

# Natural Enemies

## NE 1

**SURVEY FOR THE IMPORTANT NATURAL ENEMIES ASSOCIATED WITH INSECT SPECIES *PSEUDOCOCCIDAE* AND THEIR DISTRIBUTION.** Nadia Al-Khateeb<sup>1</sup> and Louai Asslan<sup>2</sup>. (1) Directorate of Agriculture and Agrarian Reform of Lattakia, Lattakia Center for Rearing Natural Enemies, Lattakia, Syria, E-mail: [nadia@arabscientist.org](mailto:nadia@arabscientist.org); (2) Faculty of Agriculture, Damascus University, Damascus, Syria, E-mail: [louai@arabscientist.org](mailto:louai@arabscientist.org)

A survey was conducted during 2001-2002 covering Citrus trees at gardens and open orchards of the Lattakia region along the Syrian Coast, aiming to identify the most important predators and parasitoids over the *Pseudococcidae* and to study their distribution. The study revealed the presence of the following predator species: *Nephus includens* Kirsch (Coleoptera: Coccinellidae), *Sempheroobius* spp. (Symphyerobidae: Neuroptera) and *Chrysopa* sp. (Chrysopidae: Neuroptera). The research results proved that the predator *Nephus includens* achieved higher infestation rate than the previous predators, achieving the highest rate in August with significant differences ( $P < 0.05$ ), while the highest infestation rate of the predators (*Sempheroobius* spp. and *Chrysopa* sp.) was in June. The following parasitoid species were identified: *Clausenia purpurea*, *Anagyrus agraisensis* Saraswat and *Pachyneuron* sp. The parasitoid *Clausenia purpurea* reached the highest infestation rate in July of 86.60% with significant differences ( $P < 0.05$ ) compared with population rates of other parasitoids.

## NE 2

**DETERMINATION OF THE MOST IMPORTANT BIOLOGICAL INDICATORS OF THE PREDATOR *NEPHUS INCLUDENS* KIRCH AS COMPARED WITH THOSE OF THE FAMOUS PREDATOR *CRYPTOLAEMUS MONTROUZIERI* MULSANT.** Nadia Al-Khateeb<sup>1</sup> and Louai Asslan<sup>2</sup>. (1) Directorate of Agriculture And Agrarian Reform of Lattakia, Lattakia Center for Rearing Natural Enemies, P.O. Box 2012, Lattakia, Syria, e-mail: [nadia@arabscientist.org](mailto:nadia@arabscientist.org); (2) Faculty of Agriculture, Damascus University, Damascus, Syria, E-mail: [louai@arabscientist.org](mailto:louai@arabscientist.org)

*Cryptolaemus montouzieri* Mulsant and the local predator *Nephus includens* were reared on the *Planococcus citri* Risso in Lattakia center for Rearing Natural Enemies. A comparative study on the important biological parameters (Predation rate, life cycle, longevity, starvation tolerance, fecundity, sex ratio, adult emergence) for both predators was carried out under laboratory conditions. Results indicated that the predation rate of *C. montro- uzieri* males and females, was three folds higher than that of *N. includens*. The perdition rate for the third instar of the first predator was three times higher than that of the second predator, with

significantly differences reaching  $10.53 \pm 2.41$ ,  $30.87 \pm 3.76$  nymphs (second nymphal instars)/day. The results showed an increase of 1.8 fold in the fecundity index of *C. monrtouzieri* females as compared to those of *N. includens*. Whereas, both predators has similar values for other biological parameters (biologic development stages, longevity for males and females, adults emergence, sex ratio).

### NE 3

**ECOLOGICAL AND BIOLOGICAL STUDIES OF *BEMISIA TABACI* GENN. (HOMOPTERA: ALEYRODIDAE) AND ITS NATURAL ENEMIES ALONG THE SYRIAN COAST.** Rafeek Abboud<sup>1</sup> and Mohammad Ahmad<sup>2</sup>. General Commission for Scientific Agricultural Research (GCSAR), Center in Lattakia, Lattakia, Syria, e-mail: elibcwan@scs-net.org; (2) Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria.

The tobacco whitefly *Bemisia tabaci* Genn. (Homoptera: Aleyrodidae) was reared on cucumber, tomato and cabbage at 27 C. Development of immature stage lasted 18.43 days on cucumber and 21.17 days on tomato, and the differences were significant. Most of eggs and first instar larvae developed on young leaves, the second and third instar larvae developed on middle leaves, and most of the pupae and empty pupal cases were found on old leaves. The insect appeared at the beginning of May during 1999 and at late of May during 2000 in open fields. The numbers of immature stages in august 1999 were 57.66, 16.13 and 44.49/ 1 cm<sup>2</sup> for egg, larvae and pupae, respectively. Many predators and the parasite *eretmocerus mundus* were present, which decreased the pest population densities at the late summer and fall season.

### NE 4

**BIOLOGY OF THE COCCINELLID *PSYLLOBORA (THEA) BISOCTONOTATA* MULS. (COLEOPTERA: COCCINELLIDAE) A PREDATOR OF POWDERY MIDEW FUNGI.** Mohammad Ahmad<sup>1</sup>, Ghaidaa Younis<sup>2</sup> and Nawal Ali<sup>2</sup>. (1) Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria; (2) Department of Botany, Faculty of Science, Tishreen University, Lattakia, Syria.

The Coccinellid, *Psyllobora (Thea) bisohtonotata* Muls. (Coleoptera: Coccinellidae) is widely spread along the coastal region of Syria. This lady bird, in both larval and adult stages, was found feeding on many powdery mildew species (Erysiphaceae), which infect various plant species (weeds, field corps, fruit trees and forest trees). The activity of the insect starts from the beginning of April until the end of November (2001). The biology of *P. bisohtonotata* was studied under laboratory conditions (27 C, 12 h light) using leaves of *picris echioides* infected with *Erysiphe cichoracearum*. The total period of the life cycle was  $24.1 \pm 2.08$

days, mean female fecundity was  $102 \pm 88.50$  eggs, longevity was  $47.25 \pm 19.69$  days for males and  $54.25 \pm 14.26$  days for females. *P. bisoconotata* was recorded on 52 plant species belonging to 24 families.

#### NE 5

**MORPHOLOGY AND BIOLOGY OF THE COCCINELLID *VIBIDIA DUODECIMGUTTATA* PODA (COLEOPTERA: COCCINELLIDAE) A PREDATOR OF POWDERY MILDEW FUNGI (ERYSIPHACEAE).** Ghaidaa Younis<sup>1</sup>, Mohammad Ahmad<sup>2</sup> and Nawal Ali<sup>1</sup>. (1) Department of Botany, Faculty of Science, Tishreen University, Lattakia, Syria; (2) Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria.

The Coccinellid *Vibidia duodecimguttata* Poda (Coleoptera: Coccinellidae) is wide-spread along the coastal region of Syria. The ladybird was found feeding on many species of powdery mildew (Erysiphaceae), which infect various plant species (weeds, crops, fruit and forest trees). The insect activity starts from mid June until the end of December 2001. Morphology and biology of *Vibidia duodecimguttata* were studied under laboratory condition ( $2.5 \pm 2$  C,  $70 \pm 5\%$  RH, 12 h) using *Morus nigra* leaves infected with *Phyllactinia guttata*. Life stages and instars of *V. duodecimguttata* were described, measured and weighed. The total period of the life cycle was  $22.3 \pm 1.22$  days. Mean female fecundity was  $74.93 \pm 48.61$  eggs, longevity  $98.8 \pm 46.86$  days for females and  $79.9 \pm 39.69$  days for males. *V. duodecimguttata* was recorded on 11 plant species belonging to 7 families.

#### NE 6

**SURVEY AND THE SEASONAL ABUNDANCE OF THE PARASITOIDS OF THE CITRUS LEAF MINER (*PHYLLOCNITIS CITRELLA* STANTON) ALONG THE SYRIAN COAST.** Ahmad Rai, Kais Ghazal and Fedaa Shamseen, Agriculture Department of Lattakia, Lattakia Center for Rearing Natural Enemies, P.O. Box 3100, Lattakia, Syria.

The parasitoids of citrus leaf miner were surveyed during 2001 and 2002. Four parasitoids were identified during the two years. The parasitoids *Semiela cher petiolatus* Girault, imported from Australia in 1995, was the most abundant, and its parasitism rate was 92.94 and 94.48% in the two years, respectively. The rate of an other imported parasitoid *Cirrospilus ingenuus* Gahan during 1995 was successively 1.81 and 0.18%, whereas that parasitism of local parasitoids was low. The parasitism rate of local parasitoid *Citrostichus phyllocnistoides* Narayanan classified in 2000 in Syria was 4.32 and 2.16% and that of the local parasitoid *Ratziburgiola incompleta* classified in 1994 was 0.93 and 3.14%, in the two years, respectively.

#### NE 7

**SURVEY AND DISTRIBUTION OF COCCINELLIDS ON CITRUS ALONG THE SYRIAN COAST.** Fedaa Shamseen, Ahmad Rai and Kais Ghazal, Agriculture Department of Lattakia, Lattakia Center for Rearing Natural Enemies, P.O. Box 3100, Lattakia, Syria.

Coccinellids were surveyed in six locations in the Lattakia region during 2001-2002. Twenty-one Coccinellids species were surveyed. Six predators were found the most common in 2001 and 2002. The relative occurrence of *Chilocorus bipustalatus* Linneus in sticky traps in the two years was 22.05 and 17.87%, and in the multiplied net was 57 and 58%; *Rodalia Cardinales* in sticky traps was 23.5 and 36%, and in the multiplied net was 0.99 and 2.98%; *Scymnus Syriacus* in Sticky traps was 21.8 and 18.96%, and in the multiplied net was 8.18 and 21.8%.; *Scymnus aptzy* in sticky traps was 14.77 and 0.48%, and in the multiplied net was 4.26 and 3.86%; *Serangium Parcesetum* in sticky traps was 7.24 and 5.05%, and in the multiplied net was 6.15 and 10.66%, especially at locations of intensive infestation with soft brown scale (*Coccus Hesperidum*); and *Oeuopia conglabata* in sticky traps was 1.58 and 5.67%, and in the multiplied net was 0.18 and 7.23%. The relative occurrence of the other predators was very low in both sticky traps or in the multiplied net.

#### NE 8

**HOST-AGE AND HOST-SPECIES PREFERENCE OF VARIOUS STRAINS OF THE EGG PARASITOID, *TRICHOGRAMMA CACOECIAE* MARCHAL.** Wa'el Almatni<sup>1</sup>, C.P.W. Zebitz<sup>2</sup>, J.C. Monje<sup>2</sup>, M. Jamal<sup>3</sup>. (1) Department of Plant Protection, Ministry of Agriculture, Damascus, Syria, E-mail: almatni@scs-net.org; (2) Institute of Phytomedicin, University of Hohenheim, 70593, Stuttgart, Germany; (3) Department of Plant Protection, Faculty of Agriculture, Damascus University, Damascus, Syria.

Host-age preference was assessed by directly observing the behavior of single females of four strains (German, Danish, and two Syrian) of *Trichogramma cacoeciae* Marchal towards randomly arranged small groups of fresh (<24 h) and old (red ring stage) eggs of codling moth, *Cydia pomonella* L. Subsequently, the number of parasitized eggs of each age was recorded. Results showed that one of the Syrian strains (Sy2) behaved indifferently between both ages, whereas other three strains preferred significantly fresh eggs rather than old ones. The host-selection behavior of the same four strains of *T. cacoeciae*, towards eggs of *C. pomonella* and the grape berry moth, *Lobesia botrana* (Denis and Schiffer.), was investigated in the laboratory. It is preferable that the candidate strain for biocontrol of *C. pomonella* is also effective on *L. botrana*, the most important

grapevine pest in the area proposed for release. Continuous observation for one hour was done on searching and parasitizing behavior of individual females, which offered alternatively the same numbers of two host-eggs in a rectangular grid. A 24 hours release-host-select test was done with providing the same numbers (15 eggs) of the two hosts to identify their preference behavior. Results showed significant difference between strains in their preference to both hosts. Preference index suggests that German and Danish strains prefer *Cydia* eggs over *Lobesia* eggs ( $P>0.05$ ) in a 24-hour test and one hour observation. In contrast, both Syrian strains, Sy1 and Sy2, have no significant ( $P<0.05$ ) preference to *Cydia* or *Lobesia* host-eggs in both kind of tests.

#### NE 9

#### **SIGNIFICANCE OF HYPER PARASITIZATION OF PRIMARY CEREAL APHID PARASITOIDS IN EGYPT “HYMENOPTERA, PARASITICA”.**

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Cereal aphids are the major insect pests of wheat in Egypt. A survey of the most abundant parasitoid species; primary and/or secondary, associated with cereal aphid species in wheat fields, in four agro-ecosystems in Egypt, was carried out for four growing seasons 1997/98-2000/2001 to evaluate the significance of hyperparasitization of primary cereal aphid parasitoids. The survey revealed the presence of 7 and 7, primary and secondary parasitoid species. Average percentage of the parasitism by the primary parasitoides did not exceed 36 % in the four seasons. *Aphidius* spp. (*matricariae* and *colemani*) and *Diaeretiella rapae* were the most abundant primary parasitoid species (represented by 35.9 and 34.3%, respectively). Total percentage of hyperparasitism in all over the wheat regions ranged between 19.1 and 24.6% and averaged 21.2%. Highest percentage (51.5%) of hyperparasitism was recorded in the New Valley, whereas the lowest (2.8%) was found in middle of the Delta. Cynipids were the most abundant secondary parasitoid species (represented by 76.2%).

#### NE 10

**SURVEY OF LADYBIRDS (COLEOPTERA: COCCINELLIDAE) ON CONIFERALES IN SOUTH OF SYRIA.** Nazeer Khalil, Department of Animal Biology, Faculty of Sciences, Damascus University, Syria, E-mail: khalil-n@scs-net.org

A survey for Coccinellid species on Coniferous trees in south of Syria was conducted during 2001 and 2002. The results revealed the presence of 16 species belonging to 7 tribes and 5 subfamilies. All of the listed species were found to be predatory beetles attacking different arthropod pests including aphids, scale insects and mites. The investigation included their prevalence and distribution in south Syria.

#### NE 11

**PRELIMINARY DETERMINATION OF SYRPHID FLIES (SYRPHIDAE: DIPTERA) IN DAMASCUS AREA.** Abdulnabi Basheer and Marawan Abou Al-Shamat, Department of Plant Protection, Faculty of Agriculture, Damascus University, Damascus, Syria.

This research was conducted in two fields in Damascus, a bean field and a peach field. The duration of experiment was 10 months with the main objective to identify the syrphid flies in Damascus city. Four species: *Syrphus ribesii*, *Metasyrphus corolla*, *Scaeva pyrastii* and *Episyrphus balteatus* and others were identified to belong to the following four genera: *Melanstoma*, *Didea*, *Eristalis* and *Epistrophe*.

#### NE 12

**A DATA BASE FOR THE NATURAL ENEMIES RECORDED IN SYRIA AND NEIGHBORING COUNTRIES.** Wa'el Almatni<sup>1</sup> and Hassan Samara<sup>2</sup>. (1) Department of Plant Protection, Ministry of Agriculture, Damascus, Syria, E-mail: almatni@scs-net.org; (2) Bouraq telecommunication service, Damascus, Syria.

Most natural enemies recorded on arthropods in the east Mediterranean region (Syria, Lebanon and Jordan), were documented electronically on a CD to build a data base which capture the available information on part of the local fauna. This electronic compendium contains information on 766 animal species known as natural enemies of arthropods in this region. The record for each species includes the Latin scientific name, the taxonomic status, geographical distribution in this area, and its hosts or its preys, in addition to environmental information associated with the species local ecology. The compendium also contains ca. 400 photos of the important natural enemies. The search mechanisms and the automatic sorting in this compendium equip researchers with an efficient tool for information retrieval.