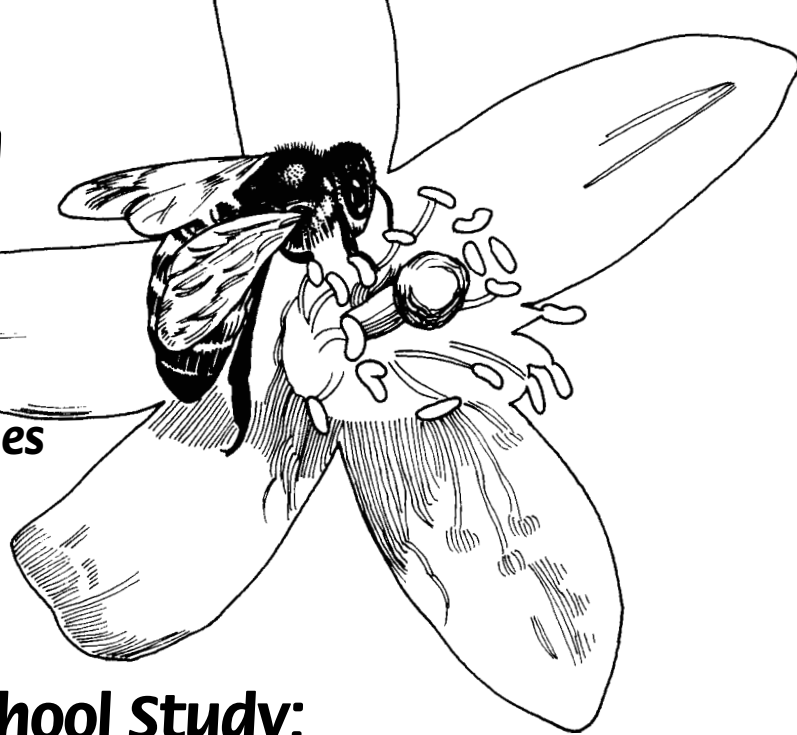


APIS



Apicultural Information and Issues

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Department of Entomology and Nematology

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Inside APIS:

High School Study

Good news: No pesticides found in the analyzed honey. *Page 1.*

Varroa Destructor

A new name for an old parasite. *Page 2.*

Pollination Gains Respect

International Initiative on the Conservation and Sustainable Use of Pollinators. *Page 2.*

New Zealand Reevaluation

Royal jelly use is found riskier than pollen or propolis. *Page 3.*

APIS Challenge Update

July 15 deadline is near. *Page 3.*

Social Insects and Earth's Magnetic Field

Magnetite in bees and ants, and what that means. *Page 4.*

Apitherapy CD-ROM

Release is expected in September; early discount available. *Page 4.*

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High School Study: No Pesticides Found in Honey

MR. LEONARD J. MERAW¹ reports on work by high school students who have analyzed honey for both pesticide residues and sugar components². The report is from a cooperative project among one school in Michigan and several in Germany. Funding for the initiative came from a Fraser Educational Foundation Grant. Links to a variety of World Wide Web sites done by a student, Elizabeth Blair, are also available on the site³.

Four honey samples were analyzed, one each from Armada, Michigan; Phoenix, Arizona; Braunschweig, Germany; and Mouchard, France. The respective honey types were: wildflower (pH value: 3.63), mesquite (pH value: 3.42), pine forest (pH value: 4.44) and lavender (pH value: 3.38)⁴. Each honey sample was analyzed for a variety of possible pesticide contaminants by means of GC/MS (gas chromatography mass spectrometry). In addition, a detailed sugar profile was determined for two of the samples using LC/MS (liquid chromatography mass spectrometry). The tests were performed by Shrader Laboratories, 3814 Vinewood, Detroit, MI 48208⁵.

CONCLUSIONS from the analyses show no detectable pesticide contamination for any sample. The list of materials tested for is extensive and includes, among others, aldrine, lindane, chlordane, dieldrine, endosulfan, endrine, toxaphene, heptachlor, and methoxychlor.

Sugars found in honey were mostly fructose (six carbon atoms) and sucrose (12 carbon atoms). Also present were smaller components of larger sugars (18 carbon atoms). The Michigan sample was 31 percent fructose, 55.1 percent sucrose and 13.9 percent sugars with 18 carbon atoms. The Arizona honey had slightly less fructose (30.2 percent), more sucrose (66.5 percent) and much less of sugars with 18 carbon atoms (3.3 percent). It would be interesting to see the sugar analysis for the European samples. My guess is that the Pine Forest honey would be greatly different, as it more than likely is honeydew, produced from secretions of other insects.

Mr. Meraw says that only two sugar analyses were done because of the high cost. A sugar profile is twice as expensive as a pesticide screening. He concludes: "I'm confident that the high level of test sophistication possibly illustrates that pesticide contamination in honey might not be as big a problem as some suspect." The Michigan sample is from a farming area where the beekeeper noted that various pesticides are used throughout the year. ■

¹ xmeraw@ameritech.net

² <http://www.ameritech.net/users/xmeraw/coop.html>

³ <http://www.ameritech.net/users/xmeraw/glinks.html>

⁴ <http://www.ifas.ufl.edu/~mts/apishtm/apis97/apjul97.htm#2>

⁵ <http://www.shraderlabs.com/>

Varroa Destructor: **A New Name for an Old Parasite**

BEEKEEPERS AND RESEARCHERS acquainted with the history and biology of the parasitic mite *Varroa jacobsoni* will now have to confront the fact that it has not caused the problems it was supposed to have. Rather, the blame now lies squarely with its cousin, *Varroa destructor*. In a recent article in *Experimental and Applied Acarology* (Vol. 24, No. 3: pp.165–189, March 2000) Drs. Denis Anderson and J.W.H. Trueman reveal that Varroa is indeed more than one species. This conclusion appears to have been inevitable given studies reported at the 1999 Apimondia meeting in Vancouver, BC, Canada⁶.

According to the abstract of the publication, *Varroa jacobsoni* was first described as a natural ectoparasitic mite of the Eastern honey bee (*Apis cerana*) throughout Asia. It later switched hosts to the Western honey bee (*A. mellifera*) and has now become a serious worldwide pest. It was introduced into Florida in 1987⁷. The mite is now resident in all the mainland United States and much of Canada and has literally changed the face of beekeeping forever in North America⁸.

The authors of the publication referenced above state: “The studies reported here on genotypic, phenotypic and reproductive variation among *V. jacobsoni* infesting *A. cerana* throughout Asia demonstrate that *V. jacobsoni* is a complex of at

least two different species. In a new classification *V. jacobsoni* is here redefined as encompassing nine haplotypes (mites with distinct mtDNA CO-I gene sequences) that infest *A. cerana* in the Malaysia-Indonesia region. Included is a Java haplotype, specimens of which were used to first describe *V. jacobsoni* at the beginning of this century. A new name, *V. destructor* n. sp., is given to six haplotypes that infest *A. cerana* on mainland Asia. Adult females of *V. destructor* are significantly larger and less spherical in shape than females of *V. jacobsoni* and they are also reproductively isolated from females of *V. jacobsoni*.

“The taxonomic positions of a further three unique haplotypes that infest *A. cerana* in the Philippines is uncertain and requires further study. Other studies reported here also show that only two of the 18 different haplotypes concealed within the complex of mites infesting *A. cerana* have become pests of *A. mellifera* worldwide. Both belong to *V. destructor*, and they are not *V. jacobsoni*. The most common is a Korea haplotype, so-called because it was also found parasitizing *A. cerana* in South Korea. It was identified on *A. mellifera* in Europe, the Middle East, Africa, Asia, and the Americas. Less common is a Japan/Thailand haplotype, so-called because it was also found parasitizing *A. cerana* in Japan and Thailand. It was identified on

“

Our research will influence quarantine protocols for bee mites, and may present new strategies for mite control.

”

- Denis Anderson and
J.W.H. Trueman

A. mellifera in Japan, Thailand and the Americas. Our results imply that the findings of past research on *V. jacobsoni* are applicable mostly to *V. destructor*. Our results will also influence quarantine protocols for bee mites, and may present new strategies for mite control.”

This paper is particularly relevant at this time, given that the Varroa mite has recently been discovered in New Zealand⁹. It will be interesting to see which mite has actually been introduced to that country. This could be vital information as Kiwi beekeepers seek viable options in eradicating/controlling this parasite. ■

International Initiative on the Conservation and Sustainable Use of Pollinators: Pollination Gets More Respect

THE FIFTH CONFERENCE of the Convention on Biological Diversity has decided to establish an international initiative on conservation and sustainable use of pollinators. The objective is to mount an international initiative for the conservation and sustainable use of pollinators as a cross-cutting initiative within the programme of work on agricultural biodiversity as a coordinated worldwide action. This includes monitoring pollinator decline, its causes and its impact on pollination services, addressing the lack of taxonomic information on pollinators; assessing the economic

value of pollination and the economic impact of the decline of pollination services; and promoting the conservation, restoration and sustainable use of pollinator diversity in agriculture and related ecosystems.

The document drafted by the Convention requests the executive secretary to invite the Food and Agriculture Organization of the United Nations (FAO)¹⁰ to facilitate and coordinate the initiative in close cooperation with other relevant organizations. It also recommends establishing a coordinating mechanism, with geographical balance and with leading relevant or-

ganizations preparing a proposal for a plan of action taking into account the recommendations in the Sao Paulo Declaration on Pollinators. Finally, it calls for submission to and review by the Subsidiary Body on Scientific, Technical and Technological Advice and consideration by the Conference of the Parties at its sixth (next) meeting.

All this means an official watch is now being kept on this important area and obligates the FAO to make a contribution and follow up on the issue. The full document can be seen on the Web. ■

A Reevaluation of Human Allergy to Bee Products in New Zealand: Use of Royal Jelly Carries the Most Risk

MR. CLIFF VAN EATON in New Zealand has brought to my attention a recent publication, "Report on the Findings of the Bee Product Warning Scientific Review Working Group," August 1999, by Solas Consulting Group. The full document (229 Kb) is available on the Web¹².

The Working Group, which included physicians, governmental officials and others, looked at three bee products with reference to risk from allergic reactions. The conclusions, summarized here for both propolis and pollen are: "Risk management should be limited to ingredient labelling of all products containing bee pollen and propolis by whatever means. This may be through voluntary labelling and a self-regulated industry code of practice, or through mandatory labelling." Risk of allergic reactions from either of these products is considered minimal at present.

Royal Jelly merited the same treatment, but the Working Group also "estimated that the risk of adverse health effects in the general population from ingestion of royal jelly was higher than that for other bee products, and also identified that asthmatics represent a population group with higher susceptibility to adverse health effects than the general population." The Working Group, therefore, recommends the following statement be present on all food products/dietary supplements containing royal jelly: "**Royal jelly may cause serious allergic reactions. Most reports have been in asthma sufferers.**"

According to the report, "A Hong Kong study on asthmatics reports positive skin prick tests for 16.8% of a Hong Kong asthmatic population tested for allergy to royal jelly (this paper estimated that 30% of the Hong Kong population used royal jelly). This followed an earlier population survey in Hong Kong showing 7% of asthmatics had a positive skin prick test to royal jelly. 0.6% of respondents in the second study reported an adverse reaction to royal jelly. In total there have been 37 reports of serious adverse reactions (anaphylaxis/ bronchospasm/asthma) to royal jelly. Due to duplication in scientific literature and different reporting methods in different countries, these figures are considered to be indicative only."

The report continues: "In categorising adverse health effects as 'serious' or oth-

erwise for the purposes of risk assessment policy, the Working Group did not place a different status on death as an outcome compared with other manifestations of 'serious' adverse health effects. However, The Working Group recognised that risk perception is an important issue in stakeholder evaluation (and participation) in risk management decisions. In particular, the public is likely to view death as a more important risk event than other 'serious' adverse health effects, even though all 'serious' adverse health effects may result in death in different circumstances. For this reason, The Working Group placed considerable emphasis on evaluating the three reported cases (in Australia) of death linked to oral ingestion of royal jelly."

THE WORKING GROUP was unable to assess the claimed association with the ingestion of the royal jelly and the reported death of a 31-year-old surfer. It quoted Dr. Alain Rohan (head of the ADRS), "It would not be fair or scientifically defensible to pin this death on the product." This report, therefore, excluded this event from its risk characterization.

Inadequate information was available to support the finding of the coroner on the claimed association between ingestion of royal jelly and the death of an 11-year-old girl. In particular, this was because of the retrospective and anecdotal evidence of exposure and the lack of supporting analytical data. The Working Group, therefore,

excluded this report from risk characterization. However, evidence concerning the death of a 23-year-old woman was enough to conclude that there is a strong association between the ingestion of royal jelly and the development of an acute asthmatic episode with a fatal outcome. I described the above reports in the May 1996 *APIS*¹³, with a follow-up in the July issue¹⁴.

The report states that bee products are considered as therapeutic goods in Australia, but not in New Zealand, where they are recognized as dietary supplements. It states: "There was insufficient comparative information available to compare royal jelly to other dietary supplements when assessing the 'proportionality' of different management options. The Working Group did note that for food there have been 141 admissions to New Zealand hospitals for anaphylactic shock (page 42 of the NNFA submissions to the Regulation Review Committee) but believes that consumers have a greater expectation for safety of ingested goods presented in packaged form. This is considered to be particularly true for dietary supplements.

Finally, The Working Group was not in a position to evaluate claimed benefits of royal jelly, and these were not included in benefit parameters in the risk management framework. Ingredient labeling was considered to be a systematic, low-cost risk management activity appropriate to the circumstances. ■

Year 2000 APIS Challenge Update: Deadline Draws Near

THE CHALLENGE CONTINUES with the following objectives:

1. The goal is to have confirmed names of 50 (fifty) beekeepers who have presented 2 (two) presentations to schools on the joys of beekeeping.
2. The deadline is July 15. Thus, this project will be soon terminate, certainly by the time this newsletter is printed and mailed. Those receiving this publication electronically will have a little more time to respond. Thanks to everyone who has contributed so far.

To see the results so far look on the Web¹⁵. ■

⁶ <http://www.ifas.ufl.edu/~mts/apishtm/Apis99/apsep99.htm#2>

⁷ <http://www.ifas.ufl.edu/~mts/apishtm/apis87/apoct87.htm#1>

⁸ <http://www.ifas.ufl.edu/~mts/apishtm/apis99/apsep99.htm#3>

⁹ http://www.ifas.ufl.edu/~mts/apishtm/Apis_2000/apjun_2000.htm#7

¹⁰ <http://www.fao.org>

¹¹ http://www.ifas.ufl.edu/~mts/apishtm/apis_2000/Conservation_of_pollinators.htm

¹² http://www.ifas.ufl.edu/~mts/apishtm/apis_2000/pdf/BeeSciRev.pdf

¹³ <http://www.ifas.ufl.edu/~mts/apishtm/apis96/apmay96.htm#3>

¹⁴ <http://www.ifas.ufl.edu/~mts/apishtm/apis96/apjul96.htm#4>

¹⁵ http://www.ifas.ufl.edu/~mts/apishtm/apis_2000/communicating_the_joy_of_keeping.htm

Social Insects and the Earth's Magnetic Field: Magnetite in Bees and Ants

IN THE JUNE 2000 ISSUE of *Ciencia Al Día Internacional* (Vol. 2, No. 3), authors S. Darci, et al, have written an article titled "Efectos del campo geomagnético en insectos sociales"¹⁶. My translation is: magnetic field effects on social insects. The animal most studied in this area, according to the authors, has been the honey bee, *Apis mellifera*. It is known that the famous bee dances are oriented toward the Earth's gravitation field. The dances, however, often contain "errors" that can vary with the magnetic field. These errors, the authors say, are not "system noises," but are constant with all bees that are dancing at

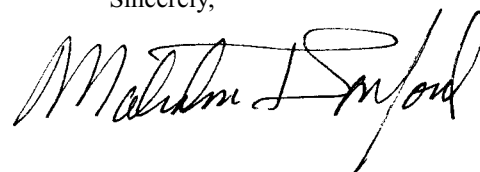
any particular time. Magnetite has been found in bees' abdomens and swarms also show an inherited magnetic field effect; they invariably construct new comb oriented in the same direction as their parent colony. The authors have only been able to change this orientation using relatively strong magnets, 10 times the Earth's force, which is approximately 0.25 Oe (Oersteds), in Rio de Janeiro, Brazil.

The best hypothesis for how bees can maintain their electromagnetic orientation, according to the authors, is the presence of very small (nano) particles of magnetite in the bee abdomen. The authors say

that the magnetic properties of these particles change with their size and shape. Certain small particles (supermagnetics) below a certain critical size can modify their direction (magnetized vector) based on temperature changes without losing their magnetic properties or physically moving. Thus, they can respond rapidly to magnetic field variations during a honey bee's flight. The authors reveal that their studies using Paramagnetic Electronic Resonance confirm the presence of supermagnetic particles isolated from magnetite such as that found in honey bee abdomens.

Magnetic material has also been found by the authors in ants, which appear to use this as an orientation device during migration. An important characteristic of magnetoreception is that it is species-specific, the authors say. Three mechanisms are postulated as the basis for magnetoreception: a) ferromagnetic, magnetite particles that act in conjunction with magnetic fields; b) modification of insect vision through chemical radicals, which depend on the presence of magnetic fields; and c) electromagnetic induction, where magnetic flux produces electric fields and currents, such as those found in certain species of electric fish. For more information on magnetic fields look on the Web¹⁷. The relationship between magnetic fields and human health is also of interest¹⁸. ■

Sincerely,



Apitherapy CD-ROM: Release Expected in September 2000

THE APIMONDIA STANDING COMMISSION OF APITHERAPY is advertising the imminent release of its official CD-ROM in French, English and Spanish at the Apiservices beekeeping megasite¹⁹. Video presentations, animations, pictures, one hour of sound comments, and more than 200 screens offer over three hours of fascinating information to a diverse audience about this fast-growing field²⁰. The CD-ROM is both Macintosh and PC compatible and contains the following topics: biology of the honeybee and its nest (hive), products of the beehive, medicinal plants and essential oils, human pathologies (diseases), api-pharmacopoeia, medical techniques (treatments), standardization and chemotypes, humanitarian action, and other general information about apitherapy.

Early-bird prices are still available at 49 Euros. The regular price, when published, will be 69 Euros. Release is expected in September 2000. Apimondia will receive royalties from this work, which will help the Apitherapy Commission carry on its humanitarian activities in many countries. For further information consult the Web²¹. ■

¹⁶<http://www.ciencia.cl/CienciaAlDia/volumen3/numero2/articulos/articulo5.html>

¹⁷ <http://www-spf.gsfc.nasa.gov/Education/>

¹⁸<http://www.mcw.edu/gcrc/cop/static-fields-cancer-FAQ/QandA.html#1>

¹⁹<http://bee.airoot.com/beeculture/digital/column5.htm>

²⁰<http://bee.airoot.com/beeculture/digital/column14.htm>

²¹ <http://www.beekeeping.com/cd/us/index.htm>

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Malcolm T. Sanford
P.O. Box 110620, Building 970
University of Florida
Gainesville, FL 32611-0620

Phone: (352) 392-1801, Ext. 143
Fax: (352) 392-0190
Internet: MTS@GNV.IFAS.UFL.EDU

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