

ISSIS-XII (Crete, Greece, April-2010) recognises Zvi Mendel for his excellence and outstanding contributions to scale insect studies

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Introduction

The first Award by an ISSIS Symposium was awarded to Alfred Serge Balachowsky in 1983 at ISSIS-V, Budapest, Hungary. Since then additional 8 awards have been awarded as follows:

-1994 (ISSIS-VII) at Bet Dagan, Israel, to Douglas J. Williams

-1998 (ISSIS-VIII) at Wye, UK, to Michael Kosztarab

-2001 (ISSIS-IX) at Padova, Italy, to Evelyn M. Danzig

-2004 (ISSIS-X) at Adana, Turkey, to Yair Ben-Dov, Jan Koteja, and to Sadao Takagi

-2007 (ISSIS-XI) at Lisbon, Portugal, to Chris Hodgson, and Dug Miller

This list clearly demonstrates that ISSIS awards are restricted to colleagues whose main contributions have been in the disciplines of taxonomy and systematics of scale insects. Therefore, it was proposed and decided by the International Advisory Committee of ISSIS to honour also colleagues for their excellent achievements in other disciplines of Scale Insect Studies.

The International Advisory Committee of ISSIS agreed that the twelfth ISSIS Meeting in Crete, Greece, April 2010 recognise and honour Zvi Mendel, from Israel, for his outstanding contribution to coccidology in re-

search, chemical ecology, biological control and IPM of scale insects. It is my great privilege, on behalf of all our colleagues, to explain why Zvi fully deserves this honour.

Zvi, fondly called Zvika by his friends and colleagues, was born on December 26, 1948, in Tel Aviv, Israel, and it was in the nearby city of Givatayim where he grew up. His wife Diza told me that he was interested in Nature, Natural History and Entomology from an early age. We may assume that it was evidently an early indication of Zvi's future interests in entomology.

From 1962 to 1966 he studied at an Agricultural High School, and from 1966 to 1969 he fulfilled his Military Service. Zvi studied at the Faculty of Agriculture, Rehovot, gaining his BSc in 1972 and MSc in 1976. He worked on his PhD from 1976 to 1980 under the supervision of David Rosen and Haggai Podoler and gained his degree of PhD in 1981. Between 1979 and the present, Zvika has been a Research Entomologist at the Department of Entomology, Bet Dagan, and has served as Department Head from 1996 to 2000. In 1999, he was also appointed Professor at the Faculty of Agriculture, where he is still teaching the course on Forest Entomology.

Main disciplines

Zvi's research on scale insects has concentrated on two main disciplines, namely

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chemical ecology and various aspects of IPM.

Chemical Ecology of scale insects

Zvi carried out, in collaboration with the chemistry group of the Department of Entomology and with research groups abroad, extensive research on the chemical ecology of three scale insects and its application in their management.

***Matsucoccus josephi*:** The joint team isolated, identified and synthesized the racemic pheromone of the Israeli bast scale, *Matsucoccus josephi* Bodenheimer & Harpaz. Field experiments indicated that the racemic pheromone is highly attractive to males of the Israeli bast scale and it is also a potent kairomone of the predator, *Elatophilus hebraicus*. Synthesis of the chiral pheromone components, followed by GC-EAD experiments and field tests established the chirality of the natural pheromone/ kairomone. Preparation of analogues and availability of the pheromones of the allopatric sex pheromones of *M. feytaudi* and *M. matsumuræ* enabled a study of the structure-activity relationship of the pheromone/kairomone. Specifically designed analogues attract selectively *Matsucoccus* males or *Elatophilus* spp. and lacewing spp. and enable selective tracing of population levels of *M. josephi* or its predator, *E. hebraicus*.

***Planococcus citri*:** Improved synthesis of the sex pheromone of *Planococcus citri* and optimization of trap parameters enabled extensive field work on its control. Control by mass trapping is difficult but outbreaks of pest populations and monitoring, particularly, in green-houses, is practical. A system of specific trap patterns in green-houses growing spice plants has been developed which enables efficient detection of local high densities of the pest and its control with appropriate chemicals. The kairomonal activity of the pheromone was tested in Israel, in

Italy and Portugal. Surprisingly, a stronger kairomonal activity for the natural enemies of *P. citri* was observed with the *P. ficus* sex pheromone.

***Planococcus ficus*:** The joint team isolated and identified two chemically related chiral components (S-lavandulol senecioate, main component, and S-lavandulol isovalerate, minor) of the female sex pheromone of the Mediterranean vine mealybug, *Planococcus ficus*. The main component had been independently identified shortly before in California. The relative amount of the minor component was generation dependent, its amount increasing significantly from the first to the third generation in laboratory reared populations. The males displayed ambiguous behavior to the minor component: repulsion in the vineyard, and attraction of laboratory reared males. Laboratory experiments led to the discovery of several male phenotypes. Field tests in different vineyards revealed that, in sites with high population densities of the mealybug, both components attracted males. These observations indicated that the occurrence of the second component and existence of several male phenotypes is caused by high population densities.

IPM of scale insects

1. Improvement of the biological control of *Icerya purchasi* in Israel by introduction of the parasitoid *Chryptochaetum iceryae*.
2. Enhancement of natural enemies of the Israeli bast scale *Matsucoccus josephi*, utilizing the kairomonal activity of the *Matsucoccus josephi* sex pheromone.
3. The solanum mealybug, *Phenacoccus solani*, is an invasive pest in Israel. In recent years Zvi has been developing methods for early monitoring of the pest and introduction of exotic natural enemies.
4. Studies (in collaboration with Daniel Blumberg) on the encapsulation of parasitoids by scale insects.

In addition to his research activity on scale insect, Zvi is leading the research on other insect pests, such as:

- IPM of the Pine processionary moth *Thaumetopoea pityocampa*.
- Bark beetles in forest trees,
- *Capnodis and Scolytus amygdali* on stone fruit
- Eucalyptus gall wasp
- Yellow-legged Clearwing - *Synanthedon vespiformis*

Zvi is the author and/or co-author (updated January 2009) of about 270 publications. About 50% of the publications deal with ecology, chemical ecology, life history and biological control of scale insects.

Zvika is the Supervisor or Co-supervisor of 23 M.Sc. Students (10 of which studied scale insects) and 9 Ph.D. students (6 of which studied scale insects).

In 2008 the Agricultural Research Organization, Bet Dagan, awarded him the 2008 Annual Award for his for outstanding achievements in the control and management of insect pests in agriculture.

Zvika, all your colleague who are present here and those absent, and not least your wife Diza and your three children, wish you a successful and fruitful continuation of your research studies and look forward to meet you in future ISSIS meetings.