

IXS-6

Advances in the Study of *Aphytis* (Hymenoptera: Aphelinidae)

DELAYED EFFECTS OF PESTICIDES ON HYMENOPTERAN PARASITE: THE ROLE OF THE SCALE COVER OF DIASPIDID INSECTS. Ephraim Cohen, Mohammad El-Hamalawi, Haggai Podoler (The Hebrew University of Jerusalem, Department of Entomology, Faculty of Agriculture, Rehovot 76 100, Israel).

Diaspidid insects are characterized by a waxy and relatively thick scale cover which plays a significant protective role against physical and chemical assault. Due to their lipophilic nature these scales absorb and retain part of applied pesticides. Thus, females of the Florida red scale *Cryosomphalus conidius* were considerably more sensitive to malathion when applied to insects from which covers were removed. Upon their emergence adults of the exoparasite *Aphytis holoxanthus* were exposed to lethal levels of the organophosphorus insecticide retained in the compartment of the host shield. However, immature stages of the parasitoid were not affected by malathion previously applied on the host. Mortality of adult parasitoids was observed even 14 days after treatment with malathion. As a given pesticide dissipates in the environment, it may be protected and retained inside scale covers of diaspidid insects. This retention, and as a result the delayed effect of pesticides on nontarget beneficial insects, may explain some failures in biological control of diaspidid pests.

MORPHOMETRIC COMPARISONS OF *APHYTIS* SPECIES IN THE *LINGNANENSIS* GROUP, AND PRELIMINARY DNA SEQUENCE DATA. James B. Woolley, Mike Rose and Pete Krauter, Department of Entomology, Texas A&M University, College Station, Texas 77843, USA. Size and shape differences in adult female *Aphytis* (Hymenoptera: Aphelinidae) were characterized by digitization of homologous landmark points on the antennae, ovipositors, dorsum of mesosoma and fore wings. Landmarks were chosen to represent shape differences between forms and for accuracy in location. Distances between landmarks were analyzed by principal component analysis, discriminant analysis and canonical variates analysis. Specimens of the following were examined: *Aphytis lingnanensis* from *Aonidiella aurantii* and *Diaspis echinocacti* from California, from *Unaspis citri* from Florida and from *Insulaspis gloverii* from Texas and Mexico, and *Aphytis yanonensis* from *Unaspis yanonensis* from Japan. Mitochondrial DNA was extracted from progeny of female isolines of *A. yanonensis* and *lingnanensis* (*Unaspis* race) and a 600 bp portion of the 16s ribosomal sequence was amplified and sequenced using asymmetrical PCR and cloning methods (*yanonensis*) or cloning alone (*lingnanensis*). Results indicate a surprising amount of divergence for two closely related species (approximately 20%), suggesting that the 16s sequence has considerable information for species-level systematics in *Aphytis*.

THE APHYTIS FAUNA OF THE AUSTRALIAN REGION. Dahms, Edward Clive (Queensland Museum, PO Box 3300, South Brisbane Q 4101, Australia).

(1979)

Rosen and De Bach list 18 species of *Aphytis* from Australia which compares favourably with other regions. Most of the species were described by A.A. Girault without host data. Australia is poorly sampled taxonomically with most type localities being in coastal Queensland around Brisbane and Cairns. Diaspididae (*Aphytis* hosts) in Australia are rich in species, but the fauna is estimated at only 20% known. It is reasonable to assume that the Australian *Aphytis* fauna may be coincidentally rich.

Of the 43 principal pest species of diaspidids in the world 24 are known from Australia. *Aphytis* species being used for biological control include *A. melinus*, *A. chrysomephali* and *A. lingnanensis*.

THE APHYTIS FAUNA OF THE AFROTROPICAL REGION (HYMENOPTERA: APHELINIDAE). G.L. Prinsloo (Biosystematics Division, Plant Protection Research Institute, Private Bag 1134, Pretoria, 0001, South Africa)

*Aphytis* Howard, the species of which are primary endoparasitoids, is the largest of the nine aphelinid genera associated with Diaspididae in the Region. Thirty described and 4 undescribed species (about 33% of the known world fauna) are known from the Region. The Afrotropical fauna comprises three elements: species that have been deliberately introduced for biological control purposes (5 spp.); those that have been accidentally introduced (5 spp.); and those believed to be indigenous (24 spp.). Most species and their hosts are known only from southern Africa, where these faunas have been extensively sampled. This allows certain extrapolations regarding the distribution of the genus *Aphytis* elsewhere in the Region. A small proportion of the fauna is probably confined to the southern subregion, while the majority of species are thought to be widespread in sub-Saharan Africa with some occurring in other zoogeographical regions as well. Known hosts include 37 species in 29 genera of Diaspididae, while a significant number of diaspidids in the Region do not seem to act as hosts. Host species belonging to very widespread genera seem to be preferred to those of endemic genera; only 4 of the 29 genera are confined to the Afrotropical region, the remainder occurring elsewhere as well.

SPECIES OF APHYTIS OCCURRING IN CHINA AND THEIR ROLE IN BIOLOGICAL CONTROL. Hui Ren (Guangdong Entomological Institute, Guangzhou 510260, China)

22 species of *Aphytis* are recorded occurring in China with a description as new, and their role in biological control. These species are *A. acalcaratus*, *A. chionaspis*, *A. chrysomephali*, *A. confusae*, *A. debachi*, *A. diaspidis*, *A. gordoni*, *A. hispanicus*, *A. holoxanthus*, *A. lepidosaphes*, *A. lingnanensis*, *A. longicaudus*, *A. maculicornis*, *A. melinus*, *A. nezalac*, *A. vtilaspidis*, *A. nigricornis* sp. nov., *A. philippinensis*, *A. proclia*, *A. vandenboschi*, *A. vittatus*, *A. yanonensis*.

SPECIES OF APHYTIS OCCURRING IN THE USSR AND THEIR ROLE IN BIOLOGICAL CONTROL. Valentina A. Yasnosh (Dep. of Biological control, Georgian Sci. Institute of Plant Protection 380062-Tbilisi, Chavchavadze av. 82, Georgia)

The *Aphytis* fauna (Hymenoptera: Aphelinidae), parasites of armoured Scales (Coccinea: Diaspididae) consists of 14 species which are distributed; 12-in European part and on the Caucasus, among them 7-on Black Sea coast and 5-in Transcaucasian region, 6-in Central Asia and 5-on Far East (Vladivostok) where two new species recently are registered- *Aphytis stepanovi* Jasnosh, sp. n., *A. vandenboschi* De Bach and Rosen. The role of *Aphytis* species in biological control and the perspectives of new species introduction are discussed.