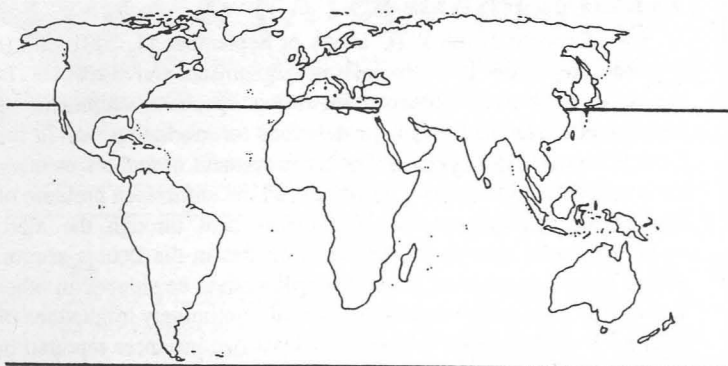




# LEPIDOPTERA NEWS

December 2001

No. 4

## MONARCH WATCH 2001

SCIENTISTS AT NEW YORK'S ANNUAL "MONARCH WATCH" EMPHASIZE  
DEFORESTATION AND Bt-CORN DANGERS

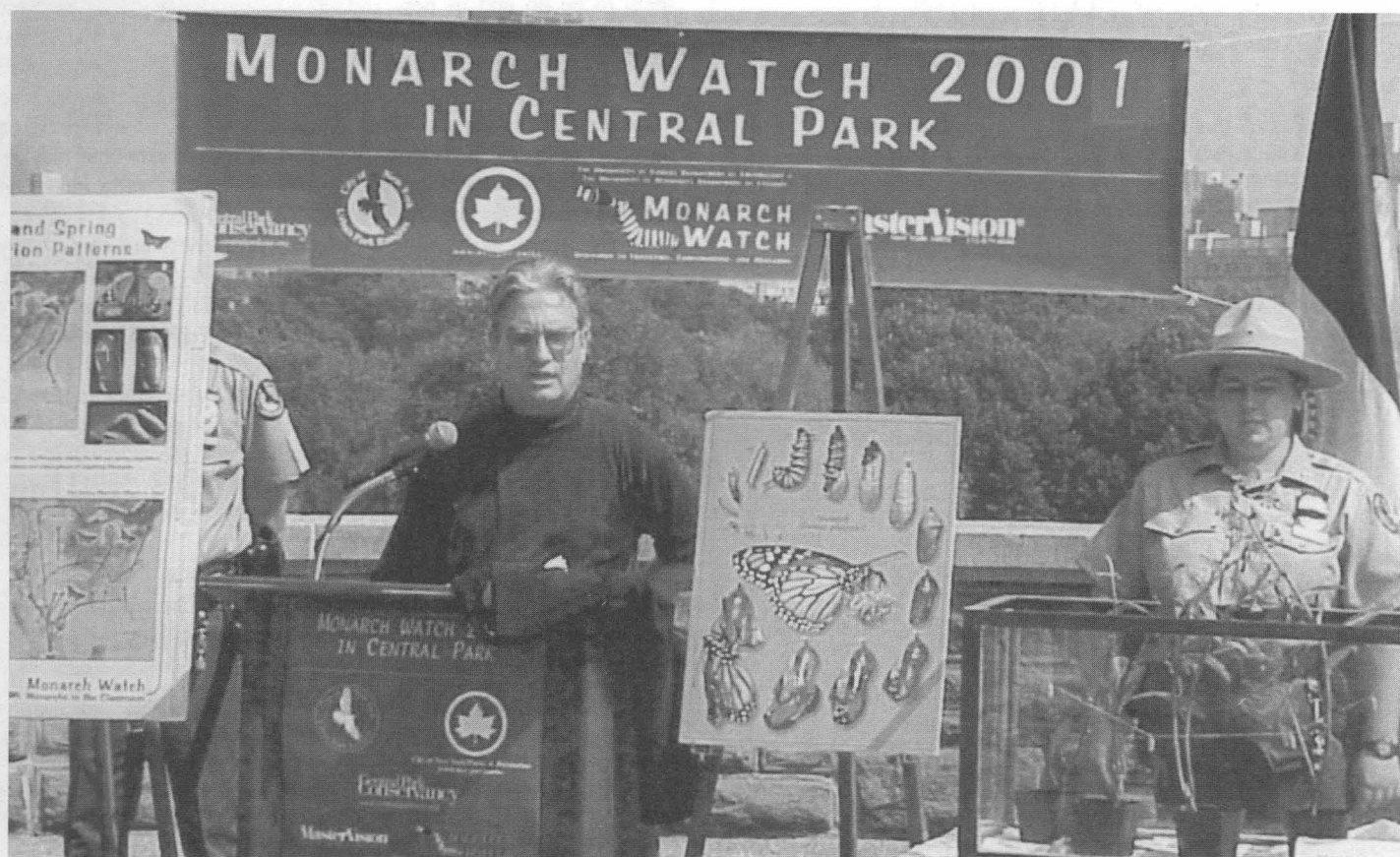


Fig. 1. Dr. Kurt Johnson reviewing reports by the World Wildlife Fund and Dr. Lincoln P. Brower, at Monarch Watch 2001 in New York City. (© D. Allen)

Despite the World Trade Center tragedy of September 11, New York City's annual "Monarch Watch" event commenced in Central Park on September 22, with several hundred spectators and numerous representatives of world conservation groups in attendance (see *Lepid. News*, September 2000, for notes on the Monarch Watch program from last year).

Keynote scientific data at the event was provided by the World Wildlife Fund, whose Mexican components manage the new conservation strategy on the ground in Mexico (WWFM), and Dr. Lincoln P. Brower, Monarch expert and chief advisor to WWF.

WWFM and Mexico's Fondo Mexicana para la Conservación de la Naturaleza have helped the Mexican government design an inno-

ovative conservation scheme to protect and restore the unique high-altitude fir forest ecosystem providing critical winter habitat for the Monarch butterfly (*Danaus plexippus* (Linnaeus)). This new conservation scheme includes an innovative new trust fund (the new "Monarch Butterfly Conservation Fund" ["Fideicomiso Monarca" in Spanish]) designed to involve the local populace in the conservation effort. Elements of the plan were outlined in the September 2000 issue of *Lepidoptera News*; legal work on the entity (which will allow the receiving of public donations) is just about completed.

As noted there, an attempt to protect the overwintering grounds was first made in 1986, when a Presidential Decree created the Monarch Butterfly Special Biosphere Reserve which [cont. on p. 6]

# LEPIDOPTERA NEWS

Editor: J. B. Heppner  
Assoc. Editor: Thomas C. Emmel

Published by the  
Association for Tropical Lepidoptera, Inc.  
P. O. Box 141210

Gainesville, FL 32614-1210, USA

Tel: (352) 392-5894 FAX: (352) 392-0479 www.troplep.org  
Frequency: Quarterly (March, June, September, December)  
e-mail: jbhatl@aol.com ISSN: 1062-6581

The Association for Tropical Lepidoptera, Inc., is a non-profit corporation for the study and conservation of tropical and subtropical Lepidoptera of the world. Contributions are tax-deductible. Advertising is accepted.

## ASSOCIATION FOR TROPICAL LEPIDOPTERA

### BOARD OF DIRECTORS

|                              |                            |
|------------------------------|----------------------------|
| Vitor O. Becker (Brazil)     | Gerardo Lamas (Peru)       |
| Don R. Davis (USA)           | Olaf H. H. Mielke (Brazil) |
| Boyce A. Drummond, III (USA) | Eugene G. Munroe (Canada)  |
| Peter J. Eliazar (USA)       | Jon D. Turner (USA)        |
| Thomas C. Emmel (USA)        |                            |

Chairman and Executive Director: J. B. Heppner

### ADVISORY COUNCIL

|                                |                               |
|--------------------------------|-------------------------------|
| Andrés O. Angulo (Chile)       | Jean-Francois Landry (Canada) |
| Yutaka Arita (Japan)           | Torben B. Larsen (England)    |
| George T. Austin (USA)         | Claude Lemaire (France)       |
| Manuel A. Balcázar L. (Mexico) | Jorge Llorente B. (Mexico)    |
| Henry S. Barlow (Malaysia)     | Martin Lödl (Austria)         |
| Dubi Benyamini (Israel)        | Wolfram Mey (Germany)         |
| Ronald Boender (USA)           | Kauri Mikkola (Finland)       |
| Keith S. Brown Jr. (Brazil)    | Scott E. Miller (USA)         |
| José A. Clavijo A. (Venezuela) | Joël Minet (France)           |
| Charles V. Covell Jr. (USA)    | W. M. Neukirchen (Germany)    |
| U. Dall'Asta (Belgium)         | K. T. Park (South Korea)      |
| Philip J. DeVries (USA)        | Rod E. Parrott (Canada)       |
| Edward W. Diehl (Indonesia)    | Amnuay Pinratana (Thailand)   |
| Julian P. Donahue (USA)        | Dalibor Povolný (Czech Rep.)  |
| Ulf Eitschberger (Germany)     | Jozef Razowski (Poland)       |
| Eric Garraway (Jamaica)        | M. Alma Solis (USA)           |
| Dale H. Habeck (USA)           | Dieter Stünig (Germany)       |
| Christoph Häuser (Germany)     | Gerhard Tarmann (Austria)     |
| Lowell N. Harris (USA)         | Paul Thiaucourt (France)      |
| Hiroshi Inoue (Japan)          | Jürgen H. R. Thiele (Germany) |
| Daniel H. Janzen (USA)         | Antonio Vives M. (Spain)      |
| Kurt Johnson (USA)             | András Vojnits (Hungary)      |
| R. L. Kitching (Australia)     | Hsiau-Yue Wang (Taiwan)       |
| George O. Krizek (USA)         | Per O. Wickman (Sweden)       |
| Tosio Kumata (Japan)           | Allen M. Young (USA)          |

**JOURNALS:** separates (1990-95 only), \$1 first page, 25¢ each added page (specify author and citation). Past journal issues: \$22.50 each (1990-2001) (1994 *HL* double issue: \$45). *Lepid. News*: \$10 per year.

**CONTENTS** for the journals are issued every two years.

**NEW MEMBERS:** the ATL journals are \$65 the first year for new members, the same as ATL members who pay before Dec. 31 each year. New members may join ATL anytime but membership begins in January (either the year of joining or for the next year).

## TO OUR READERS

The aftermath of the WTC attack of September 11, 2001, still is reverberating in the USA, not just in Afghanistan and elsewhere. In this issue a serious advisory involving specimen shipments is highlighted. It seems the new postal plans for irradiating mail in the United States, to help prevent further movement of anthrax or other toxic substances in the mail, has produced the unforeseen problem of damage to various materials commonly sent through the mail, including insect specimens. The note on this in the Letters section herein notes a number of items that will have to be shipped in other ways if mail becomes routinely irradiated. Preliminary irradiations of mail have even resulted in fires in at least two instances reported in the news media. Even such common items as books will no longer be safe in the U.S. mail, since irradiation will damage paper and other cellulose products, thus making books deteriorate faster after irradiation. Likewise, insect labels would be affected and to some extent specimens themselves; and what the results would be for specimens as the insect pins became heated from irradiation is not clear. Obviously, no living material could be sent in the mail. There seem to be no end of new and unforeseen changes with the new millenium, and more that have an impact on biodiversity studies that include Lepidoptera. What remains uncertain is what would happen to all critical shipments should the express delivery services also irradiate their shipments. What is clear, however, is that specimen transport will cost a great deal more than it does now and may be entirely eliminated for museum specimens, thus greatly hindering specimen-based research.

In this issue, we also have an essay on the Bt-corn controversy as this involves the well-known monarch butterfly of North America, kindly allowed to be reprinted by the author and the Orion Society and their *Orion* magazine. A bibliography on pertinent Bt-corn articles has been added herein.

We have the annual literature review, this year for Lepidoptera papers and books from 2000. The numbers of papers keep rising almost every year as all papers of more biosystematic interest to lepidopterists are included.

To all members — best wishes for the New Year!

J. B. HEPPNER  
Executive Director

## NOTES

- 2002 Annual Meeting:** April 5-7 in Gainesville.
- 2002 Annual Photo Contest:** deadline is March 15, 2002. Note that the prize awards include a Grand Prize winner (award may be cash or a book). Interested persons should request an entry form for contest submissions.
- Cover Photos:** members can note that color photos for journal covers are always sought. ATL does not pay photo fees. Photos should be exceptionally sharp and in our page proportion.
- ATL Debentures:** a number of ATL members have already taken advantage of our interest rates and invested in ATL debentures. Please let us know what you can do to help! Returns of principal (at end of period) and interest (paid annually) are guaranteed.
- ATL Home Page:** see it at <http://www.troplep.org>. Coming soon (hopefully): color photo files of worldwide butterflies and moths!
- ATL Photo Archives:** Do not forget to consider ATL as the ultimate depository for your valued color slides of moths and butterflies and larvae. Do not let your investment of time and effort go to relatives who may not appreciate photographs of Lepidoptera; donate them to the ATL Photo Archives. You are also welcome to send listings of your holdings to add to the ATL Photofile database.
- Life memberships:** ATL life membership is a one-time payment of \$2,000 (or \$400 per year for 5 years).



# LETTERS

## MAIL IRRADIATION PRESENTS NEW PROBLEMS FOR MUSEUMS

The mailings of anthrax-laden letters in the United States during October 2001, resulted in adoption of various measures designed to safeguard the mail system. One expected proposal is irradiation of future mail shipments throughout the United States. More immediately, in the Washington, D.C. area, most mail to Federal agencies from mid-October to mid-November was held at mail sorting centers for examination and/or irradiation. This has presented new problems for museum materials sent through the mail, like to the Smithsonian Institution.

On 28 November 2001, Sally Shelton, of the Smithsonian Institution, sent a memo to Smithsonian staff about the mail problems, and the notes therein have been circulated to various persons interested in the repercussions this presents to specimen shipments. Excerpts are noted below. Also, the United States Postal Service (USPS) sent the following memo to government agencies on 19 November:

Dear Government Mail Customer:

On Monday, November 19, the Washington, DC post office begins delivering federal government mail that has been irradiated at a Lima, Ohio facility.

The irradiation process is safe, but can affect certain products sent through the mail. Although it is unlikely that the treated mail now being delivered contains any of the following products, if received, they should be discarded and replacements obtained:

- Any biological sample, blood, fecal, etc., could be rendered useless
- Diagnostic kits, such as those used to monitor blood sugar levels, could be adversely affected
- Photographic film will be fully exposed
- Food will be adversely affected
- Drugs and medicines could have efficacy and safety affected
- Eyeglasses and contact lenses could be adversely affected
- Electronic devices would likely be rendered inoperable

While the first pieces of irradiated mail being delivered are First-Class Letters, over time, departments and agencies will also be receiving flats (larger envelopes) and packages. It is more likely that the items listed above would be contained in flats or packages. Mail that has been irradiated includes First-Class letters postmarked since October 12 and addressed to Washington, DC government customers with ZIP Codes beginning with 202-205.

The irradiation process used at the Lima facility was tested and found to be effective by an interagency team of scientific experts that recommended release of the mail for delivery. The group was organized by the White House Office of Science and Technology Policy and included the Armed Forces Radiobiology Research Institute, the Food and Drug Administration, the Department of Agriculture and the National Institute of Standards and Technology.

Sincerely,  
original signed by: Thomas G. Day  
Vice President, Engineering  
United States Postal Service

Specimen packages were held for several weeks, causing concern about possible damage from museum pests. The Smithsonian memo then goes on to note irradiation problems by summarizing irradiation issues prepared by the Smithsonian Center for Materials Research and Education (SCMRE) (a full copy can be obtained online at the website: [http://www.si.edu/scmre/mail\\_irradiation.html](http://www.si.edu/scmre/mail_irradiation.html)).

In brief, SCMRE identifies the following risks posed by irradiation of organic and inorganic materials at the dosages suggested by the USPS:

- Living specimens (including seeds and gametes) will be killed.
- Cellulosic materials will be seriously affected, with the risk of embrittlement, discoloration and oxidation. This affects paper (including labels) and other plant-based materials as well as botanical specimens.
- Proteinaceous materials may be affected in similar ways, though perhaps not to the same extent. This affects anything made from or containing skin,

chitin, feathers, hair or fur, or comparable products.

DNA is particularly at risk. Materials sent out for genetic analysis will be severely compromised, with the risk of both recombination and outright destruction.

Discoloration and fading will occur in a wide range of materials, from textiles to specimens to photographs.

Glass and mineral specimens may also be discolored.

Containers themselves may be adversely affected. Rubber and plastic seals and stoppers may become embrittled.

Magnetic media will probably lose significant information content, and undeveloped photographic film will be exposed.

Some heating of materials may result, which can cause problems with preservative solutions and with adhesives.

Mitigation through shielding in the mail enclosure itself is not practical.

There is no apparent risk to the recipient from residual radiation, however. The principal risks are to the integrity and stability of the materials being shipped and irradiated. The units being purchased by the USPS for irradiation of mail are linear electron accelerators, used industrially for sterilization of food. USPS has a short statement at: <http://www.kodak.com/US/en/corp/aboutKodak/sanitize.shtml>. The first of these units will be installed in the DC area, most likely at Brentwood, as early as next month. We are certain that all incoming mail will be irradiated, but are not sure if outgoing mail will also be treated. At the moment, the plan is to irradiate flat mail (e.g. letters), not packages. That obviously could change in response to a threat or incident. A package irradiated on two sides would receive, logically, a double dosage.

There are no provisions at this time for exempting museum-bound shipments or for marking materials that have been irradiated by the USPS. However, the Smithsonian Institution is continuing a dialogue with the U. S. Postal Service on possible alternatives. There is some discussion in the medical community about seeking ways to handle mail order medication, mailing of medical test specimens, and living and genetic materials without placing them at risk. We are requesting any and all guidelines produced for this purpose.

In light of this, our procedures for handling loans and exchanges must be reviewed. Note that this problem is currently unique to the DC area but will in all likelihood become national as the planned 8-20 irradiation units are installed at key centers nationwide. There are several approaches that should be considered:

Immediate curtailment of mail-based specimen, artifact, photographic and magnetic media shipments. We recommend that all but the most critical shipments to NMNH be limited until the scope of the irradiation protocol is better known. In addition, scientifically and culturally significant holdings should not be sent into the DC area via USPS at this time. This is especially advisable for tissue samples and other genetic-resource specimens and for magnetic and unexposed photographic material.

The Smithsonian memo then goes on to recommend the use of delivery services such as Federal Express and United Parcel Service (UPS). For text and image mailing, persons are encouraged to send such items via e-mail attachments. Visiting researchers are encouraged to make on-site visits rather than ask for specimen loans, and likewise the return to loans can be as hand-carried items. The Smithsonian is also suggesting extension of some specimen loans as a temporary solution until the entire irradiation of mail is clarified.

All these matters also pertain to overseas mail and specimen loans. Likewise, it is to be expected that other museums will follow suit and make similar recommendations for specimens, artifacts, and other sensitive items to be shipped.

Many new problems are arising as a result of mail terrorism that no one had to consider before, but it is clear from the results to be expected of irradiation of mail, that many objects and specimens would be damaged if sent as normal mail items, thus posing considerable problems for research needs of museum specimens and transfer of film and electronic media. Also, personal hand-carrying of such items is not always viable, since new scanning of passenger baggage also would affect some sensitive materials if taken on planes. Also, it has been reported that some boxes of pinned insects have not been allowed onto commercial flights in the USA, as they were seen as "dangerous projectiles" of metal.

If the delivery services also begin irradiation of packages, then almost no specimens could be safely mailed from museums to researchers, thus considerably cramping future studies. All this would bring us back a 100 years to a time when most specimens were not allowed to be sent, especially overseas, and one had to make the expensive personal visits to museums to be able to see specimens and types. We certainly have a beginning to a new century with repercussions that were not anticipated just a few months ago.

J. B. HEPNER  
Gainesville, Florida

#### POSTSCRIPT

A December 7, 2001, Associated Press report noted that some batches of mail being irradiated at a Bridgeport, NJ, post office caught fire on two days, and over 90 pounds of various kinds of mail was destroyed. The U.S. Postal Service stated: "Our engineers believe both incidents are linked to material present in the mail which cause overheating during radiation exposure." And further noted that "these two incidents are regrettable but expected." The AP report noted further that postal officials "declined to specify what materials might have overheated to cause the fires, saying that they did not want to give information to potential saboteurs."

With further such fires "expected," as the postal service states, one clearly cannot safely send specimens (or for that matter, anything unique or of value) through the mail anymore, and especially not larvae in alcohol vials.

### POSSIBLE SMITHSONIAN BUDGET CUTS CALLED 'DEVASTATING'

The following was reported in the *Washington Post* newspaper, December 6, 2001:

The Bush administration has proposed a series of cuts in the Smithsonian Institution's budget, trims that lawmakers say would "cause serious and irreparable harm" to the museum complex.

In the preliminary work on the president's budget for the fiscal year starting Oct. 1, 2002, the Office of Management and Budget has suggested three fairly dramatic changes:

"OMB wants to transfer \$35 million from Smithsonian research offices to the National Science Foundation. A congressional analysis of the plan said "OMB proposes to strip SI of its most acclaimed science research operations, while failing to provide the resources necessary to improve other science units."

"The budget office also suggested stopping the restoration of the Old Patent Office in downtown Washington for a year. The historic building houses two important Smithsonian art museums: the National Portrait Gallery and the Smithsonian American Art Museum. Both have been closed since 1999, when the renovation began, and had been scheduled to reopen no later than 2005. The cost of the renovation has escalated to \$214 million from \$60 million. The federal government has paid \$49 million for the restoration; much of the rest will come from private funds raised by the museum.

"OMB also suggested taking \$20 million from Smithsonian general funds to improve security at the museums.

Jennifer Wood, a spokesperson for the Office of Management and Budget, said the plans "are in a predecisional stage."

But Rep. Robert Matsui (D-Calif.), a member of the Smithsonian Board of Regents, said, "The proposed cuts could be devastating. What we are looking at in inflation dollars is an 8 percent cut over 2002 appropriations. That is a blow to an organization already suffering from major cash flow problems at a time when we are trying to get people back to Washington."

The Smithsonian and the OMB still have time to negotiate. The formulation of the 2003 budget doesn't officially end until the president sends his budget request to Congress in February. The museum has responded to the OMB proposals through channels in a formal appeal. "We can make no other comment at this time," said David J. Umansky, the Smithsonian director of communications.

In a letter handed to OMB director Mitchell E. Daniels Jr., a group

of 32 lawmakers acknowledged that the overall budget for 2003 would be tight because of the war on terrorism. However, they said: "Because of the already daunting funding circumstances faced by the Smithsonian, and the very unique role it plays for our nation, we strongly believe that any such treatment of the Smithsonian budget will cause serious and irreparable harm to that organization and its programs."

In reaction to the uproar over science programs at the Smithsonian this year, Congress restricted changes in its science effort. It ordered that everything be left alone until the blue-ribbon commission reviewing all science programs issued its report. That is not expected until late next year.

In the letter to Daniels, the lawmakers stressed the importance of current building projects at the Smithsonian, including a sprawling annex for the National Air and Space Museum in Virginia, the National Museum of the American Indian and the Patent Building. "Each of these three projects, and the museums they will house, have extensive support here in Congress and across the country. Furthermore, should major cuts be required to the Smithsonian, these efforts could cause expensive delays or even serious contract penalties if the projects were to be canceled altogether."

The proposal to transfer research funds affects the Smithsonian Environmental Research Center in Edgewater, Md., the Smithsonian Tropical Research Institute in Panama and the Smithsonian Astrophysical Observatory, a joint operation with Harvard University in Cambridge, Mass.

Last year, according to Smithsonian records, the three leveraged their \$35 million federal appropriation to raise \$94 million in competitive grants.

A congressional source familiar with the proposals said the OMB plan essentially cuts the Smithsonian's mission in half because its scientific research programs would be decimated. "They could go down the tubes," he said.

The Smithsonian supports its programs through both private and federal funds. The Smithsonian received \$497 million from the government in the current fiscal year.

For several months this year, the science programs at the Smithsonian have been at the center of a controversy. Lawrence Small, the Smithsonian's secretary, proposed cutting several divisions. He eventually reversed a plan to close the Conservation and Research Center in Front Royal, Va., a facility that studies endangered species. His turnaround followed protests from lawmakers, nationally known scientists and scientific organizations. The Smithsonian Center for Materials Research and Education was also spared by congressional intervention.

Small still plans to reorganize the institution's science research, which has been one of the Smithsonian Institution's missions since its founding more than 150 years ago. Some of the plans to streamline the sciences into "areas of excellence" met with vehement protest at the National Museum of Natural History.

JACQUELINE TRECOTT  
Washington Post Staff Writer  
Thursday, December 6, 2001; Page C01

### OLD NAMES?

I read with interest your letter in *Lepid. News* 2001 (2) on the potential for displacement of familiar family-group names by the discovery of obscure generic names with priority over their junior counterparts that serve as types of said family-group names. The example you gave imagined the replacement of *Nymphalis* with an older name, which . . . would force replacement of . . . Nymphalidae, etc. Your readers will be relieved to know that . . . the 1999 Code says, "When the type genus of a nominal family-group taxon is considered to be a junior synonym of the name of another nominal genus, the family-group name is not to be replaced on that account alone." . . . So the Nymphalidae can rest easy, even if *Nymphalis* [were] a junior synonym.

ANDY BROWER  
Oregon State University  
Corvallis, Oregon



## COMMENTS ON COLLECTING AND NABA

As a member of ATL, NABA and other Lep organizations I'm responding with my personal viewpoint to the recent lengthy diatribe against a purported NABA policy against collecting.

I wholeheartedly agree that collecting is not immoral. It is through collections and raising species that we become educated.

In fact, NOWHERE in the NABA organizational material is there any mention of any policy against collecting! All the chapters and butterfly counts I'm aware of over the years, do use nets for at least uncommon species, that may be released or collected for further examination. On other outings, we may request no collecting, which certainly doesn't prevent your return to collect. NABA does encourage viewing species, also usually mentioning that you will find the experience more satisfying by using close-focus binoculars. Two lepidopterist friends after being with and sharing binoculars with butterflyers, have obtained binoculars to use for butterflying.

From a different perspective, with greatly diminishing habitat, let alone all the obstacles an egg has of reaching adult stage, wouldn't it be almost foolhardy and perhaps immoral for a growing national organization of thousands to encourage ALL its members to collect, even if only resulting in immediately reducing adult quantities for others to view and enjoy?

It has been said there probably haven't been more than 200 serious and consistent collectors at any previous time in the U.S. Most young collectors get sated after awhile going on to other activities. Undoubtedly, with wider recognition of butterflying, many others will become interested in leps and hopefully more interested in study which includes collecting plus a general awareness of the worth of financing more research and collections positions. Butterflyers can undoubtedly add considerable information, as have the multitude of birders about distribution, life cycles, habitat, etc., just by having more people being aware, in the field, sharing their sightings and experiences, which is already happening in south Texas.

On the other hand, collectors aren't necessarily altruistic, often not sharing localities for fear of other collectors cleaning out the adults. Particularly troubling is hearing a collector talking about going back to a site time and again to collect "all" of a particular species, especially when it may be a rarely documented species, only found every few years.

With all due respect, please try to separate NABA and our President Jeffrey Glassberg to some extent. Glassberg, as mentioned, is "... a man of great vision for the development of presenting butterflies as a new nature sport. ..." I feel he is to be highly commended for his extensive time, effort and financial support toward raising awareness of butterflies as part of the great need for conserving habitat plus working toward that end, such as helping in establishing a NABA Butterfly Park in south Texas.

Dr. Glassberg, as most individuals at least middle-age, does have some very strong opinions. These are not necessarily those of the organization. Two that come to mind are his adamant opposition to release of butterflies and assigning his own common names to some south of the border species already known otherwise in literature. Because NABA is "his" organization, as President, Editor of the quarterly magazine, financial backer, etc., and has personal public viewpoints, these views will likely be promulgated until we become larger, stronger, and a more diverse organization with others also in decision-making positions. At that time, a few changes of NABA are to be expected as a normal occurrence.

While ATL and NABA may not see eye to eye on everything, I hope ATL members will welcome NABA members into the family of lepidoptery, recognizing that we all have a genuine interest and need to work together in learning more about butterflies and preserving their continuation.

WANDA DAMERON  
Los Angeles, California

Thank you for writing the excellent letter on NABA in *Lepid. News*.

THOMAS SLONE  
Oakland, California

I read your long letter in *Lepidoptera News* with great approval. [The anti-collecting view] is like a religious fervor. I think a shortened version of the letter should go to the *Lepid. Soc. News* to get a wider audience and reaction. British Butterfly Conservation are doing a tremendous job of conserving habitat but they don't ban collecting, only discouraging collecting species in those areas where they are endangered by habitat destruction. I remember remarking, many years ago, on being taken to a pine barren near Albany, NY, that the 'Karner Blue' was abundant in that particular barren but there was talk of a supermarket buying the land!

PAUL MILNER  
Pisgah Forest, North Carolina

I would like to send a copy of your letter, "NABA Calls Collectors Immoral," . . . to [the] Southern Lepidopterists' Society newsletter for publication. . . . The more people who read your words . . . the better the scientific community will be.

LEROY KOEHN  
Georgetown, Kentucky

I thoroughly enjoyed your article in *Lepidoptera News* #3. . . . We've all heard this argument in bits and pieces; but this was so eloquently and succinctly done, I laughed, I cried. . . . It's so true about the "big lie," and I've been a volunteer ranger for the NPS [National Park Service], going on about 12 years, not to mention research with Ed [Knudson] for USFWS [U.S. Fish & Wildlife Service], Audubon [Society], TNC [The Nature Conservancy], TPWS [Texas Parks & Wildlife Service], etc., and have found at least a few good people. . . . I subscribed to "Listserve" here in Texas, earlier this year, and was kicked off because of some things I had to say. . . . It's nice to see that you . . . told the truth. . . . Ed [Knudson] was equally impressed by this masterpiece, and I wish this could be reprinted somewhere that has a larger audience.

CHARLES BORDELON  
Houston, Texas

The view of NABA regarding collecting was expressed in 1993 in the first issue of *American Butterflies* and is, "Collecting butterflies is not included among the purposes of NABA but NABA is not in opposition to other groups for which this may be a legitimate purpose." That position remains unchanged. I personally have no opposition to the collection of butterflies for scientific purposes and my extensive collection of Neotropical hairstreaks resides at the Smithsonian Institution.

In the article "Mitchell's Satyr Rides Again" (*American Butterflies*, Fall 2001, p. 16), I describe my and Jane Scott's discovery of a major population of Mitchell's Satyrs in Alabama. In the introduction to the article I state, "The last Mitchell's Satyrs in New Jersey were killed by immoral collectors." It is very difficult to believe that a person would read this to mean that all collectors are immoral. If I had said, "The embezzlement was aided by immoral accountants," would anyone read that to mean that I viewed all accountants as immoral? Obviously, I meant that the particular collectors involved, who collected (illegally trespassing on private land) every day during Mitchell's Satyr brief flight season and collected every Mitchell's Satyr that they saw, were immoral. If you don't believe that collecting every individual one can find of a rare and colonial species is immoral, then we disagree.

JEFFREY GLASSBERG  
President, NABA  
Morristown, New Jersey

I almost did not renew, but your letter about NABA and Glassberg convinced me to renew. Nice to see that someone still has the courage to speak up.

JEFF BAIER  
Napa, California

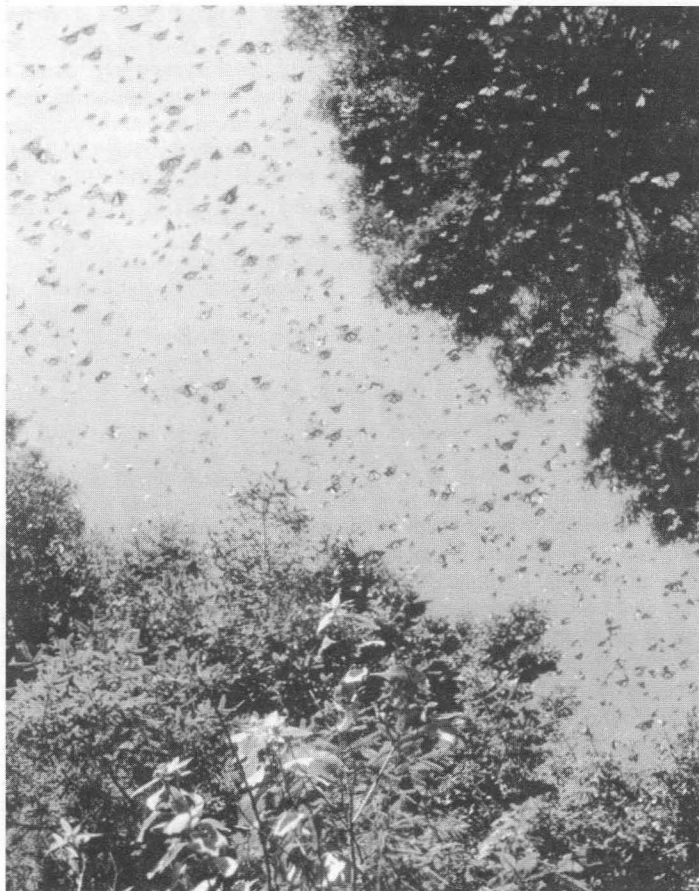


Fig. 2. Monarchs swarming during bright sunshine in Michoacán, Mexico, wintering haven (El Rosario Reserve, Angangueo). (© R. DeCandido)

protected 5 separate sanctuaries totaling 16,110 hectares. However, studies showed that between 1984 and 1999, 44% of high quality forest inside the reserve has been degraded, caused mainly by continued and uncontrolled access to forest resources. The annual deforestation rate for this period was 2.41%. It was obvious that the current conservation scheme has not worked. In November, 1997, during the Tri-national North American Conference on the Monarch Butterfly, SEMARNAP (the Mexican Ministry for the Environment, Natural Resources and Fisheries) decided to review the 1986 decree.

In support of this initiative, different institutions, led by WWFM and advisors like Dr. Lincoln P. Brower, developed a technical proposal for the redefinition of the protected area's boundaries. This proposal was

finished in June 2000 and served as the basis for a Presidential Decree that expanded the Reserve, connecting the 1986 sanctuaries in a contiguous corridor of 56,259 hectares. The new Reserve represents a viable solution both from the standpoint of the Monarchs, as well as for the economic well being of the local people that will be directly affected by changes in land use.

Economic incentives for local landowners need to be implemented to achieve successful conservation of the new reserve's forest ecosystem. WWFM and FMCN have established a trust fund which will provide the necessary financial resources to support long-term conservation activities and sustainable forest management by the local communities within the core zone of the new reserve. For the first time in Mexico's history, a conservation trust fund will be created specifically to offer incentives to local communities affected by the establishment of a protected area, making them integral participants in conservation and sustainable use activities.

Linking a compensation mechanism or an economic incentive system to the declaration of a protected area is an innovative concept in Mexico. Historically, land use limitations imposed by protected areas have given few options to land owners, unintentionally generating illegal resource use and social conflicts. Representatives of the WWFM emphasized that redefining the protected area of the Monarch overwintering sites and offering a compensation scheme to land owners presents a unique opportunity to change the way protected areas are established and managed in Mexico.

For more information, lepidopterists can contact WWF Mexico Program, Av. México #51, Col. Hipódromo, México City, D.F. 06100, México (e-mail: [wwfmex@compuserve.com.mx](mailto:wwfmex@compuserve.com.mx)).

Dr. Lincoln Brower, who provided comments presented by Dr. Kurt Johnson, emphasized the still unresolved role of genetically engineered "Bt corn" as a danger to Monarchs in North America. Drawing from comments he recently published in *Orion Magazine* (Brower, 2001), he noted that the genetically engineered strain of corn known as "Bt Corn" produces pollen that can kill Monarch Butterfly caterpillars. Contrary to some reports in the news media, these findings (by Cornell University scientists) have not been discounted by reliable research from other quarters, especially research institutions supported by entities of the agro-industrial sector which have a financial stake in the widespread use of the genetically engineered crops. He noted that the agriculture industry has a history of carelessness with regard to collateral damage to benign or beneficial species that are part of the natural web of life.

He explained that the danger in the genetic engineering strategy is that it inserts various foreign genes into crop plants, in this case a bacterial gene that produces a toxin that kills the target species, the corn ear worm. However, in germination and growth of the genetically modified plants, the inserted DNA expresses itself in every cell — roots, stems, leaves, seed, and pollen of the corn plant all contain the Bt toxin. As a result, when the pollen is deposited by wind onto the leaves of milkweeds, Monarch caterpillars ingest it and can thus be endangered.

The Cornell research included mathematical models showing that pollen shedding and Monarch breeding happen simultaneously over considerable geographic ranges and that extensive monarch breeding occurs on milkweed in and around cultivated corn.

Dr. Brower emphasized that a major issue emerging from the Bt Corn debate is the way in which supposedly objective scientific information is influenced by the agro-business sector in a desire to manipulate the federal regulatory processes of the EPA. He said that a long look must be taken by science at the entire spectrum of genetically engineered crops in the future. A danger is that the "willy-nilly" application of these techniques may accelerate the industrialization of agriculture, global overpopulation, and further impoverishment of biological diversity.

KURT JOHNSON, Brooklyn, New York

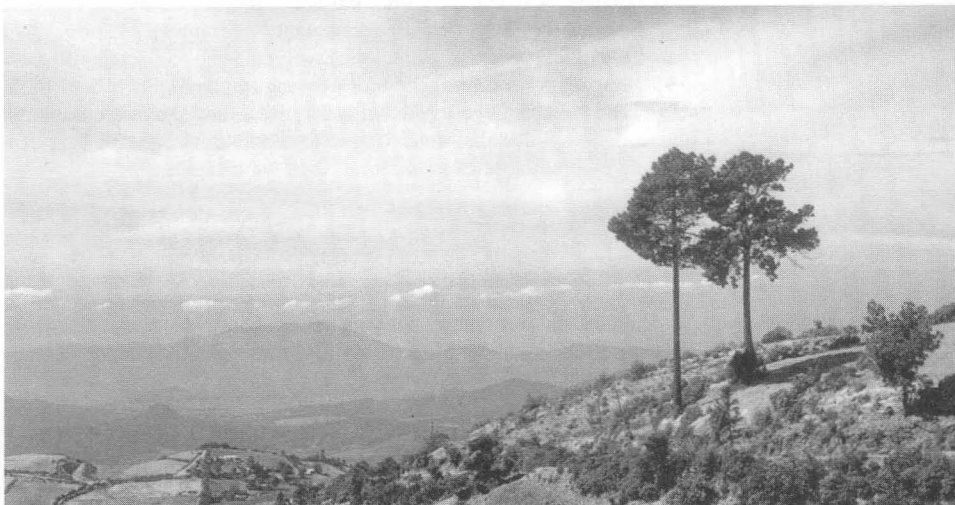


Fig. 3. Deforested areas in Michoacán, Mexico (El Rosario Reserve, Angangueo). (© R. DeCandido)



# THE CONCISE ATLAS OF BUTTERFLIES OF THE WORLD

by Bernard d'Abrera

2001. Millhouse Publishers, Melbourne, Australia. 353pp, 150 col. pl. (available in the U.S. from: BioQuip Products, 17803 La Salle Avenue, Gardena, CA 90248) US\$112.50 (Cat. #9128)

This latest atlas treatment by Bernard d'Abrera is a landmark in the publishing of books that attempt to cover the diversity of butterflies on a worldwide scale. The concisely expert text and marvelous color plates represent a real "door-opener" for the novice who wants to obtain a useful overview of the world's butterfly fauna and dream of traveling to exotic areas to see these beautiful creatures for himself or herself. Even the professional can usefully employ this work to quickly trace down an illustration of a rare genus or even species with which he or she is unfamiliar, or learn the number of species in each genus worldwide. Some critics, looking only at the evolution-creation debate, may overlook this invaluable contribution. Buy the book. Read it. And hopefully plan to use it as an overall guide to the wonderful diversity represented among the world's 20,000 species of butterflies.

D'Abrera has long been famous for the superb photographic quality of his series of books on the butterflies and larger moths of the world, and this book continues the incredibly high standards already set in his 20-plus previous published works. There is a really excellent introductory section on the biology of the butterfly, and its place in nature. Illustrated with spectacular half- and full-page color pictures taken in nature, the vivid world of insects and the place of butterflies in it is brought dramatically home to the reader. The writing is clear and unambiguous. The illustrations contribute in perfect harmony to the impact of the message, particularly when the author takes up the topics of the hand of man in causing extinction and reduction in the numbers of butterflies worldwide.

As he delves into taxonomy and classification, d'Abrera spends a great deal of effort in explaining to the reader where the author stands as a philosopher of science. At this point, the reader enters the potentially most controversial and philosophically arguable part of this outstanding book. If the professional evolutionist or biologist can read through this carefully, he will realize that d'Abrera has actually presented an amazing intellectual tour de force, covering d'Abrera's evaluation of many of history's most notable naturalists and professional biological scientists from Plato and Aristotle right to the present day. From his creationist perspective, he evaluates their discourses on evolution, or their incidental contributions to the development of evolutionary theory, in particular, the Darwinian theory of evolution. If you thought that an English bacteriologist, Dr. Alexander Fleming, discovered the antibiotic Penicillin, think again. D'Abrera reveals that it was a fellow Australian scientist, Sir Howard Florey, who should receive the credit (p. 50). And so it goes: d'Abrera's insightful evaluations of many of the most notable biologists of western civilization, and of their discoveries. He also provides a remarkable gallery of illustrations of many of these people (some of which I have now seen for the first time).

When he launches into the philosophical choices that he sees involved in the topics of mimicry, protective resemblance, and of course the overall concept of evolution, you may not agree with his arguments, but you cannot ignore them, if you wish to be intellectually honest and consider both sides of the evolution-creation controversy. I actually found it quite stimulating to read these sections, particularly his initial forewarning (in the long Foreword) when he paints the picture of a large ocean liner, proceeding at full-speed on a long voyage with most of the people on board engaging in a debate about classification and past history of species rather than worrying about an inventory and conservation of what we have left today (given that the world has so little time to save a tiny remnant of what even a century ago was a far greater diversity).

Throughout this section, the illustrations are stunning, the debate stimulating, and the topical coverages, particularly the conservation issues (including the role of museums such as the famous British

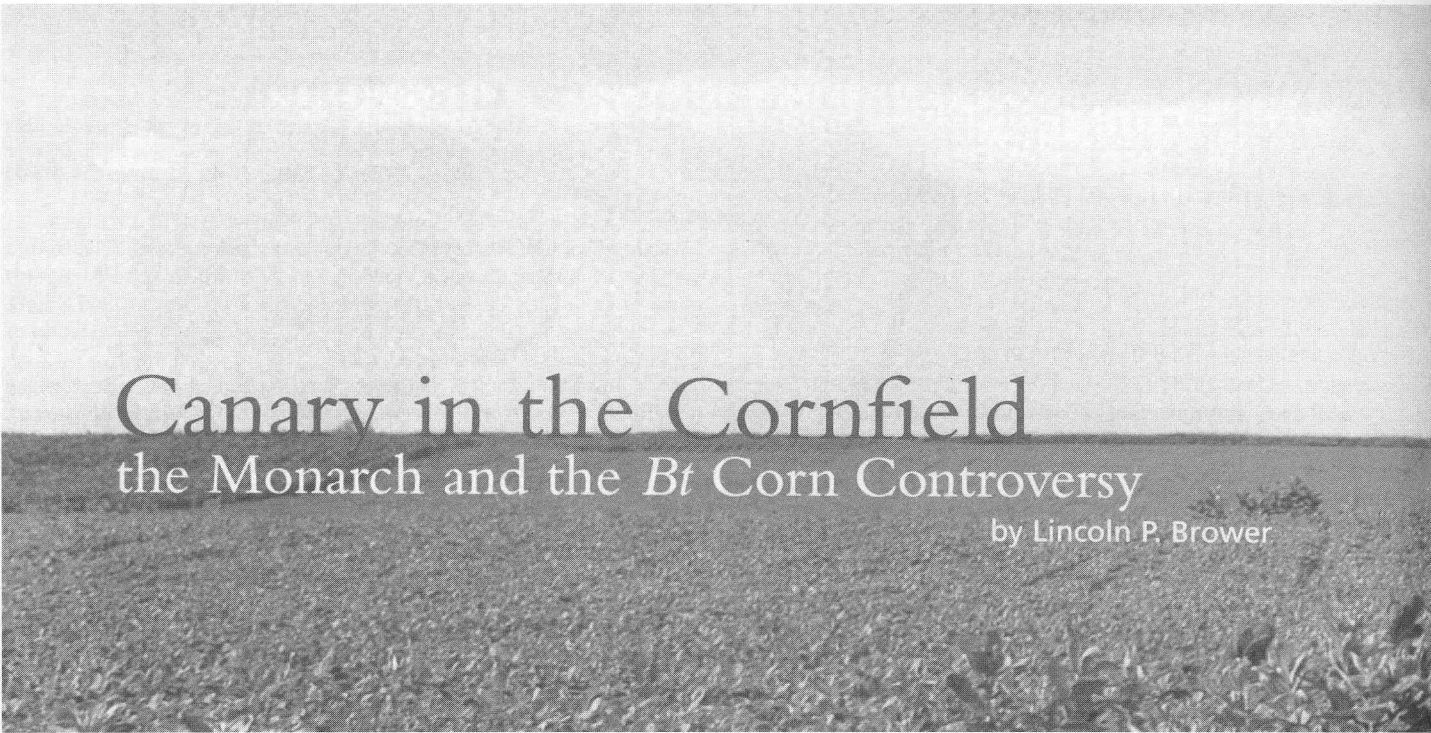
Museum (Natural History), are invaluable contributions. The author summarizes his metaphysical views in Part IV in which he reconciles his observations of the flow of time with the Book of Genesis, and I leave it to the reader to conclude what he or she wishes after examination of the arguments that d'Abrera sets forth.

The rest of the book is an extraordinarily succinct presentation of the butterflies of the world, over 4,000 of them! Beautifully illustrated, organized by each faunal region of the world, this is a book to treasure and to use repeatedly. You can use it to identify your specimens if you don't have access to the expensive main series of larger volumes and if you do have that series, you will find this book, to use the author's words, "a most necessary supplement to them." In part, this is because the author made corrections and additions to the systematics and nomenclature used in the preceding series, and he also publishes several new genera, new species, and a review (starting on p. 194) of the Neotropical genus "*Thecla*" (Lycaenidae), which will probably send some American specialists in the group into a new energy orbit, but then controversy is good for stimulating more study on Lepidoptera, isn't it?

Anyway, this review should be used as an inducement for you to buy the book, to use the concise atlas approach to examine the wealth of diversity among the butterflies of the world, and to resolve to pursue your own future contributions towards taxonomy, conservation, and other essential issues. As noted, this book also contains d'Abrera's most forceful argument to date in presenting his case for the unacceptability of evolutionary doctrine and indeed virtually all evolutionary thinking, whether it be in mimicry, taxonomy, or even ecology. But this does not prevent even the most detached agnostic and atheist from using the book to his or her profit in identifying and appreciating the diversity of this wonderful group of animals, the butterflies. Indeed, some of such persuasion may particularly appreciate the iconoclastic philosophical approach that d'Abrera sets forth, surpassing all his previously published debates on evolution in this newest volume.

THOMAS C. EMMEL

McGuire Center for Lepidoptera Research  
P. O. Box 118525, University of Florida  
Gainesville, FL 32611, USA



# Canary in the Cornfield

## the Monarch and the *Bt* Corn Controversy

by Lincoln P. Brower

I HAVE STUDIED the monarch butterfly since 1954, and it is not unusual for me to receive inquiries about the biology and conservation of this wonderful insect. None was more fateful than a phone call in September 1998 from Linda Rayor telling me of a discovery made by her and her Cornell University colleagues, John Losey and Maureen Carter — that a genetically engineered strain of corn, the so-called Bt corn, produced pollen that could kill monarch caterpillars. Shortly afterwards Losey, Rayor, and I had a discussion about the implications of their study; the forces behind biotechnology are powerful ones, and it was obvious that the Cornell findings had serious scientific, political, and economic implications. Yet none of us could have predicted the firestorm that was about to descend.

This story is about how the proponents of the new genetic engineering technology distorted the scientific inquiry into the possible harmful effects of Bt corn on the monarch butterfly. In the ongoing debate over the Cornell findings, the scientific process has been spun, massaged, and manipulated by the agricultural industry, the U.S. Department of Agriculture, the U.S. Environmental Protection Agency, and elements of the North American academic community. The process disregarded international scientific standards and has helped to make science the handmaiden of industrial agriculture. As a consequence of these irregular proceedings, the monarch-Bt corn debate risks losing sight of a larger, more serious issue: the real danger that genetically engineered crops will accelerate the industrialization of agriculture, human overpopulation, and the impoverishment of biological diversity.

THE FINDINGS OF the Cornell scientists should not have come as a surprise, given the agricultural industry's history of carelessness with respect to nontarget species — benign or beneficial species that are part of the natural web of life. Forty years ago Rachel Carson alerted us that the chemical industry was spreading synthetic insecticides that were killing legions of beneficial insects and the birds that ate them.

In the years following *Silent Spring*, some agricultural industries looked for alternatives to chemical insecticides, and agricultural entomologists tried to develop solutions that would be more specific. One was to release foreign parasites to control crop and forest pests, many of which themselves had been accidentally imported. Hundreds of species of wasps, flies, beetles, nematode worms, fungi, bacteria, and viruses were gathered across the globe and released in North America by agricultural scientists. These exotic control agents also attack many nontarget species with serious, but largely ignored, effects upon native ecosystems.

Another biological approach was to manipulate the soil bacterium *Bacillus thuringiensis*. The Bt bacterium secretes a protein that, when ingested by a sensitive insect, causes the larval gut to break down and a gooey, black death ensues. Industrial and academic scientists have selected numerous Bt strains that are toxic to the larvae of different groups of insects. The *Bt kurstaki* strain is lethal to the caterpillars of virtually all moths and butterflies and is produced in mass cultures that are harvested and sold as Dipel. Used in home gardens as a "natural" toxic powder to kill tomato hornworms and cabbage caterpillars, Dipel is also sprayed to kill gypsy moth caterpillars in the eastern deciduous forests, spruce budworms in the northern boreal forests, and tussock moth caterpillars in the western Douglas fir forests. Extensive sprayings of Dipel and its derivatives, along with repeated releases of exotic parasitic insects, have severely reduced the populations of many benign and beneficial native insects, including several of the New England silk moths renowned for their elegance and bizarre caterpillars.

The danger to nonpest species was raised to a far more sophisticated level by the new science of genetic engineering, which makes it possible to transfer genes between any species on earth. When successful, the transferred genes give the recipient species the ability to synthesize proteins that were specific to the donor species. An obvious strategy would be to insert various Bt genes into crop plants. Then as the seeds of the genetically modified strain sprout and grow, the inserted DNA would express itself in every single cell of the growing seedlings. Wonder of wonders, the roots, stems, leaves, and seeds of the plant contain the Bt toxin and are toxic to virtually all caterpillars. Agricultural companies introduced the Bt genes into several crops, including potatoes, soybeans, cotton, and corn. One major target was the European corn borer moth, an economically damaging species that is found throughout the eastern United States and southern Canada.

Before any of these genetically modified organisms (GMOs) could be used commercially, the EPA required a battery of toxicology tests. The toxins of various Bt corn strains showed no apparent adverse effects on honeybees, ladybird beetles, and a few other invertebrates. The test results, together with the fact that the toxin is inactivated in the acid milieu of mammalian guts, led U.S. regulatory agencies to judge nearly all Bt corn strains safe for human consumption and the environment. Critically, however, toxicologists ignored the potential impact on nontarget species of butterflies and moths that are the denizens of the same ecosystems in which corn is grown.

Many biologists heralded the new Bt corn technology because they believed it would mitigate the need to spray insecticidal chemicals. The



corporations involved in marketing the seeds (for the most part the same ones that had developed the synthetic insecticides several decades earlier) sponsored a multimillion-dollar campaign touting them as an environmental panacea. The response was stunning: by the 1998 season, twenty-five percent of the total U.S. corn crop (of eighty million acres) was planted with Bt corn.

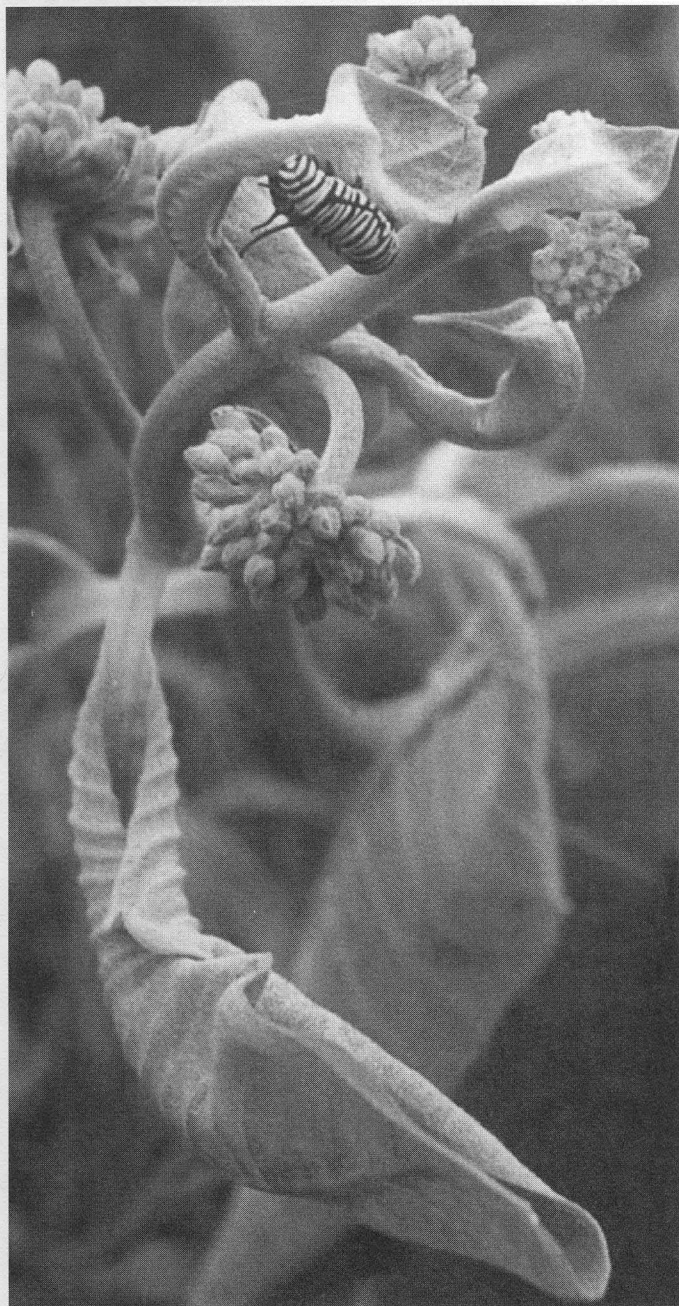


Fig. 1. Monarch caterpillar feeding on stunted leaves of an herbicided milkweed plant.

Genetic engineering also led to the development of numerous crop strains resistant to herbicides. It is now possible, for example, for farmers to plant "Roundup Ready" seeds of several crops — seeds that produce seedlings unaffected by Roundup spray. Roundup eliminates competing weeds, as well as nearly all native flora—including milkweeds, upon which the monarch depends. In the grassland states, nightly advertisements repeatedly promote the latest herbicide technologies. The result of such extensive use of herbicide-resistant crops is the destruction of biodiversity throughout North America and elsewhere, as millions of acres of land are converted to monoculture deserts of potatoes, soybeans, cotton, or corn.

If plants can be genetically engineered to produce their own pesticides and to resist synthetic herbicides, it is certain that crop strains can also be developed to grow in virtually any soils. Looking beneath the purported advantages of the new GMO technology to agriculture and corporate profits, an alternative view is that these corporations are converting the natural world into a biologically impoverished planet massively overpopulated by a single species: *Homo sapiens*. The sweeping extent of this technology can be seen in chicken factories that sit in the middle of vast cornfields, devoid of all native plants. The rich web of life that formerly occupied this prairie community has been reduced to an industrial food chain that has only three links: sunlight to corn, corn to chickens and chickens to humans.

**K**NOWING THAT THEIR FINDINGS had implications for the hot topic of genetically modified food, the Cornell scientists submitted their manuscript to the American journal *Science*. Before sending manuscripts out for peer review, the editors screen them, using likely audience interest as one acceptance criterion. Despite the relevance of the monarch study to a timely scientific issue, the manuscript did not pass this hurdle. With a growing realization of the magnitude of the bomb they were sitting on, Losey, Rayor, and Carter revised their manuscript and submitted it to the British journal *Nature*. Popular and scientific challenges to the release of genetically modified organisms into natural environments have been major press fodder in Europe, and the editors of *Nature* sent the paper out for peer review. It was published in May 1999.

In their article, "Transgenic Pollen Harms Monarch Larvae," the Cornell authors asked: could windblown corn pollen accumulate on plants that grow extensively in and adjacent to cornfields and, like conventional insecticides, inadvertently kill native insects that are not pests? To test this question, they chose the monarch as their nontarget species. Female monarchs lay eggs on wild milkweed plants, the only plants that their caterpillars can eat. In their experiment, conducted in the laboratory, the authors dusted pollen gathered from one of the Bt corn strains onto the leaves of the common milkweed. They established that caterpillars that fed on the dusted leaves ate less, grew more slowly, and suffered higher mortality than caterpillars reared on milkweed leaves dusted with pollen from a non-Bt corn strain. The scientists were circumspect about their results and stated clearly that more research was needed to determine the impact of the toxic pollen on monarchs in the natural environment.

According to a private communication, an ashen-faced president of a major biotech company marched into a board meeting shortly after the article appeared and stated, "I have only one thing to say about the Cornell publication: Bambi." Had the scientists chosen a different insect, it is likely that few people would have responded to the *Nature* paper. They used the monarch, however, loved by schoolchildren, gardeners, and millions of other people throughout the world. The monarch instantly became a *bête noire* for the field of biotechnology. The world press latched onto the study even before the article was in print, and soon protesters wearing corn and butterfly costumes were marching in the streets.

**T**HE AGRICULTURAL INDUSTRY'S reaction to the news was immediate and vigorous. Criticisms belittling the Cornell study appeared widely in the U.S. and on British television. Agricultural companies launched web pages (for example, on [monsanto.com](http://monsanto.com), [novartis.com](http://novartis.com), and [farmsource.com](http://farmsource.com)) downplaying and, in some instances, ridiculing the study. The principal argument they put forward was that the benefits of using Bt corn far outweigh the environmental costs of the pesticides it replaces. Their most common assertion — that Bt corn reduces the need for other insecticides in cornfields by two orders of magnitude, a gross exaggeration — was repeated in press releases and uncritically accepted by numerous scientists. This same justification was used in articles favoring the new technology that appeared in respected journals, such as the *Proceedings of the National Academy of Sciences, U.S.A.*

The Cornell study mobilized the environmental community at a critical time because the earlier approval of Bt corn was about to expire, and the EPA was required to undertake a reassessment process before

renewing the registration. The Union of Concerned Scientists and the Environmental Defense Fund petitioned the EPA to restrict the planting of Bt corn and to reassess the environmental risks of genetically engineered crops. The environmentalists' initiative made it clear that further scientific study of the relationship between the monarch and Bt corn was needed before a ruling could be made. From this point on, however, scientific efforts to define that relationship would be overshadowed by the agricultural industry's efforts to control the information on which the EPA decision would be based.

The industry's early responses to the Cornell paper were designed to cast doubt on whether the scientists' laboratory findings were applicable to monarch caterpillars in the field. Many statements were misleading, fanciful, and betrayed an ignorance of the monarch's natural history. Incorrect or speculative pronouncements fed to the media included that the major geographic area of monarch reproduction lies outside the corn belt; that monarchs breed before pollen is released from the corn tassels; and that pollen release occurs over too short a time to have a major impact on the caterpillars. All these industry-released statements ignored the extensively documented literature on the monarch's lifecycle, including information known since the nineteenth century that multiple overlapping generations of the monarch occur throughout the summer breeding range, virtually assuring that the monarch caterpillars would be widely exposed to the shedding corn pollen. Other press reports asserted that few pollen grains land on milkweed leaves, that monarchs lay most of their eggs on the undersurfaces of the leaves, that milkweed leaves have slick surfaces to which corn pollen grains will not stick, that the toxicity of the pollen grains is below the threshold that kills monarch larvae, and that one hundred times more monarchs are killed by cars and trucks than by Bt corn. The most flagrant lack of scholarship exhibited by the Bt corn proponents was their failure to cite the current scientific literature documenting that extensive monarch breeding occurs throughout the North American corn belt.



Fig. 2. A female monarch laying its egg on a milkweed.

The agricultural industry's manipulation of the press was soon made even clearer. Several corporations, including the Monsanto Company, Novartis A.G. of Switzerland, and the Pioneer Hi-Bred of DuPont Company formed a soothingly named consortium, the Agricultural Biotechnology Stewardship Working Group (ABSWG). The ABSWG contacted university scientists and provided funding for studies that would address issues raised by the Cornell findings. U.S. and Canadian scientists conducted a research program during the summer of 1999, the

results of which were to be presented at a scientific symposium in Chicago on November 2, hosted by the ABSWG, and also attended by representatives of the EPA and the USDA. The avowed purpose of this symposium was for the scientists to present and discuss their findings, review their methodologies, and determine through consensus what information was inconclusive or missing.

Because of the manner in which the press releases had been handled, I had an uneasy feeling about ABSWG's symposium and how the results of the summer research would be reported there. Fortunately, a private foundation concerned about the threat of Bt corn to the monarch made it possible for me and monarch expert Myron Zalucki, of Queensland University in Australia, to attend. Our mission was to use our combined knowledge of monarch biology to make a fair and critical evaluation of the scientific content of the presentations. Because of the hurried nature of their summer research, all of the meeting participants prefaced their scientific presentations with the caveat that their data and conclusions were preliminary. Some results indicated possible major impact, others suggested minor impact, and most agreed that the current research base could not resolve the problem. Afterward, Zalucki and I concluded that the available toxicology data were inadequate and that far more field studies were needed to ascertain the extent of overlap between monarch breeding, milkweed plant distribution, and corn pollen shedding. We also recommended several specific biological questions that needed to be answered before the EPA could possibly make an informed judgment on whether to renew the registration of Bt corn.

At the meeting, Carol Yoon, a *New York Times* science journalist, made a stunning announcement: she had just received a fax from her *Times* editor indicating that a media advisory had been released earlier in the day. The headline describing the still-in-progress meeting stated: "Scientific Symposium to Show No Harm to Monarch Butterfly." Several of the participating scientists whose studies were supported by ABSWG had apparently agreed on the contents of the misleading press statement prior to the symposium. There was now no doubt that the symposium had been co-opted by the ABSWG, and that the press was being manipulated. Yoon's report exposing this fiasco, "No Consensus on the Effects of Engineering on Corn Crops," was published in the *Times* on November 4.

A little more than a month later, on December 8, 1999, the EPA held a Scientific Advisory Panel meeting, a requirement of the EPA regulatory process leading to renewal or denial of re-registering Bt corn for commercial use. Though public comment was allowed, surprisingly few people attended the meeting. I related that the results of the Chicago meeting had been inconclusive and obfuscated by the Agricultural Biotechnology Stewardship Working Group. Another testimony, by a scientist representing one of the agricultural companies, was a vituperative commentary on both the Cornell results and another recent *Nature* paper documenting that Bt toxin can leach from the corn plants into the soil. A clear pattern was emerging: corporate spokespeople will attack scientists who discover any potentially adverse environmental effects of GMO crops.

Following these meetings, demands from the environmental community for further research on the impact of Bt corn on the monarch grew stronger. In the spring of 2000 the industries and the USDA jointly announced that each was allocating \$100,000 for a competitive grants program to support several Bt corn and monarch butterfly research Projects during the coming summer. A number of monarch scientists speculated that the paltry funding was a palliative and that the resulting research findings would be ignored in the EPA's re-registration deliberations.

Aware that new data and more sophisticated analyses would be forthcoming, the Union of Concerned Scientists and eleven other public-interest organizations made a request to the EPA: to postpone the next Scientific Advisory Panel (SAP) meeting until more data were collected and made available to the public, including the scientists' findings gathered over the summer of 2000. The EPA, however, held the SAP meeting on October 19, a month *before* the scientific symposium was scheduled to take place.

Prior to the SAP meeting, the EPA had allowed several corporations to review the agency's preliminary assessment and suggest modifications.



In addition, the EPA allowed the companies to withhold important data as confidential business information. One of the principal documents contained approximately forty deletions of so-called "proprietary" data. It was therefore impossible for the EPA panel or independent scientists to evaluate the data. Both industry and the EPA documents also ignored relevant data readily available in the scientific literature. Thus, without considering the new information that would be presented the following month, and drawing passages almost verbatim from documents prepared by industry, the EPA's interim assessment of the risks and benefits presented to the SAP stated that "the published preliminary monarch toxicity information is not sufficient to cause undue concern of harmful widespread effects to monarch butterflies at this time."

THE SUMMER 2000 research results were presented in November at a second Chicago symposium, attended by many of the same industry, academic, and governmental groups that had been present at the 1999 symposium. Investigations examined the toxicity of the various strains of Bt pollen, when and where monarchs feed and breed, and where they encounter the pollen. Some of the findings seemed reassuring. Toxicity studies appeared to indicate that the pollen of some strains of Bt corn was less lethal than that of others and that most of the strains currently in use may be in the less-toxic group. Several studies indicated that corn pollen does not drift very far from the cropfield, and a risk analysis using the new data predicted little effect on larvae feeding on milkweeds beyond a few meters from the edge of a field. Other studies warned of new threats. One determined Bt pollen to be toxic to later-stage monarch larvae — significant because older caterpillars had been assumed to be less sensitive than the young ones. Clarifying a contentious point of the 1999 symposium, new data fed into revised computer models now led to predictions that pollen shedding and monarch breeding happen simultaneously over wide geographic areas. This finding was made all the more important by new data showing that extensive monarch breeding occurs on milkweed growing *inside* cornfields. This, in turn, underscored the devastating effects that the long-term use of herbicides, and genetically manipulated organisms such as Round-up Ready crops, will have as their use totally eliminates milkweeds from the fields.

The papers presented at this symposium reflected the complexities of the Bt corn issue. Working with different methodologies even in areas where their investigations overlapped, the scientists' findings were not easily compared. The studies, for example, used different techniques for collecting and testing pollen samples and for controlling contamination by other vegetable matter. In addition, none of the studies addressed Zalucki's and my recommendations that toxicology tests were needed to determine whether sublethal doses of pollen ingested by larvae affect reproduction or migratory capacities of adult butterflies. In summary, despite the EPA's interim assessment, the overall database that had been assembled through November 2000 was not adequate to resolve whether Bt pollen is a significant detriment to the monarch butterfly.

A MAJOR ISSUE that emerges from the Bt corn debate is the way in which scientific information is obtained and used in the federal regulatory process — a question with consequences far greater than the decision to register or ban Bt corn. As the handling of the monarch saga has shown, the EPA's October 2000 decision was based on scientific information that was largely controlled by the industry and failed to measure up to even minimum standards adhered to by the international scientific community. These standards require peer review of manuscripts by independent scientists chosen by the editorial boards of scholarly scientific journals. Peer review assures that experiments are reproducible, that the data are statistically valid, that the conclusions are logically derived from the data, and that they state clearly what is and what is not resolved. This independent evaluation of scientific evidence is a *sine qua non* for the integrity of science. By ignoring the standard of peer-reviewed science and by relying on information supplied by the same corporations that it means to regulate, the current U.S. federal regulatory system is severely flawed.

The Bt corn issue has raised public concerns about the system by which the federal government evaluates the safety of genetically

engineered products. The process that will finally determine the commercial fate of Bt corn is the same one that is applied to every one of the thousands of toxic chemical products and genetically modified organisms that fall under the jurisdiction of our nation's regulatory system. This is the system warned of in *Silent Spring*. It is the system that Wendell Berry described more than thirty years ago. Will North American society ever face up to the environmental and cultural erosion caused by the cozy economic relationships of agriculture, business, government, and large segments of academia?

This Bt corn-monarch butterfly saga provides evidence that international agricultural and chemical corporations, a large segment of the academic community, and our federal regulatory agencies care not one whit about biodiversity. Sophisticated advertising, such as that by Archer Daniels Midland Company, an underwriter of nightly news broadcasts on PBS, garners public support for seemingly heroic agricultural technologies designed to feed everyone, everywhere. The same advertisement implies that the beneficent company is developing corn crops engineered to replace petroleum.

It seems certain that the profit-driven mindset of our political and corporate leaders will continue to promote biotechnology, and to fuel unsustainable human population growth with its consequent usurpation of natural habitats and their rich arrays of natural creatures, large and small.

LINCOLN P. BROWER

Sweet Briar College, Sweet Briar, Virginia

This essay was originally published in *Orion* magazine, Spring 2001. Reprinting permission granted by Dr. Brower, and by The Orion Society, 187 Main St., Great Barrington, MA 01230. [www.oriononline.org](http://www.oriononline.org).

#### POSTSCRIPT

Bt corn was relicensed by EPA in the fall of 2001 following several industry-sponsored studies. Industry control of the process did not allow reasonable time for critical review, and what was made public was replete with censored information. Control extended to five peer reviewed manuscripts that were said to be unavailable for scrutiny for "proprietary" reasons. These were finally released by the National Academy of Sciences ludicrously close to the end of the public review period as an "early edition" on the World Wide Web. The Bt corn proponents' shrewd orchestration of these papers allowed EPA to get off the hook and relicense Bt corn. Some of the new data supported the Losey *et al.* findings that had been vituperatively attacked when their story broke in *Nature* in May 1999. The questions of toxicity to the five larval instars of the monarch, as well as non-lethal but possibly debilitating effects on adult monarchs, remain unanswered. The industry touted finding that pollen does not blow far from the cornfields became irrelevant when it was discovered that large numbers of milkweeds fed upon by monarch larvae in the corn belt grow inside the cornfields. Ominously, these milkweeds are assured elimination as new crops that are genetically engineered to resist herbicides take over and sterilize the industrial corn and soybean fields. The widely propounded myth that Bt corn significantly reduces the use of insecticides to a significant degree lives on. The foxes have indeed been effective in guarding their chicken coops.

#### Bt and Monarchs: References

- Barboza, D.  
1999. Biotech companies take on critics of gene-altered food. *New York Times*, Nov. 12.
- Baur, R., M. Haribal, J. A. A. Renwick, and E. Stadler  
1998. Contact chemoreception related to host selection and oviposition behaviour in the monarch butterfly, *Danaus plexippus*. *Physiol. Ent.* (Oxford), 23:7-19.
- Bean, M. J.  
1999. Throwing caution to the wind: monarchs and Bt pollen. *Wings* (Portland), 22:22-23.
- Beegle, C. C., and T. Yamamoto  
1992. History of *Bacillus thuringiensis* Berliner research and development. *Can. Ent.* (Ottawa), 124:587-616.
- Bouchie, A. J.  
2000. Bt corn kills monarch? *Nature Biotech.* (New York), 18:1025.

- Brower, L. P.  
1999. Will biotechnology doom the monarch? *Defenders* (), 79:39-41.  
2001. Canary in the cornfield: the monarch and the Bt corn controversy. *Orion* (Great Barrington, Ma), 20(2):32-41.
- Brower, L. P., and M. P. Zalucki  
1999. Bt corn and its effects on monarch butterflies: a note of caution. *Monarch News* (), 10:1, 4-5.
- Bruening, G.  
2000. Transgenes are revolutionizing crop production. *Calif. Agric.* (Berkeley), 54(4):36-46.
- Estruch, J. J., N. B. Carozzi, N. Desai, et al.  
1997. transgenic plants: an emerging approach to pest control. *Nature Biotech.* (New York), 15:137-141.
- Federici, B.  
1998. Broadscale use of pest-killing plants to be true test. *Calif. Agric.* (Berkeley), 52(6):14-20.
- Ferber, D.  
1999. GM crops in the cross hairs. *Sci.* (Washington), 286:1662-1666.
- Gibo, D. L., and J. A. McCurdy  
1993. Lipid accumulation by migrating monarch butterflies (*Danaus plexippus* L.). *Can. J. Zool.* (Ottawa), 71:76-82.
- Gill, S. S., E. A. Cowles, and P. V. Pietrantonio  
1992. The mode of action of *Bacillus thuringiensis* endotoxins. *Ann. Rev. Ent.* (Palo Alto), 37:615-636.
- Gould, F.  
1998. Sustainability of transgenic insecticidal cultivars: integrating pest genetics and ecology. *Ann. Rev. Ent.* (Palo Alto), 43:701-706.
- Gould, F., A. Anderson, A. Reynolds, et al.  
1995. Selection and genetic analysis of a *Heliothis virescens* (Lepidoptera: Noctuidae) strain with high levels of resistance to some *Bacillus thuringiensis* toxins. *J. Econ. Ent.* (Lanham), 88:1545-1559.
- Hansen-J., L. C., and J. J. Obrycki  
2000. Field deposition of Bt transgenic corn pollen: lethal effects on the monarch butterfly. *Oecolog.* (Berlin), 125:241-248.
- Hartzler, R. G., and D. D. Buhler  
2000. Occurrence of common milkweed (*Asclepias syriaca*) in cropland and adjacent areas. *Crop Prot.* (Oxford), 19:363-366.
- Hilbeck, A., M. Baumgartner, P. M. Fired, and F. Bigler  
1998. Effects of transgenic *Bacillus thuringiensis* corn-fed prey on mortality and development time of immature *Chrysoperla carnea* (Neuroptera: Chrysopidae). *Environ. Ent.* (Lanham), 27:480-487.
- Hileman, B.  
2000. Bt threat to monarch caterpillars affirmed. *Chem. Engineer. News* (Chicago), 78(35):7.
- Hodgson, J.  
2000. Critics slam new monarch Bt-corn data criticized. *Nature Biotech.* (New York), 18:1030.
- James, C.  
1999. Global review of commercialized transgenic crops: 1998. *Int. Serv. Acquis. Agri-Biotech Appl. Publ.* (Ithaca), 8.
- Johnson, M. T., and F. Gould  
1992. Interaction of genetically engineered host plant resistance and natural enemies of *Heliothis virescens* (Lepidoptera: Noctuidae). *Environ. Ent.* (Lanham), 21:586-597.
- Knowles, B. H., and J. A. T. Dow  
1993. The crystal delta-endotoxins of *Bacillus thuringiensis*: models for their mechanism of action on the insect gut. *BioEssays* (Cambridge), 15:469-476.
- Losey, J. E., L. S. Rayor, and M. E. Carter  
1999. Transgenic pollen harms monarch larvae. *Nature* (London), 399:214.
- Malcolm, S. B., B. J. Cockrell, and L. P. Brower  
1993. Spring recolonization of eastern North America by the monarch butterfly: successive brood or single sweep migration. In S. B. Malcolm and M. P. Zalucki (eds.), *Biology and Conservation of the Monarch Butterfly*, 253-267. Los Angeles: Nat. Hist. Mus. L. A. Co.
- Milius, S.  
2001. Bt corn risk to monarchs is "negligible." *Sci. News* (Washington), 160: 164.
- Munkvold, G. P., R. L. Hellmich, and L. G. Rice  
1999. Comparison of fumonisin concentrations in kernels of transgenic Bt maize hybrids and nontransgenic hybrids. *Plant Disease* (St. Paul), 83: 130-138.
- Oberhauser, K. S., M. D. Prysby, H. R. Matilla, D. E. Stanley-Horne, M. K. Sears, D. Galen, E. Olson, J. M. Pleasants, W.-K. F. Lam, and R. L. Hellmich  
2001b. Temporal and spatial overlap between monarch larvae and corn pollen. *Proc. Natl. Acad. Sci.* (Washington), 2001 Early Edition:1-6.
- Paoletti, M. G., and D. Pimentel  
1996. Genetic engineering in agriculture and the environment. *BioSci.* (Washington), 46:665-673.
- Pilcher, C. D., J. J. Obrycki, M. E. Rice, and L. C. Lewis  
1997. Preimaginal development, survival, and field abundance of insect predators on transgenic *Bacillus thuringiensis* corn. *Environ. Ent.* (Lanham), 26:446-454.
- Pilcher, C. D., M. E. Rice, J. J. Obrycki, and L. C. Lewis  
1997. Field and laboratory evaluation of transgenic *Bacillus thuringiensis* corn on secondary lepidopteran pests (Lepidoptera: Noctuidae). *J. Econ. Ent.* (Lanham), 90:669-678.
- Pimentel, D. S., and P. H. Raven  
2000. Commentary. Bt corn pollen impacts on nontarget Lepidoptera: assessment of effects in nature. *Proc. Natl. Acad. Sci.* (Washington), 97:8198-8199.
- Pollack, A.  
2001a. Data on genetically modified corn. *New York Times*, Sept. 8.  
2001b. New research fuels debate over genetic food altering. *New York Times*, Sept. 9.
- Raynor, G. S., E. C. Ogden, and J. V. Hayes  
1972. Dispersion and deposition of corn pollen from experimental sources. *Agron. J.* (Madison), 64:420-427.
- Schuler, T. H.  
2000. The impact of insect resistant GM crops on populations of natural enemies. *Antenna* (London), 24:59-65.
- Sears, M. K., R. L. Hellmich, D. E. Stanley-Horn, K. S. Oberhauser, J. M. Pleasants, H. R. Matilla, B. D. Siegfried, and G. P. Diveley  
2001. Impact of Bt corn pollen on monarch butterfly populations: a risk assessment. *Proc. Natl. Acad. Sci.* (Washington), 2001 (Oct) Early Edition (PDF).
- Shelton, A. M., and M. K. Sears  
2001. The monarch butterfly controversy: scientific interpretation of a phenomenon. *Plant J.* (), 27:483-488.
- Snow, A. A., and P. M. Palma  
1997. Commercialization of transgenic plants: potential ecological risks. *BioSci.* (Washington), 47:86-96.
- Stanley-Horn, D. E., G. P. Diveley, R. L. Hellmich, H. R. Matilla, M. K. Sears, R. Rose, L. C. H. Jesse, J. E. Losey, J. J. Obrycki, and L. Lewis  
2001. Assessing the impact of Cry1Ab-expressing corn pollen on monarch butterfly larvae in field studies. *Proc. Natl. Acad. Sci.* (Washington), 2001 Early Edition:1-6.
- Tabashnik, B. E.  
1994. Evolution of resistance to *Bacillus thuringiensis*. *Ann. Rev. Ent.* (Palo Alto), 39:47-79.
- Tuskes, P. M., and L. P. Brower  
1978. Overwintering ecology of the monarch butterfly, *Danaus plexippus* L., in California. *Ecol. Ent.* (Lanham), 3:141-153.
- Wagner, D. L., J. W. Peacock, J. L. Carter, and S. E. Talley  
1996. Field assessment of *Bacillus thuringiensis* on nontarget Lepidoptera. *Environ. Ent.* (Lanham), 25:1444-1454.
- Wassenaar, L. I., and K. A. Hobson  
1998. Natal origins of migratory monarch butterflies at wintering colonies in Mexico: new isotopic evidence. *Proc. Natl. Acad. Sci.* (Washington), 95:15436-15439.
- Whaley, W. H., J. Anhold, and G. B. Schaalje  
1998. Canyon drift and dispersion of *Bacillus thuringiensis* and its effects on select nontarget lepidopterans in Utah. *Environ. Ent.* (Lanham), 27: 539-548.
- Wraight, C. L., A. R. Angeri, M. J. Carroll, and M. R. Berenbaum  
2000. Absence of toxicity of *Bacillus thuringiensis* pollen to black swallow-tails under field conditions. *Proc. Natl. Acad. Sci.* (Washington), 94: 770-773.
- Yoon, C. K.  
1999a. Altered corn may imperil butterfly, researchers say. *New York Times*, May 20.  
1999b. No consensus on the effects of engineering on corn crops. *New York Times*, Nov. 4.  
2000a. E.P.A. announces new rules on genetically altered corn. *New York Times*, Jan. 17.  
2000b. Type of biotech corn found to be safe to a butterfly species. *New York Times*, Jun. 6.  
2000c. New data in duel of biotech corn vs. butterflies. *New York Times*, Aug. 22.  
2000d. Biotech corn isn't serious threat to monarchs, draft U.S. report finds. *New York Times*, Sep. 26.  
2000e. What's next for biotech crops? *New York Times*, Dec. 19.  
2001. Genetic modification taints corn in Mexico. *New York Times*, Oct. 2.
- Zalucki, M. P., and R. L. Kitching  
1982. Temporal and spatial variation of mortality in field populations of *Danaus plexippus* L. and *D. chrysippus* L. larvae (Lepidoptera: Nymphalidae). *Oecolog.* (Berlin), 53:201-207.



# NEW LITERATURE - 2000

References included herein are from the 2000 primary Lepidoptera literature of books and major journals, totalling 1,824 titles (see *Lepid. News.*, March 2000, for a listing of major journals consulted). The bibliography is divided into sections for the subject matter of the papers cited: General, Personalia/History, Morphology/Physiology, Economic/Medical, Holarctic, and Tropical papers. The economic section includes only those papers on Lepidoptera pests that may be of more general interest to members; not listed are about as many papers as are listed herein, involving Lepidoptera in such subjects as pest control, molecular biology, silkworm culture, etc., or where a lepidopteran is only used as the subject of various experimental studies. Within the Holarctic and Tropical sections, the papers (mostly taxonomic) are listed alphabetically by family and author, or under the more general headings of Heterocera, Lepidoptera, and Rhopalocera. Papers are listed once except in rare instances where the subject matter pertains to more than one section or family. Notations are made in square brackets after some citations for the country or countries involved, or the taxa being discussed, when this is not obvious from the title. Papers listed with English titles, but with text in other languages, have the text language noted in square brackets at the end of that citation. Papers are dated with dates of issue; thus, some citations show a cover date at the end different from the actual date of issue (papers not noting the true issue date in the issue have the correct date in square brackets). J.B.H.

## GENERAL

- Agassiz, D.**  
2000. Hazards of moth collecting - Uganda. *Ent. Rec. J. Var.* (Surrey), 112:218-219.
- Aridjis, H.**  
2000. Flight of kings. The monarch butterfly: memory and poetry. *Amicus J.* (New York), 22:26-29. [Mexico]
- Arnqvist, G., M. Edvardsson, U. Friberg, and T. Nilsson**  
2000. Sexual conflict promotes speciation in insects. *Proc. Natl. Acad. Sci.* (Washington), 97:10460-10464. [Sweden]
- Barendregt, A., T. Heijerman, R. Kleukers, and M. Ottenheim**  
2000. Is re-introduction of insects useful? *Ent. Ber.* (Amsterdam), 60:131-136. [Netherlands]
- Basset, Y.**  
2000. Insect herbivores foraging on seedlings in an unlogged rain forest in Guyana: spatial and temporal considerations. *Stud. Neotrop. Faun. Environ.* (Lisse), 35:115-129. [Panama]
- Bink, F. A.**  
2000. Re-introduction of insects, a practical approach. *Ent. Ber.* (Amsterdam), 60:96-106. [Netherlands]
- Boettner, G. H., J. S. Elkinton, and C. J. Boettner**  
2000. Effects of a biological control introduction on three nontarget native species of saturniid moths. *Conserv. Biol.* (Cambridge), 14:1798-1806. [USA]
- Boots, M.**  
2000. Kinship and cannibalism in the Indian meal moth, *Plodia interpunctella*: no evidence of kin discrimination. *Evol. Ecol. Res.* (Tucson), 2:251-256. [Japan]
- Boroughs, D.**  
2000. On the wings of hope. *Int. Wildlife* (Reston), 30(4):12-19. [Papilionoidea; Kenya]
- Bouchie, A. J.**  
2000. Bt corn kills monarch? *Nature Biotech.* (New York), 18:1025. [Nymphalidae; USA]
- Boughton, D. A.**  
2000. The dispersal system of a butterfly: a test of source-sink theory suggests the intermediate-scale hypothesis. *Amer. Nat.* (Chicago), 156:131-144. [Nymphalidae; USA]
- Brakefield, P. M., and T. G. Liebert**  
2000. Evolutionary dynamics of declining melanism in the peppered moth in the Netherlands. *Proc. Roy. Soc. (B) Biol. Sci.* (London), 267:1953-1957. [Geometridae]
- Bristow, R.**  
2000. First millennium butterflies? *Ent. Rec. J. Var.* (Surrey), 112:130. [England]
- Bruening, G.**  
2000. Transgenes are revolutionizing crop production. *Calif. Agric.* (Berkeley), 54(4):36-46. [Noctuidae, Nymphalidae; USA]
- Brusca, R. C.**  
2000. Unraveling the history of arthropod biodiversification. *Ann. Missouri Bot. Garden* (St. Louis), 87:13-25.
- Brusseaux, G.**  
2000. Les Insectes, nouveaux acteurs dans la protection de la nature. *Alexanor* (Paris), 21:67-70. (1999). [France]
- Chapman, J. W., T. Williams, A. M. Martinez, J. Cisneros, P. Caballero, R. D. Cave, and D. Goulson**  
2000. Does cannibalism in *Spodoptera frugiperda* (Lepidoptera: Noctuidae) reduce the risk of predation? *Behav. Ecol. Sociobiol.* (Berlin), 48:321-327. [Nicaragua]
- Collinge, S. K.**  
2000. Effects of grassland fragmentation on insect species loss, colonization, and movement patterns. *Ecol.* (Washington), 81:2211-2226. [USA]
- Cook, L. M.**  
2000. Changing views on melanic moths. *Biol. J. Linn. Soc.* (London), 69:431-441. [England]
- Corbet, S. A.**  
2000. Butterfly nectaring flowers: butterfly morphology and flower form. *Ent. Exp. Appl.* (Amsterdam), 96:289-298. [England]
- Costen, P. D. M.**  
2000. Millennial moths. *Ent. Rec. J. Var.* (Surrey), 112:130. [England]
- Cowley, M. J. R., R. J. Wilson, J. L. Leon-C., D. Gutierrez, C. R. Bulman, and C. D. Thomas**  
2000. Habitat-based statistical models for predicting the spatial distribution of butterflies and day-flying moths in a fragmented landscape. *J. Appl. Ecol.* (Oxford), 37(Suppl. 1):60-72. [England]
- Danks, H. V.**  
2000. Measuring and reporting life-cycle duration in insects and arachnids. *Eur. J. Ent.* (Ceské Budějovice), 97:285-303.
- DeVries, P. J.**  
2000a. Diversity of butterflies. In S. Levin (ed.), *Encyclopedia of Biodiversity*, 559-574. San Diego: Academic Pr.  
2000b. The other side of butterfly diversity: symbiotic associations between caterpillars and ants. *Lore* (Milwaukee), 2000:5-11.
- Dudley, R.**  
2000. *The Biomechanics of Insect Flight: Form, Function, Evolution*. Princeton: Princeton Univ. Pr. 476pp., 6 pls.
- Eubanks, M. D., and R. F. Denno**  
2000. Host plants mediate omnivore-herbivore interactions and influence prey suppression. *Ecol.* (Washington), 81:936-947. [Noctuidae; USA]
- Forslund, M.**  
2000. New regulations for protection of species by the law. *Ent. Tidskr.* (Stockholm), 121:13-20. [Sweden] [in Swedish]
- Fullard, J. H., L. D. Otero, A. Orellana, and A. Surlykke**  
2000. Auditory sensitivity and diel flight activity in Neotropical Lepidoptera. *Ann. Ent. Soc. Amer.* (Lanham), 93:956-965. [Venezuela]
- García-B., E.**  
2000. Climate and size in butterflies (Lepidoptera: Papilionoidea). *Bol. Asoc. Esp. Ent.* (Burjassot), 24:47-64. [in Spanish]
- Gogstad, G. O.**  
2000. Acid rain and the disappearance of the apollo butterfly *Parnassius apollo* (L., 1758) from coastal areas of Norway. *Norw. J. Ent.* (Trondheim), 47: 25-28.
- Gotthard, K.**  
2000. Increased risk of predation as a cost of high growth rate: an experimental test in a butterfly. *J. Anim. Ecol.* (Oxford), 69:896-902. [Nymphalidae; Switzerland]
- Goverde, M., M. G. A. van der Heijden, W. Wiemken I. R. Sanders, and A. Erhardt**  
2000. Arbuscular mycorrhizal fungi influence life history traits of a lepidopteran herbivore. *Oecolog.* (Berlin), 125:362-369. [Lycaenidae; Switzerland]
- Hamar, K. C., and J. K. Hill**  
2000. Scale-dependent effects of habitat disturbance on species richness in tropical forests. *Conserv. Biol.* (Cambridge), 14:1435-1440. [Indonesia]
- Hansen, J., L. C., and J. J. Obrycki**  
2000. Field deposition of Bt transgenic corn pollen: lethal effects on the monarch butterfly. *Oecolog.* (Berlin), 125:241-248. [Nymphalidae; USA]
- Hanski, I., and O. Ovaskainen**  
2000. The metapopulation capacity of a fragmented landscape. *Nature* (London), 404:755-758. [Finland]
- Hedwig, B.**  
2000. A highly sensitive opt-electronic system for the measurement of movements. *J. Neurosci. Methods* (Amsterdam), 100:165-171. [England]
- Hernandez, F., and R. Guillen**  
2000. Microwave processing for scanning electron microscopy. *Eur. J. Morphol.* (Lisse), 38:109-111.
- Heyer, W. R., J. Coddington, W. J. Kress, P. Acevedo, D. Cole, T. L. Erwin, B. J. Meggers, M. G. Pogue, R. W. Thorington, R. P. Vari, M. J. Weitzman, and S. H. Weitzman**  
[2000]. Amazonian biotic data and conservation decisions. *Cienc. Cultura* (São Paulo), 51:372-385. (1999)
- Hileman, B.**  
2000. Bt threat to monarch caterpillars affirmed. *Chem. Engineer. News* (Chicago), 78(35):7. [USA]
- Hodgson, J.**

2000. Critics slam new monarch Bt-corn data criticized. *Nature Biotech.* (New York), 18:1030. [Nymphalidae; USA]
- Hunter, A. F., and J. S. Elkinton**  
2000. Effects of synchrony with host plant on populations of a spring-feeding lepidopteran. *Ecol.* (Washington), 81:1248-1261. [Lymantriidae; USA]
- Jang, Y.-W., and M. D. Greenfield**  
2000. Quantitative genetics of female choice in an ultrasonic pyralid moth, *Achroia grisella*: variation and evolvability of preference along multiple dimensions of the male advertisement signal. *Heredity* (Oxford), 84:73-80. [USA]
- Jensen, M. N.**  
2000. Silk moth deaths show perils of biocontrol. *Sci.* (Washington), 290:2230-2231. [Saturniidae; USA]
- Johnson, K.**  
2000a. A journey to Nabokov's Karner, New York — a conservation dilemma. *News Lepid. Soc.* (Los Angeles), 42:45-47. [USA]  
2000b. Monarch experts gather in New York: sound alarm on monarch situation in Mexico. *News Lepid. Soc.* (Los Angeles), 42:96-97, 102-103. [USA]
- Kilman, S.**  
2000. Modified corn threat to butterfly, study affirms. *Wall Street J.* (New York), 236 (Aug. 22): B8. [Nymphalidae; USA]
- King, R. S.**  
2000. Evaluation of survey methods for the Karner blue butterfly on the Necedah Wildlife Management Area. *Trans. Wisc. Acad. Sci.* (Madison), 88:67-75. [USA]
- Kitching, R. L., A. G. Orr, L. Thalib, H. Mitchell, M. S. Hopkins, and A. W. Graham**  
2000. Moth assemblages as indicators of environmental quality in remnants of upland Australian rain forest. *J. Appl. Ecol.* (Oxford), 37:284-297. [Australia]
- Kolligs, D.**  
2000. Ecological effects of artificial light sources on nocturnally active insects, in particular on butterflies (Lepidoptera). *Faun.-Ökol. Mitt. Suppl.* (Neumünster), 28:1-136. [Germany] [in German]
- Kruys, I.**  
2000. Butterfly watching: an alternative to collecting. *Fauna Flora* (Stockholm), 95:105-112. [in Swedish]
- Lande, R., P. J. DeVries, and T. R. Walla**  
2000. When species accumulation curves intersect: implications for ranking diversity using small samples. *Oikos* (Copenhagen), 89:601-605. [USA]
- Larsen, T. B.**  
2000a. Hazards of butterfly collecting — anybody there? — Botswana 1991. *Ent. Rec. J. Var.* (Surrey), 112:21-22.  
2000b. Hazards of butterfly collecting — the non-turbulent priest — Ghana 1994. *Ent. Rec. J. Var.* (Surrey), 112:89-91.  
2000c. Hazards of butterfly collecting: visiting the Flemings — Malaysia, 1975. *Ent. Rec. J. Var.* (Surrey), 112:135-137.  
2000d. Hazards of butterfly collecting — chasing *Papilio parsimon*, London 1999. *Ent. Rec. J. Var.* (Surrey), 112:167-168. [Sierra Leone]  
2000e. Butterfly rape. *Ent. Rec. J. Var.* (Surrey), 112:182. [Philippines]  
2000f. Hazards of butterfly collecting — Juche in Burkina Faso, February 1988. *Ent. Rec. J. Var.* (Surrey), 112:217-218.  
2000g. Hazards of butterfly collecting — late 1999. What is *Brephidium exilis* doing in the Emirates? *Ent. Rec. J. Var.* (Surrey), 112:273-274.
- Lawes, M. J., H. A. C. Eeley, and S. E. Piper**  
2000. The relationship between local and regional diversity of indigenous forest fauna in KwaZulu-Natal Province, South Africa. *Biodivers. Conserv.* (London), 9:683-705.
- Li, Q.-X.**  
2000. New usage of the computer in insect classification. *Entomotaxon.* (Yangling), 22:153-156.
- Lushai, G., W. Fjellsted, O. Marcovitch, K. Aagaard, T. N. Sherratt, J. A. Allen, and N. Maclean**  
2000. Application of molecular techniques to non-lethal tissue samples of endangered butterfly populations (*Parnassius apollo* L.) in Norway for conservation management. *Biol. Conserv.* (Oxford), 94:43-50.
- Lynn, M.**  
2000. Antibiotics for butterflies and moths? *News Lepid. Soc.* (Los Angeles), 42:70. [USA]
- Maelzer, D. A., and M. P. Zalucki**  
2000. Long range forecasts of the numbers of *Helicoverpa punctigera* and *H. armigera* (Lepidoptera: Noctuidae) in Australia using the southern oscillation index and the sea surface temperature. *Bull. Ent. Res.* (London), 90:133-146.
- Milius, S.**  
2000. Fly may be depleting U.S. giant silk moths. *Sci. News* (Washington), 158:359.
- Mitchell, A., C. Mitter, and J. C. Regier**  
2000. More taxa or more characters revisited: combining data from nuclear protein-encoding genes for phylogenetic analyses of Noctuoidea (Insecta: Lepidoptera). *Syst. Biol.* (Bristol, Pa), 49:202-224.
- Nabli, H., W. C. Bailey, and S. Necibi**  
2000. Responses of Lepidoptera in central Missouri to traps with different light sources. *J. Kansas Ent. Soc.* (Lawrence), 72:82-90. (1999). [USA]
- Negron-O., V., and D. L. Gorchov**  
2000. Effects of fire season and postfire herbivory on the cycad *Zamia pumila* (Zamiaceae) in slash pine savanna, Everglades National Park, Florida. *Int. J. Plant Sci.* (Chicago), 161:659-669. [Arctiidae; USA]
- Nel, J., and A. Nel**  
2000. Microlépidoptères méconnus: plus de 750 espèces en danger en France. Plaidoyer pour une recherche fondamentale négligée (Insecta, Lepidoptera). *Bull. Soc. Ent. Fr.* (Paris), 105:213-216.
- Novotny, V., and Y. Basset**  
2000. Rare species in communities of tropical insect herbivores: pondering the mystery of singletons. *Oikos* (Copenhagen), 89:564-572. [New Guinea]
- Odegaard, F.**  
2000. How many species of arthroods? Erwin's estimate revised. *Biol. J. Linn. Soc.* (London), 71:583-597.
- Orivel, J., and A. Dejean**  
2000. Myrmecophily in Hesperidae. The case of *Vettius tertianus* in ant gardens. *Comp. Rend. Acad. Sci. (3. Sci. Vie)* (Paris), 323:705-715. [Israel]
- Pimentel, D. S., and P. H. Raven**  
2000. Bt corn pollen impacts on nontarget Lepidoptera: assessment of effects in nature. *Proc. Natl. Acad. Sci.* (Washington), 97:8198-8199. [USA]
- Plant, C. W.**  
2000. Hazards of moth collecting: taking the hiss in Hampshire. *Ent. Rec. J. Var.* (Surrey), 112:168-169, [England]
- Pogue, M. G.**  
2000. Preliminary estimates of Lepidoptera diversity from specific sites in the Neotropics using complementarity and species richness estimators. *J. Lepid. Soc.* (Los Angeles), 53:65-71. (1999)
- Raghu, S.**  
2000. Insect collection in the tropics; obsessions, myths and realities. *Antenna* (London), 24:135-140.
- Richers, K.**  
2000. Classic collecting campaigns: Greer, Arizona. *News Lepid. Soc.* (Los Angeles), 42:42-43.
- Rust, J.**  
2000. Fossil record of mass moth migration. *Nature* (London), 405:530-531.
- Rudolph, D. C., and C. A. Ely**  
2000. The influence of fire on lepidopteran abundance and community structure in forested habitats of eastern Texas. *Texas J. Sci.* (San Angelo), 52 (Suppl.):127-138. [Rhopalocera; USA]
- Rydell, J., and W. C. Lancaster**  
2000. Flight and thermoregulation in moths were shaped by predation from bats. *Oikos* (Copenhagen), 88:13-18. [Sweden]
- Santoro, G.**  
2000. Silent summer. *Discover* (New York), 21:76-79. [USA]
- Schmitt, T.**  
2000. Eine *Erebia aethiopella* (Hoffmannsegg, 1806) mit drei Fühlern (Lepidoptera: Nymphalidae, Satyrinae). *Nach. Ent. Ver. Apollo* (Frankfurt), (n.s.) 21:191-192. [France]
- Schuler, T. H.**  
2000. The impact of insect resistant GM crops on populations of natural enemies. *Antenna* (London), 24:59-65.
- Soberón, J., J. E. Llorente-B., and L. Oñate**  
2000. The use of specimen-label databases for conservation purposes: an example using Mexican papilionid and pierid butterflies. *Biodivers. Conserv.* (London), 9:1441-1466.
- Speakman, J. R., and J. Rydell**  
2000. Avoidance Behaviour of bats and moths: when is it predator defence? *Oikos* (Copenhagen), 88:221-223. [Sweden]
- Springer, J.**  
2000. Definitive destination: the New Jersey pine barrens. *Amer. Butt.* (Morristown), 8(4):4-16. [USA]
- Sukhovolskii, V. G., T. M. Ovchinnikova, and T. A. Vshivkova**  
2000. The insect as consumer: the effective behavior model. *Dokl. Akad. Nauk* (St. Petersburg), 373:424-426. [Lymantriidae; Russia] [in Russian]
- Svensson, G. P.**  
2000. Tracking insects with harmonic radar. *Fauna Flora* (Stockholm), 95:92-96. [Sweden]
- Travassos, M. A., and N. E. Pierce**  
2000. Acoustics, context and function of vibrational signaling in a lycaenid butterfly-ant mutualism. *Anim. Behav.* (London), 60:13-26. [Australia]
- Volney, W. J. A., and R. A. Fleming**  
2000. Climate change and impacts of boreal forest insects. *Agric. Ecosyst. Environ.* (Amsterdam), 82:283-294. [Tortricidae; Canada]
- Wade, N.**  
2000. In death-defying act, butterfly thrives on poison vine. *New York Times*,



**Weast, R. D.**

2000. Using the antibiotic Ciprio to reduce disease in Saturniidae. *News Lepid. Soc.* (Los Angeles), 42:40. [USA]

**Wiegmann, B. M., C. Mitter, J. C. Regier, T. P. Friedlander, D. M. Wagner, and E. S. Nielsen**

2000. Nuclear genes resolve Mesozoic-aged divergences in the insect order Lepidoptera. *Molec. Phylog. Evol.* (San Diego), 15:242-259.

**Willott, S. J., D. C. Lim, S. G. Compton, and S. L. Sutton**

2000. Effects of selective logging on the butterflies of a Bornean rainforest. *Conserv. Biol.* (Cambridge), 14:1055-1065. [Borneo]

**Work, T. T., and D. G. McCullough**

2000. Lepidopteran communities in two forest ecosystems during the first gypsy moth outbreaks in northern Michigan. *Environ. Ent.* (Lanham), 29: 884-900. [USA]

**Wright, C. L., A. R. Anger, M. J. Carroll, and M. R. Berenbaum**

2000. Absence of toxicity of *Bacillus thuringiensis* pollen to black swallowtails under field conditions. *PNAS USA*, 94:770-773.

**Wranik, W.**

2000. The Socotra Archipelago at the turn of the millennium. *Quadrifina* (Vienna), 3:71-271.

**Wynhoff, I., J. G. B. Oostermeijer, C. A. M. van Swaay, J. G. van der Made, and H. H. T. Prins**

2000. Re-introduction in practice: *Maculinea teleius* and *M. nausithous* (Lepidoptera: Lycaenidae). *Ent. Ber.* (Amsterdam), 60:107-117. [Netherlands]

**Yoon, C. K.**

- 2000a. New data in duel of biotech corn vs. butterflies. *New York Times*, 149 (Aug. 22):F2. [Nymphalidae; USA]
- 2000b. Monarch butterflies lose much of their wintering grounds. *New York Times*, 149 (Sep. 12):F1, F4. [Nymphalidae; Mexico]
- 2000c. Biotech corn isn't serious threat to monarchs, draft U.S. report finds. *New York Times*, 150 (Sep. 26):F4. [Nymphalidae; USA]

**PERSONALIA and HISTORY****Anon.**

- 2000a. [Obituary]: Kazuo Saitoh. *Lepid. News* (Gainesville), 1999(4):52. [Japan]
- 2000a. [Obituary]: John Hinchliff. *News Lepid. Soc.* (Los Angeles), 42:14. [USA]
- 2000b. [Obituary]: Dr. Ralph W. Macy. *News Lepid. Soc.* (Los Angeles), 42:14. [USA]
- 2000c. [Obituary]: Dr. W. Herb Wagner, Jr. *News Lepid. Soc.* (Los Angeles), 42:14. [USA]
- 2000d. [Obituary]: Dr. J. Benjamin Ziegler. *News Lepid. Soc.* (Los Angeles), 42:14. [USA]
- 2000e. [Obituary]: Ralph Macy, scientist and author, dies at 94. *News Lepid. Soc.* (Los Angeles), 42: 43.
- 2000f. [Obituary]: Gerhard Hesselbarth. *News Lepid. Soc.* (Los Angeles), 42:71. [Germany]
- 2000g. [Obituary]: Dr. Stanley Temple. *News Lepid. Soc.* (Los Angeles), 42:71. [USA]
- 2000h. [Obituary]: Benjamin Harrison Landing, M.D. *News Lepid. Soc.* (Los Angeles), 42:71. [USA]
- 2000i. [Obituary]: Dr. Sonja E. Teraguchi. *News Lepid. Soc.* (Los Angeles), 42:97. [USA]
- 2000j. [Obituary]: Richard Fall. *News Lepid. Soc.* (Los Angeles), 42:97. [USA]

**Bastin, J.-P.**

2000. In memoriam, L. A. Berger. *Lambill.* (Tervuren), 100:572-573. [Belgium]

**Boyd, B., and R. M. Pyle**

2000. *Nabokov's Butterflies: Unpublished and Uncollected Writings*. Boston: Beacon Pr. 782pp., 31 pls.

**Buchsbaum, U.**

2000. Prof. Dr. Zdravko Lorković (1900-1998). *Nachbl. Bayer. Ent.* (Munich), 49:43-44. [Croatia]

**Buhs, J. B.**

2000. Building on bedrock: William Steel Creighton and the reformation of ant systematics, 1926-1970. *J. Hist. Biol.* (Dordrecht), 33:27-70. [USA]

**Cohen, A.**

2000. Roland Trimen in South Africa; butterflies and Bowkers. *Antenna* (London), 24:124-134.

**Fryer, G.**

2000. James Bolton's 18th century paintings of Lepidoptera. *Naturalist* (Sheffield), 125:113-119. [England]

**Gaedike, R.**

2000. Axel Scholz (11.6.1957-30.6.1998). *Nota Lepid.* (Basel), 23:78-80. [Germany]

**Heppner, J. B.**

2000. Shall Mary Villiers, Duchess of Richmond, have a butterfly patronym?

**Klausnitzer, B.**

2000. Laudatio für Herrn Sanitätsrat Dr. Helmut Steuer anlässlich der Verleihung der Ehrenmitgliedschaft durch die Entomofaunistische Gesellschaft e.V. Üdersee bei Eberswalde, am 13.5.2000. *Ent. Nachr. Ber.* (Dresden), 44:211-213. [Germany]

**Kobes, L. W. R.**

2000. Obituary: Stefan Kager, Nuremberg, 10/7/1915-10/01/1998. In *Heterocera Sumatrana*, 12(2):63-65. Göttingen: Heteroc. Sumatrana Soc. [Germany] [in German]

**Metzler, E. H.**

2000. *MONA* is 30 years old in 2000. *News Lepid. Soc.* (Los Angeles), 42:41. [USA]

**Meyer-Westfeld, N.**

2000. Gerhard Hesselbarth 2. Februar 1912-31. Dezember 1999. *Nachr. Ent. Ver. Apollo* (Frankfurt), (n.s.) 21:24. [Germany]

**Nässig, W. A.**

- 2000a. Schmetterlingssammlung von Willi Cron, Oberursel, an das Museum Senckenberg gegangen. *Nachr. Ent. Ver. Apollo* (Frankfurt), (n.s.) 21:81. [Germany]

- 2000b. Die Schmetterlingssammlung von Hermann Wilde an das Forschungsinstitut Senckenberg gelangt. *Nachr. Ent. Ver. Apollo* (Frankfurt), (n.s.) 21:112. [Germany]

**Naumann, C. M.**

- 2000a. Zu Besuch beim Grossfürsten Nikolai Mikhailovich Romanoff. *Ent. Zeit.* (Stuttgart), 110:12-17. [Georgia; Russia]

- 2000b. Shahkuh — ein Traum wird wahr. *Ent. Zeit.* (Stuttgart), 110:203-211. [Iran]

**Nicolay, S. S.**

2000. Dr. J. Benjamin Ziegler (1917-2000). *News Lepid. Soc.* (Los Angeles), 42:14-15. [USA]

**Olivier, A.**

2000. Christian Friedrich Freyer's "Neue Beiträge zur Schmetterlingskunde mit Abbildungen nach der Natur": an alysis, with new data on its publication dates. *Beitr. Ent.* (Berlin), 50:407-486.

**Peigler, R. S., and E. W. Classey**

2000. Seitz' *Macrolepidoptera of the World*: perspectives from a taxonomist and a publisher. *News Lepid. Soc.* (Los Angeles), 42:93-95, 108-109.

**Pierre, J.**

- 2000a. In memoriam. Jean Bourgogne (1903-1999). *Bull. Soc. Ent. Fr.* (Paris), 104:407-408. (1999) [France]

- 2000b. In memoriam. Georges Bernardi (1922-1999). *Bull. Soc. Ent. Fr.* (Paris), 105:5-14. [France]

**Plant, C. W.**

- 2000a. Steve Church. *Ent. Rec. J. Var.* (Surrey), 112:84. [England]

- 2000b. Brian Baker. *Ent. Rec. J. Var.* (Surrey), 112:126. [England]

**Salmon, M. A.**

2000. *The Aurelian Legacy: British Butterflies and their Collectors*. Great Horkesley: Harley Bks. 432pp.

**Venable, R.**

2000. Meet the butterflyers: Harry LeGrand. *Amer. Butt.* (Morristown), 8(4):26-29. [USA]

**MORPHOLOGY and PHYSIOLOGY****Alekseev, A. A., A. V. Tkachev, A. K. Dobrotvorskii, J. A. Klun, and G. A. Tolstikov**

2000. A study of synthetic attractants of Siberian moth *Dendrolimus superans* Butl. (Lepidoptera: Lasiocampidae). *Dokl. Akad. Nauk* (St. Petersburg), 373:129-131. [Russia] [in Russian]

**Anderson, P., E. Hallberg, and M. Subchev**

2000. Morphology of antennal sensilla auricillica and their detection of plant volatiles in the herald moth, *Scoliopteryx libatrix* L. (Lepidoptera: Noctuidae). *Arth. Struct. Develop.* (Oxford), 29:33-41. [Sweden]

**Arakaki, N., and S. Wakamura**

2000. Different electroantennograms and field responses in males to virgin females between Okinawa and Ishigaki strains of the tussock moth, *Orgyia postica* (Lepidoptera: Lymantriidae). *Ent. Sci.* (Tokyo), 3:421-426.

**Backman, A.-C., P. Anderson, M. Bengtsson, J. Lofqvist, C. R. Unelius, and P. Witzgall**

2000. Antennal response of codling moth males, *Cydia pomonella* L. (Lepidoptera: Tortricidae), to the geometric isomers of codlemone and codlemone acetate. *J. Comp. Physiol. (A) Sens. Neural Behav. Physiol.* (Berlin), 186:513-519. [Sweden]

**Badegana, A. M., and P. H. Ngameni**

2000. Rearing of potato tuber moth *Phthorimaea operculella* Zel. (Lepidoptera: Gelechiidae) in the laboratory, biological parameters and influence of sugar levels in the feeding of adults. *Tropicult.* (Brussels), 18:23-25. [Cameroon] [in French]

- Belanger, J. H., and B. A. Trimmer**  
2000. Combined kinematic and electromyographic analyses of proleg function during crawling by the caterpillar *Manduca sexta*. *J. Comp. Physiol. (A) Sens. Neur. Behav. Physiol.* (Berlin), 186:1031-1039. [Sphingidae; USA]
- Benny, T. M., and V. S. K. Nair**  
[2000]. Involvement of ecdysteroids in the fusion of testes lobes of *Spodoptera mauritia* Boisd. (Lepidoptera: Noctuidae). *J. Ent. Res.* (New Delhi), 23:343-345. (1999) [India]
- Briscoe, A. D.**  
2000. Six opsins from the butterfly *Papilio glaucus*: molecular phylogenetic evidence for paralogous origins of red-sensitive visual pigments in insects. *J. Molec. Evol.* (Berlin), 51:110-121. [Papilionidae; USA]
- Brückmann, M., J. R. Trigo, M. A. Foglio, and T. Hartmann**  
2000. Storage and metabolism of radioactively labeled pyrrolizidine alkaloids by butterflies and larvae of *Mechanitis polymnia* (Lepidoptera: Nymphalidae, Ithomiinae). *Chemoecol.* (Basel), 10:25-32. [Brazil]
- Burghardt, F., H. Knüttel, M. Becker, and K. Fiedler**  
2000. Flavonoid wing pigments increase attractiveness of female common blue (*Polyommatus icarus*) butterflies to mate-searching males. *Naturwiss.* (Berlin), 87:304-307. [Lycaenidae; Germany]
- Callahan, F. E., R. G. Vogt, M. L. Tucker, J. C. Dickens, and A. K. Mattoo**  
2000. High level expression of "male specific" pheromone binding proteins (PBPs) in the antennae of female noctuid moths. *Ins. Biochem. Molec. Biol.* (Oxford), 30:507-514. [USA]
- Cardé, R. T., and B. G. J. Knols**  
2000. Effects of light levels and plume structure on the orientation manoeuvres of male gypsy moths flying along pheromone plumes. *Physiol. Ent.* (London), 25:141-150. [Lymantriidae; USA]
- Clark, R. M.**  
2000. A technique for extraction of intact mitochondrial DNA molecules from larvae of saturniid moths (Lepidoptera: Saturniidae) for use in taxonomic studies. *J. Lepid. Soc.* (Los Angeles), 53:49-54. (1999) [USA]
- Consoulas, C., U. Rose, and R. B. Levine**  
2000. Remodeling of the femoral chordotonal organ during metamorphosis of the hawkmoth, *Manduca sexta*. *J. Comp. Neurol.* (Berlin), 426:391-405. [Sphingidae; USA]
- Córdoba-A., A.**  
2000. Evolución y diversidad de la morfología de los genitales masculinos en insectos. *Fol. Ent. Mex.* [Xalapa], 110:95-111.
- Cymborowski, B.**  
2000. Temperature-dependent regulatory mechanism of larval development of the wax moth (*Galleria mellonella*). *Acta Biochem. Polon.* (Warsaw), 47:215-221. [Poland]
- Daly, K. C., and A. J. Figueredo**  
2000. Habituation of sexual response in male *Heliothis* moths. *Physiol. Ent.* (London), 25:180-190. [Noctuidae; USA]
- Daly, K. C., and B. H. Smith**  
2000. Associative olfactory learning in the moth *Manduca sexta*. *J. Exp. Biol.* (Cambridge), 203:2025-2038. [Sphingidae; USA]
- Danks, H. V.**  
2000. Insect cold hardiness: a Canadian perspective. *Cryo Lett.* (Cambridge), 21:297-308.
- DeBarr, G. L., J. L. Hanula, C. G. Niwa, and J. C. Nord**  
2000. Synthetic pheromones disrupt male *Dioryctria* spp. moths in a loblolly pine seed orchard. *Can. Ent.* (Ottawa), 132:345-351. [USA]
- Delisle, J., J.-F. Picimbon, and J. Simard**  
2000. Regulation of pheromone inhibition in mated females of *Choristoneura fumiferana* and *C. rosaceana*. *J. Ins. Physiol.* (Oxford), 46:913-921. [Canada]
- Deml, R.**  
2000a. Morphological details of the larval 'funnel warts' of *Lymantria dispar* (Linnaeus, 1758) (Lepidoptera: Lymantriidae). *Ent. Zeit.* (Stuttgart), 110:168-170. [Germany]  
2000b. Morphological aspects of the horn-shaped scoli of the larva of *Attacus atlas* (Linnaeus, 1758) (Lepidoptera: Saturniidae). *Nach. Ent. Ver. Apollo* (Frankfurt), (n.s.) 21:177-180. [Thailand]
- Dolinskaya, I. V., and I. G. Pljushch**  
2000. A comparative characteristic of the moth eggs of Noctuoidea and "bombycoid complex" (Lepidoptera) and its significance for the systematics. *Ent. Basil.* (Basel), 22:298-292.
- Dussourd, D. E., and A. M. Hoyle**  
2000. Poisoned plusiines: toxicity of milkweed latex and cardenolides to some generalist caterpillars. *Chemoecol.* (Basel), 10:11-16. [Noctuidae; USA]
- Drijfhout, F. P., T. A. Van beek, J. H. Visser, and A. De Groot**  
2000. On-line thermal desorption-gas chromatography of insect pheromones for pheromone analysis. *J. Chem. Ecol.* (New York), 26:1383-1392. [Tortricidae; Netherlands]
- Dudley, R.**  
2000. *The Biomechanics of Insect Flight: Form, Function, Evolution*. Princeton: Princeton Univ. Pr. 476pp.
- Eiras, A. E.**  
2000. Calling behaviour and evaluation of sex pheromone glands extract of *Neoleucinoides elegantis* Guenée (Lepidoptera: Crambidae) in wind tunnel. *An. Soc. Ent. Bras.* (Itabuna), 29:453-460. [Brazil]
- Ekesi, S.**  
2000. Effect of volatiles and crude extracts of different plant materials on egg viability of *Maruca vitrata* and *Clavigralla tomentosicollis*. *Phytoparasit.* (Rehovot), 28:305-310. [Pyralidae; Kenya]
- El-Sayed, A., I. Liblikas, and R. Unelius**  
2000. Flight and molecular modeling study on the response of codling moth, *Cydia pomonella* (Lepidoptera: Tortricidae) to (E,E)-8,10-dodecadien-1-ol and its geometrical isomers. *Zeit Naturfor. (C) Biosci.* (Tübingen), 55:1011-1017. [Canada]
- Evenden, M. L., G. J. R. Judd, and J. H. Borden**  
2000. Investigations of mechanisms of pheromone communication disruption of *Choristoneura rosaceana* (Harris) in a wind tunnel. *J. Ins. Behav.* (New York), 13:499-510. [Tortricidae; USA]
- Everaerts, C., M. Cusson, and J. N. McNeil**  
2000. The influence of smoke volatiles on sexual maturation and juvenile hormone biosynthesis in the black army cutworm, *Actebia fennica* (Lepidoptera: Noctuidae). *Ins. Biochem. Molec. Biol.* (Oxford), 30:855-862. [Canada]
- Fantinou, A. A., and E. A. Kogkou**  
2000. Effect of thermoperiod on diapause induction of *Sesamia nonagrioides* (Lepidoptera-Noctuidae). *Environ. Ent.* (Lanham), 29:489-494. [Greece]
- Fordyce, J. A.**  
2000. A model without a mimic: aristolochic acids from the California pipevine swallowtail, *Battus philenor hirsuta*, and its host plant, *Aristolochia californica*. *J. Chem. Ecol.* (New York), 26:2567-2578. [Papilionidae; USA]
- Foster, S. P., and W. P. Thomas**  
2000. Identification of a sex pheromone component of the raspberry budmoth, *Heterocrossa rubophaga*. *J. Chem. Ecol.* (New York), 26:2549-2555. [Carposinidae; New Zealand]
- Francke, W., E. Plass, N. Zimmermann, H. Tietgen, T. Tolasch, S. Franke, M. Subchev, T. Toshova, J. A. Pickett, L. J. Wadhams, and C. M. Woodcock**  
2000. Major sex pheromone component of female herald moth *Scoliopteryx libatrix* is the novel branched alkene (6Z,13)-methylheneicosene. *J. Chem. Ecol.* (New York), 26:1135-1149. [Noctuidae; England]
- Fullard, J. H., L. D. Otero, A. Orellana, and A. Surlykke**  
2000. Auditory sensitivity and diel flight activity in Neotropical Lepidoptera. *Ann. Ent. Soc. Amer.* (Lanham), 93:956-965.
- Galizia, C. G., and R. Menzel**  
2000. Probing the olfactory code. *Nature Neurosci.* (), 3:853-845. [Sphingidae; Germany]
- Galizia, C. G., S. Sachse, and H. Mustaparta**  
2000. Calcium responses to pheromones and plant odours in the antennal lobes of the male and female moth *Heliothis virescens*. *J. Comp. Physiol. (A) Sens. Neur. Behav. Physiol.* (Berlin), 186:1049-1063. [Noctuidae; Germany]
- Garvey, L. K., G. M. Gutierrez, and H. M. Krider**  
2000. Ultrastructure and morphogenesis of the apyrene and eupyrene spermatozoa in the gypsy moth (Lepidoptera: Lymantriidae). *Ann. Ent. Soc. Amer.* (Lanham), 93:1147-1155. [USA]
- Gemenio, C., A. F. Lutfallah, and K. F. Haynes**  
2000. Pheromone blend variation and cross-attraction among populations of the black cutworm moth (Lepidoptera: Noctuidae). *Ann. Ent. Soc. Amer.* (Lanham), 93:1322-1328. [USA]
- Gere, G.**  
[2000]. The nutritional value of the biomass of butterflies and moths in temperate and tropical climates, II. *Opusc. Zool.* (Budapest), 31:63-68. [Hungary, Vietnam]
- Gilbert, N., and D. A. Raworth**  
2000. Insects and temperature — differential effects of experimental conditions on growth and development. *Can. Ent.* (Ottawa), 132:539-549. [Pieridae; Australia, Canada, England]
- Gomi, T.**  
2000. Effects of timing of diapause induction on winter survival and reproductive success in *Hyphantria cunea* in a transition area of voltinism. *Ent. Sci.* (Tokyo), 3:433-438. [Arctiidae; Japan]
- Gotthard, K., S. Nylin, and C. Wiklund**  
2000. Individual state controls temperature dependence in a butterfly (*Lasiomata maera*). *Proc. Roy. Soc. (B) Biol. Sci.* (London), 267:589-593. [Nymphalidae; Switzerland]
- Grant, A. J., and R. J. O'Connell**  
2000. Responses of olfactory receptor neurons in *Utetheisa ornatrix* to gender-specific odors. *J. Comp. Physiol. (A) Sens. Neur. Behav. Physiol.* (Berlin), 186:535-542.
- Grant, G. G., B. Zhao, and D. Langevin**



2000. Oviposition response of spruce budworm (Lepidoptera: Tortricidae) to aliphatic carboxylic acids. *Environ. Ent.* (Lanham), 29:164-170. [Canada]
- Greenfield, M. D., and T. Weber**
  2000. Evolution of ultrasonic signalling in wax moths: discrimination of ultrasonic mating calls from bat echolocation signals and the exploitation of an anti-predator receiver bias by sexual advertisement. *Ethol. Ecol. Evol.* (Florence), 12:259-279. [Pyralidae; USA]
- Gronning, E. K., D. M. Borchert, D. G. Pfeiffer, C. M. Felland, J. F. Walgenbach, L. A. Hull, and J. C. Killian**
  2000. Effect of specific and generic sex attractant blends on pheromone trap captures of four leafroller species in Mid-Atlantic apple orchards. *J. Econ. Ent.* (Lanham), 93:157-164. [USA]
- Hansen, M. D. D.**
  2000. Lipid content of migrant red admirals (*Vanessa atalanta* L.) in Denmark in autumn 1998. *Ent. Medd.* (Copenhagen), 68:133-135.
- Hasenfuss, I.**
  2000. Evolutionary pathways of truncanal tympanal organs in Lepidoptera (Insecta: Holometabola). *Zool. Anz.* (Jena), 239:27-44.
- Hirayama, C., M. Sugimura, H. Saito, and M. Nakamura**
  2000. Host plant urease in the hemolymph of the silkworm, *Bombyx mori*. *J. Ins. Physiol.* (Oxford), 46:1415-1421. [Bombycidae; Japan]
- Hiro Yoshi, S.**
  2000. Effects of aging, temperature and photoperiod on testis development of *Polygona c-aureum* (Lepidoptera: Nymphalidae). *Ent. Sci.* (Tokyo), 3: 227-236. [Japan]
- Honda, H., M. Tanemura, and A. Yoshida**
  2000. Differentiation of wing epidermal scale cells in a butterfly under the lateral inhibition model: appearance of large cells in a polygonal pattern. *Acta Biotheoret.* (Dordrecht), 48:121-136. [Pieridae; Japan]
- Hong, J., G.-Y. Ye, L.-X. Xing, C. Hu, and T. Matsumura**
  - [2000]. Ultrastructural comparisons among male external genitalia of four *Leuconia* species (Lepidoptera: Papilionidae). (1999) [China] [in Chinese]
- Howell, J. F., and L. G. Neven**
  2000. Physiological development time and zero development temperature of the codling moth (Lepidoptera: Tortricidae). *Environ. Ent.* (Lanham), 29:766-772. [USA]
- Hou, M.-L., and C.-F. Sheng**
  2000. Effects of different foods on growth, development and reproduction of cotton bollworm, *Helicoverpa armigera* (Hübner) (Lepidoptera: Noctuidae). *Acta Ent. Sinica* (Beijing), 43:168-175. [China] [in Chinese]
- Hwang, J.-S., C.-C. Hung, and C.-Y. Liu**
  2000. Electroantennogram responses of the carambola fruit borer, *Eucosma notanthes* Meyrick (Lepidoptera: Eucosmidae), to sex pheromone chemicals. *Zhonghua Kunchong* (Taipei), 20:97-107. [Taiwan] [in Chinese]
- Jayaswal, K. P., and S. K. Raut**
  2000. Influence of low temperature incubation on diapause and quantitative traits in *Bombyx mori* L. *Uttara Pradesh J. Zool.* (Muzaffarnagar), 20: 233-237. [Bombycidae; India]
- Jiggins, F. M., G. D. D. Hurst, C. D. Jiggins, J. H. G. van den Schulenburg, and M. E. N. Majerus**
  2000. The butterfly *Danaus chrysippus* is infected by a male-killing *Spiroplasma* bacterium. *Parasitol.* (Cambridge), 120:439-446. [East Africa]
- Johnson, K. S., and R. V. Barbehenn**
  2000. Oxygen levels in the gut lumens of herbivorous insects. *J. Ins. Physiol.* (Oxford), 46:897-903. [USA] [Lymantriidae]
- Joseph, T. M.**
  2000. Antifeedant and growth inhibitory effects of neem seed kernel extract on *Ailanthus* defoliator, *Eligma narcissus indica* Roth. (Lepidoptera: Noctuidae). *Entomon* (Trivandrum), 25:67-72. [India]
- Juan, A., A. Sans, and M. Riba**
  2000. Antifeedant activity of fruit and seed extracts of *Melia azedarach* and *Azadirachta indica* on larvae of *Sesamia nonagrioides*. *Phytoparasit.* (Rehovot), 28:311-319. [Noctuidae; Spain]
- Kawaguchi, Y., M. Ichida, T. Kusakabe, and K. Koga**
  2000. Chorion morphology of the eri-silkworm, *Samia cynthia ricini* (Donovan) (Lepidoptera: Saturniidae). *Appl. Ent. Zool.* (Tokyo), 35:427-434. [Japan]
- Kawamura, N., N. Yamashiki, H. Saitoh, and K. Sahara**
  2000. Peristaltic squeezing of sperm bundles at the late stage of spermatogenesis in the silkworm, *Bombyx mori*. *J. Morphol.* (New York), 246:53-58. [Bombycidae; Japan]
- Kerns, D. L.**
  2000. Mating disruption of beet armyworm (Lepidoptera: Noctuidae) in vegetables by a synthetic pheromone. *Crop Prot.* (Oxford), 19:327-334. [USA]
- Kim, Y.-G., and W.-R. Song**
  2000. Effect of thermoperiod and photoperiod on cold tolerance of *Spodoptera exigua* (Lepidoptera: Noctuidae). *Environ. Ent.* (Lanham), 29:868-873. [USA]
- Kitamoto, J., K. Ozaki, and K. Arikawa**
  2000. Ultraviolet and violet receptors express identical mRNA encoding an ultraviolet-absorbing opsin: identification and histological localization of two mRNAs encoding short-wavelength-absorbing opsins in the retina of the butterfly *Papilio xuthus*. *J. Exp. Biol.* (Cambridge), 203:2887-2894. [Japan]
- Klitzke, C. F., and K. S. Brown, Jr.**
  2000. The occurrence of aristolochic acids in Neotropical troilid swallowtails (Lepidoptera: Papilionidae). *Chemoecol.* (Basel), 10:99-102. [Brazil]
- Kosegawa, E., G. V. Reddy, K. Shimizu, and T. Okajima**
  2000. Induction of non-diapause egg by dark and low temperature incubation in local variety of the silkworm, *Bombyx mori*. *J. Sericult. Sci. Japan* (Tokyo), 69:369-375. [Bombycidae; Japan] [in Japanese]
- Kou, R., and S.-J. Chen**
  2000. Allatotrophic and nervous control of corpora allata in the adult male loyey leafworm, *Mythimna loyeyi* (Lepidoptera: Noctuidae). *Physiol. Ent.* (London), 25:273-280. [Taiwan]
- Kozlov, M. V., E. Haukioja, and E. F. Kovnatsky**
  2000. Uptake and excretion of nickel and copper by leaf-mining larvae of *Eriocrania semipurpurella* (Lepidoptera: Eriocraniidae) feeding on contaminated birch foliage. *Envir. Pollut.* (Barking), 108:303-310.
- Krenn, H. W.**
  2000. Proboscis musculature in the butterfly, *Vanessa cardui* (Nymphalidae, Lepidoptera: settling the proboscis recoiling controversy. *Acta Zool.* (Stockholm), 81:259-266. [Austria]
- Krenn, H. W., and N. P. Kristensen**
  2000. Early evolution of the proboscis of Lepidoptera (Insecta): external morphology of the galea in basal glossatan moths lineages, with remarks on the origin of the pilifers. *Zool. Anz.* (Jena), 239:179-196.
- Kumar, V., A. M. Babu, B. K. Kariappa, K. P. Jayaswal, R. L. Katiyar, and R. K. Datta**
  2000. Surface ultrastructure of the egg chorion of *Spilarctia obliqua* Walker (Lepidoptera Arctiidae). *Redia* (Florence), 82:137-143. (1999) [India]
- Landolt, P. J.**
  2000. New chemical attractants for trapping *Lacanobia subjuncta*, *Mamestra configurata*, and *Xestia c-nigrum* (Lepidoptera: Noctuidae). *J. Econ. Ent.* (Lanham), 93:101-106. [USA]
- Lapshin, D. N., and M. V. Fyodorova**
  2000. The functions of the B-cell in the tympanic organs of nocturnal moths (Lepidoptera: Noctuoidea). *Sensor. Sist.* (Moscow), 14:148-155. [Russia] [in Russian]
- Lapshin, D. N., and D. D. Vorontsov**
  - 2000a. Ultrasonic emission of noctuid moths (Lepidoptera, Noctuidae): main characteristics of signals and possible mechanisms of their generation. *Zool. Zhurn.* (Moscow), 79:1189-1201. [Russia] [in Russian]
  - 2000b. Reactions of noctuid moths (Noctuidae, Lepidoptera) to retransmitted echo-like signals. *Sensor. Sist.* (Moscow), 14:156-166. [Russia] [in Russian]
  - 2000c. Frequency tuning of the hearing system of noctuid moths (Lepidoptera: Noctuidae) during flight. *Sensor. Sist.* (Moscow), 14:304-313. [Russia] [in Russian]
- Layne, J. R., Jr., and D. K. Kuharsky**
  2000. Triggering of cryoprotectant synthesis in the woolly bear caterpillar (*Pyrrharctia isabella* Lepidoptera: Arctiidae). *J. Exp. Zool.* (New York), 286:367-371. [England]
- Lebedeva, K. V., N. V. Vendilo, S. A. Kurbatov, V. A. Pletnev, V. L. Ponomarev, Y. B. Pyatnova, and N. I. Bocharova**
  2000. Identification of the pheromone of eastern-meadow cutworm *Mythimna separata* (Lepidoptera: Noctuidae). *Agrokhim.* (Moscow), 5:57-69. [Russia] [in Russian]
- Lebedeva, K. V., N. V. Vendilo, V. A. Pletnev, V. L. Ponomarev, S. A. Kurbatov, V. V. Voronkova, and V. A. Shchennikov**
  2000. Search for the pheromone of heart-and-dart moth *Agrotis exclamationis* (Lepidoptera: Noctuidae). *Agrokhim.* (Moscow), 8:71-75. [Russia] [in Russian]
- Legaspi, J. C., B. C. Legaspi, Jr., and R. R. Saldana**
  - [2000]. Evaluation of a synthetic pheromone for control of the Mexican rice borer (Lepidoptera: Pyralidae) in south Texas. *Subtrop. Plant Sci.* (Edinburg, Tx), 51:49-55. (1999) [USA]
- Li, Q., S. D. Eigenbrode, G. R. Stringman, and M. R. Thiagarajah**
  2000. Feeding and growth of *Plutella xylostella* and *Spodoptera eridania* on *Brassica juncea* with varying glucosinolate concentrations and myrosinase activities. *J. Chem. Ecol.* (New York), 26:2401-2419. [Noctuidae, Plutellidae; USA]
- Liang, T., S. Kuwahara, M. Hasegawa, and O. Kodama**
  2000. Simple synthesis of 5,9-dimethylated long-chain alkanes, the sex pheromones of leaf miner moths. *Biosci. Biotech. Biochem.* (Tokyo), 64: 2474-2477. [Japan]

- Lödl, M.  
2000a. Details of the "posterior abdominal brush" and other scent organs of quadrifine noctuids with special reference to Hypeninae and Herminiinae (Lepidoptera: Noctuidae). *Quadrifina* (Vienna), 3:279-294.  
2000b. The modification of the "posterior notal wing process" of the forewing in the family Noctuidae and its importance for taxonomy (Insecta, Lepidoptera). *Quadrifina* (Vienna), 3:303-323.  
2000c. The "scaphium-pocket" and the "pocket-knife"-functional and morphological peculiarities of the uncus of noctuid moths (Insecta: Lepidoptera: Noctuidae). *Ann. Naturhist. Mus. Wien (B) Bot. Zool.* (Vienna), 102:7-21.
- Loudon, C., and M. A. R. Koehl  
2000. Sniffing by a silkworm moth: wing fanning enhances air penetration through and pheromone interception by antennae. *J. Exp. Biol.* (Cambridge), 203:2977-2990. [Bombycidae; USA]
- Luhkhtanov, V. A.  
2000. Sex chromatin and sex chromosome systems in nonditrysian Lepidoptera (Insecta). *J. Zool. Syst. Evol. Res.* (Berlin), 38:73-79.
- Malo, E. A., M. Renou, and A. Guerrero  
2000. Analytical studies of *Spodoptera litoralis* sex pheromone components by electroantennography and coupled gas chromatography-electroantennographic detection. *Talanta* (Amsterdam), 52:525-532.
- Mancebo, F., L. Hilje, G. A. Mora, and R. Salazar  
2000. Antifeedant activity of *Quassia amara* (Simaroubaceae) extracts on *Hypsipyla grandella* (Lepidoptera: Pyralidae) larvae. *Crop Prot.* (Oxford), 19:301-305. [Costa Rica]
- Marek, J., F. Krampl, and I. Hrdý  
2000. (E,Z)-7,9-dodecadien-1-yl acetate acts as attractant for males of the genus *Idaea* (Lepidoptera: Geometridae: Sterrhinae). *Plant Prot. Sci.* (Brno), 36:95-100. [Czech Rep.]
- McElfresh, J. S., X. Chen, D. W. Ross, and J. G. Millar  
2000. Sex pheromone blend of the pandora moth (Lepidoptera: Saturniidae), an outbreak pest in pine forests (Pinaceae). *Can. Ent.* (Ottawa), 132:775-787. [USA]
- Mielke, C. G.  
[2000]. Morfología externa de lepidópteros como una importante herramienta de clasificación. *Mariposas Mundo* (Buenos Aires), 5:5-9. [Brazil]
- Miller, N. W., J. R. Nechols, M. J. Horak, and T. M. Loughin  
2000. Photoperiodic regulation of seasonal diapause induction in the field bindweed moth, *Tyta luctuosa* (Lepidoptera: Noctuidae). *Biol. Contr.* (Orlando), 19:139-148. [Italy, USA]
- Morrow, E. H.  
2000. Giant sperm in a Neotropical moth *Xenosoma geometrigna* (Lepidoptera: Arctiidae). *Eur. J. Ent.* (České Budějovice), 97:281-283.
- Morrow, E. H., and M. J. G. Gage  
2000. The evolution of sperm length in moths. *Proc. Roy. Soc. (B) Biol. Sci.* (London), 267:307-313. [England]
- Murlis, J., M. A. Willis, and R. T. Cardé  
2000. Spatial and temporal structures of pheromone plumes in fields and forests. *Physiol. Ent.* (London), 25:211-222. [Lymantriidae; USA]
- Nagaraju, J.  
2000. Recent advances in molecular genetics of the silk moth, *Bombyx mori*. *Curr. Sci.* (Bangalore), 78:151-161. [India]
- Neven, L. G., H. L. Ferguson, and A. Knight  
2000. Sub-zero cooling synchronizes post-diapause development of codling moth, *Cydia pomonella*. *Cryo Lett.* (Cambridge), 21:203-214. [Tortricidae; USA]
- Nomura, M., and T. Miyata  
2000. Effects of pyriproxyfen, insect growth regulator on reproduction of common cutworm, *Spodoptera litura* (Fabricius) (Lepidoptera: Noctuidae). *Japan. J. Appl. Ent. Zool.* (Tokyo), 44:81-88. [Japan] [in Japanese]
- Norman, A. P., and G. Jones  
2000. Size, peripheral auditory tuning and target strength in noctuid moths. *Physiol. Ent.* (London), 25:346-353. [England]
- O'Brien, D. M., D. P. Schrag, and C. Martinez-del R.  
2000. Allocation to reproduction in a hawkmoth: a quantitative analysis using stable carbon isotopes. *Ecol.* (Washington), 81:2822-2831. [Sphingidae; USA]
- O'Dwyer, C., and P. M. Attiwill  
2000. Restoration of a native grassland as habitat for the golden sun moth *Synemon plana* Walker (Lepidoptera: Castniidae) at Mount Piper, Australia. *Restor. Ecol.* (Malden, Ma), 8:170-174.
- Oliver, J. E., J. C. Dickens, M. Zlotina, V. C. Mastro, and G. I. Yurchenko  
[2000]. Sex attractant of the rosy Russian gypsy moth (*Lymantria mathura* Moore). *Zeit. Naturfor. (C) Biosci.* (Tübingen), 54:387-394. (1999) [Russia]
- Ômura, H., K. Honda, and N. Hayashi  
2000. Identification of feeding attractants in oak sap for adults of two nymphalid butterflies, *Kaniska canace* and *Vanessa indica*. *Physiol. Ent.* (London), 25:281-287. [Japan]
- Ômura, H., S. Morinaka, and K. Honda  
2000. Chemical nature of volatile compounds from the valvae and wings of male *Delias* butterflies (Lepidoptera: Pieridae). *Ent. Sci.* (Tokyo), 3:427-432. [Bali, New Guinea]
- Ono, H., R. Nishida, and Y. Kuwahara  
2000a. Oviposition stimulant for a Rutaceae-feeding sawflytail butterfly, *Papilio bianor* (Lepidoptera: Papilionidae): hydroxycinnamic acid derivative from *Orixa japonica*. *Appl. Ent. Zool.* (Tokyo), 35:119-123. [Japan]  
2000b. A dihydroxy- $\gamma$ -lactone as an oviposition stimulant for the swallowtail butterfly, *Papilio bianor*, from the rutaceous plant, *Orixa japonica*. *Biosci. Biotech. Biochem.* (Tokyo), 64:1970-1973. [Japan]
- Osborn, F., F. Sánchez, and K. Jaffé  
2000. Ultrastructure of the spines and neck gland of *Abananote hylonome* Doubleday, 1844 (Lepidoptera: Nymphalidae). *Int. J. Ins. Morph. Embryol.* (Oxford), 28:321-330. [Venezuela]
- Palli, S. R., T. R. Ladd, W. L. Tomkins, S. Shu, S. B. Ramaswamy, Y. Tanaka, B. Arif, and A. Retnakaran  
2000. *Choristoneura fumiferana* entomopoxvirus prevents metamorphosis and modulates juvenile hormone and ecdysteroid titers. *Ins. Biochem. Molec. Biol.* (Oxford), 30:869-876. [Tortricidae; Canada]
- Panday, A. K., and V. B. Upadhyay  
[2000]. Impact of refrigeration of eggs and prerefrigeration period on the larval weight of *Bombyx mori* Linn. *J. Adv. Zool.* (Gorakhpur), 20:85-89. (1999) [Bombycidae; India]
- Park, Y.-I., H. A. Wood, and Y.-C. Lee  
[2000]. Monosaccharide compositions of *Danaus plexippus* (monarch butterfly) and *Trichoplusia ni* (cabbage looper) egg glycoproteins. *Glycoconjugate J.* (London), 16:629-638. (1999) [USA]
- Peloquin, J. J., S. T. Thibault, R. Staten, and T. A. Miller  
2000. Germ-line transformation of pink bollworm (Lepidoptera: Gelechiidae) mediated by the piggyBac transposable element. *Ins. Molec. Biol.* (Oxford), 9:323-333. [USA]
- Petersen, C., H. A. Woods, and J. G. Kingsolver  
2000. Stage-specific effects of temperature and dietary protein on growth and survival of *Manduca sexta* caterpillars. *Physiol. Ent.* (London), 25:35-40. [Sphingidae; USA]
- Pljushch, I. G., and I. V. Dolinskaya  
2000. External morphology of the eggs of some tiger-moths (Lepidoptera, Arctiidae). *Lambill.* (Tervuren), 100:33-41. [Ukraine]
- Poirier, L. M., and J. H. Borden  
2000. Influence of diet on repellent and feeding-deterrent activity of larval oral exudate in spruce budworms (Lepidoptera: Tortricidae). *Can. Ent.* (Ottawa), 132:81-89. [Canada]
- Qureshi, M. H., T. Murai, H. Yoshida, and H. Tsumuki  
2000. Populational variation in diapause-induction and -termination of *Helicoverpa armigera* (Lepidoptera: Noctuidae). *Appl. Ent. Zool.* (Tokyo), 35:357-360. [Japan]
- Ramaswamy, S. B., S. Shu, G. N. Mbata, A. Rachinsky, Y.-I. Park, L. Crigler, S. Donald, and A. Srinivasan  
2000. Role of juvenile hormone-esterase in mating-stimulated egg development in the moth *Heliothis virescens*. *Ins. Biochem. Molec. Biol.* (Oxford), 30:785-791. [Noctuidae; USA]
- Raubenheimer, D., and L. B. Browne  
2000. Developmental changes in the patterns of feeding in fourth- and fifth-instar *Helicoverpa armigera* caterpillars. *Physiol. Ent.* (London), 25:390-399. [Noctuidae; Australia]
- Roesingh, P., K. H. Hora, S.-Y. Fung, A. Peltenburg, and S. B. J. Menken  
2000. Host acceptance behaviour of the small ermine moth *Yponomeuta cognagellus*: larvae and adults use different stimuli. *Chemoecol.* (Basel), 10:41-47. [Yponomeutidae; Netherlands]
- Roessler, W., L. P. Tolbert, and J. G. Hildebrand  
2000. Importance of timing of olfactory receptor-axon outgrowth for glomerulus development in *Manduca sexta*. *J. Comp. Neurol.* (New York), 425:233-243. [Sphingidae; Germany]
- Romeis, J., and F. L. Wäckers  
2000. Feeding responses by female *Pieris brassicae* butterflies to carbohydrates and amino acids. *Physiol. Ent.* (London), 25:247-253. [Switzerland]
- Rutowski, R. L.  
2000. Variation of eye size in butterflies: inter- and intraspecific patterns. *J. Zool.* (London), 252:187-195. [USA]
- Rutowski, R. L., and M. B. Kimball  
2000. Seeing the world through butterfly eyes. *Amer. Butt.* (Morristown), 8(4): 18-25. [USA]
- Sannino, L., and B. Espinosa  
2000. Comparative morphological study on pupae of Plusiinae and observations on the vice-like abdominal structures (Lepidoptera, Noctuidae). *Atalanta* (Munich), 31:229-243. [Italy]
- Sasaerila, Y., G. Gries, R. Gries, and T.-C. Boo  
2000. Specificity of communication channels in four limacodid moths: *Darna*



- bradleyi, *Darna trima*, *Setothosea asigna*, and *Setora nitens* (Lepidoptera: Limacodidae). *Chemoecol.* (Basel), 10:193-199. [Borneo]
- Sasaerila, Y., R. Gries, G. Gries, G. Khaskin, and Hardi  
2000. Sex pheromone components of nettle caterpillar, *Setora nitens*, *J. Chem. Ecol.* (New York), 26:1983-1990. [Limacodidae; Malaysia]
- Sawada, H., M. Nakagoshi, K. Mase, and T. Yamamoto  
2000. Occurrence of ommochrome-containing pigment granules in the central nervous system of the silkworm, *Bombyx mori*. *J. Comp. Physiol. (B) Comp. Biochem. Physiol.* (Berlin), 125B:421-428. [Japan]
- Si, S.-L., S.-F. Xu, and J.-W. Du  
2000. Pheromone activity of male accessory gland factors in female *Helicoverpa assulta*. *Acta Ent. Sinica* (Beijing), 43:120-126. [Noctuidae; China] [in Chinese]
- Silk, P. J., G. C. Loneragan, D. C. Allen, and S. Spear-O'Mara  
2000. Potential sex pheromone components of the saddled prominent (Lepidoptera: Notodontidae). *Can. Ent.* (Ottawa), 132:681-684. [Canada]
- Sime, K. R., P. P. Feeny, and M. M. Haribal  
2000. Sequestration of aristolochic acids by the pipevine swallowtail, *Battus philenor* (L.): evidence and ecological implications. *Chemoecol.* (Basel), 10:169-178. [Papilionidae; USA]
- Singtripop, T., S. Wanichacheewa, and S. Sakurai  
2000. Juvenile hormone-mediated termination of larval diapause in the bamboo borer, *Omphisa fuscidentalis*. *Ins. Biochem. Molec. Biol.* (Oxford), 30:847-854. [Pyralidae; Japan]
- Skals, N., and A. Surlykke  
2000. Hearing and evasive behaviour in the greater wax moth, *Galleria mellonella* (Pyralidae). *Physiol. Ent.* (London), 25:354-362. [Denmark]
- Steppan, S. J.  
2000. Flexural stiffness patterns of butterfly wings (Papilionoidea). *J. Res. Lepid.* (Beverly Hills), 35:61-77. (1996) [USA]
- Subchev, M., M. Toth, D. Wu, L. Stanimirova, T. Toshova, and Z. Karpate  
2000. Sex attractant for *Diloba caeruleocephala* (L.) (Lep., Dilobidae): (Z)-8-tridecenyl acetate. *J. Appl. Ent.* (Hamburg), 124:197-199. [Noctuidae; Bulgaria]
- Šula, J., and K. Spitzer  
2000. Allozyme polymorphism in isolated populations of the moth *Coenophila subrosea* (Lepidoptera: Noctuidae) from three central European peat bogs. *Eur. J. Ent.* (České Budějovice), 97:7-12. [Czech Rep.]
- Tabatabai, S., C. Chervin, A. Hamilton, and A. Hoffmann  
2000. Sensitivity of pupae of lightbrown apple moth, *Epiphyas postvittana* (Walker) (Lepidoptera: Tortricidae), to combinations of abiotic stresses. *Aust. J. Ent.* (Carlton), 39:78-82. [Australia]
- Takabayashi, J., Y. Sato, S. Yano, and N. Ohsaki  
2000. Presence of oily droplets from the dorsal setae of *Pieris rapae* larvae (Lepidoptera: Pieridae). *Appl. Ent. Zool.* (Tokyo), 35:115-118. [Japan]
- Takanashi, T., S. Ohno, Y.-P. Huang, S. Tatsuki, H. Honda, and Y. Ishikawa  
2000. A sex pheromone component novel to *Ostrinia* identified from *Ostrinia latipennis* (Lepidoptera: Crambidae). *Chemoecol.* (Basel), 10:143-147. [Japan]
- Tanzubil, P. B., G. W. K. Mensah, and A. R. McCaffery  
2000. Diapause initiation and incidence in the millet stem borer, *Coniesta ignefusalis* (Lepidoptera: Pyralidae): the role of the host plant. *Bull. Ent. Res.* (London), 90:365-371. [Ghana]
- Timmermann, S., and M. R. Berenbaum  
2000. Uric acid deposition in larval integument of black swallowtails and speculation on its possible functions. *J. Lepid. Soc.* (Los Angeles), 53:104-107. (1999) [USA]
- Tiwari, S. K., and R. S. Bhatt  
[2000]. Effect of barthrin on the developmental stages of rice-moth, *Corcyra cephalonica* Staint. (Lepidoptera: Pyralidae). *J. Adv. Zool.* (Gorakhpur), 20:103-105. (1999) [India]
- Tsuchihara, K., K. Ueno, A. Yamanaka, K. Isono, K. Endo, R. Nishida, K. Yoshihara, and F. Tokunaga  
2000. A putative binding protein for lipophilic substances related to butterfly oviposition. *FEBS Lett.* (Amsterdam), 478:299-303. [Japan]
- Tsumuki, H.  
2000. Review of low temperature tolerance and ice nuclei in insects, with special emphasis on larvae of the rice stem borer, *Chilo suppressalis* Walker. *Japan. J. Appl. Ent. Zool.* (Tokyo), 44:149-154. [Japan] [in Japanese]
- Tung, L.-C., J.-T. Lin, and R.-S. Tsai  
2000. Morphology of the compound eyes of hevea tussock moth, *Orgyia postica* (Lepidoptera: Lymantriidae). *Zhonghua Kunchong* (Taipei), 20:179-185. [Taiwan]
- Valeur, P. G., B. S. Hansson, K. Markebo, and C. Löfstedt  
2000. Relationship between sex pheromone elicited behaviour and response of single olfactory receptor neurones in a wind tunnel. *Physiol. Ent.* (London), 35:223-232. [Noctuidae; Sweden]
- Vukusic, P., J. R. Sambles, and C. R. Lawrence  
2000. Colour mixing in wing scales of a butterfly. *Nature* (London), 404:457. [SE Asia]
- Wakeham-Dawson, A., and O. Kudrna  
2000a. A quantitative description of androconia from Staudinger's *Pseudochazara de Lesse*, 1951 (Lepidoptera: Nymphalidae, Satyrinae) type specimens in the Zoological Museum of the Humboldt University of Berlin. *Ent. Gaz.* (Wallingford), 51:75-81. [Europe]
- Watanabe, M., M. Bon'no, and A. Hachisuka  
2000. Euphyrene sperm migrates to spermatheca after apyrene sperm in the swallowtail butterfly, *Papilio xuthus* L. (Lepidoptera: Papilionidae). *J. Ethol.* (Kyoto), 18:91-99. [Japan]
- Weller, S. J., R. B. Simmons, R. Boada, and W. E. Conner  
2000. Abdominal modifications occurring in wasp mimics of the Ctenuchine-Euchromiine clade (Lepidoptera: Arctiidae). *Ann. Ent. Soc. Amer.* (Lanham), 93:920-928. [Neotropical]
- Wijngarden, P. J., and P. M. Brakefield  
2000. The genetic basis of eyespot size in the butterfly *Bicyclus anynana*: an analysis of line crosses. *Heredity* (Oxford), 85:471-479. [Nymphalidae; Africa]
- Wipking, W., and J. Kurtz  
2000. Genetic variability in the diapause response of the burnet moth *Zygaena trifolii* (Lepidoptera: Zygaenidae). *J. Inst. Physiol.* (Oxford), 46:127-134. [Germany]
- Witzgall, P., M. Bengtsson, and R. M. Trimble  
2000. Sex pheromone of grape berry moth (Lepidoptera: Tortricidae). *Environ. Ent.* (Lanham), 29:433-436. [Canada]
- Wolf, K. W., C. Murphy, W. Reid, and E. Garraway  
2000. Fine structure of the eggshell in *Utetheisa ornatrix* (Lepidoptera: Arctiidae). *Invert. Reprod. Develop.* (Rehovot), 38:85-94. [Jamaica]
- Woods, H. A.  
2000. Patterns and mechanisms of growth of fifth-instar *Manduca sexta* caterpillars following exposure to low- or high-protein food during early instars. *Physiol. Biochem. Zool.* (), 72:445-454. [Sphingidae; USA]
- Woods, H. A., and E. A. Bernays  
2000. Water homeostasis by wild larvae of *Manduca sexta*. *Physiol. Ent.* (London), 25:82-87. [Sphingidae; USA]
- Xu, W.-H., Y.-J. Wang, L.-B. Zhang, and G.-P. Lin  
2000. Molecular cloning of a gene encoding the protein for pheromone biosynthesis activating neuropeptide in *Heliothis armigera*. *Acta Ent. Sinica* (Beijing), 43:113-119. [Noctuidae; China] [in Chinese]
- Yack, J. E., L. D. Otero, J. W. Dawson, A. Surlykke, and J. H. Fullard  
2000. Sound production and hearing in the blue cracker butterfly *Hamadryas feronia* (Lepidoptera, Nymphalidae) from Venezuela. *J. Exp. Biol.* (Cambridge), 203:3689-3702.
- Yadav, J. S., and E. J. Reddy  
2000. Synthesis of (3E,5Z)-3,5-dodecadienylacetate, the sex pheromone of *Phtheochroa cranaodes* (Lepidoptera, Tortricidae). *Biosci. Biotech. Biochem.* (Tokyo), 64:1713-1721. [India]
- Yamanaka, A., T. Ito, D. Koga, T. Sato, M. Ochiai, and K. Endo  
2000. Purification and characterization of biliverdin-binding protein from larval hemolymph of the swallowtail butterfly, *Papilio xuthus* L. *Biosci. Biotech. Biochem.* (Tokyo), 64:1978-1981. [Japan]
- Yamamoto, M., M. Kiso, H. Yamazawa, J. Takeuchi, and T. Ando  
2000. Identification of chiral sex pheromone secreted by giant geometrid moth, *Biston robustum* Butler. *J. Chem. Ecol.* (New York), 26:2579-2590. [Japan]
- Yoshida, A., A. Noda, A. Yamana, and H. Numata  
2000. Arrangement of scent scales in the male wings of the small white cabbage butterfly (Lepidoptera: Pieridae). *Ent. Sci.* (Tokyo), 3:345-349. [Japan]
- Zhao, C.-H.  
2000. Research progress on biosynthesis of sex pheromones in moths. *Acta Ent. Sinica* (Beijing), 43:429-439. [China] [in Chinese]
- Zhou, S.-J., R. S. Criddle, and E. J. Mitcham  
2000. Metabolic response of *Platynota stultana* pupae to controlled atmospheres and its relation to insect mortality response. *J. Ins. Physiol.* (Oxford), 46:1375-1385. [Tortricidae; USA]
- Zhou, X.-F., M. Coll, and S. W. Applebaum  
2000. Effect of temperature and photoperiod on juvenile hormone biosynthesis and sexual maturation in the cotton bollworm, *Helicoverpa armigera*: implications for life history traits. *Ins. Biochem. Molec. Biol.* (Oxford), 30:863-868. [Israel]
- Ziemba, K. S., and R. L. Rutowski  
2000. Sexual dimorphism in eye morphology in a butterfly (*Asterocampa leilia*; Lepidoptera, Nymphalidae). *Psyche* (Cambridge, Ma), 103:25-36. [USA]

# ECONOMIC LEPIDOPTERA

**Ballard, J., D. J. Ellis, and C. C. Payne**

2000. Uptake of granulovirus from the surface of apples and leaves by first instar larvae of the codling moth *Cydia pomonella* L. (Lepidoptera: Olethreutidae). *Biocontr. Sci. Tech.* (Abingdon), 10:617-625. [Tortricidae; England]

**Begum, A. N., H. K. Basavaraja, P. S. Rao, M. Rekha, and M. M. Ahsan**

2000. Identification of bivoltine silkworm hybrids suitable for tropical climates. *Indian J. Sericult.* (Mysore), 39:24-29. [Bombycidae; India]

**Bhatia, R., R. Sharma, and R. P. Agnihotri**

2000. Incidence, varietal preference and control of fruit borer, *Conopomorpha cramerella* (Lepidoptera: Gracillariidae) on litchi (*Litchi chinensis*) in Himachal Pradesh. *Indian J. Agric. Sci.* (Karnal), 70:301-304. [India]

**Boedts, B.**

- [2000]. Evaluation of commercial silkworm varieties and rearing practices in villages of north-eastern Thailand. *Tropicult.* (Brussels), 16-17:29-36. (1998-99) [in French]

**Briggs, C. J., S. M. Sait, M. Begon, D. J. Thompson, and H. C. J. Godfray**

2000. What causes generation cycles in populations of stored-product moths? *J. Anim. Ecol.* (Oxford), 69:352-366.

**Bruening, G.**

2000. Transgenes are revolutionizing crop production. *Calif. Agric.* (Berkeley), 54(4):36-46. [Noctuidae, Nymphalidae; USA]

**Butturini, A., R. Tiso, and F. Molinari**

2000. Phenological forecasting model for *Cydia funebrana*. *Bull. OEPP* (Oxford), 30:131-136. [Italy]

**Chagas, M. C. M., and J. R. P. Parra**

2000. *Phyllocnistis citrella* Stainton (Lepidoptera: Gracillariidae): técnica de criação e biologia em diferentes temperaturas. *An. Soc. Ent. Bras.* (Itabuna), 29:227-235. [Brazil]

**Cheng, C.-H.**

2000. Monitoring and forecasting of rice stem borer, *Chilo suppressalis* (Walker) based on the sex pheromone trap catches. *Plant Prot. Bull.* (Taichung), 42:201-212. [Taiwan] [in Chinese]

**Coll, M., S. Gavish, and I. Dori**

2000. Population biology of the potato tuber moth, *Phthorimaea operculella* (Lepidoptera: Gelechiidae), in two potato cropping systems in Israel. *Bull. Ent. Res.* (London), 90:309-315.

**Cooke, B. J., and J. Roland**

2000. Spatial analysis of large-scale patterns of forest tent caterpillar outbreaks. *Ecosci.* (Quebec), 7:410-422. [Lasiocampidae; Canada]

**Datta, R. K., and S. K. Ashwath**

2000. Strategies in genetics and molecular biology for strengthening silkworm breeding. *Indian J. Sericult.* (Mysore), 39:1-8. [Bombycidae; India]

**DeBarr, G. L., J. L. Hanula, C. G. Niwa, and J. C. Nord**

2000. Synthetic pheromones disrupt male *Dioryctria* spp. moths in a loblolly pine seed orchard. *Can. Ent.* (Ottawa), 132:345-351. [USA]

**Diaconu, A., C. Pisica, I. Andriescu, and A. Lozan**

2000. The complex of parasitoids of the feeding larvae of *Cydia pomonella* L. (Lep.: Tortricidae). *Mitt. Schweiz. Ent. Ges.* (Zurich), 73:13-22. [Romania]

**Doud, C. W., and T. W. Phillips**

2000. Activity of *Plodia interpunctella* (Lepidoptera: Pyralidae) in and around flour mills. *J. Econ. Ent.* (Lanham), 93:1842-1847. [USA]

**Ebenebe, A. A., J. van den Berg, and T. C. de K. van der Linde**

2000. Seasonal flight activity of the maize stalk borer, *Busseola fusca* (Fuller) (Lepidoptera: Noctuidae), in Lesotho. *Afr. Ent.* (Pretoria), 8:63-68.

**Erelli, M. C., and J. S. Elkinton**

- 2000a. Maternal effects on gypsy moth (Lepidoptera: Lymantriidae) population dynamics: a field experiment. *Environ. Ent.* (Lanham), 29:476-488. [USA]

- 2000b. Factors influencing dispersal in neonate gypsy moths (Lepidoptera: Lymantriidae). *Environ. Ent.* (Lanham), 29:509-515. [USA]

**Fitzpatrick, S. M., J. T. Troubridge, and D. Henderson**

2000. *Ochroleuca implecta* (Lepidoptera: Noctuidae), a new cutworm pest of cranberries. *Can. Ent.* (Ottawa), 132:365-367. [Canada]

**Habermann, M.**

- 2000a. The larch casebearer and its host tree: I. Population dynamics of the larch casebearer (*Coleophora laricella* Hbn.) from latent to outbreak density in the field. *For. Ecol. Mgmt.* (Amsterdam), 136:11-22. [Germany]

- 2000b. The larch casebearer and its host tree: II. changes in needle physiology of the infested trees. *For. Ecol. Mgmt.* (Amsterdam), 136:23-34. [Germany]

**Hicks, B. J., and A. D. Watt**

2000. Fungal disease and parasitism in *Panolis flammea* during 1998: evidence of change in the diversity and impact of the natural enemies of a forest pest. *Forestry* (Oxford), 73:31-36. [Scotland]

**Holloway, J. D.**

2000. Famille Noctuidae. In A. Polaszek, G. Delvare, and D. Blary (eds.), *Les Foreurs des Tiges de Cereales en Afrique: Importance Economique, Systematique, Ennemis naturels et Methodes de Lutte*, 81-89. Montpellier: Ctr. Coop. Internal. Rech. Agron. Devel. [Africa]

**Ikenaga, H., K. Yasuda, K. Hirano, H. Nakakita, and N. Sota**

2000. Seasonal prevalence of pink scavenger caterpillar, *Anatrachyntis rileyi* (Walsingham) (Lepidoptera: Cosmopterigidae) in rice and feed mills. *Japan. J. Appl. Ent. Zool.* (Tokyo), 44:229-234. [Japan] [in Japanese]

**Jeon, H.-Y., D.-S. Kim, M.-R. Cho, M.-S. Yi, and Y.-D. Chang**

2000. Recent status of major fruit tree pest occurrences in Korea. *J. Korean Soc. Hort. Sci.* (Seoul), 41:607-612. [Gracillariidae, Lyonetiidae] [in Korean]

**Keiper, J. B., M. Sanford, J. Jiannino, and W. E. Walton**

2000. Invertebrates inhabiting wetland monocots damaged by Lepidoptera. *Ent. News* (Philadelphia), 111:348-354. [Noctuidae; USA]

**Kfir, R.**

2000. Seasonal occurrence, parasitoids and pathogens of the African stem borer, *Busseola fusca* (Fuller) (Lepidoptera: Noctuidae), on cereal crops in South Africa. *Afr. Ent.* (Pretoria), 8:1-14.

**Khan, S., S. Davison, and M. G. Wright**

2000. Identification of an entomopathogenic bacterium that infected a colony of *Pieris brassicae* (Linnaeus) (Lepidoptera: Pieridae) in South Africa. *Afr. Ent.* (Pretoria), 8:141-143.

**Klein-K., C., and D. F. Waterhouse**

2000. *Distribution and Importance of Arthropods Associated with Agriculture and Forestry in Chile*. Canberra: Australian Ctr. Internatl. Agric. Res. 231pp.

**Kumar, M., and M. Ahmad**

2000. Record of lymantriid species defoliating *Paulownia fortunei* in India. *Indian For.* (Dehra Dun), 126:1319-1325.

**Lang, R. F., R. D. Richard, P. E. Parker, and L. Wendel**

2000. Release and establishment of diffuse and spotted knapweed biocontrol agents by USDA, APHIS, PPQ, in the United States. *Pan-Pac. Ent.* (San Francisco), 76:197-218.

**Leyva, K. J., and K. M. Clancy, and P. W. Price**

2000. Oviposition preference and larval performance of the western spruce budworm (Lepidoptera: Tortricidae). *Environ. Ent.* (Lanham), 29:281-289. [USA]

**Lo, P. L., D. M. Suckling, S. J. Bradley, J. T. S. Walker, P. W. Shaw, and G. M. Burnip**

2000. Factors affecting feeding site preferences of lightbrown apple moth, *Epiphyas postvittana* (Lepidoptera: Tortricidae), on apple trees in New Zealand. *New Zealand J. Crop Hort. Sci.* (Wellington), 28:235-243.

**Loganathan, J., and P. M. M. David**

- [2000]. Natural parasitism in teak defoliator, *Hyblaea puera* Cramer (Lepidoptera: Hyblaeidae) in intensively managed plantation. *J. Biol. Contr.* (Coimbatore), 13:115-120. (1999) [India]

**Luna, M. G., and N. E. Sanchez**

- [2000]. Specific composition and abundance of the soybean defoliator Lepidoptera community in northwest Buenos Aires, Argentina. *Revta. Soc. Ent. Arg.* (La Plata), 58:67-75. (1999) [in Spanish]

**Maes, K. V. N.**

- 2000a. Ordre Lepidoptera. Introduction. In A. Polaszek, G. Delvare, and D. Blary (eds.), *Les Foreurs des Tiges de Cereales en Afrique: Importance Economique, Systematique, Ennemis naturels et Methodes de Lutte*, 77-80. Montpellier: Ctr. Coop. Internal. Rech. Agron. Devel. [Africa]

- 2000b. Superfamille Pyraloidea: Crambidae, Pyralidae. In A. Polaszek, G. Delvare, and D. Blary (eds.), *Les Foreurs des Tiges de Cereales en Afrique: Importance Economique, Systematique, Ennemis naturels et Methodes de Lutte*, 91-103. Montpellier: Ctr. Coop. Internal. Rech. Agron. Devel. [Africa]

**Mani, M., C. Gopalakrishnan, and A. Krishnamoorthy**

2000. Natural parasitism on the pomegranate hairy caterpillar *Trabala vishnou* Lefevre (Lepidoptera: Lasiocampidae) in Karnataka. *Entomon* (Trivandrum), 25:241-243. [India]

**Mantey, K. D., H. R. Moffitt, and L. G. Neven**

2000. Laboratory rearing of lesser appleworm (Lepidoptera: Tortricidae). *J. Econ. Ent.* (Lanham), 93:1021-1024. [USA]

**Marini, fil., O. J.**

2000. Distance-limited recolonization of burned cerrado by leaf-miners and gallers in central Brazil. *Environ. Ent.* (Lanham), 29:901-906.

**Markin, G. P., and R. F. Nagata**

2000. Host suitability studies of the moth, *Pyrausta nereidella* Hampson (Lepidoptera: Pyralidae), as a control agent of the forest weed banana poka, *Passiflora mollissima* (HBK) Bailey, in Hawaii. *Proc. Hawaii. Ent. Soc.* (Honolulu), 34:169-179.

**McBride, J.**

2000. Fending off Siberian moths. *Agric. Res.* (Washington), 48(4):20. [Russia]

**McCravy, K. W., and C. W. Berisford**

2000. Parasitoids of the Nantucket pine tip moth (Lepidoptera: Tortricidae) in



- the coastal plain of Georgia. *J. Ent. Sci.* (Tifton), 35:220-226. [USA]
- Meijerman, L., W. E. van Ginkel, and S. A. Ulenberg**  
2000. Les chenilles electrophorese. In A. Polaszek, G. Delvare, and D. Blary (eds.), *Les Foreurs des Tiges de Cereales en Afrique: Importance Economique, Systematique, Ennemis naturels et Methodes de Lutte*, 121-125. Montpellier: Ctr. Coop. Int. Rech. Agron. Devel. [Africa]
- Meijerman, L., and S. A. Ulenberg**  
2000. Les chenilles morphologie. In A. Polaszek, G. Delvare, and D. Blary (eds.), *Les Foreurs des Tiges de Cereales en Afrique: Importance Economique, Systematique, Ennemis naturels et Methodes de Lutte*, 105-119. Montpellier: Ctr. Coop. Int. Rech. Agron. Devel. [Africa]
- Mendel, Z.**  
2000. The phytophagous insect fauna of *Pinus halepensis* and *P. brutia* forests in the Mediterranean. In *Ecology, Biogeography and Management of Pinus halepensis and P. brutia Forest Ecosystems in the Mediterranean Basin*, 217-236. Leiden: Bakhuis Publ.
- Mills, N., C. Pickel, S. Mansfield, S. McDougall, R. Nuchner, J. Caprile, J. Erdstrom, R. Elkins, J. Hasey, K. Kelley, B. Krueger, B. Olson, and R. Stocker**  
2000. Mass releases of *Trichogramma* wasps can reduce damage from codling moth. *Calif. Agric.* (Berkeley), 54(6):22-25. [Tortricidae; USA]
- Mo, J.-C., P.-J. Zhuang, and Z.-H. Tang**  
2000. Effect of migration on the evolution of resistance of pest population to insecticides. *Acta Ent. Sinica* (Beijing), 43:143-151. [Plutellidae; China] [in Chinese]
- Morewood, P., G. Gries, J. Liska, P. Kapitola, D. Haussler, K. Moller, and H. Bogenschutz**  
2000. Towards pheromone-based monitoring of nun moth, *Lymantria monacha* (L.) (Lep., Lymantriidae) populations. *J. Appl. Ecol.* (Oxford), 124:77-85. [Europe]
- Nagarkatti, S., A. Muza, and M. Saunders**  
2000. Meridic diet for *Endopiza viteana* (Lepidoptera: Tortricidae). *Can. Ent.* (Ottawa), 132:259-261. [USA]
- Nascimento, F. N. do, W. da S. Santos, J. de M. Pinto, and P. C. R. Cassino**  
2000. Parasitismo em larvas de *Phyllocnistis citrella* Stainton (Lepidoptera: Gracillariidae) no Estado do Rio de Janeiro. *An. Soc. Ent. Bras.* (Itabuna), 29:377-379. [Brazil]
- Ndemah, R., F. Schulthess, M. Poehling, and C. Borgemeister**  
2000. Species composition and seasonal dynamics of lepidopterous stem borers on maize and elephant grass, *Pennisetum purpureum* (Moench) (Poaceae), at two forest margin sites in Cameroon. *Afr. Ent.* (Pretoria), 8:265-272. [Noctuidae, Pyralidae, Tortricidae]
- Odindo, M. O., and F. O. Onyango**  
2000. L'eleve des borer du sorgho et du mais. In A. Polaszek, G. Delvare, and D. Blary (eds.), *Les Foreurs des Tiges de Cereales en Afrique: Importance Economique, Systematique, Ennemis naturels et Methodes de Lutte*, 61-74. Montpellier: Ctr. Coop. Int. Rech. Agron. Devel. [Africa]
- Ohmura, H., K. Tsuda, H. Kamiwada, and K. Kusigemati**  
2000. Rearing of rice leafroller, *Cnaphalocrocis medinalis* (Guenée) (Lepidoptera: Pyralidae), on artificial diets. *Japan. J. Appl. Ent. Zool.* (Tokyo), 44:119-123. [Japan]
- O'Rourke, P. K., and W. D. Hutchison**  
2000. First report of the western bean cutworm, *Richia albicosta* (Smith) (Lepidoptera: Noctuidae), in Minnesota. *J. Agric. Urban Ent.* (Clemson), 17:213-217. [USA]
- Paul, S. K., S. Jha, and M. R. Ghosh**  
2000. Morphometric studies of *Pericallia ricini* F. (Arctiidae) and *Euproctis fraterna* (Moore) (Lymantriidae) infesting castor (*Ricinus communis* L.). *Uttar Pradesh J. Zool.* (Muzaffarnagar), 20:69-71. [India]
- Polaszek, H., G. Delvare, and D. Blary (eds.)**  
2000. *Les Foreurs des Tiges de Cereales en Afrique: Importance Economique, Systematique, Ennemis naturels et Methodes de Lutte*. Montpellier: Ctr. Coop. Internal. Rech. Agron. Devel. 534pp. [Africa]
- Polesny, F., O. Rupf, and E. Kuehrer**  
2000. Tortricid pests in orchards and viticulture, from basic data sampling to internet warning service. *Bull. OEPP* (Oxford), 30:127-129. [Austria]
- Powell, G. W., B. M. Wikeem, and A. Sturko**  
2000. Biology of *Agapeta zoegana* (Lepidoptera: Cochylidae), propagated for the biological control of knapweeds (Asteraceae). *Can. Ent.* (Ottawa), 132:223-230. [Canada]
- Pratissoli, D., and M. J. Fonazier**  
[2000]. Occurrence of *Trichogramma acacioi* Brun, Moraes & Soares (Hym.: Trichogrammatidae), in eggs of *Nipteria panacea* Thierry-Mieg (Lep.: Geometridae), a geometrid defoliator of avocado. *An. Soc. Ent. Bras.* (Itabuna), 28:347-349. (1999) [Brazil] [in Portuguese]
- Radeloff, V. C., D. J. Mladenoff, and M. S. Boyce**  
2000. The changing relation of landscape patterns and jack pine budworm populations during an outbreak. *Oikos* (Copenhagen), 90:417-430. [Tortricidae; USA]
- Sanchez-S., S.**  
2000. Insectos asociados con la carambola (*Averrhoa carambola* L.) (Oxalidaceae) en el estado de Tabasco, Mexico. *Fol. Ent. Mex.* (Xalapa), 108:121-124.
- Saucke, H., F. Dori, and H. Schmutterer**  
2000. Biological and integrated control of *Plutella xylostella* (Lep., Yponomeutidae) and *Crociodolomia pavonana* (Lep., Pyralidae) in brassica crops in Papua New Guinea. *Biocontr. Sci. Tech.* (Abingdon), 10:595-606. [Germany]
- Sétamou, M., F. Schulthess, S. Gounou, H.-M. Poehling, and C. Borgemeister**  
2000. Host plants and population dynamics of the ear borer *Mussidia nigrivenella* (Lepidoptera: Pyralidae) in Benin. *Environ. Ent.* (Lanham), 29:516-524.
- Sétamou, M., F. Schulthess, H.-M. Poehling, and C. Borgemeister**  
2000. Spatial distribution and samping plans for *Mussidia nigrivenella* (Lepidoptera: Pyralidae) on cultivated and wild host plants in Benin. *Environ. Ent.* (Lanham), 29:1216-1225.
- Stiling, P.**  
2000. A worm that turned. *Nat. Hist.* (New York), 109:40-43. [Pyralidae; Neotropical]
- Stiling, P., A. Rossi, and D. Gordon**  
2000. The difficulties of single factor thinking in restoration: replanting a rare cactus in the Florida Keys. *Biol. Conserv.* (Oxford), 94:327-333. [Pyralidae; USA]
- Story, J. M., W. R. Good, L. J. White, and L. Smith**  
2000. Effects of the interaction of the biocontrol agent *Agapeta zoegana* L. (Lepidoptera: Cochylidae) and grass competition on spotted knapweed. *Biol. Contr.* (Orlando), 17:182-190.
- Sujatha, A., and S. P. Singh**  
[2000]. Natural enemy complex of coconut leaf eating caterpillar, *Opisina arenosella* Walker (Lepidoptera: Xylorictidae [sic]) in Karnataka. *J. Biol. Contr.* (Coimbatore), 13:51-58. (1999) [Oecophoridae; India]
- Sushil, S. N., Y. D. Mishra, A. Bhattacharya, and P. Kumar**  
[2000]. Screening of some egg parasitoids against *Pseudohypatopa pulvereana* (Meyr.) (Lepidoptera: Blastobasidae): a serious predator of lac insect, *Kerria lacca* (Kerr.). *J. Ent. Res.* (New Delhi), 23:365-368. (1999) [India]
- Tanhuanpaa, M.**  
2000. The role of natural enemies in preventing outbreaks of *Epirrita autumnata* in southern Finland. *Ann. Univ. Turku. (A. Biol.-Geogr.-Geol.)* (Turku), 137:1-13. [Geometridae]
- Tanhuanpaa, M., K. Ruohomaki, and E. Uusipaikka**  
2000. High larval predation rate in non-outbreaking populations of a geometrid moth. *Ecol.* (Washington), 82:281-289. [Finland]
- Tanzubil, P. B., A. R. McCaffery, and G. W. K. Mensah**  
2000. Diapause termination in the millet stem borer, *Coniesta ignefusalis* (Lepidoptera: Pyralidae) in Ghana as affected by photoperiod and moisture. *Bull. Ent. Res.* (London), 90:89-95.
- Tanzubil, P. B., G. W. K. Mensah, and A. R. McCaffery**  
2000. Diapause initiation and incidence in the millet stem borer, *Coniesta ignefusalis* (Lepidoptera: Pyralidae): the role of the host plant. *Bull. Ent. Res.* (London), 90:365-371. [Ghana]
- Trimble, R. M., and C. A. Tyndall**  
2000. Disruption of mating in the spotted tentiform leafminer (Lepidoptera: Gracillariidae) using sthnetic sex pheromone. *Can. Ent.* (Ottawa), 132:107-117. [Canada]
- Tsankov, G. G., and P. Mirchev**  
2000. Utilization of diflu-benzuron to control *Gelechia senticetella* (Stgr.) (Lepidoptera: Gelechiidae), a dangerous pest of *Juniperus excelsa* M. B. (Cupressaceae) in Bulgaria. *Anz. Schädlingsk.* (Berlin), 73:107-109.
- Urbaneja, A., E. Llacer, O. Tomas, A. Garrido, and J.-A. Jacas**  
2000. Indigenous natural enemies associated with *Phyllocnistis citrella* (Lepidoptera: Gracillariidae) in eastern Spain. *Biol. Contr.* (Orlando), 18:199-207.
- Vargas-O., H., D. Bobadilla-G., M. Jimenez-R., and H. Vargas-C.**  
[2000]. A preliminary trial about larval susceptibility of *Phyllocnistis citrella* Stainton (Lepidoptera: Gracillariidae) to insecticides sprayed on the foliage. *Idesia* (Arica), 16:23-27. (1999) [Chile] [in Spanish]
- Venette, R. C., E. Naranjo, and W. D. Hutchison**  
2000. Implications of larval mortality at low temperatures and high soil moistures for establishment of pink bollworm (Lepidoptera: Gelechiidae) in southeastern United States cotton. *Environ. Ent.* (Lanham), 29: 1018-1026.
- Virtanen, T.**  
2000. Patterns in the ecology of herbivorous insects in northern areas explained by regional or local climate. *Ann. Univ. Turku. (A. Biol.-Geogr.-Geol.)* (Turku), 123:1-28. (1999) [Finland]
- Visalakshmi, V., P. A. Rao, and P. V. Krishnayya**  
2000. Utility of sex pheromone for monitoring *Heliothis armigera* (Hub.) infesting sunflower. *J. Ent. Res.* (New Delhi), 24:255-258. [India]
- Williams, D. W., and A. M. Liebhold**

2000. Spatial synchrony of spruce budworm outbreaks in eastern North America. *Ecol. (Washington)*, 81:2753-2766. [USA]
- Wills, E.**  
2000. The release and establishment of two biological control agents of horehound (*Marrubium vulgare* L.) in south-eastern Australia. *Plant Prot. Qtr. (Mt. Eliza)*, 15:26-28. [Pterophoridae, Sesiidae]
- Wraight, C. L., A. R. Angeri, M. J. Carroll, and M. R. Berenbaum**  
2000. Absence of toxicity of *Bacillus thuringiensis* pollen to black swallowtails under field conditions. *PNAS USA*, 94:770-773.
- Yaman, M., and Z. Demirbag**  
2000. Studies of bacteria as potential microbial control agents of the large white butterfly, *Pieris brassicae* (Linnaeus) (Lepidoptera: Pieridae). *Afr. Ent. (Pretoria)*, 8:145-149. [South Africa, Turkey]
- Yokoyama, V. Y., and G. T. Miller**  
2000. Response of omnivorous leafroller (Lepidoptera: Tortricidae) and onion thrips (Thysanoptera: Thripidae) to low-temperature storage. *J. Econ. Ent. (Lanham)*, 93:1031-1034. [USA]
- Zanuncio, J. C., C. A. D. Teixeira, and M. F. Sossai**  
[2000]. Natural enemies of *Nomophila* sp. (Lepidoptera: Pyralidae), a cut-worm of *Eucalyptus grandis* (Myrtaceae) seedlings in Vicosia, Minas Gerais, Brazil. *An. Soc. Ent. Bras. (Itabuna)*, 28:357-358. (1999) [Brazil]
- Zanuncio, J. C., T. V. Zanuncio, E. T. Lopes, and F. S. Ramalho**  
2000. Temporal variations of Lepidoptera collected in an *Eucalyptus* plantation in the state of Goias, Brazil. *Neth. J. Zool. (Leiden)*, 50:435-443.
- Zimmermann, H. G., V. C. Moran, and J. H. Hoffmann**  
2000. The renowned cactus moth, *Cactoblastis cactorum*: its natural history and threat to native *Opuntia* florae in Mexico and the United States of America. *Divers. Dist. (Oxford)*, 6:259-269.

## MEDICAL

- Bhende, M., J. Biswas, T. Sharma, S. K. Chopra, L. Gopal, and C. M. Shroff**  
2000. Ultrasound biomicroscopy in the diagnosis and management of pars planitis caused by caterpillar hairs. *Amer. J. Ophthalmol. (Chicago)*, 130:125-126. [India]
- Conrath, J., E. Hadjadj, B. Balansard, and B. Ridings**  
2000. Caterpillar setae-induced acute anterior uveitis: a case report. *Amer. J. Ophthalmol. (Chicago)*, 130:841-83. [France]
- Horng, C.-T., P.-I. Chou, and J.-B. Liang**  
2000. Caterpillar setae in the deep cornea and anterior chamber. *Amer. J. Ophthalmol. (Chicago)*, 129:384-385. [Taiwan]
- Imamura, N., T. Ishikawa, T. Ohtsuka, K. Yamamoto, M. Dekura, H. Fukami, and R. Nishida**  
2000. An antibiotic from *Penicillium* sp. covering the cocoon of the leaf-rolling moth, *Dactyloglyphia tonica*. *Biosci. Biotech. Biochem. (Tokyo)*, 64:2216-2217. [Tortricidae; Japan]
- Isbister, G. K., and P. I. Whelan**  
2000. Envenomation by the billygoat plum stinging caterpillar (*Thosia penthina*). *Med. J. Austr. (Sydney)*, 173:4-18. [Limacodidae; Australia]
- Lopez, M., A. Gil, and C. L. Arocha-Pinango**  
2000. The action of *Lonomia achelous* caterpillars venom on human factor V. *Thrombosis Res. (Oxford)*, 98:103-110. [Venezuela]
- Nishimune, T., Y. Watanabe, H. Okazaki, and H. Akai**  
2000. Thiamin is decomposed due to *Anaphe* spp. entomophagy in seasonal ataxia patients in Nigeria. *J. Nutrition (Bethesda)*, 130:1625-1628.
- Roodt, A. R. de, O. D. Salomon, and T. A. Orduna**  
2000. Accidents due to Lepidoptera with special reference to *Lonomia* sp. *Medicina (Buenos Aires)*, 60:964-972. [Saturniidae; Argentina] [in Spanish]
- Vega, J. M., I. Moneo, A. Armentia, J. Vega, R. de la Fuente, and A. Fernandez**  
2000. Pine processionary caterpillar as a new cause of immunologic contact urticaria. *Contact Dermat. (Copenhagen)*, 43:129-132. [Spain]

## HOLARCTIC LEPIDOPTERA

### ACROLEPIIDAE

- Yasuda, K.**  
2000. A new species of the genus *Acrolepiopsis* Gaedike (Lepidoptera: Acrolepiidae) injurious to Chinese yam and its closely allied species from Japan. *Appl. Ent. Zool. (Tokyo)*, 35:419-425.

### ADELIDAE

- Robbins, J.**  
2000. *Nemophora cupriacella* (Hb.) (Lep.: Incurvariidae) new to Warwickshire. *Ent. Rec. J. Var. (Surrey)*, 112:12. [England]
- Sims, I.**  
2000. Notes on the behaviour of *Adela cuprella* (D. & S.) (Lep.: Incurvariidae). *Ent. Rec. J. Var. (Surrey)*, 112:171-173. [England]

### ALUCITIDAE

- Zagulajev, A. K.**  
2000. New species of the multiplumed moths (Lepidoptera, Alucitidae) of the fauna of Russia and neighboring countries. *Ent. Obozr. (Moscow)*, 79: 880-890. [Armenia, Azerbaijan, Bulgaria, Russia] [in Russian]

### ARCTIIDAE

- Beaumont, H. E.**  
2000. Occurrence of two adventive species of Ctenuchidae (Lepidoptera) in Yorkshire. *Naturalist (Sheffield)*, 125:119-120. [England; Neotropical]
- Bethholtz, P.-E.**  
2000. Genetic status and fluctuating asymmetry in an endangered population of the moth *Dysauxes ancilla* L. (Lepidoptera: Ctenuchidae). *J. Ins. Conserv. (Dordrecht)*, 4:93-98.
- Eitschberger, U., and H. Steiniger**  
2000a. Arctiidae 1998. *Atalanta* (Munich), 31:20. [Germany]  
2000b. Arctiidae 1999. *Atalanta* (Marktleuthen), 31:435. [Germany]
- Fang, C.**  
2000. *Lepidoptera Arctiidae*. In *Fauna Sinica (Insecta)*. Vol. 19. Beijing: Sci. Pr. 589pp, 20 pl. [in Chinese]
- Firmin, J.**  
2000. Red-necked footman *Atolmis rubricollis* (L.) (Lep.: Arctiidae) in Essex. *Ent. Rec. J. Var. (Surrey)*, 112:270. [England]
- Gomi, T.**  
2000. Effects of timing of diapause induction on winter survival and reproductive success in *Hyphantria cunea* in a transition area of voltinism. *Ent. Sci. (Tokyo)*, 3:433-438. [Japan]
- Goodey, B.**  
2000. The nine-spotted *Amata phegea* (L.) (Lep.: Ctenuchidae) in Essex. *Ent. Rec. J. Var. (Surrey)*, 112:263-264. [England]
- Hagen, W. ten, and K. G. Schurian**  
2000. Eine Zucht von *Callimorpha splendidior* (Tams, 1922) (Lepidoptera: Arctiidae). *Nach. Ent. Ver. Apollo (Frankfurt)*, (n.s.), 21:1-4. [Iran]
- Harbich, H.**  
2000. Arctiidae 1999. *Atalanta* (Marktleuthen), 31:437-440. [Germany]
- Howard, R.**  
2000. A suspected resident population of *Lithosia quadra* (Linnaeus) (Lepidoptera: Arctiidae) on the Lizard Peninsula, Cornwall, and the possibility of migratory supplementation. *Ent. Gaz. (Wallingford)*, 51:1-10. [England]
- Jones, D. A.**  
2000. Temperatures in the Cothill habitat of *Panaxia (Callimorpha) dominula* L. (the scarlet tiger moth). *Heredity (Oxford)*, 84:578-586. [England]
- Karban, R., and G. English-Loeb**  
2000. Lethal and non-lethal parasitoids of *Platypreria virginalis* (Arctiidae). *J. Lepid. Soc. (Los Angeles)*, 53:72-73. (1999) [USA]
- Komatsu, T.**  
2000. Two aberrant examples of moths with bilateral asymmetry on forewing pattern. *Japan Heteroc. J. (Tokyo)*, 210:187. [Japan] [in Japanese]
- Marciniak, B., and L. Przybyłowicz**  
2000. A new record of *Utetheisa pulchella* (Linnaeus, 1758) from Poland (Lepidoptera, Arctiidae). *Atalanta* (Munich), 31:75-76.
- Marmet, P., and J. Schmid**  
2000. Arctiidae – Bärenspinner. In *Schmetterlinge und ihre Lebensräume: Arten - Gefährdung - Schutz. Schweiz und angrenzenden Gebiete*, 3:581-744, pl. 26-34. Basel: Pro Natura - Schweiz. Bund Naturschutz. [Switzerland]
- Murase, M.**  
2000. Hibernation and larval host range of *Lemyra flammeola* (Moore) (Arctiidae) in Wakayama Pref. *Japan Heteroc. J. (Tokyo)*, 207:135. [Japan] [in Japanese]
- Pljushch, I. G., and W. G. Dolin**  
2000. Über die Verbreitung und Veränderlichkeit *Palearctia erschoffi* (Alpheraki), 1882 (Lepidoptera: Arctiidae). *Lambill. (Tervuren)*, 100:433-437. [Kirghistan]
- Pljushch, I. G., and I. V. Dolinskaya**  
2000a. External morphology of the eggs of some tiger-moths (Lepidoptera, Arctiidae). *Lambill. (Tervuren)*, 100:33-41. [Ukraine]  
2000b. Eggshell fine structure of some species of Lithosiinae (Arctiidae) of Far East Russia. *Nota Lepid. (Basel)*, 23:60-63.
- Saldaitis, A., P. Ivinskis, and S. Churkin**  
2000. *Palearctia rasa* spec. nov., a new tiger moth from China (Lepidoptera, Arctiidae). *Atalanta* (Marktleuthen), 31:505-510, pl. 21b. [China (Xinjiang)]
- Wander, A.**  
2000. Rediscovery of hoary footman *Eilema caniola* (Hb.) (Lep.: Arctiidae) on Anglesey. *Ent. Rec. J. Var. (Surrey)*, 112:251. [England]
- Yamauchi, T.**  
2000. A gynandromorph of *Lemyra imparilis* (Butler) (Arctiidae, Lepidoptera) from Japan. *Trans. Lepid. Soc. Japan (Tokyo)*, 51:166-168.



# ARGYRESTHIIDAE

Goodey, B.

2000. *Argyresthia cupressella* Wals. and *A. trifasciata* Stdr. (Lep.: Yponomeutidae). *Ent. Rec. J. Var. (Surrey)*, 112:169. [England]

Parsons, M. S.

2000. Further records of *Argyresthia trifasciata* Staudinger, 1871 (Lepidoptera: Yponomeutidae). *Ent. Gaz. (Wallingford)*, 51:31-32. [England]

Plant, C. W., M. R. Honey, and G. Martin

2000. *Argyresthia trifasciata* Stdr., 1871 (Lep.: Yponomeutidae) new to Hertfordshire (VC 20) and South Essex (VC 18), with further records from London (VC 17, 21) and with a summary of its British distribution and status. *Ent. Rec. J. Var. (Surrey)*, 112:257-262. [England]

White, M. J.

2000. Records of *Argyresthia conjugella* Zell. (Lep.: Yponomeutidae) from Glamorgan. *Ent. Rec. J. Var. (Surrey)*, 112:176. [England]

# BLASTOBASIDAE

Park, K.-T., and S.-Y. Sim

2000. New records of Blastobasidae (Lepidoptera) from Korea, with description of a new species. *Korean J. Biol. Sci. (Seoul)*, 4:245-250.

# BOMBYCIDAE

Jost, B., J. Schmid, and H.-P. Wymann

2000. Bombycidae – Seidenspinner. In *Schmetterlinge und ihre Lebensräume: Arten - Gefährdung - Schutz. Schweiz und angrenzenden Gebiete*, 3:399-402, pl. 17. Basel: Pro Natura - Schweiz. Bund Naturschutz.

# BUCCULATRICIDAE

Mey, W.

2000. Eine neue *Bucculatrix*-Art aus Mittelasien (Lep., Bucculatricidae). *Ent. Nachr. Ber. (Dresden)*, 44:43-44. [Kirgistan]

# CARPOSINIDAE

Han, K.-S., J.-K. Jung, K.-H. Choi, S.-W. Lee, and K.-S. Boo

2000. Sex pheromone composition and male trapping of the peach fruit moth, *Carpocapsa sasakii* (Matsumura) (Lepidoptera: Carposinidae) in Korea. *J. Asia-Pac. Ent. (Seoul)*, 3:83-88.

# CHOREUTIDAE

Kurz, M., and P. Huemer

2000. Erstnachweis von *Anthophila abhasica* Danilevsky, 1969, in den Alpen. *Nachrbl. Bayer. Ent. (Munich)*, 49:87-91. [Austria, Germany]

# COLEOPHORIDAE

Habermann, M.

2000. The larch casebearer and its host tree: I. Population dynamics of the larch casebearer (*Coleophora laricella* Hbn.) from latent to outbreak density in the field. *For. Ecol. Mgmt. (Amsterdam)*, 136:11-22. [Germany]

Haggett, G. M.

2000. The early stages of *Coleophora tricolor* Walsingham, 1899 (Lepidoptera: Coleophoridae) on the Norfolk Breck and their significance for conservation management. *Ent. Gaz. (Wallingford)*, 51:215-234. [England]

Li, H.-H., and L.-Y., Zheng

- [2000]. Studies on the Chinese Coleophoridae (Lepidoptera): the *Coleophora follicularis* group, with descriptions of three new species. *Acta Ent. Sinica (Beijing)*, 42:411-417. (1999) [China]

- 2000a. A taxonomic study on the *Coleophora milvipennis* group (Lepidoptera: Coleophoridae) from China. *Acta Sci. Nat. Univ. Nankaiensis (Nankai)*, 33:1-14.

- 2000b. Studies on the Chinese Coleophoridae (Lepidoptera): the *Coleophora absinthii* group, with description of one new species. *Acta Ent. Sinica (Beijing)*, 43:188-192. [China]

Sugisima, K., and Y. Arita

2000. A new species of a gelechioid genus, *Idioglossa* Walsingham (Lepidoptera, Batrachedridae, Batrachedrinae), from Japan. *Trans. Lepid. Soc. Japan (Tokyo)*, 51:319-336.

# COSMOPTERIGIDAE

Ikenaga, H., K. Yasuda, K. Hirano, H. Nakakita, and N. Sota

2000. Seasonal prevalence of pink scavenger caterpillar, *Anatrachyntis rileyi* (Walsingham) (Lepidoptera: Cosmopterigidae) in rice and feed mills. *Japan. J. Appl. Ent. Zool. (Tokyo)*, 44:229-234. [Japan] [in Japanese]

Murase, M.

2000. Two micro-moths (Cochylidae and Cosmopterigidae) feeding on fruits of *Paederia scandens* infested by larvae of *Edulicodes inouella* (Pyralidae, Phycitinae). *Japan Heteroc. J. (Tokyo)*, 211:203-204. [Japan] [in Japanese]

Mopper, S., P. Stiling, K. Landau, D. Simberloff, and P. Van Zandt

2000. Spatiotemporal variation in leafminer population structure and adaptation to individual oak trees. *Ecol. (Washington)*, 81:1577-1587. [USA]

Nel, J., and A. Nel

2000. Contribution à la connaissance des lépidoptères des îles Canaries, avec la description de *Coccidiphila patriciae* n. sp. (Lepidoptera, Cosmoptera rigidae). *Bull. Soc. Ent. Fr. (Paris)*, 105:381-385. [Canary Is.]

# COSSIDAE

Brünner-Garten, K.

2000. Blausieb *Zeuzera pyrina* L. In Roteichen. *Galathea* (Nuremberg), 16:54. [Germany]

Buser, R., W. Huber, and R. Joos

2000. Cossidae – Holzbohrer. In *Schmetterlinge und ihre Lebensräume: Arten - Gefährdung - Schutz. Schweiz und angrenzenden Gebiete*, 3:97-116, pl. 2. Basel: Pro Natura - Schweiz. Bund Naturschutz. [Switzerland]

Gul, H., and Wali-ur-Rahman

- [2000]. A note on walnut borer, *Zeuzera coffeae* (Cossidae, Lepidoptera) on walnut trees. *Pakistan J. For. (Peshawar)*, 49:117-120. [Pakistan]

Patočka, J.

2000. The pupae of the central and western European cossids (Lepidoptera: Cossidae). *Ent. Ber. (Amsterdam)*, 60:61-68. (1999) [in German]

# DIOPTIDAE

Braswell, W. E., and J. R. Ott

2000. The biology of *Doa ampla* (Grote) (Lepidoptera: Doidae) on its host plant *Stillingia texana* (Euphorbiaceae). *Proc. Ent. Soc. Washington*, 102:507-518. [USA]

# ELACHISTIDAE

Heppner, J. B.

2000. *Dicranoctetes brachelytrifoliella*, a leafminer on cogongrass in Florida (Lepidoptera: Elachistidae). *Lepid. News (Gainesville)*, 2000(2):23. [USA]

Traugott-Olsen, E.

2000. Variation in *Elachista biatomella* (Stainton, 1848). A review of the species-group, with description of four new species (Lepidoptera: Elachistidae). *SHILAP Revta. Lepid. (Madrid)*, 28:63-90. [Europe, North Africa, Central Asia]

# ENDROMIDAE

Jost, B., J. Schmid, and H.-P. Wymann

2000. Endromidae – Frühlingsspinner. In *Schmetterlinge und ihre Lebensräume: Arten - Gefährdung - Schutz. Schweiz und angrenzenden Gebiete*, 3:362-366, pl. 19. Basel: Pro Natura - Schweiz. Bund Naturschutz. [Switzerland]

# EPERMENIIDAE

Gaedike, R., and H. Kuroko

2000. A new species of the genus *Epermenia* (Lepidoptera: Epermeniidae) from Japan. *Tinea (Tokyo)*, 16:218-221.

# ERIOCRANIIDAE

Fisher, A. E. I., S. E. Hartley, and M. Young

2000. Direct and indirect competitive effects of foliage feeding guilds on the performance of the birch leaf-miner *Eriocrania*. *J. Anim. Ecol. (Oxford)*, 69: 165-176. [England]

Kula, E.

2000. Miners of the genus *Eriocrania* Zeller: pests on birch-trees with gradation potential. *J. For. Sci. (Prague)*, 46:27-33. [Czech Rep.]

Sutter, R.

2000. Beiträge zur Insektenfauna Ostdeutschlands: Lepidoptera-Eriocraniidae (Insecta). *Faun. Abh. (Dresden)*, 22:49-67. [Germany]

# GELECHIIDAE

Bidzilya, O.

2000. New records of gelechiid moths from the southern Siberia with description of three new species (Lepidoptera). *Beitr. Ent. (Berlin)*, 50: 385-395. [Russia]

Coll, M., S. Gavish, and I. Dori

2000. Population biology of the potato tuber moth, *Phthorimaea operculella* (Lepidoptera: Gelechiidae), in two potato cropping systems in Israel. *Bull. Ent. Res. (London)*, 90:309-315.

Heckford, R. J.

2000. *Caryocolum marmoreum* (Haworth) (Lepidoptera: Gelechiidae): some apparently unrecorded observations on the early larval stages. *Ent. Gaz. (Wallingford)*, 51:194. [England]

Hollingworth, T.

2000. *Monochroa palustrella* Douglas, nouvelle espèce pour la France (Lep., Gelechiidae). *Bull. Soc. Ent. Fr. (Paris)*, 104:412. (1999)

Huemer, P., and Z. Tokar

2000. *Psamathocrita dalmatinella* sp.n., eine verkannt Schmetterlingsart aus dem Mediterraneum (Lepidoptera, Gelechiidae). *Zeit. Arbeitsgem. Österr. Ent.* (Vienna), 52:1-10. [Croatia]
- Lee, S.-M., and K.-T. Park  
2000. Three species of the subfamily Gelechiinae (Lepidoptera) new to Korea. *Ins. Koreana* (Chunchon), 17:63-70.
- Li, H.-H., and S.-X. Wang  
2000a. One new species and three new records of the genus *Dichomeris* from Henan Province (Lepidoptera: Gelechiidae). In X. Shen, et al. (eds.), *Insects of the mountains Funie and Dabie regions. In The Fauna and Taxonomy of Insects in Henan*, 4:45-50. [China]  
2000b. Three new species and one new record of the gelechiid moths from Henan Province (Lepidoptera: Gelechiidae). In X. Shen, et al. (eds.), *Insects of the mountains Funie and Dabie regions. In The Fauna and Taxonomy of Insects in Henan*, 4:51-57. [China]
- Martinsen, G. D., K. D. Floate, A. M. Waltz, G. M. Wimp, and T. G. Whitham  
2000. Positive interactions between leafrollers and other arthropods enhance biodiversity on hybrid cottonwoods. *Oecol.* (Berlin), 123:82-89. [Anacampsis; USA]
- Park, K.-T.  
2000. A new species of Gelechiidae (Insecta, Lepidoptera) from Korea. *Korean J. Syst. Zool.* (Seoul), 16:165-168.
- Park, K.-T., J.-S. Lee, and L.-S. Lee  
2000. Gelechiidae (Lepidoptera) from Changbai-san in China. *Korean J. Appl. Ent.* (Suwon), 39:239-244.
- Ponomarenko, M. G.  
2000. New species and new synonym of the genus *Metanarsia* Staudinger (Lepidoptera, Gelechiidae). *Tinea* (Tokyo), 16:222-225. [Russia]
- Povolný, D.  
2000a. Four new Nearctic species of the genus *Tuta* Strand, 1910 (Lepidoptera: Gelechiidae). *SHILAP Revia. Lepid.* (Madrid), 28:213-225. [USA]  
2000b. Towards the interpretation of the Palaearctic taxa of the *Scrobipalpa psilella* (Herrich-Schäffer, 1854) - complex (Lepidoptera, Gelechiidae, Gnorimoschemini). *Acta Univ. Agric. Silvicult. Mendel. Brun.* (Brno), 49:39-58. [Europe]
- Prins, W. De  
2000a. *Stenolechiodos pseudogemmellus*, een nieuwe soort voor de Belgische fauna (Lepidoptera: Gelechiidae). *Phegea* (Antwerp), 28:7-9. [Belgium]  
2000b. *Monochroa palustrella*, een nieuwe soort voor de Belgische fauna (Lepidoptera: Gelechiidae). *Phegea* (Antwerp), 28:81-82. [Belgium]  
2000c. *Scrobipalpa costella*, een nieuwe soort voor de Belgische fauna (Lepidoptera: Gelechiidae). *Phegea* (Antwerp), 28:125-126. [Belgium]
- Sakamaki, Y.  
2000. Japanese species of the genus *Apatetris* (Lepidoptera, Gelechiidae). *Tijds. Ent.* (Amsterdam), 143:211-220. [Japan]
- Ueda, T., and M. G. Ponomarenko  
2000. Two new species of the genus *Faristenia* Ponomarenko, 1991 (Lepidoptera, Gelechiidae) from Japan. *Trans. Lepid. Soc. Japan* (Tokyo), 51:119-126.
- Valeen, Y.  
2000. Trois nouveaux Gelechiidae pour la faune belge (Lepidoptera: Gelechiidae). *Phegea* (Antwerp), 28:10-11. [Belgium]
- Venette, R. C., E. Naranjo, and W. D. Hutchison  
2000. Implications of larval mortality at low temperatures and high soil moisture for establishment of pink bollworm (Lepidoptera: Gelechiidae) in southeastern United States cotton. *Environ. Ent.* (Lanham), 29:1018-1026.
- Yang, C.-X., and H.-H. Li  
2000. A new species of the genus *Anarsia* Zeller (Lepidoptera: Gelechiidae) injurious to *Carana korshinskii* Komarov (Leguminosae). *Acta Zootaxon. Sinica* (Yangling), 25:187-190. [China]
- GEOMETRIDAE**
- Allen, A. A.  
2000. An unusual early brood of the willow beauty *Peribatodes rhomboidaria* (D. & S.) (Lep.: Geometridae)? *Ent. Rec. J. Var.* (Surrey), 112:10. [England]
- Anikin, V. V., S. A. Sachkov, V. V. Zolotuhin, and E. M. Antonova  
2000. "Fauna Lepidopterologica Volgo-Uralensis" 150 years later: changes and additions. Part 3. Geometridae (Insecta, Lepidoptera). *Atalanta* (Munich), 31:293-326. [Russia]
- Antonova, E. M., and A. M. Tikhomirov  
2000. The geometrids (Lepidoptera, Geometridae) of Ivanovo Province. *Byull. Moskov. Obsh. Isp. Prir. Otd. Biol.* (Moscow), 105:17-26. [Russia] [in Russian]
- Aston, A.  
2000. Lilac beauty *Apeira syringaria* (L.) (Lep.: Geometridae): second generation examples at Selborne, North Hampshire. *Ent. Rec. J. Var.* (Surrey), 112:219. [England]
- Beljaev, E. A.  
2000. Remarkable new genus and new species of the geometrid moths from Central Asia, related to the genus *Desertobia* Viidallepp, 1989 (Lepidoptera, Geometridae, Ennominae) with notes on the taxonomy of the Desertobiini. *Tinea* (Tokyo), 16:240-245. [Kazakhstan]
- Beljaev, E. A., and R. B. Kuranishi  
2000. Geometrid moths (Lepidoptera: Geometridae) collected from the Kamchatka Peninsula and the North Kuril Islands in 1996-1997. *Nat. Hist. Res.* (Chiba), 7 (Spec. Iss.):235-242. [Russia]
- Beljaev, E. A., and D. Stüning  
2000. A new species of *Psilalcis* Warren, 1893 from the East Asia (Lepidoptera, Geometridae, Ennominae). *Ins. Koreana* (Chunchon), 17:215-220.
- Bérard, R.  
2000. *Archiearis tourangini* Sand, nouvelle espèce distincte d'*Archiearis notha* Hübner. *Bull. Mens. Soc. Linn. Lyon*, 69:142-144. [France]
- Brakefield, P. M., and T. G. Liebert  
2000. Evolutionary dynamics of declining melanism in the peppered moth in the Netherlands. *Proc. Roy. Soc. (B) Biol. Sci.* (London), 267:1953-1957.
- Brown, D.  
2000. Lilac beauty *Apeira syringaria* (L.) (Lep.: Geometridae): a second generation specimen at Chalcote, Warwick. *Ent. Rec. J. Var.* (Surrey), 112:170. [England]
- Choi, S.-W.  
2000a. A cladistic analysis of the Therini: a new synonym of the Cidariini (Lepidoptera: Geometridae, Larentiinae). *Amer. Mus. Novit.* (New York), 3295:1-25. [Holarctic]  
2000b. The occurrence of *Lampropteryx suffumata* (Denis & Schiffermüller) (Lepidoptera: Geometridae) in North America. *Pan-Pac. Ent.* (San Francisco), 76:123-125. [USA: Alaska]  
2000c. Cladistic biogeography of the tribe Cidariini (Lepidoptera, Geometridae) in the Holarctic and Indo-Chinese regions. *Biol. J. Linn. Soc.* (London), 71:529-547. [China, India, Japan, Russia, Taiwan]
- Cook, L. M.  
2000a. A century and a half of peppered moths. *Ent. Rec. J. Var.* (Surrey), 112:77-82. [England]  
2000b. Changing views on melanic moths. *Biol. J. Linn. Soc.* (London), 69:431-441. [England]
- Cook, L. M., and B. S. Grant  
2000. Frequency of *insularia* during the decline in melanics in the peppered moth *Biston betularia* in Britain. *Heredity* (Oxford), 85:580-585.
- Dappoto, L., and F. Fabiano  
2000. Notes on some interesting Geometridae collected in Tuscany (Italy). *Nota Lepid.* (Basel), 23:185-190.
- Doak, P.  
2000a. Population consequences of restricted dispersal for an insect herbivore in a subdivided habitat. *Ecol.* (Washington), 81:1828-1841. [Itame; USA]  
2000b. Habitat patchiness and the distribution, abundance, and population dynamics of an insect herbivore. *Ecol.* (Washington), 81:1842-1857. [Itame; USA]
- Embacher, G.  
2000. Beitrag zur Verbreitung von *Eupithecia conterminata* (Lienig & Zeller, 1846) (Lepidoptera, Geometridae). *Nachbl. Bayer. Ent.* (Munich), 49: 21-26. [Austria, France, Germany, Switzerland]
- Firmin, J.  
2000. A memorable night for orange moths *Angeronia prunaria* (L.) (Lep.: Geometridae). *Ent. Rec. J. Var.* (Surrey), 112:23. [England]
- Greene, E.  
2000. Collection of emerald moths in the genus *Nemoria* (Geometridae). *News Lepid. Soc.* (Los Angeles), 42:28-29. [USA]
- Grant, B. S., and C. A. Clarke  
2000. An examination of intraseasonal variation in the incidence of melanism in peppered moths, *Biston betularia* (Geometridae). *J. Lepid. Soc.* (Los Angeles), 53:99-103. [England]
- Hammerson, M.  
2000. A January spruce carpet *Thera britannica* (Turner) (Lep.: Geometridae). *Ent. Rec. J. Var.* (Surrey), 112:104. [England]
- Hausmann, A., and G. M. Laszlo  
[2000]. Taxonomic and faunistic studies on Turkmenian Sterrhinae (Lepidoptera: Geometridae). *Fol. Ent. Hung.* (Budapest), 60:317-324. [Turkmenistan]
- Heinicke, W.  
2000. Ein mißgebildetes männliches Genitale bei *Mniotype anilis* (Boisduval, 1840) (Lep., Noctuidae). *Ent. Nachr. Ber.* (Dresden), 44:205-206. [France]
- Ikinoue, T.  
2000. *Synegia ohtsukai* Sato (Geometridae) from Yamaguchi Prefecture. *Yugato* (Niigata), 162:138. [Japan] [in Japanese]
- Inoue, H.  
2000. Descriptions of males of *Eupithecia caliginea* Butler and *E. fujisana* Inoue with a list of species-group taxa of *Eupithecia* changes and newly



- joined after 1982 to Japan (Geometridae). *Yugato* (Niigata), 160:49-53. [in Japanese]
- Kerimova, I. G.**  
2000. On the biology and ecology of *Tephрина arenacearia* Den. et Schiff. (Lepidoptera: Geometridae) in Azerbaijan. *Polsk. Pismo Ent.* (Gdynia), 69:363-368.
- Lastuchin, A.**  
2000. Eine kommentierte Artenliste der Blütenspanner der Tschuvasschia (Osteuropa, Russland) (Lepidoptera, Geometridae, Eupitheciini et Perizomini). *Atalanta* (Munich), 31:251-263. [Russia]
- Majerus, M. E. N., C. F. A. Burton, and J. Stalker**  
2000. A bird's eye view of the peppered moth. *J. Evol. Biol.* (Basel), 13:155-159. [England]
- McCormick, R.**  
2000. Cypress carpet *Thera cupressata* Geyer (Lep.: Geometridae) new to Devon. *Ent. Rec. J. Var.* (Surrey), 112:106. [England]
- Mironov, V. G.**  
2000. Systematics of the geometrid moth tribe Perizomini (Lepidoptera, Geometridae, Larentiinae). *Ent. Obozr.* (Moscow), 79:112-122. [in Russian]
- Murase, M.**  
2000a. Larva of *Pseudocollix kawamurai* (Inoue) (Geometridae, Larentiinae) feeding on *Maesa japonica* (Myrsinaceae). *Japan Heteroc. J.* (Tokyo), 211:213. [Japan] [in Japanese]  
2000b. Larvae of Geometridae found on flowers in Wakayama Prefecture II. *Yugato* (Niigata), 161:97-98. [Japan] [in Japanese]
- Nishihara, K.**  
2000. The early stages of *Apochima praeacutaria* (Inoue) (Geometridae). *Yugato* (Niigata), 160:71-75. [Japan] [in Japanese]
- Nyst, R. H.**  
2000. Ajouts à la distribution géographique du genre *Crocota* (Lepidoptera: Geometridae). *Phegea* (Antwerp), 28:123. [Austria, France, Switzerland]
- Parenzan, P., S. Bella, and P. Russo**  
[2000]. First record of *Idaea completa* (Staudinger, 1892) (Lepidoptera: Geometridae) new for Sicily and Italy, Contributions to the knowledge of the Lepidoptera of Sicily. VI. *Ent.* (Bari), 32:195-199. (1998) [in Italian]
- Parenzan, P., A. Hausmann, and S. Scalercio**  
[2000]. Addenda and corrigenda to Geometridae of southern Italy. Contributions to knowledge of the Lepidoptera in southern Italy. XX. *Ent.* (Bari), 32:51-79. (1998) [in Italian]
- Ruohomaki, K., M. Tanhuanpaa, M. P. Ayres, P. Kaitaniemi, T. Tammaru, and E. Haukioja**  
2000. Causes of cyclicity of *Epirrita autumnata* (Lepidoptera, Geometridae): grandiose theory and tedious practice. *Pop. Ecol.* (Tokyo), 42:211-223. [Finland]
- Sannino, L., and B. Espinosa**  
[2000]. Morphological and ethological aspects of *Scopula turbidaria* (Lepidoptera, Geometridae). *Frag. Ent.* (Rome), 31:377-395. (1999) [Italy] [in Italian]
- Sato, R., and M. Furukawa**  
2000. Melanic form of *Ascotis selenaria cretacea* (Butler) (Geometridae). *Yugato* (Niigata), 159:29. [Japan] [in Japanese]
- Sato, R., and H. Kogi**  
2000. Additional records of *Perizoma haasi* (Hedemann) (Geometridae, Larentiinae) from Japan, with description of male and female genitalia. *Yugato* (Niigata), 161:89-91. [in Japanese]
- Shepard, J. H., and R. S. Zack**  
2000. A remarkable and disjunct range extension for the genus *Yermoia* McDunnough (Lepidoptera: Geometridae). *Pan-Pac. Ent.* (San Francisco), 76:121-122. [USA]
- Sugiyama, T.**  
2000. Winter geometrid moths taken at Akgase Park, Urawa, Saitama Pref. *Yugato* (Niigata), 159:36. [Japan] [in Japanese]
- Tammaru, T., and J. Javoš**  
2000. Responses of ovipositing moths (Lepidoptera: Geometridae) to host plant deprivation: life-history aspects and implications for population dynamics. *Environ. Ent.* (Lanham), 29:1002-1010. [Estonia]
- Tammaru, T., K. Ruohomaki, and M. Montola**  
2000. Crowding-induced plasticity in *Epirrita autumnata* (Lepidoptera: Geometridae): weak evidence of specific modifications in reaction norms. *Oikos* (Copenhagen), 90:171-181. [Estonia]
- Teder, T., M. Tanhuanpaa, K. Ruohomaki, P. Kaitaniemi, and J. Henriksson**  
2000. Temporal and spatial variation os larval paraasitism in non-outbreaking populations of a folivorous moth. *Oecolog.* (Berlin), 123:516-524. [*Epirrita*; Estonia]
- Tominaga, S.**  
2000. Pupa of *Traminda aventiaria* (Guenée) (Geometridae, Sterrhinae) from *Lagerstroemia*. *Japan Heteroc. J.* (Tokyo), 207:132. [Japan] [in Japanese]
- Vasilenko, S. V.**  
2000. New species of the genus *Idaea* (Lepidoptera, Geometridae) from the Far East. *Zool. Zhurn.* (Moscow), 79:868-870. [Russia] [in Russian]
- West, B. K.**  
2000a. *Perizoma affinitata* (Steph.) (Lep.: Geometridae) in north-west Kent. *Ent. Rec. J. Var.* (Surrey), 112:24. [England]  
2000b. *Abraxas sylvata* (Scop.) (Lep.: Geometridae) in the London area. *Ent. Rec. J. Var.* (Surrey), 112:42-43. [England]  
2000c. *Ennomos autumnaria* (Wern.) (Lep.: Geometridae) in north-west Kent. *Ent. Rec. J. Var.* (Surrey), 112:43. [England]  
2000d. *Apeira syringaria* (L.) (Lep.: Geometridae): a second generation specimen at Dartford, Kent in 1999. *Ent. Rec. J. Var.* (Surrey), 112:83. [England]
- White, J. A., and T. G. Whitman**  
2000. Associational susceptibility of cottonwood to a box elder herbivore. *Ecol.* (Washington), 81:1795-1803. [*Alspohila*; USA]
- Yazaki, M.**  
2000. *Biston takeuchii* Matsumura (Geometridae) taken in Gifu Prefecture. *Yugato* (Niigata), 159:38. [Japan] [in Japanese]
- GLYPHIPTERIGIDAE**  
**Kun, A., and C. Szabóky**  
2000. Rediscovery of *Glyphipterix loricatella* in Hungary (Lepidoptera: Glyphipterigidae). *Holarctic Lepid.* (Gainesville), 6:75-76. (1999)
- GRACILLARIIDAE**  
**Alahmed, A. M. N.**  
2000. The population dynamics of the citrus leafminer *Phyllocnistis citrella* (Lepidoptera: Gracillariidae) on lime trees in Riyadh, Saudi Arabia. *Saudi J. Biol. Sci.* (Riyadh), 7:89-93.
- Bond, K. G. M.**  
2000. A further note on the phenology of *Phyllonorycter nigrescentella* (Logan, 1851) (Lepidoptera: Gracillariidae). *Ent. Gaz.* (Wallingford), 51:82.
- Djemai, I., R. Meyhoefer, and J. Casas**  
2000. Geometrical games between a host and a parasitoid. *Amer. Nat.* (Chicago), 156:257-265. [*Phyllonorycter*] [France]
- Hellrigl, K., and P. Ambrosi**  
2000. Distribution of the horse-chestnut leafminer, *Cameraria ohridella* Desch. & Dimic (Lepid., Gracillariidae), in the region South Tyrol-Trentino (northern Italy). *Anz. Schädlingssk.* (Berlin), 73(2):25-32. [in German]
- Laasonen, E. M., and L. Laasonen**  
2000. Habitual differences of *Phyllonorycter salictella* (Zeller, 1846) and *P. heringiella* (Gronlein, 1932) (Lepidoptera: Gracillariidae) in two finnish materials: a problem pair. *Ent. Fenn.* (Helsinki), 11:175-181. [Finland]
- Mozuraitis, R., V. Buda, V. Jonusaite, A.-K. Borg-Karlson, and R. Noeika**  
2000. Sex pheromones of *Phyllonorycter acerfoliella* and *Ph. heegerella* and communication peculiarities in three species of leafmining moths. *Ent. Exp. Appl.* (Amsterdam), 94:15-23. [Lithuania]
- Murase, M.**  
2000. *Caloptilia kutokoi* Kumata (Gracillariidae) from Wakayama Prefecture. *Yugato* (Niigata), 161:98. [Japan] [in Japanese]
- Nässig, W. A.**  
2000. Informationen, Internetseiten und neue Erkenntnisse über die Roskastanienminiermotte *Cameraria ohridella* (Deschka & Dimic, 1985) (Lepidoptera: Gracillariidae). *Nach. Ent. Ver. Apollo* (Frankfurt), (n.s.) 21:186. [Europe]
- Prins, W. De, and J. Pupliesiene**  
2000. *Cameraria ohridella*, een nieuwe soort voor de Belgische fauna (Lepidoptera: Gracillariidae). *Phegea* (Antwerp), 28:1-6. [Belgium]
- Rott, A. S., and H. C. J. Godfray**  
2000. The structure of a leafminer-parasitoid community. *J. Anim. Ecol.* (Oxford), 69:274-289. [England]
- Sekita, N.**  
2000. Mass flight activity of the apple leafminer *Phyllonorycter ringoniella* (Lepidoptera: Gracillariidae). *Appl. Ent. Zool.* (Tokyo), 35:481-485. [Japan]
- Subchev, M. A., G. R. Markova, R. I. Tomov, and S. Voerman**  
[2000]. *Phyllonorycter pyrifoliella* Grsm. (Lepidoptera: Gracillariidae): investigations by pheromone traps in Bulgaria. *Acta Zool. Bulg.* (Sofia), 51:125-130. (1999)
- Triberti, P.**  
[2000a]. Some new Palaearctic species of the genus *Parornix* Spuler, 1910 (Lepidoptera Gracillariidae). *Boll. Mus. Civic. Stor. Nat. Verona*, 22:167-173. (1998) [Italy, North Africa]  
[2000b]. Remarks on the phylogeny of the genera *Parornix* Spuler and *Callisto* Stephens (Lepidoptera Gracillariidae). *Boll. Mus. Civic. Stor. Nat. Verona*, 22:175-197. (1998) [Palearctic]
- Trimble, R. M., and C. A. Tyndall**  
2000. Disruption of mating in the spotted tentiform leafminer (Lepidoptera:

- Gracillariidae) using synthetic sex pheromone. *Can. Ent. (Ottawa)*, 132:107-117. [Canada]
- Ujiye, T.**  
2000. Biology and control of the citrus leafminer, *Phyllocnistis citrella* Stainton (Lepidoptera: Gracillariidae) in Japan. *Japan Agric. Res. Qtr.* (Tsukuba), 34:167-173.
- Wagner, D. L., J. L. Loose, T. D. Fitzgerald, J. A. De Benedictis, and D. R. Davis**  
2000. A hidden past: the hypermetamorphic development of *Marmara arbutiella* (Lepidoptera: Gracillariidae). *Ann. Ent. Soc. Amer.* (Lanham), 93:59-64. [USA]
- HEPIALIDAE**
- Buser, H., W. Huber, and R. Joos**  
2000. Hepialidae – Wurzelbohrer. In *Schmetterlinge und ihre Lebensräume: Arten - Gefährdung - Schutz. Schweiz und angrenzenden Gebiete*, 3:61-96, pl. 1-2. Basel: Pro Natura - Schweiz. Bund Naturschutz.
- Nielsen, E. S., G. S. Robinson, and D. L. Wagner**  
2000. Ghost-moths of the world: a global inventory and bibliography of the Exoporia (Mnesarchaeoidea and Hepialoidea) (Lepidoptera). *J. Nat. Hist.* (London), 34:823-878.
- Ueda, K.**  
2000. Hepialidae. In *Moths of Nepal*, 6:70-93, pl. 169.
- Yamamoto, M.**  
2000. *Palpifer sexnotata* (Moore) (Hepialidae) from Kanagawa. *Japan Heteroc. J.* (Tokyo), 211:215. [Japan] [in Japanese]
- HESPERIIDAE**
- Brock, J.**  
2000. Silver-spotted skipper. *Amer. Butt.* (Morristown), 8(3):41-43. [USA]
- Burns, J. M.**  
2000. *Pyrgus communis* and *Pyrgus albescens* (Hesperiidae: Pyrginae) are separate transcontinental species with variable but diagnostic valves. *J. Lepid. Soc.* (Los Angeles), 54:52-71. [USA]
- Gatrelle, R. R.**  
2000. Description of a new subspecies of *Poanes aaroni* (Hesperiidae [sic]: Hesperinae) from the west central Gulf Coast of the southern United States. *Taxon. Rep.* (Goose Creek), 2(2):1-9.
- Glassberg, J.**  
2000. Checkered skippers. Part 2: Grizzled skipper and two-banded, mountain and small checkered-skippers. *Amer. Butt.* (Morristown), 8(1):36-39. [USA]
- Gros, P.**  
2000. Belliers Würfel-Dickkopffalter, *Pyrgus bellieri* (Oberthür, 1910), aus dem Gardaseegebiet im Trentino (Italien) (Lepidoptera, Hesperiidae). *Nachbl. Bayer. Ent.* (Munich), 49:27-30. [Italy]
- Hermann, G., R. Steiner, and J. Trautner**  
2000. Zum Überwinterungsstadium und Larvalhabitat des Dickkopffalters *Pyrgus alveus* (Hübner, [1803]) in Baden-Württemberg (Lepidoptera: Hesperiidae). *Ent. Zeit.* (Stuttgart), 110:275-277. [Germany]
- Korb, S. K.**  
2000. Une sous-espèce nouvelle de *Pyrgus alpinus* (Erschoff) du Ti'en-chan septentrional (Lepidoptera Hesperiidae). *Alexanor* (Paris), 21:83-87. (1999) [Russia]
- Mitsuhashi, W.**  
2000. First record of *Pelopidas mathias* (Fabricius) (Lepidoptera, Hesperiidae) from Aomori Prefecture, Japan. *Trans. Lepid. Soc. Japan* (Tokyo), 52:49-50. [in Japanese]
- Orivel, J., and A. Dejean**  
2000. Myrmecophily in Hesperiidae. The case of *Vettius tertianus* in ant gardens. *Comp. Rend. Acad. Sci. (3. Sci. Vie)* (Paris), 323:705-715. [Israel]
- Reinhardt, R.**  
2000. Eine 2. Generation von *Erynnis tages* (Linnaeus, 1758) (Lep., Hesperiidae) in Sachsen. *Ent. Nachr. Ber.* (Dresden), 44:24. [Germany]
- Yasuyuki**  
2000. Discovery of *Thymelicus lineola* in Hokkaido. *Yadoriga* (Tokyo), 184:46-55. [Japan] [in Japanese]
- HETEROCERA**
- Agassiz, D.**  
2000. The 1997 Presidential address — Part 2 why do names change? *Br. J. Ent. Nat. Hist.* (London), 13:41-49. [England]
- Anikin, V. V., S. A. Sachkov, and V. V. Zolotuhin**  
2000a. "Fauna Lepidopterologica Volgo-Uralensis" 150 years later: changes and additions. Part 2. Bombyces and Sphinges (Insecta, Lepidoptera). *Atalanta* (Munich), 31:265-292. [Russia]
- 2000b. "Fauna Lepidopterologica Volgo-Uralensis" 150 years later: changes and additions. Part 6. Tineoidea (Insecta, Lepidoptera). *Atalanta* (Munich), 31:368-376. [Russia]
- Arnscheid, W. R.**  
2000. Die Macrolepidopteren-Fauna Westliguriens (Riviera dei Fiori und ligurische Alpen in Oberitalien) (Insecta, Lepidoptera). *Neue Ent. Nachr.* (Marktleuthen), 47:1-310. [Italy]
- Aston, A.**  
2000. Fourth update of early emergences of moths at Selborne. *Ent. Rec. J. Var.* (Surrey), 112:183-185. [England]
- Barbosa, P., A. Segarra, and P. Gross**  
2000. Structure of two macrolepidopteran assemblages on *Salix nigra* (Marsh) and *Acer negundo* L.: abundance, diversity, richness, and persistence of spruce species. *Ecol. Ent.* (London), 25:374-379. [USA]
- Barnett, R.**  
2000. More on unusual micro-moths in Somerset. *Ent. Rec. J. Var.* (London), 112:128-129. [England]
- Beaumont, H. E.**  
2000. The October occurrence of *Orthopygia glaucinalis* (L.) (Lep.: Pyralidae) and *Pseudargyrotoza conwagana* (Fabr.) (Lep.: Tortricidae) in Yorkshire. *Ent. Rec. J. Var.* (Surrey), 112:12. [England]
- Birkett, N. L.**  
2000. Two uncommon immigrants to Westmoreland (VC 69). *Ent. Rec. J. Var.* (Surrey), 112:252. [England]
- Blázquez, A., J. Hernández-Roldán, M. A. Nieto, and A. García-Santano**  
2000. Nuevos datos sobre la fauna de macroheteróceros de la provincia de Cáceres (España) III (Insecta: Lepidoptera). *SHILAP Revta. Lepid.* (Madrid), 28:173-186. [Spain]
- Buhl, O., P. Falck, B. Jørgensen, O. Karsholt, K. Larsen, and F. Vilhelmsen**  
2000. Records of Microlepidoptera from Denmark in 1999 (Lepidoptera). *Ent. Medd.* (Copenhagen), 68:121-131. [in Danish]
- Buvat, R., and J. Nel**  
2000. Trois Microlépidoptères nouveaux ou méconnus de la faune de France (Lepidoptera Gelechiidae, Stathmopodidae et Epermeniidae). *Alexanor* (Paris), 21:95-99. (1999)
- Covell, C. V., Jr., L. D. Gibson, and D. J. Wright**  
2000. New state records and new available names for species of Kentucky moths (Insecta: Lepidoptera). *J. Ky. Acad. Sci.* (Lexington), 61:105-107. [USA]
- Dolinskaya, I. V., and I. G. Pljushch**  
2000. A comparative characteristic of the moth eggs of Noctuoidea and "bombycoid complex" (Lepidoptera) and its significance for the systematics. *Ent. Basil.* (Basel), 22:298-292.
- Emmet, A. M.**  
2000a. New vice-county records of microlepidoptera. *Ent. Rec. J. Var.* (Surrey), 112:114. [England]
- 2000b. Tables showing the number of Microlepidoptera recorded from the British Isles, May 2000. *Ent. Rec. J. Var.* (Surrey), 112:155-159. [England]
- Ferge, L. A., and G. J. Balogh**  
2000. *Checklist of Wisconsin Moths (Superfamilies Drepanoidea, Geometroidea, Mimallonoidea, Bombycoidea, Sphingoidea and Noctuoidea)*. Milwaukee: Milwaukee Public Mus. (Contrib. in Biol. Geol. Milwaukee Public Mus., 93) 48pp.
- Gavloski, J. E., and R. J. Lamb**  
2000. Compensation for herbivory in cruciferous plants: specific responses to three defoliating insects. *Environ. Ent.* (Lanham), 29:1258-1267. [Canada]
- Gerstberger, M.**  
2000. Weitere Ergänzungen zur Kleinschmetterlingsfauna der Länder Berlin und Brandenburg (Lep.). *Ent. Nachr. Ber.* (Dresden), 44:105-110. [Germany]
- Haruta, T.**  
2000. *Moths of Nepal. Part 6.* Tokyo: Japan Heteroc. Soc. (In Tinea, 16, Suppl. 1). 163pp, pl. 161-174.
- Hornemann, A., and H. Seipel**  
2000. Bemerkenswerte Neu- und Wiederfunde für die Nachtfalterfauna von Südhessen (Lepidoptera: Zygaenidae, Geometridae, Notodontidae, Noctuidae). *Nach. Ent. Ver. Apollo* (Frankfurt), (n.s.) 21:181-184. [Germany]
- Huisman, K. J., and J. C. Koster**  
2000. New and interesting Microlepidoptera from the Netherlands in particular from the years 1997 and 1998 (Lepidoptera). *Ent. Ber.* (Amsterdam), 60:193-216. [in Dutch]
- Kawahara, S.**  
2000. Moths of Koshimizu-cho, northeast Hokkaido VI. *Yugato* (Niigata), 159:5-12. [Japan] [in Japanese]
- Knill-Jones, S. A.**  
2000. New vice-county records of Lepidoptera for the Isle of Wight during 1999. *Ent. Rec. J. Var.* (Surrey), 112:74. [England]
- Komatsu, T., and T. Inoko**  
2000. Brahmaeidae, Saturniidae and Sphingidae from the southern part of Hokkaido. *Yugato* (Niigata), 160:63-70. [Japan] [in Japanese]



- Kozlov, M. V., J. Jalava, and E. Shutova  
2000. New records of Lepidoptera from the Kola Peninsula, northwestern Russia. *Ent. Fenn. (Helsinki)*, 11:131-136.
- Kusunoki, Y., and N. Yasuda  
2000a. On early stages of alpine moths in Hokkaido (2). *Yugato* (Niigata), 159:19-28. [Japan] [in Japanese]  
2000b. On early stages of alpine moths in Hokkaido (3). *Yugato* (Niigata), 162:127-138. [Japan] [in Japanese]
- Laguerre, M.  
[2000]. On some heterocerous Lepidoptera species that are little known or new for Gironde, France – third note. *Bull. Soc. Linn. Bordeaux* (Bordeaux), 27:81-86. (1999) [in French]
- Langmaid, J. R., and M. R. Young  
2000. Microlepidoptera review of 1999. *Ent. Rec. J. Var. (Surrey)*, 112:189-203. [England]
- Lévesque, R.  
2000. Complément au catalogue des lépidoptères de l'Ouest atlantique (1913-1932) d'Henri Gelin et Daniel Lucas (Lepidoptera Heterocera). *Alexanor* (Paris), 21:33-37. (1999) [France]
- Luhkkanen, V. A.  
2000. Sex chromatin and sex chromosome systems in nonditrysian Lepidoptera (Insecta). *J. Zool. Syst. Evol. Res.* (Berlin), 38:73-79.
- Martin, G., L. K. Barnett, and C. Emms  
2000. On some macrolepidoptera of Madeira with special reference to Funchal Ecological Park. *Ent. Gaz.* (Wallingford), 51:33-37.
- Mérit, X., and V. Mérit  
2000. Observations lépidoptériques intéressantes effectuées en 1995, millésime riche en aberrations. Corrigendum (Lepidoptera Heterocera). *Alexanor* (Paris), 21:19. (1999) [France]
- Miller, J. C., and P. C. Hammond  
2000. *Macromoths of Northwest Forests and Woodlands*. Morgantown: USDA For. Serv. 133pp. [USA]
- Murase, M.  
2000a. Records of some moth larvae taken from *Hibiscus hamabo* (Malvaceae) and *Corchoropsis tomentosa* (Tiliaceae). *Japan Heteroc. J.* (Tokyo), 207:133-135. [Japan] [in Japanese]  
2000b. Four moth species feeding on Leguminosae in Wakayama Prefecture. *Yugato* (Niigata), 160:75-76. [Japan] [in Japanese]
- Nabli, H., W. C. Bailey, and S. Necibi  
2000. Responses of Lepidoptera in central Missouri to traps with different light sources. *J. Kansas Ent. Soc.* (Lawrence), 72:82-90. (1999). [USA]
- Nakajima, H., H. Kobayashi, K. Eda, Y. Yanagita, and N. Iizuka  
2000. Notes on the moths collected on Mts. Sugoroku-dake to Washiba-dake in the Hida Range, including alpine zone. *Yugato* (Niigata), 160:54-62. [Japan] [in Japanese]
- Nel, J., and A. Nel  
2000. Microlépidoptères méconnus: plus de 750 espèces en danger en France. Plaidoyer pour une recherche fondamentale négligée (Insecta, Lepidoptera). *Bull. Soc. Ent. Fr.* (Paris), 105:213-216.
- Nielsen, E. S., G. S. Robinson, and D. L. Wagner  
2000. Ghost-moths of the world: a global inventory and bibliography of the Exoporia (Mnesarchaeoidea and Hepialoidea) (Lepidoptera). *J. Nat. Hist.* (London), 34:823-878.
- Nieminen, M., H. Rita, and P. Uuvana  
[2000]. Body size and migration rate in moths. *Ecography* (Copenhagen), 22:697-707. (1999) [Finland]
- Nishio, N.  
2000. Moths as pollinators of *Oenothera biennis* (Onagraceae). *Yugato* (Niigata), 162:124-126. [Japan] [in Japanese]
- Ohno, T., T. Hirowatari, and T. Ueda  
2000. Lepidoptera that infests *Quercus acorns* in Mt. Mikusayama. *Trans. Lepid. Soc. Japan* (Tokyo), 51:99-107. [Japan] [Japanese]
- Owada, M., Y. Arita, Y. Kishida, M. Ikeda, and U. Jinbo  
2000. Moths of the garden of the Imperial Palace, Tokyo, central Japan. *Mem. Natl. Sci. Mus.* (Tokyo), 36:115-168.
- Palmqvist, G.  
2000. Remarkable records of macrolepidoptera in Sweden 1999. *Ent. Tidskr.* (Stockholm), 121:31-45. [in Swedish]
- Parenti, U.  
2000. *A Guide to the Microlepidoptera of Europe*. Turin: Mus. Reg. Sci. Nat. 426pp. (156 pl.). (Guide I, Mus. Reg. Sci. Nat.).
- Parsons, M. S., D. Green, and P. Waring  
2000a. The action for threatened moths project. *Ent. Rec. J. Var. (Surrey)*, 112:15-21. [England]  
2000b. The action for threatened moths project. *Br. J. Ent. Nat. Hist.* (London), 13:57-63. [England]
- Patočka, J.  
2000. Die Puppen der mitteleuropäischen Schmetterlinge (Insecta: Lepidoptera: Superfamilie Yponomeutoidea: Familien Heliodinidae, Bedelliidae und Lyonetiidae). *Linzer Biol. Beitr.* (Linz), 32:195-212. [Europe]
- Poltavsky, A. N., and K. S. Artohin  
2000. New and rare Macrolepidoptera of the Rostov-on-Don region in south Russia (Lepidoptera). *Phegea* (Antwerp), 28:131-147.
- Ponomarenko, M. G., and R. B. Kuranishi  
2000. Microlepidoptera (Insecta: Lepidoptera) collected from the Kamchatka Peninsula and the North Kuril Islands in 1996-1997. *Nat. Hist. Res.* (Chiba), 7 (Spec. Iss.):243-252. [Russia]
- Prins, W. De  
2000. Interessante waarnemingen van Lepidoptera in België in 1999 (Lepidoptera). *Phegea* (Antwerp), 28:15-18. [Belgium]
- Rogard, J.  
2000. Interesting captures (Lepidoptera, Crambidae, Geometridae, Arctiidae, Noctuidae). *Bull. Soc. Linn. Bordeaux*, 28:73075. [in French]
- Rust, J.  
2000. Massenflüge von Lepidopteren über die Nordsee im Alttertiär (Insecta, Lepidoptera). *Atalanta* (Marktleuthen), 31:577-583. [Denmark]
- Rydell, J., H. Roininen, and K. W. Philip  
2000. Persistence of bat defence reactions in high arctic moths (Lepidoptera). *Proc. Roy. Soc., B. Biol. Sci.* (London), 267:553-557. [Canada]
- Ryholm, N., and A. Ohlsson  
2000. Interesting records of Lepidoptera in the taiga- and tundra regions of Sweden 1999. *Ent. Tidskr.* (Stockholm), 121:47-52. [in Swedish]
- Sagliocco, J.-L.  
2000. The insect fauna associated with horehound (*Marrubium vulgare* L.) in western Mediterranean Europe and Morocco: potential for biological control in Australia. *Plant Prot. Qtr.* (Mt. Eliza), 15:21-25. [Europe]
- Sato, R.  
2000. Bibliography of the moth fauna of Niigata Prefecture, Supplement 37. *Yugato* (Niigata), 159:30. [Japan] [in Japanese]
- Sciarretta, A., and P. Parenzan  
[2000]. Contribution to the knowledge of the macrolepidoptera of Molise (Italy): Bombyces and Sphinges (Heterocera). *Ent. (Bari)*, 32:81-107. (1998) [in Italian]
- Sloten, J.  
2000. Some interesting rearing records from Florida and Texas. *News Lepid. Soc.* (Los Angeles), 42:12-13, 32. [USA]
- Stradler, B., and T. Müller  
2000. Effects of aphids and moth caterpillars on epiphytic microorganisms in canopies of forest trees. *Can. J. For. Res.* (Ottawa), 30:631-638. [Germany]
- Sugi, S.  
2000. 'Post-MJ' Additions of Species and Changes in Names of Japanese Moths. Edition 2. Tokyo: Japan Heteroc. Soc. 171pp. [in Japanese]
- Svensson, I.  
2000. Remarkable records of Microlepidoptera in Sweden during 1999. *Ent. Tidskr.* (Stockholm), 121:1-12. [in Swedish]
- Tannert, R., and R. Rupprecht  
2000. Erfassung der Insektenfauna im Nürnberger Reichswald bei Fischbach-Brunn von 1978 bis 1999 – insbesondere Macro-, Microlepidoptera und Coleoptera. *Galathea* (Nuremberg), 16:75-108. [Germany]
- Tshistjakov, Y. A.  
2000. An annotated checklist of larger moths (Lepidoptera, Heterocera, except Geometridae and Noctuidae) of the Kamchatka Peninsula, with notes on their zoogeography. *Nat. Hist. Res.* (Chiba), 7 (Spec. Iss.):253-266. [Russia]
- White, M. J.  
2000. Some moths new to Monmouthshire. *Ent. Rec. J. Var. (Surrey)*, 112:41-42. [England]
- Wolton, R. J.  
2000. The larger moths (Macrolepidoptera) of culm grassland, north Devon. *Ent. Rec. J. Var. (Surrey)*, 112:141-153. [England]
- HYBLAEIDAE**  
Nishio, N.  
2000. Mating behavior of *Hyblaea fortissima* (Hyblaeidae). *Yugato* (Niigata), 160:82-83. [Japan] [in Japanese]
- INCURVARIIDAE**  
Okamoto, H., and T. Hirowatari  
2000. Biology of *Vespina nielsenii* Kozlov (Lepidoptera: Incurvariidae); with description of immature stages and redescription of adults. *Ent. Sci.* (Tokyo), 3:511-518. [Japan]
- LASIOCAMPIDAE**  
Alekshev, A. A., A. V. Tkachev, A. K. Dobrotvorskii, J. A. Klun, and G. A. Tolstikov  
2000. A study of synthetic attractants of Siberian moth *Dendrolimus superans* Butl. (Lepidoptera: Lasiocampidae). *Dokl. Akad. Nauk* (St. Petersburg), 373:129-131. [Russia] [in Russian]
- Cooke, B. J., and J. Roland

2000. Spatial analysis of large-scale patterns of forest tent caterpillar outbreaks. *Ecosci.* (Quebec), 7:410-422. [Canada]
- Jost, B., J. Schmid, and H.-P. Wymann**
2000. Lasiocampidae – Glucken, Wollraupenspinner. In *Schmetterlinge und ihre Lebensräume: Arten - Gefährdung - Schutz. Schweiz und angrenzenden Gebiete*, 3:263-350, pl. 11-15. Basel: Pro Natura - Schweiz. Bund Naturschutz. [Switzerland]
- Klun, J. A., Y. N. Baranchikov, V. C. Mastro, Y. Hijji, J. Nicholson, I. Reganovich, and T. A. Vshivkova**
2000. A sex attractant for the Siberian moth *Dendrolimus superans sibiricus* (Lepidoptera: Lasiocampidae). *J. Ent. Sci.* (Tifton), 35:158-166. [Russia]
- Myers, J. H.**
2000. Population fluctuations of the western tent caterpillar in southwestern British Columbia. *Pop. Ecol.* (Tokyo), 42:231-241. [Canada]
- Pletnev, V. A., V. L. Ponomarev, N. V. Vendilo, S. A. Kurbatov, and K. V. Lebedeva**
2000. Search of the pheromone of Siberian silkworm *Dendrolimus superans sibiricus* (Lepidoptera: Lasiocampidae). *Agrokhim.* (Moscow), 6:67-72. [Russia] [in Russian]
- Regier, J. C., C. Mitter, R. S. Peigler, and T. P. Friedlander**
2000. Phylogenetic relationships in Lasiocampidae (Lepidoptera): initial evidence from elongation factor-1 $\alpha$  sequences. *Ins. Syst. Evol.* (Stenstrup), 31:179-186. [New World]
- Ruf, C., and K. Fiedler**
- 2000a. Trail following as a rare phenomenon among non-social lappet moth larvae (Lepidoptera: Lasiocampidae). *Ent. General.* (Stuttgart), 25:17-25. [Germany]
- 2000b. Thermal gains through collective metabolic heat production in social caterpillars of *Eriogaster lanestris*. *Naturwissenschaft.* (Berlin), 87:193-196. [Germany]
- Verdinelli, M., G. Serra, and P. Luciano**
2000. Observations on spatial distribution of *Malacosoma neustrium* (L.) egg masses and tents in Sardinian cork oak forests. *Redia* (Florence), 82:181-196. (1999) [Italy] [in Italian]
- Yukinari, M.**
2000. Notes on biology of *Gastropacha orientalis* Sheljuzhko (Lepidoptera: Lasiocampidae). *Yugato* (Tokyo), 185:28-30. [Japan] [in Japanese]
- Zolotuhin, V. V., and I. Y. Kostjuk**
2000. *Phantosoma witti* gen. et sp. nov., a new autumn lasiocampid moth from Turkmenistan (Lasiocampidae). *Nota Lepid.* (Basel), 23:141-146.
- LEMONIIDAE**
- Jost, B., J. Schmid, and H.-P. Wymann**
2000. Lemoniidae – Wiesenspinner. In *Schmetterlinge und ihre Lebensräume: Arten - Gefährdung - Schutz. Schweiz und angrenzenden Gebiete*, 3:351-361, pl. 15. Basel: Pro Natura - Schweiz. Bund Naturschutz. [Switzerland]
- LEPIDOPTERA**
- Aarvik, L., K. Berggrem, and L. O. Hansen**
2000. *Catalogus Lepidopterorum Norvegiae*. Oslo: Lepid. Arbeitsgruppe. 192pp. [Norway]
- Aistleitner, U., K. Lechner, and A. Ortner**
2000. Notizen zur Schmetterlingsfauna des Burgenlandes, Austria or. (Insecta, Lepidoptera). *Zeit. Arbeitsgem. Österr. Ent.* (Vienna), 52:23-34. [Austria]
- Al-Houty, W.**
2000. Some Lepidoptera recorded from Kuwait. *Nach. Ent. Ver. Apollo* (Frankfurt), (n.s.) 21:109-111.
- Béa, A.-M.**
2000. Contribution à la connaissance de la faune lépidoptérique de Broglie (Eure) (Rhopalocera et Heterocera). *Alexanor* (Paris), 21:21-32. (1999) [France]
- Beshkov, S. V., and S. P. Abadjiev**
2000. The butterfly and moth fauna of the areas around the lakes of Durankulak, Exerets, Shabla and Shablenska Tuzla in NE Bulgaria (Insecta: Lepidoptera). *Atalanta* (Marktleuthen), 31:543-573.
- Biermann, H.**
2000. Die Entwicklung der Tagfalter- und Widderchenfauna im Raum Warburg-Diemenstadt seit etwa 1850 (Lepidoptera, Rhopalocera et Zygaenidae). *Atalanta* (Marktleuthen), 31:531-542. [Germany]
- Bischof, A.**
2000. Beitrag zur Kenntnis der Schmetterlingsfauna im Domleschg und Heinzenberg, Graubünden, Schweiz (Lepidoptera: Papilionoidea, Hesperioidea, Zygaenoidea). *Opusc. Zool. Flumin.* (Flumserberg), 188: 1-84. [Switzerland]
- Bordelon, C., Jr., and E. Knudson**
2000. New records of Lepidoptera from Texas and the USA, and illustrations of other interesting species. *News Lepid. Soc.* (Los Angeles), 42:3-7, 19.
- Bradley, J. D.**
- 2000a. *Checklist of Lepidoptera Recorded from the British Isles*. Fordingbridge. 116pp.
- 2000b. *Log Book of British Lepidoptera*. Fordingbridge.
- Brown, J. W., and K. Bash**
2000. The Lepidoptera of Marine Corps Air Station Miramar: calculating faunal similarity among sampling sites and estimating total species richness. *J. Res. Lepid.* (Beverly Hills), 36:45-78. (1997) [USA]
- Butler, L., and J. Strazanac**
2000. Occurrence of Lepidoptera on selected host trees in two central Appalachian national forests. *Ann. Ent. Soc. Amer.* (Lanham), 93:500-511. [USA]
- Castner, J. L.**
2000. *Photographic Atlas of Entomology and Guide to Insect Identification*. Gainesville: Feline Pr. 174pp. [USA]
- Corley, M. F. V., A. J. Gardiner, N. Cleere, and P. D. Wallis**
2000. Further additions to the Lepidoptera of Algarve, Portugal (Insecta: Lepidoptera). *SHILAP Revta. Lepid.* (Madrid), 28:245-319.
- Cowley, M. J. R., R. J. Wilson, J. L. Leon-C., D. Gutierrez, C. R. Bulman, and C. D. Thomas**
2000. Habitat-based statistical models for predicting the spatial distribution of butterflies and day-flying moths in a fragmented landscape. *J. Appl. Ecol.* (Oxford), 37(Suppl. 1):60-72. [England]
- Crabtree, L. L., and R. Leuschner**
2000. Records for the utilization of *Prunus* as a larval foodplant by 71 species of Lepidoptera in northeast California. *Taxon. Rep.* (Goose Creek), 2(7):1-6. [USA]
- Dubatolov, V. V., and O. E. Kosterin**
2000. Nemoral species of Lepidoptera (Insecta) in Siberia: a novel view on their history and the timing of their range disjunctions. *Ent. Fenn.* (Helsinki), 11:141-166. [Russia]
- Dutreix, C., and D. Morel**
2000. *Inventaire détaillé des Insectes Macro-Lépidoptères de Bourgogne*. (3rd ed.). Paris: Edit. Gr. IDEA. 57pp. [France]
- Embacher, G.**
2000. Kleiner Beitrag zur Lepidopterenfauna Griechenlands (Insecta: Lepidoptera). *Zeit. Arbeitsgem. Österr. Ent.* (Vienna), 52:65-70. [Greece]
- Foster, A. P.**
2000. Lepidoptera observed in Lanzarote during February 2000. *Ent. Rec. J. Var.* (Surrey), 112:271. [Canary Is.]
- Földner, K.**
2000. Neufunde und Bestätigung verschollener Macrolepidopteren im südlichen Niedersachsen. *Ent. Zeit.* (Stuttgart), 110:130-133. [Germany]
- Hasenfuss, I.**
2000. Evolutionary pathways of truncanal tympanal organs in Lepidoptera (Insecta: Holometabola). *Zool. Anz.* (Jena), 239:27-44.
- Heinecke, C.**
2000. The forest of Hasbruch near Bremen, Lower Saxony, Germany, as ecological niche for butterflies and moths (Insecta: Lepidoptera). *Drosera* (Oldenburg), 2000(1-2):73-98. [in German]
- Heppner, J. B. (ed.)**
2000. Lepidoptera (moths, butterflies, and skippers). In R. H. Arnett, Jr. (ed.), *American Insects: a Handbook of the Insects of America North of Mexico* (2nd ed.), 631-827. Boca Raton: CRC Pr.
- Heres, A.**
2000. Saison entomologique 1998. Observations insolites dans les Alpes-de-Haute-Provence (Lepidoptera: Lycaenidae, Nymphalidae et Sphingidae). *Alexanor* (Paris), 1:105-111. (1999) [France]
- Holbeck, H. B., H. D. Clausen, and J. Reddersen**
2000. Dagsommerfugles og køllesvaermers valg af nektarplanter I et økologisk landburs småbiotoper (Papilionoidea, Hesperioidea og Zygaenidae). *Ent. Meddel.* (Copenhagen), 68:47-59. [Denmark]
- Karsholt, O.**
2000. Contributions to the Lepidoptera fauna of the Madeiran Islands. 1. Introduction. *Beitr. Ent.* (Berlin), 50:397-405. [Portugal (Madeira Is.)]
- Keller, W. C. F., S. Keller-Stänz, P. Gloor, A. Kopp, and W. Dür**
2000. Neue Erkenntnisse über die Veränderungen der Tag- und Nachtfalterfauna (Lepidoptera) in der Region Rehetobel AR im 20. Jahrhundert. *Ber. St. Gall. Naturwiss. Ges.* (St. Gallen), 89:155-126. [Switzerland]
- Kennedy, T. B., A. M. Merenlender, and C. L. Vinyard**
2000. A comparison of riparian condition and aquatic invertebrate community indices in central Nevada. *W. N. Amer. Nat.* (Provo), 60:255-272. [USA]
- Kolligs, D.**
2000. Ecological effects of artificial light sources on nocturnally active insects, in particular on butterflies (Lepidoptera). *Faun.-Ökol. Mitt. Suppl.* (Neumünster), 28:1-136. [Germany] [in German]
- Krenn, H. W., and N. P. Kristensen**
2000. Early evolution of the proboscis of Lepidoptera (Insecta): external morphology of the galea in basal glossatan moths lineages, with remarks on the origin of the pilifers. *Zool. Anz.* (Jena), 239:179-196.
- Knudson, E., and C. Bordelon, Jr.**
2000. *Checklist of the Lepidoptera of Texas*. (rev. ed). Houston. (Texas Lepid.



- Surv. Publ. 6). [21]+49+[7]pp. [USA]
- Kraus, W.**  
2000. Beobachtungen zur Macrolepidopteren-Fauna der Iberischen Halbinsel. Teil 3 (letzter Teil): Artenliste Noctuidae bis Arctiidae (Schluss), Nachtrag, Literatur, Register. *Nachr. Ent. Ver. Apollo* (Frankfurt), (n.s.) 20:337-408. (1999) [Spain]
- Kudrna, O.**  
2000. Die Schmetterlinge der FFH-Richtlinie 92/43/EWG der EU. *Oedippus* (Schweinfurt), 18:1-28. [Europe]
- Kunte, K.**  
2000. *Butterflies of Peninsular India*. Hyderabad: Univ. Pr. 254pp, 32 pl.
- Kydd, B., and S. Hewitt (ed.)**  
2000. *A Checklist of the Butterflies and Larger Moths of Cumbria*. Carlisle: Tullie House Mus. 44pp. [England]
- Lehmann, L.**  
2000. Beitrag zur Kenntnis der Makrolepidopterenfauna des Kirgisischen Gebirges. *Nach. Ent. Ver. Apollo* (Frankfurt), (n.s.) 21:91-98. [Kirghizistan]
- Lewandowski, S.**  
2000. Beitrag zur Lepidopterenfauna von Zypern. *Ent. Zeit.* (Stuttgart), 110:376-377. [Cyprus]
- Lichtenberger, F.**  
2000. Beitrag zur Schmetterlingsfauna der "Feuchten Ebene" südlich von Wien. Teil I: Die Welschen Halten bei Ebreichsdorf (Lepidoptera). *Zeit. Arbeitsgem. Österr. Ent.* (Vienna), 52:71-96. [Austria]
- Luquet, G. C.**  
2000. *Biocoenotique des Lépidoptères du Mont Ventoux (Vaucluse)*. Paris. 399pp. (Suppl., *Alexanor*). [France]
- Mateo-Lozano, J. M.**  
2000. Fauna lepidopterológica del área de Reserva del Pinsapar (Parque Natural Sierra de Grazalema, Cádiz, España) (Insecta: Lepidoptera). *SHILAP Revta. Lepid.* (Madrid), 28:133-172. [Spain]
- Matsumoto, T., T. Sunahara, and N. Suzuki**  
2000. Effects of nonhost and host plants on insect herbivory covarying with plant size in the cruciferous plant *Turritis glabra*. *Pop. Ecol.* (Tokyo), 42:145-152. [Japan]
- Moritz, K.**  
2000. Beiträge zur Insektenfauna des Bezirks Matterburg, Burgenland. *Zeit. Arbeitsgem. Österr. Ent.* (Vienna), 52:35-54. [Austria]
- Nemeth, L.**  
[2000]. Data on the macrolepidoptera fauna of Croatia and Slovenia (Lepidoptera). *Fol. Ent. Hung.* (Budapest), 60:355-361. (1999) [in Hungarian]
- Pathak, S. C., V. Kulshrestha, and A. K. Choubey**  
2000. A study of insects of terrestrial origin over north Arabian Sea. *Entomon* (Trivandrum), 25:209-216.
- Reinhardt, R.**  
2000. Falterverluste durch Freßfeinde. *Ent. Nachr. Ber.* (Dresden), 44:86-87. [Germany]
- Rogard, J.**  
[2000]. Lepidoptera captures with honey lures at Carcans (Gironde). *Bull. Soc. Linn. Bordeaux*, 27:76. (1999) [France] [in French]
- Skinner, B., and G. A. Collins**  
2000. The immigration of Lepidoptera to the British Isles in 1998. *Ent. Rec. J. Var. (Surrey)*, 112:233-251. [England]
- Skinner, B., and M. S. Parsons**  
2000. The immigration of Lepidoptera to the British Isles in 1997. *Ent. Rec. J. Var. (Surrey)*, 112:49-73. [England]
- Stamp, N. E., and M. D. Bowers**  
2000. Foraging behaviour of caterpillars given a choice of plant genotypes in the presence of insect predators. *Ecol. Ent.* (London), 25:486-492. [USA]
- Tadauchi, O., and H. Inoue**  
2000. On MOKUROKU file based on "A Check List of Japanese Insects" on internet. *Esakia* (Fukuoka), 40:81-84. [Japan]  
URL: <http://konchudb.agr.kyushu-u.ac.jp/mokuroku/index-e.html/>
- Thiele, V.**  
2000. Zur Kenntnis der Schmetterlingsfauna verschiedener Flußaltypen in Mecklenburg-Vorpommern (Lep.). *Ent. Nachr. Ber.* (Dresden), 44:137-144. [Germany]
- Thomson, G. (ed.)**  
2000. *Insectorum Minimorum Animalium Theatrum*. Lockerbie. 66pp. [1634, T. Moufet, reprint]
- Vanholder, B.**  
2000. Trekvlinders in 1999, zestiende jaarverslag (Lepidoptera). *Phegea* (Antwerp), 28:37-56. [Belgium]
- Vos, R. de**  
2000. Migrating Lepidoptera in 1999 (sixtieth report). *Ent. Ber.* (Amsterdam), 60:217-230. [Netherlands] [in Dutch]
- Weihrauch, F.**  
2000. Die Großschmetterlingsfauna an Kulturhopfen (*Humulus lupulus* L.) in der Hallertau (Lepidoptera: Hepialidae, Lasiocampidae, Sphingidae, Lycaenidae, Nymphalidae, Geometridae, Noctuidae, Lymantriidae, Arctiidae). *Nachrbl. Bayer. Ent.* (Munich), 49:11-20. [Germany]
- Work, T. T., and D. G. McCullough**  
2000. Lepidopteran communities in two forest ecosystems during the first gypsy moth outbreaks in northern Michigan. *Environ. Ent.* (Lanham), 29:884-900. [USA]
- Wrobel, M. (ed.)**  
2000. *Elsevier's Dictionary of Butterflies and Moths, in Latin, English, German, French and Italian*. Amsterdam: Elsevier. 278pp.
- LIMACODIDAE**  
**Ohbayashi, T., and K. Takeuchi**  
2000. On the larva of *Belippa boninensis* (Matsumura) (Limacodidae). *Japan Heteroc. J.* (Tokyo), 208:141-142. [Ryukyus] [in Japanese]
- LYCAENIDAE**  
**Agrawal, A. A., and J. A. Fordyce**  
2000. Induced indirect defence in a lycaenid-ant association: the regulation of a resource in a mutualism. *Proc. Roy. Soc. (B. Biol. Sci.)* (London), 267:1857-1861. [Canada]
- Arnaud, J.-P.**  
2000. *Cacyreus marshalli* Butler en France: contribution à l'ébauche de la cartographie de son extension (Lepidoptera Lycaenidae). *Alexanor* (Paris), 111-112. (1999)
- Bálint, Z., Y.-F. Hsu, and K. Johnson**  
2000. *Plebejus fyodor* sp. n. from the Tibetan Plateau (Lepidoptera: Lycaenidae). *Fol. Ent. Hung.* (Budapest), 61:181-186. [China: Sichuan]
- Benyamini, D.**  
2000. *Pseudophilotes jordanicus* a new relict species of the SE. Mediterranean (Lepidoptera: Lycaenidae). *Linn. Belg.* (Beersel), 17:359-370.
- Burghardt, F., H. Knüttel, M. Becker, and K. Fiedler**  
2000. Flavonoid wing pigments increase attractiveness of female common blue (*Polyommatus icarus*) butterflies to mate-searching males. *Naturwissenschaften* (Berlin), 87:304-307. [Germany]
- Carbonell, F.**  
2000. Contribution à la connaissance du genre *Agrodiaetus* Hübner (1822), *A. barmifurza* n. sp. et *A. musa esfahensis* n. ssp. en Iran méridional (Lepidoptera: Lycaenidae). *Linn. Belg.* (Beersel), 17:211-217 (1999).
- Carbonell, F., and A. R. Naderi**  
2000. Contribution à la connaissance du genre *Agrodiaetus* Hübner (1822), *A. arasbarani* nouvelle espèce dans le nord-ouest de l'Iran (Lepidoptera: Lycaenidae). *Linn. Belg.* (Beersel), 17:218-220 (1999).
- Cordero, C.**  
2000a. Is spermatophore number a good measure of mating frequency in female *Callophrys xami* (Lycaenidae)? *J. Lepid. Soc.* 53:169-170. [Mexico]  
2000b. Trade-off between fitness components in males of the polyphagous butterfly, *Callophrys xami* (Lycaenidae): the effect of multiple mating on longevity. *Behav. Ecol. Sociobiol.* (Berlin), 48:458-462. [Mexico]
- Cordero, C., R. Macías, and G. Jiménez**  
2000. The number of copulations of territorial males of the butterfly *Callophrys xami* (Lycaenidae). *J. Res. Lepid.* (Beverly Hills), 35:78-89. (1996) [Mexico]
- Dantchenko, A.**  
2000. A new taxon of the genus *Polyommatus* Latreille, 1804 from the Transcaucasus (Lepidoptera, Lycaenidae). *Neue Ent. Nachr.* (Markt-leuthen), 48:69-71, 94-95 (pl. 12). [Armenia]
- Dukont, D.**  
2000. Découverte et description de la femelle de *Polyommatus bollandi* Dumont 1998 et considérations nouvelles sur le mâle (Lepidoptera: Lycaenidae). *Linn. Belg.* (Beersel), 17:273-275. [Turkey]
- Dyck, H. van, J. G. B. Oostermeijer, W. Telloen, V. Feenstra, A. van der Hidde, and I. Wynhoff**  
2000. Does the presence of ant nests matter for oviposition to a specialized myrmecophilous *Maculinea* butterfly? *Proc. Roy. Soc. Biol. Sci. (B)* (London), 267:861-866. [Netherlands]
- Figurny-Puchalska, E., R. M. E. Gadeberg, and J. J. Boomsma**  
2000. Comparison of genetic population structure of the large blue butterflies *Maculinea nausithous* and *M. teleius*. *Biodivers. Conserv.* (London), 9:419-432. [Poland]
- Fischer, K., and K. Fiedler**  
2000a. Response of the copper butterfly *Lycaena tityrus* to increased leaf nitrogen in natural food plants: evidence against the nitrogen limitation hypothesis. *Oecolog.* (Berlin), 124:235-241. [Germany]  
2000b. Sex-related differences in reaction norms in the butterfly *Lycaena tityrus* (Lepidoptera: Lycaenidae). *Oikos* (Copenhagen), 90:372-380. [Germany]
- Glassberg, J.**  
2000. *Satyrion* hairstreaks: Acadian, California, and sylvan. *Amer. Butt.* (Morristown), 8(2):22-24. [USA]
- Goverde, M., M. G. A. van der Heijden, W. Wiemken I. R. Sanders, and A.**

- Erhardt**  
2000. Arbuscular mycorrhizal fungi influence life history traits of a lepidopteran herbivore. *Oecolog.* (Berlin), 125:362-369. [Lycaenidae; Switzerland]
- Gries, N.**  
2000. Erstfund von *Cacyreus marshalli* Butler, 1898, in Deutschland. *Ent. Zeit.* (Stuttgart), 331. [Germany]
- Grundel, R., N. B. Pavlovic, and S. L. Sulzman**  
2000. Nectar plant selection by the Karner blue butterfly (*Lycaeides melissa samuelis*) at the Indiana Dunes National Lakeshore. *Amer. Midl. Nat.* (Notre Dame), 144:1-10. [USA]
- Hagen, W. ten, and W. Eckweiler**  
2000. Zur Taxonomie von *Lycaena (Thersamonia) lampon* (Lederer, 1870) und *L. (T.) lamponides* (Staudinger, 1901) stat. nov. (Lepidoptera: Lycaenidae). *Nach. Ent. Ver. Apollo* (Frankfurt), (n.s.) 21:49-54. [Iran]
- Hagen, W. ten, and K. G. Schurian**  
2000. Eine neue Unterart von *Polyommatus (Agrodiaetus) darius* Eckweiler & ten Hagen, 1998 aus Nordwestiran (Lepidoptera: Lycaenidae). *Nach. Ent. Ver. Apollo* (Frankfurt), (n.s.) 21:113-115. [Iran]
- Hammond, P. C., and D. V. McCorkle**  
2000. A new species of *Philotiella* from the Oregon Cascade Range (Lepidoptera: Lycaenidae). *Holarctic Lepid.* (Gainesville), 6:77-82. (1999) [USA]
- Hoshikawa, K.**  
2000. Cold resistance in hibernating pupae of *Scolitantides orion* (Pallas) (Lepidoptera, Lycaenidae). *Trans. Lepid. Soc. Japan* (Tokyo), 51:127-130. [Japan]
- Hughes, J. B.**  
2000. The scale of resource specialization and the distribution and abundance of lycaenid butterflies. *Oecolog* (Berlin), 123:375-383. [USA]
- Imafuku, M., T. Ohtani, and T. Takeuchi**  
2000. Copulation of *Neozephyrus japonicus* (Lycaenidae) under captive conditions. *Trans. Lepid. Soc. Japan* (Tokyo), 52:1-10. [Japan]
- Inoue, T., and I. Okochi**  
2000. First record of *Fixsenia w-album* (Lepidoptera, Lycaenidae) from Ibaraki Prefecture, Honshu. *Trans. Lepid. Soc. Japan* (Tokyo), 51:117-118. [Japan]
- Ivonin, V. V., and O. E. Kosterin**  
2000. A new subspecies of *Polyommatus icadius* (Groum-Grzhimailo, 1890) from the Russian Altai (Lepidoptera, Lycaenidae). *Atalanta* (Munich), 31:171-177, pl. 13.
- Johnson, K.**  
2000a. A journey to Nabokov's Karner, New York — a conservation dilemma. *News Lepid. Soc.* (Los Angeles), 42:45-47. [USA]  
2000b. A journey to Nabokov's Karner, New York: a conservation dilemma. *Lepid. News* (Gainesville), 2000(2):18-19. [USA]
- Jones, R. A.**  
2000. Chalkhill blue and small copper butterflies feeding on dung. *Br. J. Ent. Nat. Hist.* (London), 13:134-135. [England]
- King, R. S.**  
2000. Evaluation of survey methods for the Karner blue butterfly on the Necedah Wildlife Management Area. *Trans. Wisc. Acad. Sci.* (Madison), 88:67-75. [USA]
- Kistner, F., and A. Beck**  
2000. Falterbeobachtungen auf Fuerteventura: Erstnachweis von *Leptotes pirithous* (Linnaeus, 1767) für die kanarischen Inseln (Lepidoptera: Lycaenidae). *Nach. Ent. Ver. Apollo* (Frankfurt), (n.s.) 21:99-102. [Spain (Canary Is.)]
- Kolligs, D.**  
2000. Zur Ökologie des Brombeersipfelfalters, *Callophrys rubi* (Linnaeus, 1758), in Schleswig-Holstein (Lepidoptera: Lycaenidae). *Nachr. Ent. Ver. Apollo* (Frankfurt), (n.s.) 20:281-289. (1999) [Germany]
- Korb, S. K.**  
2000. Nouveaux taxa des genres *Hyponephele* Muschamp, 1915, et *Polyommatus* Latreille, 1804, du Nord-Est asiatique (Lepidoptera Nymphalidae Satyrinae et Lycaenidae). *Alexanor* (Paris), 21:51-59. (1999) [Russia]
- Leigheb, G., D. Jutzeler, and V. Cameron-Curry**  
2000. The breeding of *Pseudophilotes barbagiae* De Prins & van der Poorten, 1970, an endemic species of the Gennargentu Massif, Sardinia, Italy (Lepidoptera: Lycaenidae). *Linn. Belg.* (Beersel), 17: 239-246.
- León-C., J. L., M. J. R. Cowley, and C. D. Thomas**  
[2000]. Detecting decline in a formerly widespread species: how common is the common blue butterfly *Polommatus icarus*? *Ecography* (Copenhagen), 22:643-650. (1999) [England]  
2000. The distribution and decline of a widespread butterfly *Lycaene phlaeas* in a pastoral landscape. *Ecol. Ent.* (London), 25:285-294. [England]
- Lukhtanov, V. A.**  
2000. Zur Systematik und Verbreitung der Taxa der *Athamanthia dimorpha*-Gruppe (Lepidoptera, Lycaenidae). *Atalanta* (Munich), 31:179-192, pl. 14. [C. Asia]
- Maechler, J.**  
2000. Nouvelles captures de *Cacyreus marshalli* Btlr., 1897, dans le Var (Lepidoptera Lycaenidae). *Alexanor* (Paris), 21:63-64. (1999) [France]
- Marttila, O., K. Saarinen, and P. Marttila**  
2000. Six years from passing bell to recovery: habitat restoration og the threatened chequered blue butterfly (*Scolitantides orion*) in SE Finland. *Ent. Fenn.* (Helsinki), 11:113-117.
- Meyer-Hozak, C.**  
2000. Population biology of *Maculinea rebeli* (Lepidoptera: Lycaenidae) on the chalk grasslands of eastern Westphalia (Germany) and implications for conservation. *J. Ins. Conserv.* (Dordrecht), 4:63-72.
- Mothiron, P.**  
2000. L'Hérault, nouvelle étrape française pour l'envahissant *Cacyreus marshalli* Butler, 1898 (Lepidoptera Lycaenidae). *Alexanor* (Paris), 21: 49-50. (1999) [France]
- Nekrutenko, Y. P.**  
2000a. A catalogue of the type specimens of Palaearctic Riodinidae and Lycaenidae (Lepidoptera, Rhopalocera) deposited in the collection of the Museum für Naturkunde der Humboldt Universität zu Berlin. *Nota Lepid.* (Basel), 23:192-352.  
2000b. A catalogue of the type specimens of Lycaenidae deposited in the collection of the Staatliches Museum für Tierkunde Dresden (Insecta: Lepidoptera: Rhopalocera). *Ent. Abh.* (Dresden), 59:143-215.
- Nel, A., and J. Nel**  
2000. Nouvelles citations de *Cacyreus marshalli* Butler, 1898, pour la France et l'Espagne (Lep., Lycaenidae). *Bull. Soc. Ent. Fr.* (Paris), 105:386. [France, Spain]
- Nisaka, Y.**  
2000. [Blues in Europe]. *Yadoriga* (Tokyo), 184:2-40. [in Japanese]
- Ohgane, H., S. Onodera, and S. Hashimoto**  
2000. On the effects of temperature in the larval stage to the adult external characters of *Fixsenia iyonis surugaensis* (Fujioka) (Lepidoptera, Lycaenidae). *Trans. Lepid. Soc. Japan* (Tokyo), 52:58-62. [Japan]
- Olivier, A.**  
2000. Discovery of the types of *Polyommatus (Agrodiaetus) actis* and its taxonomic consequences (Lycaenidae). *Nota Lepid.* (Basel), 23:86-118. [Turkey]
- Olivier, A., D. van der Poorten, and W. De Prins**  
2000. *Polyommatus (Agrodiaetus) arvinensis* stat. nov. And *P. (A.) sigberti* sp. nov., two vicariant species known so far only from Turkey (Lepidoptera: Lycaenidae). *Phegea* (Antwerp), 28:57-74.
- Oorschot, H. van, and S. Wagener**  
2000. Zu *Tomares* in der Türkei. Ergänzungen und Korrekturen zu Hesselbarth, van Oorschot & Wagener, 1995: Die Tagfalter der Türkei. 3. *Phegea* (Antwerp), 28:87-117. [Turkey]
- Pasquier, G.**  
2000. First verified capture of *Cacyreus marshalli* in Gironde, France (Lepidoptera, Lycaenidae). *Bull. Soc. Linn. Bordeaux*, 28:97-98. [in French]
- Pavulaan, H., and D. M. Wright**  
2000. The biology, life history, and taxonomy of *Celastrina neglectamajor* (Lycaenidae: Polyommatinae). *Taxon. Rep.* (Goose Creek), 2(5):1-18. [USA]
- Pfeifer, M. A., U. R. Andrick, W. Frey, and J. Settele**  
2000. On the ethology and ecology of a small and isolated population of the dusky large blue butterfly *Glaucopsyche (Maculinea) nausithous* (Lycaenidae). *Nota Lepid.* (Basel), 23:147-172. [Germany]
- Pupliesiene, J., and A. Olivier**  
2000. The karyotype and chromosome number of *Polyommatus buzulmavi* (Lycaenidae). *Nota Lepid.* (Basel), 23:71-77. [Turkey]
- Przybyłowicz, L.**  
2000. Polish butterflies of the subgenus *Polyommatus (Agrodiaetus)* (Lepidoptera: Lycaenidae). *Polsk. Pismo Ent.* (Gdynia), 69:329-334. [Poland]
- Quivron, D.**  
2000. *Cacyreus marshalli* Btlr. en Haute-Provence (Lepidoptera Lycaenidae). *Alexanor* (Paris), 21:79-80. (1999) [France]
- Ruffin, J., and J. Glassberg**  
2000. Miami blues still fly. *Amer. Butt.* (Morristown), 8(1):28-29. [USA]
- Ruiz, J. L., and F. J. Pérez-López**  
2000. Presencia de *Cacyreus marshalli* (Butler, 1898) en Ceuta (norte de la Península Tingitana) (Lepidoptera Lycaenidae). *Alexanor* (Paris), 21: 93-94. (1999) [Spain]
- Rusterholz, H.-P., and A. Erhardt**  
2000. Can nectar properties explain sex-specific flower preferences in the Adonis blue butterfly *Lysandra bellargus*? *Ecol. Ent.* (London), 25:81-90. [Switzerland]
- Schurian, K. G., and W. ten Hagen**  
2000. Beitrag zur Biologie von *Polyommatus (Agrodiaetus) glaucias* (Lederer, 1871) (Lepidoptera: Lycaenidae). *Nach. Ent. Ver. Apollo* (Frankfurt), (n.s.), 21:19-23. [Iran]