

Economic Entomology

E 1

THE CANNIBALISTIC PHENOMENON OF ADULTS AND LARVAE OF THE CONFUSED FLOUR BEETLE, *TRIBOLIUM CONFUSUM* (COLEOPTERA:TENEBRIONIDAE). Hassan Maghrabi and Nawal Mahfuod, Zoology Department, Faculty of Science, Al-Fatah University, P.O Box 13799, Tripoli, Libya, E-mail: Drmaghrabi@Yahoo.com

The phenomenon of cannibalism was examined as it is practiced by the confused flour beetle : The consumption of eggs (E) and pupae (P) by larvae (L) and adults (A). The insect cultures were maintained on whole-wheat flour , yeast , and no-food for 24 and 48 hrs at 29 C and 70% relative humidity. ANOVA of the data revealed that cannibalistic mean rates of (Ex L and A), (LxA), (PxL), (LxPxA), and time periods were significantly different ($P<0.01$). On the other hand, yeast medium showed less cannibalistic effect on the insect than flour. But with lack of food, a great cannibalistic pressure was observed. The importance of intraspecific cannibalism both as a source of mortality and as population regulatory mechanism for the *Tribolium confusum* is stressed throughout this work.

E 2

MEDICINAL PLANTS AND SEEDS EFFECTS ON THE SURVIVAL OF CONFUSED FLOUR BEETLE, *TRIBOLIUM CONFUSUM* (COLEOPTERA: TENEBRIONIDAE). Nawal Mahfuod and Hassan Maghrabi, Zoology Department, Faculty of Science, Al-Fatah University, P.O Box 13799, Tripoli, Libya, E-mail: Drmaghrabi@Yahoo.com

A study on food preference for the confused flour beetle, *Tribolium confusum*, in relation to insect development on some selected food groups: seeds, flour, spices, nuts and medicinal plants showed significant statistical differences ($P<0.01$). Fourteen preferred diets and ten medicinal plants and seed mixtures were tested for their effect on the development and survival of the confused flour beetle. The results revealed significant statistical differences ($P<0.01$) for the repellency, deterrents of feeding and mortality effects on adult *Tribolium confusum* mainly for Mint, Cloves, Rue, Rosemary, Cinammon, Thyme, Fenugreek and Eucalyptus; which encouraged their incorporation as natural control sources for the integrated control of the confused flour beetle as a part of stored food products.

E 3

FAO'S EFFORTS FOR THE MANAGEMENT OF THE PEACH FRUIT FLY (*BACTROCERA ZONATA*) IN THE MIDDLE EAST AND NORTH AFRICA COUNTRIES. Khaled Alrouechdi, 3 bis rue Abdelmalek Ibn Marouene P.O. Box 300 Cité Mahrajène 1082 Tunis-Belvédère, Tunisia.

The Peach Fruit Fly (PFF) is an extremely aggressive pest that infests some of the main commercial fruit and vegetable crops including citrus, peach, mango, guava and tomatoes. It causes up to 100% loss when untreated. In the Middle East region, *B. zonata* is established and widespread in Egypt and also present in Yemen, Iran, Saudi Arabia and Oman. It has been recently reported in Palestine and Lebanon. Should this pest spread to PFF-free countries around the Mediterranean Basin and get established, the economic impact on the domestic and export market fruit production could be in the order of billions of US dollars per year as a consequence of increased direct damage, control, quarantine restrictions, cost of certification programmes (including post harvest treatments) and social and environmental impact. To further acknowledge this serious problem and its regional implications, representatives from the Middle East and North African countries, strongly supported the idea of establishing a FAO/ PFF regional project to assess the current status of the pest in the region, build up a vigilance system and create an emergency response capability to face eventual pest outbreaks. The concerned Governments requested FAO technical assistance to facilitate the establishment of this project and to strengthen the capabilities for PFF surveillance and emergency preparedness. The objective of the regional project (13 countries) is to assist in eliminating the PFF in countries where it is established and in preventing its dissemination to other countries of the region, through field control/eradication actions and capacity strengthening in PFF management, surveillance and emergency preparedness. The project will also facilitate the establishment of a Regional Task Force (RTF) for concerted action.

E 4

A NEW RECORD OF CHAFER INSECT *EUSERICA MURZKA* (SUB FAMILY: MELOLONTHINAE, FAMILY: SCORABAEIDAE, ORDER: COLEOPTERA). Mohamed Massoued Abud Alla Dodo¹, Ali Ramadan Abd Alla AlDeeb² and Omran Mohamed Ali Bawa². (1) The National Certified Seed multiplication Center, Tisawa Project, Libya; (2) Arab Center for Research and Development of Saharan Communities, P.O Box 26, Murzuk, Libya, E-mail: Scmuzuk@hotmail.com

Many plant pests and diseases are widely spread and they attack many agricultural products. In 1999, the chafer insect it was noticed for the first time in the south west region of Libya to destroy the leaves and flowers of alfalfa fields

and other crops such as sesame, jews Mallow and also attack the new leaves of many trees such as peach and zizphus spin. Larva feed on roots and potato tubers. This insect is considered as one of the most harmful pest on alfalfa seed products and potato tubers. During the period from April to October, it starts activity during the night. During flying, the insect make a characteristic noise caused by wing movement. Specimens were collected and sent to the British Natural History Museum for identification and classification. The insect was found to belong to Order: Coleoptera, Family-Scarabaeidae, Sub family: Melolonthinae, Genus: Euserica, species unkown. The authors suggested the name *Euserica murzka* which was accepted as the scientific name by the British Natural History Museum and a common name "African chafer".

E 5

INSECT PESTS OF ORNAMENTAL PLANTS AND THEIR NATURAL ENEMIES IN EL-BEIDA CITY, LIBYA. Adil H. Amin, Biology Section, Department of Basic Science, University of El-Marj, P.O. Box 894, El-Marj, Libya, E-mail: adil_h_Korachi@yahoo.com

A survey of insect pests of ornamental plants and their natural enemies was conducted in El-Beida city, Libya, where 28 species of insect pests belonging to 14 families and 6 orders feeding on 26 species of ornamental plants were recorded. These insects included 20 species in the order Homoptera, two species each in the orders Hemiptera, Thysanoptera and Lepidoptera, and one species each in the orders Coleoptera and Hymenoptera. In addition, 13 species of natural enemies were recorded on insect pests of ornamental plants including 10 species of predators, 8 species of family Coccinellidae, and one species each of the families Anthorcoridae and Syrphidae, and three parasitoid wasps belonging to the families Aphelinidae, Aphidiidae and Pteromalidae.

E 6

COMMON INSECTS IN NORTHERN JORDAN. Ahmad Katbeh-Bader, Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman 11942, Jordan, E-mail: Ahmadk@ju.edu.jo

Weekly field trips to collect insects were conducted in northern Jordan from March to August 2001, in order to establish an insect museum at Al Albayt University in Al Mafraq City, north Jordan. Thousands of specimens were collected, pinned and preserved at Ibn Al Beetar Museum. A total of 83 species were identified. Lepidoptera included 43 species of butterflies and moths, Orthoptera 14 species of grasshoppers, Hemiptera 10 species of bugs, Coleoptera 8 species of beetles, Odonata 6 species of dragonflies and damselflies, and Neuroptera 2 species of antlions. However, many species belonging to several orders were not identified.

The collected species were beneficial and harmful insects which constitute an important part of the insect diversity in the area.

E 7

A TAXONOMIC STUDY OF THE LONG HORNED GRASSHOPPERS OF JORDAN (ORTHOPTERA: TETTIGONIIDAE). Ahmad Mahasneh and Ahmad Katbeh-Bader, Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman 11942, Jordan, E-mail: Ahmadv@ju.edu.jo

Weekly field trips to collect tettigoniids were conducted from February 2002 to the spring of 2003. Many specimens were collected from the different parts of Jordan. Specimens of Tettigoniidae collected previously from Jordan and preserved in the University of Jordan Insects Museum as well as other Jordanian collections were also studied. The specimens were found to belong to 25 species in eight genera and six subfamilies. Keys for the identification of subfamilies, tribes, genera, subgenera and species recorded in Jordan were constructed and provided with the necessary illustrations. For each species, the valid name, synonymy list, distribution in the world, collecting sites and dates in Jordan, description, color photographs of the entire specimen, were provided.

E 8

POPULATION DYNAMICS OF THE CITRUS MEALYBUG *PLANOCOCCUS CITRI* RISSO (HOMOPTERA: PSEUDOCOCCIDAE) ON GRAPEVINE IN TUNISIA. N. Mahfoudhi¹, M.H. Dhouibi¹, N. Chabbouh² and R. Bessai². (1) Laboratoire d'entomologie, Institut National Agronomique de Tunisie (INAT), 43 avenue Charles Nicolle, 1082 Tunis –Mahrajène Tunisie, E-mail: nmahfoudhi@yahoo.fr; (2) Laboratoire de protection des végétaux, Institut National de la Recherche Agronomique de Tunisie (INRAT), Rue Hedi Kharray, 2049 Ariana – Tunisie.

The citrus mealybug, *Planococcus citri*, is a serious pest of grapevine in Tunisia. Population dynamics was studied using both pheromone traps and plants samples. The study was carried out in two vineyards in the north of Tunisia. *Planococcus citri* overwinter in the lower vine sections, such as trunk and roots. Mealybug density increased in spring (April-May) and started to move on to the upper parts of the vine (new canes, leaves and bunches) as the season progressed. There were 3-4 generations of the *P. citri* per year as suggested by sampling and male flights by pheromones traps. In autumn, mealybugs returned to protected parts. Two native parasitoids were recorded; *Anagyrus pseudococci* (Girault) and *Leptomastidea abnormis* (Girault). The parasitism level was low in the beginning of the season (2.73% in May), which is attributed to the mealybug distribution in protected parts. The peak of parasitism (28.57%) was recorded in September.

E 9

ECOLOGY AND BIOLOGY OF WHEAT STEM SAWFLY IN NORTHERN SYRIA. Mohamed Izzat Ghannoum¹, M.N. Al-Salty² and Jom'a Ibrahim². (1) ICARDA, P.O. Box 5466, Aleppo, Syria, E-mail: I.Ghannoum@cgiar.org; (2) Plant Protection Department, Faculty of Agriculture, University of Aleppo, Aleppo, Syria.

Wheat stem sawfly is one of the main pests that affect barley and wheat in northern Syria. Larva feed on the contents of the host stem, resulting in empty or small-seed spikes. The larvae move down-ward in the stem where it hibernates as a developed larvae, leading to lodging of stems and to yield loss. During the 2000-2002 period, a survey was conducted in some fields to assess the infestation level, the dominant species present and the most vulnerable areas. Some entries, including local cultivars, were screened under natural infestation conditions in the infested areas to evaluate their resistance to this insect.

E 10

POPULATION DYNAMIC OF THE MEDITERRANEAN FRUIT FLY, *CERATITIS CAPITATA* WIEDE (DIPTERA: TEPHRITIDAE) IN THE COASTAL REGION OF SYRIA. Mohammad Ahmad¹ and Majeda Mofleh². (1) Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria, (2) General Commission of Agricultural Research, Lattakia Research Center, Lattakia, Syria.

The Mediterranean fruit fly, *Ceratitis capitata* Wiede (Diptera: Tephritidae) is considered as a serious pest to many important fruit crops in Syria. Population changes of adult males were studied using pheromone traps containing TML capsules. The variation of the insect density, especially the males, appeared to be in conformity with abundance of inter-cropped hosts and their maturity time. When the site has contained one host or more relatives as in citrus for example, the population peak was at the middle of citrus season (December). Whereas, when there was a differences in hosts maturities (peaches and citrus) two peaks were observed. The first peak was at the end of the peaches season (August) and the second peak was in December. The insect activity did not stop but it went down to a very low level in all studied sites during spring months, due to the absence of host fruits. There was no relation between the average temperatures and the amount of catch during the study period has not bear show. Whereas, temperature had a clear effect on the daily activity period of the insect during summer season, as traps caught a greater number of males in moderate temperatures. In hot day hours, insects tended to hide and became inactive. Nine generations for fruit fly

(*C. capitata*) per year were registered. The generation period varied between one to two months.

E 11

THE STUDY OF THE RATE OF SCALES INSECTS (*AONIDIELLA AURANTII* MASKLL, *LEPIDOSAPHES BECKII* NEWMAN *PARLATORIA PERGANDII* COMSTOCK) BETWEEN EACH OTHER AND ITS NATURAL ENEMIES ON CITRUS IN THE SYRIAN COAST. Kais Ghazal, Ahmad Rai, and Fedaa Shamseen, Agriculture Department of Lattakia, Lattakia Centre for Insectary and Reared Natural Enemies, P.O. Box 3100, Lattakia, Syria.

The Armored Scale insects are considered as main pests which infest citrus in Syria and the main species on citrus in Syria are *A.aurantii*, *L. beckii* and *P. pergandii*. The study aimed to identify the most common insect on citrus. The occurrence of the three insects on citrus fruits in the 2001/2002 growing season in seven locations was monitored. *P. pergandii* reached the highest infestation rate (62.5%) followed by *A. aurantii* (22.6%) and *L. beckii* (14.9%). There was very significant differences at 0.05% level in four locations between *P. pergandii* and the sum of *L. beckii* and *A. aurantii*, and only one location with no significant difference among the three insects. During 2002/2003 growing season and in 11 locations, again *P. pergandii* was the most common (65.22%). The infestation rate of *A. aurantii* was 28.26% and that of *L. beckii* was 6.52%. There was so significant differences at 0.05% level in five locations between *P. pergandii* and the sum *A. aurantii* and *L. beckii*. Three parasitoids on *P. pergandii* (*Encarsia* spp., *Aphytis* spp. and unknown parasitoids) and one cheyletid mite predator were identified. Likewise, four parasitoids on *L. beckii* (*Encarsia* spp., *Aphytis* spp., *Marietta picta* and unknown parasitoids) were identified. Additionally, two predators on the three insects (*Chilocorus bipustulatus* Linnaeus and *Rhyzobius* spp.) were also identified.

E 12

EFFECTS OF FOOD TYPE AND TEMPERATURE ON DEVELOPMENTAL STAGES AND FECUNDITY OF THE CERAIN MITE *DERMATOPHAGOIDES FARINAE* HUGHUS (ACARI: ASTIGMATA: PYROGLYPHIDAE). Hassan A. Taha and Maraiam A. El- Sandy, Plant Protection Research Institute, Dokki, Giza, Egypt.

Biological and Ecological Studies were carried out on the grain mite *Dermatophagoides farinae* Hughus, when reared on three different food sources: dry yeast granules, crushed wheat and crushed rice under laboratory conditions of 25 and 30 C and 60±5% RH. Results obtained revealed that dry yeast granules was the most attractive and favored food for the mite *D. farinae*. It was suitable to some

extent for mite survival and population build up. The generation period was completed in the shortest time when mites were fed on dry yeast at either temperatures. Female longevity required 28.6 and 22.8 days and deposited 65.2 and 55.9 eggs with a daily rate of 3.5 and 3.7 eggs when mites were fed on dry yeast at 25 and 30 C, respectively. Other diets led to a longer generation period and reduced egg deposition when the mites were reared at the above mentioned temperatures.

E 13

ECOLOGICAL AND BIOLOGICAL STUDY FOR THE EXPANSION OF THE *PSEDOCOCIDAE* ON CITRUS IN THE SYRIAN COST. Louai Asslan¹ and Nadia Al-Khateeb². (1) Faculty of Agriculture, Damascus University, Damascus, Syria, E-mail: louai@arabscientist.org; (2) Directorate of Agriculture and Agrarian Reform of Lattakia, Lattakia Insectary-Reared Natural Enemies, Lattakia, Syria, E-mail: nadia@arabscientist.org

During the years 2001-2002 a survey for mealy bugs on leaves and fruits of citrus trees was conducted at the gardens and open orchards around Lattakia and along the Syrian Coast. The results of the study revealed the presence of the following species: *Planococcus citri* Risso, *Pseudococcus comstocki* Kuwana, *Pseudococcus adonidium* Linne at all the sites, with the highest infestation rate of the three species being in August. The infestation rate on the leaves in the citrus gardens around the city reached 19.13, 2.5 and 78.32% for the three species, respectively. The infestation rate in the citrus open orchards was 40.54, 2.46 and 57.0%, respectively. *P. citri* was the most common on citrus fruits. The generation duration for the mentioned three species under Lab conditions reached 41.6 ± 4.79 , 38.1 ± 3.70 and 39.5 ± 5.46 days, respectively.

E 14

A PRELIMINARY STUDY OF INSECT PESTS THAT INFEST THE LEBANESE CEDAR (*CEDRUS LIBANI*) ALONG THE SYRIAN COAST. Sleiman Ihsan, Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria.

The Lebanese cedar tree spreads in three eastern Mediterranean countries which are Syria, Lebanon and Turkey. It is found in more than 90% of the current area in Turkey, and most of it is natural communities. The Lebanese cedar does not form pure forests along the Syrian coast, but it is found as separate patches in the northern part of the coastal mountain series which do not exceed 1000 hectares. In a recent study on insects that infest the Lebanese cedar tree along the Syrian coast, the following insect pests which attack different parts of the tree were detected: Cedar park beetle (*Phloeotribus cedrus*) and *Ernopius* sp. that feeds on summer buds, *Barbara osmana* that feeds on the seeds inside cones, the cedar shoot moth

(*Dichelia cedricola*) whose larvae feed on needle leaves by making linear tunnels. Furthermore, the cedar aphid (*Cinara cedre* Mineus) and three scale insect species of the genera *Dynaspidotus*, *Leucaspis* and *Lepidosaphes* were identified. In addition, an insect of the order Diptera, and family Helomyzidae that feed on the fallen cones and their seeds was detected, but the species is not identified yet.

E 15

BIOECOLOGICAL STUDY OF WHEAT INSECTS IN MITIDJA (ALGIERS). Doumandji-Mitiche Bahia and Mohand Kaci Hakima, National agricultural Institute, El-Harrach, Algeria, E-mail: doumandjimitiche@yahoo.fr

Wheat is the most important crop in Algeria, since it is the major food source for the population. The present study aimed to survey the parasites and insect pests of this crop. The study was carried out in the Mitidja region situated in the north of the country, and is characterized by conditions favourable for most insect species. Three stations were selected: Oud Smar, Rouiba and Boudouaou. Color traps, luminous traps and bury pots were used in the survey. The recovery of trap catches continued every 15 days during 2001 and this permitted to identify 182 species belonging to 11 orders: Thysanoptera, Blattoptera, Dermaptera, Orthoptera, Heteroptera, Homoptera, Coleoptera, Neuroptera, Hymenoptera, Lepidoptera and Diptera. The most important order was Coleoptera, where 69 species in 23 families were recorded. Boudouaou's station was the richest with 123 species. Finally, among caught insects, the most important were *Sitobium avenae*, *Rhopalosiphum padi* and *Anthicus instabilis*, and among the predatory species, *Coccinella algerica* and *Hippodamia variegata* were the most common.

E 16

ORTHOPTERA (CAELIFERA: ENSIFERA) IN ALGERIA: REPARTITION. Amina Damerdji, Biology Department, Faculty of Sciences, University of Aboubekr Belkaïd, B.P 119, Tlemcen, Algeria.

Algeria is divided in to four regions, the west, the center, the east and the south. Each one of these regions includes a certain number of stations where orthopterologic inventories are made. The different data concerning the censuses of the *Orthoptera* found in the different regions were assembled. The order *Orthoptera* is divided in two sub-orders among which are the *Ensifera* and *Caelifera* which is the most important, and includes 110 species divided into 3 families, namely the *Acrididae*, the *Pamphagidae*, and the *Pyrgomorphidae*. The first family is very diversified, since it includes as many as 84 species. The sub-order *Ensifera* comprises 27 species (24 *Tettigoniidae* and 3 *Gryllotalpidae*), approximately as many as the two *Caelifera* families *Pamphagidae* and *Pyrgomorphidae*. First, the *Orthopteran* species were surveyed in each of the four

regions. The central region was the richest, with 80 species, whereas the number goes down to half in the south.

E 17

THE ORTHOPTERA SPECIES ALONG THE NORTH-SOUTH ZONE OF TELMECEN (ALGERIA). Amina Damerdji, Biology Department, Faculty of Sciences, University of Aboubekr Belkaïd, B.P 119, Tlemcen, Algeria.

The Tlemecen region is located in the north-western part of Algeria. Surveys made along the north-south zone and covered many stations, starting from Ghazaouet to El-Aricha going through the mountains of Telemecen with Hafir and Zarifet, the plains of Maghnia, and finally Tlemcen and its surroundings. Samples were collected monthly for one year. The orthopterologic inventory was made for each station, and a comparison was made between the different stations. The results are treated by factorial analysis of the correspondences (A.F.C), and accordingly several sets were identified.

E 18

SURVEY OF INSECTS ASSOCIATED WITH CITRUS IN WESTERN REGION OF LIBYA. N.K. Abukhashim and A. H. Arhoma, Plant Protection Department, Faculty of Agriculture, El-Fateh University, Libya.

A general survey of insects on citrus trees was carried out in the western region of Libya during 1999–2000. Thirty seven species belonging to Ten orders were recorded. The most economic existing phytophagous insects were: The citrus leaf miner (*Phyllocnistis citrella*), the mediterranean fruit fly (*Ceratitis capitata*), the citrus aphid (*Toxoptera aurantii*), the red scale (*Aonidiella aurantii*) and the black scale (*Parlatoria ziziphus*). These species were recorded on all citrus species and in all surveyed regions.

E 19

SURVEY FOR DISTRIBUTION AND HOST RANGE OF THE GREATER MELON FRUIT FLY *DACUS FRONTALIS* (BECKER) IN LIBYA. N.K. Abukhashim¹, M.G. Abdussalam², A.S. Mabrook², K.S. Shukre², O.H. Taha², O.E. Esam², E.B. Farag², M.A. Hiatham² and M.H. Abdulwahed. (1) Plant Protection Department, Faculty of Agriculture, El-Fateh University, Libya; (2) Biotechnology Research Center, Tajoura, Libya.

Survey was conducted on the greater melon fly *Dacus frontalis* (Becker) associated with cucurbits in Libya. This study was conducted in 99 sites distributed along the eastern, western, southern and central regions of Libya, during 2001 and 2002. The study showed that *Dacus frontalis* is widely spread in all cucurbit orchards of the surveyed area of western and southern regions, moderately

distributed in central region, and least abundant in eastern regions. The results showed that the infestation was recorded on seven cucurbit species (*Citrullus lanatu*, *Cucumis melo* (L.), *Cucurbita pepo* (L.), *Cucumis sativus* (L.), *Cucumis melo* var. *flexuosus*, *Cucurbita moschata*, and one wild species, *Citrullus colocynthis* and one species, *Solanum melonena* (L.), was recorded as a new host for the first time.

E 20

BIOLOGICAL STUDIES ON CERTAIN INSECTS OF GENUS *EPHESTIA*.

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The laboratory work was carried out at the plant protection department; of Agriculture at Faculty of Al-Azhar University. The periodical samples have been taken and brought from Baharia oasis. The aim of this study is to understand the biology, seasonal abundance, ecology, chemical and biologicla control of *E. cautella* and *E. calidella*. Results related to *E. cautella* indicated that it has 5 generations/ year, the mean number of eggs laid by a single female during its whole life ranged between 52.38 egg and 159.29 egg, the mean preoviposition period for laying eggs was 1.2-1.8 days, the mean oviposition period for laying eggs was 1.0-1.8 days. The two insects larvae attack the immature and mature dates on the trees and in the store. Satisfactory protection of date bunches from attack by *E. cautella* and *E. caliedella* was achieved by covering, the bunches during the first half of July. Storing dry date fruits as separated or attached to their spates, with or without cap, were evaluated for their effect on the susceptability of date palm to infestation with *E. cautella* and *E. calidella*.

E 21

BIOLOGY OF APPLE INSECT BORER *ZEUZERA PYRINA* L. (LEPIDOPTERA: COSSIDAE) IN AL-JABEL AL-AKHDER REGION, LIBYA. **Jamila S. Al-Aspaly**, M. El-Barouni, I.M. El-Ghariani and A. Bataw. Plant Protection Department, Omar Al-Mukhtar University, P.O. Box 919, El-Beida, Libya.

The study was conducted in Al-Jabel Al-Khder area located north east of Libya. This area in the last few decads experienced extensive apple tree cultivation. The aim of this study was to investigate the life cycle of the apple stem borer *Z. Pyrina* L. under the local climatic conditions, and identify its hosts, percent infestation and its distribution. The data showed that the emergence of adults started from end of May to mid August. It has one generation per year with exception of few larvae (10-20%) that can stay in a quiescent stage until the next season. After egg-hatching the larvae stayed without feeding for 3 to 4 days, then started boring in the stem. It has six larval instars and lived about 9 months inside

the tunnels. The pupa lived from 4 to 6 weeks. The data revealed that the pest appeared to infest many plants in Al-gabal Al-Akhder and the most preferred hosts infested were apples, pears and nuts.

E 22

RESEARCH ON OCNERIDIA VOLXEMI BOL. (PAMPHAGIDAE, ORTHOPTERA) IN SETIFIAN HIGH PLAINS (NORTH-EASTERN OF ALGERIA). Mustapha Bounechada¹ and Salaheddine Doumandji². (1) Département d'Agronomie, Faculté des Sciences, Université de Sétif, 19000, Algérie, E-mail Bounechadam@yahoo.fr; (2) Institut National d'Agronomie, El-harrach 16000, Algeria.

Ocneridia volxemi commonly called "Boukrouma" because of its pronotum bent. This Pamphagidae is considered to be the grasshopper species which cause the most damage to cereals in the area of Setif and other cereal areas of Algeria. When it pullulates it causes important damage on the cereals. To protect the cereal fields the governmental agencies concerned (National Institute of Plant Protection) are obliged to spray thousands of hectares with chemicals (Malathion). To better understand this species, a study was carried out over six consecutive years (1994 to 1999) in various locations. It included biological (life cycle) ecological (pollution factors) and behavioral (sexual and dietary food) aspects, in addition to biological control (*Beauveria bassiana*).

E 23

DESERT LOCUST IN LIBYA. Faraj Mohamed Karra, National Committee for Desert Locust Control, Libya.

Libya is considered as one of the countries which is subject to Desert Locust (*Schistocerca gregaria*) invasions, and last invasion was in 1988. This pest can reach Libya through several entry points located in the west, southwest and south regions. Libya has made an effort to limit the danger of this pest by establishing an independent body to be responsible for monitoring invasion and the local breeding areas in addition to organizing and supervising the control campaign during the invasion, in addition to surveys. The National Committee for Desert Locust Control and its branches of control centers are distributed in the areas considered as important entry points and breeding areas. Migration is one of the characters of Desert Locust, which permits it to migrate from one country to another and from one region to another. This character necessitates activating the international, regional and bilateral cooperation agencies. Libya is an active member of the International Committee for Desert Locust Control (DLCC), the Commission for Controlling the Desert Locust in the Western Region (CLCPRO) and the EMPRES project. In addition, Libya is well represented in international

and regional conferences, seminars and workshops, with several bilateral agreements with the neighboring countries aiming at surveying and controlling Desert Locust.

E 24

SURVEY AND DISPERSAL OF ORIENTAL YELLOW SCALE INSECT *AONIDIELLA ORIENTALIS* (NEWST.) ON CITRUS IN CENTRAL IRAQ.

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The study confirmed the occurrence of oriental yellow scale insect *Aonidiella orientalis* (Newst.) in a large number of citrus orchards in the central region of Iraq and estimated the severity of infestation at different locations. Sour orange twigs infestation level was 100, 45 and 80%, the leaves 78, 36.2 and 55% and the fruits 45.0, 20.5 and 30.2% in Baghdad, Dialaa and Wasit, respectively. The insect did not have any effect on citrus in Karbalaa and Al-Najaf governorates. The presence of the soft scale insect *Coccus hesperidum* L. was also recorded on citrus trees in few numbers, but without economical damage. The survey also recorded the presence of oriental yellow scale insect on fruit trees and ornamental plants and bushes. There was a significant statistical variation in the total population density on different citrus species, with 7.41, 4.30, 3.41, 2.77, 1.09 and 1.07 insect/in² on Grape-fruit, sweet lemon, sour lemon, sour orange and orange, respectively.

E 25

SUGAR BEET PESTS (DISEASES AND INSECTS) DURING THE LAST TWO DECADES IN EGYPT. M.M.A. El-Kholi, Sugar Crops Research Institute, ARC, 12619 Giza, Egypt, E-mail: el_kholi@yahoo.com

Under Egyptian environmental conditions, sugar beet plants are subjected to attack by numerous pests (diseases & insects) during germination, emergence or juvenile growth causing considerable economic losses (individual plants up to 70 %) in total production. Sugar beet seedling stage (30–45 days) is threatened by several diseases (fungal pathogens, i.e., *Rhizoctonia solani*, *Fusarium* spp., *Pythium* spp., *Sclerotium rolfsii*, *Phoma betae*) causing pre- and post-emergence damping-off, and seedling blight (black leg), while certain pests i.e., wireworms, mole crickets, cutworms, birds, rats and leaf eaters, such as *Spodoptera littoralis* and *Spodoptera exigua* are attack seedlings causing losses in the total stand in the field. Meanwhile, sugar beet foliage (45-210 days) are attacked by numerous pests (diseases & insects). Cercospora leaf spot, Powdery mildew and beet rust are the major diseases in sugar beet plantation. While *Cassida vittata*, *Pegomyia mixta*, *Scrobipalpa ocellatella*, *Temnorhinus brevis* and European corn borer

(*Ostrinia nubilalis*) are the major insects. The Integrated Crop and Pest Management (ICPM) is important to reduce the losses and increase sugar beet productivity.

E 26

ECONOMIC PESTS OF DATE PALMS IN LIBYA. Ezarug A. Edongali and H.M. Kerra, University of El-Fatih, P.O. Box 13274, Tripoli, Libya, E-mail: Edongali48@hotmail.com

Date palm tree during its growth and development is attacked by different pests, such as Animal pests like scale insects, mealy bugs, dubas bugs, frond and stem borer, dry fruit beetles, lepidoptera moths, mites, birds, and rodents, or diseases, such as inflorescences rot, black scorch, diplodia disease, false smut, leaf spots, fruit rots. In addition, there are abiotic stresses such as poor soils deficient in Mn, P, and other essential micronutrients. Soil salinity is also a major restricting factor in date palm growth especially in poorly drained soils. Climatic factors, such as wind, sudden rise in temperature during the ripening season, causing reduction in quantity and quality of dates. All these factors singly or in combination could cause a great loss in quality and yield of date palm.

E 27

A TAXONOMIC STUDY OF THE BEEFLIES OF JORDAN (BOMBYLIIDAE: DIPTERA). Sahar Arabyat and Ahmad Katbeh-Bader, Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman 11942 Jordan, E-mail: Ahmadk@ju.edu.jo

Weekly field trips to collect bee flies were conducted from October 2001 to November 2002. More than 870 specimens from 73 localities were collected. Specimens of Bombyliidae collected previously from Jordan and preserved in the University of Jordan Insects Museum as well as other Jordanian collections were also studied. The specimens were found to belong to 131 species in 42 genera and eight subfamilies. Of these, 124 species are recorded for the first time. Keys for the identification of subfamilies, tribes, genera, subgenera and species recorded in Jordan were constructed and provided with the necessary illustrations. For each species, the valid name, synonymy list, distribution in the world, collecting sites and dates in Jordan, color photographs of the entire specimen, original drawings of wing venation, were provided.