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ARAB SOCIETY FOR PLANT PROTECTION

# ARAB AND NEAR EAST PLANT PROTECTION BULLETIN

نشرة وقاية النبات في البلدان العربية والشرق الأدنى

**(ANEPPB)**



# ARAB AND NEAR EAST PLANT PROTECTION BULLETIN (ANEPPB)

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# CONTENTS

<b>EDITORIAL - Plant Virus Taxonomy: The New Binomial Nomenclature for Virus Species</b>	<b>3</b>
<b>CROP PROTECTION NEWS FROM ARAB AND NEAR EAST COUNTRIES</b>	<b>5</b>
• <b>INVASIVE, NEW PESTS AND BENEFICIAL</b>	<b>5</b>
• <b>RESEARCH HIGHLIGHTS</b>	<b>9</b>
<b>GRADUATE STUDENT'S ACTIVITIES (M. Sc. AND PH. D. THESIS)</b>	<b>12</b>
<b>FOOD AND AGRICULTURE ORGANIZATION (FAO) PLANT PROTECTION ACTIVITIES</b>	<b>19</b>
FAO Holds the closing workshop for the regional project to Mitigate the risks of Fall Armyworm	19
FAO holds farmer field schools training on date palm pest management in Saudi Arabia	20
FAO Plant Protection division in NENA meets with WEQAA	21
FAO PARTICIPATES IN KING FAISAL UNIVERSITY WORKSHOP ON METHODS FOR MONITORING THE DESERTIFICATION PROCESS AND WAYS TO ADDRESS IT	21
FAO COLLABORATES WITH KING FAISAL UNIVERSITY (KFU) TO OPTIMIZE THE EFFECTIVE CONTROL OF THE RED PALM WEEVIL	22
FAO PARTICIPATES IN THE SECOND SESSION MEETINGS OF THE INTERNATIONAL DATES COUNCIL	<b>23</b>
FAO PARTICIPATES IN THE FIRST INTERNATIONAL FORUM ON DATES PROMOTION IN MUSCAT.	24
FAO ORGANIZED A STUDY TOUR FOR REPRESENTATIVES OF THE OMANI MINISTRY OF AGRICULTURE	25
<b>ACTIVITIES OF THE COMMISSION FOR CONTROLLING THE DESERT LOCUST IN THE CENTRAL REGION (CRC), FAO</b>	<b>26</b>
<b>ARAB SOCIETY FOR PLANT PROTECTION NEWS</b>	<b>28</b>
THE 14 <sup>TH</sup> ARAB CONFERENCE OF PLANT PROTECTION	28
ASPP ORGANIZE A WORKSHOP IN COLLABORATION WITH BASRAH UNIVERSITY "PHYTOSANITARY TECHNOLOGIES IN PLANT PROPAGATION AND DISTRIBUTION AND THEIR ROLE IN FOOD SECURITY".15-16 MAY 2023	29
<b>NEWS OF ASPP MEMBERS ABROAD</b>	<b>30</b>
KING SAUD UNIVERSITY IN RIYADH, KINGDOM OF SAUDI ARABIA, HOSTED THE INTERNATIONAL CONFERENCE & EXHIBITION FOR SCIENCE (ICES2023)	32
<b>XYLELLA FASTIDIOSA NEWS</b>	<b>33</b>
<b>GENERAL NEWS</b>	<b>35</b>
ANNOUNCING THE KHALIFA INTERNATIONAL AWARD FOR DATE PALM AND AGRICULTURAL INNOVATION WINNERS' NAMES, IN ITS FIFTEENTH SESSION	35
<b>SELECTED RESEARCH PAPERS</b>	<b>40</b>
<b>PAPERS PUBLISHED IN THE ARAB JOURNAL OF PLANT PROTECTION (AJPP) VOLUME 41 ISSUE 1, MARCH 2023</b>	<b>41</b>
<b>SELECTED GLOBAL PESTS</b>	<b>43</b>
<b>EVENTS OF INTEREST</b>	<b>44</b>



### Plant Virus Taxonomy: The New Binomial Nomenclature For Virus Species

The International Committee on Taxonomy of Viruses (ICTV), founded in 1966, is responsible for developing and maintaining an internationally agreed system of hierarchical classification of viruses and naming of taxa. The ICTV oversees also the classification of other mobile genetic elements, including satellite nucleic acids, viriforms and viroids. The advancements in virus taxonomy are made available to the scientific community through a website (<https://ictv.global/>).

Contrary to what could be commonly perceived, taxonomy is a very dynamic discipline since classification may change as far as new data are obtained. Over time the ICTV has adapted its taxonomic framework to the current knowledge on the evolution of virosphere. In particular, the ICTV now allows the classification of viruses known only from genome sequences obtained by metagenomic analyses. Taxonomic ranks have been expanded beyond orders up to realms, to include eight primary ranks (realm, kingdom, phylum, class, order, family, genus and species) and seven secondary ranks (subrealm, subkingdom, subphylum, subclass, suborder, subfamily and subgenus), paving the way to comprehensive studies on evolutionary connections of viruses. Thus, taxa in the 15-rank taxonomy must be monophyletic. An example is the realm *Riboviria*, the first established realm comprising all currently classified RNA viruses. The only mandatory taxa are genus and species, meaning that unassigned species in a family will be abolished unless they are assigned to a genus.


At present, virus taxonomy consists of 6 realms, 10 kingdoms, 17 phyla, 2 subphyla, 39 classes, 65 orders, 8 suborders, 233 families, 168 subfamilies, 2606 genera, 84 sub-



genera, 10434 species (<https://ictv.global/taxonomy>).

The expansion of taxonomic ranks brings virus taxonomy closer to other biological taxonomies. Species naming in all these taxonomies follow a Latinized binomial format (i.e., binomial nomenclature) first introduced by Carl Linnaeus in 1753, consisting of two italicized words indicating the genus (“genus name”) and the species (“specific name/species epithet”), respectively. Typical examples of binomial species names are *Arabidopsis thaliana*, *Saccharomyces cerevisiae*, *Homo sapiens*, and *Escherichia coli*.

In contrast, viral species names did not follow a uniform format, except for the requirement to be italicized and to have the first letter of the first word capitalized. The distinction between the virus species and the virus name based mainly on the font style has been for years cause of confusion between two substantially different con-



cepts. In fact, “virus species” is a taxonomic category, whereas “virus” is referred to the physical entity, which is able to infect a host, or can be studied in laboratories. Taking cucumber mosaic virus as an example, the correct wording would have been: “The species *Cucumber mosaic virus* is a member of the genus *Cucumovirus* in the family *Bromoviridae*”, but “Plants infected by cucumber mosaic virus (CMV) show symptoms”. The difficulty in discriminating between virus and virus species is testified by the numerous mistakes contained in published scientific papers.

The ICTV recognized the need for a standardized nomenclature for virus species a long time ago and, after years of internal debates, in 2020 launched a call for public discussion and feedback on adopting a uniform binomial nomenclature. Following this, a binomial nomenclature for virus species was ratified by the ICTV in the 2021 vote. Thus, a virus species name will consist of two (and only two) italicized words, the first one being the genus name and the second one consisting of a “freeform” species epithet. In this framework, Linnaean-style, Latinized virus species are permitted, but not mandated. The species names can be composed using the standard Latin-script English alphabet containing 26 letters and/or Arabic numbers.

Starting 2021, newly created virus species names adopted a binomial format. The process of renaming all current species is underway and must be completed by the end of June 2023, to be ratified early in 2024. Very importantly, this process involves virus species names only. The common virus name will remain unchanged, and will be the same which has been always used.

Plant virologists showed much concern about the adoption of binomials to name virus species. Indeed, plant viruses usually have nicely descriptive names, which are familiar to most of the plant virology community. Once established that virus names will not be affected by the conversion of virus species names into binomials, an effort to reach a consensus among the plant virus Study Groups to find a shared binomial format is ongoing. For the time being, most of the Study Groups in the Plant Viruses Subcommittee adopted a Latinized, Linnaean-style binomial format. The species epithet recalls mainly the host, the geographic origin, or symptoms, and there is space for creativity. It must be noted that “Latinized” does not mean “Latin”, so there is no need to study this language to develop Latinized binomials. For example, the former virus species *Citrus psorosis virus*, now has a binomial format *Ophiopvirus citri*, where *Ophiopvirus* is the genus name and *citri* is derived from the host genus *Citrus*.

All the virus species currently approved by the ICTV are reported in two publicly available spreadsheets, the Master Species List (MSL) (<https://ictv.global/msl>) and the Virus Metadata Resource (VMR) (<https://ictv.global/vmr>). The VMR is particularly useful, since it reports both virus species and virus names, as well as the exemplar isolates and GenBank entries, making it easy to identify virus taxonomy.

### **Luisa Rubino**

Senior Researcher at the National Research Council (CNR), Institute for Sustainable Plant Protection (IPSP), via Amendola, 165/a, 70126-Bari,  
[luisa.rubino@ipsp.cnr.it](mailto:luisa.rubino@ipsp.cnr.it)

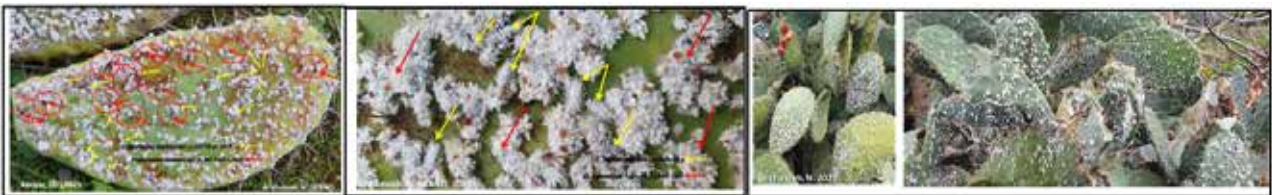
### invasive, new pests and beneficials

#### Syria

#### First record of the predator *Cryptolaemus montrouzieri* Mulsant (Coccinellidae: Coleoptera) on *Dactylopius opuntiae* (Cockerell) (Hemiptera: Dactylopiidae) in Syria

All stages of the predator *Cryptolaemus montrouzieri* (Larva, Pupa and adult) were observed on *Dactylopius opuntiae* on the host plant *Opuntia ficus-indica* in Baniyas along the Syrian coast during January 2023. This predator probably spread naturally on *Dactylopius opuntiae* due to the frequent annual release of the predator along the coastal region to control Pseudococcidae on citrus and before its release from the laboratories of Lattakia Center for Rearing Natural Enemies, which is a good and important indicator to control this invasive pest by safe biological methods. Cactus plates were transferred to the entomology laboratory of the center and developmental stages of both *D. opuntiae* and *C. montrouzieri* were isolated and characterized. Laboratory rearing is currently carried out to monitor the bio-efficiency of the predator for several generations. *C. montrouzieri* was introduced to Syria from Turkey in 1995; since then, it was reared at the center to release it periodically to control citrus mealybug. [Nadia Al-Khateeb(Syria), Biological Control Center, Directorate of Agriculture, Lattakia, Syria,2023]. [alkh.nadia@gmail.com](mailto:alkh.nadia@gmail.com)

Dr.Nadia published informative literature on the same predator; to check it, click on the link <https://iraqi-datepalms.net/?p=15400>



#### First record of *Acotyledon paradoxa* Oudemans (Acari:Acaridae) as a Pest of the eggs of *Bombyx mori* L. (Lepidoptera: Bombycidae) in Syria

All the mobile stages of *Acotyledon paradoxa* Oudemans, 1903 (Acari: Astigmata: Acaridae) were herein collected from the stock box of *Bombyx mori* L. (Lepidoptera: Bombycidae) feeding on eggs reared at Plant Protection laboratories (Faculty of Agriculture, Damascus University) in 2022. Mite adults and deutonymphs were cleared up in lactic acid, mounted in Hoyer's medium on a glass slide, dried in an oven at 45 °C, and then examined under a phase contrast microscope. Adult mites are whitish, shiny to yellowish in color. Adult females are 486 µm long and 312 µm wide. Adult males are 428 µm long and 224 µm wide. Idiosoma is very wide; Gnathosoma is longer than wide at the base. Propodosoma with a large punctate shield. Legs are of medium length, claws are normal and much shorter than tarsi. The copulatory opening ventral is close to posterior border of the body, with a very small and flat papilla. Vulva situated at the level of coxae IV. Genital suckers are well developed. Anus ventral, relatively far in front of the posterior margin of the body. Anal shield of female with six thin, slightly unequal anal setae, male with only three pairs of setae. Legs chaetotaxy in males is as in female but there are no foliate setae on tarsi I-IV. *Acotyledon* species are serious pests of stored grains and other stored products; they inhabit a wide range of habitats, of which some insects. *Acotyledon paradoxa* specimens were collected from the nests of owls, bats, and different rodents and the



stored wheat and granaries. This is the first record of *Acotyledon paradoxa* from Syria; *Bombyxmori* eggs add a new host of this acarid mite. [Mohamad Kanouh, Hicham Alrouz, Zakaria Al-naser (Syria), Department of Plant Protection, Faculty of Agriculture Damascus University, Syria, 2023].

### First record of the predator eighteen-spot ladybird *Myrrha octodecimguttata* (Coleoptera: Coccinellidae)

The predator *Myrrha octodecimguttata* (Linnaeus, 1758) was recorded for the first time in Lattakia-Syria on aphid colonies in maize fields and mixed with *Spodoptera frugiperda* during October and November 2022. It lives primarily in pine forests and feeds on aphids. *Myrrha octodecimguttata* is a medium-sized oval shaped ladybird ranging in length from 4.0-5.0 mm. with eighteen creamy white spots.



The head is brown with two white marks; the pronotum is also brown and has conspicuous whitish sides and white spots on the anterior and posterior edges. The white markings result in a rounded brown 'M' mark on the pronotum. The larva of *Myrrha octodecimguttata* is brown to greyish brown; the tubercles are mostly black, except for the dorso-lateral (dl) strumae sparse, and Lateral (L) groups on the first abdominal segment, which are bright orange. [Nadia Ibrahim Al-Khateeb<sup>(1)</sup>, Alaa Turkey Saleh<sup>(2)</sup>.(Syria), <sup>(1)</sup>Biological Control Center, Directorate of Agriculture, Lattakia, Syria. E-mail: [alkh.nadia@gmail.com](mailto:alkh.nadia@gmail.com) <sup>(2)</sup>. Biological control studies and Research Center, Faculty of Agriculture, Damascus University.

### The first report of Phloeospora leaf spot on mulberry caused by *Phloeospora maculans* in Lattakia, Syria

The mulberry tree (*Morus* spp.) has been cultivated in Syria for a long time due to its importance in Sericulture and silk industry, which has been famous since the first century AD. Recently spread of leaf spot disease on mulberry trees was noticed, resulting in significant losses in production.



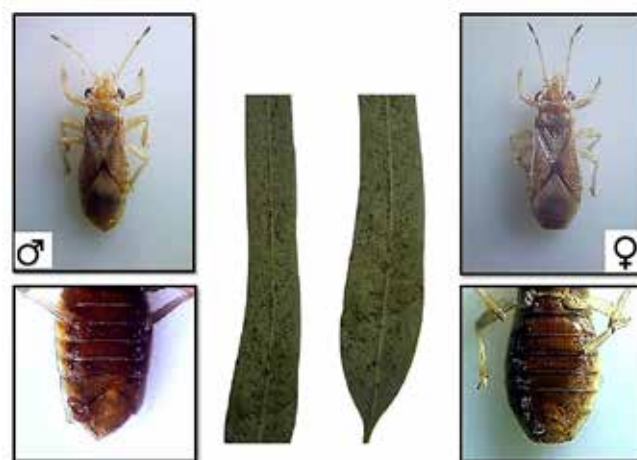
The study was conducted within the project "Development of Silkworm Breeding Project in Syria". Monthly field surveys were carried out in Lattakia from mid-May to end-October 2021. 40-60 mulberry trees were examined monthly, symptoms were recorded on the affected leaves with spots of different shapes and sizes. Infection rate and severity were estimated. Samples were collected from infected leaves, and pathogenic fungi were isolated on artificial cultures. The causative agent was identified based on disease symptoms and morphological and microscopic characteristics. Pathogenicity was studied (Koch's hypothesis). The results showed a high prevalence of this disease on *Morus* spp. The disease symptoms appeared on mature leaves in mid-June. The highest infection and severity rates were recorded in the second half of September (53.33%, 45.18%), respectively. Microscopic examination revealed that the fungus forms its conidiomata centrally at spot level, in the form of acervuli with circular, disc-shaped, white or pale gray, dimensions (145) 160-190 (210) micrometers (N=30), formed under the epidermis in concentric circles appear mostly on the



upper and sometimes on both surfaces of the leaf. It consists of a large number of short clublike undivided and colorless conidia  $6.5\text{--}20.5 \times 2.5\text{--}4.0 \mu\text{m}$ , at the end of which are threadlike and colorless conidia, and often curved and sometimes straight, divided by 1-6 septa. They are (17)  $25\text{--}55$  (62)  $\mu\text{m}$  long and  $2.4\text{--}3.7 \mu\text{m}$  wide ( $n=30$ ). The artificial infection showed spots appearance on 12-15 days after infection. The isolation results showed that the causative fungus is the same at the source (Koch hypotheses). Accordingly, it is likely that the causative fungus is *Phloeospora maculans* (Sandri) Allesch. based on morphological characteristics. Based on available data, this fungus is recorded for the first time in Syria, and it seems that the disease is not new in the region, but it has been confused with anthracnose disease that shares it almost similar symptoms. [Mohammad Matar, Faculty of Agricultural Engineering, Tishreen University, Syria, Atie Arab, Agricultural Scientific Research Center in Lattakia, Syria, 2023]. [dr.mmatar@hotmail.com](mailto:dr.mmatar@hotmail.com), [atiearab@hotmail.com](mailto:atiearab@hotmail.com)

### First record of Bronze bug, *Thaumastocoris peregrinus* Carpintero and Dellapé, 2006 (Hemiptera: Thaumastocoridae) in Syria

The new insect species was identified based morphological characters of some mature and immature specimens collected from *Eucalyptus camaldulensis* trees located in Latakia Governorate, Syria, during October 2022. The bronze bug is considered an invasive insect in the Mediterranean countries, as it was recorded in Italy, Spain, Greece, Albania, Malta, Portugal and Gibraltar. The origin of this insect species considered inconspicuous, although the first description of this species was from Argentina in 2006, but the researchers indicated that the origin of this insect is Australia, and it was introduced to the rest of 29 countries reported so far. The number of host plants reached 15 species belonging to the genus *Eucalyptus* and one belonging to the genus *Corymbia*, both of which belong to the same family. The aggressive behavior of individuals of this insect while moving on the surface of human skin was observed through “biting” or “stinging”, as cited in some literatures. This study is the first report of this species and family in Syria. [Mahran Zeity, Atia Arab and Ola Salman, Latakia Research Center, General Commission for Scientific Agricultural Research, Damascus, Syria, in Eppo Bulletin, 2023]. DOI: [10.1111/EPP.12925](https://doi.org/10.1111/EPP.12925). in press).



**Bronze bug, *Thaumastocoris peregrinus*, dorsal and ventral view of female and male, symptoms on the infested leaves**



## First report of *Neopestalotiopsis clavispora* causing crown and root rot of strawberry in Syria.

Crown and root rot disease of strawberry (*Fragaria ananassa* Duch.) was reported in greenhouses in several locations in the countryside of southern Tartous and western Homs in November 2021. A field survey was carried out to estimate the disease frequency, incidence and severity. The pathogenic fungus was isolated and its morphological, microscopic characteristics and pathogenicity were studied on seedlings of Fortina and Festival cultivars under controlled conditions.



The results showed a severe spread of the disease. The frequency rate was 65%, and the infection rate ranged between 20%-80%. Symptoms appeared as pale reddish-brown spots on leaf margins, desiccation of flowers and stolons (runners), rotting and brown discoloration of the roots and the crown, and then wilting and death of affected plants. The isolation results showed that 85% of the isolates belonged to a single fungus of the genus *Neopestalotiopsis* spp. The fungus colonies grew well on the PDA medium. They were white and cottony and appeared in overlapping circular rings concentric with serrated edges on the upper surface of the Petri dish and a light brown-orange color on the lower side. The fungus acervuli were formed after eight days of incubation at 25 °C in the form of black dots, which are spherical-elliptical or irregular in shape, singular, and scattered within the mycelium. An acervula has a diameter of 150-250 µm that gradually increases to 450-550 µm After 20 days. Conidiophores are short, thin-walled, straight, unbranched, and colorless. The conidiospores are spindle-shaped, often straight, and sometimes curved. A conidiospore is (21.5)16.5-26.5(29.5) µm long, 6.5-7.4 µm wide (n=50), divided by four clear transverse septa into 5 cells. Three of those cells are swollen, light brown in the middle and dark blackish at the sides, and have a double wall. The remaining two terminal cells, the apical and the basal are uncolored. The basal cell is elongated, tapering at the end (3.5-5.5) µm (n = 30), attached to a single appendage, tubular, thin-walled, transparent, unbranched, is (4.5)-6.5-9.5(11.5) µm long (n = 30). While the apical cell is (7.5) 9.5-15.5 (35.5) µm (n = 30) in length, has a curved end which is 2-4.5 µm long (n = 30), is often associated with 2-3 appendages, and rarely with 4 appendages, threadlike, translucent. Accordingly, the fungus was identified as *Neopestalotiopsis clavispora* (G.F. Atk.) Steyaert (Maharachikumbura *et al.*, 2014). The results of the artificial infection showed that the symptoms appeared on the infected plants 20 days after infection and were identical to the natural symptoms of the origin and the characteristics of the pathogenic fungi (Koch hypothesis). According to the available data, this is the first report of *N. clavispora* as a cause of crown and root rot on strawberries in Syria. **[Mohamad Matar (Syria), Faculty of Agricultural Engineering, Tishreen University – Syria, 2023].**

## Tunisia

### The emergence of the apricot seed wasp *Eurytoma samsonowi* Vassiliev (Hymenoptera: Eurytomidae) as an economic pest of apricots in Tunisia

Many eurytomid (Eurytomidae) wasps are plant parasites, and some are economical, agricultural pests. In 2015, a new eurytomid wasp species was detected attacking apricots in the governorate of Gafsa located in the southern west region of Tunisia. Morphological and molecular identifications allowed to identify the pest as the apricot seed wasp *Eurytoma samsonowi* Vassiliev, a new record in Tunisia and Africa. Besides, field surveys were performed from 2017 to 2021 in order to assess the distribution of *E. samsonowi* in the main Tunisian apricot production areas, to characterize its symptoms of an attack and to assess its damage on different apricot cultivars. The pest has limited distribution in Tunisia as it was found only in the governorates of Gafsa, Sidi Bouzid and Tozeur. Larvae of this pest feed on apricot nucellar tissues. Infested fruits either prematurely fall on the ground or turn black, become 'mummified', and remain attached to the tree. The highest infestation rates were recorded on Bayoudhi cultivar ranging from 64 to 76% depending on the year. Infestation rates registered on Bedri and Amor Leuch cultivars ranged from 24% to 51% and 27 to 53%, respectively. Therefore, this insect should be considered as an economic pest of apricots in Tunisia. Possible management measures and future outlooks are discussed. [Takwa Wannassi<sup>1</sup>, Ahlem Harbi<sup>1</sup>, Khaled Abbes<sup>1</sup>, Mohamed Elimem<sup>2</sup>, Gérard Delvare<sup>3</sup>, Brahim Chermiti<sup>1</sup> (Tunisia), <sup>1</sup>High Agronomic Institute of Chott-Mariem, Department of Biological Sciences and Plant Protection, University of Sousse. <sup>2</sup>High School of Agriculture of Mograne, University of Carthage, Zaghouane, Tunisia. <sup>3</sup>Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement (CIRAD), Montpellier SupAgro, INRA, IRD, Univ. Montpellier, Montpellier, France, 2022].

## RESEARCH HIGHLIGHTS

### Algeria

**Efficacy of the combination tebuconazole-*Bacillus* in the control of the *Fusarium culmorum* responsible for *Fusarium* crown rot in durum wheat.** The results of this study showed that the tested antagonistic bacteria namely *Bacillus amyloliquefaciens* BB19 (B19) and *Bacillus atrophaeus* B16 (B16) and fungicides (tebuconazole, fludioxonil-difenoconazole and difenoconazole) inhibit significantly the "in vitro" growth of the two *Fusarium culmorum* isolates (FC1 and FC2). Contrarily, in the growth chamber experiments, the B19 and B16 strains and tebuconazole each alone showed a lower inhibition effect. However, the results of the combination method were promising. The losses caused by the FC1 and FC2 isolates were significantly reduced and the growth parameters were significantly improved. In the presence of FC2 isolate, the combination "tebuconazole-B19" gave more than 50% increase in the length of the root system and 76.42% enhancement in the fresh weight of the root system compared to the positive control. It was also observed that necrosis and browning symptoms on wheat seedlings disappeared. Statistical analysis revealed that the combination "tebuconazole-B19" was synergistic regarding all the studied growth parameters. [Amor Bencheikh, Hicham Meziti, Soumia Chinoune and Bouthaina Dekhane (Algeria), Department of Microbiology, Faculty of Nature and Life Sciences, Laboratory of applied Microbiology, Ferhat ABBAS University, Setif, Algeria. Archives of Phytopathology and Plant Protection, Volume 55, 1841-1858.2022].

## Algeria

**Varietal resistance of Algerian bread wheat against *Fusarium culmorum*, the main agent of crown rot on wheat.** *Fusarium* crown rot (FCR) is one of the serious wheat diseases. FC11 is one strain among 34 isolates obtained in a previous study and identified as *Fusarium culmorum* strain that is highly pathogenic. FC11 was assigned the accession number MW151664 by NCBI GenBank. Two resistance/sensitivity tests were conducted on 9 cultivars (cv) of bread wheat. The *In vitro* test in the oven with the parameters; percentage of germination inhibition (%GI), to determine the tolerance of seedlings germination and the Area under the Disease Progress Curve (AUDPC) to test the tolerance to the initial infection of germinated coleoptiles. In *in-vivo* test in the growth chamber, the disease severity (DS) parameter used to test the cultivars ability to tolerate FCR induced by *F. culmorum*. The results showed that all cultivars were susceptible to FC11 with a significant decrease in germination and coleoptile emergence rate with GI% and AUDPC values reaching up to 68.35, and 68.98% for cv. Boumerzoug and Hidhab, respectively. The cv. Bordj Mehis and Ain Abid showed significant susceptibility to *F. culmorum*, where the length of the vegetative system and fresh weight (RCL% and RCW%) were negatively affected up to 28.66 and 56.66%, respectively. In this work, the cv. Akhamokh showed an interesting level of FCR tolerance among other cultivars tested. [Hamza Bouanaka, Ines Bellil and Douadi Khelifi (Algeria), Archives of Phytopathology and Plant Protection. 2023]. <https://doi.org/10.1080/03235408.2023.2178064>

## Iraq

**Induction of defensive enzymes in sunflower plants treated with agrochemicals against *Macrophomina phaseolina*.** This study was carried out for the estimation of polyphenols (TP) and induction of oxidative enzymes polyphenol oxidase (PPO) and peroxidase (POD) in sunflower plants through seed immersion in agrochemicals of salicylic acid (SA) and water soluble chitosan (CH) in addition to a conidial suspension of *Trichoderma harzianum* and then analysis of plant content of carbohydrates and protein. The highest level of PPO 253.3 U · min<sup>-1</sup> was detected in 50 ppm SA for six h. Next was *T. harzianum* when catalyzed PPO with 193.67 U · min<sup>-1</sup>. Peroxidase was substantially catalyzed in accordance with the increment of inducers. Sunflower roots induced TP with up to 4.88 mg · g<sup>-1</sup> in plants treated with SA at 50 ppm for 6 h and then declined with an increasing SA dose. The total carbohydrate content in leaves of 320 mg · 100 g<sup>-1</sup> was found in treatments of CH at 50 ppm for 6 h. In roots, a carbohydrate content of 500 mg · 100 g<sup>-1</sup> was observed using CH 75 ppm for 6 h. *Trichoderma harzianum* remarkably increased proteins in leaves and roots by up to 25% compared to 16.9% in control. These results suggest that inducing the plants' defence mechanism by applying salicylic acid and chitosan and bio-control of *T. harzianum* may offer alternative methods for controlling charcoal rot of sunflower due to the creation of defensive enzymes and could support plant vigor by enhancement of its protein and carbohydrate content. [Khadeeja Ahmed Sido and Wazeer Ali Hassan (Iraq), Plant Protection Department, College of Agricultural Engineering Sciences, University of Duhok, Kurdistan Region, Duhok, Iraq. Journal of Plant Protection Research, Vol. 62, No. 4: 341-349, 2022]. DOI: [10.24425/jppr.2022.143233](https://doi.org/10.24425/jppr.2022.143233)



## Tunisia

**Aphrophoridae as potential vectors of *Xylella fastidiosa* in Tunisia.** The present study is an update on the situation of potential vectors of *Xylella fastidiosa* in Tunisia. Investigations in nine Tunisian regions (Nabeul, Bizerte, Béja, Jendouba, Zaghouan, Kairouan, Ben Arous, Tunis and Manouba) from 2018 to 2021 allowed for the observation of 3758 Aphrophoridae among a total of 9702 Auchenorrhyncha individuals collected by sweep net. Four Aphrophoridae species were identified with *Philaenus tessellatus* as most abundant (62%), followed by *Neophilaenus campestris* (28%), *Neophilaenus lineatus* (5%) and *Philaenus maghresignus* (5%). Aphrophoridae individuals were found to be particularly abundant in both forests of Nabeul and Jendouba, secondarily in olive groves and dry grassland. Furthermore, their distribution on weed hosts was followed in these two regions where nymphs and adults are widely distributed. *P. tessellatus* appears to be the most abundant species as determined either by conventional sweep netting for adults or by plant sampling on *Sonchus*, *Smyrni-um*, *Cirsium*, *Rumex*, *Polygonum* and *Picris* for nymphs. Limited numbers of adults of *P. maghresignus* were detected by sweep netting, while nymphs of this species were found on *Asphodelus microcarpus* only. *N. campestris* was found in high numbers on plants belonging to the Poaceae family in forests, dry grassland and olive groves whereas *N. lineatus* occurred on herbs under or near olive trees and in dry grasslands. [Boukhris-Bouhachem, Sonia, Rebha Souissi, Raied Abou Kubaa, Maroun El Moujabber, and Vladimir Gnezdilov. INRAT-National Agricultural Research Institute of Tunisia, University of Carthage, Tunis, Tunisia, CNR, Istituto per la Protezione Sostenibile delle Piante, Bari, Italy. CIHEAM-Mediterranean Agronomic Institute, Bari, Italy. Zoological Institute, Russian Academy of Sciences, 1 Universitetskaya Emb., 199034 Saint Petersburg, Russia *Insects* 14, no. 2: 119,2023] <https://doi.org/10.3390/insects14020119>

**Phytochemical evaluation and nematicide effect of a leaf aqueous extract of *Eucalyptus globulus* against *Pratylenchus vulnus* infecting apple.** The nematicide effect of an aqueous extract from dried leaves of *Eucalyptus globulus* was evaluated against the root lesion nematode *Pratylenchus vulnus* in vitro and in vivo trials. In both experiments, the application of four concentrations of a dried leaf aqueous extract (30 g/100 mL: 100%, 20 g/100 mL : 60%, 10 g/100 mL: 30%, 5 g/100 mL: 15%; w/v) significantly reduced the nematode number of females and males in roots of the apple rootstock MM106. In vitro tests showed that the highest mortality was recorded with the undiluted concentration (96%) after 72 h of exposure time. Results of in vivo experiment revealed also that the concentration 100% has significantly increased the reduction rates of the nematode population of females and males (84.43% and 91.40%, respectively) compared to the other concentrations. The chemical treatment with Oxamyl G has significantly reduced the female and male population by 98.30% and 100%, respectively. The chemical analysis of dried leaves of *Eucalyptus globulus* showed high levels of total phenol and total flavonoid contents and exhibited high antioxidant capacity. The obtained results suggest that aqueous extracts of *Eucalyptus globulus* leaves have a promising nematicide potential against *P. vulnus*. [Chihani-Hammas, N., Hajji-Hedfi, L., Larayedh, A., Regaieg, H., and Horrigue-Raouani, N. (Tunisia), *Tunisian Journal of Plant Protection* 17 (2): 43-54, 2022].

**Allelopathic effect of Barley (*Hordeum vulgare*) and Rapeseed (*Brassica napus*) crops on early growth of acetolactate Synthase (ALS)-Resistant *Glebionis coronaria*.** *Glebionis coronaria* is a serious threat to cereal production in Northern Tunisia. Previous results showed that *G. coronaria* has developed resistance to acetolactate synthase (ALS)-inhibiting herbicides, which limits their use in cereal cropping systems. The use of allelopathic crops has been reported as a potential alternative to herbicides to control resistant weed populations. The aim of this study is to evaluate the effect of five allelopathic crops on the early growth of *G. coronaria*. In vitro experiments using aqueous extracts of different crops and in-pot experiments with increasing rates of barley (*Hordeum vulgare*) and rapeseed (*Brassica napus*) residues were performed for this purpose. All tested crops showed allelopathic effects on *G. coronaria* and were able to reduce its root length at the concentration of 50 g/L. Barley and rapeseed were the most effective crops, with 70% and 60% of root length reduction, respectively. An aqueous extract concentration study with five increasing concentrations of 12.5, 25, 50, 75, and 100 % was performed with these two crops, and root length was significantly reduced with increasing concentration, being up to 80% with the highest aqueous extract concentration of barley. The in vitro results were supported by the in pots experiment: Shortest roots length and highest dry mass reduction were obtained by the highest barley (0.64 g/kg) and rapeseed (8 g/kg) residue concentrations. This study confirmed the allelopathic potential of both barley and rapeseed in reducing the early growth of ALS-resistant *G. coronaria*, suggesting the effectiveness of these crops if integrated with other control measures for the management of resistant population of *G. coronaria* in cereal fields. [Hada, Z., Jenfaoui, H., Khammassi, M., Matmati, A., and Souissi, T. (Tunisia), *Tunisian Journal of Plant Protection* 17 (2): 55-66, 2022].

***Nicotiana glauca*, a key plant for tomato growth enhancement and for the weed *Cynodon dactylon* control.** Worldwide, weeds are the costliest category of agricultural pests. They decrease yields and product quality, hence managing them is vital to successful crop cultivation which is the objective of the current study. The present work aims to evaluate the phytotoxicity of the vegetative part and the flowers of *Nicotiana glauca* on tomato and the weed *Cynodon dactylon*. Experiments were carried out under field conditions, and a number of biochemical and physiological parameters were determined after harvest. The results showed that adding powdered dried flowers to potting soil (in an amount of 1%) was the most effective treatment either to inhibit *C. dactylon* growth or to increase the tomato yield. The stimulations in the shoot, root and fresh weight were respectively 35.25%, 328.97%, and 159.04%. It is also remarkable that aqueous extracts of the vegetative part and flowers spray and vegetative part incorporation into soil treatments were effective in stimulating the growth of tomato, but they were less effective in inhibiting the weed growth. In fact, the greatest inhibitions in shoot, rhizomes and fresh weight did not exceed 66.31%, 70.54% and 96.54% after adding powdered dried vegetative part (in amount of 0.6%). The defence strategy developed by lettuce to deal with allelopathic stress could explain the stimulation of tomato growth. Indeed, it increased the production of some metabolites such as polyphenols, flavanols, proanthocyanidins, flavonoids and tannins in addition to proline and carotenoids. An improvement of PAL and TAL activities with stimulation of the antioxidant activity by increasing DPPH free radical-scavenging activity were also recorded. However, the respiration reduction and the membrane integrity perturbation (demonstrated by an increase in malondialdehyde content and electrolyte leakage) could explain the weed growth inhibition. These findings emphasize that the use of the powdered dried flowers of *N. glauca* are effective and easily approach to exploit its valuable secondary metabolites either to control *C. dactylon* or to improve the production of tomatoes. [Jmii, G., Sayari, M., Mars, M., Gharsallaoui, S., and Haouala, R. (Tunisia), *Tunisian Journal of Plant Protection* 17 (2): 77-96, 2022].



## Plant Protection News in the Arab and Near East Countries

### Graduate Students Thesis (M.Sc.&Ph.D.)

#### Enhancing cotton plant resistance to cotton's whitefly "*Bemisia tabaci*" and identifying its biotypes in North Syria

Whiteflies *Bemisia tabaci* (Gennadius) is an important pest on cotton because there is a big demand for effective eco-friendly ways to achieve sustainable pest management. The Results showed that the correlation was significantly positive between egg and trichome density and its value was ( $R=0.45$ ). Significant differences were found in eggs, and nymphal densities in the cotton genotype and variety Raqqa5 was the highest density of whiteflies nymphs and eggs in pot experiments. Whiteflies densities peak was 2<sup>nd</sup> third of September and returned to decline until mid-October, and the density of whiteflies nymphs was the highest on variety Raqqa5 during two seasons of the study in fields experiments. Results of useful microorganisms showed that the highest coexistent rates were recorded with GHA, K, B, Asp isolates in all plant parts. Also, there were significant differences in roots length, vegetative height, dry and wet weight between T<sub>wood</sub>, B<sub>bacteria</sub>, GHA, T<sub>950</sub>, Asp, B.S and control treatment. All strains treatments had low densities of whitefly's nymphs and no differences between them and densities of nymphs varied from 67.25 to 89.17 nymphs per leaf. Finally, shaved and unshaved seeds coating and spraying treatment had low densities of whitefly's nymphs than irrigation treatments and all previous methods of isolates inoculation had significant differences with control treatment. Results of fields' experiments showed that both seed coating treatments had low densities of whiteflies' nymphs /leaf (23.03-27.34 compared with control 54.76), and enhanced availability of studied nutritious minerals. whiteflies biotypes widespread in Syria had been identified by carrying out mtCOI Sequencing which were MAEM1 B, MAEM1 nonB, MED Q<sub>1</sub>, MED Q<sub>2</sub> and Asia II 1. **[Ziad Aleisa (Syria), Supervision Dr. Mohammad Nayef Alsalty, Dr.Moneer Alnabhan, Ahmad Algomaa, Faculty of Agriculture Plant, Protection Department, Aleppo University, Aleppo, Syria.(Doctorate,2023)].** [ziadissa989@gmail.com](mailto:ziadissa989@gmail.com)

#### An ecological study of trunk borers infesting Jujube *Ziziphus* spp. Trees and evaluation of some factors of integrated management against them in province of Basra

The study included a field survey of the orchards of Jujube orchards in the province of Basra during the years of 2020 and 2021. Jujube trees were infested by three trunk borers in the Province of Basra *Chrysobothris affinis* (Fabricius, 1974) (Coleoptera, Buprestidae) and *Anthaxia semiramis* Obenberger, 1913 (Coleoptera, Buprestidae) and *Enneadesmus optusidentatus* (Lesne, 1899), (Coleoptera)). A new parasitoid *Tanycoryphus tibialis* on *C. affinis* was recorded for the first time in Iraq. An integrated management study of flat-headed borers *C. affinis* was conducted on Jujube trees cv. Tuffahi by using physical, cultural, and chemical control using systemic pesticides (Confidor, Mospilan, Aktara). Pesticide residues and economic feasibility of their use were also estimated. **[Mohammed Mahdie Mazaal (Iraq), Plant Protection Department, Basra University, College of Agriculture, The Supervisor: Aqeel A. Alyousuf (Doctorate, 2023)].**

#### Etiology of grapevine rugose wood disease in Algeria at the department of Botany

Grapevine Rugose wood complex (RW) is one of the major diseases affecting grapevines worldwide. It is a disease related to the alteration of grapevine wood, which includes





different syndromes affecting the woody cylinder, cambium tissues, and bark. Symptoms such as tissue swelling at the graft union and more or less intense proliferation and cracking of the bark are mainly apparent after grafting. The grapevine rugose wood disease is caused by viruses, including *Grapevine virus A*, *Grapevine virus B*, *Grapevine virus D*, *Grapevine virus E*, *Grapevine virus F* and *Grapevine rupestris stem pitting-associated virus*, which belong to the *Vitivirus* and *Foveavirus* genera of the *Betaflexiviridae* family. Our study aimed to investigate the prevalence and distribution of the three main viruses associated with Grapevine Rugose Wood disease (GVA, GVD, and GRSPaV) in the most important wine-growing regions in Algeria. We also aimed to study the genetic diversity of Grapevine rupestris stem pitting-associated virus (GRSPaV) by targeting the capsid protein (CP) gene through RT-PCR and sequencing. Additionally, we identified mealybug species associated with Algerian viticulture that could potentially serve as vectors for the wood disease viruses, using morphological identification and molecular techniques. An RT-PCR analysis was performed on 202 samples to determine the prevalence of GVA, GVD, and GRSPaV. The results show that Grapevine Rugose Wood disease is present in all surveyed vineyards with an overall infection rate of 68.8%. GRSPaV is the most prevalent virus in Algeria followed by GVA and GVD. GVD was detected for the first time in Algeria in six out of 202 samples. The results of the study on the genetic diversity of GRSPaV revealed the distribution of Algerian isolates into four phylogenetic groups, with the majority of sequences grouped in groups III and IV. The inventory study of mealybug species identified only one species, *Planococcus ficus*, which was encountered in all surveyed vineyards except for recently cultivated table grape plots. **[Adel Bashir (Algeria), The National Higher School of Agronomy El Harrach-Algiers. Supervision of Dr. Arezki Lehad , National Higher School of Agronomy of El Harrach as a principal Supervisor in cooperation with Dr. Naima Mahfoudi from the Institute of Agricultural Research in Tunis (INRAT) as Co-Supervisor.(Doctorate,2023).**

### **Habits diversity of some acarofauna communicated with biosphere and the abiotic components at opted areas in North Sinai, Egypt**

The present work deals with the habits diversity of some Acarofauna communicated with biosphere and the abiotic components at opted areas such as El-Arish and Beer El-Abd in North Sinai, Egypt. The inspection of the study proved the occurrence of 120 species, belonging to 66 genera and 30 families. The collected taxa represented three major groups: Phytophagous mites, Biocontrol Acari species (mites and ticks) being predators or parasites and mites whose feeding habits are uncertain. The population dynamics was carried out for both *Tetranychus urticae* Koch and the associated predatory mite *Amblyseius gossypii* ElBadry to show their active periods that advantageously in controlling *T. urticae* biologically. Both species were recorded on seven year old guava trees in an orchard in Beer El-Abd city, North Sinai Governorate, Egypt. The study was conducted during April 2019 to March 2021. Observations were done fortnightly on both mite species density per leaf by selecting ten guava trees, each of four accessions and five branches from each plant, with the help of 20x hand lens. During both years, the population of *T. urticae* showed its highest density through two essential periods in early and mid-summer, while the predatory mite, *A. gossypii* began its activity with the beginning of the prey activity. During winter season, the population of both the prey and the predator dropped. The spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae) is an important mite pest that heavily infests apple tree leaves in North Sinai, Egypt. The life cycle of the mite was conducted on the leaves of apple at room temperature ranging



from 25-30 °C and 60±10% relative humidity. Both sexes of the mite passed through four movable stages (larva, protonymph, deutonymph and adult) beside the egg. There was a short resting period known as quiescent stage termed as protochrysalis, deutochrysalis and tritochrysalis, respectively. The female per-oviposition, oviposition and post-oviposition periods were estimated. The morphology of all developmental stages was mentioned. Mean total immature was (5.87±1.37) and (5.91±1.05) day, life cycle was (7.63±1.72) and (7.57±1.29), longevity (7.98±2.69) and (2.52±1.22) day, life span was (15.61±1.64) and (10.09±1.08) day for female and male respectively, number of eggs/female and number of eggs/female/days were recorded. [Eman A.I. Ali (Egypt), Faculty of Environmental and Agricultural Sciences, El-Arish University, Egypt. Supervisors Committee: Prof. Dr. Mohamed M.H. Kandeel, Faculty of Technology and Development, Zagazig University, Prof. Dr. Salah M. Abd El-Kariem and Prof. Dr. Mohamed Nagib El-Basiony, Faculty of Environmental and Agricultural Sciences, El-Arish University, Egypt. Faculty of Environmental Agricultural Sciences, El-Arish University, Egypt (Doctorate, 2023).


### **A Taxonomic study of the family Eulophidae (Hymenoptera) in Latakia province**

In this study, 636 plant samples bearing insect infestations were collected from 12 locations in Latakia province during 2020. 219 Eulophidae specimens emerged after being reared from their insect hosts. Morphological and Taxonomical aspects of the collected specimens have been studied. The identification key of recorded species is given according to the most important taxonomic features. A total of five species are recorded and classified, and these are: *Neochrysocharis formosa*, *Chrysocharis polyzo*, *Semiela cher petiolatus*, *Diglyphus crassinervis*, *Diglyphus isaea*. The following species *Chrysocharis polyzo* and *Diglyphus crassinervis* are considered the first ever recorded in Syria. [Rezk Nizar Mhanna (Syria), Supervisor: Prof. Dr. Nabil Abo Kaf, Department of Plant Protection, College of Agricultural Engineering, Tishreen University, Syrian Arab Republic (Master, 2023)].

### **Genetic and biological control of wheat common bunt disease under rain-fed cultivation**

Common bunt disease incited by *Tilletia caries*, *T. laevis*, and *T. intermedia* is one of the most important wheat diseases in the Iraqi Kurdistan Region. The current study was conducted from 2020 to 2022 to determine the disease incidence in seed lots of three silos within Sulaimani province. Host response of the local bread wheat, durum wheat, and Triticale cultivars to common bunt disease under artificial inoculation conditions at Sulaimani. The efficiency of the known Bt resistance genes against the pathogen populations, the impact of some chemical fungicides and bio-agents in disease control of common bunt and molecular mapping of the available genes in wheat cultivars in Sulaimani. High contamination was detected in the mean of grade two seed samples ( $5.3 \times 10^6$  teliospores gr<sup>-1</sup>), grade three seed ( $21.3 \times 10^6$  teliospores gr<sup>-1</sup>), and the refused grain sample ( $46.4 \times 10^8$  teliospores gr<sup>-1</sup>) in Sulaimani silos. In contrast, no teliospores were found in all grade one seed samples. The highest contamination in





the refused grain samples reached to  $74.9 \times 10^9$  teliospores gr-1 in wheat grain sample of Bazyan within the Piramagroon silo, followed by  $16.4 \times 10^8$  teliospores gr-1 of grains in Said Sadiq silo. Host response of wheat cultivars to common bunt disease under artificial inoculation conditions during two growing seasons, revealed a wide range of variations in the response of the tested cultivars against the CB pathogen.

The majority of bread wheat cultivars explored susceptible to highly susceptible reactions to common bunt disease under artificial inoculation conditions in Sulaimani. The mean infection percentage of the cultivars ranged from 31.5% in Buhoth 22 to 91.97% in Al-Fateh, While Farris1, Ashur, Tamuz 3, Al-Madian, Latiffiya, Al-Baraka, and Rabia, were resistant (0.28% to 3.98%) and Bura, Iratom, Maarooof and Al-Rasheed were moderately resistant (10.39% to 21.10%). Durum wheat and triticale cultivars showed high resistance to the disease when inoculated with the pathogen populations of bread wheat origin. The frequency percentage of *T. caries*, was higher than *T. laevis* and *T. intermedia* in bread wheat and triticale cultivars 64% and 73% respectively, while *T. laevis* was higher in durum wheat and triticale cultivars 18% and 27% respectively. The known resistant Bt genes Bt1, Bt3, Bt6, Bt8, Bt9, Bt10, Bt11. Bt12, Bt13, and Btp showed high efficiency against the predominant populations of *Tilletia* spp under artificial inoculation conditions in Sulaimani, while Bt0, Bt2, Bt4, Bt5, Bt7, Bt14, and Bt15 were ineffective against the pathogen populations. Chemical control of the disease on two wheat cultivars using different fungicides (Dividend, Raxil Bayer, and Raxil Al-Tariq) at two levels revealed that all the chemical treatments significantly decreased the mean infection percent of wheat cultivars with common bunt disease by 95.4% compared to the control treatment. In contrast, the application of Dividends completely controlled the disease even if it has used at a rate is less than the recommended dose by 20%. Biological control of the disease using *Trichoderma harzianum*, *Basilus subtilis*, and *Pseudomonas fluorescence* revealed no significant differences between the biological treatments and the control in the mean of common bunt infection. Although, the treatments reduced common bunt infection by 11% in *P. fluorescence*, 9.5% in *B. subtilis*, and 1.6% in *T. harzianum*. Using molecular approaches for mapping the available known resistance (Bt8, Bt9, Bt10, Bt11 and Bt12) genes in the local wheat cultivars revealed that most of the cultivars lack these genes except Charmo and Hsad, which possess the known resistance gene Bt9 and Buhoth 10 that hold resistant gene Bt12. **[Peshawa Hama Gharaib (Iraq), Supervised by Prof. Dr. Emad Mahmood Al-Maarooof, College of Agricultural Engineering Science, University of Sulaimani, (Master, 2023)].**

### **Phenotypic and molecular identification of fungi associated with tissue culture date palm offshoots and evaluation of the efficiency of Silver Nanoparticles and *Trichoderma longibrachiatum* in their control in Basra Governorate**

The results of isolation from the affected tissue culture offshoot parts (shoots and roots) showed the isolation of 36 species of fungi, the most important of which are species belonging to the genus *Fusarium*, *Alternaria* and *Cladosporium*, as well as the species *Thielaviopsis paradoxa*. Fungi were molecularly identified based on the ITS1-ITS4 gene and recorded in the NCBI Gen Bank. Pot experiments also showed the ability of silver nanoparticles and the biological fungus *Trichoderma longibrachiatum* to reduce the rate and severity of the disease of death and yellowing of palm seedlings caused by the fungus *Fusarium solani*. **[Alaa ,O. Manea (Iraq), Plant Protection Department, Agriculture College, Uni of Basra-IRAQ . Supervisor Prof, Dr. Mohammed, A. Fayyad and Assist Prof Dr.Yehya, A. Salih (Doctorate, 2022)].**






## **A taxonomic study of the wheat gall nematodes *Anguina tritici* and the wheat cyst nematodes *Heterodera avenae* in central and Southern Iraq and their integrated management**

The study included a field survey of wheat fields in the governorates of Basra, Dhi Qar, Maysan, Najaf, Qadisiyah, Wasit, Baghdad and Diyala. Findings showed that the wheat gall nematodes *Anguina tritici* was present in all surveyed areas at varying infection rates. The Cyst nematode *Heterodera avenae* was also found and recorded for the first time in Iraq in three governorates (Najaf, Baghdad, and Maysan), causing varying infection rates. Both species, *A. tritici* and *H. avenae*, were diagnosed according to standard phenotypic and morphometric phenotypes (morphometrics) as well as molecularly based on the ITS4 gene and recorded in the NCBI Gen Bank. The study also showed that the fungus *Arthrobotrys eudermata* and the chemical pesticide Velum were highly efficient in reducing infection and increasing wheat yield, mainly when combined. It was also shown that the sprinkler irrigation method significantly increases yield and reduces seed gall compared to conventional (flooding) irrigation. **[Muhammad Hamdan Ghadban(Iraq), Department Plant Protection, College of Agriculture, University of Basra, Iraq. Under the Supervision of Asst. Prof. Dr. Diaan Salem Ali and Prof. Dr. Ramin Abbas Heidari , University of Tehran, College of Agriculture and Natural Resources, (Doctorate, 2022)].**

## **A biological and ecological study of tomato leaf miner *Tuta absoluta* (Meyrick,1917) and efficacy of some parasitoids**

This study was carried out in Agricultural Scientific Research Centre in Latakia to estimate the biological parameters of *T. absoluta* and evaluate the effect of temperature in its development, longevity, and reproduction in parthenogenesis. The experiments were carried out at a constant temperature of (10, 20, 30 ° C), 60-65% RH, and photoperiod (16L: 8D). Biological parameters were analyzed according to the theory of Age-stage two-sex life table by using the computer program TWO-SEX MSChart. The highest value of intrinsic rate increase ( $r$ ), the final increase rate ( $\lambda$ ), and net reproductive rate ( $R_0$ ) were (0.0439±0.0028 female/female/day). (1.0449±0.0029). (7.01±0.8705 female/female/generation) respectively at 20 ° C.

The lowest value of net reproductive rate ( $R_0$ ) was (0.92±0.1250 female/female/generation) at 30 ° C. Generation time ( $T$ ) was the longest (44.3±0.203 days) at 20 ° C and decreased (26.38±1.156 days) at 30 ° C. The life tables parameters of larval ectoparasitoid *Bracon concolorans* (Marshall,1900) was studied on mature larvae of tomato leafminer *Tuta absoluta* (Meyrick) (Lepidoptera: Gelechiidae) at laboratory temperature, with sexual reproduction and arrhenotokous parthenogenesis. The parameters were calculated using Two Sex-MSChart. Results showed that the following values (sexual reproduction): net reproductive rate  $R_0 = 46.58 \pm 7.2$  Female/female/generation, the intrinsic rate of increase ( $r$ ) = 0.2187±0.0102 Female/female/day, mean generation time ( $T$ ) = 17.559±0.302 days, The doubling time of population (DT) = 3.1684 days, gross reproductive rate (GRR) = 50.91±7.656 individuals/offspring, Finite rate of increase ( $\lambda$ ) = 1.2445±0.0127, fecundity ( $F$ ) = 89.58±6.719 eggs/female. In (arrhenotokous Parthenogenesis):, Finite rate of increase ( $\lambda$ ) = 1, net reproductive rate  $R_0$ , the intrinsic rate of increase ( $r$ ) and gross reproductive rate (GRR) = 0. This study was carried to estimate life tables of *Trichogramma oleae* and evaluate the effect of constant temperature in its development and longevity. The experiments were carried out at a constant temperature of (20, 25, 30 ° C), 60-65% RH, and photoperiod (16L: 8D). Results showed that the highest value of intrinsic rate increase ( $r$ ), the final increase rate



( $\lambda$ ), and net reproductive rate ( $R_0$ ) were ( $50.58 \pm 7.215$  female/female/day). ( $0.006 \cdot (0.4132 \pm 0.022 \pm 1.531)$  female/female/generation) respectively at  $30^\circ\text{C}$ . The lowest value of net reproductive rate ( $R_0$ ) was ( $0.92 \pm 0.1250$  female/female/generation) at  $30^\circ\text{C}$ . Generation time (T) was the longest ( $17.761 \pm 0.132$  days) at  $20^\circ\text{C}$  and decreased ( $0.316 \pm 8.12$  days) at  $30^\circ\text{C}$ . Hymenopteran parasitoids of a tomato leaf miner (*Tuta absoluta*) were collected from tomato fields in Latakia and Tartus provinces of Syria during the period 2019-2021. The identified parasitoids are the first records of tomato leaf miners (*Tuta absoluta*) in Syria. The most widely spread of these species was *Neochrysocharis formosa* (31.29%) and *S. japonicus* (30.53%), then *Diglyphus isaea* (14.5%), followed by *Bracon nigricans* (5.34%), and *Pnigalio* sp. Species (3.5%), *Bracon concolorans* (3.35%), then *Habrobracon hebetor* 2.7%, and *Pachycrepoidieus vindemmiae* (1.5%) followed by *Pteromalus* sp (1.3%) then *Elasmus* sp. (1.37%), *Glyptapanteles* sp. (*Goniozus nephatidis* 0.9%), and *Telenomus* sp (0.6%) then *P. agraulis* (0.45%) followed by *Aphanogmus clavicornis*, *Hemiptarsenus unguicellus*, *Osculobracon* sp. and *Apanteles* sp. (0.3%). The experiment was carried out to estimate the efficacy of larval parasitoid *B. brevicornis* in cages. Analysis ANOVA showed significant differences between two treatments and control in number of alive and dead larvae and number of tunnels, and apparent differences between the two treatments. **[Rawa Muhsen Youssef (Syria), Supervisors: Prof. Dr. Nabil Abo Kaf, Department of Plant Protection, College of Agricultural Engineering /Tishreen University, and Dr. Rafeek Abboud Researcher – General Commission for Scientific Agricultural Research - Syrian Arab Republic (Doctorate, 2022)].**

#### **Evaluate the efficiency of *Pseudomonas fluorescence* and some plant extracts in controlling okra (*Abelmoschus esculents*) root rot disease**

The results of the study showed the efficiency of *Pseudomonas fluorescence* and eucalyptus leaf extract in reducing okra root rot disease caused by the *Rhizoctonia solani* and *Macrophomina phaseolina*, and these two treatments also led to the improvement of growth indicators, yield and percentage of seed germination **[Tsyer M. Khudair (Iraq), Plant Protection Department, College of Agriculture, Basra University, Iraq, Supervisor Dr. Layla, A. Banyan (Master, 2022)].**

#### **A Study of the life tables of the insect *Psylla eucalyptus*, *Glycaspis brimblecombei*, and its parasitoid, *Psyllaphagus bliteus*, in Latakia Governorate**

Red gum lerp psyllid *Glycaspis brimblecombei* Moore, 1964 (Hemiptera: Aphalaridae) is one of the most serious pests of several species of Eucalyptus, especially *Eucalyptus camaludensis* the most widespread species in Syria. *Psyllaphagus bliteus* Riek 1962 (Hymenoptera: Encyrtidae) is a specialized Parasitoid of *G. brimblecombei* nymphs. This study was carried out in 2020 in the Agricultural scientific research Centre in Lattakia – Syria, to estimate biological parameters, the longevity of different stages and the fecundity of psyllid adults in laboratory conditions. Biological parameters were analyzed according to the theory of the Age-stage two-sex life table. The values of the intrinsic rate of increase ( $r$ ), the finite increase of rate ( $\lambda$ ), and net reproductive rate ( $R_0$ ) for *G. brimblecombei* were ( $0.047 \text{ day}^{-1}$ ,  $1.04 \text{ day}^{-1}$ ,  $5.43$  offspring/individual) respectively, while it was ( $0.15 \text{ day}^{-1}$ ,  $1.16 \text{ day}^{-1}$ ,  $5.26$  offspring/individual) for *P. bliteus*. Generation time (T) for both *G. brimblecombei* and *P. bliteus* was (35.98 days, 10.86 days) respectively. The sex ratio was (1: 1.7) female: male for *G. brimblecombei* (1:1) female: male for *P. bliteus*. **[Sinan Sleman (Syria), Supervisor: Prof. Dr. Nabil Abo Kaf, Department of Plant Protection, College of Agricultural Engineering, Tishreen University, Syrian Arab Republic (Master, 2022)].**

# Food and Agriculture Organization (FAO) Plant Protection Activities

## Activities of the regional office of Food and Agriculture Organization of the United Nations – Near East and North Africa

### FAO Holds the closing workshop for the regional project to Mitigate the risks of Fall Armyworm

**13 March 2023, Amman**

The Food and Agriculture Organization of the United Nations (FAO) held the closing workshop of the regional project “Emergency Preparedness and Response to Strengthen the Capacities of Near East and North African (NENA) Countries to Mitigate the Risks of Fall Armyworm (FAW)” from 13 to 14 March in the Jordanian capital, Amman, with the presence of representatives of the ministries of agriculture in the countries participating in the project. The workshop reviewed



the risks of FAW and the efforts of FAO to mitigate the risks of FAW which attacks crops like corn, rice, sorghum, millet, sugar cane, vegetable crops, and cotton. Moreover, the workshop discussed the implementation of FAW integrated control strategy in the NENA region, in particular in the Hashemite Kingdom of Jordan, the Lebanese Republic, the Syrian Arab Republic, the West Bank, and the Gaza Strip, in addition to discussing the final report of the project, which included achievements, success stories, lessons learned, and challenges and recommendations.

“The outputs of this workshop will provide regional guidance and recommendations on reducing the spread of FAW and measures to control it,” said Nabil Assaf, Representative of FAO in Jordan. “The workshop aims to encourage the exchange of information among countries in the NENA region on the integrated techniques and technologies to control FAW, as well as to learn about the progress made in the implementation of the project in Jordan, Lebanon, Palestine, Syria, and to collect suggestions for the way forward in FAO Global Action to combat this pest,” Assaf added. The workshop also included a panel discussion on the Farmers Field Schools that were implemented in Jordan in the regions of Deir Alla, the southern Shuna, and the southern Jordan Valley, in addition to a field visit to a model farm and the inauguration of a new laboratory for the production of natural enemies. “FAW is one of the most dangerous pests that attack many economically important crops, as it can feed on more than 80 plant species,” explained Thaer Yaseen, Regional Plant Protection Officer at the Regional Office of the Food and Agriculture Organization of the United Nations in the Near East and North Africa. “The pest was able, during the last four years, to move between different countries and infect crops in 79 countries in Africa, Asia, and the Pacific, while the pest was reported in 12 of the 19



countries of the NENA region,” Yaseen added. Yaseen stated that FAO is always rushing to help local governments and small farmers in countries affected by the presence of emerging pests, and in the case of FAW, the organization has prepared and approved a technical cooperation project to support regional and local capacities to monitor and control FAW in Jordan, Lebanon, Palestine, and Syria as soon as the ministries of agriculture in those countries requested the support of the organization. “We are fully aware of the importance of true partnership between the public sector and international organizations such as FAO in advancing the status of the agricultural sector.

Moreover, we are aware of the organization’s efforts through projects at the local and the regional level in supporting the efforts of the Ministry of Agriculture in applying integrated control programs for agricultural pests by providing the latest methods in the field of control through the use of local and regional experts, as well as the use of agricultural pesticides that have the best effect in control and are safe to use on farmers and agricultural products,” explained Ayman Al-Oran, Assistant Secretary-General of the Jordanian Plant Resources, representative of the Jordanian Minister of Agriculture Khaled Al-Hunaifat. The FAW Technical Cooperation Program project was launched through a virtual workshop to support the authorities of the participating countries to mitigate the risks of FAW in February 2021, in the presence of stakeholders, partners, decision-makers from the public and private sectors, local and international organizations, as well as experts and researchers. <https://bit.ly/3yKsGUC>

## **FAO holds farmer field schools training on date palm pest management in Saudi Arabia**

**15 March 2023, Riyadh**

The Food and Agriculture Organization of the United Nations, in cooperation with the Weqaa Center, held a refresher training programme to train Farmer Field School (FFS) facilitators on date palm pest management and on controlling the Red Palm Weevil (RPW) in the Kingdom of Saudi Arabia (KSA) during from



12 to 15 March, with the participation of regional and local experts and trainers from various regions of KSA, within the framework of the regional program for the eradication of RPW in the Near East and North Africa (NENA) region. The program aims at enhancing the level of control of RPW and other palm pests as well as integrating good agricultural practices in the NENA region.

In addition, the programme aims to qualify farmers to manage and control RPW. The training discussed the basic pillars and the main elements in designing the FFS curriculum while defining the special objectives of the FFS, the steps for establishing an FFS and how to appropriately choose the FFS location. Moreover, the trainees examined how to select facilitators and farmers for the FFS and define their tasks and needs to control and eradicate RPW and other palm pests, as well as identify wrong practices in handling



RPW and the integration of good agricultural practices. The training organized a field visit to a date palm farm in the city of Diriyah in north-west Riyadh, during which trainees learned how to analyze the agricultural ecosystem in the FFS and attended an FFS simulation meeting in groups. The training programme also discussed the periodic and visual inspection of palm trees, the discussion of the up-to-date inspection techniques, as well as the follow-up and evaluation process, and the discussion of the post-field school stage, including the FAO FFS guide, the economic analysis of FFS, and the FFS operating budget throughout the season. The programme seeks to train FFS facilitators to come up with a coherent and closely related system in the field of early control of palm pests and to discuss the qualifications and training of the FFS facilitators to manage and control RPW in KSA. <https://bit.ly/3Ttug6O>



## FAO Plant Protection division in NENA meets with WEQAA

**27 February 2023, Riyadh**

The Regional Plant Protection Officer at FAO Regional Office for the Near East and North Africa (NENA), Thaeer Yaseen, met with the Chief Executive Officer of the National Center for the Prevention and Control of Plants and Animal Diseases (Weqaa)



in Riyadh, the Kingdom of Saudi Arabia (KSA). During the meeting, they examined the updates of the regional programme for the eradication of the Red Palm Weevil (RPW) and areas of cooperation between the Food and Agriculture Organization (FAO) and Weqaa in the field of management of transboundary pests, especially the use of biological pest control methods. In addition, the meeting discussed the adoption of the ePhyto Solution and the development of a seedling certification programme in KSA. The meeting also discussed the preparations for the International Plant Protection Convention (IPPC) regional workshop for the Near East and North Africa region, which KSA will host in 2023.

## FAO Participates in King Faisal University workshop on methods for monitoring the desertification process and ways to address it

**26 February 2023, Cairo**

The Food and Agriculture Organization of the United Nations (FAO) is participating in a workshop entitled “Methods for Monitoring the Desertification Process and Ways to Address It”, organized by King Faisal University (KFU), represented by the Environmen-



tal Protection Unit at the Vice Presidency for Graduate Studies and Scientific Research, in cooperation with the College of Agricultural Sciences on February 26, in Al-Hasa, Saudi Arabia. The workshop aims to introduce the dangers of desertification and educate the community about its



harmful effects on the environment, society and the economy. Discussions will include defining the rules and regulations governing the operations of preserving vegetation cover and presenting the most important and effective methods and techniques to combat desertification, in addition to introducing sustainable land and water management methods .FAO is delivering two presentations, “Transboundary pests and plants and their devastating effects on vegetation cover” by Thaer Yaseen, Regional Plant Protection Officer at FAO regional office in the Near East and North Africa (NENA), and “International efforts to combat desertification”, which will be presented by Firas Ziyadat, Land and Water Department official at FAO office in Rome. The workshop discusses a set of topics related to desertification: sustainable land and water management, international efforts to combat desertification, evaluation of international legal mechanisms for combating desertification within the framework of sustainable development, protection of vegetation cover and green belts, and the relationship between climate change and desertification. <https://bit.ly/3zySlkP>

## FAO Collaborates with King Faisal University (KFU) to Optimize the Effective Control of the Red Palm Weevil

**26 February, 2023, Saudi Arabia**

The Food and Agriculture Organization of the United Nations (FAO), in collaboration with King Faisal University (KFU), Kingdom of Saudi Arabia, conducted a study on the optimization of management tools for effective control



of Red Palm Weevil (RPW) and the development of innovative technology to control RPW apical infestation. The study observed the improvement of the fumigation technique currently adopted against the RPW in the Kingdom of Saudi Arabia, the development of a quarantine protocol for fumigating date palm offshoots using phosphine





gas and the evaluation of RPW insecticides and injection, in addition to examining techniques for controlling RPW apical infestations. During the study, a series of laboratory, semi-field, and field experiments were conducted on two aspects of the project: developing a quarantine protocol for date palm seedlings and evaluating injection techniques to control RPW palm tree trunk infestations. Researchers found that the development of a quarantine protocol by sterilizing palm offshoots by dipping them in pesticide solution was effective and led to the death of 100% of the larvae, pupae, and adults of the RPW. Moreover, the efficacy of “Emmamectin benzoate” insecticide at a concentration of 4% against the RPW was evaluated by microinjection on large palms.

The recommended dose of 50 ml led to the death of 100% of the RPW larvae, while the tissue extracted from the palm one month after the treatment caused approximately 92% mortality of the larvae that were fed on these tissues under laboratory conditions. In 2022, FAO signed a letter of agreement with KFU in KSA “in order to promote scientific research and innovation for long-term solutions and sustainable control of the RPW”, within the framework of the Food and Agriculture Organization of the United Nations programme to eradicate RPW from the Near East and North Africa region.

## FAO Participates in the second session meetings of the International Dates Council

### 16 February 2023, Saudi Arabia

The Food and Agriculture Organization of the United Nations (FAO) participated in the second session meetings of the International Dates Council, via videoconference, on February 15 and 16, under the chairmanship of the Kingdom of Saudi Arabia (KSA).

The meetings reviewed the most prominent work of the Council during last year, which included the organization of international forums and scientific meetings, participation in international conferences and exhibitions, in addition to the agreements signed by the Council’s secretariat with international Arab organizations.

The meeting approved the Council’s work plan for 2023, priority projects and activities as well as assigning Council committees to member states and organizations, foremost of which is the Marketing and Promotion Committee, in addition to the Technical Committee and the Information, Networks and Statistics Committee. The meetings valued the efforts made by the International Dates Council’s General Secretariat during the previous session. The meeting also examined the targeted

## اجتماع الدورة الثانية لمجلس اعضاء المجلس الدولي للتمور



projects during 2023 while focusing on marketing dates, the partnership with the private sector and their success stories. In addition, the members discussed developing a draft marketing standards manual for date varieties and improving the quality of dates in accordance with the requirements of the global market, as well as the need to establish a database of date palms and dates, to seek the help of experts and specialists in carrying out various agricultural research in this field, and to cooperate in this with many agricultural bodies, local and international organizations.

The meeting thanked KSA's government for sponsoring the council's budget for two years at USD 4 million and for hosting its headquarters in Riyadh. The meeting also welcomed the membership of the Arab Organization for Agricultural Development and the Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD) as associate members of the International Dates Council.

## **FAO Participates in the First International Forum on dates promotion in Muscat**

**Januray 18-19,2023, Muscat-Oman**

The first international forum of expertise on "Developing Practices of Marketing and Promotion of Dates", organized by the International Dates Council in partnership with the Ministry of Agriculture, Fisheries and Water Resources, kicked off Wednesday in Muscat, Sultanate of Oman.

*"FAO contributes to the support and development of agricultural policies and the development of modern farming methods to obtain better production quality that includes all value chains for date production and other related activities,"* said Thaeer Yaseen, the regional Plant Protection officer at the Food and Agriculture Organization of the United Nations (FAO) Regional Office for the Near East, and North Africa during his participation in the opening session.

Thaeer Yaseen, the regional Plant Protection officer at the Food and Agriculture Organization of the United Nations (FAO) Regional Office for the Near East, and North Africa during his participation in the opening session.

**Yaseen** added that marketing systems and infrastructure for marketing dates in most region countries need more development and support. For example, in 2021, Egypt, which is the largest producer of dates in the world, exported only 1.9% of its production, as it ranked tenth among date exporters, which calls for effective marketing strategies for dates while focusing on quality systems to increase demand through investment and innovation in this field. The forum, which lasts for two days from January 18 to 19, addresses issues of date production, marketing, and promotion besides discussing the benefits of consuming dates that could be secured for all segments of the value chain, including farmers, manufacturers, marketers, traders, and consumers, as well as the national economy, the environment, and sustainable development. Many researchers and specialists from various academic and research establishments are participating in the forum, in the field of palm cultivation and marketing and the production and processing of dates. In addition, the forum is attended by several economists, nutrition and marketing experts from various local and international organizations, government agencies, and the private sector, as well as several ambassadors and commercial offices. The forum focuses on the importance of the contribution of dates to food security, its role in enhancing production techniques, manufacturing, marketing, and trade to maximize the



economic and environmental impact and emphasizes important pioneering experiences in the field of investment in date manufacturing industries. The marketing of dates is among the most critical points for the development of the palm and dates sector, as the marketing systems and infrastructure for marketing dates in most countries are generally ineffective, so it is necessary to build effective marketing strategies and focus on quality systems to increase demand through investment and innovation in this field.

## **FAO Organized a Study Tour for Representatives of the Omani Ministry of Agriculture**

**21 December 2022, Italy**

In the framework of the “*Development, Production and Multiplication of Certified Citrus Propagation Materials*” project, the Food and Agriculture Organization of the United Nations (FAO) organized a study tour in Italy for two Omani staff from the Ministry of Agriculture, Fisheries and Water Resources in collaboration with the Mediterranean Agronomic Institute of Bari (CIHEAM Bari) in order to exchange the best practices on the production and propagation of citrus plants free from diseases. The training course and technical visits were coordinated by CI-



HEAM Bari experts Khaled Djelouah, the Scientific Administrator of the Integrated Pest Management Sector, and Giuseppe Cavallo, a Technical Agent, to strengthen the knowledge and skills of the Omani trainees on citrus certification programs. During the visit, the trainees visited the Conservation center Martucci, at the Department of Soil, Plant and Food Sciences at the University of Bari, the pre-multiplication center in the Centre of Research, Experimentation and Training Center in Agriculture (CRSFA) Basile Caramia in Locorotondo, the Mother plant plots of the nursery's consortium in Palagianò, the Nurseries of Milone and Serratore located in Lamezia Terme and the experimental germplasm plot of the Research Centre for Olive, Fruit and Citrus Crops in Acireale (CREA). FAO and the Sultanate of Oman launched the “*Development, Production and Multiplication of Certified Citrus Propagation Materials*” project in 2018 to strengthen the existing facilities of the previous certification programme and to review and assess the required updates. Furthermore, the project aims to support nursery workers organizations and raise awareness for using true-to-type and healthy planting materials through a certification scheme to secure higher-quality nursery planting materials. In addition, the project goals include evaluating the facilities needed for mass production and distribution of the certified plants originating from primary sources and mother plants. The project also works on identifying governmental and private sector actors to be involved directly and indirectly in implementing the legislating process for the citrus certification programme and relative protocols for inspections.







## 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: Calm

General situation during February 2023 Forecast until mid-April 2023

Provided by the FAO Emergency Centre for Desert Locust (ECLLO).

#### General Situation

##### Calm situation

The Desert Locust situation continued to remain calm during February. Similar to January, scattered and small groups of adults remained in the southern Western Sahara of Morocco where some were copulating. Ground teams treated 606 ha. In Sudan, adult groups increased in the Red Sea coast and subcoastal areas as vegetation started to dry out and ground teams treated 3 826 ha. In Saudi Arabia, a few mature groups of adults were copulating on the northern Red Sea coast where 410 ha were treated. Low numbers of adults were present in southeast Egypt and the Red Sea coast of Yemen. In the Eastern Region, good rain fell on the coast of Iran for the second month in a row. During the forecast period, small hatching will occur in the southern Western Sahara of Morocco while scattered adults will move further north where rain is supposed to fall and small-scale spring breeding can occur. In Saudi Arabia, low numbers of adults are likely to move to the interior where good rains are supposed to fall there as well as on the coast of southeast Iran and southwest Pakistan during March and April. Consequently, spring breeding may occur on a small scale.

##### Western Region: Calm

**SITUATION.** A few mature groups of adults and some copulating in the southern Western Sahara of **Morocco** (606 ha treated). No locusts were reported elsewhere in the region.

**FORECAST.** Some adults may stay in parts of the southern Western Sahara of **Morocco** where hatching may occur. However, most of the adults will move further north to Wadi Draa in Morocco while a few locusts may occur in central and southern **Algeria** and southwest **Libya**. Rains are supposed to fall in parts of the spring area where small-scale breeding may occur.

##### Central Region: Calm

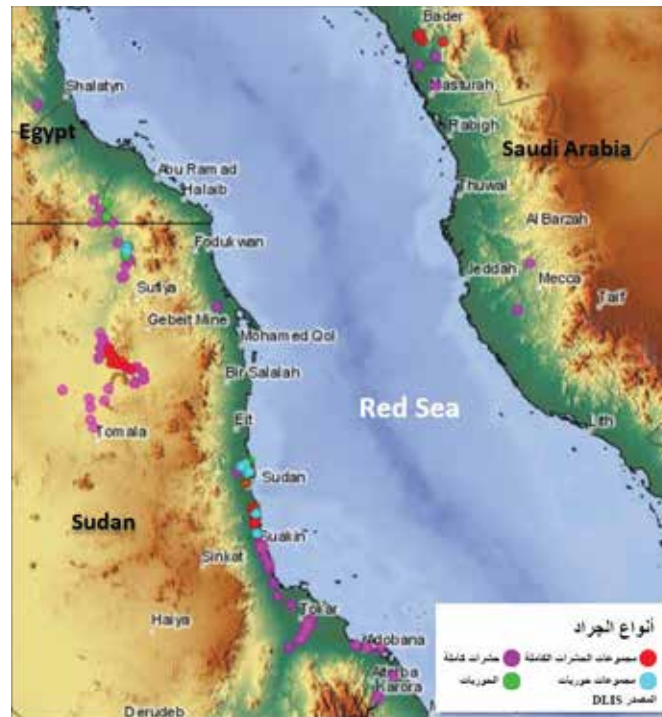
**SITUATION.** Small adult groups, some copulating and late instar hoppers in the coast and subcoastal area of the Red Sea in **Sudan** (3 826 ha treated); a few mature adult groups in the northern Red Sea coast of **Saudi Arabia** (410 ha); low numbers of hoppers and adults in southeast **Egypt** and adults on the Red Sea coast in **Yemen**.

**FORECAST.** Low numbers of locusts will decline on the Red Sea coast in **Sudan, Egypt, Eritrea, Saudi Arabia**, and **Yemen**. A few adults may move from the coast of Saudi Arabia to the interior, where good rains and small-scale spring breeding could occur in March and April.

## Easter Region: Calm

**SITUATION.** No locusts present.

**FORECAST.** A few locusts may occur on the coast of southeast **Iran** and southwest **Pakistan** and start breeding on a small scale during the spring.



Map 1 locust situation February 2023

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>

## 4<sup>th</sup> Field Trials Testing Drones Used for Desert Locust Surveys”

A regional workshop on “4<sup>th</sup> Trail for Testing Drones Used for Desert Locust Surveys” was organized by the Commission for Controlling Desert Locust in the Central Region (CRC) in cooperation with the Commission for Controlling Desert Locust in the Western Region (CLCPRO) and the Locust Control Center, Directorate General of Agriculture Development, Ministry of Agriculture and Fisheries (Oman). Two companies (SenseFly SA, an AgEagle company - Switzerland and Hojung Solution - South Korea) were selected to assess their proposed drones for locust survey requirements and define with companies the improvements to be made to the proposed prototype



4<sup>th</sup> Trail on Testing Drones Used for Desert Locust Surveys

## Regional workshop on “Aerial Spraying Techniques for Desert Locusts.”

During 19-23 February 2023, the Commission for Controlling Desert Locust in the Central Region (CRC), Jointly with the Commission for Controlling Desert Locust in the Western Region (CLCPRO), organized a regional workshop on “Aerial Spraying Techniques of Desert Locust” in Jeddah, Saudi Arabia in cooperation with the General Administration for Desert Locust Control of the National Center for the Prevention & Control of Plant Pests & Animal Diseases (WEQAA)”. Eighteen participants participated in the training course from ten member countries of CRC and CLCPRO: Algeria, Egypt, Iraq, Jordan, Mauritania, Morocco, Oman, Saudi Arabia, Sudan and the United Arab Emirates. Three of the trainees (from Iraq, Morocco and Emirates) were pilots, and the remaining trainees were either Plant Protection or Locust Officers;



A group photo of participants on the Aerial Spraying Techniques of Desert Locust (19-23 Feb. 23 - Saudi Arabi

## Arab Society for Plant Protection News

### New Email address for the Arab Journal of Plant Protection

Starting January 2023 the Arab Society of Plant Protection established a new email address for the Arab Journal of Plant Protection. All new manuscripts or follow-up on already submitted articles should be addressed to the following email address: [ajpp@arabjournalpp.org](mailto:ajpp@arabjournalpp.org). In addition, all reviewers should send their evaluations to the new email address. Meanwhile, the old email address will remain functional until October 2023. The new email address has a much larger capacity, and authors who submit articles will no more receive delivery failure notices.

### The 14<sup>th</sup> Arab Conference of Plant Protection

The Higher National School of Agronomy in Algeria(ENSA) has graciously agreed to host the 14th Arab Congress of Plant Protection Sciences in the fall of 2025. A detailed letter was sent on March 23 to the Director, Professor Dr Hartani Tarik, explaining all the conference details and requirements.





## Aspp organize a workshop in collaboration with basrah university “phytosanitary technologies in plant propagation and distribution and their role in food security”.15-16 may 2023

The Faculty of Agriculture, Basrah University, Iraq, in collaboration with the Arab Society for Plant Protection (ASPP) organize a regional workshop entitled “phytosanitary technologies in plant propagation and distribution and their role in food security” to be held at Oil Cultural Center in Basrah, Iraq during the period May 15-16, 2023.

### Workshop objectives

An important aspect of a healthy crop is to reduce the risk of the introduction and avoid the spread of pests, to ensure that these pests cannot threaten food security. Various phytosanitary procedures have been established to minimize the risk of pest transmission through plant propagation materials, including seeds, and providing farmers access to such quality propagation material is crucial for food production and biodiversity. This workshop is intended to expose participants (graduate students, research scientists, extension and quarantine workers, policy makers)

to the advances made so far to reduce the risk of pest’s invasion and the production of healthy high-yielding crops by farmers. Actions that provide farmers with healthy (pest-free) propagation material avoid more efforts being needed at the farm level to ensure food security. The workshop will also be an opportunity for scientists in Iraq and the neighboring countries to present the most recent research results in areas related to the workshop themes, share benefits and discuss means and ways how to improve it. Furthermore, the workshop will be an opportunity to create new partnerships through collaborative projects at the national, regional and international levels.

### Workshop themes

Participants are encouraged to give presentations that falls under any of the following themes:

- » Phytosanitary risk management
- » Importance of phytosanitary regulations for plant health to enhance food security
- » Importance of establishing pest surveillance system to improve plant health and increase food production
- » National mitigation strategies for emerging invasive pests
- » Improved phytosanitary strategies for pest surveillance
- » Production and distribution of certified healthy seeds (vegetables, cereals, legumes)
- » Production and distribution of certified healthy vegetative propagation materials (citrus, date palm, olives, stone fruits, grapes)
- » How to minimize mycotoxin contamination in plant propagation material, especially seeds.

**workshop coordinator Dr. Mohamed Amer Fayadh (email: muamer2010@yahoo.com)**



## Plant protection graduates between hope for a decent life or unemployed

At the kind invitation of the chairperson of the Plant Protection Department and within the activities of job counseling for the students of the department at the College of Agriculture, the University of Jordan, Professor Dr. Ibrahim Al-Jboory, the past president of the Arab Society for Plant Protection presented a lecture on March 8, 2023, entitled "Plant Protection Graduates between Hope for a



Decent Life or the Unemployed" The lecture was attended by Prof. Dr. Ahmed Katbeh, responsible for career counseling in the department and Vice President of the Arab Society for Plant Protection, and Dr. Kholoud Al-Ananbeh, Head of the Department, Dr. Nihaya Al-Karabliya, Dr. Wissam Obeidat and Eng. Wafaa Nasr and more than 50 students. Al-Jboory gave the lecture for the third time in three consecutive years, each time an update was added to it according to the available developments in the agricultural sector. This year he briefly highlighted the most important pests that concern plant protection workers as an introduction to the intervention and after that, according to his experience and experience that exceeded forty years in agricultural and occupational work, he presented to the students a group of precious ideas and opportunities available in Jordan and other Arab countries for field work, as well as prompting many of them to enroll in postgraduate studies to broaden their perceptions and enter the field of minor specialization.

Al-Jboory saw that students have the desire to develop their cognitive and methodological abilities based on what they learned at the university, and he also felt that there was a competition to excel and complete education or enter the field of agricultural work. He wish the students excellence and success in their work, and certainly we all stand with them hand in hand to help and enlighten them if they need that.

## NEWS OF ASPP MEMBERS ABROAD

### Studies of *Fusarium virguliforme* causing sudden death syndrome of soybean

**Ramiz Mahdi Saleh Alabdalsaid**, born in Basrah 1978- Iraq. Held a bachelor's degree in Agricultural Sciences from the Agricultural college - Department of Plant Protection at the University of Basrah in 2000. Also, held a master's degree in plant pathology from the same department and college in 2004. Joined in Agricultural Sciences at Southern Illinois University in the United States of America, and obtained Doctorate in plant pathology in 2021. Currently, work as an Associate professor with 18 years of experience. Took the position, the head of the department of date palm varieties and diseases. Also was the associate of date palm research center director. A faculty member at the date palm research center / University





of Basrah, teaches at the College of Agriculture - University of Basrah. He accomplished and published several scientific research papers. The dissertation title was **Studies of *Fusarium virguliforme* causing sudden death syndrome of soybean.** *Fusarium virguliforme* is a problematic pathogen for soybean farmers worldwide, causing a sudden death syndrome that can destroy entire crops. This pathogen is soil-borne, persisting in the form of chlamydospores for a long time, reaching up to 15 years, and waiting to strike when conditions are just right. This study aimed to uncover the secrets of this difficult-to-find pathogen, shedding light on its behavior and providing critical insights into its life cycle. By gaining a deeper understanding of the mechanisms and habits of the pathogen *F. virguliforme*. Also, to detect the pattern of root colonization by the pathogen in soybean varieties, resistant and susceptible.

Furthermore, how both soybean genotypes responded to the pathogen attack was analysed. By shedding light on these aspects of plant-fungus interactions, we can better understand the complex relationship between soybeans and *F. virguliforme*, potentially leading to better crop management practices and disease control strategies. **(Doctorate, 2023).**

### **Nanopore technology applied to targeted detection of tomato brown rugose fruit Virus allows sequencing of related Viruses and the Diagnosis of Mixed infections.**

Tomato (*Solanum lycopersicum*) plants from a commercial glasshouse were identified with symptoms compatible with a tomato brown rugose fruit virus (ToBRFV) infection. Reverse transcription-PCR and quantitative PCR confirmed the presence of ToBRFV. Subsequently, the same RNA sample and a second from tomato plants infected with a similar tobamovirus, tomato mottle mosaic virus (ToMMV), were extracted and processed for high-throughput sequencing with the Oxford Nanopore Technology (ONT). For the targeted detection of ToBRFV, the two libraries were synthesized by using six ToBRFV sequence-specific primers in the reverse transcription step.

This innovative target enrichment technology enabled deep coverage sequencing of ToBRFV, with 30% of the total reads mapping to the target virus genome and 57% mapping to the host genome. The same set of primers applied to the ToMMV library generated 5% of the total reads mapping to the latter virus, indicating that sequencing of similar, non-target viral sequences was also allowed. Further, the complete genome of pepino mosaic virus (PepMV) was also sequenced from the ToBRFV library, thus suggesting that even using multiple sequence-specific primers, a low rate of off-target sequencing can usefully provide additional information on unexpected viral species coinfecting the same samples in an individual assay.

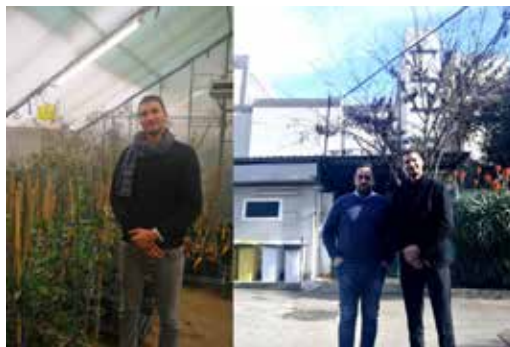
These results demonstrate that targeted nanopore sequencing can specifically identify viral agents and has sufficient sensitivity towards non-target organisms to provide evidence of mixed virus infections. **[Abou Kubaa, Raied, Serafina Serena Amoia, Giuseppe Altamura, Angelantonio Minafra, Michela Chiumenti, and Fabrizio Cillo. Institute for Sustainable Plant Protection—National Research Council, Bari, Italy. Department of Soil, Plant and Food Sciences, University of Bari Aldo Moro, Bari, Italy. Research, Experimentation and Education Centre in Agriculture (CRSFA) “Basile Caramia”, Locorotondo, Italy, Plants, 12(5), 999, 2023].**

<https://doi.org/10.3390/plants12050999>



## Visit to the National Research Council of Italy (IPSP-CNR), Bari, Italy

Within the framework of scientific collaboration in the field of plant pathology protection, Dr. Kherroubi Mounir, a professor and researcher at the Higher School of Bashir Brahimi in Kobba, Algeria, visited the National Research Council of Italy (IPSP-CNR), Bari, Italy, from 10/01/2023 to 17/01/2023. During this visit, Mr. Mounir observed all relative protocols to the detection and identification of *Xylella fastidiosa* (DNA extraction, qPCR, ...) in the laboratory, as well as symptoms induced by this bacterium on different host plants such as olives, almonds... etc and under the supervision of Dr. Raied Abou Kubaa. During this visit, the potential threats in the Algerian-Italian Mediterranean region were also discussed, with the possibility of collaboration between the two institutions in future international projects to detect the bacterium and/or limit its spread in the Mediterranean region.



This visit was concluded in preparing a memorandum of understanding to be signed between the two parties for joint coordination and exchange of experiences and researchers between the two laboratories.

## King Saud University in Riyadh, Kingdom of Saudi Arabia, hosted the International Conference & Exhibition for Science (ICES2023)

King Saud University in Riyadh, Kingdom of Saudi Arabia, hosted the International Conference & Exhibition for Science (ICES2023) with the participation of elite experts, researchers and academics from 80 countries around the world from February 6-8, 2023. From the Arab Society for Plant Protection, Dr. Raied Abou Kubaa, a researcher at the National Research Institute of Italy (CNR) Institute for Sustainable Plant Protection (IPSP-Bari), Italy, participated in the conference in collaboration with Prof. Khaled Al-Alhudaib, King Faisal University in Al-Ahsa and Eng. Abdulaziz Al-Zamil, the National Center for the Prevention and Control of Plants and Animal Diseases (WEQAA) in Riyadh. The research entitled: Insights into the emerging plant pathogen *Xylella fastidiosa* with particular emphasis on the case of Saudi Arabia, was presented. At the conference, Abou Kubaa presented an introduction about the bacterial disease, the current situation in Italy, the Mediterranean basin and some Middle Eastern countries, symptoms of the disease on different host plants, the prevention methods and some recommendations to avoid the entry of the disease into the Kingdom of Saudi Arabia. On the side-line of the conference, a meeting was held at the WEQAA center in Riyadh, which included the researchers and in the presence of Mr. Eng. Ayman Al-Ghamdi, CEO of WEQAA center, and Eng: Abdulaziz Al-Shuraidi, National Director of the Integrated Pest and Plant Diseases Project.



### Xylella: Science at the Heart of Solutions, a Congress in Bari

On **16,03,2023**, the Institute for sustainable plant protection of the National Research Council (CNR-IPSP) in Bari, organized, at the Polytechnic of Bari, the meeting “Xylella Emergency, science to the Center of Solutions”. The event, which included in the celebrations of the Centenary of the



CNR, illustrated the contribution of the institute in tackling the epidemic that has destroyed the olive sector, particularly in Puglia region. The most recent researches on this subject were also illustrated, with the aim of strengthening the interactions between the scientific world and operators in the agricultural sector. The meeting was held ten years after the discovery of *Xylella fastidiosa* in the olive trees of Salento. The works were introduced by the Rector of the Polytechnic of Bari Francesco Cupertino, the Director of the Department of Soil, Plants and Food of the University of Bari Aldo Moro Maria De Angelis, the vice president of the Scientific Council of the CNR and ordinary Chemist of the University of Bari Aldo Moro Luisa Torsi. The President of the CNR, Maria Chiara Carrozza also spoke via video link. The Director of the CNR-IPSP, Mauro Centritto and the two researchers Donato Boscia and Maria Saponari, were also among the leading experts on the disease. Among the most significant results was the first identification of two varieties of olive trees - Leccino and FS-17 - with resistance characteristics, which allowed a first derogation from the ban on planting species susceptible to the bacterium in the Apulian areas affected by the epidemic. With regard to the FS-17 variety, the subject of a CNR patent is now close to expiring; the project, which aimed at registration within the National Voluntary Qualification System, was illustrated to accompany the free multiplication of the variety by ensuring a “certification” guarantee of health and genetic identity. The meeting continued with a round table attended by institutional personalities and industry experts. **[By Dr. Raied Abou Kubaa, a researcher at CNR-IPSP, Bari, Italy,2023]**

### Landscape and Vegetation Patterns Zoning Is a Methodological Tool for Management Costs Implications Due to *Xylella fastidiosa* Invasion.

*Philaenus spumarius* (Linnaeus 1758, hereafter *Ps*) is considered one of the main insect vectors responsible for the spread of an alien biota, *Xylella fastidiosa* (Wells 1987, hereafter *Xf*), in the Salento area, Apulia region (Southern Italy). Effective management of this biological invader depends on the continuous surveillance and monitoring of its insect vector. As such, this research elicits the invasion drivers (i.e., landscape and vegetation indicators) that influence the abundance and dynamics of this vector and, consequently, the spatial spread of this bacterium in this Italian region. For this purpose, a spatial pattern clustering methodological approach is considered. The results reveal that spatial variation and territorial differentiation may differ from zone to zone in the same invaded area, for which effective management and monitoring planning should be addressed. Further, six agro-ecosystems zones have been identified with respect to five indicators: (i) vegetation index, (ii) intensity of cultivation, (iii) cultural diversity, (iv) density of agricultural landscape elements, and (v) altitude. This paper has public implications and con-

tributes to understanding how zoning of an infected area, by an alien biota, into homogenous zones may impact its effective management costs. This approach could also be applied in other countries affected or potentially affected by the phenomenon of *Xf* invasion. [Bozzo, Francesco, Michel Frem, Vincenzo Fucilli, Gianluigi Cardone, Paolo Francesco Garofoli, Stefania Geronimo, and Alessandro Petrontino. Department of Agro-Environmental and Territorial Sciences, University of Bari—Aldo Moro, Via Amendola 165/A, 70126 Bari, Italy. Sinagri Srl, Spin Off of the University of Bari—Aldo Moro, Via Amendola 165/A, 70126 Bari, Italy. Lebanese Agricultural Research Institute, Zone El Roumieh, Qleiat, Keserwan, Lebanon. Mediterranean Agronomic Institute, CIHEAM BARI, Via Ceglie 9, Valenzano, 70010 Bari, Italy. Department of Environment, Landscape and Urban Quality, Apulia Region, Via Giovanni Gentile 52, 70126 Bari, Italy, 2022. Land 11, no. 7: 1105. <https://doi.org/10.3390/land11071105>

### Isolation and Molecular Characterization of *Xylella fastidiosa* with Proactive Sustainable Management

*Xylella fastidiosa* is a xylem-limited quarantine plant bacterium, it attacks a large number of plant species causing various symptoms ranging from chlorosis to plant dieback. These symptoms result from the colonization of xylem tissues by the bacterium, blocking the plant's transport of water and mineral elements. The disease can have a very significant impact from an economic, environmental and social point of view. Despite considerable research efforts, neither a direct treatment nor an efficient strategy has yet been developed for combatting *Xylella*-associated diseases. The objectives of this thesis work are i) Proactive sustainable management of *Xylella fastidiosa* (Xf) ii) Molecular characterization of *Xylella fastidiosa* subsp. *pauca* ST53, and iii) Ecological biocontrol using antimicrobial peptides (AMPs). Due to the great diversity of climatic zones of Xf and



to evaluate the risk of potential establishment within countries free of the disease, herein the case of Morocco, surveys were carried out in different regions of Morocco, Tangier, Beni Mellal, Marrakech, Errachidia, Azilal, Meknes, Haouz and Gharb and on other plant crops of high economic value such as almonds, citrus and olives, to detect the presence of Xf. Results did not show any positive sample in the investigated areas, confirming that Morocco - up to this day - still remains a territory free of this bacterium. Owing to the vulnerable geographical position and climate of Morocco, trade, and the presence of potential vectors of Xf, and for proactive and sustainable management of Xf, it is considered necessary to understand the host plant's response mechanisms to Xf. To this end, an assessment of macro and microelements content mainly: Ca, Cu, Fe, Mg, Mn, Na, Zn and P in olive leaves as well as phenolic and flavonoids compounds, were carried out to develop hypotheses related to a possible resistance or susceptibility of the Moroccan olive trees to Xf infection. Our study revealed that the varieties 'Arbozana', 'Arbiquina', 'Menara' and 'Haouzia' could tolerate Xf infection to varying degrees containing high values of Mn (30 mg/kg), Cu (17 g/kg), phenolic compounds (16 mg GAE/g), flavonoids (13 mg GAE/g) and low values in Ca (13g/kg). Thus, providing additional support for the disease response of the resistant variety 'Leccino' and the two susceptible varieties 'Ogliarola salentina' and 'Cellina di Nardö'. In addition, molecular characterization of Xf was carried out following pure culture isolation of the bacterium from naturally infected host plants showing





symptoms related to Xf, *Olea europaea* L. *Polygala myrtifolia* and *Rosmarinus officinalis* collected in the region of Puglia in southern Italy. Prior to the isolation of the bacterium by two extraction methods which were printing and sap extraction, molecular VI DNA amplification techniques, RT-LAMP and qPCR were used to determine the presence or absence of bacteria in all hosts. Pure bacterial cultures were obtained from both *Olea europaea* L. and *Polygala myrtifolia* extracts plated in buffered cysteine-yeast extract (BCYE) media. Besides *Olea europaea*, *Polygala myrtifolia* seems to have a good potential for isolation, and the printing method has presented significantly better results. Two olive isolates were subsequently typed using the Multilocus Sequencing Typing (MLST), showing genetic commonality with De Donno (ST53) strain and ascertaining that the Apulia region still has the same sequence type ST53. To date, neither a direct treatment nor an efficient strategy has yet been developed for combatting Xylella-associated diseases. Defence compounds with highly effective mechanisms of action that could be of much value to combat this vector-borne pathogen are still needed.

Thus, we disclose the bioactivity of 9 AMPs (i.e. Ascaphin-8, Piscidin 1, BPI78, DASamP1, DASamP2, Maculatin 1.3, Lycotoxin I, 1036 and RIJK2), reported in the literature to be efficient on human and animal bacteria, i.e., *Escherichia coli*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa*, against Xf, through in-vitro and in-vivo experiments. Based on Viable-quantitative PCR (v-qPCR), fluorescence microscopy (FM), optical density (OD), and transmission electron microscopy (TEM) assays, peptides Ascaphin-8, DASamP1 and DASamP2 showed to have the highest bactericidal and antibiofilm activities, and being more efficient than the peptide PBI78, reported as one of 3 the most potent AMPs against Xf at present. Furthermore, these AMPs showed low to no toxicity when tested on eukaryotic cells. In the in-planta tests, no Xf disease symptoms were noticed in *Nicotiana tabacum* plants treated with the AMPs, 40 days post-inoculation. These results highlighted the high antagonistic activity of tested AMPs, Ascaphin-8, DASamP1, and DASamP2 candidates against Xf that could lead to the development of promising eco-managing Xf related diseases. **[Kaoutar Elhandi** successfully defended his doctoral thesis entitled “**Isolation and Molecular Characterization of *Xylella fastidiosa* with Proactive Sustainable Management and Biocontrol Using Antimicrobial Peptides**” at Moulay Ismail University, Faculty of Sciences (UMI), the National Institute of Agronomic Research of Meknes, Morocco (INRA Meknes), and the International Center for Advanced Mediterranean Agronomic Studies, Italy (CIHEAMBari) 2023].

## General News

**Announcing the Khalifa International Award for Date Palm and Agricultural Innovation Winners' names, in its Fifteenth session**

**Announcing the winners of the Distinguished and Innovative Farmer Award in the UAE, in its Fifth session.**

**H.E. Sheikh Nahayan Mabarak Al Nahayan: The Award has become a platform for international partnerships, in the field of Date Palm Development Sector.**





**H.E. Sheikh Nahayan Mabarak Al Nahyan, Minister of Tolerance and Coexistence, Chairman of Khalifa International Award for Date Palm and Agricultural Innovation Board of Trustees**, extended his sincere appreciation to the patronage, guidance and continuous support of **H.H. Sheikh Mansour bin Zayed Al Nahyan, Deputy Prime Minister, Minister of Presidential Court**, which contributed to strengthening the leading position of the United Arab Emirates in the development of the date palm cultivation sector nationally, regionally, and internationally, through cooperation with date producing countries, and concerned regional and international organizations. His Excellency also expressed his confidence in the efforts put by the Award's General Secretariat, which played an important role in building international partnerships for the development of this sector. Dr. Abdelouahhab Zaid, Secretary General of Khalifa International Award for Date Palm and Agricultural Innovation, during his speech at the press conference held on Monday, 20<sup>th</sup> of February, 2023, at Emirates Palace hotel, Abu Dhabi, in the presence of Dr. Helal Humaid Saed Al Kaabi, Member of the Award's Board of Trustees, Secretary General of the Abu Dhabi Quality and Conformity Council, and Mr. Mohammed Ghanem Al Mansouri, representative of Al Foah company, announced the names of the Khalifa International Award winners, in its Fifteenth session, as well as the winners of the Distinguished and innovative farmer Award in the UAE, in its Fifth session.

### **International Award Winners**

#### **Pioneering Development and Productive Projects category awarded to:**

- ❖ The Date Palm in Al Ain Oasis By: Al Ain City Municipality / UAE

#### **Distinguished Innovative Studies and Modern Technology category (Equally awarded to):**

- ❖ Early detection of red palm weevil using a distributed optical sensor By: King Abdullah University of Science and Technology & Ministry of Environment, Water and Agriculture, Date Palm Research Center, Al Ahsa / KSA

#### **And**

- ❖ The aminocyclopropane, carboxylic acid deaminase-producing *Streptomyces Viola-ceoruber*, UAE can protect from sudden decline syndrome on date palm By: Dr. Syn-an Abuqamar / UAEU / UAE In cooperation with ADAFSA, KCGEB & Murdoch University in Australia

#### **Influential Figure in the Field of Date Palm and Agricultural Innovation category (Equally awarded to):**

- ❖ Prof. Samir H. Al-Shakir, PhD / Iraq

#### **And**

- ❖ Prof. Ricardo Salomón Torres, PhD / Mexico

#### **Pioneering and Sophisticated Innovations Serving the Agricultural Sector category awarded to:**

- ❖ From Waste to Wealth: **By: Dr. Lai Kok Song / Higher Colleges of Technology / UAE**

#### **A vital leap and significant steps**

The Chairman of the Award's Board of Trustees referred 169 scientists representing 26 countries did participate in the Award's Fifteenth session.



### **Arge scita (Symphyta: Argidae): a potential emerging phytophagous for almond?**

Infestations of *Arge scita* (Mocsáry, 1880) were recorded for the first time in Italy in the summer of 2022. Almond trees showing severe leaf damage caused by the sawfly larvae feeding on the leaf lamina were recorded in the Salento peninsula of the Apulia region (southern Italy). Severely infested trees had a defoliated looking-appearance, with the lamina of the whole foliage completely consumed, with only the thick middle vein and petioles remaining attached to the trees. The occurrence of *A. scita* on the infested trees was confirmed by molecular and morphological characterization of specimens of larvae at different stages and adults. The simultaneous presence on the infested trees of eggs, larvae of different ages, cocoons and adults suggests that, most likely, this sawfly in our environmental conditions, behaves as a multivoltine species. Further investigations and surveys are needed to assess the life cycle and the host range and understand whether this phytophagous could represent a serious threat in areas where almond trees are cultivated. [Vincenzo Cavalieri, Angelo G. Delle Donne, Maria Saponari, Mauro Carrieri, Donato Boscia & Crescenza Dongiovanni. CNR - Istituto per la Protezione Sostenibile delle Piante, Sede Secondaria Di Bari, Bari, Italy Centro Di Ricerca, Sperimentazione e Formazione in Agricoltura “Basile Caramia”, Locorotondo (Bari), Italy. Servizio Fitosanitario, Regione Puglia, Italy. *Phytoparasitica* ,2023]. <https://doi.org/10.1007/s12600-023-01071-0>

### **Workshop: Opportunities and challenges of adopting an IPM system under local conditions March, 7, 2023**

Believing in the Egyptian Society of Integrated Pest Management (ESIPM) in the efforts made by research and governments in many developing countries over the past decades to encourage the adoption of the IPM system in solving pest problems while preserving health and the environment. With the agreement at the same time that the current situation indicates that the level of adoption of the system in such countries is still not satisfactory and at the most superficial levels. The ESIPM, in cooperation with the Agricultural Pesticides Committee, held a workshop on Tuesday, March 7, 2023, to encourage new ideas and to emphasize the importance of taking joint measures for all concerned parties through legislative, technical, economic, and social tracks to ensure the implementation of integrated pest management practices, and the growth and escalation of IPM products in the market. More than 45 scientists and specialists in plant protection from various research institutes participated in the workshop. Adding, about 200 participants from Egypt and 7 Arab countries via Zoom webinar. The workshop was organized and prepared to be a profound contribution to enhancing the efforts exerted in farmers' adoption of IPM in solving pest problems they face. To achieve this goal, the workshop focused on some essential themes active in this field, namely:

- » Challenges of implementing IPM and practical difficulties versus chances of success.
- « The current status of adopting IPM to solve agricultural pest problems in Egypt.
- » Options and tactics available for use within IPM programs.
- » The role of training, public awareness and farmers' acceptance in adopting the IPM system on a large scale.
- » Elements of success of a developed program for the management of Fall Armyworm in Egypt - Case study.

**El-Zemaity** added that an online opinion poll was conducted on the current situation of IPM implementation (via Google form), to which 95 participants responded. They agreed





in their responses, in different proportions, that:

1. The practices that farmers follow in solving pest problems are often what is known as integrated pest control and not integrated pest management in its true sense (60% range between agree and very agree).
2. IPM applications currently implemented include small farmers (92% disagree and agree to some extent).
3. Dissemination of the IPM system requires work on education and raising awareness among farmers (96% agree and very agree).
4. The prevailing control programs are often not evaluated at the end of each season (68% ranged between agree and very agree).
5. Predominantly control options are tested standalone rather than as a bundle with other IPM components (67% agree to agree very).
6. The prevailing applications for using chemical pesticides are carried out individually to solve the problem of pests (68% between somewhat agreeable and agreeable).
7. The prevailing IPM level is non-existent or low (72% between somewhat agreeable and acceptable).
8. There are challenges to implementing IPM on a large scale in Egypt (96% agree to agree strongly).
9. The challenges of implementing the IPM system in Egypt can be overcome (81% ranged between somewhat agreeing and agreeing).
10. There are opportunities to implement IPM on a large scale in Egypt (77% range between somewhat agreeable and agreeable).
11. There is a need for binding legislation/regulations for farmers to implement IPM (93% agree to agree very).
12. There is a need to establish a supervisory body or committee responsible for IPM (94% between agree and very agree).
13. The number of qualified or trained cadres currently available is sufficient to work on the dissemination of IPM (69% disagree and agree to some extent).
14. Qualifying specialized cadres to work as technical managers in the IPM (IPM manager) (94.5% between agree and very agree) is necessary.
15. There is an expected role for the certificates and labels accompanying the product, indicating that IPM practices are being followed in increasing the demand for such products and spreading the adoption of the system (82% between agree and very agree).
16. There is a need to oblige technicians and extension workers of commercial or industrial companies when dealing with farmers with integrated pest management (90.4% between agree and very agree).

On the other hand, the discussion and brainstorming session showed the necessary need to implement the system in a way that is compatible with our local conditions, and better compatibility with the requirements of the local and export markets, and keep abreast of developments in installing the system in many countries of the world, including the goals of the European green deal and the farm-to-fork strategy.

## Integrated Pest Management of Fruit and Vegetable Crops (IPM)

### Innovative Approaches and Technologies for an IPM of Mediterranean Fruit and Vegetable Crops Academic Year 2022- 2023

The Master course aims at training a new generation of motivated students towards professional and academic careers that could promote integrated pest management (IPM) strategies for sustainable intensification of tree and vegetable crops in the Mediterranean agroecosystems. The course deals with the management of plant pests and diseases with a focus on agroecological and food systems. Students will learn about the ecological and epidemiological traits of pests and pathogens, and how to apply innovative and smart technologies to diagnose, monitor and manage plant diseases. The course will launch innovative IPM strategies to cope with pests and diseases affecting the most important Mediterranean fruit and vegetable crops. In addition, risks connected to emerging transboundary pests and diseases will be highlighted and quarantine measures to prevent their introduction and the possible establishment will be analysed.

At the end of the course, students will know how to:

- » Analyse and build agroecosystems for sustainable management of pests and diseases;
- » Evaluate products for pests and disease control and their relevant regulations;
- » Develop tools for rapid and timely identification, diagnosis and monitoring of pathogens and pests;
- » Solve farm-related problems using biodiversity policy, resistant cultivars, graft combination
- » choices, rational application of pesticides and biological control methods;
- » Plan and implement IPM strategies in different ecosystems;
- » Exploit and apply preventive measures, i.e., plant quarantine measures and certification programmes for the control of important plant pests and diseases.

To apply for the degree, click on the link <https://bit.ly/3KtHRHi>



## Selected Research Papers

- **Developmental Differentiations of Major Maize Stemborers Due to Global Warming in Temperate and Tropical Climates.** Baptiste Régnier, Judith Legrand, Paul-André Calatayud and François Rebaudo, *Insects* , 14(1), 51, 2023.  
<https://doi.org/10.3390/insects14010051>
- **Selection and Comparative Gene Expression of Midgut-Specific Targets for *Drosophila suzukii*.** June-Sun Yoon, Seung-Joon Ahn and Man-Yeon Choi, *Insects* ,14(1), 76, 2023.  
<https://doi.org/10.3390/insects14010076>
- **Potential of Entomopathogenic Nematode HbSD as a Candidate Biocontrol Agent against *Spodoptera frugiperda*.** Yuan Chen, Haibo Long, Tao Jin , Zhengqiang Peng ,Yanfang Sun and Tuizi Feng, *Insects* , 14(1), 2, 2023  
<https://doi.org/10.3390/insects14010002>
- **Impact of Initial Population Density of the Dubas Bug, *Ommatissus lybicus* (Hemiptera: Tropiduchidae), on Oviposition Behaviour, Chlorophyll, Biomass and Nutritional Response of Date Palm (*Phoenix dactylifera*).** Nasser Al-Abri, Suad Al-Raqami , Maryam Al-Hashemi , Rashid Al-Shidi, Salim Al-Khatri and Rumiana V. Ray, *Insects* , 14(1), 12, 2023.  
<https://doi.org/10.3390/insects14010012>
- **Removal of Pesticides from Water and Wastewater: Chemical, physical and biological treatment approaches.** Iman A. Saleh, Nabil Zouari, Mohammad A. Al-Ghout, Volume 19, August 2020, 101026.  
<https://doi.org/10.1016/j.eti.2020.101026>
- **Endophytic and rhizobacteria functionalities in alleviating drought stress in maize plants.** Victor Funso Agunbiade, Olubukola Oluranti Babalola, *Plant Protection Science*, 59(1): 1–18, 2023.  
[DOI: 10.17221/61/2022-PPS](https://doi.org/10.17221/61/2022-PPS)
- **Endophytic fungi and their potential in controlling white root disease of cashew.** Fitra Parlindo, Suryo Wiyono, Efi Toding Tondok, *Plant Protect. Sci.*, 59(1):73-91, 2023.  
[DOI: 10.17221/134/2021-PPS](https://doi.org/10.17221/134/2021-PPS)
- **Characterization, expression analysis and RNAi-mediated knockdown of two aquaporin genes in the cotton leafworm, *Spodoptera littoralis* (Lepidoptera: Noctuidae).** Sayed KHALIL, Shimaa EL-GAMAL, Samir IBRAHIM, Sawsan ELATEEK, *Eur. J. Entomol.* 120: 15-25, 2023.  
[DOI: 10.14411/eje.2023.003](https://doi.org/10.14411/eje.2023.003)



# PAPERS published in THE Arab Journal of Plant Protection (AJPP), Volume 41, issue 1, March 2023

## BIOLOGY

### Relative Feeding Potential and Biology of Fall Armyworm, *Spodoptera frugiperda* Fed on Different Host Plants

M.I. Ullah, M. Arshad, W. Ahmed, N. Altaf, A. Arroj and M. Afzal (PAKISTAN)

Pages 1-7

<https://doi.org/10.22268/AJPP-41.1.001007>

## SURVEY

### Survey of Citrus Nematode *Tylenchulus semipenetrans* Causing Citrus Slow Decline in Karbala Province of Iraq

W.J.A. Jabbar and E.M. Abedulridah (IRAQ)

Pages 8-11

<https://doi.org/10.22268/AJPP-41.1.008011>

### First Record of the Eucalyptus Gall Wasp, *Ophelimus maskelli* (Ashmead) in Nineveh Governorate, Iraq

H.M.M. Al-Jalal and W.A. Yahya (IRAQ)

Pages 12-14

<https://doi.org/10.22268/AJPP-41.1.012014>

### The First Record of *Ero aphana* (Araneae: Mimetidae) in Egypt

M.A.R. Sawers, S.M.O. El-Bishlawy, M.F. Hassan and G.M.S. Sallam (EGYPT)

Pages 15-17

<https://doi.org/10.22268/AJPP-41.1.015017>

## CONTROL

### Studying the Efficiency of Essential Oil Blends with the Pesticide Abamectin against Adult and Larvae of *Trogoderma granarium* (Everts)

D.H.H. Al Mansoori, F.S. Al Bayati and S.M. Jawad (IRAQ)

Pages 18-27

<https://doi.org/10.22268/AJPP-41.1.018027>

### A Study on the Toxicity and Sublethal Concentrations of Three Insecticides on the Population Dynamics of Green Lacewing *Chrysoperla carnea* Stephens

A. Alsendi, A.A. Kareem, M. Havasi and Gh. Golmohammadi (IRAN & IRAQ)

Pages 28-36

<https://doi.org/10.22268/AJPP-41.1.028036>

### Control of *Spodoptera exigua* Which Attacks Pepper Crop in Armenia Using Different Chemical Insecticides

H.L. Terlemezyan and M.H. Ghazaryan (ARMENIA)

Pages 37-39

<https://doi.org/10.22268/AJPP-41.1.037039>

### Lethal and Sublethal Effects of Mixed Pesticides on *Tetranychus urticae* Koch and its Predator *Phytoseiulus persimilis*

D.A.M. Abdou, M.M. Elbokl, A.E.M. Abd Elmageed and M.G. Habashy (EGYPT)

Pages 40-47

<https://doi.org/10.22268/AJPP-41.1.040047>



## BIOLOGICAL CONTROL

### **Biology and Feeding Potential of the Predator, *Hippodamia convergens* Guér., on Four Aphid Species Under Laboratory Conditions**

A.A.A. Saleh, H.S. El-Tahawe, H. El-Nagar and A.S. Jabbar (EGYPT & IRAQ)

Pages 48-53

<https://doi.org/10.22268/AJPP-41.1.048053>

## PLANT EXTRACTS

### **Evaluation of the Efficacy of Commercial Plant Extracts of Palazin and Tondxier Against the Red Flour Beetle *Tribolium castaneum* (Herbest) Under Laboratory Conditions**

N.C.H. Al-Fatlawi and S. Al-Zurfi (IRAQ)

Pages 54-57

<https://doi.org/10.22268/AJPP-41.1.054057>

### **Effect of Humic Acid and Henna Extract *Lawsonia inermis* on Dubas Bug *Ommatissus binotatus* on Date Palm Trees in the South of Iraq**

G.F. Al-Saedi (IRAQ)

Pages 58-64

<https://doi.org/10.22268/AJPP-41.1.058064>

## DISEASE PHYSIOLOGY

### **Detection of the Enzymes and Toxins Produced by the Pathogenic Fungi that Cause Chias Pollen Disease on Different Date Palm Cultivars in Iraq**

Kh.A. Mohamed and M.A. Alfahd (IRAQ)

Pages 65-70

<https://doi.org/10.22268/AJPP-41.1.065070>

## INDUCED HOST RESISTANCE

### **Efficiency of Different Local Isolates of *Bacillus subtilis* in Inducing Resistance Against Tomato spotted wilt virus in Pepper Plants**

H.H. Ali, A.H. Mohamed and R.N. Mhed (IRAQ)

Pages 71-76

<https://doi.org/10.22268/AJPP-41.1.071076>

## MOLECULAR STUDIES

### **High-Throughput Sequencing and Bioinformatic Analysis Reveal Presence of the Endogenous Pararetrovirus Tobacco vein clearing virus Genome in the Tomato (*Solanum lycopersicum*) Host Genome**

M.O. Abass and A.A. Lahuf (IRAQ)

Pages 77-84

<https://doi.org/10.22268/AJPP-41.1.077084>

## REVIEW PAPER: BENEFICIARY INSECTS

### **Defense Behavior of Honeybee *Apis mellifera* L. Hives: A Review**

M.A.A.W. Al-Etby (IRAQ)

Pages 85-92

<https://doi.org/10.22268/AJPP-41.1.085092>

## SELECTED GLOBAL PESTS

- ❖ **Asian Longhorned Beetle, *Anoplophora glabripennis* (Coleoptera: Cerambycidae), detected in Switzerland.** In August of 2022, Asian longhorned beetle, *Anoplophora glabripennis* (Coleoptera: Cerambycidae), was found infesting *Acer* spp. (maple), *Salix* sp. (willow), and other tree species in Switzerland. Phytosanitary measures have been implemented. *Anoplophora glabripennis* is a pest of *Acer* spp., *Populus* spp. (poplar), *Salix* spp., and *Ulmus* spp. (elm). *Anoplophora glabripennis* has been reported from Lebanon and parts of Europe, Asia, and North America. In the United States, *A. glabripennis* is under official control in Ohio, New York, Massachusetts, and South Carolina. **References:** Kanton Luzern. 2022. Asiatischer Laubholzbockkäfer in Zell: Erste Zwischenbilanz der Berkämpfungsmassnahmen. Kanton Luzern. November 21, 2022. Last accessed January 26, 2023, from <https://bit.ly/3HC9eP4>
- ❖ **2023/034-First Report of *Spodoptera frugiperda* in Cyprus.** The NPPO of Cyprus recently informed the EPPO Secretariat of the first record of the fall armyworm *Spodoptera frugiperda* on its territory. Three moths were trapped by an amateur entomologist with a light trap in January 2023 in a private garden in Pissouri Village (Limassol district). The identity of the pest was confirmed by the National reference laboratory of Cyprus as well as by the EU reference laboratories based on morphology and molecular tests. Official surveys are planned to delimit the extend of the infestation. It is noted that in the area around the trap, there are no maize (*Zea mays*) crops. The other major host plants, rice (*Oryza sativa*) and sugarcane (*Saccharum officinarum*) are not cultivated in Cyprus whilst *Sorghum bicolor* is cultivated only in a few areas. The pest status of *Spodoptera frugiperda* in Cyprus is officially declared as: Present, under eradication. **Source: NPPO of Cyprus (2023-02). Pictures: *Spodoptera frugiperda*.** <https://gd.eppo.int/taxon/LAPHFR/photos>
- ❖ **2023/035 First Report of *Spodoptera frugiperda* in Türkiye.** The fall armyworm, *Spodoptera frugiperda* (Lepidoptera: Noctuidae – EPPO A2 List) is reported for the first time from Türkiye. The pest was found in Adana province during surveys conducted in maize (*Zea mays*) fields during 2022. *S. frugiperda* was identified based on morphological characteristics of collected larvae. In addition, typical damage was observed on young maize plants. In September/October 2022, further surveys were carried out in the province of Adana in 4 maize fields and all of them were found to be infested. It is noted that further work is needed on the distribution, host plants, damage, and potential natural enemies of *S. frugiperda* in Türkiye. The situation of *Spodoptera frugiperda* in Türkiye can be described as follows: Present, not widely distributed. **Source: Pehlivan S, Atakan E (2022) First record of the fall armyworm, *Spodoptera frugiperda* (J.E. Smith, 1797) (Lepidoptera: Noctuidae) in Türkiye. Çukurova Journal of Agricultural and Food Sciences 37(2), 139-145.** Pictures: *Spodoptera frugiperda*. <https://gd.eppo.int/taxon/LAPHFR/photos>



## Events of interest

<b>2023 /5 /15-18</b>	2 <sup>nd</sup> International Molecular Plant Protection Congress, BURSA, TÜRKİYE <a href="https://www.imppc2023.org/en">/https://www.imppc2023.org/en</a>
<b>8/2023/ 20-25</b>	in Lyon, France. <a href="https://www.icpp2023.org">https://</a> (12 <sup>th</sup> International Congress on Plant Pathology (ICPP2023 <a href="https://www.icpp2023.org">/www.icpp2023.org</a>
<b>2023 /8/ 20</b>	4 <sup>th</sup> European conference on <i>Xylella fastidiosa</i> . Lyon, France. <a href="https://bit.ly/3TB-jtHz">https://bit.ly/3TB-jtHz</a>
<b>2023 /10/ 5-8</b>	XIV International Agriculture Symposium “AGROSYM 2023” Jahorina, Bosnia and Herzegovina. <a href="http://agrosym.ues.rs.ba">http://agrosym.ues.rs.ba</a>
<b>2023 /10/ 16-19</b>	The 6th International Rice Congress (IRC 2023) MANILA, PHILIPPINES <a href="https://www.irri.org/IRC2023-teaser.html">https://www.irri.org/IRC2023-teaser.html</a>

The CNR IPSP and the University of Bari research groups visited an orchard with diverse olive cultivars to be tested for resistance to *Xylella*. The trial is in the Salento epidemica area in which plants are exposed to natural infections and is carried out in the frame of the Project Biosavex.



On the sidelines of his lecture at the University of Jordan, Dr. Ibrahim AL-Jboory, the former president of the Arab Society for Plant Protection, accompanied by the vice-president of the society, Dr. Ahmed Katbeh and Dr. Wassim Obeidat, visited the virus experiments carried out by the distinguished virologist Dr. Nidaa Salem, accompanied by one of her students.



Eng. Iman Merabti, a PhD student from Ben Tofail University in Kenitra, Morocco, is attending a training course at the Institute for Sustainable Plant Protection, Italian National Research Center (IPSP-CNR) within the CURE-XF project. Italian experts from the same institute.



**The Editorial Board of The Arab and Near East Plant Protection Bulletin Highly Appreciates the Contribution of Several Arab Scientists in This Issue, namely:**

Abdulnabi Bashir(Syria), Wazeer Ali Hassan (Iraq), Mohammed Mahdie Mazaal(Iraq), Nadia Ibrahim Al-Khateeb (Syria), Alaa Turkey Saleh (Syria), Zakaria Al-naser (Syria), Dr. Abdelouahhab Zaid (UAE), Ziad Aleisa (Syria), Ramiz Mahdi Saleh Alabdalsaid(Iraq), Eman A.I. Ali (Egypt), Mohammad Matar(Syria), Mahran Zeity (Syria), Takwa Wannassi (Tunisia), Kaoutar Elhandi (Morocco), Peshawa Hama Gharaib (Iraq), Emad Mahmood Al-Maarouf (Iraq), Zinette Mousa (Lebanon), AlSarai Alalawi Mamoon (FAORNE), Heba Tokali (FAO-Egypt), Yosra Ahmed (FAORNE), Samar Negida(FAORNE).

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**The bulletin's editorial board invites the society members to send their scientific findings and news related to plant protection in Arab countries and elsewhere. We also invite scientists studying abroad to share their information and achievements with colleagues in this bulletin.**

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ASPP Office, P.O. Box 113-6057, Beirut, Lebanon; Tel/Fax: (+961-1) 809173

E-mail: [aspp@arabjournalpp.org](mailto:aspp@arabjournalpp.org)

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