

**K.R.S. Ascher**  
1923–2003



*IN MEMORIAM*

Professor Kurt Robert Simon Ascher, known in Israel as Prof. Shimon Ascher, died on November 23, 2003. He was a world-renowned insect toxicologist, a leading scientist in the Institute of Plant Protection, Agricultural Research Organization (ARO), and an Editor-in-Chief of *Phytoparasitica*, the Israel Journal of Plant Protection Sciences, since 1979. He was born in Nuremberg, Germany, on December 24, 1923, and immigrated to Israel with his family in 1935, as a boy. His primary and high school education was received in the “Maaleh” school in Jerusalem. He started his university studies at the young age of 16 and in 1944 completed his chemistry studies for the Master of Science degree at The Hebrew University of Jerusalem, where he then served as a research assistant until 1947. In that year he joined the Hagana (which became the Israel Defense Forces, IDF) in Jerusalem and subsequently served in Tel Aviv as an officer.

Shimon Ascher was about to start a teaching career as a chemistry teacher in Haifa but in 1949 a research position became vacant in Rosh Pinna under Prof. G.G. Mer, the Director of the Malaria Research Station. Until 1951, he worked with Prof. Mer on mosquito control and resistance to DDT, as well as DDT synergism, as a strategy to reduce mosquito resistance. Shimon Ascher greatly admired Prof. Mer, and expressed his feelings by giving his newborn daughter Jessica the middle name Gideona (Gideon was Prof. Mer’s first name). This was in 1964, the same year that Prof. Mer passed away. Another scientist whom Shimon Ascher highly respected was the outstanding chemist Prof. E.D. Bergmann [see: Ascher, K.R.S. and Shaaya, E. (1975) Ernst David Bergmann: An Obituary. *Phytoparasitica* 3:145-147].

In 1951 Shimon Ascher joined the Medical Research Laboratories of the IDF’s Medical Corps, and worked on the effects of chlorinated hydrocarbons and other chemical insecticides and their synergism to improve housefly control.

In 1954 he was granted a sabbatical year from the IDF and spent it as a WHO scholar at the Geigy Agrochemical Company in Basel, Switzerland, working on chemical insecticides and on mosquito resistance to insecticides. Already during his service in the Medical Corps, Ascher was able to exhibit the scientific merit of his approach to reducing the reproductive capacity of the mosquito [see: Ascher, K.R.S. (1957) Prevention of oviposition in the housefly through tarsal contact agents. *Science* 125:938]. His work on insect resistance to chemical insecticides was not limited to human medical problems but was widened to agricultural pests [see: Ascher, K.R.S. (1957) Resistance of the Spiny Boll Worm to endrin in Israel. *Nature* 179:324]. In 1957 he left the IDF and went to Rome,

Italy, where he worked for 3 years in the University Institute - Istituto Superiori di Sanita. While working there, he developed the pest control concept of *negative correlation to resistance*. With this concept he showed that insect pests that develop resistance to one group of chemicals can be affected by a different group of chemical insecticides and be more susceptible to them.

In 1960 Shimon Ascher joined the National and University Institute of Agriculture (NUIA) in Rehovot (today the ARO in Bet Dagan) and started to work with the late Prof. E. Rivnay; subsequently he was appointed Head of the Department of Toxicology. In 1969 he was promoted to Research Scientist grade A and in 1972 to A+ (parallel to full Professor). From 1975 until 1979 he headed the Institute of Plant Protection and was a member of the Professional Promotion Committee of the ARO. During the years 1982-1984 he served again as the Head of the Institute of Plant Protection, but limited this term to two years, because he wanted to spend more time on research.

During the 1960s and early 1970s Shimon Ascher was invited to important international symposia and meetings to lecture on chemical control of pests and on insect resistance to chemical insecticides. At that time, traveling abroad from Israel to scientific meetings was limited to a very few, highly recommended top scientists, who included Prof. Ascher. He was the only one selected from Israel to participate in 1960 in an Entomological Meeting at Prague, Czechoslovakia, then behind the Iron Curtain, with all the associated restrictions on scientists from Israel against visiting that country.

In 1989 Shimon Ascher officially retired from the ARO, but still continued to work full time for several years, until failing health began to limit his activities. Over the course of his many years at the ARO, his work covered several important research areas:

(i) *Insect chemosterilants*. The work on chemosterilants started already when he was in the Medical Corps, IDF, with the study of ovicidal effects caused by chemicals such as fluorocarbon in mosquitoes. Subsequently, this work continued in the NUIA - today the ARO - with screening sterilizing effects of m-xylohydroquinine and organotin compounds as chemosterilants on lepidopteran insects.

(ii) *Antifeedants*. The discovery that organotin compounds can serve as antifeedants in insects was the outcome of a pioneering field of research introduced by Shimon Ascher. The phenomenon that fentin fungicides prevent damage by caterpillars to field crops led to a long-range study of defining antifeeding effects of organotin compounds in different insect pests, and establishing global use of the compounds as commercial insecticides for plant protection, mostly in developing countries [see: Ascher, K.R.S. (1979) Fifteen years (1963-1978) of organotin antifeedants - a chronological bibliography. *Phytoparasitica* 7:117-137].

(iii) *Phagostimulants*. At the beginning of the 1970s Shimon Ascher started out on a new scientific pathway: identification of phagostimulants and quantification of their effects on insects. The phagostimulatory effects of different sugars and related compounds was evaluated in a fruitful collaboration with the chemist Prof. H.M. Flowers of the Weizmann Institute of Science, Rehovot. The development of bioassay methods for phagostimulants based on 'Styropor' (polystyrene) lamellae paved the way to large-scale and simple means of screening phagostimulatory agents in insects [see: Ascher, K.R.S. and Meisner, J. (1973) Evaluation of a method for assay of phagostimulants with *Spodoptera littoralis* larvae under various conditions. *Entomol. Exp. Appl.* 16:104-114].

(iv) *Insecticidal plant substances*. Ascher was a worldwide pioneer in the investigation and evaluation of the biological effects of products from the neem tree, *Azadirachta indica*. As a result of a very fruitful collaboration with a leading neem investigator, Prof. H. Schmutterer, the products of this tree today are among the few safe and effective natural insecticides used widely in biological Insect Pest Management (IPM) and in bio-organic agriculture. Scientific papers presented at the three symposia dedicated to neem products were published in books edited by Shimon Ascher and German colleagues:

- Schmutterer, H., Ascher, K.R.S. and Rembold, H. [Eds.] (1981) Natural Pesticides from the

- Neem Tree (*Azadirachta indica* A. Juss.). Proc. 1<sup>st</sup> International Neem Conf. (1980, Rottach-Egern, Germany). GTZ, Eschborn, Germany.
- Schmutterer, H. and Ascher, K.R.S. [Eds.] (1984) Natural Pesticides from the Neem Tree (*Azadirachta indica* A. Juss) and Other Tropical Plants. Proc. 2<sup>nd</sup> International Neem Conf. (1983, Rauischholzhausen, Germany). GTZ, Eschborn, Germany.
  - Schmutterer, H. and Ascher, K.R.S. [Eds.] (1987) Natural Pesticides from the Neem Tree (*Azadirachta indica* A. Juss) and Other Tropical Plants. Proc. 3<sup>rd</sup> International Neem Conf. (1986, Nairobi, Kenya). GTZ, Eschborn, Germany.

Prof. Ascher showed that the nonconventional effects of the neem tree products were manifold: partial reduction or complete inhibition of fecundity and/or in some cases egg hatchability; reduction of the adult lifespan; oviposition repellence in females; direct ovicidal effects; antifeedant effects; formation of permanent larvae; and regulation of insect growth with molting failures among the various insect stages. The effects were studied in Lepidoptera, Coleoptera, thrips, leafminers, cicadas and mites. The effects of neem compounds on mites were investigated in collaboration with Dr. Fadel Mansour.

Phagodeterrent effects of gossypol and high-gossypol strains of cotton were studied in lepidopteran pests in an active collaboration with Dr. J. Meisner [see: Meisner, J., Ascher, K.R.S. and Zur, M. (1977) Phagodetergency induced by pure gossypol and leaf extracts of a cotton strain with high gossypol content on the larva of *Spodoptera littoralis*. *J. Econ. Entomol.* 70:149-150]. Also midgut enzyme inhibition caused by gossypol was evaluated in *Spodoptera littoralis* larvae.

An additional group of plant chemicals affecting insects were the withanolides – naturally occurring steroids in solanaceous plants – which Ascher demonstrated had marked antifeeding effects on insects. The effects of these natural steroids on insects were investigated within the framework of a BARD project in collaboration with Prof. M. Jacobson, Beltsville, Maryland, USA.

(v) *Insect Growth Regulators (IGRs)*. Shimon Ascher started to study the effects of chitin synthesis inhibitors on insects as early as the 1970s [see: Ascher, K.R.S. and Nemny, N.E. (1976) Toxicity of the chitin synthesis inhibitors, diflubenzuron and its chloro-analogue, to *Spodoptera littoralis* larvae. *Pestic. Sci.* 7:1-9]. Throughout the years he continued to work on this group of insecticides. He screened the IGR effects of benzoylphenyl urea, diflubenzuron, triflumuron, teflubenzuron and hexaflumuron, usually on the test insect *Spodoptera littoralis*. Ovicidal properties of juvenile hormone mimic compounds were also screened for IGR effects. No fewer than 20 papers authored by Shimon Ascher were dedicated to evaluation of IGR effects on insects.

Prof. Ascher's last challenging project, during the years 1994-1997, was supported by the Israel Institute of Social Security, through the fund for prevention of work accidents. The work was entitled: "Minimizing poisoning accidents in workers in greenhouse agriculture by means of replacing toxic insecticides with products of *Azadirachta indica* against *Frankliniella occidentalis*, *Thrips tabaci*, *Liriomyza huidobrensis* and Cicadas." In this research, commercial products from seeds of the Indian *Azadirachta* (neem tree) showed promising effectiveness against the project insects.

In 1997 Shimon Ascher was awarded the Karl Escherich medal by the German Society for General and Applied Entomology for his: "Fundamental and milestone works in insect toxicology and resistance to pesticides, his involvement in developing chitin synthesis inhibitors and utilization and use of plant materials against pests – achievements that were obtained through intensive international collaboration."

In 1999 Prof. Ascher was the recipient of the IPPC (XIVth International Plant Protection Congress) Award of Distinction for his pioneering research on natural products from the neem tree and their use for pest control, as well as natural products from other plants for that purpose. He is considered the forefather of the antifeeding concept, and is the one who coined this term.

K.R.S. Ascher was the author of more than 200 publications, including chapters in books, and also edited several books. In addition to the three books on neem, he co-edited the following:

- Ascher, K.R.S. and Ben-Dov, Y. [Eds.] (1995) International Symposium of Scale Insect

- Studies. Proc. Entomological Society of Israel, Bet Dagan, Israel. *Isr. J. Entomol.* vol 29.
- Ascher, K.R.S. [Ed.] and Margalit, Y. [Co-Ed.] (1998) Proc. of the 2<sup>nd</sup> En Gedi Conference on Bacterial Control of Agricultural Insect Pests and Vectors of Human Diseases (Shoresh, Israel).
  - Grinstein, A., Ascher, K.R.S., Matthews, G.A., Katan, J. and Gamliel, A. [Eds.] (1997) Improved Application Technology for Reducing Pesticide Dosages and Environmental Pollution – A Written Symposium. *Phytoparasitica* 25:(suppl.).-
  - Navon, A. and Ascher, K.R.S. [Eds.] (2000) Bioassays of Entomopathogenic Microbes and Nematodes. CABI Publishing, Wallingford, Oxfordshire, UK.

In addition, Shimon Ascher was an active co-author of three chapters of the book: Schmutterer, H. [Ed.] (1995) *The Neem Tree*. VCH, Weinheim, Germany. He also served as a co-editor of the *Israel Journal of Entomology*, from 1994 to 1999.

We were fortunate to have known and worked with Prof. Ascher. Utmost diligence and an uncompromising attitude to his work were the driving forces which typified him and which enabled him to become a leading pioneer researcher in insect toxicology. His work did not end in the afternoon hours but continued into the late night time: writing manuscripts, editing articles for *Phytoparasitica*, reading papers and books, writing research proposals and more. He was a pedantic scientist, always looking for a high level of experimental work by his technicians and research students, but he also rewarded all who were involved in the work with full authorship in the resultant papers.

Shimon Ascher always read a voluminous amount of scientific literature in order to be up-to-date with the latest entomological and toxicological information, and would converse with co-workers and colleagues, to widen and enrich his knowledge beyond his current research.

The care and concern Shimon Ascher expressed for his employees and colleagues was another of his estimable attributes. When help was needed, he invested every effort to alleviate or solve their personal problems and difficulties. Prof. Ascher will be remembered fondly for introducing a pleasant and humorous atmosphere in the lab among his colleagues and others around him. His scientific presentations were commonly colored with a sense of humor. In fact, he kept in his laboratory a special folder with jokes, humorous articles and cartoons which he incorporated in his talks and lectures. His interests and knowledge in areas beyond his scientific pursuits included history, literature, music and art – under the strong influence of European culture.

Prof. Ascher continued to work at the ARO until his poor health prevented him from traveling to his lab. Nevertheless, he kept himself abreast of the on-going research and continued his writings as well as his editorial work for *Phytoparasitica* until the last months of his life. We had hoped that he would recover from his health problems, as had happened in the past, but to our deep sorrow he could not overcome his illnesses, and died on November 23, 2003.

Prof. Shimon Ascher is survived by his wife Chana, son Yaakov, daughter Jessica, and six grandchildren. He will be deeply missed by his loving family, friends and colleagues in Israel and abroad, members of the Institute of Plant Protection, ARO, the *Phytoparasitica* Executive Editor and Editorial Board, the Entomological Society of Israel, and the entire entomological community.

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