papers slated for publication in Volume 33 and an equal number have been received for inclusion in Volume 34 (2001). Tracking and processing this many papers is a time-consuming process, and I ask authors and the readership to be patient. I greatly appreciate your interest in publishing in TGLE and I offer assurance that all submitted manuscripts are receiving equal and fair treatment.

Poetic Memories of the 2000 Annual Meeting

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E-mail: grimnes@alma.edu

One of the delights of attending an MES meeting is that they are usually located in very picturesque settings. In addition to the presentations, one often has the chance to explore unfamiliar territory. Our 2000 meeting was held at Kellogg Biological Station on Gull Lake. After the talks were completed, I took a walk along the shore. I offer these observations, both as a memory of that meeting and an incentive for members to consider attending again.

bug lover's slide show
all the little parasites
caught on the fly

summer afternoon
the wasp inspects a crevice
in the new slate wall

summer evening
the plop of a turtle
into spreading ripples

Tomicus minor Update

In the last issue of the MES Newsletter [2000. V45(3-4): 9-10], Haack et al. mentioned that a single specimen of the Eurasian pine-infesting bark beetle *Tomicus minor* had been collected in Ontario, Canada, in 2000 and identified by Bruce Gill (Centre for Plant Quarantine Pests, Ottawa, Canada, gillbd@em.agr.ca). However, in a recent e-mail message (28-II-01), Jose Galian (University of Murcia, Spain, jgalian@um.es) reported that based on DNA analysis of that actual specimen, the suspect beetle was actually *Tomicus piniperda*, not *Tomicus minor*. Therefore, there is no evidence now that *Tomicus minor* is established in North America. *RAH, Editor's note.*

The Small Hive Beetle –a New Pest of Honey Bees in the United States

Zachary Y. Huang and Huarong Lin

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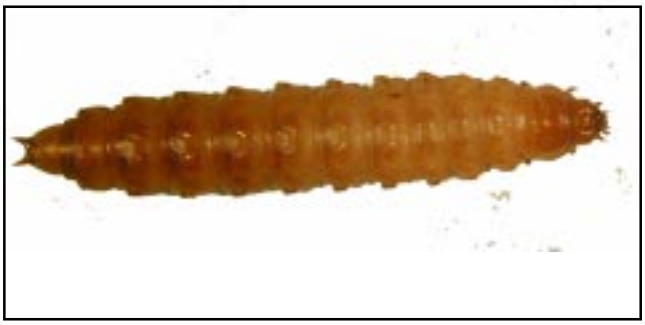
E-mail: bees@msu.edu and huarong@msu.edu

The small hive beetle, *Aethina tumida* Murray (Coleoptera: Nitidulidae), was first reported in the Western Hemisphere in Florida during May 1998. Its route of entry into the U.S. is unknown. The small hive beetle is native to sub-Saharan Africa where it is considered of minor importance. In its native range, this beetle attacks small or weak honey bee colonies or combs in storage, and thus treatment is seldom necessary. On the other hand, in the U.S., the small hive beetle has caused considerable damage to honey bee colonies, especially in Florida where beekeepers were entirely unprepared and knew little about the pest.

Classification and morphology. The small hive beetle is a member of the beetle family Nitidulidae. Most nitidulids are scavengers and are commonly referred to as sap beetles. Small hive beetle adults are about 5-7 mm long, dark brown to nearly black, and have clubbed antennae (see Figure). They move quickly and play dead when touched. Larvae are elongate whitish grubs with three pairs of legs (see Figure) and can be easily confused with wax moth (*Galleria*) larvae. Wax moth larvae have prolegs and tend to undulate as they move, while small hive beetle larvae lack prolegs and do not undulate.

Distribution. The small hive beetle is currently established in Florida, North and South Carolina, Georgia, Ohio and Massachusetts. It has also been reported in Minnesota, Wisconsin, Michigan, Tennessee, Maine, Indiana and North Dakota, but probably has not yet become established in these states. This pest may be even more widespread because in 1998, Florida beekeepers shipped about 100,000 colonies to about 20 U.S. states to meet crop pollination demands throughout the country. Many of these colonies came from southern counties known to be infested with small hive beetles.

Adult small hive beetle, Aethina tumida



Larva of the small hive beetle, Aethina tumida

Biology. Small hive beetle adults probably use olfactory cues to find honey bee hives. Adult females seek crevices or cavities inside the hive for oviposition. Eggs usually hatch in 2-3 days. The larvae feed on honey, pollen, bee brood, and wax. Larvae typically develop in 10-16 days. Mature larvae are attracted to light and must enter the soil to pupate. After 3-4 weeks the new adults emerge, disperse, and seek out bee hives. Adults can live up to 6 months and can fly up to 14 miles when searching for a colony. It has been shown that the small hive beetle can complete development (egg to adult) on rotten fruits such as cantaloupe and strawberry. In laboratory studies, the beetles have been able to complete their life cycle in bumble bee nests, but it is not clear whether they can invade bumble bee nests under natural conditions.

Damage to colonies and stored honey. Both larvae and adults of the small hive beetle feed on bee brood, pollen, wax, honey, and cause damage to brood and honey combs. The beetle larvae leave behind a slimy substance with a bad odor. When small hive beetle infestations are high, honey bees abandon the comb or colony. Infestations can build to damaging levels when honey combs are stored in the honey house for a few days to a few weeks while awaiting extraction.

Control. The most critical element in controlling the small hive beetle is early detection. Beekeepers should carefully check colonies for small hive beetles, especially the inside of the top cover and bottom board of each hive. If beetles are found and positively identified, CheckMite+ strips, also called Bayer Bee Strips (active ingredient coumaphos) can be applied to treat infested colonies. CheckMite+ strips should be cut in half, with each half stapled to a 4 by 4 inch piece of corrugated cardboard that has had the outer layer of one side removed to expose the corrugation. CheckMite+ strips should be stapled to the exposed side and the piece of cardboard placed near the center of the bottom board with the strips down. Small hive beetle adults are attracted to the cardboard, which serves as a hiding place. Beetles are then killed by contact with the CheckMite+ strip. Hives should not be treated more than four times per year to prevent development of resistance of small hive beetles to the pesticide. CheckMite+ strips work best when adults first invade a bee colony before the beetles initiate egg laying. Beetle larvae remain in the frames, thereby not contacting the cardboard trap and thus not being killed.

Treatment of the soil with insecticides would complement the use of CheckMite+ strips since larvae would be killed upon entering the soil to pupate. GardStar (40% permethrin) is registered for use against small hive beetles and is often available at stores selling cattle pesticides. A solution of GardStar (0.05% active ingredient, 5 ml per liter) should be sprayed on the soil in the area underneath each hive and at least one foot beyond the hive periphery in all directions.

Currently, most damage by the small hive beetle occurs to hives in honey houses. It is no longer a safe practice for beekeepers to

Continued on page 8

47TH ANNUAL MEETING OF THE MICHIGAN ENTOMOLOGICAL SOCIETY

Saturday, June 9, 2001

This year's 47th meeting of our society will be held in the NW corner of the Lower Peninsula in scenic Glen Arbor – close to Sleeping Bear Dunes National Lakeshore and only 32 miles from Traverse City. The meeting will be held at The Leelanau School, a private preparatory school that has educated students from all over the world. The site is located along the Crystal River, and you'll enjoy the rustic location and scenic qualities of the area. We are trying something new – a **Saturday** meeting, which should benefit members that have to travel some distance or have a difficult time getting a weekday off to attend an annual meeting. The area is full of scenic opportunities, and we hope you'll attend.

We are actively seeking papers, poster sessions, and exhibits. The annual meeting pre-registration form and call for papers and exhibits form are included as an insert of this newsletter.

This year's featured speaker will be **Ann B. Swengel** of Baraboo, Wisconsin. Ann is the vice president of the North American Butterfly Association, co-editor of the annual report of the 4th of July Butterfly Count Program, and has authored many papers on field research of Lepidoptera in a variety of journals. She has published extensively on tallgrass prairie and pine barrens Lepidoptera. We are sure you won't want to miss her presentation and the chance to speak with her on topics of mutual interest. Ann's presentation is titled "The Logic of the Species" and will be an engaging talk for all levels of expertise.

The Crystal River flows through The Leelanau School grounds. Photograph by M.O'Brien

The *desired* theme for this year's meeting is the **Biodiversity of the Great Lakes Region** and especially, the impact that man has had on native species or the introduction of new species to the ecosystem. This could include the impact of non-native species on our economy, the task of regulatory agencies to monitor and reduce the dangers of incoming pests, and of course, the current research underway to combat non-native insects in the Great Lakes. Of course, presentations dealing with the documentation of native species and biodiversity surveys in the region and their status would be most welcome, as are any other aspects of entomological research. We are also featuring the opportunity for students to present talks as part of the Student Competition. As with last year, there will be prizes for the top three presentations. Please refer to the registration insert and page 3 for more information.

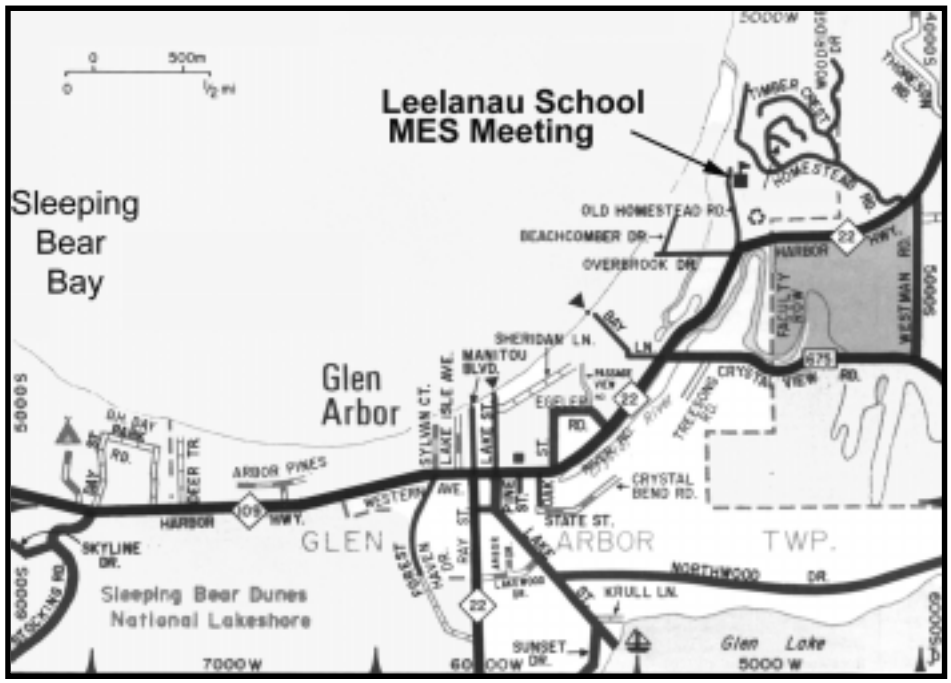
To build on last year's successful 2000 photosalon, once again, all MES members and their families are invited to submit their best photographs of insects and related arthropods. The contest is designed to recognize the best efforts of photographers to document both the biological and aesthetic aspects of insect life. William Westrate is coordinating the photosalon and an application form is included as an insert of this newsletter. Judging will take place Friday prior to the meeting and members attending the meeting on Saturday will view the winning photographs. This is your opportunity to see your best shots displayed on a future color page of the newsletter and on the cover of The Great Lakes Entomologist!

Of course, we are allowing time to visit with colleagues and socialize with our fellow members. Early arrivals can lodge Friday night at the Leelanau School, as we have a dormitory reserved for us. Meals will be served on the campus (7:30-8:30 a.m., 12:00-1:00 p.m., 5:30-6:30 p.m.). This will allow time to catch up on conversation and meet with the speakers. Do plan to arrive Friday evening and join in the fun!

Field activities are planned on Saturday evening and Sunday, June 10. Therefore, lodging will be available for Saturday night, too. Members are invited to visit and collect in the varied habitats of the Leelanau Peninsula. On Sunday, June 10 we will have a field trip sponsored by the Michigan Odonata Survey to several sites in the area. Consider making this a two-night stay. You'll enjoy what the area has to offer, from great restaurants, art galleries and boutiques to the scenic Sleeping Bear Dunes and other natural areas.

Costs for meals and lodging at The Leelanau School are located on the pre-registration form. The fees are very reasonable, especially given the tourism factor for the Leelanau Peninsula. If you plan on staying at the Leelanau School you are encouraged to submit your pre-registration form as soon as possible. For more information on the area, go to http://www.leelanau.com/online/. There are many campgrounds and other types of lodging available in the area, ranging from bed and breakfast establishments to hotels. You are also encouraged to go to http://www.mapquest.com for travel directions to Glen Arbor from wherever you are departing.

To drive to the Leelanau School (1 Old Homestead Road) from Traverse City, take US31 to SR72 (west) for about 22 miles to SR22. Go N on SR22 for 8.1 miles to Glen Arbor. Old Homestead Road is about 1 mile N of Glen Arbor on SR22 (see map). The distance from Lansing is about 220 miles, and 212 from Ann Arbor.



Please contact Mark O'Brien if you have questions about the meeting: Mark O'Brien, Museum of Zoology, University of Michigan, Ann Arbor, MI 48109-1079. Phone: 734-647-2199; Fax: 734-763-4080, E-mail: mfobrien@umich.edu

Registration form and Call for Papers and Poster Presentations are found on pages 9-10. Tear out or photocopy.

2001 PHOTOSALON COMPETITION

Members of the Michigan Entomological Society and their families are invited to submit their best photographs for the MES 2001 photosalon competition. Winning photographs will be displayed on a color page of the MES newsletter and as cover photos for The Great Lakes Entomologist.. Up to 4 photographic slides of insects and related arthropods can be entered in the contest. Remember that print negatives can be converted into excellent slides. Single winning photos will be selected in each of the following two categories and 1st, 2nd, and 3rd place winning photos will be awarded the judges choice from all combined entries.

Category I - Life History and Behavior: photographs that exhibit some aspect of insect life with entries judged based on technical difficulty, rarity, and entomological content as well as overall aesthetic qualities.

Category II - Insect Portraits: photographs that depict insects in a static or active state with entries judged on overall aesthetic qualities, technical difficulty, and rarity within the insect or arthropod group.

Deadline for submissions is May 17th. Entries will be judged on Friday June 8th, prior to the MES annual meeting at The Leelanau School in Glen Arbor. Winning slides will be viewed during the annual meeting on Saturday June 9th. You do not need to attend the MES annual meeting to enter the competition.

PHOTOSALON SUBMISSIONS

Entries are limited to 4 slides per individual submitted in one package postmarked no later than May 17th and a completed copy of the entry form (see reverse of this page) must accompany the submission to qualify for judging. Include a SASE with the mailing for the return of slides. Information on the form must include the insect subject's order and family and if known, genus and species (scientific and /or common names acceptable). The Life History and Behavior Category entries must include the briefest of descriptions of activity depicted. Although all care will be taken to ensure proper handling, MES and the individuals involved in the contest cannot be held responsible for the loss or damage of any entry. Winners will be notified when entries are returned no later than July 1st.

Entry form on page 11. Tear out or photocopy.

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store honey supers in honey houses for a month before extracting the honey if colonies are infested with small hive beetles. Honey should be extracted promptly (within 2-3 days), honey houses should be kept clean, and extracted supers should be fumigated prior to storage or putting them back into colonies.

Outlook for Michigan. Small hive beetles were first discovered in Michigan in 1999. In a survey conducted during summer 2000, 3 infested colonies were found in southwest Michigan. It is difficult to say when the small hive beetle will become established in the state of Michigan. Once established, constant treatment will be required for this pest, thus increasing the cost of honey production and pollination. Because the small hive beetle is able to overwinter in Minnesota, it is clear that it will survive winter in Michigan as well, especially inside beehives. The beetles would not survive Michigan winters in unheated honey houses or outside a beehive. To reduce the chances of establishment, beekeepers who bring in bees from outside of Michigan should take special precautions and always treat the soil before placing hives. Spread of the small hive beetle should be slower in Michigan than in Florida due to Michigan's colder weather and lack of decaying fruits and vegetables year-round, which may serve as an alternate breeding site for the beetles.

The bottom line is that Michigan beekeepers have one more pest to deal with that is here to stay. All beekeepers must pay special attention to this new pest and hope that it does not soon become established in Michigan.

Gypsy Moth in Michigan: An Update

Roger Mech,[1] Robert Heyd,[2] and Frank Sapio[3]
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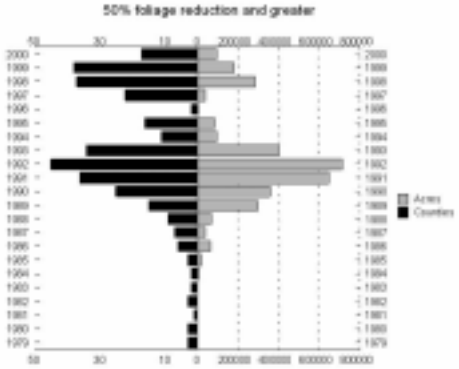
Once the bane of Michigan residents, tourists and forest health specialists alike, the gypsy moth (*Lymantria dispar*) has maintained a relatively low profile in Michigan in recent summers. Accidentally introduced from Europe into Massachusetts in the late 1800s, this hardwood defoliator found its way into Michigan in the 1950s and was setting defoliation records as recently as 10 years ago. Since then, gypsy moth population levels have begun to cycle across the state.

Gypsy moth defoliation history



As the figures show, the number of acres defoliated by gypsy moth has, on average, been declining since 1993. While populations temporarily rebounded in 1998, much of the defoliation was concentrated in the oak forests of Michigan's southwestern Lower Peninsula. Prior to this time, these areas were not known to harbor large gypsy moth populations. The years 1997 –2000 marked the initial outbreak phase in these southwestern forests, a phenomenon typically marked by 2-3 years of heavy, widespread defoliation followed by a uniform collapse of the gypsy moth population. Assuming trends similar to other parts of Michigan's Lower Peninsula, future gypsy moth outbreaks in southwestern Michigan should be smaller in size, shorter in duration, and collapse more quickly.

A decline in county participation in the Michigan Cooperative Gypsy Moth Suppression Program also reflects this trend. In 2000, 19 counties participated in the program, aerially spraying 79,000 acres with the biological insecticide *B.t.* In 2001, only 8 counties will take part, with plans to treat about 6,500 acres.

Gypsy Moth Defoliation in Lower Michigan 1992

Gypsy Moth Defoliation in Lower Michigan 2000

Continued on page 13

NOTICES

Checklist of Wisconsin Moths. Written by Leslie Ferge and George Balogh, 2000, Milwaukee Public Museum Contributions in Biology and Geology. No. 93. Price $6.00 plus $3.00 for mailing and handling ($4 if foreign). Write: Museum Shop, Milwaukee Public Museum, 800 West Wells Street, Milwaukee, WI 53233. (WI residents, 5% sales tax.)

Great Lakes Odonata meeting. Tuesday, July 3 to Friday, July 6 at Laurentian Lodge, Ontario. Contact: Colin Jones, Natural Heritage Information Centre, Ministry of Natural Resources, 300 Water St., 2nd Floor, North Tower, P.O. Box 7000, Peterborough, ON, K9J 8M5, Tel: (705) 755-2166, E-mail: colin.jones@mnr.gov.on.ca

Lepidotpera Reprints Available: Moths of Douglas Lake Region, Michigan (4 papers), Great Lakes Entomologist 1970 (Sphingidae-Arctiidae), 1981 (Noctuidae), 1983 (Misc.), 1991 (Geometridae), Journal of the Lepidopterists Society 1956 (*Pieris virginiana* and *Erora laeta*), Annals of the Entomological Scoiety of America 1952 (Hesperiidae). contact: E.G. Voss, Univ. of Michigan Herbarium, North Univ. Bldg., Ann Arbor 48109-1057. E-mail: egvoss@umich.edu.

Meeting and Lodging Pre-Registration Form
Michigan Entomological Society

47th Annual Meeting

The Leelanau School, Glen Arbor, Michigan

Friday, June 8 to Sunday June 10, 2001

Pre-registration deadline is 17 May 2001

Name _____

Guest Name(s) _____

Address _____

City _____ State/Prov. _____ Zip _____ Email _____

Phone: Day _____ Eve _____ Fax _____

Date and Estimated Time of Arrival _____

Accomodations: Single (Sgl) ($64/night) or double (Dbl) ($52/night per person) dormitory rooms; linens and bedding will be provided. If you wish to designate a roomate for a double room, please indicate on the line below:

My roomate preference is: _____ No Preference _____

Rates include dinner (served 5:30 - 6:30 p.m.) on Friday, breakfast, lunch and dinner on Saturday, and breakfast on Sunday. Meals are served cafeteria style in the dining hall beginning with dinner on Friday June 8, through breakfast, Sunday, June 10.

Please indicate which night(s) you'll be staying

LODGING/MEALS (pick one)	PRICE	X # of people	SUBTOTAL
Arrive Friday PM, Leave Saturday PM	52.00 (Dbl) 64.00 (Sgl)		
Arrive Sat AM, leave Sunday AM	52.00 (Dbl) 64.00 (Sgl)		
Arrive Friday, leave Sunday AM (2 nights)	104.00 (Dbl) 128.00 (Sgl)		
Arrive Saturday, meals only, no lodging	18.00		
Annual Meeting Registration Fee	20.00		20.00
	TOTAL ENCLOSED:		

Visitors must abide by Leelanau's policy of no smoking or drinking alcoholic beverages on campus.

Note: Make checks payable to: **Michigan Entomological Society**.

Return by 17 May to:

Mark F. O'Brien, Museum of Zoology, University of Michigan, Ann Arbor, MI 49109-1079
Phone: 734-647-2199, fax 734-763-4080; email: mfobrien@umich.edu

[*Retain a copy for your records*]

Call for Papers and Poster & Display Pre-Registration Form

Michigan Entomological Society

Forty-seventh Annual Meeting

The Leelanau School, Glen Arbor, Michigan

Saturday, June 9, 2001

Please submit an abstract of your paper by 1 July 2001 to MES Newsletter editor Bob Haack on disk or by e-mail (haack@pilot.msu.edu). Papers may be submitted to the Editor of *The Great Lakes Entomologist* or to the Editor of the Newsletter to be considered for publication. *Talks greater than 15 minutes in length by special arrangement only.*

Presentation: _____ PAPER (15 min talk) _____ POSTER _____ DISPLAY

Title: _____

_____

Author(s): _____

_____

Affiliation: _____

_____

___STUDENT COMPETITION ENTRY* ___STUDENT ___FACULTY ___OTHER

Equipment required: _____ 35mm slide projector _____ Overhead projector

Other _____

Poster and Display Parameters:

Size: _____ X _____

Support: ____ Free Standing _____ Need Support (Specify_____)

Electricity needed: ____Yes ____ No

Other needs: _____

Contact person: _____

Name _____

Address _____

_____

Phone _____ Fax _____ E mail _____

**Student Competition* - open to any undergraduate or graduate student. Entries for the Student Competition must include an abstract (no more than 1/2 page) submitted with this form, as well as a signed statement of student's status submitted by his/her academic advisor.

Return by 11 May to: Mark F. O'Brien, Museum of Zoology, University of Michigan, Ann Arbor, MI 49109-1079

Phone: 734-647-2199, fax 734-763-4080; e-mail: mfobrien@umich.edu

PHOTO SALON SUBMISSION FORM

Photographer'sAddress _____

CityState/Prov. _____ Zip _____ Email _____

Phone: Day _____ Eve _____ Fax _____

Institutional Affiliation _____

EACH SLIDE must be labeled with the following information that corresponds to the submission numbers listed below:

- Submission number
- Photographer's name
- Address
- Phone number
- Category I: Life history and behaviors
- Category II: Insect portraits

Submission 1 Entry Category (check one): I _____ II _____

Title and Subjects _____

Description and Comments _____

_____

Equipment and film _____

Award (for judges use) _____

Submission 2 Entry Category (check one): I _____ II _____

Title and Subjects _____

Description and Comments _____

_____

Equipment and film _____

Award (for judges use) _____

Submission 3 Entry Category (check one): I _____ II _____

Title and Subjects _____

Description and Comments _____

_____

Equipment and film _____

Award (for judges use) _____

Submission 4 Entry Category (check one): I _____ II _____

Title and Subjects _____

Description and Comments _____

_____

Equipment and film _____

Award (for judges use) _____

Submit entries (postmarked no later than **17 May**) and questions to:

William P. Westrate
21406 McKenzie Street
Cassopolis, Michigan 49031
Phone: 616-782-3280

Continued from page 8

What is responsible for this downward spiral in gypsy moth populations? Certainly viral and fungal epizootics (disease outbreaks) are playing an important role. The nucleopolyhedrosis virus (NPV) is a pathogen that occurs naturally in nearly all gypsy moth populations. Caterpillars are infected with NPV when they feed on leaves contaminated with the virus. NPV invades through the gut wall, disintegrating internal organs and killing the insects within 10-14 days. NPV is historically a density-dependent mortality factor in gypsy moth populations, usually associated with high populations that are suffering from competition-induced stresses.

In addition to NPV, the entomopathogenic fungus called *Entomophaga maimaiga* has shown promise as an effective tool in the fight against gypsy moth. The fungus was first introduced to the U.S. East Coast from Japan at the turn of the century, but this introduction did not appear to be successful. The fungus reappeared unexpectedly in 1989 and caused heavy larval mortality in gypsy moth populations in Massachusetts, New York, Connecticut and other northeastern U.S. states. *Entomophaga* was introduced into Michigan in 1991. *Entomophaga maimaiga* can be effective in both high- and low-density gypsy moth populations, but its effectiveness depends on spring weather conditions. Spores of the fungus overwinter in the soil. If adequate moisture and cool temperatures occur in spring, these spores germinate and infect young gypsy moth larvae as they move across the soil.

To-date, the effect of the fungus on gypsy moth populations in Michigan has been inconsistent. In some areas, good rainfall in spring has resulted in heavy mortality of late stage larvae. In other areas, however, weather conditions have been unsuitable for the fungal resting spores and little mortality has occurred. The NPV pathogen, on the other hand, continues to be an effective natural control in high-density gypsy moth populations. This pathogen may also be causing more larval mortality than expected in relatively low-level populations. Research to assess the impact and interactions of the fungus and NPV pathogens in Michigan is underway at Michigan State University, in cooperation with the U.S. Forest Service, Cornell University, USDA APHIS, the University of Minnesota, and the Michigan Departments of Agriculture and Natural Resources. The scientists are also comparing climatic conditions and weather patterns in Michigan, the north central region, and across eastern North America, to evaluate the potential likelihood that *E. maimaiga* will spread and help control gypsy moth as this pest expands into new areas.

Researchers at Michigan State University and the U.S. Forest Service are also investigating overwintering mortality of gypsy moth eggs. Data suggest that cold winter temperatures may not play as important a role in gypsy moth egg mortality as previously thought. Instead, heat and desiccation caused by solar radiation in autumn may be the principal mortality agent, especially for eggs laid on tree trunks and other vertical surfaces exposed to southern or western aspects. This finding may help explain why gypsy moth females commonly place their egg masses beneath branches and in other shaded areas.

New Affiliation for Michigan Natural Features Inventory

Mary L. Rabe
Zoology Program Leader, Michigan Natural Features Inventory, Michigan State University Extension, Stevens T. Mason Bldg., P.O. Box 30444, Lansing, MI 48909-7944
E-mail: rabem@state.mi.us

Michigan Natural Features Inventory (MNFI), designed to collect and distribute information regarding Michigan's vulnerable natural features, has just completed it 20th year. Formerly a partnership program between the Michigan Department of Natural Resources (MDNR) and The Nature Conservancy, it has recently evolved to a partnership program between MDNR and Michigan State University Extension (MSUE).

The merger presents some exciting opportunities for both programs. MNFI brings a dedicated staff responsible for the inventory of nearly 700 species of endangered or threatened plants and animals and numerous natural communities. Combined with MSUE's focus on outreach, MNFI is hoping to make their comprehensive database more readily available for the public and critical land use decisions.

The merger is expected to provide MSUE an opportunity to expand its relationship with MNFI affiliates including Michigan's Department of Natural Resources and Department of Environmental Quality. The cooperation also presents MSU students with volunteer and internship opportunities as well as professional guidance and mentoring.

MNFI is still comfortably sharing space with the MDNR in downtown Lansing, where the program has been housed since its inception. MNFI director Judy Soule is working to bridge the physical gap between our two partners by rotating between offices at both programs. Future proposed plans include office space at MSU for MNFI scientists within their department of study.

MNFI resigned their former affiliation with The Nature Conservancy and became MSU employees on 1 July 2000. The Nature Conservancy's Michigan Chapter pledged a $300,000 endowment for MNFI to facilitate their transition to the MSUE.

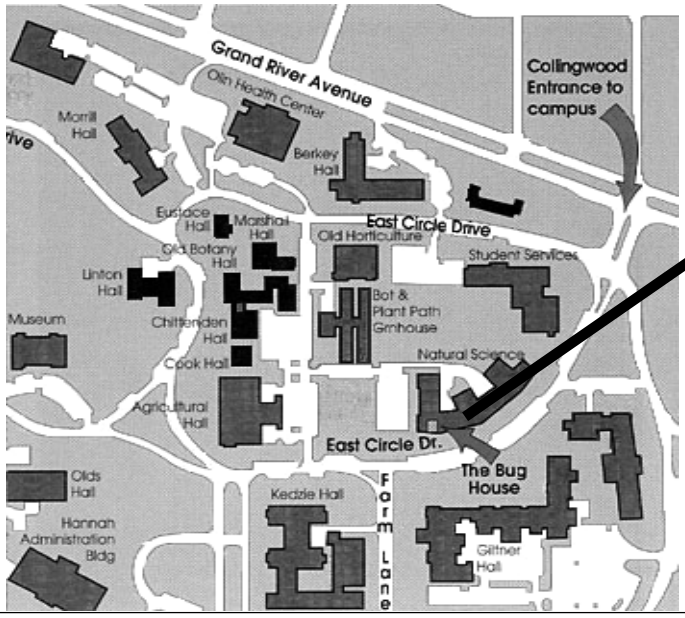
Errata

We would like to correct a few errors that appeared in the last issue of the MES Newsletter [2000. V45(3-4)]. On page 4, in the story "MES Newsletters of Old," it was Kurt Bohnsack who spoke on soil fauna of the George Reserve, not "Bottnsack." Also, after a more detailed analysis of the quarantine history of *Tomicus piniperda* in North America (p. 9), we now realize that the number of *T. piniperda*-infested counties in the U.S. was 148 at the close of 1995 (not 147), 224 in 1997 (not 220), and 243 in 1998 (not 238). Also, it was implied that *T. piniperda* was first found in Quebec in 1999 (p. 10). Actually, *T. piniperda* was first collected in Quebec in 1998 (at 2 locations in one county: Le-Haut-Saint-Francois County), but no Quebec county was quarantined for *T. piniperda* until 1999. *RAH & TMP, Editors' note.*

Breaking Diapause
10 March 2001

Come and meet with other fellow entomologists and insect enthusiasts!
Bring along insects to identify.
Refreshments will be provided.
Tour the Michigan State University Insect Collection and the Bug House.

For more information, contact Mo Nielsen by phone at 517-355-7294 or by e-mail at nielsen4@pilot.msu.edu



Where?

When?

Saturday, 10 March 2001
9 AM until mid-afternoon
Room 244
Natural Science Building
East Circle Drive, MSU
(above the Bug House)

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