



Insect Rearing Group

FRASS newsletter

Vol. 14 No. 1. October 1991

"Arthropod Species in Culture"

This publication has been most helpful to biologists who want to use insects and to entomologists who are attempting to rear species with which they are not familiar.

We are in the process of revising this publication, last revised in 1987 by D.R. Edwards, N.C. Leppla, and W.A. Dickerson. This time we are using the Paradox Database program, which will facilitate updates in a more timely manner.

On the last page you will find a questionnaire which can be used to indicate which arthropod species are reared at your facility. Your cooperation in this survey is greatly appreciated. **If you are aware of other scientists who are rearing arthropods, please give them a copy of the form.**

First International Insect Rearing Symposium

Topics at this gathering will be: Insect colonization, Rearing, Mass production, and Quality control with emphasis on natural enemies of arthropods and weeds. Jointly sponsored by Canada, USSR, and USA. To be held in Quebec, in August/September, 1992. For information contact Norm Leppla, 301 436-5478.

XIX International Congress of Entomology "Insect Behavior - Its Influence on the Development of Insect Rearing Technology for Research and Pest Management". To be held in Beijing, China, June/July, 1992. For information contact Tom Anderson, BASF Corp., Box 13528, Research Triangle Park, NC 27709. Tel: 919 248-6660 Fax: 919 549-9566 or Pritam Singh, DSIR Plant Protection, Private Bag, Auckland, New Zealand. Tel: 649 893-660 Fax: 649 863-330.

ANBP is the Association of Natural Biocontrol Producers formed in 1990 now has 26 producer/distributor members and 57 associate members. This is a new non-profit organization representing the producers and distributors of natural enemies, including predators and parasites. Their main goals are to provide a unified approach for the promotion and improvement of the natural enemy industry, to foster programs which enhance the quality and standardization of natural enemy production, encourage self regulation to enhance professionalism of its membership, work for the continued improvement in the quality of agriculture production as well as enhancement of the environment, and promote research and education on the use of natural enemies. For more information on this organization contact: Sinthia Penn, President of ANBP, Beneficial Insectary, 245 Oak Run Rd., Oak Run, CA 96069. 916 472-3715.

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Frass Newsletter is a cooperative effort among the Insect Rearing Group, designed to provide a vehicle for communication among scientists involved in all aspects of insect rearing. Please participate by sending editorial comments, short papers on new rearing techniques, information requests, requests for starter colonies, your source list for supplies, items for sale or trade, announcements, appropriate meeting dates, or other related news items. This issue is brought to you by Entotech, Inc. Edited by Dennis R. Edwards, Entotech, Inc., 1497 Drew Avenue, Davis, CA 95616. 916 757-4700.

FRASS is available to those scientists interested in rearing. Send subscription requests to: Ron Wheeler, Chevron Chemical Corp., Box 4010, Richmond, CA 94804.

Advances in Insect Rearing for Research and Pest Management edited by Thomas E. Anderson and Norman C. Leppla. The efficient production of large numbers of high-quality insects is a concern both for basic research and for the success of control programs for pests of agricultural and medical significance. This volume provides a comprehensive overview of this important issue, identifying the major applications for insect-rearing technology. The chapters, international in scope, cover genetics and molecular biology; insect rearing and the development of bioengineered crops; nutrition, digestion, and artificial diets; and the practical concerns of commercial insect rearing. June 1991; ca. 412 pages; O.S133.7835-4 (sc:ANDADVS), \$32.50; Rights world; Westview Studies in Insect Biology.



ESA Annual Meeting Formal Conference
Bally's Grand Hotel Insect Rearing
Reno, Nevada
December 8-12, 1991

Physiological significance of Nutrition in mass rearing. **D. Stanley-Samuels**, Dept. Entomology, Univ. of Nebraska, Lincoln, NB

What happens to the fatty-acid composition of the gypsy moth high wheat-germ diet over time? **T.M. O'Dell**, USDA-FS, Hamden, CT; and **D. Stanley-Samuels**, Dept. Entomology, Univ. of Nebraska, Lincoln, NB

Stability of ascorbic acid in diets of gypsy moth. **M.E. Montgomery**, USDA-FS, Hamden, CT

Digestive enzymes as indicators of nutritional needs. **A.C. Cohen**, USDA-ARS, Honeybee Biology and Biocontrol Lab, Tucson, AZ

In-vitro rearing of parasitoids. **W.C. Nettles Jr.**, USDA-ARS, Weslaco, TX

Artificial diets for predaceous ladybugs (Coleoptera: Coccinellidae). **J.B. Johnson** and **L.R. Elbertson**, Division of Entomology, University of Idaho, Moscow, ID

An artificial diet for rearing Colorado potato beetle larvae. **O.T. Forrester Jr.**, USDA-APHIS S&T, Mission Plant Methods Center, Moore Air Base, Edinburg, TX

Effect of artificial diet composition on growth and survival of beet armyworm. **T.C. MacRae**, Entotech, Inc., Davis, CA

The development and evaluation of a homogenized pork liver diet for mass rearing coccinellid adults and larvae. **R.V. Flanders**, USDA-APHIS PPQ, National Biological Control Lab, Niles, MI

Nutritional requirements for optimal production. **S.L. Penn**, Beneficial Insectary, Oak Run, CA

Business meeting.

Birthday party for codling moth

Pritam Singh held a celebration to honor the 200th generation of DSIR's codling moth colony. Pritam submitted this article:

Codling moth - The New Zealand Connection: Codling moth is a lepidopterous insect originally native to south-eastern Europe but now cosmopolitan in distribution. This species is now a key pest of international importance. Its movement from one country to another influences export of millions of dollars of fruit. It attacks a range of crops in New Zealand including apples, pears, walnuts, plums, peaches, nectarines, cherries, and apricots.

Smith in 1980 (Entomologist's Monthly Magazine Vol 26: 218-219) wrote 'I think in all probability it was imported directly by the mail steamers which have plied monthly between San Francisco and Auckland for the last twenty years; from this source unquestionably came *Carpocapsa pomonella* (codling moth) in imported apples into New Zealand'. As steamships were coming to New Zealand about 1870, the pest could have arrived about this time.

The introduction was unnoticed until Meyrick collected the codling moth on 31 December 1879 from Wellington Botanical Gardens (Source Meyrick Diary - John Dugdale). Subsequently in 1833, he published a description of the codling moth (Transactions and Proceedings of the NZ Institute Vol 15:61-62).

Hudson in 1890 reported that the codling moth damage in some districts was up to 90%. He proposed quarantine of the affected orchards at least for a year, and the destruction of all apples in December as one of the control measures (Transactions and Proceedings of the NZ Institute Vol 23: 56-58).

Family Tree: The present DSIR codling moth colony is 23 years old and produced its 200th generation in April 1991. It was established in the laboratory from diapausing larvae collected from apple orchards in Nelson on 5 October 1967 by Howard Wearing. The first generation moths (6 males and 3 females) emerged on 1 March 1968. In the laboratory, 9-10 generations can be reared in a year. Every year during the last 5 years, over 100,000 codling moth adults were reared. However, in the field, the codling moth has only 1½ generations in the South Island and 2½ generations in the North Island per year.

From 1969 to 1974, wild moths were regularly introduced to the colony every year. No further wild introductions have been made since 1975.

The colony was brought to Auckland in 1973 when DSIR Entomology Division moved from Nelson. The rearing Section was established in 1975 and Dr. Pritam Singh took over the rearing of the codling moth. The colony has passed through several population "bottle necks", at least three major ones. Once the cause was mechanical failure of the environmental control room, and twice granulosis virus infected the colony. On each occasion the colony was rejuvenated from about 100 individuals (30-50 pairs).

The last virus infected was during the 152nd - 153rd generation in October 1985. It took nearly one year of careful and time-consuming line breeding to create a virus free colony. This is the only codling moth colony in the world which has been continuously reared for 200 generations in the laboratory and is currently virus free.

In 1986, an albino strain was found in the culture. From one pair it was reared 8 generations before the colony died out.

The colony has not fed on or seen apples or other fruits during its 23 years of life. It has been reared entirely on an artificial diet containing wheat germ, bran, and flour, casein, cellulose powder, cholesterol, minerals and B-complex vitamins. The high quality diet and controlled environment produces high quality insects for research.

Benefits to New Zealand from codling moth research: Many countries, including Japan, require our produce to be totally free of diseases and insect pests, especially those not present in their own country. Therefore, prior to exporting cherries and nectarines, tests must be carried out on all stages of insects to assess and compare their dosage-mortality response to methyl bromide fumigation. To prove the treatment is 100% effective, about ½ a million codling moths were used to develop the quarantine treatment protocols for 8 varieties of cherries and 3 varieties of nectarines for export to Japan.

Market access has been gained for cherries and nectarines to Japan and summer fruit to Australia, with economic benefits of over \$ 10 million per annum.

Another scientific program involves the use of codling moth sex pheromone as a control method, along with investigations in biological pesticides for integrated control of codling moth.

National Biological Control Institute:

The National Biological Control Institute (NBCI) was established by the United States Department of Agriculture, Animal and Plant Health Inspection Service (APHIS) in 1990 to demonstrate its commitment to biological control as a viable pest control strategy. The NBCI serves as a liaison between APHIS and other federal agencies; cooperating local, state, national, and international institutions; private industry; and the general public. It provides national leadership in coordinating and implementing the use of biological control agents in suppressing animal and plant pests. It is committed to developing greater scientific and technological capabilities in biological control and to increasing its application.

The National Biological Control Institute is located at APHIS headquarters in Hyattsville, Maryland. For further information, write to USDA-APHIS NBCI; Room 539, Federal Building; 6505 Belcrest Road; Hyattsville, MD 20782 or call 301 436-5478.



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For "Arthropod Species in Culture" Please provide the following information:

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Name:

Address:

City:

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Zip Code:

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List arthropod species currently in culture: (use additional sheet if necessary)

ORDER	FAMILY	GENUS	SPECIES	SUB-SPECIES	COMMON NAME
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