Food and Agriculture Organization of the United Nations

النشرة الإخبارية لوقاية النبات في البلدان العربية والشرق الأدنى

ARAB AND NEAR EAST PLANT PROTECTION NEWSLETTER (ANEPPNEL)

2021

ARAB AND NEAR EAST PLANT PROTECTION NEWSLETTER

Food and Agriculture Organization of the United Nations

The Arab Society for Plant Protection and the Near East Regional Office of the FAO jointly publishes the Arab and Near East Plant Protection Newsletter (ANEPPNEL), three times per year. All correspondence should be sent by email to the Editor (aneppnl@gmail.com).

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Food and Agriculture Organization of the United Nations

Number 82 April, 2021

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EDITORIAL

Current Situation of *Xylella fastidiosa* in Europe

In 1892, Newton Pierce was the first to report on a disease caused by *Xylella fastidiosa*. Pierce studied an epidemic of vine disease in Southern California that had devastating consequences to the grape industry in the region, and until the end of the last century the bacterium remained confined to the Americas. *X. fastidiosa* re-emerged as a plant pathogen of global importance in 2013 when it was first associated with an olive tree disease in Apulia (Southern Italy), where a dramatic outbreak has been decimating the olive and created unprecedented turmoil for the local economy and posed critical challenges for its management. Since then, the pest was identified in 2015 in France (Corse and PACA region), in 2016 in Spain (Balearic Islands, province of Alicante and Autonomous Region of Madrid) and, more recently, in Tuscany, Italy, and in Portugal.

The presence of subspecies *pauca*, *fastidiosa* and *multiplex* was reported, together with the identification of several STs, causing a severe impact especially on the olive industry in southern Italy (subsp. *Pauca*) and on the Spanish almonds (subsp. *Multiplex*), two of the 595 plant species so far identified as potential hosts of the bacterium.
Thanks to the wide-scale use of genomic sequencing, it is now clear that the origin of *X. fastidiosa* in Europe has a longer history than previously thought and, moreover, it is also evident that some strains are less aggressive than others, therefore, measures to control the impact of the infections should be tailored to the specific scenarios occurring in the EU outbreaks in different areas: *X. fastidiosa* is one species, but each epidemics is characterized by different genotypes of the bacterium, different epidemiological conditions, including vector species and populations, climate, frequency and distribution of sensitive plant species, degree of sensitivity of each host plant….etc

The only confirmed vectors of *X. fastidiosa* in the EU are, up to now, *Philaenus spumarius* (*Hemiptera: Aphrophoridae*), and in experimental conditions, *Neophilaenus campestris* and *Philaenus italosignus* (*Hemiptera: Aphrophoridae*), however any xylem sap-feeding insect could be a potential vector for *X. fastidiosa*.

Since this pathogen is a quarantine bacterium in the European Union (EU), and its impact revealed in Italy to be dramatic, this prompted the European Commission to issue,

since 2014, a number of legislative measures aimed to eradicate or contain the further spread of the bacterium. The current Regulation, the COMMISSION IMPLEMENTING REGULATION (EU) 2020/1201, has been published in August 2020 (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R1201) **which regulates the production and movement of plants, the rules for monitoring the territories, the measures of eradication and/or containment.**

At the research level, the European Commission and regional authorities are now supporting several programs aimed to find effective methods to mitigate and contain the impact of *X. fastidiosa* on olives, the predominant host affected in this epidemic. Among the most relevant projects that should be cited are POnTE (https://www.ponteproject.eu/) **and XF.ACTORS** (https://www.xfactorsproject.eu/) **that made it possible to significantly expand knowledge on the genetic of the bacterium, the identification and characterization of the vectors, the identification of the hosts of the different genotypes, the improvement of the diagnostic protocols end of the methods for the early detection, the biological characterization of various strains ecc. Moreover, these studies provided preliminary evidence of the presence of some resistance traits in some olive cultivars that represent a promising approach currently under investigation for long-term management strategies.**

Donato Boscia
CNR-Institute for Sustainable Plant Protection
Via Amendola 165/A - 70126 BARI (ITALY) donato.boscia@cnr.it

❖ Crop Protection News from Arab and Near East Countries

INVASIVE AND NEW PESTS

ALGERIA

First Report of *Grapevine Pinot Gris virus* Infecting Grapevine in Algeria.

Grapevine Pinot Gris virus is a member of the genus Trichovirus in the family Betaflexiviridae. Grapevine Pinot gris virus (GPGV) was first reported in Italy in 2012 in grapevines exhibiting leaf mottling and deformation disease (GLMD) (Giampetruzzi et al. 2012). Since then, the virus has been detected in most grapevine-growing regions in the European, Asian, American, and Australian continents (Hily et al. 2020). In 2019, a total of 37 grapevine samples, collected during the prospection of neglected cultivars grown in Babar region in Northeast Algeria (Rahali et al. 2019), were analyzed for the presence of GPGV. After RNA extraction and reverse transcription, GPGV detection was carried out by SYBR Green real-time PCR with primer pair CPF3/R3 as described by Bertazzon et al. (2017). One sample of Vitis vinifera L. cultivar Clairette, without any clear symptom of GLMD, tested positive for GPGV. Clairette, a French cultivar, was the most important white variety grown in Algeria during the French colonization. To confirm the presence of GPGV, Sanger sequencing was performed in both directions on the amplicon obtained by RT-PCR performed with primer pair DetF/DetR, spanning the end of the movement protein and the beginning of the coat protein genes (Morelli et al. 2014). The obtained sequence of 556 bp was deposited in GenBank under accession number MT272732. Searches using the BLASTn tool against the NCBI nucleotide collection database showed that the Algerian GPGV isolate shared the highest sequence identity at the nucleotide level (98.6%) with Slovakian isolates SK30 and SK704 (accessions nos. KF134123 and KU949328). A maximum-likelihood phylogenetic cladogram was constructed with MEGA-X (Tamura et al. 2007) using the Algerian sample and 10 reference sequences from different geographic origins: three from the Americas (U.S.A., Canada, and Uruguay), two from Asia (China and Pakistan), and five from Europe (Slovakia, Germany, France, United Kingdom, and Italy). The Algerian GPGV isolate grouped with isolates coming from Europe and the Americas in a distinct cluster separated from the Asian ones. To our knowledge, this is the first report of GPGV in Algeria and the first one in the African continent. The origin of such GPGV infection is quite mysterious, because it is known that this virus can be distributed with trading of infected grapevine propagation material (Fajardo et al. 2017) and locally by the eriophyid mite Colomerus vitis (Malagnini et al. 2016). The presence of GPGV in the neglected cultivar Clairette grown in the mountains of Babar, where wine-growing is minimal, is unlikely to be the result of vine-to-vine transmission mediated by mites, which have never been observed in that area (M. Rahali, personal communication), and even less probably caused by the use of infected rootstocks, because these vines are not grafted. On the contrary, it is possible that the GPGV infection represents a heritage of the French colonization of Algeria that took place until 1960, a period when the virus may have already been present in France, as hypothesized by Hily et al. (2020). More extensive surveys, mainly on grapevine cultivars imported from France to Algeria, are necessary to support this hypothesis. **[N. Bertazzon, M. Rahali, E. Angelini, M. Crespan, and D. Migliaro (Algeria), Council for Agricultural Research and Economics, Research Centre for Viticulture and Enology, Conegliano (TV), Italy. Laboratory of Genetic, Biotechnology and Valorization of Bioresources (LGBVB), University of Biskra, Algeria, Plant disease: 11 Nov 2020].** https://doi.org/10.1094/PDIS-04-20-0723-PDN

EGYPT

Three New Species of Mites (Acari: Acaridae and Histiostomatidae) from Manure and Dung-Hills, Assiut, Upper Egypt.

Three new species (*Myianoetus manurei* n. sp, *Myianoetus assiuti* n. sp. and *Acotyledon shortisetoses* n. sp.) represented only by their hypopial nymphs (heteromorphic deutonymphs), extracted from manure and dung-hills, Assiut, Upper Egypt were identified. The holotype deutonymph and paratype deutonymphs of each species are deposited in the Acari collection of Plant Protection Department, Faculty of Agriculture. Assiut University, Assiut 71526 Egypt. The descriptions and illustrations of the new species are given below. **[Sayed A. Eraky, Rahma M. Abdel-Aziz and Tarek M. Abo-Elmaged (Egypt), Egyptian Academic Journal of Biological Sciences, 12(2):75-82, 2020].**

Impact of Climate Change on the Appearance of Fire blight Disease in a New Area in Egypt.

Fire blight disease was first recorded in Egypt in 1962 on pear in an area between Alexandria and Damanhour. The disease spread throughout the governorates of the Nile Delta until it reached the pear orchards in the surrounding governorates. Fire blight was never observed in the extended desert of the Faiyum governorate in northern Upper Egypt. Symptoms of fire blight were observed on pear orchards in March 2019 at Sawl Village, Atfih center, in the south of the Giza governorate. Blossom blight, leaf and shoot blight, branch cankers symptoms were observed on 15-20-year-old pear trees. The Global Positioning System (GPS) coordinates of the diseased pear orchards are 29°22'42.7"N 31°14'19.1"E. Selected five isolates produced on MS medium from infected pear samples were pathogenic on immature pear fruitlets. Morphological, physiological, and biochemical characteristics of the obtained isolates were conforming to the characteristics of *Erwinia amylovora*. The primers AMSJ14258 and AMSK14892c generated an amplicon of the expected size (600 bp) for all five isolates. The percentage of visibly diseased trees in the affected orchard was 100%. While the percentage of visibly diseased blossom clusters of the trees of the affected orchard was varied, in a range between 42.5 to 78.1%. As far as we know, this is the first recorded outbreak of fire blight disease in this area, south of 30 ° N latitude and near latitude 29 ° N in Egypt. Climatic data were studied during the winter and spring in the season of 2018/2019 and those of the previous three seasons, especially during blooming and early fruiting (March, and April), to build a relationship between the climatic change and fire blight disease outbreaks in pear orchards at this area. The results showed that despite the uncommon events in climate conditions in 2019, compared to the previous three years, the unusual increase in the intensity of rains in March 2019 with the availability of the other climatic conditions could be the most important reason of fire blight disease outbreaks in this region of Egypt recently. **[Ashraf F. Abd El-Rahman, and Shaker M. Abolmaaty (Egypt), Accepted: 27 Sept. 2020, Future J. Biol., 3, 37-48, 2020].**

IRAN

First Report of Grapevine Red Globe Virus in Grapevine in Iran.

The grapevine red globe virus (GRGV) is a tentative member of the genus *Maculavirus* in the family *Tymoviridae*. The GRGV was first reported from Italy and since then from several other countries (Abou Ghanem-Sabanadzovic et al. 2003). To investigate the presence of GRGV in Iran, a total of 52 grapevine leaf samples showing symptoms of yellow mosaic and vein banding were collected from several locations in five provinces of Iran. GRGV was detected in 9 out of the 52 samples by RT/PCR using GRGV-specific primers (Ruiz-García et al. 2018), as well as general primers for tymovirids (Komínek et al. 2009). The RT/PCR product obtained with the GRGV-specific primers of an isolate from Tabriz (GRGV-Tab) was cloned and sequenced (GenBank accession No. MN232826). The resulting sequence was 91% identical to the German GRGV isolate (MG779496) and 90% to the reference isolate Graciano-T101 (NC_030693). Two additional primer sets, GRGV-1560 s (5′GCATTGGATCCGCACCAATG3′) and GRGV-2850as (5′CAAGAAGTTGTAGATGGTGGC3′) designed for the amplification of the 5′-terminal part of the replicase gene, and GRGV-5550 s (5′GAAGAGAAGAAGGCCTCCTACC3′) and GRGV-6850as (5′GCGCGGAATTTAAAGTGGG3′) for the amplification of the 3′-terminal part of the replicase gene, the entire open reading frame 2 and the 3′UTR of the GRGV-Tab isolate (corresponding to approximately 40% of the viral genome), were used, and the resulting RT/PCR products cloned and sequenced (MT591224-25). The resulting sequences of the GRGV-Tab isolate shared 85% and 93% identity at the nucleotide and 87% and 98% at the amino acid levels, respectively, with the corresponding sequences of the reference isolate. To our knowledge, this is the first report of GRGV in Iranian vineyards. Further studies will be necessary to assess its distribution nationwide and genetic diversity, as well as its potential threat to the grape production in Iran. **[Shaheen Nourinejhad Zarghani, Maryam Khalili, Akbar Dizadji & Thierry Wetzel (Iran), Department of Plant Protection, College of Abouraihan, University of Tehran, Iran. DLR Rheinpfalz, Institute of Plant Protection, Germany. Department of Plant Protection, College of Agriculture and Natural Resources, University of Tehran, Iran. UMR BFP, INRAE, University Bordeaux, Villenave d'Ornon, France, Journal of Plant Pathology, 2021]**. https://doi.org/10.1007/s42161-021-00749-w

First Report of Pyracantha Dieback caused by *Trichothecium roseum* in Iran.

Scarlet firethorn (*Pyracantha coccinea* M. Roem.) is an evergreen shrub belonging to the Rosaceae family. In 2015, *P. coccinea* plants exhibited dieback disease in Yazd province (central province of Iran). The main disease

symptoms included progressive death of shoot tips and weak plants (the incidence of the disease was about 40%). From symptomatic plants, samples were collected and transferred to the laboratory. After superficially disinfection with 1% sodium hypochlorite, the symptomatic samples were plated on potato dextrose agar (PDA) medium and incubated at 28 ± 2 °C for 5 days (Basavand *et al*. 2020). The fungal colonies were pink-to-white and hyaline hyphae in appearance. Conidiophores were simple or branched and ellipsoidal or pyriform conidia (measured 15.4 to 19.2 × 7 to 10.2 µm) formed in basipetal chains. These isolates were recognized as *Trichothecium roseum* (Pers.) Link based on morphological features (Wright et al. 2007). Genomic DNA of a reference isolate was extracted and the (ITS) region was amplified and sequenced (White *et al*. 1990). Sequence analysis (GenBank accession No. KR364570) with BLAST indicated the highest similarity (100%) with *T. roseum* isolates deposited in GenBank. Pathogenicity of isolates was tested on *P. coccinea* by inoculating three twigs from two plants in a greenhouse at 25 ± 2 °C. Mycelial plugs, 0.5 cm in diameter, were placed on surface-scratched twigs and control plants were inoculated with agar plugs. Two weeks following the appearance of dieback-like symptoms, the isolates inoculated were re-isolated. To our knowledge, this is the first report of *T. roseum* on *P. coccinea* in Iran and worldwide. **[Saman Firouzianbandpey, Mohammad-Ali Tajik Ghanbari, Hakimeh Ziaie Juybari, Mojtaba Dehghan-Niri & Esmaeil Basavand (Iran), Department of Plant Pathology, Vali-E-Asr University of Rafsanjan, Rafsanjan, Iran, Department of Plant Pathology, Sari Agricultural Sciences and Natural Resources University, Sari, Iran. Journal of Plant Pathology, 15.02.2021].** https://doi.org/10.1007/s42161-021-00769-6

MOROCCO

First Report of Grapevine Yellow Speckle Viroid 1 Infecting Grapevine (*Vitis vinifera* L.) in Morocco.

During July 2019, seven grapevines (Vitis vinifera L.) of cultivar Muscat exhibited shortened internodes with tiny yellow leaves in a commercial vineyard in Meknès region, central part of Morocco. Leaf samples were collected from the seven symptomatic and other four symptomless vines, and total RNA was extracted using an RNeasy Plant Mini Kit (Qiagen, Germany). The presence of grapevine yellow speckle viroid 1 (GYSVd-1) was tested by reverse transcription (RT)-PCR with primer pair PBCVd100C/194H (Nakaune and Nakano 2006) for the amplification of a 220-bp region of the genome. All the symptomatic and two asymptomatic vines tested positive for GYSVd-1, hence, the symptoms observed in the vineyard cannot be attributed to GYSVd-1. PCR products were purified using a DNA extraction kit (Fermentas, Lithuania) and sequenced in both directions. Nucleotide blast analysis confirmed the presence of GYSVd-1. To further verify these results, the full-length genome of three Moroccan GYSVd-1 isolates was amplified by RT-PCR using primers 5′-TGTGGTTCCTGTGGTTTCAC-3′ and 5′-ACCACAAGCAAGAAGATCCG-3′ (Ward et al. 2011) and the amplicons were sequenced in both directions. The three new GYSVd-1 sequences were 99.18–99.91% identical and were deposited in GenBank under accession numbers MH414919, MH414920 and MH414921. BLASTN analysis indicated 99% sequence identity with the Spanish isolate E27-YS1 (KJ466324). To our knowledge, this is the first report of GYSVd-1 presence in Morocco. More work is needed to study the distribution and the potential effect of this viroid in grapevines grown in Morocco. **[Mohammad Afechtal (Morocco), Regional Agricultural Research Center of Kénitra, Laboratory of Virology, National Institute for Agricultural Research (INRA), 14 rue Ibn Temmam, B.P. 257, Kénitra, Morocco, Journal of Plant Pathology, 25.11.2020].** https://doi.org/10.1007/s42161-020-00708-x

First Report of Citrus Leaf Blotch Virus Infecting Orange and Mandarin Trees in Morocco.

During the late summer of 2019, a small scale field survey was conducted to assess the sanitary status of citrus orchards in Gharb region in the northwest of Morocco. A total of 30 symptomless citrus trees, belonging to six cultivars (Valencia Late, Washington Navel and Salustiana oranges, Common clementine, Nova mandarin and Eureka lemon) were randomly sampled from six orchards and screened for the presence of citrus tristeza virus (CTV), citrus psorosis virus (CPsV), citrus variegation virus (CVV) and citrus leaf blotch virus (CLBV). RT-PCR test using standard protocols was performed on total RNA preparations recovered from 0.2 g of leaf tissues process by RNeasy Plant Mini Kit (Qiagen, Germany). Results showed high infections by CPsV (46.7%), and CVV (66.7%) and lower infections by CLBV (13.3%) whereas CTV was not detected. CPsV and CVV occur in Morocco (Afechtal, 2018) while the presence of CLBV had not been reported yet. In this study, four citrus trees, two of cv. Nova and two of cv. Valencia Late were positive for CLBV. The latter two trees were also infected by CPsV. Detection of CLBV (the type species of the genus *Citrivirus* of the family *Betaflexiviridae*) was firstly assessed by a primer set targeting 456 bp in the RNA-dependent RNA polymerase (RdRp) gene and then confirmed by a primer

set targeting the coat protein (CP) gene (Vives et al. 2002). BLASTn analysis of the CLBV Moroccan isolates (MW115851-MW115854) showed 97.95-98.86%, identities with the French isolate SRA-153 (AJ318061). To the best of our knowledge, this study represents the first report of the occurrence of CLBV in Morocco and North Africa. Since CLBV can infect several host species including *Citrus* spp., sweet cherry, kiwifruit, peony and most recently mulberry tree, further investigations should address the prevalence, distribution and the impact of CLBV infections in Morocco. **[Mohamed Afechtal, Giuliana Loconsole, Maria Saponari and Raied Abou Kubaa (Morocco), National Institute for Agricultural Research (INRA), Regional Center of Kénitra, 14 rue Ibn Temmam, PO Box 257, Kénitra, Morocco. Instituto per la Protezione Sostenibile delle Piante, UOS Bari, Consiglio Nazionale delle Ricerche, I-70126, Bari, Italy, Journal of Plant Pathology, 2021].** https://doi.org/10.1007/s42161-021-00789-2

SYRIA

First Record of Red Velvet Mite, *Trombidium holosericeum* (Linnaeus, 1758) (Acari: Trombidiidae) in Syria.

Trombidium holosericeum (Linnaeus, 1758) (Acari: Trombidiidae) was recorded in large numbers on the surface of the soil and under rocks and plant remains in some olive groves in the areas of Suqaylabiyah and Masyaf (Hama governorate) and around olive trees in Abu Jerash farm in the Faculty of Agriculture, Damascus University during Seasonal 2019-2020. The mites were defined in the Biological Control Research and Studies Center at the Faculty of Agriculture, Damascus University, using specialized classification keys, depending on the morphological characteristics of the larval and adult female stages. The body is 4 mm long. The soft, brightly red body is covered with fine hairs, giving it a velvety appearance. The small eyes are located on stalks. They have scissor-like chelicerae and their pedipalps are used as touch organs. Its bright red color results from carotenoids, warning predators about the toxicity of the mite (aposematism). While adults live freely and are often found wandering about, searching for small animals and insect eggs for food, the larvae try to find a host to attach themselves to, often an insect like a grasshopper or diptere, but also arachnids like harvestmen or spiders. At this stage they are seen as red globules on their hosts, sucking body liquid without severely harming the host. These larvae then develop into free-living nymphs that resemble adults. **[Mohamad Kanouh, Abdul-Nabi Basheer, Mohamad Imad El-Araj(Syria), Department of Plant Protection, Faculty of Agriculture, Damascus University, Syria. 2021].**

First Record of Cyclama mite *Phytonemus pallidus fragariae* (Banks, 1901) (Acari : Tarsonemidae) as a pest on strawberry plants in some nurseries in Syria.

The strawberry acarius *Phytonemus pallidus fragariae* (Banks, 1901) (Acari: Tarsonemidae) was recorded in large numbers on the young flowers and leaves of strawberry plants in some nurseries in the Adawi area (Damascus governorate) during the 2020 season. The mites were defined in the Biological Control Research and Studies Center at the Faculty of Agriculture, Damascus University, using specialized classification keys, depending on the morphological characteristics of the adult female stage. Small mites with yellowish brown adult female (Fig. 1a), that are 250–260 µm long, with hind legs reduced to slender thread like structures and adulte males with the modified fourth pair of legs, approximately 75% of the size of the female. The numbers of this mite increased during the months of July and August on the fresh leaves, which became deformed, wrinkled and stunted due to the infection. Infection with this mite after the formation of the flowering buds reduced the size and quality of the fruits. This is the first recording of the Cyclama mites on strawberries in Syria. **[Mohamad Kanouh, Abdul-Nabi Basheer، Mohamad Imad El-Araj (Syria), Department of Plant Protection, Faculty of Agriculture Damascus University ،Syria).**

First Report of the Parasitoid wasp, *Hyposoter leucomerus* (Thomson, 1887) (Hym.: Ichneumonidae, Campopleginae) in Syria.

The parasitoid *Hyposoter leucomerus* (Thomson, 1887) was recorded on the larvae of small cabbage butterfly in cabbage fields in Damascus countryside. The main diagnostic morphological characters of *H. leucomerus* are: fore and mid coxa completely and hind coxa apically yellow; all trochanters yellow; hind tarsus predominantly yellow. The adult wasp is black with lighter colored abdomen and legs, and is (6-12 mm) long. The adult wasp lays its egg in the caterpillar. After hatching, the larva develops within the caterpillar, and the host caterpillar shrinks and becomes hard and brittle. The cocoon of *H. leucomerus* is white speckled on leaves in the field. **[Hoda Kawas,**

Abdulnabi Basheer (Syria), Department of Plant Protection, Faculty of Agriculture, University of Damascus, Syria, 2021].

First Report of the Parasitoid wasp, *Compsilura concinnata* (Meigen, 1824) (Diptera: Tachinidae) in Syria.

The parasitoid *Compsilura concinnata (*Meigen, 1824) was recorded on the larvae of small cabbage butterfly *Pieris rapae* L. in cabbage fields in Damascus countryside. The main diagnostic morphological characters of *C. concinnata* are: adult are similar in size and shape to the common house fly. More specifically, the adults are about 7.5 mm long, have a white face, and a whitish colored thorax with four black stripes. Pupae are about 6.5 mm long, brown in color, and elliptically shaped. Larvae are cream colored. The larva is creamy in color, and it is found in the mid intestine of the host. The parasitoid is larval-puppal parasitoid. The female lays an egg ready to hatch inside the host. The laid egg has a long, curved fork that pierces the host's body wall. **[Abdulnabi Basheer, Houda Kawas. (Syria), Department of Plant Protection, Faculty of Agriculture, University of Damascus, Syria, 2021].**

First Record of Fall Armyworm (*Spodoptera frugiperda*) in Syria.

The fall armyworm *Spodoptera frugiperda* is a lepidopteran pest that can damage and destroy a wide variety of crops. It is widely present in the Americans and has been invasive in Africa since 2016. Larvae of *S. frugiperda* were found for the first time in four rural farms on maize plants (*Zea mays*) located in Tafas town (Dara'a Governorate, in the south-west of Syria) in November 2020. Infested maize showed the typical damage symptoms caused by *S. frugiperda*. Furthermore, morphological identification of larvae based on standard parameters of larvae confirmed the identity of the pest as fall armyworm. Considering the recent introduction of the pest into the EPPO region, it could be concluded that the pest probably entered Syria through natural spread (active flight and via wind currents) from Jordan, which borders Syria in the southern part and where the pest was found very recently. **[K. Heinoun, E. Muhammad, H. Abdullah Smadi, D. Annahhas and Raied Abou Kubaa (Syria), Department of Plant Protection, Ministry of Agriculture and Agrarian Reform, Damascus (Syria). Istituto per la Protezione Sostenibile delle Piante, UOS Bari, Consiglio Nazionale delle Ricerche, I-70126, Bari, Italy. Bulletin OEPP/EPPO Bulletin 0 (0), 1-3. (2021), Published online 11 February, 2021].** https://doi.org/10.1111/epp.12735

YEMEN

First Record of the Glover Scale (Ficus Mussel (oystershell) Scale), *Lepidosaphes gloverii* (Packard, 1869) (Diaspididae; Homoptera) in Yemen.

In this study, the insect was found in October 2019 on *Ficus nitida* trees planted in the yards of the Faculty of Agriculture at the University of Sana's, which reach more than two meters. At the end of December 2020, the classification of this insect was finished and the insect was called a Glover scale or ficus mussel scale (*Lepidosaphes gloverii* Packard) in the family of armored scale insect (Diaspididae). The adult female was 2.5-3.5 mm long, elongate and parallel-sided, slightly convex, not strongly tapered towards the exuvial end; brownish-yellow (young) to dark brown (old), with yellowish-brown exuviae at the narrow end. Male scale cover is similar to that of female but smaller, with yellow terminal exuviae. *L. gloverii* is a polyphagous species. According to Davidson and Miller, 1990, its host range covers eight plant families and 19 genera, but it may be wider. *Citrus* spp. and related species are the favoured hosts. So it is found only on *Citrus* in Mediterranean counties. The reproduction of *L. gloverii* is sexual, and each female lays about 200 eggs, arranged in two rows between the dorsal and ventra scale covers. The eggs changed colour from white to purple just before hatching. The first instar of nymph (crawlers) settled on twigs, leaves and fruit within 12 hours of hatching. This is the first record of *L. gloverii* (Packard, 1869) in Yemen, and also this is may be the first record of *L. gloverii* on *ficus nitida* trees in the world. It was observed that the insect continues to grow and reproduce during the winter, although temperature in Sana's in December 2020 and January 2021 were low of 15ºC and sometimes less. There are at least 150 described species in *Lepidosaphes*, so the identification of this insect was quite difficult and took a long time.

[Hassan Sulaiman Ahmed Mahdi, (Yemen), Plant Protection Department, Faculty of Agriculture, Sana'a University, Yemen, 2021]. hsamahdi@yahoo.com.

First Record of the Leaf-gall thrips of Ficus, *Gynaikothrips ficorum* (Marchal, 1908) (Thysanoptera: Phlaeothripidae) and the predator anthocorid, *Montandoniola confusa* Streito and Matocq (Hemiptera: Anthocoridae) in Yemen.

In this study, the leaf-gall thrips of Ficus and the predator were found in January 2021 on *Ficus nitida* trees planted in the yards of the Faculty of Agriculture at the University of Sana's, which reach less than two meters. At the end of March 2021, the classification of this insect and the predator were finished and they were called: Leaf-gall thrips (*Gynaikothrips ficorum* (Marchal) in the family (Phlaeothripidae) and (*Montandoniola confusa* Streito and Matocq) (Anthocoridae) respectively. Leaf-gall thrips in the genus *Gynaikothrips* originatiung in Southeast Asia infest *Ficus*. Species in the *Gynaikothrips* have been described from Africa. *G. ficorum* is pantropical, appearing wherever *Ficus microcarpa* L. is planted. It is recorded from Algeria, Palestine, India and the United States. The egg is cylindrical with rounded ends, smooth, and is a translucent white. There are two larval instars. The first instar is small and translucent white. The second instar is larger, light yellow and the posterior tube is dark and is held pointing up. The second instar is similar to the adult in size and shape. Both the first and second instars have red eyes. The prepupa has wing buds that are externally visible. The pupa has longer wing buds and the antennae are folded back over the head. The adult varies from 2.6 to 3.6 mm in length and has dark yellowish-brown to black color. With the exception of the legs and last abdominal segment, dorsal striation is shown on the adult. The determination between *Gynaikothrips* speices has been based only on differences in the length of the pronotal setae. This is the first record of *G.ficorum* on *ficus nitida* in Yemen.

Prey preference studies revealed that eggs were the numerically preferred host stage for predator *M. confusa*. Females of the predator consumed significanly more eggs than males (83-91 versus 25-35 per 48h period, respectively). Fecundity of the predator was significantly high, 10.6±1.5 eggs per 48h period. Evaluations showed that *M. confusa* reproduced throughout the year and reduced thrips population ≥95% and leaf galls by up to 77% within 5 weeks. **[Hassan Sulaiman Ahmed Mahdi (Yemen), Plant Protection Department, Faculty of Agriculture, Sana'a University, 2021].** hsamahdi@yahoo.com

RESEARCH HIGHLIGHTS

ALGERIA

Diet Selection of *Heteracris littoralis*, in a Cultivated Environment, Mzab valley, Septentrional Sahara, Algeria. This paper presents the results of a study on the diet of *Heteracris littoralis* in an agro-ecosystem at Mzab valley, Ghardaïa Province, Northern Sahara, Algeria. The diet was determined by the analysis of plant fragments in the feces of *H. littoralis* sampled in the field. The studied grasshopper consumed 12 of the 30 plant species found in the cultivated environment. The results showed that the locust predominantly fed on a few plants, such as *Lagenaria siceraria* and *Solanum lycopersicum*, although their diet includes over 12 plant species. Its food niche breadth was narrow (0.51), with a selectivity index of 0.61 for females, 0.52 for males and 0.42 for larvae. The plants consumed by the two sexes and larvae were not significantly different. This study suggests that Eyprepocnemidinae is a polyphagous grasshopper species, in spite of pronounced preference towards Cucurbitaceae and Solanaceae. This property results in a low Berger-Parker index value (0.24). Results are of great significance, increasing the understanding of insect herbivore feeding behavior and how to control the damage caused by this Orthoptera. **[Zergoun, Y., Guezoul, O., Sekour, M., Bouras, N., and Holtz, M.D. (Algeria/Canada), Tunisian Journal of Plant Protection 15 (2): 69-80, 2020].**

Potentials of the Extracts of Algerian Saharan Plant *Cotula cinerea* for the Management of Two Insect Pests, *Aphis fabae* and *Tribolium castaneum*. The insecticidal potential of the Saharan plant *Cotula cinerea*, was evaluated on two insect species namely *Aphis fabae* and *Tribolium castaneum* by topical application (contact toxicity) and repellency test. A crude ethanolic extract of aerial part of the plant was prepared and tested in the

laboratory on adults of both species. For contact toxicity, five doses were tested on each of the two species 1.56, 3.12, 6.25, 12.5 and 25 mg/ml for *A. fabae* and 25, 50, 250, 350 and 500 µg/insect for *T. castaneum*. The repellency of the extract was studied at the dose 500 µg/insect for *T. castaneum* and 25 µg/ml for *A. fabae*. Results showed that the repellency of the extract increased with exposure time and the highest rates were observed after 4 h of exposure (72.33 ± 22% for *T. castaneum* and 87 ± 3.6% for *A. fabae*). For insecticidal activity, at the highest doses (25 mg/ml and 500 µg/ml), 100% mortality is obtained 72 h after treatment for *A. fabae* and after 48 h for *T. castaneum*. The extract of this plant was found to be more toxic against *T. castaneum* adults. LD_{50} calculated 24 h after treatment for the two species is estimated at 1.7 mg/ml for *A. fabae* and at 30.3 µg/insect for *T. castaneum*. The extract of this plant inhibited the activity of acetylcholinesterase (AChE) in both insect species. This result suggests that this plant has a neurotoxic effect on *A. fabae* and *T. castaneum*. The results of phytochemical study showed that the plant is mainly rich in flavonoids, gallic tannins, alkaloids, saponosides and glucosides. The insecticidal effect obtained in this study could be due to the synergetic action of all constituents of the extract. Results suggest the possibility of using the extracts of this plant in integrated pest management to replace the chemical insecticides. **[Acheuk, F., Abdellaoui, K., Lakhdari, W., Chahbar, N., Dehliz, A., Belaid, M., Baouche, N., and Bouazouz, H. (Algeria/Tunisia), Tunisian Journal of Plant Protection 15 (2): 41-57, 2020].**

Identity and Biocontrol Efficiency of *Trichoderma* spp. Isolated from different Soils and Ecosystems in Algeria. Forty-six strains of *Trichoderma* spp. have been isolated from soils in different locations and ecosystems of Algeria. They were identified at species level by analysis of their Internal Transcribed Spacers regions 1 and 2 (ITS1 and ITS2) of rDNA and a partial sequence of the Translation Elongation Factor 1-alpha (TEF 1-α) gene. The 46 *Trichoderma* spp. were assigned to *Trichoderma atroviride* (12 strains), *T. gamsii* (10), *T. orientale* (1) and 23 to *T. harzianum* species complex (*T. harzianum, T. afroharzianum, T. atrobrunneum* and *T. guizhouense*). In the present study we highlight that *T. gamsii*, *T. orientale*, *T. atrobrunneum* and *T. guizhouense* are being reported for the first time in Algeria. *Trichoderma* spp. isolates growth was evaluated at temperatures ranging from 10 to 40 °C on PDA medium. The optimum growth was recorded at 25 °C and 30 °C, and only *T. orientale* was able to grow at 40 °C. The in vitro test revealed the potential antagonist of *Trichoderma* spp. isolates against four pathogenic species associated with strategic crops in Algeria, *Fusarium culmorum*, *Botrytis cinerea*, *Alternaria solani* and *Rhizoctonia solani*. In direct confrontation, the growth rate inhibition was ranked between 37.22% and 80.95% while in indirect confrontation was between 00% and 88.89%. The biocontrol assay carried out on wheat plant showed that *T. atroviride* (Ta.09), *T. orientale* (To.15), *T. afroharzianum* (T af. 17 and T af. 37) and *T. gamsii* (T g. 39) performed well against *F. culmorum* the crown rot and head blight pathogen of wheat in Algeria. This finding is based on the significant decrease in disease severity compared to the control (>82%). Data recorded, have also shown that *T. atroviride* Ta.09 recorded the highest percentage of disease reduction (97.28**%). [Saliha Chihat, Maria Pia Aleandri, Andrea Vannini, Natalia Bruni & Houda Boureghda.(Algeria), Laboratory of Phytopathology and Molecular Biology, Department of Botany, National Higher School of Agronomy, Algiers, Algeria. Department for Innovation in Biological, Agrifood and Forest Systems (DIBAF), Università Della Tuscia. Via S. Camillo de Lellis, 01100, VITERBO, Italy, Journal of Plant Pathology , 09.02.2021].** https://doi.org/10.1007/s42161-021-00761-0

Identification and Pathogenicity of *Fusarium* spp. associated with tuber dry rot and wilt of potato in Algeria. *Fusarium* is one of the most important genera of phytopathogenic fungi, causing potato wilt in the field and potato tuber dry rot during storage. The objectives of this study were to identify *Fusarium* species associated with both potato diseases in different growing regions in Algeria, and to assess their pathogenicity. Among the 152 isolates collected from symptomatic potato plants and tubers in different provinces in Algeria, 13 species of *Fusarium* and *Neocosmospora* were identified. Among these three species were isolated only from plants showing symptoms of *Fusarium* potato wilt (*F. oxysporum*, *F. venenatum*, *Neocosmospora solani*). Two species (*F. culmorum*, *N. tonkinensis*) and an isolate of Neocosmospora sp. were found exclusively in tubers with potato dry rot and the remaining ones (*F. redolens*, *F.* cf. *tricinctum*, *F. sambucinum*, *F.* cf. *incarnatum-equiseti*, *F. nygamai*, *F. brachygibbosum* and *N. falciformis*) were associated with both sample types. *F. sambucinum* was the most frequent species (52.6% of isolates). *F. oxysporum* and *F. nygamai* isolates were the most aggressive in the potato wilt pathogenicity test, and *F. sambucinum* isolates were the most aggressive in the potato tuber pathogenicity test. This is the first study identifying and characterizing potato dry rot and potato wilt pathogens in Algeria. **[Nadia Azil, Emil Stefańczyk, Sylwester Sobkowiak, Saliha Chihat, Houda Boureghda and Jadwiga Śliwka(Algeria),European Journal of Plant Pathology,2021].** https://doi.org/10.1007/s10658-020-02177-5

***Trichoderma atroviride* Induces Biochemical Markers Associated with Resistance to *Fusarium culmorum*, the main Crown Rot Pathogen of Wheat in Algeria.** *Fusarium culmo*rum (W.G. Sm.) Sacc. is the main causal agent of wheat crown rot in Algeria, which affects the yield and seed quality due to the presence of mycotoxins. In the present study, we evaluated the effect of the biocontrol agent *Trichoderma atroviride* (Ta.13) P. Karsten on the antioxidant enzymes activities (peroxidase and catalase), as well as on phenolic and protein content of three wheat varieties, compared to uninoculated controls. The data showed that *T. atroviride* induced systemically higher levels of these factors. In general, maximum induction was recorded in the Waha variety, followed by Ain Abid, when plants were co-inoculated by both Ta.13 and *F. culmorum* versus *F. culmorum* only. At the same time, lowest levels of these factors occurred in the Vitron variety. The highest accumulation of phenols in basal areas of the wheat plant occurred in the Waha variety, with an increase of up to 1400% compared to the control, and, also in Waha, there was the greatest increase of peroxidase activity in the foliar tissues, up to 282% of the control. Protein content in Waha in the plant collars increased 66% in co-treated plants. On the other hand, the highest increases in catalase activity were detected in the basal stem and leaves of Ain Abid variety co-inoculated with Ta.13 and *F. culmorum*, with 641% and 788% increases in these tissues, respectively. Our results show that there are variety-dependant physiological changes exhibited by the wheat plant during interaction with the pathogen and the antagonist. **[Fayza Belhadj Benyahya, Zayneb Kthirib, Walid Hamada and Houda Boureghda, (Algeria), Biocontrol Science and Technology, 2020].** https://doi.org/10.1080/09583157.2020.1853676

Identity and Biocontrol Efficiency of *Trichoderma* spp. Isolated from Different Soils and Ecosystems in Algeria. Forty-six strains of *Trichoderma* spp. have been isolated from soils in different locations and ecosystems of Algeria. They were identified at species level by analysis of their Internal Transcribed Spacers regions 1 and 2 (ITS1 and ITS2) of rDNA and a partial sequence of the Translation Elongation Factor 1-alpha (TEF 1-α) gene. The 46 *Trichoderma* spp. were assigned to *Trichoderma atroviride* (12 strains), *T. gamsii* (10), *T. orientale* (1) and 23 to *T. harzianum* species complex (*T. harzianum, T. afroharzianum, T. atrobrunneum* and *T. guizhouense*). In the present study we highlight that *T. gamsii, T. orientale, T. atrobrunneum* and *T. guizhouense* are being reported for the first time in Algeria. *Trichoderma* spp. isolates growth was evaluated at temperatures ranging from 10 to 40 °C on PDA medium. The optimum growth was recorded at 25 °C and 30 °C, and only *T. orientale* was able to grow at 40 °C. The in vitro test revealed the potential antagonist of *Trichoderma* spp. isolates against four pathogenic species associated with strategic crops in Algeria, *Fusarium culmorum*, *Botrytis cinerea*, *Alternaria solani* and *Rhizoctonia solani*. In direct confrontation, the growth rate inhibition was ranked between 37.22% and 80.95% while in indirect confrontation was between 00% and 88.89%. The biocontrol assay carried out on wheat plant showed that *T.* that *T. atroviride* (Ta.09), *T. orientale* (To.15), *T. afroharzianum* (T af. 17 and T af. 37) and *T. gamsii* (T g. 39) performed well against *F. culmorum* the crown rot and head blight pathogen of wheat in Algeria. This finding is based on the significant decrease in disease severity compared to the control (> 82%). Data recorded, have also shown that *T. atroviride* Ta.09 recorded the highest percentage of disease reduction (97.28**%). [Saliha Chihat, Maria Pia Aleandri, Andrea Vannini, Natalia Bruni and Houda Boureghda (Algeria), Journal of Plant Pathology,2021].** https://link.springer.com/article/10.1007%2Fs42161-021-00761-0

Molecular Identification and Phylogenetic Diversity of Cereal Cyst Nematodes (*Heterodera* spp.) Populations from Algeria. Cereal cyst nematodes (CCN), *Heterodera* spp., are the most devastating plant-parasitic nematodes of cereals causing serious global economic losses. In this study, surveys to investigate plant-parasitic nematodes associated with wheat were performed in twenty fields in twelve provinces of Algeria in 2018. Cereal cyst nematodes were found in 41.6% of the investigated wheat fields. Forty-eight CCN populations from twenty locations were obtained and morphologically classified. To confirm the morphological classification, the internal transcribed spacer (ITS) of rDNA was amplified with F194/F195 primers, sequenced, and analyzed using BLASTn searches of the NCBI database. Populations were classified as *Heterodera avenae*, *H. hordecalis*, *H. carotae*, and *H. cruciferae. Heterodera carotae* and *H. cruciferae* are reported in Algeria for the first time from two and three surveyed locations, respectively. *Heterodera carotae* and *H. cruciferae* were grouped into a well-supported clade and close to populations from Italy and the Netherlands in the phylogenetic tree, respectively. *Heterodera hordecalis* and *H. avenae* were found in ten and five fields, respectively. Based on phylogenetic analysis, *H. hordecalis* showed high similarity to the Israeli population, whereas *H. avenae* populations from Algeria were found to have high similarity to the Spanish population. Due to the variation among the Algerian populations of *H. hordecalis* and *H. avenae*, it can be assumed they have been introduced into Algeria multiple times. **[Mehalaine, K., M. Imren, G. Özer, M. Hammache, and A. A. Dababat (Algeria), Nematropica, 50:134-143, 2020].**

Studies on Potato Cyst Nematodes in Algeria. In Algeria, the presence of potato cyst nematodes was first noticed in 1953 in a few fields in the Algiers region. It is thought that these nematodes had been introduced in the 1940s, soon after World War II, with seed potatoes imported from England (GB). Studies conducted in the late 2010s confirmed the presence of both *Globodera pallida* and *G.rostochiensis*(EPPO A2 List). Recent morphological and molecular studies were conducted to determine the identity of potato cyst nematodes in the main potato-growing regions of Algeria. Soil samples were collected from 2014 to 2018 in potato fields from 17 regions. 44% of the studied samples contained *G. pallida* alone, 28% *G. rostochiensis* alone and 28% mixtures of the two species. In terms of distribution, results were as follows:

- *Globodera pallida* (alone) was found in some samples from the regions of Ain Defla, Algiers, Blida, Bouira, Boumerdès, Djelfa, Mostaganem, Relizane, Tipaza.
- *Globodera rostochiensis* (alone) was found in some samples from the regions of Chlef, El Oued, Mascara, Mostaganem, Sétif, and Tlemcen.
- Mixed infections were found in some samples from the regions of Ain Defla, Guelma, Mascara, Mila, Mostaganem, and Tébessa.

Most nematode isolates found in the central part of the studied area belonged to *G. pallida*, while *G. rostochiensis* isolates were more frequent in the southern part. In the eastern part, the two Globodera species were often found in mixed populations. Most of the samples identified in the western part corresponded to *G. rostochiensis* alone or mixed populations. The authors considered that these results show that Globodera species are widely distributed in the main potato-growing regions of Algeria.The situation of both Globodera pallida and *Globodera rostochiensis* in Algeria can be described as follows: Present, widespread in the main potato-production areas.**EPPO Reporting Service 2021 no. 3 – Pests14**

Source: Djebroune A, Chakali G, de Andrade E, Camacho MJ, Rusinque L, Inácio ML (2021), Integrative morphometric and molecular approach to update the impact and distribution of potato cyst nematodes *Globodera rostochiensis* and *Globodera pallida* (Tylenchida: Heteroderidae) in Algeria, Pathogens 10, 216. https://doi.org/10.3390/pathogens10020216

EGYPT

Mites Inhabiting Manure and Dunghills in Assiut Governorate, with Annotated Checklist of Mite Species Existing in Husbandry Farms in Egypt. The present survey of mite species inhabiting organic manure in different animal-sheds (i.e., buffalo, cow, sheep, goats), in both farms, the experimental farm of the Faculty of Agriculture, Assiut University and the production farm of El-Fateh district, Data showed that there were 28 mite species pertaining to 20 genera of 12 families in three mite orders (Mesostigmata, Astigmata, Trombidiformes). Mesostigmata represented by 19 species (8 families); Astigmata (Acaridida), represented by 8 species (2 families) and Trombidiformes represented by two species belonging to two families. Both mite species of the families Macrochelidae Vithzthum, 1930 and Parasitidae Oudemans, 1901 were recorded in high densities. While scarce numbers of Tarsonemidae Canestrini & Fanzago, 1876 were observed. The annotated checklist reported 150 mite species belonging to 67 genera of 26 families. **[Tarek M. Abo-Elmaged, Rahma M. Abdel-Aziz and Sayed A. Eraky (Egypt), Egyptian Academic Journal of Biological Science B. Zoology, 12(2):25-35, 2020].**

Biological Control agents in the Integrated Nematode Management of Potato in Egypt. Potato represents Egypt's largest vegetable export crop. Many plant-parasitic nematodes (PPNs) are globally inflicting damage to potato plants. In Egypt, their economic significance considerably varies according to PPN distribution, population levels, and pathogenicity.This review article highlights the biology, ecology, and economic value of the PPN control viewpoint. The integration of biological control agents (BCAs), as sound and safe potato production practice, with other phytosanitary measures to manage PPNs is presented for sustainable agriculture. A few cases of BCA integration with such other options as synergistic/additive PPN management measures to upgrade crop yields are reviewed. Yet, various attributes of BCAs should better be grasped so that they can fit in at the emerging and/or existing integrated management strategies of potato pests.A few inexpensive biocontrol products, for PPNs control on potato, versus their corresponding costly chemical nematicides are gathered and listed for consideration. Hence, raising awareness of farmers for making these biologicals familiar and easy to use will promote their wider application while offering safe and increased potato yield. **[Mahfouz M. M. Abd-Elgawad (Egypt), Egyptian Journal of Biological Pest Control, 30:121,2020].**

Isolation and Identification of Bacteria Associated with Guava Decline in Egypt. Guava (*Psidium guajava* Linn.) is one of the most popular fruits in Egypt. Guava decline is thought to be a complex disease prevailing in

tropical and subtropical regions. Several studies were completed on the role of fungi and nematode in the deterioration of guava. There is unsatisfactory information on the involvement of bacteria in this disease. In the present work, twelve isolates of bacteria were recovered from diseased guava trees at Rashid territory of El-Behera government in Egypt. The results of 16S rRNA gene sequences compared with the sequences of the Gen Bank DNA database showed that eight of these isolates belong to family *Enterobacteriaceae*, two isolates belong to family *Rhizobiaceae* and two isolates belong to family *Pseudomonadaceae*. The *Pectobacterium aroidearum* is the only species that has shown a positive result with a hypersensitive reaction (HR) test. *Agrobacterium salinitolerans* was the only species able to form small tumors in squash fruits. No evidence of formed hyperplastic syndrome on the tomato plants by *Agrobacterium salinitolerans* or any of these isolated bacteria were recognized. Potato soft rot test confirmed that only *Pectobacterium aroidearum* have the potential to cause soft rot in potato slices. The results indicate that, despite difference in pathogen propensities, *Pectobacterium aroidearum* and *Agrobacterium salinitolerans* can get involved in guava decline syndromes either single or in combination, bearing in mind the role of other pathogens such as fungi and nematodes. Further studies are needed. **[A.F. Abd El-Rahman, Naglaa M. Balabel and Rabab, M. Abd -El–Aziz (Egypt), J Am Sci, 16(3):51-62, 2020].** aabdelrahman2012@gmail.com

IRAQ

An Evaluation of Invasive Pest, Red Palm Weevil *Rhynchophorus Ferrugineus* (Olivier, 1790) (Coleoptera, Curculionidae) Population in Iraq.

The Red Palm Weevil (RPW), *Rhynchophorus ferrugineus* (Olivier, 1790) is a devastating invasive pest of palm trees, invading the Iraqi date palm tree in 2015 for the first time in Safwan county, Basrah province. The Red Palm weevil has categorized as a quarantine pest of date palm trees worldwide. In this study, five years monitoring program has been achieved by scouting the invasive pest RPW population in Safwan County by using visual sampling and Pheromone baited traps. The results indicated that the number of infested palms, increased from 12 trees in 2015 to 111 in 16 orchards in 2016. The number of the infested palms was minimized to 3 trees in the county in 2019 due to the management protocol of the Ministry of Agriculture. Furthermore, the results of RPW adults appeared monthly in the county with two activity peaks during the moderate-temperature-months. In conclusion, the quarantine and management protocol of RPW decreased the population of the invasive pest which did not spread to other districts. **[Mohammed M. Alderawii, Aqeel A. Alyousuf, Samir A. Hasan, Jasim K. Mohammed, Hussein A. Jappar and Sulochana Paudyal, (Iraq), Basrah Department of Plant Protection, Ministry of Agriculture, Basrah, Iraq; Department of Plant Protection, College of Agriculture, University of Basrah, Basrah, Iraq, Plant Protection Directorate, Iraqi Ministry of Agriculture, Baghdad, Iraq, Apex Bait Technologies Inc, CA, USA, Correspondence Author: Aqeel A. Alyousuf, Bull. Iraq nat. Hist. Mus.16 (2): 203- 218, 2020].** https://doi.org/10.26842/binhm.7.2020.16.2.0203

Plate (1): Symptoms of infection of RPW in date palms: (A) The hole in the trunk, (B) The damage inside the trunk.

Seasonal Occurrence of the Mediterranean fruit fly, *Ceratitis Capitata* in Some Orchards of Central and Southern Region of Iraq. Results of the field study of the seasonal appearance of Mediterranean Fruit Fly *Ceratitis capitata* during the growth seasons 2014-2015 in citrus and stone fruits orchards in central Iraq showed that the highest rate of caught males was reported during November of the season 2014(279 insect / trap / week), due to the increase in the availability of host plant host of this pest, including the fruits of mandarin variety Clementine, while the lowest rate of caught males was found during January , 2015(7 insect/ trap/ week). Decreases in the population density of this pest did not reach to zero in the studying sites throughout the season. The highest percentage of infestation was recorded on the fruits of kaki (83.3%) and the highest mean number of larvae was 32.75 larva/ fruit on the persimmon fruit too. Furthermore the study also showed that, through personal observations in the laboratory, the infestation of the Mediterranean fruit fly did not develop on the local variety of orange. **[Samira A. Khlaywi ; Ayad A. Al-Taweel ; Hussain F. Alrubeai and Ameera A. Mezban (Iraq), Plant Archives, Vol. 20, Supplement 2, pp. 3972-3976, Oct., 2020].**

Screening of Chickpea (*Cicer arietinum* L.) varieties in Iraq against *Macrophomina phaseolina.* *Macrophomina phaseolina* causing dry root rot (DRR) is mostly significant and widespread soilborne chickpea disease. In May, 2018, symptoms of wilt were noticed on Chickpea in Shekhan field, governorate of Ninevah, Iraq. Isolation and diagnosis results revealed that the Chickpea plants infected with wilt showed the presences of *Macrophomina phaseolina* as potential pathogen. Fungus pathogenicity in Chickpea plants was as well definite via

postulates of Koch. Molecular Macrophomina documentation of isolate was pereformed via augmenting the internal transcribed spacer (ITS) conserved ribosomal DNA region utilizing primers ITS1 and ITS4. ITS Whole sequences were compared for similarity and gaps sequences of the fungus which were homologous to *M. phaseolina* isolates in GenBank database with percentage resemblance of 99%; thus, confirming causative disease agent identity. Nucleotide ITS sequence from isolate of Iraq was as Accession No MN128590.1 was assigned at GenBank. Up to best of knowledge we have, such is concidered as 1st record in Iraq of *M. phaseolina* on the Chickpea where the current investigation was perferomed for screening several genotypes for DRR resistance. Twelve genotypes chickpea were assessed for their susceptibility to disease of DRR due to *M. phaseolina.* Genotypes varied in their susceptibility to the disease under artificial inoculation. No resistant genotypes were recorded. CHAPP2 and WR-315 were moderately resistant, PCH-15, UC27, C-104 and CPS-1 were susceptible, Annigeri, JG-62, K850, L550, BJ-212 and ICC4475 were highly susceptible. [**Ali Kareem Al-Taae, Huda Hazim Wafi AL-Taae and Saleh Ahmed Eesa Al-Jobory (Iraq), Plant Protection Department., College of Agriculture and Forestry, University of Mosul , Iraq,** P**lant Cell Biotechnology and Molecular Biology 22(7&8):114-120; 2021]. E-mail:** prof.ali@uomosul.edu.iq

Biology, Damage Assessment and Susceptibility of some Stone Fruit Trees to Infestation by the Flatheaded Tree Borer, *Sphenoptera servistana* Obenberger (Coleoptera: Buprestidae). Field studies were carried out on flatheaded tree borer, *Sphenoptera servistana* Obenb., 1929 on stone fruit trees orchards in middle of Iraq during 2019 - 2020 Baghdad, to know the temporal presence of the different stages of the insect, the nature of the tunnels in which different insect stages are formed (metamorphosis), the behavior of the different stages inside the tunnels, the host preference for the insect and the percentage of injury and damage**.** The results indicated that the longest time the insect spends is in the larval stage, where it resides most of the seasons of the year, the egg phase presence during the period from mid-May to the end of September coinciding with the presence of adults in period 135 days. As for the pupae, their presence continued for 44 days for the period from April 7 to May 21, including the period of development inside the larva. The adult stage continued to exist for a period of 128 days during the period May 22 until the end of September, including the period of development within the tunnels in the trees. The insect completes the development of most of its stages inside tunnels that dig into the xylem of the stems and branches of plum and apricot trees, except for the egg stage, on the outer surface of the bark of the stems and branches. The different stage of the flatheaded tree borer exhibits multiple behaviors within the development tunnels. The borer prefers to infest first the plum trees (cherry plum), followed by the apricot trees, where an infestation rate of 73% and 24% was recorded respectively. The results of this trials help to decide when is the suitable timing of the control programs based on the behavior and development process. The behavior of the borer and the different stages presence during the year support knowing the weakest point in which the insect should be controlled. **[Mohammed Zaidan Khalaf and Ibrahim Jaddoa Al-Jboory (Iraq), Integrated Pest Control Research Center, Directorate of Agricultural Research, Ministry of Science and Technology, Baghdad, Iraq Department of Plant Protection, College of Agriculture, University of Baghdad, Iraq, 1/3/2021]**

LEBANON

Occurrence and Distribution of Major Viruses Infecting Eggplant in Lebanon and Molecular Characterization of a Local Potato Virus X Isolate. This research was carried out in order to evaluate the presence and distribution of viral infections causing severe disease in eggplant plants collected from different districts in Bekaa valley, Lebanon. Most infected plants showed virus-like symptoms consisting predominantly of leaf blotch, mottling chlorotic and ring spots; leaf twisting and plant dwarf were also observed in the visited fields. Symptomatic and asymptomatic plants were collected and screened by ELISA test for the presence of several different pathogenic viruses potentially present in the area. Results showed that potato virus Y (PVY) was the most prevalent virus found by ELISA (detected in the 15.3% of the tested plants), followed by eggplant mottled dwarf virus (EMDV, 2.9%) and cucumber mosaic virus (CMV, 1.2%), while tomato spotted wilt virus (TSWV), alfalfa mosaic virus (AMV) and pepper mottle virus (PepMoV) were not detected. Biological indexing of symptomatic ELISA-negative plants, followed by electron microscopy, indicated the presence of virus-like particles of the genus *Potexvirus*, which was subsequently confirmed as potato virus X (PVX) by RT-PCR and Sanger sequencing. PVX was found in 35.3% of the tested plants, all sampled in the northern Bekaa area. In a phylogenetic analysis, the partial coat protein gene sequence of a selected Lebanese isolate, PVX-AK1, clustered together with other PVX isolates from Asia. Furthermore, the 124-aa sequence of PVX-AK1 shared 100% identity with PVX-UK3, an isolate which is known as avirulent in potato genotypes carrying either Nx or Rx resistance genes. This work

revealed a picture of the previously uninvestigated phytosanitary status of eggplant crops in an important horticultural area of Lebanon. **[Raied Abou Kubaa, Elia Choueiri, Angelo De Stradis, Fouad Jreijiri, Maria Saponari and Fabrizio Cillo (Lebonon), CNR Istituto per la Protezione Sostenibile delle Piante, via Amendola 122/D, 70126 Bari, Italy and LARI Department of Plant Protection, Tal Amara, Zahlé P.O. Box 287, Lebanon Agriculture, 11(2):126, 2021].** https://doi.org/10.3390/agriculture11020126

MOROCCO

A Small Scale Survey in Morocco Revealed the Presence of Four Honey Bee Viruses. A small-scale survey was conducted on 12 beehives located in the Gharb region of Morocco in order to assess for the first time the presence of honey bee-infecting viruses in the country. A total of 240 individual bee samples were screened for seven honey bee viruses using reverse transcription (RT)-PCR. Among the infected samples, 41.7% contained one virus, 15% showed mixed infection with two viruses while 3.3% contained three. Deformed wing virus (DWV), was the most prevalent one, detected in 38.3% of the samples, followed by acute bee paralysis virus (ABPV), sacbrood virus (SBV) and chronic bee paralysis virus (CBPV) (20%, 14.2% and 9.2% of infection rate, respectively). Israeli acute paralysis virus (IAPV), Kashmir bee virus (KBV) and black queen cell virus (BQCV) were not detected. Nucleotide sequences of PCR amplicons obtained from detected viruses shared 98.5-99.4% identity with isolates reported in the GenBank. Although bee viruses usually persist as asymptomatic infections and persist in the colonies as covert infections, they can dramatically affect honey bee health and shorten the lives of infected bees under certain conditions. To the best of our knowledge, this study represents the first detection of ABPV, CBPV and SBV in honey bees in Morocco.**[Mohamed Afechtal (Morocco), Majid Mounir, Khaled Djelouah, Maria Saponari & Raied Abou Kubaa, Regional Agricultural Research Center of Kenitra, National Institute for Agricultural Research (INRA), Kenitra, Morocco; Department of Food Science and Nutrition, Hassan II Institute of Agronomy and Veterinary Medicine, Rabat, Morocco; Centre International de Hautes Etudes Agronomiques Mediterraneenes, Istituto Agronomico Mediterraneo di Bari (CIHEAM/MAIB), Valenzano, BA, Italy; Istituto per la Protezione Sostenibile delle Piante, UOS Bari, Consiglio Nazionale delle Ricerche, Bari, Italy, Journal of Apicultural Research, 04.03.2021**, https://doi.org/10.1080/00218839.2021.1888497

Identification and Distribution of Major Viruses Infecting Grapevine in Morocco. In a survey during the growing seasons of 2011–2014, different viral symptoms were observed in grapevines, suggesting the presence of virus and virus-like diseases. A total of 1115 samples including 720 table and 395 wine grapes were collected from five Moroccan regions and tested by ELISA for the presence of ten different viruses. Moreover, 81 samples including some that were positive, negative and inconclusive in ELISA were confirmed in reverse transcription PCR. Among the tested grapevines, both wine (63.4%) and table grapes (60.3%) were readily infected whereas autochthonous table grapevine cultivars were less infected (31.1%). The present survey revealed the occurrence of some of the most important viruses of grapevine in Morocco of which some were of high virus incidence but also the existence of healthy selection of all cultivars screened was revealed. **[Mohamed Afechtal, Moulay Chrif Smaili, Majid Mounir, Angelantonio Minafra & Raied Abou Kubaa (Morocco), Journal of Plant Pathology (Published: 15 March 2021].** https://doi.org/10.1007/s42161-021-00810-8

SYRIA

Endophytic establishment of the fungal entomopathogen, *Beauveria bassiana* (Bals.) Vuil., in cucumber plants. The fungus, *Beauveria bassiana* (Bals.) Vuil., is one of the most important entomopathogenic fungi (EPFs). Recently, its new role was discovered in nature, to be an endophyte in plants. It has been reported as an endophytic fungus in many monocotyledonous and dicotyledonous plants. The study was conducted to evaluate the ability of the fungus, *B. bassiana*, to colonize and persist in cucumber plants under laboratory conditions and to detect its systemic growth inside the plant tissues in addition to pathogenicity in the plant. The isolate, B195, of the fungus, *B. bassiana*, was used. Five different inoculation methods were followed: seed dusting, seed immersion, soil drench, seedling drench, and foliar spray. The fungus, *B. bassiana*, could persist inside different cucumber tissues up to 90 days from inoculation. Soil drench provided the highest recovery rates, while foliar spray gave the lowest

rates. Colonization rates reached 94.44 and 73.68% for stem and 68.26 and 37.79% for root, 30- and 90-days post soil drench, respectively, while in foliar spray, it reached 33.51 and 16.45%, after 30- and 90-days post-treatment, for the stem and 9.45 and 0% for the root, respectively. No negative effects were observed in inoculated plants or on fungal pathogenicity. Results showed for the first time the ability of the fungus, *B. bassiana*, isolate B195, to artificially colonize and survive in different parts of cucumber plants under laboratory conditions by different inoculation methods and to grow systemically in plant tissues. This study is considered a preliminary study to the utilization of the fungus, *B. bassiana*, as an endophyte in cucumber plants to reduce the density of insect pests**. [Lobna Rajab, Mohammad Ahmad and Ibtisam Gazal (Syria), Egyptian Journal of Biological Pest Control, 30:143, 2020].**

TUNISIA

Effect of Deltamethrin on the Leaf Miner (*Liriomyza cicerina*) of Chickpea and its Parasitoids. The objective of this work was to investigate the effects of chemical treatments on larvae and adults of the chickpea leaf miner (*Liriomyza cicerina*) and its parasitoids. The study was conducted according to the split-plot design with three replicates, during the cropping seasons 2016 and 2017 in the northwestern Tunisia. Deltamethrin treatments were applied on winter and spring chickpea varieties (Nour and Amdoun, respectively) when the pest density reached a level of 2-3 larvae/leaf in 50% of plants in the field. The number of emerged parasitoids and pest adults were recorded, and parasitism rates were investigated after treatments. Results revealed that the number of captured pest adults has been reduced in treated plots compared to control ones. Respective reduction rates attained 64.15% and 60.17% for Nour and Amdoun varieties during 2017. Additionally, the highest and the lowest parasitism rates were recorded respectively for *Opius monilicornis* 26.09% on control samples and for *Diaulinopsis arenaria* 2.88% on treated samples of Nour variety. In all experiments, *L. cicerina* larvae adults and parasitoids mortalities were higher for the spring variety. Hence, the use of more selective insecticides should be recommended to reduce the negative side-effects on the chickpea leafminer natural enemies. **[Soltani, A., Haouel-Hamdi, S., Amri, M., Mediouni-Ben Jemâa, J. (Tunisia/Morocco), Tunisian Journal of Plant Protection 15 (2): 59-67, 2020].**

Occurrence of Fungal Diseases in Faba Bean (*Vicia faba* L.) under Salt and Drought Stress. The present work was initiated in order to test whether the growth and pathogenic behavior of fungal isolates infecting Faba bean (FB) are influenced by salt and drought stress. A collection of 108 fungal isolates was recovered from different infected FB plants grown in various bioclimatic zones in Tunisia. Koch's postulates revealed that 54% of those isolates caused root rots infection by 25% to 100% of the whole root system. Eighteen pathogenic fungal isolates were chosen based on their high incidence on various plant growth parameters using the heat map analysis to undergo the in vitro analysis, where 13 isolates belong to *Fusarium* spp. The in vitro mycelial growth of the 18 strains in potato-dextrose agar amended with NaCl and PEG6000 was strain dependent, in which *F. equiseti* (VFF12, VFF16), *F. graminearum* VFF6, *F. brachygibbosum* VFF9, *Alternaria* sp. VFF5, *Boeremia exigua* VFF4, *Rutstroemia* sp. VFF7 and *Rhizopus oryzae* VFF1 showed a significant increase by up to 150% compared to controls. Best linear unbiased predictors (BLUPs) for differences in root and shoot dry weights between control (inoculated unstressed plants) and inoculated under salt and drought stress of the tolerant fungal strains were analyzed. BLUPs of VFF16, VFF6, and VFF7 were significantly increased under both stresses compared to controls. While, BLUBs of VFF12, VFF9, and VFF4 were not significant, which maintained similar pathogenic effect. However, BLUPs of VFF5 and VFF1 were significantly decreased. Consequently, soil salinization and water deficiency - occurring nowadays in many parts of the world - can increase the aggressiveness of phytopathogenic fungi. **[Imen Haddoudi (Tunisia), Haythem Mhadhbi, Mahmoud Gargouri, Fethi Barhoumi, Samir Ben Romdhane & Moncef Mrabet. Laboratory of Legumes, Centre of Biotechnology of Borj-Cédria (CBBC), 901, 2050, Hammam-Lif, BP, Tunisia. Faculty of Sciences Tunis El Manar, University of Tunis, El Manar, 2092, Tunis, Tunisia, Laboratoire de Physiologie Moléculaire des Plantes, Centre of Biotechnology of Bor-Cédria, 901, 2050, Hammam-Lif, BP, Tunisia, European Journal of Plant Pathology volume 159, pages385–398**] https://doi.org/10.1007/s10658-020-02169-5

Defense of Host Plants against *Orgyia trigotephras* in North-East Tunisia. The egg-larval stage of *Orgyia trigotephras* were observed in shrubs maquis of Jebel Abderrahmane in north-east Tunisia, mainly on *Quercus coccifera* and *Pistacia lentiscus*, while only eggs were noticed on *Phillyrea media*. This kind of observation suggest us to study tree defense against *O. trigotephras* which will be explored by chemical analysis of *P. lentiscus*, *Q. coccifera* and *P. media*. Two types of analyses were the focus of this study to understand plant defense (i) primary metabolites and (ii) components of essential oils of these tested plants. Kjeldhal method was

used for nitrogen and Mrssorr method for potassium, sodium and phosphorus extraction. Essential oils were extracted with the hexane solvent; chemical composition was determined using (GC/MS) methods. Oil compounds were identified by comparison to their retention time. Results of mineral extraction showed that percentage of potassium, sodium, phosphorus and nitrogen were more important in *P. lentiscus* and *P. media* than in *Q. coccifera*. Five major compounds were identified from essential oils of *Q. coccifera*, four from *P. media* and four from *P. lentiscus.* Nitrogen, which is a source of protein for insects, is produced in low concentrations in the foliage, decreasing nitrogen levels strategy for defending the plant against insect larvae. The absence of monoterpens in the foliage at *P. media* could explain the choice of larvae not to feed upon this host which probably confers resistance against this defoliator. **[Ezzine, O., Chograni, H., Dhahri, S., and Ben Jamâa, M.L. (Tunisia), Tunisian Journal of Plant Protection 15 (2): 81-89, 2020].**

Coating Seeds with *Trichoderma* Strains Promotes Plant Growth and Enhance the Systemic Resistance against Fusarium Crown Rot in Durum Wheat.

Background: Fusarium crown rot is one of the major diseases that cause significant yield losses of wheat, and *Trichoderma* strains were known as an effective biocontrol agent.The aim of this study was to evaluate the potential of coating durum wheat seeds of the cultivar "Karim" with 3 different Tunisian strains of *Trichoderma* sp. (S.INAT, SIO1, SIO2) and the *Trichoderma*-based commercial product Trianum-T22 on seed germination, seedling growth, and plant defense response against the pathogen *Fusarium culmorum*. The strains were identified using molecular tools based on sequencing ITS region of ribosomal DNA. The results confirmed at 99% of homology that the strains were *T. harzianum*. Under controlled conditions, the coating seeds were released with 400 µl of spore suspension at 107 spores/ml. The seed coating with Trianum-P, and S.INAT showed the highest seed germination rates ranging from 85 to 90% while S.IO1 and S.IO2 presented the lowest germination rates with 66 and 68%, respectively. At 20 days post-infection (dpi) with *F. culmorum*, the treated plants with S.INAT and Trianum-T22 reduced the disease incidence by 53.59 and 51.79%, respectively than the control. Besides, S.INAT induced two-folds the phenolic compounds level compared to infected control. Further, the peroxidase activity was enhanced by 50% in average since 10 dpi in plants treated with S.INAT and SIO2 than the control.The results suggest that seed coating with *T. harzianum* S.INAT was a promising tool for crop production and protection under field conditions due to both direct antagonist activity and the indirect growth promotion. This strain seems to induce the systemic resistance of plants against foot crown rot disease. **[Zayneb Kthiri, Maissa Ben Jabeur, Myriam Machraoui, Samia Gargouri, Khaled Hiba and Walid Hamada (Tunisia), (Egyptian Journal of Biological Pest Control, 30:139,2020].**

PLANT PROTECTION NEWS IN THE ARAB AND NEAR EAST COUNTRIES

❖ Graduate Students Thesis (Master and Doctorate)

Evaluation of the Susceptibility of some Wheat Varieties for Infesting of *Schizaphis gramminum* (Hemiptera: Aphididae.)

Results showed that wheat plant varieties were infected with two types of aphids, the green wheat aphid *schizaphis graminum* and the oat aphid *Rhopalosiphum padi*. After analyzing the chemical content (chlorophyll, phenolate and total protein) for the cultivars and laboratory experiments (Tolerance, Antibiosis and Antixenosis), two varieties (Rasheed, IPA- 99 and Abu Ghraib) were the less harmful and more resistant varieties to aphids infections compared to the varieties: Bhooth-10, Bhooth -22, Bhooth -158, IPA -95, Fatah, Tammuz, Baraka, Latifia, and Babel 113. **[Haider Dhareb Shaaban (Iraq), College Agriculture, University of Basrah, Superviso: Dr Aqeel A. Alyousuf, (Master, 2021)].**

Taxonomical and Ecological studies of some Species of Ground Beetles (Coleoptera: Carabidae) and the Role of some of them in the Predatory Efficiency of some Insect Species in Basrah and Maysan Provinces.

Recorded in Basrah and Maysan governorates 41 Species of ground beetles, 12 species of them were recorded for the first time in Iraq and they are : *Chlaenius nigricornis* و *Harpalus herbivagus*و *Cylindera descendens* و *Pterostichus niger* و *Brachinus mansorii* و *Brachinus sanchi* و *Acupalpus marginicollis* و *Stenolophus comma* و *Agonum emarginatum* و *Dolichoctis dentata* و *Pterostichus madidus* و *Pterostichus rostratus*، The highest rate of species was *Cicindela littoralis aulicoides*, with 9.91 insects / month, and the lowest rate of 0.66 insects /month for *Stenolophus comma*, and it was in Qal'at Salih area - Maysan governorate. **[Hashim Mhawi Tuama Al-Ibadi**

(Iraq), College Agriculture, University of Basrah, Supervisor: Prof. Dr. Alaa Sabeeh Jabbar, (Doctorate, 2021),

Study some Environmental aspects of Insecta *Bagrada hilaris (*Burmester) (Hemiptera: Pentatomidae) and Control it with some Chemical and Biological Methods.

This study included a general survey of *Bagrada. hilaris* insect in six regions in Basra governorate, and a control was carried out using the two pesticides Emamectin, Acetamiprid, and the biological fungus *Beauveria bassiana*. The results of the field survey showed the presence of the insect on 16 hosts, namely, Alhanah, mustard, colza, wheat and others. The highest rate of injury appeared in the Shatt al-Arab region. Results showed that the highest intensity was in November, and that the effect of the interaction between the two pesticides and the fungus was superior to the rest of the treatments in the laboratory, pots and field. **[Auhood Jafar Toma (Iraq), College Agriculture, University of Basrah Superviser: Dr. Dhia S.AL.Waily /Dr. Ayad Abdul-Wahab Abdul- Qadir (Master, 2021)].**

The Role of Floral Diversity and Changing the Apiary Environment in the Biological Activity of *Apis mellifera* Linnaeus, 1758 Honey Bee Colonies under Basra Governorate Conditions.

This study was conducted in Basra Governorate, Shatt Al-Arab District, from mid-September 2018 to mid-September 2020, and two sites were chosen for the study, in which two rivers were chosen, one in which the water-cooling mechanism was used and the other in which this mechanism was not used during the summer critical period, and an area of land near the deceased was identified for the purpose of cultivation. Specific nectar and pollen plants during the winter season and the summer season, and these two seasons are considered critical periods for honey bees, as well as two methods for raising queens using the Ginter device and the traditional method and methods of pollination according to the areas in which the parcels were distributed .The effect of the age of the honey bee queen on the most i0mportant vital activities of the colony, such as the brood area, the area of honey, the area of pollen and the bee density, was also studied. The role of the cooling system in reducing the temperature of the beehives and the beehives and raising the percentage of their humidity was also shown. The effect of the cooling mechanism on some vital characteristics of the bee colonies from the space for the brood and the area of honey, the area of pollen, the bee density, and the amount of honey produced during the seasons of the year**. [Hassin A. Mehadi (Iraq), Plant Protection, (Doctorate, 2021)].**

A Survey of Aphids and Thrips Species Infesting some Plants of Apiaceae and their Natural Enemies and Controlling them by Using some Methods of Integrated Control.

The results of the study showed that the family plants were infected with a wide range of aphids and thrips species during the different stages of their growth, which differed in the time of their emergence and their peak according to the different types of these insects, as the highest density of Aphids coriandri insects *Hyadaphis coriandri* was recorded on the experiment plants in the beginning of December and the highest density of nymphs and adults aphids Green peaches, *Myzus persicae* and onion thrips *Thrips tabaci* during the month of March, and carrots were the most affected and preferred plant for these insects. The results of the study showed the presence of many natural enemies on the experimental plants, the most prominent of which was the predator *Orius albidipennis*, Matrixine plus EC and Confidor 200 SL also showed a higher effect in reducing the density of onion thrips and green peaches, compared to the growth regulator Match and the biocide Trichozone. **[Anmar Razak Khames (Iraq), College Agriculture, University of Basrah, Supervisor: Dr. Alaa S. Jabbar, (Master, 2021)].**

❖ Some Plant Protection Activities of FAO and Other Organizations

ACTIVITIES OF THE REGIONAL OFFICE OF FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS – NEAR EAST AND NORTH AFRICA

Launching a New Emergency Regional Project by Food and Agriculture Organization in Jordan, Lebanon, Syria and West Bank to Face Fall Armyworm Invasion

The regional office of Food and Agriculture Organization of the United Nations (FAO) in the Near East and North Africa (NENA) has launched the activities of the regional emergency project to strengthen the national and regional capacities to manage the risk of fall Armyworm (FAW). The project was launched through regional virtual inception workshop on Tuesday 23 February 2021. The representatives of Ministries of Agriculture in the participating countries; Jordan, Lebanon, Syria and West Bank, have expressed their appreciating for the efforts of FAO to support the countries that are affected by FAW, or countries that have taken proactive measures to delay the arrival of the pest and reduce the potential economic damage. The speakers have revealed their strong intentions to deepen the cooperation with regional and international organizations, as well as the national governments of the neighboring countries. Such cooperation is essential to manage transboundary pest, and any fragmented national efforts will remain inefficient compared to regionally coordinated plans. Officials of FAO have briefly presented the regional and international efforts of FAO to assist the countries to face the risk of FAW, exemplified by FAO Global Action (GA) against FAW. Through the GA, FAO is coordinating interregional efforts and evaluate proposed integrated pest management (IPM) programmes against FAW. Officials of FAO have also highlighted the previous activities implemented in terms of training sessions, procurement of traps and lures to establish surveillance system. Also, FAO has supported the capacity development for mass production of natural enemies, which FAO is considering as priority for sustainable management of FAW. The experts have illustrated the major guidelines for pesticide use against FAW, including the importance of pesticide selection and the responsible use of pesticides for effective control of pest and reducing the adverse effect on human health and environment. That cannot be achieved unless pesticides are used as one option in more comprehensive and integrated system including cultural and mechanical tools, and selection of least hazard pesticides with lower persistence, and only in case of pest population exceeding the economic threshold. The project main outcomes were thoroughly discussed, which include: awareness and extension services, capacity building ad training, planning and coordination of surveillance and integrated management. The project aims to train more than 400 specialists on basic information and skills of pest identification, monitoring and control. In addition to raining awareness of 400 farmers on FAW risk and mitigation measures to reduce potential losses, and development of national actionplan for pest surveillance and IPM and support the implementation of the action plan by providing traps, collection on data from 1000 sites, and establishment of demonstration plots for training of farmers and specialists. National Project Coordinators have explained the national workplans to face FAW in their respective countries, and they demonstrated the previous efforts and the future aims particularly for data collection, pest distribution maps, training, awareness raising campaigns and developing the capacity of natural enemies mass product. They have also mentioned the challenges faced by the national authorities to implement the national workplan, and what are their suggestions for overcoming the challenges, and the expected support from international organizations like FAO. Worth mentioning that FAO has already implemented 4 emergency projects in Egypt, Sudan, and Yemen, in addition to proving training and awareness materials and holding training workshops in Saudi Arabia and Emirate. Besides that, many virtual training sessions were accomplished during COVID-19 pandemic through zoom platform, to overcome restriction on person movement. For examples, FAO in partnership with the International Centre for Insect Physiology and Ecology has committed advanced training course on mass production of natural enemies, furthermore, audio-video training materials were developed on the laboratory process and quality measures for mass production of biological control, agents

4th Meeting on the Global Action on Highly Hazardous Pesticides (HHPs) in NENA Region

4th Zoom meeting of the National Focal Points of North Africa and NENA countries on The Global Action on Highly Hazardous Pesticides (HHPs), held on Tuesday, February 23, 2021, at 13:00 – 14:40 HRS. Cairo Local time. The meeting was facilitated by Dr. Thaer Yaseen, the Regional Plant Protection Officer of NENA and Dr. M. Jamal Hajjar (Pesticide Analyst, FAO Consultant NSPDD). The meeting was attended by 11 NFPs, representing 11 countries in the North Africa and NENA regions. In addition to participation of Baccouri, Sarra, FAO (NSP) Agricultural Officer, Ibrahim Jboori FAO Consultant FAO Egypt, and Ahmed ElSayed FAO Consultant RNE.

The NFPs and the participants discussed and proposed the following steps to be considered in the next phase to reduce the risk of highly hazardous pesticides. In terms of regulations and registration system of pesticides. In addition to management, handling, distribution and use of pesticides. The participants suggested several recommendations for the Food and Agriculture Organization of the United Nations to be considered in its annual programme and activities in the Middle East and North Africa region:

- ✓ Building the National capacity and regional coordination in the scoop of pesticide labeling standardizations in accordance with the Unified Global harmonized System (GHS)
- ✓ Review and evaluation of national life cycle of pesticides including regulations, management, registration, handling and use of pesticides in accordance with the International Code of Conduct
- ✓ Building national capacity in compliance and enforcement of a pesticide regulatory programme
- ✓ Strengthening the national capacity in the pesticide registration system, Efficacy Evaluation for the Registration of Plant Protection Products, and determination of post-harvest interval (PHI)
- ✓ Strengthening the national capacity in good agricultural practices by adopting the farmer's field schools approach
- ✓ Capacity-building in implementation of PIC convention and respect obligations
- ✓ Capacity-building in implementation of Stockholm Convention and respect the convention's obligations
- ✓ Building capacity in safe guarding and disposal of Obsolete Pesticides and preventing of future accumulation

The participants agreed that, the regional Plant Protection Officer for the Near East and North Africa, FO/RNE, in collaboration with the regional consultant (Dr. Jamal Al-Hajjar), will develop a program for the activities proposed by the NFPs with sequential plan .However, the proposed activities and capacity building should be scheduled in planned time table, to achieve the harmony between the countries of the Near East and North Africa within 5 years. **[Reported by Dr. M. Jamal Hajjar, 2021].**

CPM-15 was the first virtual meeting held during the COVID – 19 crisis

The fifteenth session of the Commission on Phytosanitary Measures (CPM-15) was held on March 2021 to review the state of plant protection around the world and adopt new international standards for phytosanitary measures and recommendations. More than 340 participants from over 106 countries and 40 observer organizations attended the first-ever virtual meeting of the IPPC governing body to identify global actions and priorities to continue preventing the spread of plant pests and diseases during the COVID-19 crisis. During the meeting, CPM adopted the new IPPC strategic framework 2020-2030, two international standards and two standards have been revised. In addition to seven treatment protocols and noted the adoption of pest identification protocol adopted by standard committee. The CPM reviewed the work of IPPC Secretariat, Implementation and Capacity Development Committee (IC), Standards Committee (SC) for 2019-2020. Furthermore, reports of Strategic Planning Group, CPM Bureau and others IPPC entities. Some of international organizations submitted written reports in the framework of cooperation in support of phytosanitary issues. The CPM brings out the adaption to the virtual work of the Implementation and Capacity Development Committee, the IC has held a series of virtual meetings to move forward on specific Implementation and Capacity Development (ICD) topics. The CPM highlighted the importance of capacity development activities under the oversee of the IC, such as the Global plant health surveillance program, the Implementation Review and Support System (IRSS), e-Commerce, and the conduct of Phytosanitary Capacity Evaluation (PCE).The discussion highlighted the need for the international plant health community to strengthen collaboration despite

all the challenges and restrictions, continue of promoting International Year of Plant Health activities which extended until mid-2021 and encouraged the countries to support the proposal of international day of plant health (12 May of each year). Stressing that the impact of the pandemic has demonstrated how protecting plants becomes more crucial than ever during a global crisis. More information available on IPPC web portal
[Ahmed Abdelmottaleb – IC member on behalf of NENA Region 2021].www.ippc.int, bidoeng@yahoo.com

Consultative workshop for the Global action Project for IPM of Fall Armyworm, February 28-March 1, 2021, Cairo, Egypt

In December 2019, the Food and Agriculture Organization (FAO) launched the 'Global action to control fall army worm (FAW) as an urgent response to the rapid spread of this invasive pest, which threatens food security and livelihoods in many regions of the world. Prevention and sustainable pest control at the global level.
The Food and Agriculture Organization (FAO) of the United Nations, in cooperation with the Ministry of Agriculture and Land Reclamation, Egypt, organized a consultative workshop for the Global action Project for IPM of Fall Armyworm, from February 28 until March 1, 2021 in Cairo, Egypt.
With the physical participation of 26 experts from different organization such as FAO in the field of plant protection, pesticides and integrated pest management. In addition, a number of specialists and stakeholders from the Ministry of Agriculture and Land Reclamation, the Agricultural Pesticides Committee - Central Department of Horticulture - Central Administration for Extension) and the national team responsible for monitoring and supervision Implementation of the plan and the technical team of the project and academics from Collages of Agriculture (Cairo University, Sadat City University, Mansoura University) and Agricultural Research Center: Plant Protection Research Institute (Biocontrol Research Department - Cotton Leaf Worm Research Department - Almond Worm Research Department) Field Crops Research Institute And the Central Laboratory for Agricultural Climate, the Center for Climate Change, Renewable Energy, and Expert Systems actively participated in this workshop. The private sector's participation also included a representative of Bayer -Crop Life Association and a number of non-governmental organizations (Agricultural Crops Export Council). The number of stakeholders also participated on the Zoom platform: more than 40 participants from Egypt, Yemen, Sudan and Mauritania.The meeting included several main themes, the most important of which are the efforts of FAO in the Near East, North Africa and Egypt and included the following items:

- The national plan to mitigate FAW in Egypt.
- Egypt's role as a model country and the implementation plan for the global movement activities in Egypt.
- Research findings and international experience on the use of agricultural practices against fall armyworm.
- Use of biological control against Fall Armyworm.
- The role of monitoring in Fall Armyworm management and the role of pesticides in fall armyworm management.
- Global experiences and lessons learned on the important role of extension and awareness in fall armyworm management.
- The role of various governmental institutions and agencies in implementing integrated management programs.
- The role of civil society organizations and farmers and producers associations.
- The role of the private sector and companies.
- Evaluating the effectiveness of integrated management programs using scientific research tools.


Strengthening Improved Seeds Production Capabilities, FAO- Yemen

The increase in food production is due to improved seeds, so farmers' access to good quality seed resources is a key factor in improving food availability and nutrition levels. Technical knowledge for the development of the seed sector is a prerequisite to develop and implement coherent policies, actions, and efficient/effective monitoring of implementation processes to ensure food and nutrition security. The Food and Agriculture Organization in Yemen has worked to strengthen the national institutions' capacities in the production of improved seeds, namely, the General seed multiplication and corporation, the Agricultural Production and Quality Control Institute, and the national genetic resources center by.

1-Providing technical support to enhance the seed production through the following:
2-Providing laboratory equipment to enhance the capabilities of the national institutions' seed production laboratories mentioned above would increase the production and quality of seeds at the national level.
3-Providing technical training to 131 technicians from the local institutions in the following fields, including training in the improvement of varieties and pre-breeding and participatory breeding, training in the use of biotechnology for the conservation of types, Training on promoting the adoption of improved varieties and seed for priority crops to extension workers, and on seed quality control.

FAO Programme on Red Palm Weevil Eradication in the Near East and North Africa Region

The Red Palm Weevil (RPW) is a serious transboundary pest of date palm, coconut and ornamental palms and is among the world's major invasive pests that attacks around 40 palm species in more than 50 countries, causing widespread damage to date palms and other plantations and impacts production, farmer livelihoods and the environment. The FAO RPW eradication programme in the NENA region addresses the gaps in RPW management in three main thematic areas: research, technology transfer and capacity building. Five Technical Working Groups (TWGs) have been formed to work in areas of RPW monitoring and early detection, farmer participation and control technologies, socio-economic impact, phytosanitary systems, border protocols and production of certified propagation material. The programme has prioritized work packages and activities to be conducted in the next 2 years. The partner's roles, budgets, workplans and timelines have been finalized and Letters of Agreements (LoAs) are being signed with partner institutions. The programme has completed the nomination of national focal points from 18 countries in NENA Region.

Five virtual meetings and four training sessions with the national focal points and leaders of the TWGs were convened in the period from November 2020 to March 2021. In the meetings the situation and plans to manage the RPW were reviewed in a number of member countries and included lectures and technical discussions that dealt with miscellaneous aspects of RPW IPM. The first meeting was held on 17th Nov 2020 and covered presentations on the status and efforts to combat the RPW in Tunisia and Yemen. Two presentations were made by Dr Thaer Yaseen on the RPW regional programme and Dr Ali Bob on the role of the national focal points and the baseline data to be collected from member countries. The 2nd meeting of national focal points and the 1st training programme was held on 22nd Dec 2020. It included a lecture on "Some tools for Integrated Management of the Red Palm Weevil" by Dr Ibrahim El Jboory, President, Arab Society of Plant Protection and two presentations on the status and RPW management in Iraq and Palestine. The 3rd meeting and 2nd training programme was held on 26th January 2021. It included a lecture on "Survey and sampling plans to determine level of RPW infestation in area wide management programs" by Dr J. Faleiro, FAO RPW consultant and two presentations on the status and RPW management in Bahrain and Libya. The 4th meeting and 3rd training programme was on 15th February 2021. Dr Hassan Alayied of King Abdulaziz City for Science and Technology, KSA presented a lecture on "RPW Early detection systems and tools". The meeting included two presentations on the status and RPW management in Algeria and Egypt. The 5th meeting and 4th training programme was on 22nd March 2021. It included a lecture on "Remote Sensing Technology for Monitoring the RPW", by Dr Raphael Cousin of Phoenix Research Center, Spain and Dr Ali El Battay of ICBA, UAE. The meeting included a presentation on the status and RPW management in Morocco. LoAs are being finalized with project partners, a meeting of the steering committee of the RPW programme was held on 10th March involving donor countries and FAO. A survey questionnaire has been shared with national focal points, for collection of baseline data needed for technical assessments in partner countries.

Upcoming activities:

Planned activities in the next quarter will include meetings, networking and training of NFPs from partner countries. The meetings will cover lectures on "RPW monitoring and surveillance" and "enhancing information

exchange and networking for improved RPW management". Country presentation in the next quarter will cover the status and RPW management in the Sultanate of Oman, Kingdom of Saudi Arabia and Sudan. An Arabic version of the FAO manual "Guidelines on RPW Management Practices" and the Proceedings of the scientific meeting held in Bari in October 2018 will be published. Analysis of baseline data on RPW status and management capacity in member countries will be completed. The programme will appoint project consultants, Letter of Agreements with partners will be signed by mid-May and the official launch of the field activities of the TWGs is expected to be in June 2021. The steering committee will meet to approve national plans and to monitor activities of the regional programme.

Activities of the Commission for Controlling the Desert Locust in the Central Region (CRC), Food and Agriculture Organization of the United Nation

Desert Locust Situation

Warning level: THREAT

General Situation of the Desert Locust during March 2021 and Forecast until mid-May 2021 provided by the FAO Emergency Centre for Desert Locust (ECLO).

General Situation

Upsurge begins to decline

The current upsurge showed signs of significant decline during March as Desert Locust swarms continued to decrease in Kenya, Ethiopia and Somalia due to ongoing control operations and poor rainfall. Swarms remained immature, waiting for the spring rains that are required for maturation and egg laying. While this may still occur in April, below-normal rainfall expected this spring would limit breeding to parts of northern Kenya and southern Ethiopia at a much lower scale than last year. If this is followed by poor rainfall this summer in northeast Ethiopia, then the Desert Locust situation should return to normal. Limited breeding occurred in northeast Tanzania from remnants of earlier swarms. Although winter-bred infestations declined along both side of the Red Sea, late hatching and hopper band formation occurred in Sudan. More importantly, widespread hatching and hopper band formation took place in the interior of Saudi Arabia where control operations combined with earlier than normal dry and hot conditions should be able to reduce these infestations. In addition, strong winds carried a few small mature swarms to Kuwait and southwest Iran. This could lead to hatching and band formation in southwest Iran during April and May. The situation remained calm in other regions and no significant developments are expected

Western Region: CALM

SITUATION. Low numbers of solitarious adults in
Morocco and Algeria.
FORECAST. Small-scale spring breeding south of the Atlas Mountains in Morocco and central Algeria

Central Region: THREAT

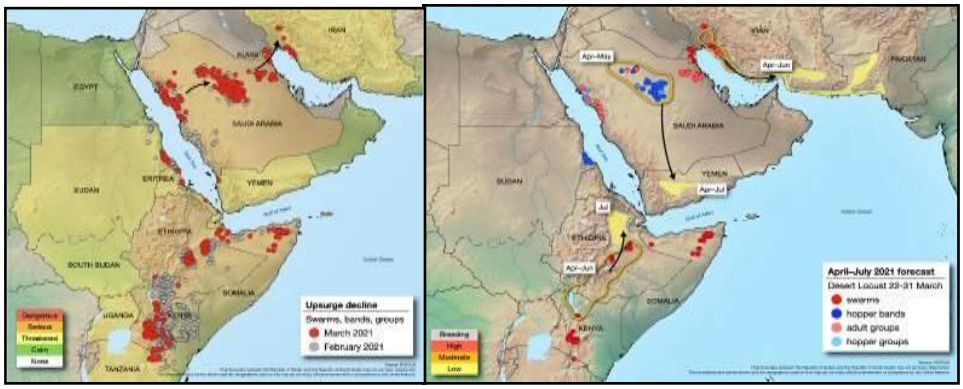
SITUATION. Swarms remain immature and decline due to control in Ethiopia (13 366 ha treated) and Kenya (1 184 ha); more swarms form in NE and NW Somalia (12 396 ha); mature swarm remnants, hatching and small bands form in northeast Tanzania (236 ha). On the Red Sea coast, hatching and hopper groups form in Eritrea (100 ha), and swarm laying, hatching and bands form in Sudan (7 437 ha). Adult groups laying, hatching and bands form in Saudi Arabia (50 120 ha) interior; few mature swarms invade Kuwait; scattered adults in Egypt and Yemen.

FORECAST. Immature swarms decline further in Kenya, Ethiopia and Somalia unless rains arrive to cause swarms to mature and lay, causing small bands to form in late April and May; more hatching and band formation in Saudi Arabia interior but may be limited by unusually hot, dry conditions, yet immature groups and small swarms could still form in May; bands, adult groups and perhaps small swarms form on central coast of Sudan and move inland; adults move from coast to interior in Yemen.

Easter Region: CALM

SITUATION. Few mature swarms invade southwest Iran
(1 521 ha treated) from Arabia.

FORECAST. Hatching and band formation in southwest Iran; small-scale breeding in southern Iran and southwest Pakistan if it rains.



Map 1 Desert Locust situation - Map 2 forecast April –July 2021

For more up to date information about the Desert Locust situation and forecasts, visit the FAO's Desert Locust website: http://www.fao.org/ag/locusts/en/info/info/index.html and FAO Commission for Controlling the Desert Locust in the Central Region http://desertlocust-crc.org. Source: The FAO Desert Locust Bulletin issued monthly in English and French by the Desert Locust Information Service, AGP Division (Rome, Italy; and Arabic version by the Commission for Controlling the Desert Locust in the Central Region (FAO Regional Office for Near East, Cairo, Egypt http://desertlocust-crc.org).

FAO's Role in the Fight against the Desert Locust

Governments are the lead responders. They are conducting aerial / ground control operations, treating infestations to reduce the locust numbers and limit reproduction.
FAO's role is to provide governments with early warning, expertise, support, and resources.
In the current crisis, FAO is:

- Supporting national survey and control teams using a handheld digital tool – to record and transmit field data to national locust centers and FAO's Desert Locust Information Service so better early warning and more accurate and timely forecasts can be provided.
- Surging experts to affected countries to rapidly boost national capacities to carry out coordinated locust-control activities, assess damages, and help teams target swarms.
- Mobilizing funding to support procurement of equipment (pesticides, biopesticides, spraying gear, airplanes, vehicles, protective clothing) so control activities could be scaled up.
- Helping governments increase, enhance and maintain surveillance, data collection, timely reporting and upscaled aerial and ground control operations.
- Implementing various projects to safeguard livelihoods and promote early recovery, targeting extremely vulnerable and food insecure households in affected countries.
- Facilitating information sharing and coordination between countries in the region.
- Helping governments strengthen national capacity to manage locusts through training and strengthen their reporting, surveillance and control capacities.
- Harnessing cutting-edge technologies and working with partners to further strengthen Desert Locust management through innovative digital tools, remote sensing, drones, models and dashboards.

The 13th Arab Congress of Plant Protection

1-The new congress date is October 31-November 5, 2021.
2-Registration deadline: September 1, 2021
3-Abstracts submission deadline (confirmation of earlier submitted abstracts, or submitting new ones): April 30, 2021.
4-Acceptance of abstracts: 30 June, 2021
5-Deadline for submitting proposals for invited concurrent oral research papers sessions: March 31, 2021
6-Second congress announcement: May 31, 2021.
7-Third and final congress announcement: July 1, 2021
8-Deadline for hotel booking: July 31, 2021
9. The email address and the website of the congress will continue to be: info@acpp-aspp.com and www.acpp-aspp.com

We apologize for any inconvenience caused by this postponement which was imposed on us by conditions beyond our control, and very much appreciate your kind understanding. Looking forward to meet you all in the fall of 2021 in Tunisia.

The Arab Society for Plant Protection
The Organizing Committee of the 13th Arab Congress of Plant Protection in Tunisia

Mediterranean Agronomic Institute of Bari /Italy, Master Students, Academic Year 2020-2021

The Master Programme: One Academic Year (60 ECTS)
The Master Programme provides a one academic year curriculum whose main objective is to prepare motivated students towards professional and academic careers that will promote integrated pest and disease management strategies for a sustainable intensification of arboriculture in the Mediterranean agroecosystems.
The Master Programme deals with the management of pests and diseases in arboriculture with a look towards agroecological and food systems. Students will learn about the ecological and epidemiological features of pests and pathogens, and how to apply innovative and smart tools for diagnosis, monitoring and management. IPM strategies will be introduced and analysed in depth for the main pests affecting the Mediterranean fruit crops. In addition, students will learn how to cope with the main risks related to emergent transboundary pests and diseases, and how to apply quarantine measures that can prevent and control their spread.
Courses are addressed to new graduate students and young professionals with a university background related to agronomic, horticultural and plant protection issues.
At the end of the course students will know:

- How to analyse and plan agroecosystems for a sustainable management of pests and diseases;
- The range of products for pests and diseases control and their relevant regulations;
- The tools for a rapid and timely diagnosis and monitoring of pathogens and pests affecting fruit crops;
- How to solve farm problems by using diverse methods including farm biodiversity management, cultivars/graft combination choices, use of pesticides and biological control;
- How to plan and implement IPM programmes for the main fruit crops, in different contexts;
- How to organize and manage important preventive measures for pest and disease control, i.e. plant quarantine and certification programmes for plant propagating material.

The Mediterranean Agronomic Institute of Bari has accepted 12 candidates this year from different Mediterranean countries (Algeria, Albania, Lebanon, Morocco, Palestine and Tunisia), including one student from Ethiopia. Dr. Ibrahim Al-Jubouri, President of the Arab Society for Plant Protection, participated as an external lecturer during the second week on Plant Pests and Mites. The Arab Society for Plant Protection wishes all students continued excellence and success for the current year and the coming years.

ASPP MEMBERS NEWS ABROAD

The Use of Semiochemical-Based Strategies for Conservation Biological Control.

Biological control is an important component of integrated pest management (IPM), based on the use of natural enemies, as predators and parasitoids or pathogens, to reduce or mitigate pests population. In this context, the knowledge of the chemical ecology of natural enemies, herbivores, and host plants is important in the development of an effective IPM program. Moreover, due to the expansion of agricultural fields, landscape, and habitat, implementing biological control may be necessary to enhance the ecological services provided by natural enemies. The manipulation of the behavior of predators and parasitoids through the use of stimuli that increase their presence in the fields can lead to an improvement of their performance to achieve a conservation of biological control. Conservation biological control is an approach that comprises a range of methods, including habitat manipulation and cultural practices that aim at sustaining natural enemy populations in their proximity and within agricultural areas and thus reducing pest presence on crops. For example, has been demonstrated that the presence of flowering plants in the field's borders can improve parasitoids parasitism rates of several pests as *Nezara viridula* L or *Chinavia hilaris* (Say), *Eurygaster integriceps* (Put) (Heteroptera: Pentatomidae). These flowering plant strips provide parasitoids and predators with sugar resources, shelter, alternative prey, and a suitable microclimate. Conservation biological control can be improved through the application of chemical ecology methods. Recently, the development of semiochemical-based tools has increased greatly, as they are considered efficient tactics for manipulating insect behavior with the objective of enhancing the biological control against herbivores. In this context, the use of semiochemicals that attract the parasitoid and predators in the proximity of the source can enhance the biological control level to protect the crop. Moreover, the identification of Herbivore-Induced Plant Volatiles (HIPVs), emitted in consequence of a pest attack, which act attracting the natural enemies can be usefully applied to the plants to protect to enhance the natural enemies presence for example, several studies showed attraction of a number of insect species and families like (Syrphidae, Braconidae, Empididae, Sarcophagidae) to methyl salicylate and (Z)-3-hexenyl acetate. Moreover, synthetic jasmonic acid applied to crop plants has been increasing the parasitism rate of caterpillar pests. Another application is also possible by using controlled-release dispensers or botanical oil-based pesticides containing synthetic HIPVs to activate indirect plant defenses and enhance the recruitment of natural enemies of pests. In other cases, the genetic modification of secondary plant metabolism is also possible which could allow appropriate semiochemicals to be generated by plants at certain growth stages finally, the pest pheromone is also exploited by the parasitoid as kairomone to find its host. This tactic is widely applied with positive results, for example, sex pheromones released by host species have been shown to serve as kairomones in host location by a number of egg parasitoids, e.g., *Chrysonotomyia ruforum* (Krausse), *Dipriocampe diprioni* (Ferrière), *Trichogramma* spp, *Telenomus* spp., and *Ooencyrtus pityocampae* (Mercet). **[Mokhtar Abdulsattar Arif [1](Iraq-Italy) and Salvatore Guarino[2], [1]Plant Protection**

Directorate, Ministry of Agriculture, Abu-Ghraib 10081, Baghdad, Iraq; mokhtar.a.arif@gmail.com**. [2]Institute of Biosciences and Bioresources (IBBR), National Research Council of Italy (CNR), Corso Calatafimi 414, 90129 Palermo, Italy;** salvatore.guarino@ibbr.cnr.it].

The in Vitro and in Planta Interspecies Interactions among Rice-Pathogenic Burkholderia Species.

Burkholderia glumae, *B. plantarii*, and *B. gladioli* are responsible for serious diseases in rice crops and co-occurrence among them has been reported. In this study, in vitro assays revealed antagonistic activity among these organisms, with *B. gladioli* demonstrating strong inhibition of *B. glumae* and *B. plantarii*. Strains of *B. glumae* and *B. plantarii* that express green fluorescent protein were constructed and used for cocultivation assays with *B. gladioli*, which confirmed the strong inhibitory activity of *B. gladioli*. Cell-free supernatants from each species were tested against cultures of counterpart species to evaluate the potential to inhibit bacterial growth. To investigate the inhibitory activity of *B. gladioli* on *B. glumae* and *B. plantarii* in rice, rice plant assays were performed and quantitative PCR (qPCR) assays were developed for in planta bacterial quantification. The results indicated that coinoculation with *B. gladioli* leads to significantly reduced disease severity and colonization of rice tissues compared with single inoculation with *B. glumae* or *B. plantarii*. This study demonstrates the interactions among three rice-pathogenic *Burkholderia* species and strong antagonistic activity of *B. gladioli* in vitro and in planta. The qPCR assays developed here could be applied for accurate quantification of these organisms from in planta samples in future studies. **[Namgyu Kim^{+}, Mohamed Mannaa^{++}(Egypt-Koria), Juyun Kim^{+}, Ji-Eun Ra, Sang-Min Kim, Chaeyeong Lee, Hyun-Hee Lee, and Young-Su Seo, Plant Disease: Vol. 105, No. January 2021].**

Response of Pine Rhizosphere Microbiota to Foliar Treatment with Resistance-Inducing Bacteria against Pine Wilt Disease.

In this study, two bacterial strains, IRP7 and IRP8, were selected to induce resistance against pine wilt disease (PWD). Foliar application with these strains to nematode-inoculated pine seedlings significantly reduced PWD severity. The effect of nematode inoculation and bacterial treatment on the rhizosphere bacterial community was investigated. The results indicated that the rhizosphere of nematode-inoculated seedlings contained a lower relative abundance of beneficial microbes such as *Paraburkholderia*, *Bradyrhizobium*, *Rhizobacter*, *Lysobacter*, and *Caballeronia*. Bacterial treatment resulted in significant changes in the microbes that were represented in relatively low relative abundance. Treatment with IRP7 resulted in an increase in the relative abundance of *Nitrospirillum*, *Bacillus*, and *Luteibacter*, which might be useful for protection against infection. Treatment with IRP8 resulted in an increase in the relative abundance of obligate bacterial predators of the *Bdellovibrio* genus that were previously shown to control several bacterial phytopathogens and may have a role in the management of nematode-carried bacteria. The selected bacteria were identified as *Pseudomonas koreensis* IRP7 and *Lysobacter enzymogenes* IRP8 and are suggested as a potential treatment for induced resistance against PWD. To our knowledge, this is the first report on the effect of foliar treatment with resistance-inducing bacteria on the rhizosphere microbiota. **[Gil Han,†, Mohamed Mannaa,† (Egypt-Koria), Namgyu Kim, Hee Won Jeon, Hyejung Jung, Hyun-Hee Lee, Junheon Kim, Jungwook Park, Ae Ran Park, Jin-Cheol Kim, and Young-Su Seo, Microorganisms: Vol. 9, No. 4, 688. Published: 26 March 2021].**

Evolution of the bread wheat D-subgenome and enriching it with diversity from *Aegilops tauschii.*

Aegilops tauschii, the diploid wild progenitor of the D-subgenome of bread wheat, constitutes a reservoir of genetic diversity for improving bread wheat performance and environmental resilience. To better define and understand this diversity, we sequenced 242 *Ae. tauschii* accessions and compared them to the wheat D-subgenome. We characterized a rare, geographically-restricted lineage of *Ae. tauschii* and discovered that it contributed to the wheat D-subgenome, thereby elucidating the origin of bread wheat from at least two independent hybridizations. We then used *k*-mer-based association mapping to identify discrete genomic regions with candidate genes for disease and pest resistance and demonstrated their functional transfer into wheat by transgenesis and wide crossing, including the generation of a library of 'synthetic' hexaploids incorporating diverse *Ae. tauschii* genomes. This pipeline permits rapid trait discovery in the diploid ancestor through to functional genetic validation in a hexaploid background amenable to breeding. This study was conducted in cooperation between 37 international institutions and research centers from all over the world

concerned with the subject of study wheat and its wild type. Seventy-nine researchers were cooperating from various disciplines related to the subject. This paper included an in-depth study of the D genome of the wild ancestor *Aegilops tauschii*. This study is now purplish in biorxiv for share with public. **[**Kumar Gaurav, Sanu Arora, Paula Silva, Javier Sánchez-Martín, Richard Horsnell, Liangliang Gao, Gurcharn S. Brar, Victoria Widrig, Jon Raupp, Narinder Singh, Shuangye Wu, Sandip M. Kale, Catherine Chinoy, Paul Nicholson, Jesús Quiroz-Chávez, James Simmonds, Sadiye Hayta, Mark A. Smedley, Wendy Harwood, Suzi Pearce, David Gilbert, Ngonidzashe Kangara, Catherine Gardener, Macarena FornerMartínez, Jiaqian Liu, Guotai Yu, Scott Boden, Attilio Pascucci, Sreya Ghosh, Amber N. Hafeez, Tom O'Hara, Joshua Waites, Jitender Cheema, Burkhard Steuernagel, Mehran Patpour, Annemarie Fejer Justesen, Shuyu Liu, Jackie C. Rudd, Raz Avni, Amir Sharon, Barbara Steiner, Rizky Pasthika Kirana, Hermann Buerstmayr, Ali A. Mehrabi, Firuza Y. Nasyrova, Noam Chayut**, Oadi Matny(Iraq-USA),** Brian J. Steffenson, Nitika Sandhu, Parveen Chhuneja, Evans Lagudah, Ahmed F. Elkot, Simon Tyrrell, Xingdong Bian, Robert P. Davey, Martin Simonsen, Leif Schauser, Vijay K. Tiwari, H. Randy Kutcher, Pierre Hucl, Aili Li, Deng-Cai Liu, Long Mao, Steven Xu, Gina Brown-Guedira, Justin Faris, Jan Dvorak, Ming-Cheng Luo, Ksenia Krasileva, Thomas Lux, Susanne Artmeier, Klaus F. X. Mayer, Cristobal Uauy, Martin Mascher, Alison R. Bentley, Beat Keller, Jesse Poland, Brande B. H. Wulff**]** https://www.biorxiv.org/content/10.1101/2021.01.31.428788v1.full

Disrupting the Homeostasis of High Mobility Group Protein Promotes the Systemic Movement of Bamboo mosaic virus.

Viruses hijack various organelles and machineries for their replication and movement. Ever more lines of evidence indicate that specific nuclear factors are involved in systemic trafficking of several viruses. However, how such factors regulate viral systemic movement remains unclear. Here, we identify a novel role for *Nicotiana benthamiana* high mobility group nucleoprotein (NbHMG1/2a) in virus movement. Although infection of *N. benthamiana* with Bamboo mosaic virus (BaMV) decreased *NbHMG1/2a* expression levels, nuclear-localized NbHMG1/2a protein was shuttled out of the nucleus into cytoplasm upon BaMV infection. *NbHMG1/2a* knockdown or even overexpression did not affect BaMV accumulation in inoculated leaves, but it did enhance systemic movement of the virus. Interestingly, the positive regulator Rap-GTPase activation protein 1 was highly upregulated upon infection with BaMV, whereas the negative regulator thioredoxin h protein was greatly reduced, no matter if *NbHMG1a/2a* was silenced or overexpressed. Our findings indicate that NbHMG1/2a may have a role in plant defense responses. Once its homeostasis is disrupted, expression of relevant host factors may be perturbed that, in turn, facilitates BaMV systemic movement. **[Mazen Alazem (Syria-Koria), Meng-Hsun He, Chih-Hao Chang, Ning Cheng and Na-Sheng Lin., Institute of Plant and Microbial Biology, Academia Sinica, Taipei, Taiwan, Journal: Frontiers in Plant Science. Dec 16; 11:597665, 2020].** doi: 10.3389/fpls.2020.597665

Odorants of *Capsicum* spp. Dried Fruits as Candidate Attractants for *Lasioderma serricorne* F. (Coleoptera: Anobiidae).

The cigarette beetle, *Lasioderma serricorne* F. (Coleoptera: Anobiidae) is an important food storage pest affecting the tobacco industry and is increasingly impacting museums and herbaria. Monitoring methods make use of pheromone traps which can be implemented using chili fruit powder. The objective of this study was to assess the response of *L. serricorne* to the volatile organic compounds (VOCs) from different chili powders in order to identify the main semiochemicals involved in this attraction. Volatiles emitted by *Capsicum annuum*, *C. frutescens*, and *C. chinense* dried fruit powders were tested in an olfactometer and collected and analyzed using SPME and GC-MS. Results indicated that *C. annuum* and *C. frutescens* VOCs elicit attraction toward *L. serricorne* adults in olfactometer, while *C. chinense* VOCs elicit no attraction. Chemicals analysis showed a higher presence of polar compounds in the VOCs of *C. annuum* and *C. frutescens* compared to *C. chinense*, with α-ionone and β-ionone being more abundant in the attractive species. Further olfactometer bioassays indicated that both α-ionone and β-ionone elicit attraction, suggesting that these compounds are candidates as synergistic attractants in pheromone monitoring traps for *L. serricorne*. **[Salvatore Guarino, Sara Basile, Mokhtar Abdulsattar Arif (Iraq-Italy), Barbara Manachini and Ezio Peri, Insects, 12, 61, 2021].** https://doi.org/10.3390/insects12010061

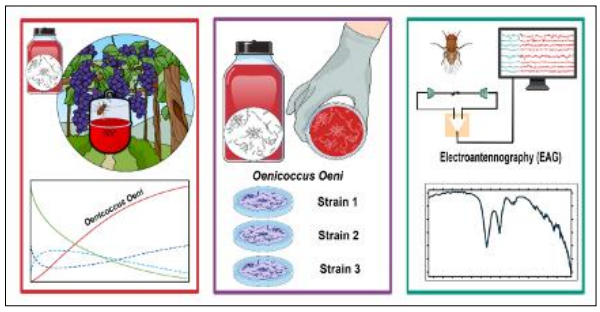
Amira Jouini successfully defended her PhD thesis entitled "Herbicidal activity of Mediterranean essential oils and their effects on soil bioindicators." At the University of Palermo (UNIPA, Italy) and the Polytechnic University of Valencia (UPV, Spain). Her work focused on the investigation of the phytotoxic and herbicidal

activities of different essential (EOs) oils extracted from Mediterranean plants for their potential use as natural herbicides in a sustainable weed management context and their effects on soil microorganisms. The results obtained from the in vitro bioassays revealed that all used EOs displayed of effectiveness against assayed weeds, controlling completely their germination process or reducing it and significantly inhibiting their seedling growth. The overall findings of her work suggest EOs application as bio-herbicides in controlled environments, such as horticulture and in greenhouse conditions. However, the optimum dose of application must be determined, to control weeds and simultaneously, not negatively affect soil microorganisms. Dr. **Amira Jouini (Tunisia), puplished her work in Journal of plants 2020, *9*(10), 1289.**

Potential Effects of Essential Oils Extracted from Mediterranean Aromatic Plants on Target Weeds and Soil Microorganisms.

Essential oils (EOs), extracted from aromatic plants, have been proposed as candidates to develop natural herbicides. This study aimed to evaluate the herbicidal potential of *Thymbra capitata* (L.) Cav., *Mentha x piperita* L. and *Santolina chamaecyparissus* L. essential oils (EOs) on *Avena fatua* L., *Echinochloa crus-galli* (L.) P. Beauv, *Portulaca oleracea* L. and *Amaranthus retroflexus* L. and their effects on soil microorganisms. A pot experiment was set up and three EOs at three doses were applied by irrigation. Efficacy and effects of EOs on weed growth were determined. Soil microbial biomass carbon and nitrogen, microbial respiration, and the main microbial groups were determined at days 7, 28 and 56. EOs demonstrated herbicidal activity, increasing their toxicity with the dose. *T. capitata* was the most effective against all weeds at the maximum dose. *P. oleracea* was the most resistant weed. Soil microorganisms, after a transient upheaval period induced by the addition of EOs, recovered their initial function and biomass. *T. capitata* EO at the highest dose did not allow soil microorganisms to recover their initial functionality. EOs exhibited great potential as natural herbicides but the optimum dose of application must be identified to control weeds and not negatively affect soil microorganisms**. [Amira Jouini (Tunisia)[1,2], Mercedes Verdeguer [2] , Samuele Pinton [2], Fabrizio Araniti[3], Eristanna Palazzolo[1], Luigi Badalucco [1] and Vito Armando Laudicina [1]* [1]Department of Agricultural, Food and Forestry Sciences, University of Palermo, Italy; [2]Mediterranean Agroforestry Institute (IAM), Universitat Politècnica de València, Spain; [3]Department AGRARIA, University Mediterranea of Reggio Calabria, Reggio Calabria, Italy, Plants , 9(10), 1289, 2020]. To read the full article please visit:** https://doi.org/10.3390/plants9101289

Selection of Lactic Acid Bacteria Species and Strains for Efficient Trapping of *Drosophila suzukii.*



Monitoring of *Drosophila suzukii* is based on the use of effective traps and baits. The current baits are insufficient to provide efficient monitoring. The use of bacteria as bio-catalyzers to produce bioactive volatiles may improve flies' attraction. Thus, we conducted this work to improve Droskidrink® bait's attractiveness using lactic acid bacteria. Different baits that were based on the use of Droskidrink® were assessed for flies' attraction in a Droso-Trap® in a vineyard. *Oenococcus oeni*, *Pediococcus* spp., and *Lactobacillus* spp. were used. The performance of the most attractive species, *O. oeni*, inoculated into Droskidrink® was assessed in laboratory tests. The responses of female flies to volatiles produced by Droskidrink® with *O. oeni* strains were recorded by electroantennography. Preliminary field assessment of baits recorded *O. oeni* as the most attractive species. Three strain groups showed adaptation to test conditions. Volatiles extracted by the headspace of baits inoculated with *O. oeni*, elicited electroantennographic responses from fly antennae. Droskidrink® inoculated with *O. oeni* is a highly attractive bait for monitoring. These findings will be useful for improving the attractiveness of *D. suzukii* commercial baits based on the utilization of LAB volatiles in a strain-dependent manner.To read the full article, please visit: https://doi.org/10.3390/insects12020153

[Amani Alawamleh *et al.* Department of Agricultural, Environmental and Food Sciences, University of Molise, Campobasso, Italy. Insects, **12(2), 153, 2021]**

Arab Society for Plant Protection (ASPP) Participation in the Borlaug Global Rust Initiative Technical Workshop (BGRI 2020), United Kingdom.

The Arab Plant Protection Society member Dr. Emad Mahmoud Al-Maaroof participated in the activities of the Borlaug Global Rust Initiative Workshop organized by the Cornell University in collaboration with the John Innes Center. The workshop was held virtually during the period 7-9/10/2020 with the participation of the best world wheat rust scientists. The workshop scientific program included 30 oral presentations and 20 posters presented within five main scientific sessions. Dr. Emad Al-Maaroof gave a presentation through this workshop entitled "Pathogenic divergence in *Puccinia striiformis* f. sp. *tritici* population, the causal agent of wheat rust in Iraq". On the sideline of the workshop a meeting was attended on the surveillance and monitoring of rust pathogens on September 25, during which the latest developments were presented regarding the spread of the dangerous race Ug99, the causal agent of black stem rust disease and its lineage group members in addition to other new races of other rust pathogens worldwide**. [Emad Mahmoud Al-Maaroof (Iraq), 2020].**

Chitosan/silica nanocomposite-based formulation alleviated gray mold through stimulation of the antioxidant system in table grapes.

The main purpose of this study was to explore the ability of a novel silica/polysaccharide polymer-based formulation, namely, chitosan/silica nanocomposites (CSNs), to directly affect Botrytis cinerea in vitro and in inoculated berries, and indirectly to induce natural host resistance via enzymatic and nonenzymatic antioxidants against gray mold of table grapes. The results indicated a positive correlation in in vitro tests in terms of radial growth, spore germination and germ tube elongation, where those parameters were completely inhibited by CSN at 1%. SEM and TEM investigations showed that morphological and internal structural damage was observed in B. cinerea-hyphae/spores treated with CSN. Additionally, most of the treated spores were affected, and cellular vacuolization and cytoplasmic disorganization were observed. The results revealed that CSN reduced gray mold incidence and severity on inoculated berries directly and indirectly. In direct activity, CSN (1%) reduced mold incidence and severity by 100% compared to the control. In indirect activity, mold incidence and severity was reduced by 51% and 64%, respectively. CSN significantly increased superoxide dismutase, ascorbate peroxidase, peroxidase, total phenol and flavonoid at 48 h post-treatment by 1.2-, 1.6-, 1.3-, 1.3- and 1.6-fold, respectively, in grape-treated tissues. It could be concluded that CSN, as a promising alternative control method against gray mold of table grapes, can directly affect the pathogen and indirectly enhance the natural host resistance of the antioxidant system. **[Youssef K. (Egypt-Brazil), Roberto S.R., International Journal of Biological Macromolecules 168 (2021) 242–250, Plant Pathology Research Institute, ARC, Egypt and Londrina State University, Brazil].**

Electrolyzed Water as a Potential Agent for Controlling Postharvest Decay of Fruits and Vegetables.

Disinfection after harvest is an essential step to maintain commodities and facilities free of fungal and bacterial postharvest pathogens, responsible of storage decay and economic losses. Electrolyzed water (EW) has gained considerable interest over the last decades as a novel broad-spectrum sanitizer. EW is sustainable and cost effective since it can be produced on-site utilizing tap water and different inexpensive salts and is healthy for both the environment and human beings. Its effectiveness in controlling fungi, yeasts, and bacteria within a wide range of pH is due to multiple mode of actions. Furthermore, its strong oxidizing potential is capable to reduce the amount of pesticide residues on fruit and vegetable surfaces and to avoid pathogen resistance. Properties of EW are related to salts employed for production, being those with low chlorine content preferable. Lastly, EW has no negative effect on the organoleptic properties and features of treated commodities. The present chapter highlights recent developments in EW generation, factors affecting its effectiveness for controlling postharvest decay of fruits and vegetables, mechanism of action on microbes and hosts, and advantages and disadvantages on its use. **[Antonio Ippolito, Annamaria Mincuzzi, Antony Surano, Khamis Youssef (Egypt-Brazil), and Simona Marianna Sanzani, 2021 pp 181-202. In: Spadaro D., Droby S., Gullino M.L. (eds) Postharvest Pathology. Plant Pathology in the 21st Century, vol 11. Springer, Cham.** https://doi.org/10.1007/978-3-030-56530-5_12 **, Department of Soil, Plant and Food Science, University of Bari "Aldo Moro", Italy and Plant Pathology Research Institute, ARC, Egypt and CIHEAM-Bari, Valenzano, Bari, Italy].**

Genomic Insights into the Antifungal Activity and Plant Growth-Promoting Ability in Bacillus velezensis CMRP 4490.

The main objective of this study was to evaluate Bacillus velezensis strain CMRP 4490 regarding its ability to inhibit soil-borne plant pathogens and to increase plant growth. The study included evaluation of in vitro antifungal control, sequencing the bacterial genome, mining genes responsible for the synthesis of secondary metabolites, root colonization ability, and greenhouse studies for the assessment of plant growth–promoting ability. The strain was obtained from soil samples in the north of Paraná in Brazil and was classified as a B. velezensis, which is considered a promising biological control agent. In vitro assay showed that B. velezensis CMRP 4490 presented antagonistic activity against Sclerotinia sclerotiorum, Macrophomina phaseolina, Botrytis cinerea, and Rhizoctonia solani with a mycelial growth inhibition of approximately 60%, without any significant difference among them. To well understand this strain and to validate its effect on growth-promoting rhizobacteria, it was decided to explore its genetic content through genome sequencing, in vitro, and greenhouse studies. The genome of CMRP 4490 was estimated at 3,996,396 bp with a GC content of 46.4% and presents 4,042 coding DNA sequences. Biosynthetic gene clusters related to the synthesis of molecules with antifungal activity were found in the genome. Genes linked to the regulation/formation of biofilms, motility, and important properties for rhizospheric colonization were also found in the genome. Application of CMRP 4490 as a coating film on soybean increased from 55.5 to 64% on germination rates when compared to the control; no differences were observed among treatments for the maize germination. The results indicated that B. velezensis CMRP 4490 could be a potential biocontrol agent with plant growth–promoting ability. **[Teixeira GM, Mosela M, Nicoletto MLA, Ribeiro RA, Hungria M, Youssef K, Higashi AY, Mian S, Ferreira AS, Gonçalves LSA, Pereira UP and de Oliveira AG (2021) Frontiers in Microbiology, 11:618415, Londrina State University, Brazil and Embrapa Soja, Londrina, Brazil, and Plant Pathology Research Institute, ARC, Egypt, 2021].**

High throughput sequencing from Angolan citrus accessions discloses the presence of emerging CTV strains.

Citrus industry is worldwide dramatically afected by outbreaks of Citrus tristeza virus (CTV). Controls should be applied to nurseries, which could act as diversity hotspots for CTV. Early detection and characterization of dangerous or emerging strains of this virus greatly help to prevent outbreaks of disease. This is particularly relevant in those growing regions where no dedicated certifcation programs are currently in use. Double-stranded RNA extracted from Citrus spp. samples, collected in two locations in Angola, were pooled and submitted to a random-primed RNA-seq. This technique was performed to acquire a higher amount of data in the survey, before the amplifcation and sequencing of genes from single plants. To confrm the CTV infection in individual plants, as suggested by RNA-seq information from the pooled samples, the analysis was integrated with multiple molecular marker amplifcation (MMM) for the main known CTV strains (T30, T36, VT and T3). From the analysis of HTS data, several assembled contigs were identifed as CTV and classifed according to their similarity to the established strains. By the MMM amplifcation, only fve individual accessions out of the eleven pooled samples, resulted to be infected by CTV. Amplifed coat protein genes from the fve positive sources were cloned and sequenced and submitted to phylogenetic analysis, while a near-complete CTV genome was also reconstructed by the fusion of three overlapping contigs. Phylogenetic analysis of the ORF1b and CP genes, retrieved by de novo assembly and RT-PCR, respectively, revealed the presence of a wide array of CTV strains in the surveyed citrus-growing spots in Angola. Importantly, molecular variants among those identifed from HTS showed high similarity with known severe strains as well as to recently described and emerging strains in other citrus-growing regions, such as S1 (California) or New Clade (Uruguay). **[Aderito Tomàs Pais da Cunha, Michela Chiumenti, Laurindo Chambula Ladeira, Raied Abou Kubaa, Giuliana Loconsole, Vitantonio Pantaleo and Angelantonio Minafra. Instituto Superior Politécnico do Kuanza Sul (ISPKS), Rua 12 de Novembro, Sumbe, Angola; Institute for Sustainable Plant Protection - Consiglio Nazionale delle Ricerche (CNR), Via Giovanni Amendola 165/A, Bari, Italy. Centro Nacional de Investigação Científica (CNIC), 201 Ho Chi Min Avenue, CP 34, Luanda, Angola, Virology Journal 18, 62 ,2021].** https://doi.org/10.1186/s12985-021-01535-x

Registration and Release of New Promising Rust Resistant Wheat Cultivars in Iraq.

Within the framework of the breeding program for improving wheat resistance to rust diseases and the new aggressive races of the pathogen, the program's efforts resulted in the registration and release of two new

promising wheat cultivars with multiple resistance to rust diseases, which was approved by the National Committee for the Registration and release of agricultural cultivars in the Iraqi ministry of agriculture under Ministerial resolution No. 41 of 12/31/2020. The program headed by Prof. Emad Mahmoud Ghaleb Al-Maarouf, a member of the Arab Plant Protection Society, and his scientific team. The variety Azmer 2 is distinguished by its multiple resistance to yellow rust, black stem rust and brown rust due to the variety containing eight identified genes as Sr46, Sr36, Sr31, Sr25, Sr22, Lr46, Lr24, Lr19 in addition to a number of unidentified resistance genes, Whereas, the new multi-resistant cultivar "Charmo" possess eight identified resistance genes Sr22, Sr2, Sr25, Sr36, Sr46, Lr46, Lr24, Lr19, in addition to a number of unidentified resistance genes. The new promising resistant wheat cultivars were also distinguished by their high yield potential compared to the local cultivars, which will make an effective contribution to securing the food basket and achieving self-sufficiency with other promising cultivars**. [Emad Mahmoud Ghaleb Al-Maarouf (Iraq), 2020]**

RNA Interference (RNAi)-Based Control of Phytophagous Mites.

Spider mites of the family Tetranychidae (Acari: Prostigmata) are pests of a wide range of crops, vegetables, and ornamental plants. The two-spotted spider mite (TSSM), *Tetranychus urticae* is distributed in more than 120 countries and has been found in association with more than 1100 host plants (Migeon and Dorkeld 2020). Chemical pesticides have long been the common method to control spider mites. However, due to their short developmental times and high reproductive potential, spider mites and in particular *T. urticae* has extraordinary ability to adapt or evolve resistance to most known active ingredients and in a manner faster than the beneficial organisms (Stumpf and Nauen 2001; Van Leeuwen et al. 2010; Schmidt-Jeffris and Beers 2015). Chemical pesticides also exert a severe risk on humans and the environment. Therefore, alternative pest control strategies that are environment-friendly and less prone to resistance are crucially needed. RNA interference (RNAi) is a post-transcriptional gene silencing process where a sequence-specific double-stranded RNA (dsRNA) degrades homologous mRNA with RNAi machinery (Fire et al. 1998). RNAi is widely used in functional genomic studies in different taxa and is extensively exploited as a potential alternative pest control measure in insects and mites (Tian et al. 2009; Kwon et al. 2016; Cao et al. 2017). RNAi bioassay starts with selecting a gene of interest, synthesize dsRNA, dsRNA delivery, and finally examining the biological impact of a silenced gene on the targeted organism. RNAi induction was demonstrated in *T. urticae* for several genes for each the gene transcription level was reduced and specific phenotypes were also observed suggesting success in gene silencing (e.g. Khila and Grbić 2007; Kwon et al. 2013, 2016; Suzuki et al 2017). The high-throughput screen of potential RNAi candidate genes is the main challenge due to the difficulty to deliver dsRNA effectively into target organisms.Oral feeding is a simple approach for delivering dsRNA into mites. This approach does not, in general, require specific technical skills compared to time-consuming microinjection or soaking techniques that may compromise the survival and physiology of test organisms. Recently, we have developed a novel method (a leaf-mimicking method) to orally deliver water-based liquid solutions into *T. urticae*. The method uses nylon mesh sheets to which the liquid is added and then covered with stretched parafilm to allow mites to feed through (further details can be found in Ghazy et al. 2020). The method has high delivery efficiency where more than 95% of the TSSM tested population could intake liquid solution with the tracer dye within 4 hours (Figure 1). Using this method, a 10 µL of liquid solution can be delivered to ~100 mites (i.e. 0.1 µL/ individual). The efficiency of the newly developed delivery method was tested for dsRNA targeting *Vacuolar-type H^+-ATPase* (*TuVATPase*) gene in *T. urticae*. The silencing of *TuVATPase* in TSSM is associated with the dark-body mite phenotype (Suzuki et al 2017) (Figure 2). Thus, the oral feeding of dsRNA enables high-throughput RNAi screens to identify genes involved in important biological processes. The evidence from our and previous work indicates that RNAi technology may play a

potential role in spider mites control. **[Noureldin Abuelfadl Ghazy[1,2] (Egypt-Japan) and Takeshi Suzuki[1] (Japan), [1]Graduate School of Bio-Applications and Systems Engineering, Tokyo University of Agriculture and Technology, Koganei, Tokyo 184-8588, Japan, [2]Agriculture Zoology Department, Faculty of Agriculture, Mansoura University, 35516 El-Mansoura, Egypt, 2020].** noureldinghazy@mans.edu.eg **(NAG),** tszk@cc.tuat.ac.jp **(TS)**

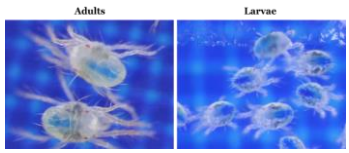


Figure 1. Oral delivery of a water-based liquid solution with a 1% (w/v) blue tracer dye (Brilliant Blue FCF) to adults and larvae of *T. urticae* using the leaf-mimicking delivery method (Ghazy et al. 2020).

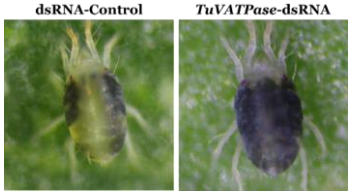


Figure 2. The dark-body phenotype of *T. urticae* adults fed on 1 µg µl−1 *dsRNA-TuVATPase* or dsRNA-Control delivered using the leaf-mimicking method. The dark-body phenotype is evidence of *TuVATPase* silencing in *T. urticae* (Suzuki et al 2017)**.**

Selected Distinguished Mediterranean Research Abstracts

Nucleotide Diversity Analysis of Candidate Genes for Verticillium Wilt Resistance in Olive.

Analyzing the molecular variability of genes potentially related to disease resistance in olive (*Olea europaea* L.) could be useful to develop marked assisted strategies for breeding as well as for general management of genetic resources. This work studied nucleotide diversity of 77 different genotypes from cultivated and wild subsp. *europaea*, subsp. *guanchica* and subsp. *cerasiformis* in coding regions of 7 disease response genes involved in different resistant mechanism against the infection of the fungal phytopathogen *Verticillium dahliae*. A total of 92 functional SNPs and 2 InDels were revealed unevenly distributed among each gen with frequencies from 0.0019 to 0.0614. Haplotype analysis were carried out to identify relationships between SNPs and disease resistance phenotypes or subspecies. Although a clear correlation attending to resistance evaluation could not be observed, phylogenetic and structure analysis showed some interesting association regarding the origin of plant materials for some genes. These are the first functional SNPs associated to Verticillium wilt resistance genes in olive and can contribute to stablish of a set of valuable markers for the management of germplasm collections and selection process in breeding programs. This research is part of a PhD thesis by **Dr. Alicia Serrano** from the University of Córdoba / Spain and the Andalusian Institute for Agricultural Research and Training (IFABA, Córdoba), which ended with the selection of three new varieties under registration, which are suitable for cultivation in areas affected by the fungus *V. dahliae* and produce excellent virgin olive oils. **[Alicia Serrano (Córdoba, Spain) Lorenzo León, Angjelina Belaj and Belén, Andalusian Institute of Agricultural Research and Training (IFAPA), Center 'Alameda del Obispo', Córdoba, Spain, 2021]. To read the full article and the articles related to Dr. Serrano please visit:** https://doi.org/10.1016/j.scienta.2020.109653,https://doi.org/10.1094/PDIS-08-20-1829-RE, https://doi.org/10.1016/j.lwt.2020.110257, https://doi.org/10.1002/ejlt.202000162,

General News

ICPP2023 Lyon, One Health for all Plants, Crops and Trees, France.

ICPP2023 First Announcement and Call for Satellite Events

The International Society for Plant Pathology (ISPP) is pleased to announce the 12th International Congress on Plant Pathology (ICPP2023) that will take place from 20-25 August 2023 in Lyon, France. The French Phytopathological Society (SFP) is honored to organize this world event for the first time! We hope that it will be the opportunity to bring together researchers from our community around the latest issues of Plant Health. Time is close to meet again in person and to find the way back to international congresses. Call for satellite events: "Take advantage of the facilities set up during the

ICPP2023-Lyon to carry out your own event in plant pathology!". A satellite event is a symposium or a workshop (half day, 1, 2 or 3 days) that will take place the weekend just before (or just after) the ICPP2023 on a topic of interest to ICPP attendees related to Plant Pathology or Plant Health. Satellite events will allow combination of both events into a single trip! For more information go to https://www.icpp2023.org/, Contacts: Dr. Nathalie Poussereau (ISPP vice-president, ICPP2023 co-chair). **Dr. Mathias Choquer (SFP board member, ICPP2023 co-chair).** https://www.icpp2023.org/

Workshop on Control Strategies of Fall Armyworm: Exchange of International Experiences

Plant Protection Research Institute successfully organized workshop for two days April, 4th and 5th. Nine agricultural specialists from USA, China, India, Zambia, Kenya and Brazil presented valuable lectures covering different approaches on FAW and its management.The invitation was public to the researchers' and specialists in the field of plant protection.More than 350 participants were attended. The results were fruitful in achieving the goal of the workshop "Control strategies of Fall Armyworm" (Exchange of International experience). Since the use of chemical pesticides was the first choice among farmers and the striking power of that unruly, rapidly reproducing and spreading insect, the insect gained resistance in subsequent generations. Indeed, it showed strong resistance to chemical pesticides and the killing of non-target organisms, and the plants themselves were affected by the effect of spraying. So it was necessary to change the concept of chemical control and search for sustainable control methods for this imported, multi-host insect with destructive power, in order to preserve food security at the local and global levels. And the success of the control has foundations that focus on studying the behavior of the insect, its life cycle, and its spread, to determine the economic thereshold for it, and then start to control it.

At the beginning of the workshop, some information was presented during the first day of the workshop, on top of which is that the pest has a capacity for genetic adaptation, which contributed to its establishment in the places it invades. This information discussed in details in lecture of the professor Dr.Lifei Director of the institute Insect Science College of Agriculture and Biotechnology, Zhejiang University, China "The genetic adaptations of Fall Armyworm *Spodoptera frugiperda* faciliated its rapid global dispersal and invasion" It is right?. Also, Professor Baoqian Lyu from the Environmental and Plant Research Institute -Chinese Academy of Tropical Agricultural Science, China discussed the importance of monitoring to this pest. He pointed out that monitoring is of utmost importance as a preemptive step to confront the pest before spreading and control it at the beginning of its emergence and limiting it to limited places and control it "Monitoring and control of cross-border pests". Dr. Robert Meaghar, Jr from Insect behavior and Biocontrol Research, Gianesville, Fl USA gave a lecture titled " Fall armyworms scouting, monitoring and surveillance, with a focus on trapping and pheromones". He also stressed the importance of monitoring for that invasive pest and explained the effectiveness of using specialized pheromones for that pest. During the next day, Dr. Sharanabassba S. Deshmukh (Department of Entomology, College of Agriculture, University of Agricultural and Horticultural Sciences, India, clarified its spread, life cycle, the damage of it which inflicts on the plant, symptoms, and the feeding behavior under the heading of "an overview of Fall Armyworm including distribution, biology, nature of damage, symptoms, host plants and feeding behavior". Besides, Dr. David Mota Sanchez's lecture from the Department of Entomology - University of Michigan in the U S A came to clarify the most important

pesticides and insect growth regulators used in controlling this pest, which proved to be effective and successful. Also, the lecture included shedding light on insect resistance to some pesticides under the title of "Pesticide management and resistance". Dr. Vinay Kalia from Indian Council of Agricultural Sciences (Indian Institute for Agricultural Research), India, explained the role of biopesticides in controlling Fall Armyworm in a lecture titled Evaluation of biopesticides against Fall Armyworms. Finally, the workshop was concluded with a lecture by Dr. Adeney de Freitas Bueno from the National Council for Scientific and Technological Development in Brazil. He focused on the importance of using parasites as Trichogramma, which has proven successful in reducing the armyworm population and the lecture title was "Biological control of Fall Armyworm".

The International Conference of Sustainable Agriculture and its Role in Economic and Human Development, University of Basrah, Collage of Agriculture, Iraq. 17-18 Feb, 2021.

The College of Agriculture - University of Basra, in cooperation with the United Nations Development Program (UNDP), is holding its fourth international remote scientific conference entitled sustainable agriculture and its role in human and economic development for the period from 17-18 / February / 2021. The Arab Society for Plant Protection has given appreciation awards for the research of five distinguished students in postgraduate studies (they are: Muhammad Sabri Al-Amara, Samer Salim Al-Shakurji, Ali Ahmad Khalaf, Ahmed Zayer Risan, Zahra and Hih Shalash) and the prizes were presented. By the Dean of the College of Agriculture, Sajid Saad Hassan, and Dr. Muhammad Aamir Fayyad, the number of research papers and lectures presented was 84. Of these, 17 were from outside Iraq and 67 from inside Iraq.

Invasive Pests and Their Risks on Agriculture in the Arab Region.

Alien or invasive pests are considered one of the major challenges to global and Arab food security in particular, and their spread has exacerbated in recent years due to climate change and the Covid-19 pandemic in addition to the emergence of the resistance problem due to the irrational use of pesticides and other reasons. The Invasive pests cause a loss of 1 trillion dollars annually distributed by the important agricultural countries, and Europe which is the closest to us loses about 12 billion dollars annually (European Union 2013). There are no figures for pests' losses in the Arab countries rather, there are general quantitative estimates that cannot be adopted. The threat of pests increased in the last three decades, started with invaded of red palm weevil *Rhynchophorus ferrugineus* in the Gulf countries in the eighties, and from there it spread to other countries of the world, followed by the citrus leaf minor *Phyllocnistis citrella* and tomato borer *Tuta absoluta* and many species of fruit flies, cochineal scale insect on cacti *Dactylopius opuntiae*, green scale on palm trees *Asterolecanium phoenicis*, and the rapid decline of olive trees caused by the Xylella bacteria. Lastly, during the last three years, Fall Armyworm (FAW) *Spodoptera frugiperda* (Smith 1797) has spread which is one of the most destructive and transboundary pests that threaten agricultural crops and food security worldwide. It is endemic in the tropical part of the Americas, and in early 2016 it moved to West Africa in Nigeria, Sao Tome and Principe from where it spreads to cover 44 countries in the African continent during 2016 and 2017. The flight capacity around 100 km per night and with assistance of wind the moth could infests more regions where the preferred host corn and sorghum are available. Day *et al*., 2017 indicates that in the absence of appropriate control methods, Fall Armyworm can cause an estimated 8.3 to 20.6 million tons per year maize losses for 12 African maize producing countries. This represents between 21-53% of the annual production of maize in these countries, and the material value of these losses is estimated between 2.48 and 6.19 billion US dollars. The insect recorded in Sudan in Yemen, India, Bangladesh, Sri Lanka and the rest of Asian countries 2018 and was reported in Egypt, China, Korea, Thailand, Japan, Nepal and Indonesia during 2019, as well as in Australia, the United Arab Emirates, Mauritania, Israel, Jordan and Syria in 2020 and the danger continues to worsen and spread to the rest of the region countries The host range of this insect is very wide, and it includes more than 352 different plants the majority of which belong to the Gramineae such as corn and

sorghum, millet, sugar cane, rice, cotton and other important hosts. Due to the importance of the insect as a main pest affecting food security, the Food and Agriculture Organization of the United Nations launched an international plan to combat this insect for the period from 2020-2022, and allocated an amount of $ 500,000 million to help countries adopting integrated management policies developed by experts. The most important control measure implemented in Africa after the first outbreak was intensive use of insecticides which demolish most of the biological enemies there. The application of the push-pull cropping system, which reduced moth infestation by 86% and increased production by 2.7 times in both Kenya Tanzania and Uganda has been promoted and adopted by the smallholder farmers in many African countries. In addition to that, a quick population survey of the biological enemies present in Africa was carried out, and recorded three important egg parasitoids, namely *Trichogramma* spp, *Telenomus remus*, *Chelonus insularis* and several larval parasites such as *Cotesia marginiventris*, *Cotesia icipe* and other species related to Braconidae, Ichneumonidae and Tachinidae and others.Biorational insecticides have been promoted and implemented, *Bacillus thuringiensis*, Emamectin benzoate,Spinosad,Azadirachtin and others belong to Diamide insecticides were applied extensively to safeguard the bioagents and suppress the pest. **[Ibrahim Al-Jboory (Iraq), Arab Society for Plant Protection, The International Conference of Sustainable Agriculture and its Role in Economic and Human Development, University of Basrah, Collage of Agriculture, Iraq. 17-18 Feb, 2021.**

New Insights on Phytoplasmas and *Xylella fastidiosa* Risk Analysis in the Arab Region.

Phytoplasmas and *Xylella fastidiosa* (*Xf*) are plant pathogenic bacteria that infect a very wide range of plant species, affecting both cultivated and wild plants in all regions of the world. Economic losses associated with these plant pathogens are high every year due to their impact on economically and ecologically important crops. During the past two decades, frequent complaints from fruit tree and vegetable growers about disease epidemics in certain Arab countries, yield losses and the appearance of peculiar symptoms such as proliferation, witches'-broom, yellowing, virescence, phyllody and leaf scorch have resulted in an increased incidence and severity of phytoplamsma diseases and have prompted surveys on *Xf* too. A disease known as almond witches'broom (AlmWB) is occurring with high incidence in Lebanon associated with the presence of '*Candidatus* Phytoplasma phoenicium' in almond and peach trees and responsible for the death of more than 100,000 trees. This disease is also widespread on almond in Iran and currently on apricot and sweet orange trees and recently reported in ornamental pomegranates in Turkey. Leaf curling, yellowing and fruit malformation causing serious economical losses on apricots and peaches revealed the presence of European stone fruit yellows (ESFY) in Egypt. *Ca.* Phytoplasma prunorum associated with leaf reddening in autumn, off-season growth in winter was reported in Tunisia. The study of phytoplasmas in Jordan indicated the occurrence of aster yellows phytoplasma (16SrI) affecting peach trees and '*Ca.* Phytoplasma solani' infecting plum trees. Bois Noir associated with the presence of '*Ca.* Phytoplasma solani is one of the most widespread disease of the grapevine yellows complex in several Arab countries such as Lebanon, Jordan and Syria. Witches' broom disease of lime (WBDL) constitutes a major threat to citrus in Sultanate of Oman and United Arab Emirates. As for field crops, phytoplasma diseases have been detected in recent years with a very limited degree in certain Arab countries. *Ca.* P. australasia and *Ca.* P. cynodontis were detected in symptomatic tomato, eggplant, mallow and Bermuda grass in Iraq, however, *Ca.* Phytoplasma trifolii was reported on tomato in Jordan and in tomato and pepper in Lebanon. Moreover, the new reports on the occurrence of *X.f* in the EPPO region, western Asia and the Middle East, the appearance of the suspicious leaf scorching symptoms similar to those caused by *Xf* in certain Arab countries and the exchange of plant propagation material of unknown sanitary status poses a high risk for the establishment and spread of this bacterium in the Arab region. Intensive studies should be carried out to investigate the distribution of the phytoplasmas insect vectors and their natural hosts all over the Arab countries as well as intensive field surveys and continuous monitoring are extremely needed to assess the sanitary status of strategic crops and to detect the bacterium *Xf* early in order to take appropriate measures to limit its spread. Strengthening human capacity in pathogens diagnosis is also an urgent need to be able to reliably detect these invasive diseases that threaten the Arab region. **[Elia Choueiri (Lebanon), Department of Plant Protection, Lebanese Agricultural Research Institute, Tal Amara, P.O. Box 287, Zahlé, Lebanon, The International Conference of Sustainable Agriculture and its Role in Economic and Human Development, University of Basrah, Collage of Agriculture, Iraq. 17-18 Feb, 2021.**

Iraq Experience on Implementation of Integrated Pests Management (IPM)/Biocontrol Programs.

The first attempt to use biological control goes back to the seventies of the last century when the Ministry of Agriculture produced a limited number of the local predator *Dicrodiplosis Sp* under normal laboratory conditions and launched it to control the mealybug on citrus, but the attempt was stopped, followed by another attempt in the latter half of the 1990s when researchers from the Atomic Energy Organization were able to developed two types of parasites against some insects and more than one type of biocides against soil fungi, but the attempt also ended as the previous one. During 2002-2003, the State Board for Agricultural Research made a wider attempt to establish units for the production of some insect parasites, but they were also completely destroyed during the occupation period in 2003. The Ministry of Agriculture restored this activity in 2003 - 2010 and after the security situation stabilized they adopted a national project for integrated pest management in agriculture, which was formally established in 2005 and whose main objectives are to develop and apply safe alternatives to chemical pesticides, especially for palm pests, grains and vegetables, and thanks to God, the pioneering mass production units for parasites Some economically important insects were still functioning. There are also several other integrated management programs for agricultural pests that the Ministry has succeeded in developing and implementing in the field. The results of these ongoing program will be presented such as *Ommatissus lybicus*, Red Palm Weevil *Rhynchophorus ferrugineus, Batrachedra amydrula* insect on date palms and *Euryagaster testindaria* on wheat crop, *Tuta absoluta* on Tomatoes and Peach Fruit Fly *Bactrocera zonara* in addition to other programs. The lecture also included the most important foundations necessary for the sustainability of integrated management programs and their relationship to sustainable development. **[Nazar N.H. Alanbaky (Iraq), Retired Expert. The International Conference of Sustainable Agriculture and its Role in Economic and Human Development, University of Basrah, College of Agriculture, Iraq. 17-18 Feb, 2021.**

The Future of our Soils: from Plant Protection Prospective.

Our food basket is considerably produced directly or indirectly on our soils; thus any limitation in soils resources or introducing plant pathogens are remarkably reduced the food supplying worldwide. Suppose to be in 2050 the food production have to increase by a 60% globally OR 100% in developing countries to meet the increase of the world population and demands. Sustainable soil management in plant protection prospective is always the best key solution for such obstacles, last decades our soils had serious health problems; considering soil borne plant pathogens as well as Heavy metals pollution which reached unprecedented levels; then our soil healthiness suffering from a significant threaten to sustain their functions as a living system. The current paper is going to shed the light on soil borne plant pathogens which are belong to different groups: fungi (true fungi and Fungal- like Oomycetes) and bacteria. In Basrah, the most destructive are the soil borne fungi; most importantly *Rhizoctonia solani*; *Fusarium* spp.; *Macrophomina phaseolina* ; *Pythium* and other pathogens during the last decades and their economic damage for agricultural sectors. Additionally, the unprecedented increase of toxic heavy metals which exceeded the world permissible levels; with their impact on the plant healthiness; more specifically: Lead; Cadmium; Cobalt and Chromium and their interaction with Bioagnet activity in our agricultural soils. With a referring to a potential solution to such problems in terms of biological and agricultural procedures. **[Professor Mohammed H Abass(Iraq),The International Conference of Sustainable Agriculture and its Role in Economic and Human Development, University of Basrah, Collage of Agriculture, Iraq. 17-18 Feb, 2021.**

Integrated Management of Red Palm Weevil and the Challenge of Preventing Invasion to other Date Palm Orchards in Iraq.

Red palm weevil (RPW) *Rhynchophorus ferrugineus* (Olivier, 1790) is considered one of the most destructive invasive pest attacking all types of palms trees including date palms worldwide. In Iraq, the first invasion of RPW in the date palms of Safwan county/Basrah province were in December 2015; Red Palm weevil have categorized as quarantine pest of date palm trees. IPM protocol has been applied to prevent the spreading of WPR to other Iraqi provinces. Since the visual symptom of the invasive pest are difficult to detect, the legislation related to taking effective quarantine protocol has been taken to prevent the invasive pest spread to other regions by restricting the transporting of the offshoots and other planting materials within and between the provinces of Iraq. An assessment of the IPM has been achieved by monitoring of RPW in Safwan County (2016-2019). The eradication efforts Mechanical and Physical control) of RPW in the 1st year after the invasion did not prevent spreading the insect to other date palm trees in Safwan County after 2015. The number of infested palms increased in the next few years. Whereas, the continuous IPM program of RPW

prevented the invasion to other counties and provinces. The data of monitoring program conducting by Basrah-Department of Plant Protection, Ministry of Agriculture, indicated that the population of RPW is growing and the number of infested orchards are increased in 2020 compared to 2019. The current paper shaded the lights on the difficulties that faced the current IPM protocols and the possibilities of invasion of RPW to new regions in Iraq. **[Aqeel Adana Alyousuf (Iraq), The International Conference of Sustainable Agriculture and its Role in Economic and Human Development, University of Basrah, Collage of Agriculture, Iraq. 17-18 Feb, 2021].**

Efficacy of Ozone against Red Flour Beetle *Tribolium castaneum* (Herbst) (Coleoptera: Tenebrionidae) at Different Temperature Levels and Exposure Times.

The efficacy of ozone (approximately of 600 mg/ hour) was evaluated against Red Flour Beetle RFB *Tribolium castaneum* (Herbst) on wheat grain and flour at different temperatures as well as exposure times under laboratory condition. The results indicated that hatching egg rates suppressions were increased due to ozone exposure with increasing of temperature. The hatch egg rates were reduced to (0 %) in the treated treatments after 10 h at 45° C. However, mortality rates of RFB were increased with maximizing of the exposure time to ozone. When ozone was applied at the lowest temperature 35˚ C for 10 h, complete mortality or few survivals of RFB were recorded in the susceptible stages (larvae and adults). The complete mortality of adults, pupae and tested larval stages were examined with decreasing of exposure of ozone to 4, 6, and 4 h at 45˚ C. In conclusion, ozone application showed the efficacy on the mortality at all stages of the stored grain pest in wheat during the exposure for 10 h at 45˚ C. Eventually, temperature was a potential factor enhancing the application of ozone for RFB control**. [Mohammed S. AL-Emara, Aqeel A. Alyousuf, Mohammed H. Abass (Iraq), State Company for Foodstuff Trading, Ministry of Trade, Iraq Mohammed S. AL-Emara ,Department of Plant Protection, College of Agriculture, University of Basrah, Basrah, Iraq. Orcid: 0000-0002-7352-0168, 2021]**

Mustapha El Bouhssini -New Position

Dr. Mustapha El Bouhssini, joined Mohammed VI Polytechnic University (UM6P, www.um6p.ma) as Distinguished Professor of Entomology and Program Leader, Biodiversity and Plant Sciences on the first of February 2021. Mustapha was the Principal entomologist at the International Center for Agricultural Research in the Dry Areas from 1996 to the end of 2020. Located at the heart of the future Green City of Benguerir in Morocco, Mohammed VI Polytechnic University, a higher education institution with an international standard, is established to serve Morocco and the African continent. Its vision is honed around research and innovation at the service of education and development. This unique nascent university, with its state-of-the-art campus and infrastructure, has woven a sound academic and research network, and its recruitment process is seeking high quality academics and professionals in order to boost its quality-oriented research environment. In its research approach, the UM6P promotes transdisciplinary, entrepreneurship spirit and collaboration with external institutions, both international ones for developing up to date science, and at continent level to address real African challenges. Dr. El Bouhssini could be reached at Mustapha.ElBouhssini@um6p.ma

Congratulations to Dr. Youssef Khamis for being selected as a member of the Egyptian Youth Academy of Sciences (EYAS).

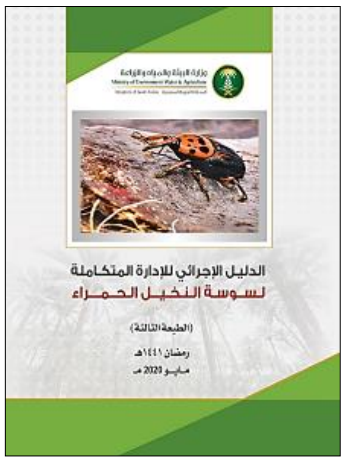
The board of the Arab Society for Plant Protection and the Editor-in-Chief of the Arab and Near East Plant Protection Newsletter, sincerely congratulates Dr. Youssef Khamis, Assistant Professor at the Plant Pathology Research Institute - Agricultural Research Center - Egypt for choosing him for membership in the Egyptian Youth Academy of Sciences (EYAS) of the Academy of Scientific Research and Technology in Egypt. It is noteworthy that the mission of the Egyptian Youth Academy of Sciences (EYAS) is to create a supportive and encouraging environment for science, technology and innovation in Egypt. The Arab Society for Plant Protection affirms its continuous support for the association's members and distinguished innovative Arab researchers, as they represent great scientific and research energy to bring about sustainable agricultural development in Arab countries and the Near East based on the various branches

of science and technology. Dr. Youssef Khamis is considered one of the Arab researchers known for their scientific competence at the Arab and international level. He is one of the editors and international referees of many international journals in the field of plant pathology and has many international articles with a high impact factor according to international publishing databases.

Books

Procedural Guide for the Integrated Management of the Red Palm Weevil.

The Ministry of Environment, Agriculture and Water (MEWA) of the Kingdom of Saudi Arabia (KSA) recently (2020) issued the third edition of the procedural guide for the integrated management of the red palm weevil (RPW). The preparation and publication of this guide is performed within the framework of implementing the components of the strategy of the integrated management and workplan for controlling RPW that was developed by MEWA in 2018 and which includes a total of 12 components: (1) training and capacity development program, (2) field monitoring system, RPW early detection and reporting, (3) database, geographic information system and remote sensing, (4) farmer participation mechanism and their cooperative societies, (5) information program and awareness campaigns, (6) integrated pest management and control practices, (7) offshoot nurseries and tissue seedlings, (8) plant quarantine and phytosanitary procedures, (9) good preventive practices, (10) monitoring, follow-up and evaluation system, (11) research, extension, documentation and knowledge sharing program, and (12) coordination mechanism and involvement of the private sector and the concerned parties. This strategy, with its multiple components, aims to unify the procedures for applying the control elements in all areas affected by RPW to control its spread and eradicate its hot spots, in order to achieve the KSA's vision 2030. In its new edition, this guide is characterized by its smooth and easy application with the aim to be the approved reference for the components of the workplan implementation in the various regions of KSA. The procedures for implementing the control program have been standardized by specifying the executive paths for each process, then adopted as step series to be executed into organized sequential frameworks in time and place to ensure good implementation and electronically recording of them, while ensuring commitment to the application of all rules of health preservation and professional safety during the implementation of all procedures. This third edition of the guide is characterized by a new vision that is fully compatible with the general orientation of MEWA in directing the program of RPW control. This edition contains 17 chapters, the most important of them concerns (1) adopting the general periodic detection as a new and important Saudi origination mechanism to follow up and assess the situation on the field, (2) expanding the field of control, in addition to injection and cleaning treatments, to fumigation with aluminum phosphide upon its experimentation by Saudi universities that confirmed its high efficiency in controlling RPW, (3) reducing reliance on targeted preventive spraying and restricting its use only after pruning actions, (4) using traps in a secondary and temporary way so that they do not to turn into a source for attracting and spreading RPW, (5) reducing the actions of removing the infested palm as an indicator of the success of control methods, (6) developing regulatory texts of internal plant quarantine for organizing offshoot and tree transportation, monitoring and inspecting their shipments, and setting terms of palm nursery creation to be free from RPW, (7) arranging mechanisms to deal with closed, neglected and uncooperative farms, (8) explaining the new partnership plan between the government and private sectors that MEWA developed recently (2020), and (9) procedure allowing the farmer, using his mobile phone, to notify suspicion of infestations, through an electronic application called "Ballagh" that MEWA has set since 2019. **[Arab & Near East Plant Protection Newsletter (ANEPPNEL) Published by the Arab Society for Plant Protection, 154 Pages, 2020].**



SELECTED RESEARCH PAPERS

- **Susceptibility of Fall Armyworms (*Spodoptera frugiperda* J.E.) from Mexico and Puerto Rico to Bt Proteins.** Rebeca Gutierrez-Moreno ,David Mota-Sanchez, Carlos A. Blanco, Desmi Chandrasena, Christina Difonzo, Jeffrey Conner, Graham Head, Kristina Berman and John Wise, Insects, 11(12), 831, 2020. https://doi.org/10.3390/insects11120831
- **Similar Gut Bacterial Microbiota in Two Fruit-Feeding Moth Pests Collected from Different Host Species and Locations.** Qiang Gong, Li-Jun Cao, Li-Na Sun, Jin-Cui Chen, Ya-Jun Gong, De-Qiang Pu,Qiong Huang, Ary Anthony Hoffmann and Shu-Jun Wei, Insects ,11(12), 840, 2020. https://doi.org/10.3390/insects11120840
- **A Pesticide Residues Insight on Honeybees, Bumblebees and Olive Oil after Pesticidal Applications against the Olive Fruit Fly *Bactrocera oleae* (Diptera: Tephritidae).** Kyriaki Varikou ,Konstantinos M. Kasiotis, Eleftheria Bempelou, Electra Manea-Karga, Chris Anagnostopoulos, Angeliki Charalampous, Nikos Garantonakis, Athanasia Birouraki, Fani Hatjina and Kyriaki Machera, Insects, 11(12), 855, 2020. https://doi.org/10.3390/insects11120855
- **First Report of *Aspergillus niger* Causing Preharvest Ear Rot Infection of Maize in Pakistan.** Farhan Goher, Faiza Shafique Khan, Saba Saeed, Muhammad Zeshan Ahmed, Salman Ghuffar, Muhammad Ammad Asif, Hafiz Arslan Anwaar, Muhammad Subhan Shafique, Khizar Razzaq , and Muhammad Amjad Ali, https://doi.org/10.1094/PDIS-05-20-1105-PDN
- **Fungal Pathogens Associated with Grapevine Trunk Diseases in young Vineyards in Sicily.** Vincenzo Mondello, Selene Giambra, Gaetano Conigliaro, Nicola Francesca, Santella Burruano, Phytopathologia Mediterranea, 59(3): 453-463, 2020.
- **In Vitro Screening of *Trichoderma* Isolates for Biocontrol of Black Foot Disease Pathogens.** Wynand Jacobus Van Jaarsveld, Francois Halleen, Lizel Mostert, Phytopathologia Mediterranea, 59(3): 465-471, 2020.
- **Population Abundance and Impact of Brown Marmorated Stink Bug *Halyomorpha halys* (Stål) on Grapevine in Northeastern Italy**. Davide Scaccini, Diego Fornasiero, Simone Vincenzi, Massimo Cecchetto, Carlo Duso, Alberto Pozzebon, IOBC-WPRS Bulletin Vol. 154, 2020.

PAPERS PUBLISHED IN THE ARAB JOURNAL OF PLANT PROTECTION (AJPP) VOLUME 39, ISSUE 1, MARCH 2021

SURVEY

Races Identification of Wheat Rusts in Syria during the 2019 Growing Season
Sh. Kharouf, Sh. Hamzeh and M.F. Azmeh (SYRIA)
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https://doi.org/10.22268/AJPP-39.1.001013

Survey of Parasitic Nematode Genera Associated with Grapevine Roots in Sweida Governorate, Syria
S.M. Al-Halabi and K. Al-Assas (SYRIA)
Pages 14-21
https://doi.org/10.22268/AJPP-39.1.014021

PLANT EXTRACTS

Effect of Plant Extracts of *Withania somnifera* (L.) Dunal. on Some Biological Performance of Cotton Leaf Worm (*Spodoptera littoralis* Boisd.)
R.S. Al-Jorany and H.I. Al-Khazraji (IRAQ)
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https://doi.org/10.22268/AJPP-39.1.022028

Effect of Eggplant Root Extracts on the Growth of Storage Fungi of Wheat Grains and Their Ability for Aflatoxin Production in Babylon Silos in Iraq
I.J. Kadhim, F.H. Kareem and S.H. Segar (IRAQ)
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https://doi.org/10.22268/AJPP-39.1.029038

DISEASE PHYSIOLOGY

Effect of Cucumber Mosaic Virus on Proline and Hydrogen Peroxide Content in Some Pepper Hybrids Grown in Lattakia Governorate, Syria
H. Al-Ajouriyeh, I. Ismail, B. Samra and F. Sahyouni (SYRIA)
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https://doi.org/10.22268/AJPP-39.1.039046

DETECTION

Detection and Molecular Characterization of Watermelon Mosaic Virus (WMV) Spread Along the Syrian Coast
A.M. Mouhanna, A.A. Ali Hasan and H.N.H. Alobaidi (SYRIA & IRAQ)
Pages 47-54
https://doi.org/10.22268/AJPP-39.1.047054

PESTICIDES

Sensitivity of Wheat Genotypes to Newly Introduced Selective Herbicides
M.R.A. El-Taif (IRAQ)
Pages 55-60
https://doi.org/10.22268/AJPP-39.1.055060

BIOLOGICAL CONTROL

Induction of Systemic Resistance in Tomato (*Solanum lycopersicom* L.) Against Damping-off Disease by Using a Mixture of Mycorrhizae
M.I. Khrieba, M.F. Azmeh, W. Chouman, I. Ghazal, and A.K. Ali (SYRIA)
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Adoption of Olive Farmers to the Integrated Pest Management Techniques in the Syrian Coastal Region
L.M. Sakr, M.J. Al-Abdallah and A.N.M. Bashir (SYRIA)
Pages 69-78, https://doi.org/10.22268/AJPP-39.1.069078

BIOLOGY

Effects of Tomato Leaf Curl Virus on Growth and Yield Parameters of Tomato Crop
Y. Iftikhar, M. Mubeen, A. Sajid, M.A. Zeshan, Q. Shakeel, A. Abbas, S. Bashir, M. Kamran and H. Anwaar (PAKISTN & CHINA)
Pages 79-83, https://doi.org/10.22268/AJPP-039.1.079083

PAPERS, WHICH WILL BE PUBLISHED IN THE ARAB JOURNAL OF PLANT PROTECTION (AJPP), VOLUME 39, ISSUE 2, JUNE 2021

- **New Invasive Insects Associated with Oak Forests in Lebanon.** Z. Moussa, E. Choueiri and A. Hanna (LEBANON).
- **Effect of Constant Temperatures on Biological Parameters of *Tuta absoluta* (Meyrick, 1917) (Lepidoptera: Gelechiidae) on Tomato Plants in Case of Asexual Reproduction (Parthenogenesis).** N. Abou Kaf, R. Yousef and R. Aboud (SYRIA).
- **Detection of Citrus Bent Leaf Viroid in Citrus Orchards of Sargodha, Pakistan.** F. Bakhtawar, Y. Iftikhar, M. A. Zeshan and M. I. Hamid (PAKISTAN).

- **Activity Monitoring of Olive Fruit Fly, *Bactrocera oleae* (Rossi) Males, and Effect of Temperature and Relative Humidity, at Al Quneitra Governorate, Southern Syria.** N. Diab, E. Joury, M. Dawoud and A. Jalloud (SYRIA).
- **Laboratory Study of the Effect of Some Factors on the Parasitoid, *Psyttalia concolor* (Szépligeti) (Hymenoptera: Braconidae), of the Olive Fruit Fly.** M. Zraiki, A.N. Bashir and Gh. Ibrahim (SYRIA).

EVENTS OF INTEREST 2021-2022

20-22/4/2021	The 16th Congress of the Mediterranean Phytopathological Union in Limasol, Cyprus. Info@easyconferences.org
29-30/4/2021	Third European Conference on *Xylella fastidiosa* and XF-ACTORS final meeting. https://www.efsa.europa.eu/en/events/event/3rd-european-conference-xylella-fastidiosa-and-xf-actors-final-meeting
18-23 /7/2021	XXXVI International Congress of Entomology, Helsinki, Finland. www.ice2020helsinki.fi
7-10 /10/2021	XII International Agriculture Symposium "AGROSYM 2021" Jahorina, Bosnia and Herzegovina. http://agrosym.ues.rs.ba/
31/10-4/11/2021	The 13th Arab Congress of Plant Protection in Tunis (2020), Hammamat, Le Royal Hotel, Tunisia. www.acpp-aspp.com
11-15/7/2022	IX EURAAC Symposium of the European Association of Acarologists in Bari- Italy, https://euraac2022.com/
18-23/7/2022	The 26th International Congress of Entomology, Helsinki, Finland, July 2022. https://ice2020helsinki.fi/
20-25/8/2023	ICPP2023 Lyon, One Health for all plants, crops and trees, France. https://www.icpp2023.org/

DRUGSTORE BEETLE, BREAD BEETLE, BISCUIT BEETLE ON CORIANDER, *STEGOBIUM PANICEUM*

New Record in Jordan by Al-Jboory and Katbeh 2021

The Editorial Board of The Arab and Near East Plant Protection Newsletter Highly Appreciates the Contribution Of Several Arab Scientists In This Issue, Namely:

Aqeel A. Alyousuf (Iraq), Abdelgid Ahmed (Egypt), Ibrahim Al-Shahwan (Saudia Arabia), Abdul-Nabi Basheer (Syria), Houda Boureghda (Algeria), Ayad A. Al-Taweel (Iraq), Hassan Sulaiman Ahmed Mahdi, (Yemen), Aziz Ajlan (Saudi Arabia), Mokhtar Abdulsattar Arif (Iraq-Italy), Elia Choueiri (Lebanon), Oadi Matny(Iraq-USA), Mazen Alazem (Syria-Korea), Mohamed Afechtal (Morocco), Amira Jouini (Tunisia), Ali Kareem Al-Taae(Iraq), Amani Alawamleh(Jordan-Italy), Emad Mahmoud Al-Maaroof (Iraq) , Mohammed Zaidan Khalaf (Iraq), Noureldin Abuelfadl Ghazy(Egypt-Japan), Imen Haddoudi (Tunisia), Youssef Khamis (Egypt-Brazil), Alicia Serrano (Córdoba-Spain), Mohamed Mannaa (Egypt-Korea), Haider Dhareb Shaaban (Iraq), Hashim Mhawi Tuama Al-Ibadi (Iraq), Auhood Jafar Toma (Iraq), Hassin A.mehadi (Iraq), Anmar Razak Khames (Iraq), Donato Boscia (Italy), Ashraf F. Abd El-Rahman (Egypt), Ahmed Abdelmottaleb (Qatar), Nazar N.H.Alanbaky (Iraq), Mohamed Amer (Iraq), Mohammed H Abass(Iraq), Aqeel Adana Alyousuf (Iraq), Anne-Sophie Roy(EPPO,France), Ahmed Abd Elmaged(Egypt), Mamoon Alalawi (FAORNE) Lidia AbdelShahid, (FAORNE), Heba Tokali (FAORNE), Ahmed Elsayed (FAORNE), Ashraf Al-Saeed Khalil (Egypt), Maged Elkahky (FAONSP), Ahmed Elkenawy(FAOEG), Ashraf Saber Alhawamdeh (FAOYE), Mustapha El Bouhssini(Morocco), Mohamed Ali Bob (FAORNE).

News and announcements from all, on any aspect of plant protection in the Arab world, are invited for the Newsletter. Contributions from the Executive Committee of the Arab Society for Plant Protection and from the four Subject Matter Committees, as well as from national societies in the Arab region dealing with any aspect of plant protection, are kindly requested and highly appreciated.

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